

# System PIE

## The Primary Phoneme Inventory and Sound Law System for Proto-Indo-European

Jouna Pyysalo

**ACADEMIC DISSERTATION**

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Der wahre Grund, warum es Comte nicht gelang, ein unlösbares Problem zu finden, besteht meiner Meinung nach darin, daß es ein unlösbares Problem überhaupt nicht gibt. Statt des törichten Ignorabimus heiße im Gegenteil unsere Lösung: *Wir müssen wissen, Wir werden wissen.*

DAVID HILBERT

*Naturerkennen und Logik (1930)*

## ABSTRACT

The Indo-European sound laws are the best known of all language families. Yet many sound laws remain incompletely formulated due to a failure in the interpretation of the Old Anatolian laryngeal. The postulation of multiple laryngeals (at least three in the mainstream laryngeal theory) has led to a significant detour in the reconstruction of Proto-Indo-European (PIE).

A single laryngeal PIE \* $\text{h}_2$   $\equiv$   $\text{H}_2$  was already discovered by Ladislav Zgusta (1951), however, and subsequently it was confirmed by Johann Tischler (1977ff.). The current dissertation studies unexplored properties of PIE \* $\text{h}_2$  and demonstrates that this laryngeal had a voiceless (PIE \* $\text{h}$ ) and a voiced (PIE \* $\text{h}_1$ ) variant with glottal fricative articulation. PIE \* $\text{h}_2$  appears with PIE \* $\text{a}$  in diphonemic PIE \* $\text{h}_2\text{a}$  and \* $\text{a}\text{h}_2$ .

This solution to the laryngeal problem allows for a clarification of the relationship between PIE \* $\text{h}/\text{h}_1$  and the rest of the phoneme inventory. Segmental analysis results in System PIE, the primary phoneme inventory for Proto-Indo-European consisting of

PIE \* $\text{a}/\bar{\text{a}}^?$  \* $\text{e}/\bar{\text{e}}$  \* $\text{h}/\text{h}_1$  \* $\text{i}/\bar{\text{i}}$  \* $\text{k}/\text{g}$  \* $\text{l}/\bar{\text{l}}$  \* $\text{m}/\bar{\text{m}}$  \* $\text{n}/\bar{\text{n}}$  \* $\text{o}/\bar{\text{o}}$  \* $\text{p}/\text{b}$  \* $\text{r}/\bar{\text{r}}$  \* $\text{s}/\text{z}$  \* $\text{t}/\text{d}$  \* $\text{u}/\bar{\text{u}}$ .

The phoneme inventory of System PIE is minimal: it cannot be reduced and it is sufficient to generate attested Indo-European forms. Accordingly, the import of System PIE for Indo-European linguistics is comparable to mastery of the building blocks of DNA.

In addition, the dissertation modernizes the essential Indo-European sound laws in terms of the laryngeal PIE \* $\text{h}/\text{h}_1$ . Due to the advanced stage of Indo-European linguistics, no entirely new sound laws are presented, because the yet remaining problems of the traditional sound laws reflect the absence of the comparative interpretation of the Old Anatolian laryngeal.

The scientific framework used in this study is the comparative method of reconstruction, recognized as a branch of natural science already by August Schleicher. The dissertation contributes to the development of the field by explicating the comparative method by means of predicate calculus, including a precise formulation of Schleicher's intuitive description of the decision method for Indo-European etymology. As such, the reconstruction theory System PIE can be digitalized (i.e. turned into a programming language that can generate Indo-European data from reconstructions).

The most reliable etymological and standard dictionaries are used as the material of the dissertation. While these sources present the data and etymological suggestions that exist to date, no full comparative conclusions have yet been drawn. As a contribution to this vital area of the field, the dissertation presents hundreds of new etymologies, which serve as preliminary examples of the Proto-Indo-European Lexicon (PIE Lexicon), a digital etymological dictionary of Indo-European languages that will be published at <http://pielexicon.hum.helsinki.fi>.

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In many ways, this dissertation reflects my academic career.

My studies at the University of Helsinki began with Classical Greek under the able instruction of Prof. Maarit Kaimio, Prof. Jaakko Frösen, Prof. Paavo Castrén and Dr. Erkki Sironen. The demands and discipline of my subsequent M.A. studies inculcated in me the value of thorough philological competence in that language, something for which I owe gratitude to these professors and many others. Latin was a natural continuation of Greek, taught to me by Prof. Olli Salomies and others. Later I became familiar with the rest of the ancient Italic dialects, and it is my great pleasure to thank the Latinists for their assistance in this regard.

A solid foundation in the Sanskrit language was laid for me by Prof. Asko Parpola and Prof. Klaus Karttunen. Soon I became particularly interested in the Rig-Vedic language, which was thus added to my repertoire as well. Avestan and Old Persian were kindly introduced to me by Petri Pohjanlehto, a PhD student in the Central Asian Studies department, and I am very thankful for those who were involved in my training in Indo-Iranian as well.

Being already capable in several ancient Indo-European languages, it was natural that I would take up the task of learning them all. This process is still ongoing, but it is manageable—as demonstrated by my predecessor, Prof. Pentti Aalto. To this end, I have attended lectures by Prof. Anders Ahlquist in Old Irish, Dr. Kari Liukkonen in Lithuanian and Dr. Sanna Aro-Valjus in Hieroglyphic Luwian. I have benefited over the years from the knowledge of numerous individuals, including Prof. Jouko Lindstedt in Slavonic, and for this I am very grateful.

With time, I have gradually come to depend more and more on my own resources to learn languages on my own. As I became more familiar with the reconstruction of the Indo-European proto-language, I consequently graduated with a double M.A. degree in Indo-European linguistics under the kind and able supervision of Prof. Asko Parpola and Dr. Bertil Tikkanen.

Since embarking on my academic path, I have compiled digital dictionaries of Indo-European languages for my own personal use. Around the turn of the millennium, I combined these into an Indo-European etymological dictionary. My lexicographical interests had made me keenly aware of Oswald Szemerényi's (1996:31) words: "(...) the first task of the Indo-Europeanist is to work back to the fullest possible reconstruction of Indo-European." This proved to indeed be the case, as one can hardly compile a Proto-Indo-European dictionary without an adequate PIE phoneme inventory.

Having also learned the key Old Anatolian languages by this point, it had become clear to me for some time that the traditional (Neogrammarian)

reconstruction was outdated, in particular regarding the laryngeal. Yet my honeymoon with the laryngeal theory proved to be a short one. In discussions with Prof. Jorma Koivulehto, Prof. Raimo Anttila, Dr. Petri Kallio and Dr. Santeri Palviainen concerning the problems of the laryngeal theory, I discovered that its inaccuracies in the reconstruction of the data could not be overcome, and I am thankful to these scholars for helping me arrive at this conclusion.

When engaging in the actual writing of the dissertation, I had no other choice but to follow Darwin's example. Accordingly, "I worked on true Baconian principles, and [...] collected facts on a wholesale scale [...] grouping facts so that general laws or conclusions may be drawn from them." During this time, my academic advisors were Dr. Bertil Tikkanen, whose extensive capabilities in the field of phonetics and phonology have been a constant, reliable guidance; Dr. Martti Nyman, whose data-oriented attitude and insights into methodology were always held close; and Prof. Klaus Karttunen, whose steadfastness has always been a source of encouragement and calm.

My studies have always also included an interest in philosophy, in particular the theory of science, and therefore I followed lectures by Prof. Ilkka Niiniluoto, Dr. Heikki Kannisto and others. This interest further led me to study formal logic and mathematics under Prof. Lauri Myrberg, Dr. Juha Partanen and others. Later on, this interest would resurface in the form of language technology, and in that regard I am especially thankful to Prof. Kimmo Koskeniemi for our successful demos in coding the Indo-European sound laws of System PIE and to Mr. Aleksi Sahala, B.A.; both of them are most capable computer linguists, if I ever saw one.

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# 1 Comparative method of reconstruction in Indo-European

## *1.1 System PIE and comparative method as natural science*

### **1.1.1 Situation in the reconstruction of Proto-Indo-European**

§0. The situation of the PIE reconstruction changed decisively after Bedřich Hrozný's (1917) demonstration of the Indo-European origin of Hittite. A century later, it has become indisputable that Old Anatolian preserved a laryngeal segment Hittite  $\text{ḫ}$  that was lost in the languages on which the Neogrammarian phoneme inventory and sound law system were based. The laryngeal theory, with Møller's advancement of three laryngeals and the subsequent addition of variants, dates back to the pre-laryngeal period (1879-1880) and is based on a Semitic typology rather than Indo-European data. Accordingly, the theory cannot win the acceptance of comparatists, with the result that the study is in deadlock. With such a state of affairs, Szemerényi's (1967:92) assessment is more relevant than ever:

“What is really needed is a renewed, and unbiased, study of all the available Hittite evidence – with no attempt to force it into the strait-jacket of preconceived theories about IE ablaut or root-structure.”

Indeed, the problems with the study are caused by a lack of detailed comparative reconstruction based on the current body of greatly enriched data and the new segment PIE  $\text{*ḫ}$ , the missing link in the PIE phoneme inventory. It is well known that when data changes, theories also must change. It is not an exaggeration to say that Indo-European linguistics stands today in the very situation once sketched out by Karl Brugmann and Hermann Osthoff.<sup>1</sup>

“Ehe man weiterbaut, bedarf der ganze bau, soweit er bis jetzt dasteht, einer gründlichen revision.” (1878:xi).

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<sup>1</sup> The laryngeal is confirmed, owing to the traces of PIE  $\text{*ḫ}$  outside of Old Anatolian as well (e.g. in Rig-Vedic hiatus, regularly coinciding with  $\text{Ḫi. ḫ}$  in correspondences).

The quantitative and qualitative improvement of the presentation of the Indo-European material has reached a critical mass, allowing the solution of all major problems of PIE segmental phonology based on the comparative method of reconstruction. This window of opportunity will be explored in this study with a completely upgraded reconstruction theory, called System PIE, which is based on strict principles of natural science. In essence, System PIE consists of the primary phoneme inventory and the upgraded sound law system for Proto-Indo-European, with particular attention paid to the segmental laryngeal PIE \*h in all environments. As such, System PIE is designed to solve the critical problems of PIE phonology and open the way for a subsequent exploration of the breakthrough, especially in the fields of PIE morphology, etymology and the accent of the proto-language. Concerning these *Schwerpunkte*, the following preliminary remarks are presented.

§1. The reconstruction of the primary phoneme inventory (i.e. the phonetic and phonological component of System PIE) will not start from scratch. On the contrary, owing to the highly advanced stage of the study, the traditionally postulated proto-phonemes will serve as starting points for the case studies and solutions suggested by the comparative method will be presented for each question. In the order of appearance, the phonetic and phonological problems include:

(a) The problem of the Proto-Indo-European laryngeal PIE \*h has been preliminarily solved by the comparative school with the theory of monolaryngealism (der Monolaryngalismus). According to the proponents of this theory, there is one (and only one) laryngeal PIE \*h inductively obtainable from the Old Anatolian data. This result, originally discovered by Ladislav Zgusta (1951), has now been confirmed by Johann Tischler and his colleagues in *Hethitisches Etymologisches Glossar* (1977ff.), the most noteworthy and reliable etymological dictionary of Old Anatolian in existence.<sup>2</sup> The delay in the breakthrough of the theory has been caused by its approximate form, basically consisting only of the realization of the existence of a single PIE \*h. With an independent confirmation of the result, the study at hand continues with a complete study of PIE \*h, its properties, and the sound laws governing it in all environments. As a result, System PIE implements monolaryngealism as a full-scale reconstruction theory consisting only of postulates of the comparative method.

(b) As is well known, the problems of PIE \*h and PIE vocalism are closely knit together. At its apogee, the Neogrammarian vowel system of Brugmann contained eight cover symbols for the proto-vowels. The system was inductively reconstructed and it has the necessary minimum of phonemes required for a complete (and therefore valid) reconstruction theory. Although no additional correspondence sets have emerged in the new material, Brugmann's system is outdated, particularly in

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<sup>2</sup> In Pyysalo 2003, after comparing all the existing PIE reconstruction theories on the same material, I demonstrated the impossibility of the supported versions of multilaryngealism and concluded that monolaryngealism is the sole reconstructive possibility for Proto-Indo-European.

terms of the relation of the eight-vowel system to the laryngeal PIE \*h̥ consisting of three subsets:

1. The problem of Neogr. \*ə : a : ā ('a-vocalism') and PIE \*h̥.
2. The problem of Neogr. \*o : ō : â ('o-vocalism') and PIE \*h̥.
3. The problem of Neogr. \*e : ē ('e-vocalism') and PIE \*h̥.

The comparative solution to these main PIE ablaut problems and their relation to PIE \*h̥ is presented in Chapter 2.

(c) The problem of the resonants (or sonorants) PIE \*i u r l n m, both independently and in the environment of PIE \*h̥, is divided into:

1. The problem of semi-vowels/glides \*i, u (U) with and without PIE \*h̥.
2. The problem of liquids \*r l (L) with and without PIE \*h̥.
3. The problem of nasals \*n m (N) with and without PIE \*h̥.

The comparative solution of these problems is presented in Chapter 3.

(d) The problem of PIE obstruents, independently and in the environment of PIE \*h̥, is divided into three subsets:

1. The problem of four series of plosives (Neogr. \*T : Th : D : Dh).
2. The problem of three series of velars (Neogr. \*k : \*k̑ : \*k̑̑, etc.).
3. The problem of Indo-European fricatives (Neogr. \*s/z and PIE \*h̥).

The comparative solution of these problems is presented in Chapter 4.

(e) The problems of the PIE phoneme inventory are divided into nine subsets. To these may be added a tenth subset: their treatment in a comparatively consistent system. In order to establish the primary character of the phoneme inventory, it is demonstrated that no phonemes are absent in System PIE and that the inventory does not contain analyzable phonemes (i.e. System PIE is minimal).<sup>3</sup>

§2. PIE sound laws, comprising the phonological part of System PIE, are thoroughly upgraded (in particular, for PIE \*h̥), according to the comparative implications of the now enriched data. When necessary, the sound laws are analyzed in connection with the problems. Thus, Brugmann's Law and Osthoff's Law are upgraded in connection with the vowel system, Sievers's Law and Fortunatov's Law in connection with the resonant system and so forth until the segmental PIE sound laws have been completely revised.

§3. The key Indo-European (IE) languages for the reconstruction of PIE consist of the hundred most ancient languages from the last four millennia. Split into twelve main subgroups, the language family presents historical sound changes in a unique manner, similarly allowing the prospective reconstruction of their common ancestor, Proto-Indo-European (PIE). To date, thousands of scholars – from distinguished lexicographers to comparative linguists – have dedicated millions of man-hours to the coding of the material, making the most ancient Indo-European data finally available

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<sup>3</sup> Thus all historical proto-phonemes will be individually scrutinized for their existence and possible analytical (or 'polyphonemic') origin, ensuring that no items stand for simpler proto-phonemes (as is the case with Gr. ψ, ξ, etc.).

in a practically complete form.<sup>4</sup> The key features of PIE Lexicon, the etymological database of System PIE, form a synthesis of these efforts and can be characterized as follows:

(a) In terms of the completeness of the material, the measures recommended by Brugmann and Osthoff in the ‘Neogrammarian manifesto’ (1878) have been adopted:

“Je mehr sprachmaterial uns so in lückenloser, durch die jahrhunderte sich hinziehender schriftlicher überlieferung zur beobachtung unterbereitet ist, um so besser sind wir daran [...]” (1878 MU1:vii.)<sup>5</sup>

Historically speaking, however, the Neogrammarian theory – with its emphasis on Sanskrit, Greek and Latin – was never based on complete data, nor did it claim to be.<sup>6</sup> This provides a window of opportunity to further the reconstruction.

(b) In order to eliminate the problem of the incompleteness of the Neogrammarian reconstruction – and, even more, that of the laryngeal theory – the material of the dissertation consists of the *main bulk of stems (and morphemes) of the hundred most ancient Indo-European languages based on the most trusted mainstream dictionaries, comparatively supplemented with other critical sources.*

The full material, in homage to the most capable scholars of in the field of etymology will be separately published under the title *Proto-Indo-European Lexicon* (PIE Lexicon); it has already been compiled with a length of five thousand A3 pages. The work is currently in an advanced stage, allowing preparation of the initial letters of the PIE Lexicon for publication.

(c) The PIE Lexicon is a next-generation etymological dictionary utilizing the rules of System PIE, as presented in this study. Although hardcopy versions could be made available, the PIE Lexicon is essentially a digital enterprise<sup>7</sup> with the ultimate aim of accounting for every recorded Indo-European morpheme. This has been made possible by the general progress of language technology, exemplified today by similar products in the field, like the TITUS project (Thesaurus indogermanischer Text- und Sprachmateriel) based in Frankfurt am Main.<sup>8</sup> The TITUS project is currently publishing archaic Indo-European texts, but links to digital dictionaries are also offered on the TITUS website. Due to digital technology, the TITUS project will become available to the users of the PIE Lexicon through the common material dealt with, allowing for the further improvement of both.

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<sup>4</sup> Bammesberger (1984:9): “Seit Beginnning unseres Jahrhunderts hat sich hauptsächlich durch die Kenntnis des Hethitischen und Tocharischen die Materialbasis für die Rekonstruktion der indogermanischen Grundsprache wesentlich erweitert.”

<sup>5</sup> Zgusta (1951:428): “Il est naturel qu’une théorie nouvelle soit ainsi appliquée au matériel le plus large possible.”

<sup>6</sup> For Brugmann’s note concerning the incompleteness of all early theories (including his own), see Grundr<sup>2</sup> 1:397n1.

<sup>7</sup> The PIE Lexicon is designed to allow for an upgrading of data until all Indo-European morphemes are reconstructed. Thus, the completeness of System PIE can be demonstrated *in extenso*.

<sup>8</sup> For the TITUS Program (Das Project eines indogermanischen Thesaurus), see <http://titus.uni-frankfurt.de/indexe.htm>.



§4. Throughout the study, special weight is placed on a strict commitment to the comparative method and other methodical disciplines. This deserves a brief explanation:

(a) Anthony Fox characterizes early discussions on the comparative method in writing (1995:19):

“It must be said that nineteenth-century discussions of the method itself, and of the procedures involved in its application, are rather disappointing. Although there are many demonstrations of the *results* of the method, no detailed step-to-step explanations or explicit formalizations are forthcoming from this period.”

With the exception of Schleicher, this evaluation is generally correct. Similar ideas with an even more critical tone have been expressed by Radoslav Katičić (1970:9), a leading comparative theoretician, who writes:

“If this traditional field of linguistic studies is to be incorporated in a modern body of linguistic doctrine, the comparative method must be made explicit and its procedures must become more formal. If a method is stated explicitly it becomes possible to discern its properties and show why it is successful and where it could be expected to fail.”<sup>9</sup>

(b) Within this study are found both an explicit presentation of method (see especially Chapters 1 and 5) and its formalization in *predicate calculus*, the best known and most uncontroversial scientific meta-language in existence.<sup>10</sup> This formalization consists of a simple presentation and definition of the Indo-European material in terms of predicate calculus.<sup>11</sup> The usefulness of the formalization will be demonstrated in Chapter 5, where the decision method for the Indo-European etymology is stated as a simple formula of predicate calculus.

(c) The preliminary nature of the Paleogrammarian phoneme inventory and sound laws (based on Sanskrit) and the laryngeal theory, presenting a Semitic hypothesis on a Neogrammarian chassis, means that Indo-European linguistics depends on the Neogrammarians more than typically understood. This makes the following remark of Davies (1975:644) relevant for the study as a whole:

“What historiography [and Indo-European linguistics] most needs now is a series of attempts to investigate both the neogrammarians’ concrete achievements (about which much is known) and their theoretical presuppositions in their entirety (about which we are far less clear), to compare the two, and set them in some sort of historical perspective.”

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<sup>9</sup> As a further motivation, Katičić (1970:72) refers to the ongoing laryngeal controversy: “The heated discussion that arose about the laryngeal theory could become much more fruitful if the methodological problems were made explicit.” For a detailed account for the methodological inadequacies of the laryngeal theory, see Bammesberger 1984.

<sup>10</sup> Predicate calculus is a formalization of the universal rules of logic shared by all branches of science. Logic – and predicate calculus – remain the same, but the branches of natural science differ in the real objects embedded. For the translatability of predicate calculus into a modern programming language that allows for the testing of the sound laws of System PIE, see Chapter 5.

<sup>11</sup> Despite the introduction of notation for predicate calculus, the standard conventions in the presentation of Indo-European data are followed in this study.

§5. In one respect, Schleicher did better than the Neogrammarians, namely in viewing the comparative method as a natural science.<sup>12</sup> This highly conservative tradition is upheld by the author in *System PIE* and the *PIE Lexicon* with the principles of natural science duly followed throughout:<sup>13</sup>

(a) The comparative method of reconstruction is an empirical science. The Indo-European data is understood like DNA code, carrying genetic information, and therefore normative. Should a theory conflict with the data, corrections in the theory are sought instead of irregular explanations, in accordance with the thought of Hans Henrich Hock (1991:535):

“Given a choice, analyses postulating sound changes are more highly valued than analyses which require analogical or other non-phonetic changes. Similarly, everything else being equal, analyses operating with regular changes (sound change and/or rule-governed analogy) are preferred over those which require sporadic or less regular changes.”

By seeking improvements in the analysis of material instead of analogies, the self-correcting process of the science can be meaningfully upheld. Accordingly, the result of the method is “[...] testable in principle on the basis of particular events occurring in space and time” (see Esa Itkonen 1978:2ff. and Martti Nyman 1982:19). Basically this amounts to the acceptance of Isidore Dyen’s requirement (1969:508) that “[s]tatements regarding the nature of the proto-language are entirely inferential or analytical, not assumptive”. A theory allowing verification or falsification of every detail is pursued, and apriorist hypotheses are replaced with inductive ones.

(b) The reconstruction of proto-language means its restoration in a scientific manner that satisfies high philological, linguistic and comparative standards. Ultimately, reconstruction represents an equivalent of the Indo-European data, compressed in Proto-Indo-European formulas. Szemerényi’s (1996:32) position is compulsory throughout:

“From the outset realism, a realistic approach, plays a decisive part in reconstruction, since the reconstruction of phonetically impossible sounds and sound sequences (= words) can be considered nothing but an idle game.”

The reconstruction of proto-language is not hypothetical, but a regulated procedure defined by specific empirical criteria.<sup>14</sup> Therefore, scientific realism is the standard for the postulation of reconstruction and concept formation, which are only allowed if the objects are obtained exclusively from the material.<sup>15</sup> An isomorphic relationship

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<sup>12</sup> See Koerner (1982:2): “Schleicher’s conception of language [...] was, at least with respect to its method of investigation, a natural science (Naturwissenschaft).” See also Fox (1995:24): “The work of Schleicher and his contemporaries, on the other hand, reflects the growing interest in the natural sciences and in scientific method: ‘the method of linguistics is totally different of that of all historical disciplines, and is basically that of the natural sciences’.”

<sup>13</sup> On the structure of scientific theories, see Kuhn 1973.

<sup>14</sup> According to Szemerényi (1962), the basic principles of etymological research are phonetic, semantic and word formation criteria. See also Anttila (1969:35).

<sup>15</sup> For concept formation in the empirical sciences, see Hempel 1952.

between the objects of the theory and their counterparts in the real world is thus demanded on all levels.<sup>16</sup>

(c) In the evaluation of the Indo-European reconstruction theories, a *theory (and/or its subset) is valid if and only if it is complete and sound*.<sup>17</sup> In this regard, the counter-example procedure (i.e. constructing a set of data falsifying a hypothesis and leading to a revision of the theory) is favoured in order to take problems as part of the solution.

(d) Occam's razor,<sup>18</sup> or the 'principle of economy' (quoted here from Hock 1991:538), is adopted for the purposes of comparison of the theories and their subsets:

"Reconstructions should not violate the maxim attributed to the medieval philosopher Occam that **entia non sunt multiplicanda praeter necessitatem** 'entities (in an argument) are not to be multiplied beyond necessity'. Put differently, the simplest possible analysis is to be preferred, everything else being equal."

The converse of the principle, Occam's guillotine, is applied in the elimination of unnecessary assumptions.<sup>19</sup>

(e) The *ex nihilo nihil* principle states that nothing comes from nothing. In practice, if a measurable phenomenon exists, it can be assumed to reflect a previously existing state rather than to emerge from nowhere. The principle is also used in the evaluation of the competing theories.

(f) The *rule of unambiguity* can be defined thus: from a proposition  $p \vee q$  ('*p* or *q*'), it is not allowed to infer a proposition *p* or proposition *q* unless *p* or *q* has been proven. This rule is designed to secure the scientific character of theory by disallowing conclusions of ambiguous hypotheses.

(g) Throughout the study, 'Fick's rule' is used as the *principle of postulation* to justify the entire reconstruction. According to this key principle of the comparative method, two independent witnesses are always required.<sup>20</sup> As a consequence of this limitation, the comparative method of reconstruction in its pure form is the sole form of inference applied in this study, with the result that the very source code of Proto-Indo-European is derived in an objective manner in System PIE.

A strict adherence to these principles allows one to demonstrate that Schleicher's view of the comparative method as natural science is accurate. By sticking to principles of natural science, nothing but science is produced. The correct

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<sup>16</sup> For the opposite point of view, see Benveniste (1962:10): "On a trop cherché à convertir les laryngales en réalités phonétiques. Nous avons toujours pensé que le statut qui leur convenait présentement était celui d'êtres algébriques. Loin d'en être gênée, la reconstruction indo-européenne s'en trouve facilitée. Les modèles de reconstruction ne doivent pas dépendre d'interprétations phonétiques encore largement conjecturales et qui seraient nécessairement 'historiques'."

<sup>17</sup> A system is complete if it generates all the correct forms, not if it generates incorrect forms.

<sup>18</sup> For Occam's razor ('*entia non sunt multiplicanda praeter necessitatem*') in linguistics, see Hock (1986:538-540) and Szemerényi (1977:309).

<sup>19</sup> "If a postulate is not necessary, it is meaningless."

<sup>20</sup> See also Bammesberger (1984:11): "Um ein linguistisches Phänomen der Grundsprache zuschreiben zu können, muß es in mindestens zwei verschiedenen Sprachgruppen unverkennbare Spuren hinterlassen haben."

solutions can be simultaneously identified and calibrated to match the requirements of the now enriched data.

### 1.1.2 Forms as functions of phonemes and meanings

§0. Katičić (1970:146) expresses the key idea of language, forms as functions of meaning, as follows:

“[...] the languages in genetic research must be defined in the first place as sets of phonemic strings that serve as expression to certain contents.”

Though not sufficient as a general theory of language – which is in any case not sought in this study, being strictly limited to the Indo-European domain – Katičić’s definition provides a solid starting point for a definition of the comparative method in terms of predicate calculus.

§1. The attested forms constituting the lexical items of language  $f$  consist of the string of phonemes  $a_1, a_2, \dots, a_n$  and the meaning ‘ $x$ ’ (in practice, the translation). Consequently, the Indo-European data can be understood as a set of propositions (functions) of the form  $f(a_1, a_2, \dots, a_n) = ‘x’$ . In System PIE and in the PIE Lexicon, the stems are chosen as the basic level of description.<sup>21</sup> Accordingly, an independent entry is provided for every documented stem, and the description is understood to be complete when all attested stems have been accounted for. An example of the presentation of material based on the stems (arranged under the respective roots) is, for instance, the Old Anatolian formation<sup>22</sup>  $\sqrt{\text{š-}}$  ‘sein’ ( $\sqrt{\text{eš-}}$ ,  $\sqrt{\text{aš-}}$   $\sqrt{\text{ša-}}$ ):

Ḫi. eš-	(pr.) ‘sein’ (HEG 1:109-10, e-eš-zi [3sg], <i>KBo</i> I 53,7)
Ḫi. aš-	(pr.) ‘sein’ (HEG 1:109-10, a-ša-an-du [3pl])
HLu. sa-	(vb.) ‘be’ (CHLu. 2.34.1, sa-tú [3sg], 10.17.6, sa-ta [3pl])

In terms of predicate calculus, such entries are combined functions  $f(g(h(x))) = ‘y’$  expressing not only the stem and its meaning, but additional information like grammatical analysis (e.g. ‘(pr.)’, ‘[3sg]’, etc.), reference (e.g. ‘HEG 1:109-110’), the locus of the attested form (e.g. ‘*KBo* I 53,7’) and so forth.<sup>23</sup>

§2. In the formalization the following symbols, functions (symbol: ‘ $f$ ’)<sup>24</sup> and definitions (symbol: ‘ $\equiv$ ’) are used:

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<sup>21</sup> Hock’s (1991:29) definition is followed here: “If the main carrier of lexical meaning in a given word is morphologically complex, containing a root plus an affix, it is called a stem, such as word- $y$ , in word- $i$ -er, word- $i$ -ness.” In addition also the root, capable of taking inflectional endings, is understood as a special form of stem.

<sup>22</sup> On the topic of organization, compare Matthews (1991:26): “For some other languages, such as Sanskrit, dictionaries are organized by stems or roots...”

<sup>23</sup> The grammatical function covers the types of stems according to their grammatical class, including verbs (vb.), substantives (sb.), adjectives (a.), numerals (num.), adverbs (adv.), interjections (intj.), etc.

<sup>24</sup> Functions  $f_1, f_2, f_3, \dots$  can represent any properties (or features) or relations of the arguments  $x_1, x_2, \dots, x_n$ .

(a) The Indo-European stems are arranged under constant functions expressing the source language (e.g. Aiol., Alb., Arm., Av., etc.) of the item in question, and the scope of a function defines the lexicon of that language.<sup>25</sup>

(b) The phoneme paradigms of the individual Indo-European languages (i.e. the sets of minimal units of the sound system) can be referred to as their constant inventories. For the phoneme paradigms, an extensive definition is therefore set forth. Thus, as an example, for Greek we can define:<sup>26</sup>

$$\Phi_{\text{Gr.}} \equiv \alpha, \beta, \gamma, \delta, \varepsilon, \dots, \omega \quad (\text{the Greek phoneme inventory}).$$

In predicate calculus, the real objects  $\alpha, \beta, \gamma, \delta, \varepsilon, \dots, \omega$  can be referred to by two kinds of object variables – free ones (a, b, c, ...) and bound ones (x, y, z, ...) – both of which are further marked with subscripts ‘a<sub>1</sub>, a<sub>2</sub>, ..., a<sub>n</sub>, ...’ and ‘x<sub>1</sub>, x<sub>2</sub>, x<sub>3</sub>, ...’ as needed.<sup>27</sup>

(c) The phonemes constituting a stem are connected with a sequence function (symbol: +) expressing the left-to-right order of the objects involved (e.g. a<sub>1</sub> + a<sub>2</sub> + ... + a<sub>n</sub>). In practice, it is not necessary to write the sequence function; for example, the conventional writing (e.g. Go. ist) is understood as shorthand for Go. i+s+t.

(d) The comparative function (the symbol :) can be set between any two arguments  $\Phi_x(a)$  and  $\Phi_y(b)$  by setting them in juxtaposition (e.g. Hī. ešzi ‘is’ : Go. ist ‘is’). If the compared items are identical, then the comparative function  $\Phi_x(a) : \Phi_y(b)$  is provable and identity (the symbol =) replaces the function; otherwise its opposite is shown (by the symbol: ≠).

(e) A string of phonemes  $\Phi(a_1, a_2, \dots, a_n)$  is a morpheme, if and only if there exists an x such that ‘x’ is its meaning (possibly unknown). Formally, therefore, the morphemes are of general form  $\Phi(a_1, a_2, \dots, a_n) \equiv_{\text{df}} \text{‘x’}$ . A stem can contain multiple morphemes, and if so these are separated by segmentation function (the symbol ·) as seen, for example, with:

$$\text{OIr. do·for·mag-} \quad (\text{pr. ‘accroître’ (LEIA M-8, doformaig [3sg]).})$$

§3. In this manner, any Indo-European lexical item can be expressed in terms of predicate calculus (i.e. one-to-one mapping exists).

## 1.2 Phonetics and phonology in System PIE

### 1.2.1 Introduction: phonetics and phonology

§0. The basic situation is neatly summarized by Salmon and Smith (2005:86):

<sup>25</sup> The variables covering the constant functions (i.e. languages and dialects) are  $\Phi, \Theta, X, \dots$  possibly with subscripts ( $\Phi_1, \Phi_2, \dots, \Phi_n$ , etc.). With these the individual subgroups like ‘Baltic’, ‘Celtic’, etc. can be defined.

<sup>26</sup> The definitions of the phoneme paradigms of the Indo-European languages, available in standard grammars, are not repeated here.

<sup>27</sup> In addition, the zero phoneme (represented by the symbols  $\emptyset$  or –) is used to mark lost phonemes and the zero grade (both in IE and PIE).

“Establishing a phonological inventory is a cornerstone of linguistic description and the same naturally holds for reconstructing proto-language.”

In order to ensure the correct reconstruction of the Indo-European and Proto-Indo-European phoneme inventories, one must observe the following issues:

§1. The phoneme paradigms of Indo-European languages basically coincide with the inherited alphabets created by the inventor(s) of the respective writing systems. In this way, the inherited alphabets contain a *received internal reconstruction*. Being empirically given, reinterpretation of alphabets is seldom motivated, though naturally the properties of the systems can be dealt with by means of phonetics, the scientific study of sounds as individual objects (Trask, DPhPh:270), and phonology, the study of the relationships of sounds in a language (Trask, DPhPh:275-77).

§2. In the reconstruction of the phoneme inventory of Proto-Indo-European, only the strictest principles of the comparative method are employed. In practice, every proto-phoneme must be comparatively postulated, based on a correspondence set consistent with the full data. In particular, the so-called hypothetico-deductive method, which is occasionally allowed in historical linguistics and involves hypothetical proto-sounds and a postulation of pre-proto-language, is unnecessary.

### 1.2.2 Sounds, phonemes and phonetics

§0. The sounds of speech are concrete objects with measurable acoustic properties or features produced by airflow and the human vocal apparatus, the places of articulation and the articulator.<sup>28</sup> Strictly speaking, as no two spellings of a sound are identical, the concept of phoneme (representing actual instances and/or spelling variants  $a_1, a_2, \dots, a_n$  of a sound /a/) has been introduced.<sup>29</sup>

§1. Language reaches its written phase when the means for its transcription, most often an alphabet,<sup>30</sup> have been developed. The descriptiveness and general accuracy of the archaic Indo-European phoneme inventories results from their phonetic character. Unaffected by conventions, the main source of non-phonetic spellings or similar factors in the ancient Indo-European alphabets usually reflects the data as directly as possible, and they are usually accepted as such in a comparative study. In terms of minor exceptions, note the following phonological remarks concerning certain individual Indo-European languages:

(a) Continuing the Sumerian ideogrammatic tradition, the Old Anatolian languages (H̱i., Pal. CLu. and HLu.) are syllabic, not phonetic. Consequently, phonetic approximations are used for the presentation of the Old Anatolian data (e.g. H̱i. ešzi

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<sup>28</sup> For phonemes (sounds), see Ladefoged & Maddieson 1996. For phonetics, see Laver 1994.

<sup>29</sup> Compare the famous definition of Daniel Jones 1950, according to whom a phoneme is a family of sounds.

<sup>30</sup> For the close connection between ‘alphabet’ and ‘phoneme inventory’, compare Meriggi (1966:8): “[...] diejenige, die den uralten Begrif Buchstaben in der neuen Maskierung als ‘Phonem’ retten will.”

is written for the attested Hī. e-eš-zi ‘is’), a practice also followed in this study. Being secondary (built upon primary data), these approximations are susceptible to error, and comparative evidence is particularly important for the elimination of possible mistakes.

(b) The Indo-European languages are usually attested in their own inherited writing systems, but transcribed in the Latin alphabet (except for Greek). The scholarly transcriptions are not necessarily flawless, and scrutiny occasionally required in the phonological considerations involving the latter.<sup>31</sup>

(c) From a comparative point of view, the allophonic alternation of phonemes is caused by sound changes in varying environments. Avestan is especially rich in allophonic alternation in its alphabet, possibly reflecting its status as a sacred language. It is not uncommon that Avestan allophones cannot be explained on a synchronic basis, but instead require a historical explanation outside of the received phoneme paradigm.

§2. The comparative method of reconstruction is not primarily interested in the phoneme inventories of the individual Indo-European languages. Although all Indo-European languages preserve some proto-phonemes as such, all have gone through multiple and successive sound changes, leaving the surface level ambiguous to a degree. In particular, the following types of changes are commonplace within the Indo-European languages:

(a) Loss (or disappearance) of a proto-sound in a language (e.g. PIE \*h → Gr. Ø).

(b) Merger (or convergence) of originally distinct proto-phonemes in a language (e.g. PIE \*th \*dh \*k<sup>h</sup> \*g<sup>h</sup> → Gr. θ).

(c) Split of an original proto-phoneme as conditioned by environment (e.g. in PIE \*gh → Lat. c g h, etc.).

Owing to the secondary nature of at least some attested phonemes, the comparative method of reconstruction eliminates secondary phonemes by postulating the respective sound laws before entering into conclusions, thus focusing on the proto-phoneme inventory as the common denominator of the cognates.

### 1.2.3 The historical PIE phoneme inventories

§0. The historical PIE phoneme inventories will be briefly presented in order to test them against the enriched Indo-European data. Though outdated in certain aspects, the Neogrammarian phoneme inventory is the common starting point of all Indo-European reconstruction theories (including the one presented in this study), and thus serves as a natural point of reference for the history and development of the PIE phoneme inventory.<sup>32</sup>

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<sup>31</sup> For an example of a failure in transliteration and its consequences, see Chapter 4 for the discussion on the ‘voiced aspirate’ series (*mediae aspiratae*) of Sanskrit, historically miswritten as OInd. bh dh gh jh h instead of the proper notation OInd. bh̄ dh̄ gh̄ jh̄ h̄.

<sup>32</sup> For “Der Lautbestand der idg. Ursprache”, see Brugmann (Grundr<sup>2</sup> 1:92-93).

Within the phoneme inventory, three functional classes of phonemes, vowels (V), resonants (R) and obstruents (C) are distinguished and dealt with respectively in Chapters 2, 3 and 4. Beginning with the laryngeal PIE \*h, the overall picture of the research history can be sketched as follows:

(a) The laryngeal PIE \*h, which is absent from the Neogrammarian reconstruction, can now be added to the proto-language based on Old Anatolian, as already discovered by monolaryngealism:

Neogr.	∅	(Brugmann, Osthoff, Pokorny, Kronasser et al.)
Monolar.	PIE *h	(Zgusta, Laroche, Szemerényi, Tischler et al.)

The variations of the now outdated multilaryngealism will be discussed subsequently in their relevant contexts.

(b) At its high point, the Neogrammarian vowel system Neogr. \*V contained eight correspondence sets, provided below with the respective vowel system of the laryngeal theory:

	*a-quality:			*o-quality:		*e-quality:		
Neogr.	*ə	*a	*ā	*ā	*o	*ō	*e	*ē
LT.	*h <sub>2</sub>	*h <sub>2</sub> e/-	*eh <sub>2</sub>	–	*h <sub>3</sub> e	*eh <sub>3</sub>	*e	*eh <sub>1</sub>

(c) The Neogrammarian system of sonants<sup>33</sup> contained glides (U), liquids (L) and nasals (N), as indicated in the table below:

Neogr.	*i	i	iC	iV	*u	u	ūC	uV
	*l	l	lC	lV	*r	r	rC	rV
	*m	m	mC	mV	*n	n	nC	nV

It was further claimed that the long sonants stood for the respective short ones, plus Neogr. \*ə, now written as \*H in the laryngeal theory.

(d) The Neogrammarian obstruent system consisted of the following items:

	Plosives:					Fricatives:	
Neogr.	*p	t	k	ḱ	k <sup>u</sup>	s	ʃ
	*ph	th	kh	ḱh	k <sup>u</sup> h	sh	ʃh
	*b	d	g	ǵ	g <sup>u</sup>	z	ʒ
	*bh	dh	gh	ǵh	g <sup>u</sup> h	zh	ʒh

The following initial remarks are respectively made for each category of objects:

§1. The monolaryngealism has its roots in Zgusta's (1951) observation that there is one and only one laryngeal PIE \*h (≡ Hi. h, CLu. h, Pal. h, HLu. h), which is comparatively inferable from the Old Anatolian (and other Indo-European) data. This has now been confirmed by Johann Tischler's *Hethitisches etymologisches Glossar* (HEG 1977ff.), proving that Zgusta's conjecture was both sufficient and

<sup>33</sup> Note that in this study, the term 'resonant' is used for PIE \*i u r l n m, whereas the term 'sonants' refers to Brugmann's and Osthoff's syllabic sonants.



necessary. This decisive success provides an inductive starting point for the comparative reconstruction of the PIE laryngeal, but monolaryngealism has not inferred the properties of the cover symbol PIE \*h̥ as an independent segment and its behaviour in all environments, based on the comparative method.

§2. As for the Indo-European vowel system and its relation to the cover symbol PIE \*h̥, the following theories have been proposed:

(a) At its high point, the Neogrammarian vowel system consisted of eight cover symbols for vowels:

Neogr. \*ə, a, ā ('a-quality')    \*ā̆, o, ō ('o-quality')    \*e, ē ('e-quality').

Tested against the enriched data, the Neogrammarian vowel system is adequate in terms of the number of cover symbols and their derivation. Eight distinct correspondence sets can be inductively obtained from the data, and none of the cover symbols are redundant. In the absence of the laryngeal, the traditional system is outdated. In particular, the mutual relationships of vowels and the laryngeal and the ablaut patterns require a thorough revision.

(b) Based on Saussure's ideas, Møller (1879, 1880, 1906:vi = MØL) presented the classical three-laryngealism (now competing with Brugmann's comparative reconstruction of proto-vowels) indicated in the following table:

Neogr.	*ə	*a	*ā	*ā̆	*o	*ō	*e	*ē	–
MØL.	*A	*Ae/–	*eA	–	*Oe/–	*eO	*Ee	*eE	–

This theory was based on Saussure's (1878 = DS\*) single 'fundamental' (in modern terms 'pre-proto-vowel') \*e<sup>34</sup> of two 'coefficients sonantiques': an 'a-colouring' \*A (Neogr. \*ə = LT h<sub>2</sub>) and an 'o-colouring' \*O (= LT \*h<sub>3</sub>), with rules of compensatory lengthening and colouring obtained by structural reasoning.<sup>35</sup> For the sake of similarity with the Semitic system of laryngeals, Møller added yet another item \*E (= LT h<sub>1</sub>) and projected the assumed Proto-Semitic root shape C<sub>1</sub>C<sub>2</sub>·C<sub>3</sub> onto Proto-Indo-European,<sup>36</sup> thus giving birth to the laryngeal theory.<sup>37</sup> Unsurprisingly, this laryngeal theory conflicted with reality: after the emergence of the Old Anatolian data, Møller's original proposition of three laryngeals has been gradually downgraded. By switching to a notation in which E, A, O indicate laryngeals preserved in Old Anatolian and h<sub>1</sub>, h<sub>2</sub>, h<sub>3</sub> laryngeals that have been lost (or never

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<sup>34</sup> See Saussure (Rec. 127): "Le phonème a<sub>1</sub> [= \*e] est la voyelle radicale de toutes les racines. Il peut être seul à former le vocalisme de la racine ou bien être suivi d'une seconde sonante que nous avons appelée *coefficient sonantique*." [...] "Dans de certaines conditions, qui ne sont pas connues, a<sub>1</sub> [\*e] est remplacé par a<sub>2</sub> [\*o]; dans autres, mieux connues, il est expulsé."

<sup>35</sup> The 'rule of compensatory lengthening' refers to the postulates LT \*\*eh<sub>1</sub> → \*ē; LT \*\*eh<sub>2</sub> → \*ā; LT \*\*eh<sub>3</sub> → \*ō and the 'colouring rules' to the postulates LT \*\*h<sub>1</sub>e → \*e; LT \*\*h<sub>2</sub>e → \*a; LT \*\*h<sub>3</sub>e → \*o.

<sup>36</sup> Thus, Lindeman (1987:25) writes: "In its commonly accepted form the 'Laryngeal Theory' assumes the existence in Early Indo-European of (at least) three 'laryngeal' consonants [...]."

<sup>37</sup> For the laryngeal theory, see Hendriksen 1941, Puhvel (1960:1-13), Polomé 1965, Szemerényi 1973, Jonsson 1978, Lindeman (1982:63-64, 1987:78-79), and Bammesberger (1984:38).

never existed), we may summarize the subsequent developments of the theory as follows:

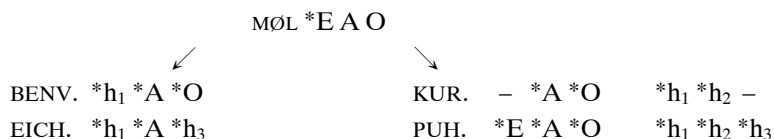
1. Benveniste's (1935 = BENV.) assumed three laryngeals: two preserved (\*A = Ĥi. ĥ, \*O = Ĥi. ĥ) and one 'lost' item (\*h<sub>1</sub> = Ĥi. Ø).

2. Kuryłowicz (1935:75f., 254f. = KUR.) assumed four laryngeals: two preserved (A and O = Ĥi. ĥ) and two 'lost' laryngeals (h<sub>1</sub> and h<sub>2</sub> [= LT h<sub>4</sub>] = Ĥi. Ø).

3. Eichner's (1973 = EICH.) assumed three laryngeals: one preserved (\*A = Ĥi. ĥ) and two lost (\*h<sub>1</sub> h<sub>3</sub> = Ĥi. Ø).

4. Puhvel's (1965 = PUH.) theory supposes e and six laryngeals, of which three have been assumedly preserved in Old Anatolian: \*E, A, O and three lost (h<sub>1</sub>, h<sub>2</sub>, h<sub>3</sub>).<sup>38</sup>

Møller's laryngeal theory has split into two subgroups. One favours weakening the original proposition of the number of preserved laryngeals (Benveniste and Eichner) and one adds the number of assumed laryngeals (Kuryłowicz and Puhvel) to compensate:



(c) The monolaryngeal theory of Indo-European vocalism is currently in its early phase, in essence consisting of the following:

1. Zgusta (1951), the first to reconstruct a single laryngeal PIE \*H coinciding with Ĥi. ĥ, argues for the favour of a colourless (or non-colouring) item. By adding the three short vowels \*e, a, o and following the rule of compensatory lengthening (\*eH → ē, \*aH → ā, \*oH → ō), Zgusta's theory has only four proto-phonemes (ZG. \*H \*e \*a \*o) and three rules (of compensatory lengthening).

2. Similarly, Szemerényi (1967:96-7 = SZ) posits one non-colouring laryngeal PIE \*H (= Ĥi. ĥ) and six vowels \*e, a, o, ē, ā, ō; thus, he disagrees with Zgusta, favouring the original quantity instead of compensatory lengthening not required in his system. From the point of view of the data, it can be readily said that this solution is superior to that of Zgusta, because Szemerényi's system contains the original vṛddhi vowels proven to exist independently of laryngeals.

(d) In order to provide an overview of the initial assumptions, the vocalisms and the laryngeals of the theories are summarized in the following table, where '-' indicates a correspondence set missing from a theory:

		Vowels:						Laryngeal:	
Neogr.	*ə	a	ā	â	o	ō	e	ē	-
DS.	*A	-	eA	-	(o)	eO	e	eA	-

<sup>38</sup> For Puhvel's motivation for the expansion of the number of laryngeals to more than three, see HED 3: v-vi: "Those who have insisted on postulating a set (preferably low) number of 'laryngeals' and hewing to them religiously have lulled themselves into a false and premature circularity."

MØL	*A	Ae/-	eA	-	Oe/-	eO	Ee	eE	-
ZG.	-	a	aH	-	o	oH	e	eH	*H
SZ.	*ə <sup>?</sup>	a	ā	-	o	ō	e	ē	*h

The theories lack at least one correspondence set, with the result that none of them are complete or acceptable as the basis of a comparative reconstruction theory as such. However, Brugmann's reconstruction is the most accurate description of the Indo-European vocalism, and the absence of the laryngeal can be corrected by the addition of the critical sound law established by the laryngeal theory and monolaryngealism:

PIE \*h̥ ≡ Hi. h, Pal., CLu., HLu. h̥ : RV 'Ø, Gr. Ø, Lat. Ø, etc.

Thus, a complete set of cover symbols emerges when the two theories are combined:

\*ə    \*a    \*ā    \*ā̃    \*o    \*ō    \*e    \*ē    \*h̥.

In Chapter 2, when the cover symbols are replaced with the actual Proto-Indo-European values, this solution will be shown as both necessary and sufficient.<sup>39</sup>

§3. Concerning the resonants, functionally defined as phonemes having vocalic (R̥) and consonantal (R) allophones, three theories have been suggested:

(a) The Neogrammarian system of sonants contained the postulates:

Neogr.	*ī̃	i	īC	ī̃V	*ū̃	u	ūC	uūV
	*l̃	l̃	l̃C	l̃V	*r̃	r̃	r̃C	r̃V
	*m̃	m̃	m̃C	m̃V	*ñ	ñ	ñC	ñV

Here the long sonants R̃ stand for short sonants plus schwa (= R̃ + ə). In the laryngeal theory, Neogr. \*ə is replaced with \*H in a completely isomorphic system:

LT	*ī̃	i	iHC	iHV	*ū̃	u	uHC	uHV
	*m̃	m̃	m̃HC	m̃HV	*ñ	ñ	ñHC	ñHV
	*l̃	l̃	l̃HC	l̃HV	*r̃	r̃	r̃HC	r̃HV

(b) The *schwa secundum* school, initiated by Schmidt, accepts Brugmann's and Osthoff's correspondence sets, but explains the epenthetic svarabhakti vocalisms of the cognates as reflecting a *schwa secundum* (written as \*ɤ) instead of the zero grade.

(c) The third tradition, dating back to the period preceding the theory of syllabic sonants, is the comparative one. According to this view, though never formulated as a full-scale theory, the identical vocalisms of cognates are directly compared and postulated to the proto-language when confirmed by at least two witnesses. This approach can be illustrated, for instance, by Verner's reconstruction (1877:125):

"[G]erm. follīpa f. 'fülle' (ahd. fullida) = altind. pūrṇātā dss., von germ. folla- 'voll' (goth. fulla-, an. full-r, as. full, ags. ful, ahd. fol) = altind. pūrṇá-, dss."

<sup>39</sup> For an interpretation of the historical connection between the Neogrammarians and monolaryngealism, see Eichner (1988:128): "Er [= der Monolaryngalismus] bildet im Grunde die Fortsetzung der Brugmannischen Auffassungen vermerhrt um die Ansicht, daß man nach der Entdeckung der anatolischen Evidenz nicht mehr ganz ohne Laryngal auskommt."

Here, in essence, an original vowel is postulated by at least “two witnesses”:

PIE \*pulno-   ≡   RV. pūrṇá-, Go. full-, ORus. pŭlnŭ-, etc.

§4. For the obstruents, functionally defined as phonemes without vocalic allophones, the Neogrammarians postulated a system of plosives and fricatives, comprising of twenty-eight proto-phonemes.

Plosives :					Fricatives :		
1.	2.	3.	4.	5.	6.	7.	
*p	t	k	k̂	k <sup>u</sup>	s	ʃ	(1)
*ph	th	kh	k̂h	k <sup>u</sup> h	sh	ʃh	(2)
*b	d	g	ĝ	g <sup>u</sup>	z	ð	(3)
*bh	dh	gh	ĝh	g <sup>u</sup> h	zh	ðh	(4)

As regards these items, discussed in full in Chapter 4, the following preliminary remarks can be made:

1. Columns 1-3 represent the *decem-taihun isogloss*, viz. the problem of the four manners of articulation T — Th — D — Dh (appearing in rows 1-4).

2. Columns 3-5 represent the *Centum-Satem isogloss*, viz. the problem of the three PIE velar series (Neogr. \*k : k̂ : k<sup>u</sup>, etc.).

3. Columns 6-7 represent the Neogrammarian fricative system, consisting of a series of sibilants and a series of interdental fricatives (or thorns), but lacking the place of articulation for laryngeal(s).

(a) Three main theories have been presented for the decem-taihun isogloss, consisting of the series T — Th — D — Df̂:

1. The traditional (Neogrammarian) theory with twenty comparatively obtained cover symbols for plosives, as already indicated in the table above.

2. The ‘root constraint theory’ of Meillet and Magnusson, which claims a complementary distribution for the series mediae (D) in the roots with two successive plosives, thus implying its secondary character.

3. Based on Saussure’s suggestion (generalized by Kuryłowicz), the series of tenues aspiratae is eliminated by means of segmental analysis in mainstream laryngeal theory.

Neogr. \*ph th kh k̂h k<sup>u</sup>h   ≡   LT \*p+h<sub>2</sub> t+h<sub>2</sub> k+h<sub>2</sub> k̂+h<sub>2</sub> k<sup>u</sup>+h<sub>2</sub>

The remaining system of three series (\*T : D : Dh) is the starting point of the so-called glottalic theory, modulations of which are based on typological considerations.

(b) The second part of the plosive problem deals with the Centum-Satem isogloss (i.e. the existence of the three velar series (Neogr. \*k : k̂ : k<sup>u</sup>)). Currently there are a number of attempts to deal with this question:

1. The Neogrammarian theory, consisting of twelve proto-phonemes (Neogr. \*k k̂ k<sup>u</sup>; \*kh k̂h k<sup>u</sup>h; \*g ĝ g<sup>u</sup>; \*gh ĝh g<sup>u</sup>h), is obtained through the comparative method. Although correct in terms of its contents, the theory is typologically problematic, because no satisfactory parallels in the languages of the world have emerged.

2. Attempts to eliminate one series by means of environments result in a reduction of the system to only two original series. In this regard, all the possible subsets of two original phonemes (i.e. \*k+\*k̂, \*k+\*k<sup>u</sup> and \*k̂+\*k<sup>u</sup>) have been suggested, but with little success.

3. When segmental analyses of the velars (Neogr. \*k<sup>u</sup> = \*ku) (Reichert) and palatals (Neogr. \*k̂ = \*ki) (Szemerényi) are combined into a single theory, the two approaches only leave the plain velar series for the proto-language, thus removing the typological problem of having three series.

(c) The Neogrammarian system of fricatives – in part artificial, in part deductive (vs. inductive) – was defective in terms of the laryngeal place of articulation. The situation is discussed separately in the next paragraph in order to illustrate the principles of segmental analysis.

§5. In order to guarantee the minimal character of the phoneme inventory of System PIE, a combinatory analysis of phonemes is carried out for vowels, resonants and obstruents in the respective chapters of the study. The testing of the postulated proto-phoneme systems can be exemplified here with an analysis of the Neogrammarian system of fricatives, in relation to which one can observe the following:

(a) Of the sibilants Neogr. \*s sh z zh, only Neogr. \*s and \*z exist as outcomes of the comparative method. The sibilants Neogr. \*sh zh were postulated on the basis of the typology of the four obstruent series Neogr. T Th D Df (‘Systemzwang’). Since the proper (comparative) reconstruction must be exclusively based on data, the constructions leaning to structures or typologies and their postulates (here Neogr. †sh and †zh) are unacceptable.

(b) The postulation of the so-called ‘thorn’ series (i.e. the four interdental fricatives)

Neogr. \*p̂      \*pĥ      \*ð̂      \*ðĥ      (Grundr<sup>2</sup> 1:790)

is based on a comparison of sibilants (in Indo-Iranian and elsewhere) and dentals (in Greek). The definition can be shown to be erroneous, because the full data of the alleged examples reveal both sibilants and dentals in Greek (and occasionally elsewhere as well). No independent segment is to be reconstructed because sibilant and dental extensions (marked I and II) exist simultaneously. The case can be illustrated, for instance, with the data:

1. Neogr. \*gĥho:(Σ)- ‘Erde, Ton’ (adv.) ‘unter, unten’ (P. 414f.)

I) PIE \*ghso-

RV. kṣá pāvant-	(m.) ‘Beschützer der Erde’ (WbRV. 362)
RV. kṣa pávant-	(m.) ‘Beschützer der Erde’ (WbRV. 362)
Gr. μόγο·ξο-	(m.) ‘Ton zum Bleichen’ (GEW 2:256)
Att. ἐγε·χθῆ-	(N.) = ἐγε·χθῆς (Schwyzer GrGr. 1:326)
RV. kṣám-	(f.) ‘die Erde, der Erdboden’ (WbRV. 363)
Gr. ἐπί·ξενος	(a.) = Gr. ἐπιχθόνιος (Schwyzer GrGr. 1:326)

II) PIE \*ghdho-

Gr. μόγο·χθο-	(m.) ‘Ton zum Bleichen’ (GEW 2:256)
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Gr. χθών	(f.) ‘Erde, Erdboden, Land’ (GEW 2:1098-9)
Phryg. γδαν μα	(f.) ‘Mother Earth’ (P. 414)
Hi. gadan	(adv.) ‘unten’ (HHand. 76, HEG 1:539ff.)

Both a sibilant and a dental extension exist, due to which the postulation of an underlying thorn is illegitimate.

2. Neogr. \*teḱp- ‘bauen, zimmern, verfertigen, schneiden, usw.’ (P. 1058-59, KEWA 1:612-3)

I) PIE \*teḱs-

RV. tákṣ-	(ao.) ‘zimmern, verfertigen’ (WbRV. 511, tákṣati)
TochB. tāks-	(vb.) ≈ ‘chop up, grind up’ (DTochB. 286, tāksoym)
LAv. tāš-	(pr.) ‘(in Scheite) zerlegen’ (AIWb. 645, tāšti [3sg])
Lat. texo-	(vb.) ‘bauen, zimmeren’ (WH 2:678, texō [1sg])
gAv. tašn-	(m.obl.) ‘Bildner, Schöpfer’ (AIWb. 645, tašnō [sgG])
Gr. τέχνη-	(f.) ‘Handwerk, Kunst(fertigkeit), List’ (GEW 2:889)

II) PIE \*teḱt-

Gr. τέκτων-	(m.) ‘Zimmermann, Handwerker’ (GEW 2:867)
LinB. tekton-	(m.) ‘Zimmermann’ (GEW 3:183, te-ko-to-ne)
Gr. τέκταινα	(f.) ‘Handwerkerin’ (GEW 2:867)

Again two different extensions (Neogr. \*teḱs- ≠ \*teḱt-) are verified instead of a single item implying a thorn. This argument can be repeated throughout the alleged examples of Neogr. \*p̥ p̥h̥ ð̥ ð̥h̥, leading to the elimination of series of thorns. Consequently only the sibilants Neogr. \*s (\*z) and the cover symbol for the laryngeal PIE \*h̥ need to be accounted for in the PIE system of fricatives.

§6. Given the existence of nine clearly defined problems, the theoretical situation in the field is transparent. Since at least sketches of comparative solutions can already be found in the literature, all problems can be solved by simple successive applications of the comparative method, as shown in this study.

## 1.3 Semantics

### 1.3.1 Symbol function and semantics

§0. From a semantic point of view, the predicate function  $\Phi(a_1, a_2, \dots, a_n) \equiv_{df} 'x'$  expressing morphemes defines correspondences of the strings of phonemes and their meanings, therefore coinciding with the concept of *symbol function*.<sup>40</sup> In semantics

<sup>40</sup> Saussure (1916) interprets the linguistic symbol as two sides of a coin, showing both form (*cheval*) and meaning ('equus'). Perhaps this is not the best available metaphor, because the two sides of a coin are not identical, nor do they refer to each other, as is essentially the case with linguistic signs; for example, see Meriggi (1966:5): “Freilich vertrete ich gerade die These, daß zwischen der Semantischen Sphäre und der Lautgestaltung des entsprechenden Ausdrucks immer ein strenger Parallelismus besteht.”

especially meanings are studied, and as the general problems of the field are well known it suffices to refer to the most relevant issues for the reconstruction of Proto-Indo-European.<sup>41</sup>

§1. Meaning can be defined in many ways, parallel or divergent.<sup>42</sup> In comparative Indo-European linguistics, the main vehicle for the delivery of meaning is translation. As translation is a concrete measurable object, it is not intended that it involve a philosophically loaded discussion about the meaning of meaning.<sup>43</sup> It should, however, be kept in mind that morphemes presuppose meaning and reconstruction presupposes morphemes; accordingly, meaning is by no means a trivial concept.<sup>44</sup> Systems lacking proper reference to meaning (see Chomsky) are of limited interest for Indo-European linguistics, where translations play a significant (non-trivial) part on several levels.<sup>45</sup>

(a) Translations are often interpretations of multiple contextual facts where an error may occur. An example of an erroneous meaning is provided by Tischler (HEG 1:164-65) explaining how a certain translation

Hi. ḥapadia- (vb.) ‘schlagen, verletzen, töten’ (HHand. 40)

should be postulated instead of the early ‘†Diener, Untergebener’, which was based on a misunderstanding of the context. Such corrections, once made, can often be verified (or falsified) by comparative analysis.<sup>46</sup>

(b) It is not uncommon for the translation of a word (or a morpheme) to be missing. This is particularly common with hapaxes and in onomastica. In order to recover this vital material, Indo-European linguistics uses multiple methodologies to supplement the missing translations, but in particular the comparative method. As an example of supplementing the missing meaning, I quote an ancient Celtic proper name:

OGaul. mageno- (PN.m.) ‘-(?)’ (ACSS. 2:374).

Though no translation is available, the method allows for a comparison with the later Celtic items:

Cymr. maen- (m.) ‘pierre : stone’ (LEIA M-9)

Bret. mean- (m.) ‘Stein’ (P. 709)

OBret. cronn ·main- (sb.) ‘pierre ronde’ (LEIA M-9)

<sup>41</sup> For a general introduction to semantics, see Lyons 1977.

<sup>42</sup> For instance, types of definitions include ostensive, iconic, nominal, extensional, grammatical and so forth.

<sup>43</sup> In this study, hybrid translations – quoting dictionaries in their original languages – are used in order to minimize the possibility of error.

<sup>44</sup> See, for instance, Nyman’s sketch of the connection (1982:32): “[...] the so-called sign rules which relate a signatum to its signans, thus making up a morpheme (Andersen 1980:3) or a phoneme [...].”

<sup>45</sup> See also Meriggi (1966:3): “[...] die asemantische Sprachwissenschaft [...], bei der man Laute und Formen, aber nicht ihre Bedeutung untersuchen soll, ist mir sinnlose.”

<sup>46</sup> In this case, Tischler’s translation is now supported by the etymology Hes. ἀπεδανο- (LSJ. 182) = ἡπεδανό- ‘schwach, gebrechlich’ (GEW 1:639-40).

Walde (and Pokorny, P. 709) correctly reconstructed PCelt. \*mageno- for the latter, but as the prototype now coincides with the actually attested ancient form, the latter can be furnished with the translation:

OGaul. mageno- (PN.m.) ‘Stein (?)’ (ACSS. 2:374).

Since no sound laws are violated, and the postulated proto-form is replaced with an actually attested form of equal shape, the comparisons of the type are allowed regardless of the subgroup involved.<sup>47</sup>

§2. As mentioned by Matthews (1991:223), the problem of the relationship between morphemes and reality was already understood in Ancient Greece:

“One of the oldest findings about the language is that the forms of lexical elements generally do not bear a natural relation to their meanings. As Hermogenes put it in a dialogue by Plato, the names of the things are justified by nothing more than rule and custom.” (Cratylus 384d)

However, some modern formulations of the idea, especially the extreme interpretation of Saussure’s slogan ‘arbitrariness of meaning’, does not serve Indo-European linguistics in an optimal manner. In particular, if the rules mentioned by Hermogenes are not recognized, several actual criteria governing the alternations of meaning are lost:

(a) The PIE roots are attested in multiple vocalizations (including zero), called its ablaut bases. The ablaut vowels modified the meaning of the root to varying degrees in a manner not yet completely understood.

(b) The PIE stems belong to various grammatical functions (e.g. verbs, substantives, adjectives, etc.) and their subclasses (e.g. active : medium/deponent : passive and transitive : intransitive, etc.). Such alternations are reflected in regular (vs. arbitrary) changes of meaning.

§3. The original PIE derivation and the subsequent sound changes have semantic consequences, especially for the following phenomena:

(a) Homonyms – morphemes with an identical phonological shape, but etymologically incompatible meanings – are commonplace both in Proto-Indo-European and Indo-European:

$$\Phi(a_1, a_2, \dots, a_n) \equiv 'x' \quad \neq \quad \Phi(a_1, a_2, \dots, a_n) \equiv 'y'.$$

The comparative method splits homonyms, arranges the morphemes under respective roots  $\mathfrak{R}_m \neq \mathfrak{R}_n$  based on their semantic values, and eliminates mergers in the process.

(b) Polysemy describes different but ultimately connected meanings of an identical sequence of phonemes, such as:

$$\Phi_x(a_1, a_2, \dots, a_n) \equiv_{df} 'x_1', 'x_2', \dots, 'x_n'.$$

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<sup>47</sup> In the digitalized platform of the PIE Lexicon, it will be possible to list all the morphological matches allowed by sound laws to test the available translations. Even if no match is found, all possible etymologies have been attempted and the reasons for their failure systematically codified; this also constitutes a scientific result.



Such variation can be traced back to a range of factors, such as the difference between the real objects designated (e.g. ModEng. plain = ‘clear’, ‘unadorned’, ‘obvious’, etc.), the grammatical classes of the stems, and so forth. From a comparative point of view, polysemy refers to items with a common semantic field and root.

(c) Synonyms or paraphrases – the forms  $\Phi_x(a_1, a_2, \dots, a_n)$  and  $\Phi_x(b_1, b_2, \dots, b_m)$  with the same meaning, but distinctive phonetic structure – are widespread in Indo-European.<sup>48</sup> Even Sanskrit, known for its synonyms, pales in comparison with Proto-Indo-European, implying that the ‘one meaning, one form’ principle cannot be followed literally in Indo-European linguistics. The principle is helpful in distinguishing forms with incompatible meanings, but it should be recognized that multiple objects with identical meaning are supported by the comparative method.

(d) It is not uncommon for a stem to have a ‘double meaning’, thus revealing a compound rather than a simple word. In such cases it is still possible to achieve correspondences by segmentation, as the two morphemes and two meanings can be attached to two different roots. An example of such analysis is found in:

Go. *aldo·min-* (m./n.) ‘ $\gamma\eta\rho\alpha\varsigma$  : old age’ (GoEtD. 25).

Here the first component (Go. *aldo*) corresponds to the meaning ‘old’, as a result of which Go. *·min-* is left with the meaning ‘age’, which still currently has no known cognates, according to Lehmann (GoEtD. 25). However, the comparison with Old Anatolian results in a direct match in:

PIE \**meh₂n-* ‘Zeit’

Hitt. *meh₂n-* (n.obl.) ‘Zeit’ (HEG 2:171, *me-eḫ-ni* [sgL])  
 Go. *·min-* (m./n.) ‘age’ (GoEtD. 25)<sup>49</sup>

Generally speaking, the data actually contains more segments than just the words (or stems), and semantic hints often lead to successful segmentation.

§4. Semantic bridges – assumed changes of meaning through a postulated (hypothetical) meaning – are relative to the phoneme inventory and sound law system at hand. In general, improvements in phonology result in increased morphological distinctions, sometimes confirming and sometimes specifying a semantic bridge. Perhaps most often, however, a semantic bridge turns out to be artificial. An illustration of this can be found with the emergence of PIE \**h* (= Hitt. *ḫ*). In the Neogrammarian system, ‘a-vocalism’ (Neogr. \**ə* a *ā*) referred to vowels; not considered root radicals, they were therefore allowed to alternate with zero. According to the modern line of thought, Neogr. \**ə* a *ā* indicates PIE \**h* ( $\approx h_2$ ), a radical consonant, thus often necessitating distinctions within the traditional roots

<sup>48</sup> A brief look at the Indo-European synonym dictionaries like Watkins 1992<sup>3</sup> and Mallory-Adams 1997 confirms that synonymy is widespread within the group.

<sup>49</sup> For an alternative extension of the root obtained similarly by Fraenkel, see his outstanding comparison of Li. *tuo·mēl* (adv.) ‘in einem fort : right away’ (LiEtWb. 445) and Go. *mel-* (n.) ‘Zeit, Stunde’ (ANetWb. 376).

held together with semantic bridges. Therefore, in the Pokorny-root \*(a)ner- ‘Mann, Mensch : Kraft, Rüstigkeit, usw.’ the following distinctions are now obligatory:

(a) PIE \*h<sub>2</sub>ner- \*h<sub>2</sub>nor- ‘man’ (P. 765). The undisputed á- in Greek (and Phrygian) implies that this root originally began with PIE \*h:

Gr. ἀνήρ-	(m.) ‘Mann’ (GEW1:107-8)
NeoPhryg. αναρ-	(m.) ‘Mann’ (P. 765)
RV. nár-	(m.obl.) ‘Mann, Mensch’ (EWA 2:19-20)
RV. nṛ-	(m.obl.) ‘Mann, Mensch’ (WbRV. 748-50, nṛbhis [I])

(b) PIE \*ner- \*nor- ‘strength, strong’ (P. 38-39, HEG 1:28). Here both Greek and Old Anatolian indicate that the root did not begin with a laryngeal:

Cymr. ner	(m.) ‘chef, seigneur’ (LEIA N-10)
Osc. niir-	(m.) ‘princeps’ (LEIA N-10, niir [sgN])
RV. nár-	(m.) ‘Held, Krieger (von Göttern)’ (WbRV. 748)
RV. nṛ-	(m.) ‘Held, Krieger (von Göttern)’ (WbRV. 748)
Hes. νόρ·εμνο-	(a.) ‘μέγας, πολύς’ (LSJ. 1186)
Gr. νορῆω	(vb.) ‘operate, effect, etc.’ (Hes. νορῆι·ἐνεργεῖ)
CLu. anari-	(c.) ‘Rüstigkeit, Lebenskraft’ (DLL 26-27)
H <sub>i</sub> . anari-	(c.) ‘Rüstigkeit, Lebenskraft, Vitalität’ (HHand. 16)
Gr. νέρο-	(m.) Hes. ἰέροξ·νέροξ (LSJ. 1170) <sup>50</sup>
OIr. nert	(n.) ‘force, vigueur, puissance, vertu’ (LEIA N-10)

The semantic bridge fails not only for morphological reasons, but because a ‘man’ is not necessarily ‘chief, hero’ or even ‘strong’. Definitely, however, he is a ‘breather’, as was suggested already by Brugmann (Grundr<sup>2</sup> 1:351), connecting Gr. ἀνήρ to the root

PIE \*h<sub>2</sub>en- ‘breath’ (P. 38-39):

RV. sám (... ) ān-	(pf.) ‘leben, atmen’ (WbRV. 50, sám (... ) āna [3sg])
Go. uz ōn-	(pret.) ‘aus-atmen’ (GoEtD. 385, uzōn [3sg])
Osc. anamo-	(m.) ‘Seele, Geist, Gesinnung, Gemüt, Müt’ (WH 1:49)

§5. Finally, it should be observed that the postulation of a PIE morpheme requires that both the formal and semantic equations match. Therefore, two morphemes

$$\Phi_x(a_1, a_2, \dots, a_n) \equiv_{df} 'x' = \Phi_y(a_1, a_2, \dots, a_n) \equiv_{df} 'y'$$

are identical only if both the proposition  $\Phi_x(a_1, a_2, \dots, a_n) = \Phi_y(a_1, a_2, \dots, a_n)$  and the proposition ‘x’ = ‘y’ are true.<sup>51</sup>

<sup>50</sup> For the alternation of the meanings, compare Gr. ἡνάξ ‘Herrscher, Herr, Fürst’ (GEW 1:102) and Li. vānagas ‘Habicht’ (LiEtWb. 1194).

<sup>51</sup> Compare Campbell (2004:356): “A generally accepted principle (advocated by Meillet) permits only comparisons which involve both sound and meaning together.” An exception to the rule consists of the forms with unknown meaning (formula  $\Phi_x(a_1, a_2, \dots, a_n) \equiv_{df} '(?)'$ ). In order to test whether a suitable translation can be found, it is naturally allowed to propose equations from among morphologically possible matches in order to arrive at the missing translation.

### 1.3.2 Semantic fields of PIE root matrices

§0. The PIE roots formed tree-shaped structures called *root matrices* with a wide range of meanings defining the *semantic field* of the matrix.<sup>52</sup> The existence of semantic fields has been understood ever since the Sanskrit grammarians constructed roots not restricted to a single but several meanings. The preconditions for a comprehensive scientific study of the semantic fields have only been created recently as a consequence of the codification of the complete Indo-European material and the advancements of computational linguistics. Here I will not propose a full-scale theory of semantic fields of the Indo-European languages, but simply sketch the general situation in a preliminary manner for the limited purposes of this study.

§1. The alternation of meanings of a semantic field is governed, for instance, by the following regular factors:

(a) The grammatical categories of the stems belonging to a root matrix. For instance, it is commonplace within PIE roots that a verb meaning ‘to go (with four legs), run’ is associated with substantives meaning ‘horse’, ‘bird’ and/or ‘foot/leg’, an adjective ‘hasty’, a numeral meaning ‘four’, a preposition(s) meaning ‘for(ward), forth, etc.’, and an adverb meaning ‘fast’. The subcategories of the stems (such as ‘transitivity’, ‘gender’, etc.) govern regular changes of meaning, which can be digitally managed.

(b) The facts of the external reality are reflected in the dimensions of a semantic field. Thus, in PIE, a verb meaning ‘make’ is often accompanied by a substantive meaning ‘hand’ (or more abstractly, ‘work’), an adjective meaning ‘capable, mighty’, a numeral meaning ‘five’, and so forth. The reasons for the alternation are readily understood (the meaning ‘hand’ is defined by the ‘(five) fingers’ and actions performed by the hand), and this kind of phenomenon can also be regulated, at least to a reasonable degree.

(c) Roots with parallel extensions with an identical meaning (or nearly so) are not uncommon in Proto-Indo-European (and Indo-European). This can be illustrated with the traditional entry Neogr. \*mēn- ‘moon, month’ (P. 731), actually a \*n-extension of the root PIE √meh₂- √mēh₂- ‘luna’:<sup>53</sup>

PIE √meh₂-	
OInd. ma-	(m.) ‘Moon’ (MonWil. 771, Lex. mah₂ [sgN])
TochA. ma ·ñkātt-	(m.) ‘dea luna’ (Poucha 212, ma ·ñkātt [sgN])

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<sup>52</sup> Note that the term ‘semantic field’ is used here in a different sense than in its original usage. The standard definition and its summary are advanced by Fox (1995:116) as follows: “Jost Trier [...] put forward the theory of the semantic fields (Trier, 1931). According to this theory, it is possible to identify areas of the vocabulary (‘fields’) within which meanings are mutually defining and delimiting, thus forming systems which have some affinity to those found in phonology and morphology. Trier illustrated this principle with an analysis of the vocabulary of ‘knowledge’ in Middle High German, demonstrating that various words used covered the field in question without gaps or overlaps, and that the field and its structure changed in response to cultural developments.” For this internal meaning of the term ‘semantic field’, see further Hock (1991:305).

<sup>53</sup> For the regular explanation of vocalisms involved, see Chapter 2.

PIE  $\sqrt{m\bar{e}h}$ -n-

RV. māñ-ścatú-	(a.) ‘den Mond verscheuchend’ (WbRV. 1028)
Li. mėna-	(m.) ‘Monat, Mond’ (LiEtWb. 435, mėnas [sgN])

PIE  $\sqrt{m\bar{e}h}$ -s-

RV. candrá-mas-	(m.obl.) ‘Mond-’ (WbRV. 436, candrá-masas [G])
RV. mās-	(m.) ‘Mond, Monat’ (WbRV. 1036, māsam [sgA])
Arm. mahik	(sb.) ‘Mondsichel’ (ArmGr. 1:191, mahik) <sup>54</sup>
Mars. mesen-	(sb.) ‘Mond’ (WbOU. 472)

PIE  $\sqrt{m\bar{e}h}$ -u-

El. μεύ-	(m.) ‘Monat, Mondsichel’ (GEW 2:227, μεύς [sgN])
OIcl. mūlin-	(m.) ‘Mond’ (ANetWb. 395, mūlinn [sgN])
OIcl. mundil-fari	(PNm.) ‘N. für den Vater des Mondes’ (ANetWb. 395)

The semantic distinctions originally caused by the extensions remain temporarily unknown, owing to the incomplete state of Indo-European studies, but in principle these can also be recoverable when a digital study of the matrices as independent (and comparable) objects becomes possible.

(d) Semantic fields of formally distinct matrices can be compared with each other in terms of alternations and parallels of meaning. Thus the commonplace alternation of meanings ‘foot’, ‘go’, ‘hasty’ etc. recurs in:

$\sqrt{pi}$ - ‘gehen; Fuß’ (for the extended root, see P. 795, \*pi-m-)

TochA. pe-	(m.) ‘pes : Fuß’ (Poucha 186, pe [sgN])
Hi. pai-	(vb1.) ‘gehen, marschieren, usw.’ (CHD P:19f.)
OInd. paya-	(vb.) ‘to go, move’ (MonWil. 585, payate [3sg])

(e) The scope of semantic fields can (and must) be tested using the procedure sketched out by Szemerényi (1977:306):

“If an etymon involves the assumption of an unusual semantic development, the researcher must re-examine the phonological and morphological aspects of the derivation.”

As semantic alternations can be verified by means of comparison or rejected due to an absence of parallels, the more matrices are reconstructed the more solutions there are for semantic problems – and the more possible it is to build a highly regulated theory.

§2. Generally speaking, the most interesting possibilities in Indo-European semantics lie in non-arbitrary alternations of meaning.

<sup>54</sup> As evidence against Hübschmann’s suggestion of a hypothetical loan (without an Iranian starting point), note the ‘a-colouring’ in Armenian and Lithuanian acute, both with agreement in PIE \*h.

(a) Usually the assumption of arbitrariness of meaning is unnecessary or misleading: our first and foremost task in (P)IE semantics is to develop a means of regulating non-arbitrary semantic alternations and providing the study with precise tools to approach a meaning as an inductive problem with a solution.

(b) Even if the meanings of the shortest (primary) PIE roots, which serve as the starting points of the matrices, eventually turn out to be arbitrary, our task is to prove this scientifically instead of assuming arbitrariness *a priori*.

§3. Due to the translatability of the Indo-European data into formulas of predicate calculus, semantics can be studied as rigorously as morphology. Therefore, instead of attempting to ignore (or dismiss) it, semantics should be understood as a vital, independent dimension of comparative reconstruction.

## 1.4 Morphology

### 1.4.1 Morphemes and morphology

§0. The basic structure of Indo-European words, consisting of morphemes in a fixed order, has been understood since the twilight of the grammatical analysis.<sup>55</sup> Owing to this fundamental structure it is not primarily the words (or even less the paradigms), but morphemes – the minimal distinct units with meaning – that comprise the focus of the comparative method of reconstruction.<sup>56</sup> For the sake of such study, Schleicher<sup>57</sup> coined (or borrowed from biology) the term morphology. The primary goals of such study, occasionally also called *root theory*, are as follows:

(a) The establishment of the Proto-Indo-European morpheme inventory consisting of all attested Indo-European morphemes arranged under PIE root matrices, segmented and stored in the lexicon with their comparative reconstructions and derivations according to the proven sound laws.<sup>58</sup>

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<sup>55</sup> For the original segmentation, which is sporadically attested in the data, see especially Avestan and Old Celtic, where segmentations (Av. *hispō.səmna-* and OGaul. *coop.*, etc.) do occur. Naturally one must also mention the systematic program of segmentation of the Sanskrit grammarians.

<sup>56</sup> For the motivation to choose morphemes as the basic level, see Fox (1995:67): “Morphemes are, in fact, more useful than whole words, since word structure may well be different in the languages compared.” For some definitions of ‘morpheme’, see Lyons (1968:108ff.) and Trask (DPhPh:227): “The minimal grammatical unit; the smallest unit which plays any part in morphology, and which cannot be further decomposed except in phonological terms.”

<sup>57</sup> Szemerényi (1996:155): “The term morphology was coined by Schleicher in 1859; see *Mémoires Acad. Impériale* 7/1/7, 35: ‘für die leere von der wortform wäle ich das wort “morphologie”.’” For the background of the term, see Koerner (1982:21): “It is quite significant that Schleicher introduced the term ‘morphology’ into linguistics (Schleicher 1859b, 1861a) in his attempt to develop a mathematical, rigorous system of language classification.” Also note that biology, the source of the term, played a significant role in Schleicher’s ideas concerning the comparative method in general.

<sup>58</sup> On the definition, see Katičić (1970:93): “Morphological correspondence of word forms can be defined by phonemic correspondence of grammatical and lexical morphs.”

(b) The study of the variation and relationships of the PIE morphemes and establishing the rules governing the derivation of the PIE roots.<sup>59</sup>

§1. In terms of morpheme inventory, I would begin by quoting Joan Bybee (1985:3):

“The traditional concern of morphology has been the identification of morphemes: dividing words into parts and assigning meaning to the parts. This is a descriptive enterprise which assumes that words are indeed divisible in parts.”

In Indo-European linguistics, this divisibility has been gained by experience; there exists general confidence on the matter. However, segmentation – the cutting of morphemes – is not governed by *a priori* rules,<sup>60</sup> but internal and external confirmation for the morpheme boundary is required.<sup>61</sup> General devices for segmentation, like “[...] Greenberg’s square test to find the morph boundaries (Essays in Linguistics 22)” (Raimo Anttila 1969:43), have been suggested and developed.<sup>62</sup> All such methodologies remain, however, subordinate to the data. For the Indo-European languages, the following principles are valid:

(a)  $\Phi_x$  is a compound, if and only if there are morphemes  $\Phi_y$  and  $\Phi_z$ , such that

$$\Phi_x(a_1, a_2, \dots, a_n) \equiv 'x' \quad \Leftrightarrow \quad \Phi_y(a_1, a_2, \dots, a_{m-1}) \equiv 'y' + \Phi_z(a_m, \dots, a_n) \equiv 'z'$$
<sup>63</sup>

(b) If a morpheme  $\Phi_y(a_1, a_2, \dots, a_{m-1}) \equiv 'y'$  is previously known and the morpheme  $\Phi_z(a_m, \dots, a_n) \equiv 'z'$  has been reached by segmentation of it, it is allowed to account for the latter in order to identify its etymology or to falsify the segmentation.

§2. According to Baudouin’s *single morpheme hypothesis*, the (Indo-European) roots and the affixes have the same status, being morphemes. Consequently, at the basic level of observation, there is only one kind of entity: morphemes.<sup>64</sup> In this context, one readily agrees with Anttila (1969:97), quoting “Schütz’s general principle that etymological research should not comprise mere sound comparison but also include word formation (341, 347).” In other words, as put by Nyman (1982:7):

“All good etymologies are generative; i.e., they are based on an explicit grammatical analysis of linguistic signs. And evaluation of etymological reconstructions also has much [in] common with evaluation of descriptive grammatical analysis.”

In accordance with these principles, System PIE and the PIE Lexicon present a morpheme-and-stem morphology accompanied by reconstruction and sound laws.

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<sup>59</sup> Note that in order to be meaningfully practiced, this part of the task requires that significant portions of the morpheme inventory must have been reconstructed.

<sup>60</sup> See Anttila (1969:12,15).

<sup>61</sup> For several violations of data in Benveniste’s segmentation, see Schmitt-Brandt (1967:14).

<sup>62</sup> Thus, one may formulate the usual segmentation rule as follows: if two forms contain *m* identical radicals, but disagree in the *n*<sup>th</sup>, then *n* is a suffix belonging to another (possibly unidentified) root.

<sup>63</sup> See Campbell (2004:357): “When compared words are analysed as being composed of more than one morpheme, it is necessary to show that the segmented morphemes (roots and affixes) in fact exist in the grammatical system.”

<sup>64</sup> This principle, well known to the Neogrammarians, lies behind their respective term for the study (viz. ‘comparative grammar’).

### 1.4.2 On classification of morphemes

§0. The classification of Indo-European morphemes is based on the linear organization of words, maximally consisting of prefix (Π), root (ῥ), root determinative (Δ), derivational suffix (Σ) and inflectional suffix (σ). The varying aspects of the Indo-European words of the shape Π·ῥ·Δ·Σ·σ are studied under the following main disciplines:

(a) Morphophonology classifies the morphemes based on their appearance and mutual order in the formula Π·ῥ·Δ·Σ·σ.

(b) Morphophonemics studies the allomorphs (in practice, the ablaut variants) of the morphemes of all categories.<sup>65</sup> The Indo-European parent language was of a root-inflected type like Arabic, and as such it contained a stock of consonantal roots with alternative vocalizations in a system resembling Semitic interdigitation (or introflexion).<sup>66</sup>

(c) A rigorous apparatus of derivational morphology has resulted in a wide variety of root shapes in Proto-Indo-European, in sharp contrast with Semitic, which is mostly based on three-literal roots. In derivational morphology, the variation of morphemes is studied according to their relative positions in the root matrix.

§1. The Proto-Indo-European words were formed based on the pattern Π·ῥ·Δ·Σ·σ, where some terms may be missing in their attested form.<sup>67</sup> The subcategories of morphemes are well known, and a brief sketch suffices here:

(a) The prefix morpheme Π can be segmented (e.g. Gr. πρo, etc.), if prefixed forms appear alongside the prefixless ones in the material. Thus, for instance, the so-called prothetic vowels PIE \*ē·ō.<sup>68</sup> are prefixes by definition, owing to the standard ablaut PIE \*ō : Ø : \*ē, in examples such as:

√m- ‘I, me, my, mine, etc.’

*m-	Gr. με [sgA], gAv. mā, OCS. mę, etc.	→	Π = Ø·
*om-	HLu. amu, Ḫi. amuk [AD]	→	Π = *ō·
*em-	Gr. ἐμέ [sgA], ἐμό- (a.) ‘mine’, Arm. im	→	Π = *ē·

<sup>65</sup> For a definition, see Bybee (1985:v): “The study of morphology approaches morphemes as the (minimal) linguistic units with semantic content, and studies relations among them. In contrast, morpho-phonemics, as classically defined, studies the relations among allomorphs – the variant phonological representations of a single morpheme.”

<sup>66</sup> In Indo-European linguistics, the proto-roots are often given in the conventional \*e-grade (e.g. √h<sub>1</sub>elu-), regardless of the actual vocalizations of the material.

<sup>67</sup> The pattern Π·ῥ·Δ·Σ·σ may naturally contain multiple items of one and the same category. Thus, for example, a compound (see Hirt 1928 and Salus 1963) may consist of several root morphemes (ῥ<sub>1</sub>·ῥ<sub>2</sub>·...·ῥ<sub>n</sub>).

<sup>68</sup> Anttila (1969:89), Schwyzler (GrGr. 1.411-413 & 433), Austin 1941, Winter 1950, Wyatt (1972:1n1), Beekes (1969:18-98), Lejeune (1953:127-9), Messing (1947:190-200), Szemerényi (1964:112, 1970<sup>1</sup>:131).

√s- ‘be’			
*s-	Osc. senti [3pl], Do. évτι, HLu. sa-tu [3sg]	→	Π = ∅ ·
*os-	Hi. Pal. CLu. ašantu [3pl] ‘sind’	→	Π = *ǵ ·
*es-	LinB. ehont-, OLi. esąti- [pt.], etc.	→	Π = *ǵ ·
√su- ‘good’			
*su-	Hi. šuħmili- (a.) ‘well-fixed’ : RV. sūmáya-	→	Π = ∅ ·
*osu-	Hi. ašu- (a.) ‘good’	→	Π = *ǵ ·
*esu-	Gr. ἐϋ·ννητο- (a.) ‘gut gesponnen’	→	Π = *ǵ ·

In the laryngeal theory, it has been assumed that the prothetic vowels would provide direct evidence for laryngeals.<sup>69</sup> However, Messing’s (1947:191) objection “one cannot rely on the prothetic vowel to always reflect a laryngeal” is correct for obvious reasons: the postulation of a laryngeal based on a prothetic vowel constitutes a violation of the ambiguity rule, because PIE \*ǵ · ǵ · are equally possible (and actually correct in cases where PIE \*h does not appear). Thus, in the above examples, the postulation of an initial laryngeal is impossible, because no trace of it appears in the zero grade of the prothetic languages (Gr. √μ-) or in Old Anatolian (HLu. √š- ‘be’, Hi. √šu- ‘good’).

(b) The root morphemes  $\mathfrak{R}$  (designated by the symbol  $\sqrt{\quad}$ ) are the main components of the words (e.g. PIE  $\sqrt{\text{pt-}}$  ‘fly’).<sup>70</sup> The root is the minimal consonant shape (morpheme) of etymologically connected words obtained when all the affixes, including the ablaut vowels, are removed.<sup>71</sup> For lexical purposes, the PIE roots can be understood as arrays of radical consonants (phonemes) appearing with the attested vocalizations.<sup>72</sup>

(c) The term ‘Wurzeldeterminativ’ (or ‘root determinative’, designated by the symbol  $\Delta$ ) was coined by Curtius and accepted by Brugmann and other Neogrammarians. As for the definition, Persson’s (Beitr. 560) general characterization can still be quoted:

“Die Elemente, um welchem die längeren Wurzelformen vermehrt zu sein scheien, und die, da sie keine klar erkennbare Bedeutung oder bestimmte Funktion aufzeigen, sich für die gewöhnliche Auffassung im allgemeinen als integrierende Teile der Wurzel darstellen, nennt man mit einem von Curtius gebrachten Namen Wurzeldeterminative; zur Definition vgl. Brugmann KvglGr. 296f., Grundr.2 II, I, 10.”<sup>73</sup>

<sup>69</sup> See Benveniste (1935:152): “La ‘prothèse vocalique’ du grec et de l’arménien a donc, au moins en partie, un fondement étymologique: c’est le reste d’une initiale ə- antéconsonantique dans une racine suffixée à l’état II.”

<sup>70</sup> For a more informal definition, see Matthews (1991:64): “A form such as *luc-* is traditionally called a root. This is a form that underlies at least one paradigm or partial paradigm, and is itself morphologically simple. Thus *luc* underlies the paradigms of both *luceo* and *lucidus*.”

<sup>71</sup> Trask (DPhPh:312) writes: “In morphology, the simplest possible form of a lexical morpheme, with no affixes, such as Latin *am-* ‘love’ or Arabic *ktb* ‘write’.” For a detailed discussion, see Anttila (1969:15) and Brugmann (Grundr.<sup>2</sup> 1:32-40).

<sup>72</sup> Anttila (1969:104,17-), Møller (1880:151<sup>1</sup>), Polomé (1965:41<sup>183</sup>), and Borgström (1954:279).

<sup>73</sup> See also Szemerényi (1996:100): “[...] \*gheud- was formed within Indo-European from the simpler \*gheu- by means of a suffix which no longer has any clearly perceptible meaning. Formative elements of this kind have been known since Curtius as root determinatives.” For the literature and a discussion, see also Ammer (1952: 195).



The root determinatives, fossilized elements between the root and the derivational and/or inflectional suffixes, are disappearing as a class of morphemes. This is due to the advancement of the field, allowing their comparison with well-defined morphemes of the lexicon. As an example of an elimination of a ‘root determinative’, we may consider the following root:

Neogr. \*mark<sup>u</sup>- ‘fassen, usw.’ (P. 739)

TochA. mar (...)	kä-	(pr.) ‘capere, comprehendere’ (Poucha 225, mar käs)
Gr. μέμαρπο-		(ao.) ‘packen, fassen, ergreifen, einholen’ (GEW 2:178)
OInd. marcaya-		(cs.) ‘to seize, take’ (MonWil. 791)
Rus. moroková-		(vb.) ‘begreifen, verstehen’ (REW 2:159)

The unextended root Neogr. \*mar- ‘fassen, usw.’ is attested beyond Tocharian:

Gr. μάρη-		(f.) ‘Hand’ (= Hes. χεῖρ, GEW 2:175, LSJ. 1081)
Alb. mora-		(ao.) ‘nehmen, halten, fassen’ (Grundr <sup>2</sup> 1:365)
Gr. μαρήγω		(pr.) ‘nehmen, usw.’ (LSJ. 1081, μαρήγει : λαμβάνει)
Gr. εὐ·μαρόση-		(f.) ‘Leichtigkeit, Bequemlichkeit’ (GEW 1:588)

The determinative Δ = PIE \*k<sup>u</sup>(e/o)- can be proven as a morpheme by noting that Tocharian has preserved its meaning (= TochA. ‘com’). Accordingly, the determinative ·k<sup>u</sup>- ‘zusammen’ can be compared to the enclitic conjunction PIE \*k<sup>u</sup>e ‘und’ (Lat. ·que, RV. ·ca, Gr. ·τε usw., P. 635), thus forming a part of the root √k<sup>u</sup>- ‘zusammen’.<sup>74</sup>

In general, close philological and comparative scrutiny often allows for a comparative identification of the roots of determinatives. As the digital technologies are steadily improving, the study of determinatives is likely to improve considerably in the future.

(d) The derivational suffixes ·Σ are defined as bound morphemes following the root after an optional root determinative. As is the case of the root determinatives, the derivational suffixes can usually be compared to the respective free morphemes, which are preserved at least in some language(s). A relatively recent example of a derivational suffix analyzed in terms of morpheme inventory is provided by Schmitt-Brandt (1967:129), who compared the causative suffix PIE \*·e<sub>1</sub><sup>e</sup>/<sub>o</sub>- \*·o<sub>1</sub><sup>e</sup>/<sub>o</sub>- (vb.) ‘·machen’ with Anatolian data in:

√i- (vbA.) ‘machen’ (vbMP.) ‘werden’ (PIE \*i- \*ei- \*oi-, HEG 1:338-343)

Lyc. ai-		(vb.) ‘machen’ (HEG 1:340, aiti [3sg])
CLu. a <sub>1</sub> a-		(vb.) ‘machen’ (DLL. 23-24, a-a-du [3sg?])
Gr. ·ó <sub>1</sub> o-		(csM.) ‘werden’ (GEW 2:109, λειυκόμαι [1sg])
Gr. ·ó <sub>1</sub> ω		(csA.) ‘machen’ (GEW 2:109, λειυκόω [1sg])
H <sub>1</sub> i. ei-		(vb.) ‘machen’ (Sum DÜ, HED I:335-347, e-it [3sg])
Gr. ·έω		(cs.) ‘machen’ (e.g. in όρχέω, GEW 2:433)

<sup>74</sup> Thus, Pokorny’s early semantical bridge ‘\*irgendwie’ (as if from the relative pronoun PIE \*k<sup>u</sup>o-, k<sup>u</sup>e-) is erroneous.

Lat. ·eo-	(cs.) ‘machen’ (e.g. in Lat. <i>lūceō</i> ‘leuchten’, WH 1:823)
RV. ·áya-	(cs.) ‘machen’ (e.g. in RV. <i>rocaya-</i> , WbRV. 1171-2)
TochA. ya-	(vb.) ‘facere’ (Poucha 235-7, <i>yatār</i> [3sg], <i>yatsi</i> [inf.])
OĪi. ia-	(vb1A.) ‘machen’ (HEG 1:338-343, <i>ia-az-zi</i> , <i>ia-an-zi</i> )
RV. ·yá-	(pr.P.) ‘werden’ (e.g. in RV. <i>badhyá-</i> , WbRV. 898)

Although the number of recognizable PIE derivational suffixes is considerably less than that of root determinatives, there are still etymologies worth comparative attention.<sup>75</sup>

(e) The inflectional suffixes  $\sigma$  (or endings) are bound morphemes by definition, but as a rule they are also connected to other items of the morphology inventory. The inflectional suffixes are typically pronouns and demonstratives (with verbs) and affixes expressing, for instance, directions and other grammatical categories (with nouns).<sup>76</sup> The connection between inflectional suffixes and the respective root morphemes can be exemplified with a well-known example:

√m- ‘ich, mich, mir, usw.’ (P. 702)

Īi. ·mi	(end.) ‘1sg-pr.’ (e.g. in <i>e-eš-mi</i> [1sg], HEG 1:109)
Gr. μῆ	(encl.sgA.) ‘mich’ (GEW 1:504)

The words detached from their inflectional suffixes are called the stems of a language and marked with a final hyphen (the symbol -):

CLu. *huap-* (a.) ‘böse : hostile’ (DLL. 50, *hu-u-ua-ap-pí* [sgD]).

§2. In Indo-European linguistics, the term morphophonemics (or root-inflection of morphemes) basically coincides with ablaut. We can define the Proto-Indo-European ablaut with the following formula (for the full derivation and proof, see Chapter 2):<sup>77</sup>

ABLAUT(PIE)  $\equiv_{df}$  PIE \*ē : e : Ø : o : ō.

In theory (and often in practice), any ablaut vowel is allowed to appear in any position and is restricted only by the attestations of the material.<sup>78</sup>

(a) The ablaut vocalizations of a root and its ablaut bases are reconstructed for every root, according to the attested forms. Thus, for instance, the ablaut of the root √bhr- ‘bear’ can be defined as PIE \*bhōr- : \*bhor- : \*bhr- : \*bher- : \*bhēr-, since such vocalizations are inferable based on the data.<sup>79</sup>

<sup>75</sup> Thus, for instance, the optative Gr. ·oi- (RV. ·e-) appears as a free morpheme in RV. *é-* (pr.) ‘von jemand bittend angehen, bitten’ (WbRV. 194, *éti* [3sg]).

<sup>76</sup> It is usually said that inflectional affixes signal grammatical relationships without changing the grammatical class of the stems.

<sup>77</sup> For the zero grade, see Anttila (1969:75), Brugmann (Grundr<sup>2</sup> 1:394, 428) and Whitney (1955:422).

<sup>78</sup> Strictly speaking, the ablaut bases of PIE roots are not allomorphs, since the vocalizations PIE \*ē : e : Ø : o : ō do not allow further reduction; they certainly make a specific difference in terms of meaning.

<sup>79</sup> Note that identification of the ablaut bases of the roots is one of the primary problems of their reconstruction, because the attested forms are built upon these.

(b) For the validity of the ablaut theory, it is vital that complete variation is taken into account and the respective sound laws are confirmed. An incomplete array of ablaut bases together with a structural approach can result in a false comparison of unidentical bases; if sound laws remain unchecked, inconsistency ensues.<sup>80</sup>

(c) Deep level bases achieved by the internal reconstruction of ‘Pre-Proto-Language’ are not accepted except for the absolute root, purged of ablaut vowels and used only for alphabetic purposes.<sup>81</sup> Thus, for example, it is permitted to postulate a zero-grade root  $\sqrt{\text{mr-}}$  ‘sterben, usw.’ (P. 735f.) even if no such vocalization is attested, because the items tagged ‘ $\sqrt{\text{v}}$ ’ are not, strictly speaking, postulated (reconstructed).<sup>82</sup>

§3. Derivational variation is widespread both in Proto-Indo-European and its successors. The variation is usually referred to as dialectal, but the data suggests that it is more likely caused by PIE derivation, and the latter terminology is preferred in this study.<sup>83</sup> The derivational variation refers to forms that are distinct from the most common formations and cannot be connected to the latter by the means of consistent sound laws. It is common for dialectal (or derivational) variants to be corroborated by at least two witnesses, thus allowing for their reconstruction in the proto-language. Exempli gratia, this is the case with:

Poln. między                    (prep.) ‘zwischen’ (REW 2:112, P. –).

The stem contains a problematic nasal vowel PSlav. \*memdj-, which is absent from the better known formation:

(a) PIE \*medhjo- ‘medius : (in the) middle (of), between’ (P. 706)

RV. mādhyā-	(a.) ‘medius’ (WbRV. 988)
LAv. ma’īdya-	(a.) ‘medius, mittlerer’ (AIWb. 1116)
Osc. mefio-	(a.) ‘mittlerer, in der Mitte befindlich’ (WbOU. 464)
Ep. μέσσο-	(a.) ‘in der Mitte befindlich, mittlerer’ (GEW 2:214)

In the extended data now at our disposal, the Slavonic form is also now paralleled:

(b) PIE \*memdhjo- ‘mittel-, zwischen’

LAv. mamδya-                    (a.) ‘mittelstark (von der Stimme)’ (AIWb. 1115)

<sup>80</sup> See, for instance, Szemerényi (1996:71): “[...] a morpheme is not necessarily an unchanging form. [...] For example, Grm. *geb-e* ‘give’, *gib-t* ‘gives’, *gab* ‘gave’, *gāb-e* (subj.) clearly contain the same morpheme, though in the different forms *geb-/gib-/gab-/gāb-*. The morpheme, therefore, has *allomorphs* [...]. The type of morpheme variation illustrated by *geben* is of great importance [...] and is known as *ablaut*.”

<sup>81</sup> Consequently, hypothetical roots with unattested vocalizations like the so-called ‘Hirtian bases’ (e.g. \*eueguh-, P. 348) are unacceptable in the comparative method.

<sup>82</sup> Roots (e.g.  $\sqrt{\text{mr-}}$ ) refer to absolutely affixless forms. Therefore, they are independent of attestations such as RV. mṛ- (aoM.) ‘sterben’ (WbRV. 1054, mṛthās [2sg]) and RV. mamr- (pf.) ‘sterben’ (WbRV. 1054, mamrús [3pl]).

<sup>83</sup> For an alternative formulation of the ‘derivational variation’ used here, see Fox (1995:51-2): “[...] although it is customary in the practice of reconstruction to take ancient attested languages (Latin, Sanskrit, Old High German, etc.) as the starting point, it is clear that these languages were in reality not the uniform linguistic systems often preserved in their classical form, but were variable and dialectally differentiated.”

Poln. między (prep.) ‘zwischen’ (REW 2:112, P. –)

Obviously, this kind of alternation is not dialectal, because there is no ‘Polish-Avestan dialect’ and we are dealing with a simple isogloss between the languages. As we may identify the derivational device leading to PIE \*memdhjo- (reduplication) and the base is confirmed by two witnesses, the isogloss containing an otherwise unattested zero grade of the root (PIE \*mdh-) is a welcome addition to the known ablaut of the root.

### 1.4.3 Morphotactics and PIE root matrices

§0. In Indo-European linguistics, the term morphotactics can be understood as the study of the morphemes in linear sequence  $\Pi \cdot \mathfrak{R} \cdot \Delta \cdot \Sigma \cdot \sigma$  (morphophonology) and ablaut PIE \*ē e Ø o ō (morphophonemics). The ultimate goal of the study is to discover and reconstruct the rules governing the derivational morphology of the proto-language. In its fully adequate form, the study requires the reconstruction of all PIE morphemes arranged under the main roots, a goal that has yet to be achieved. Despite this, a preliminary description of the PIE root matrices is sketched out for general purposes.

The Indo-European root theory has split into two main divisions:

(a) The traditional theory – which includes such figures as Brugmann, Walde, Persson and Pokorny – is empirical and inductive, and consequently it makes no *a priori* demands on the number of radical consonants of roots: the roots’ shapes implied by the comparative method and based on the evidence are projected onto the proto-language.

(b) The laryngeal theory, based on an assumed Proto-Indo-Semitic root structure  $C_1 C_2 \cdot (C_3)$ , has a vastly simplified idea of the alternation of the Indo-European roots: if the ideal shape is not attested at the surface level, laryngeals  ${}^{\dagger}h_1$  and  ${}^{\dagger}h_3$  are added in order to make the shape of the root of Proto-Indo-Semitic.

§1. The traditional root theory, based on induction, was already practiced by the Neogrammarians and continued by names like Persson, Walde and Pokorny. The intrinsic organization of the Indo-European data has informed the lexicographers and root theoreticians that the unextended roots  $\mathfrak{R}$  are accompanied with numerous parallel extensions of shapes  $\mathfrak{R} \cdot \Sigma_1, \mathfrak{R} \cdot \Sigma_2, \dots, \mathfrak{R} \cdot \Sigma_n$  (where the suffix variable  $\Sigma$  ranges across the morpheme paradigm, including the root determinatives). This approach has resulted in tree-shaped root structures, consisting of the primary root and its extensions, which are possibly further extended. The basic arrangement can be exemplified with a monoliteral root:

√i- ‘gehen’ (P. 293-297)

RV. i-

Gr. εἶ-

(pr.) ‘gehen, reiten, fahren, fliegen’ (WbRV. 195)

(vb.) ‘gehen’ (GEW 1:462-3, εἶμι [1sg])

For this root, Walde and Pokorny reconstructed multiple biliteral extensions (called ‘Bildungen’ in this context), including  $\sqrt{ia(h)}$ - (P. 296),  $\sqrt{igh}$ - (P. 296),  $\sqrt{il}$ - (P. 296),  $\sqrt{im}$ - (294),  $\sqrt{it}$ - (294),  $\sqrt{idh}$ - (P. 295),  $\sqrt{iu}$ - (P. 295), and so forth.<sup>84</sup> Characteristically, the extensions are subordinated and arranged according to the number of attested radicals. In this study, these shapes – containing the derivational structure of the primary PIE roots – are called ‘root matrices’ (or simply ‘matrices’). Though presenting a full-scale root theory before the completion of the PIE morpheme inventory would be premature, the concepts of the monoliteral root and the root matrices built upon them govern the formation and the structure of the Proto-Indo-European parent language, and some preliminary comments are in order:

(a) Many, if not all, PIE roots derive from monoliteral roots that allow no further analysis; therefore, they form the primary level of the PIE root matrices.<sup>85</sup> Recently, the existence of such roots in Old Anatolian was noted by Burrow (1979:20):

“[...] there are a larger number of monosyllabic roots in -ā in Hittite [...] which show no sign of a laryngeal, some of which have equivalents in other IE languages, and some of which do not:  $\hbar a$ - ‘to believe’,  $lā$ - ‘to loosen’,  $mā(i)$ - ‘to grow, thrive, ripen’ [...]  $nā(i)$ - ‘to lead, direct, send’ [...],  $pā(i)$ - ‘to go’ [...],  $šā(i)$ - ‘to press, impress’ [...]”<sup>86</sup>

Such monoliteral roots are, of course, not restricted to Old Anatolian. They appear practically in all cognates, as shown in the parallel examples below.<sup>87</sup> In such a manner, the phenomenon dates back to the Proto-Indo-European period and is of particular interest for the comparative method.

(b) PIE root matrices have a unique structure consisting of knots (isoglosses) based on the attested cognates. Accordingly, Proto-Indo-European had a structure (in the sense of Saussure) that can be reconstructed by accounting for all attested extensions. This not only contributes to our primary objective, the build-up of the PIE morpheme inventory, but allows for organization of the material based on the structure of the roots themselves.

(c) An argument against the comparative theory was presented by Szemerényi (1977:288); referring to Persson (1891, 1912), he wrote: “[...] new avenues seemed to be opened up with a more thorough internal analysis and comparison which lead to the doctrine of root-determinatives.” Szemerényi’s objection (1977:288) follows:

“But many scholars recognized the dangers inherent in the method of dissection. The phonic core remaining after the operation, the root, often became so tenuous—consonant

<sup>84</sup> For an example of an extension, see Gr.  $\omicron\mu\omicron$ - (m.) ‘Streifen, Gang, Weg, Bahn’ (GEW 2:363) from PIE \*oimo- (from  $\sqrt{im}$ -).

<sup>85</sup> Note that the existence of single consonant roots does not mean that multiliteral roots (without derivation from monoliteral ones) would not exist. Roots with any number of consonants (as well as vocalic roots) are accepted as proven by the comparison of material.

<sup>86</sup> For Burrow’s views on Old Anatolian in a more general context, see (1979:vii): “The special contribution of Hittite [...] is due to the fact that an earlier stage of Indo-European is reached by the comparison of Hittite and the Anatolian languages on the one hand, and the previously known IE languages on the other.”

<sup>87</sup> For additional monoliteral roots (of shape CV), see also Schmitt-Brandt (1967:13n8.).

+ vowel + consonant at the best, but often something even less substantial—that the comparisons obtained could not but be viewed with extreme skepticism.”

Szemerényi’s reasoning is difficult to accept because there is no comparative alternative, and consequently monoliteral roots have been correctly postulated ever since the 19<sup>th</sup> century (see  $\sqrt{i}$ - ‘gehen’,  $\sqrt{s}$ - ‘sein’, etc.).<sup>88</sup> The more data has emerged, however, the more clear monoliteral shapes have become; now that digital technology is supporting study of the determinatives and suffixes, it has become pointless to further deny this attested phenomenon.<sup>89</sup>

(d) The content of the traditional theory being empirical, the sole remaining problem – mentioned by Katičić (1970:141) – is the scope of the theory:

“The fundamental question is, how can bundles of isoglosses [or correspondences] be reduced to knots on genealogical trees [or root matrices] without arbitrary selection of isoglosses from the whole network that exists in reality.”

This problem can also be solved when the existing network is accounted for in the etymological dictionary, thus comprising the full extent of the data. From such structure, the knots confirmed by at least two branches can be extracted by means of digital technology.

§2. The comparative root theory posits no *a priori* restrictions on the number of radical consonants making a root. Thus monoliteral  $\mathfrak{R}(x_1)$ , biliteral  $\mathfrak{R}(x_1, x_2)$  and triliteral  $\mathfrak{R}(x_1, x_2, x_3)$  – up to *n*-literal roots  $\mathfrak{R}(x_1, x_2, \dots, x_n)$  – can be reconstructed, if implied by the data. Some examples of externally confirmed monoliteral roots and their extensions arranged under root matrices are mentioned below:

(a)  $\sqrt{m}$ - ‘disintegrate, disappear, vanish, die’

PIE $\sqrt{mo}$ -	( $\equiv \mathfrak{R}o$ -) ‘disappear, vanish, die’
$\mathfrak{H}i$ . ma-	(vb1.) $\approx$ ‘disappear, vanish’ (CHL L/N 99, ma-du [3sg])
Lat. mo-	(vbM.) ‘sterben’ (WH 2:112, mori [inf.])
PIE $\sqrt{mor}$ -	( $\equiv \mathfrak{R}o\Delta_1$ -) ‘idem’ (Ablaut: *mer- *mor- *m $\mathfrak{r}$ -)
$\mathfrak{H}i$ . mar-	(vb1.&2.) ‘verschwinden, verlorengelassen’ (HEG 2:199)
RV. mamár-	(pf.) ‘sterben’ (WbRV. 1054, mamára [3sg])
$\mathfrak{H}i$ . mer-	(vb1.) ‘verschwinden, absterben’ (HEG 2:199, me-er-zi)
RV. m $\mathfrak{r}$ -	(aoM.) ‘sterben’ (WbRV. 1054, m $\mathfrak{r}$ thās, KEWA 2:696f.)

<sup>88</sup> Also note Szemerényi’s contradictory views on the matter: while elsewhere denying such items in this context (1996:132), he points out the existence of “clearly archaic roots” that show the structures VC-, C, CV. On root theory and root shapes C and V, see also Szemerényi (1996:98-101).

<sup>89</sup> For examples of determinatives implying a monoliteral root, see Neogr. \*g<sup>u</sup>ā- g<sup>u</sup>em g<sup>u</sup>en- (Persson, Beitr. 572-3) and Burrow’s analysis (1949:32): “The Sanskrit root gam- ‘to go’ contains an enlargement -am ([P]IE -em) as is clear from the alternative root gā- which contains a different enlargement -ā. In Greek and Latin (βαίω, venio) yet a third enlargement -en appears. The usual theory which derives this n phonetically from an earlier m is both unnecessary and misleading.” The same can be said of the root \*g<sup>u</sup>ou- ‘Stier, Kuh’ (P. 482-3) and \*drā-, \*drem-, dreu- ‘run’ (Szemerényi 1996:100-1).

PIE √mort- (≡ ʔoΔ<sub>1</sub>·Σ<sub>1</sub>-)<sup>90</sup>

Gr. μορτό-	(a.) ‘man, mortal’ (LSJ. 1147, GEW 2:257, μορτός)
RV. mártā-	(m.) ‘Sterblicher, Mensch’ (WbRV. 1008-9)
Lat. mortuo-	(a.) ‘tot’ (WH 2:113, mortuus [sgN])

PIE √mosK- (≡ ʔoΔ<sub>2</sub>·Σ<sub>2</sub>-)

Ĥi. maški-	(vb.) ‘id’ (?) (CHD M-99, ma-aš-ki-id-du [3sg])
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In addition to the monoliteral root √m- (and its extensions √mor- and √mos-), yet another extension √maḥ- (≡ ʔoΔ<sub>3</sub>) has been preserved in the feminine

PIE \*mēaḥ- ‘death’:

OInd. mā-	(f.) ‘death’ (MonWil. 771, Lex. mā [sgN]).
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The extensions of the root matrices can be built in a straightforward manner based on attested forms, as has been the custom ever since the Neogrammarians.

(b) √p- ‘foot : go’ (no root given in P.)

√po- ‘go’ (no root given in P.)

HLu. pa-	(vb.) ‘go’ (CHLu. 11.1.e24, (“PES2”)pa-tu)
Gr. ἄπο πο-	(ao. <sup>?</sup> ) Hes. ἀποπεῖν · ἀπελθεῖν (LSJ. 212)
Ĥi. pa-	(vb.) ‘go, pass, flow’ (CHD P:18f., pa-an-zi [3pl])
Gr. τρί πο-	(m.) ‘tripod’ (LSJ 1821, τρίπος, τρίπου)

√pei- ‘eilen’ (P. 795)

Ĥi. pai-	(vb1.) ‘gehen, fließen, fliegen’ (CHD P:19f., paizi)
TochA. pe-	(m.) ‘pes’ (Poucha 186, pe [sgN])
Dhātup. páya-	(vbM.) ‘to go, move’ (MonWil. 585, payate [3sg])

√per- ‘eilen’ (P. 816-7)

CLu. par-	(vb1.) ‘treiben, jagen’ (?) (DLL. 77, pár-du [3sg])
RV. pípar-	(pr.) ‘hinüberführen’ (WbRV. 777-8, píparti)
HLu. para-	(sb.) ‘foot’ (CHLu. 10.14.9, (“PES”)pa+ra/i-za)
Ĥi. parḥa-	(vb.intr.) ‘eilen, jagen’ (HHand. 121, CHD P:143f.)
Gr. περάω	(pr.) ‘durchschreiten, -fahren’ (GEW 2:510)

√pet- ‘fliegen, laufen, eilen’ (P. 825-6)

AV. ví ánu papāt-	(pf.) ‘durchfliegen’ (WbRV. 761, ví ánu papāta [3sg])
Gr. πέτο-	(vb.) ‘fliegen’ (GEW 2:521-2, πέτομαι [1sg])
Ĥi. peta-	(vb.) ‘laufen, eilen, fliegen’ (CHD P:352f., pí-it-ta-i)

√peu- ‘gehen, eilen’ (no root given in P.)

Ĥi. pauan-	(n.obl.) ‘das Hinausgehen, der Ausgang’ (HHand. 128)
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<sup>90</sup> A parallel extension is ʔto·Δ·Σ- in PIE √mori- = Ĥi. mari- (vb.) ‘zerstückeln’ (HEG 2:136, mar-ri-et-ta), OLat. morī- (vb.) ‘sterben’ (WH 2:112, morīri [inf.]).

TochB. snai ·pew-	(a.) ‘without feet’ (DTochB. 399, snaipewam̄)
TochB. wi ·pew-	(a.) ‘two-footed’ (DTochB. 399, wipewam̄)

Yet again, the monoliteral root  $\sqrt{p}$ - is accompanied by multiple alternative extensions (or determinatives) constituting the matrix of the root.

§3. The comparative Indo-European root theory has been temporarily sidetracked by the laryngeal theory, where empirical theory has been replaced by Møller’s Proto-Indo-Semitic root hypothesis. Within this framework, bilateral roots would be of the oldest type, according to Møller (1906:xiv):

“Die zweikonsonantigen Wurzeln, wie bh-r-, g<sub>1</sub>-n- (in φέρω, γένος), sind innerhalb des Indogermanischen (wie entsprechend innerhalb des Semitischen) die ältesten, nicht, wie Hirt will, die jüngsten.”

Contrary to Møller’s suggestion, the monoliteral roots  $\sqrt{C}$ - are not restricted to pronouns,<sup>91</sup> but include ancient roots with nominal and verbal derivations (see above). Erroneously claiming biliteral roots to be the most ancient Indo-European ones, the root shape C<sub>1</sub>C<sub>2</sub>·(C<sub>3</sub>) is not particularly suitable for comparative reconstruction.<sup>92</sup> It makes little sense to add the root radicals (laryngeals) based on the alleged shape C<sub>1</sub>C<sub>2</sub>·(C<sub>3</sub>) and then remove these traces. This practice is particularly questionable in examples where no prothetic vowel, no compensatory lengthening, no Old Anatolian laryngeal or no other trace of a laryngeal appears:

PIE  $\sqrt{i}$ - ‘gehen, usw.’

CLu. i-	(vb.) ‘aller’ (DLL. 50, i-ti [3sg], i-du [3sg])
RV. i-	(pr.) ‘gehen, wandern, reiten, usw.’ (WbRV. 195, itás)
Gr. ἴ-	(vb.) ‘gehen’ (GEW 1:463, ἴμεν [1pl], ἴθι [2sg])

In such (and similar) circumstances, postulates like  $\sqrt{h_1i}$ - ‘gehen’ – far exceeding the allowed means of inference of natural science and the comparative method – are erroneous.

§4. The main issues concerning the PIE root theory (and/or morphotactics) can be summarized as follows:

- (a) The shortest forms of the PIE roots, whether monoliteral or multiliteral, serve as the basis upon which the extensions have been built. These extensions can be defined as knots that cannot be derived from the root through sound laws, and they reflect the PIE derivation, based on morphological rules that are still only partially known.
- (b) Owing to the principle of recursion, it can be anticipated that the formation of the extensions follows the same rules throughout the root matrices with the result that

<sup>91</sup> Møller (1911:viii): “eine Reihe einkonsonantiger einsilbiger Pronominalstämme [...] i- ‘er’ (S. 109), d- ‘dieser’ (S. 39), <sup>2</sup>t- ‘der’, <sup>1</sup>t- ‘du’ (S. 242), Á- ‘ich’ (dieses s. unter idg. e- S. 64).”

<sup>92</sup> Quoting Anttila (1969:12), Benveniste explains segmentation: “Starting from the beginning of a word, cut after the second consonant to get the root; thereafter cut behind every consonant to get suffixes (Or 174).” Although occasionally true, owing to its deductive character this is to be abandoned as a general principle.



study of the PIE derivation will be increasingly important for Indo-European morphology in the future. As a relatively complete PIE morpheme inventory is a necessary prerequisite for such study, it could take some years before the first comprehensive studies appear, but in general the development is unavoidable.

(c) Owing to unfulfilled preconditions, PIE morphotactics – the study of the mutual relationships of the morphemes – has traditionally exhibited oversimplifying tendencies. Inaccuracies with the PIE past participle can be illustrated by \*·to-, which is often claimed to take the zero-grade root (and hence consisting of general structure C<sub>1</sub>C<sub>2</sub>·tó-).<sup>93</sup> This view is, properly speaking, exaggerated in several respects:<sup>94</sup>

1. A restriction has already been suggested by Maurer (1947:3fn4), according to whom:

“It should be remarked that the rules about zero grade really apply only to roots containing a sonant after the alternating vowel. Otherwise the full grade is generally found instead, e.g. Sk. sannáḥ and sattáḥ from the root sad-, IE \*sed- ‘to sit’, Gk. λεικ-τός [sic.], root λεγ-, IE \*leǵ- ‘to gather, etc.’.”

To prevent the postulation of unattested (and unrealistic) shapes like †sp̥kto- and †tǵtó- (see Rix 1976:229) instead of the actual ones, the restriction should be accepted.

2. Furthermore, as pointed out by Persson (1912:202), the grammatical class of the stem also bears significance to the ablaut grade of the root:

“Wie bekannt, eignet Hochstufenvokalismus besonders den substantivischen *to*-Bildungen, während die partizipial verwendeten in der Regel tiefstufige Wurzelsilben haben. \*leuk̑tos \*loȗktos -om in ai. lōšṭás -am steht neben \*luk̑tos in gr. ἀλυκτοπέδη wie z. B. \*méȓtos móȓtos in ai. mártas, gr. μορτός : ἄνθρωπος θνητός Hes. neben \*mȓtós ‘gestorben’ in ai. mȓtás [...]”

3. The uniform assumption of the existence of a single \*·to-participle for every root may turn out premature as well. Thus, for instance, four distinct vocalizations appear for the root Neogr. \*do- ‘geben’ (cf. Li. dúotas ‘given’, Gr. δοτός ‘id.’, Lat. datum ‘id.’ and Lat. man·dāto- ‘Auftrag’; cf. §2.5.5. for the respective bases). In this case it is possible that participles in \*·to- could in principle be formed from any verbal stem.

(d) The ultimate reason that the corner has not been turned in morphotactics lies in the absence of a general solution to the problem of the Indo-European ablaut and the reconstruction of Ǧi. ǧ. When this problem is solved and the respective proto-vowels are reconstructed, this field of Indo-European studies will also be revitalized.

<sup>93</sup> Thus, for instance, Anttila (1969:75) writes: “Together with the -t̑-noun the -tó-participle takes zero grade of the root (Grdr 21.394, 428; Whitney Grammar 422).”

<sup>94</sup> Similar examples are readily found elsewhere in morphology. Thus, PIE \*o in C<sub>1</sub>oC<sub>2</sub>-eje/o- (Gr. ποτέο- : RV. patáya-) is not the sole vocalization of causatives, because causative bases in C<sub>1</sub>ǫC<sub>2</sub>- (Gr. ποτάομαι : RV. pātáya-) and in C<sub>1</sub>ēC<sub>2</sub>- (OInd. jāsayā- ‘to exhaust’, Av. ni-ǰāmayā- ‘make born’, etc.) occur. Likewise, the perfect in PIE \*o (cf. C<sub>1</sub>oC<sub>2</sub>- in Gr. γεγωνα ‘I am born’ = RV. jajāna) is accompanied by perfects in C<sub>1</sub>ǫC<sub>2</sub>- (Gr. γέωνοι ‘I am audible’, GEW 1:293) and C<sub>1</sub>ēC<sub>2</sub>- (Lat. ēgi, sēdi, OInd. jajāsa ‘is exhausted’, etc.).

## 1.5 The comparative method of reconstruction<sup>95</sup>

### 1.5.1 Comparative relation and its subcategories

§0. The comparative method has taken its name from the characteristic juxtaposition of objects in comparative relations:

$$\begin{array}{lcl} \Phi(a_1, a_2, \dots, a_n) \equiv_{\text{df}} 'x' & : & \Theta(b_1, b_2, \dots, b_m) \equiv_{\text{df}} 'y'^{96} \\ \text{Hi. guen} \cdot \text{zi} \equiv \text{'kill [3sg-pr]'} & : & \text{RV. han} \cdot \text{ti} \equiv \text{'kill-[3sg-pr]'} \end{array}$$

Comparative relations  $\Phi(a) : \Theta(b)$  are defined by the properties of the predicates  $\Phi$  and  $\Theta$  on two axes: genetic vs. non-genetic and internal vs. non-internal (i.e. external). If we designate the genetically related Indo-European languages with  $\Phi$ , non-genetically related languages with  $f$ , and the metalanguage with  $\mu$ , then the four logically existing domains of comparison can be expressed by the table:

	GENETIC :	NON-GENETIC:
INTERNAL:	$\Phi_m(a) : \Phi_m(b)$	$\Phi_m(a) : \mu(b)$
EXTERNAL:	$\Phi_m(a) : \Phi_n(b)$	$\Phi_m(a) : f(b)$

The defined subclasses can be briefly characterized as follows:

§1. The genetic internal relation  $\Phi_m(a) : \Phi_m(b)$  deals with objects of one and the same language  $\Phi_m$ , thus defining the synchronic/static sphere of internal comparison as, for instance, in Lat. est 'is' : Lat. erat 'was'.<sup>97</sup>

§2. The genetic external relation  $\Phi_m(a) : \Phi_n(b)$  compares objects of two different Indo-European languages  $\Phi_m$  and  $\Phi_n$  (e.g. Lat. est : Hi. ešzi). The forms are usually attested at different periods of time, due to which the field of study is often referred to as diachronic (or historical) linguistics.

§3. The non-genetic internal relation  $\Phi_m(a) : \mu(b)$  represents analytic assertions of the metalanguage at various levels of formalism (e.g. Hi. eš-  $\equiv_{\text{df}}$  VC). In order to eliminate the apparent effects of the sound laws in the cognates, the use of structural metalanguage is limited to the portions of proto-language where no ambiguity appears.

§4. The non-genetic external relation  $\Phi_m(a) : f(b)$  compares Indo-European languages  $\Phi_m$  to other natural languages of the world that are not considered to be

<sup>95</sup> For the principles of the comparative method, see Szemerényi 1962, Bammesberger (1984:16-8), and Shields (1992:4-10). For a historical presentation, see Paul 1898, and for a more recent one, Fox 1995.

<sup>96</sup> In such equations, objects of any level (e.g. phonemes or their properties, meanings, morphemes, and/or sound laws) can be compared as defined by the context.

<sup>97</sup> Furthermore, note the distinctions made by Nyman (1982:3fn3): "In the first place a 'synchronic' description is supposed to be a snapshot of a socio-historical 'πάντα ὅεϊ' (cf. Saussure's 'état de langue'). In the second place, a 'synchronic' description means simply structural analysis of the object language(s)."

genetically related. In practice, the propositions define the domain of typology, or the classification and study of languages according to their structural features.<sup>98</sup>

### 1.5.2 Genetic internal comparison (Grammarians)

§0. The genetic internal comparison<sup>99</sup> is defined by the formula

$$\Phi_m(a_1, a_2, \dots, a_m) \quad : \quad \Phi_m(b_1, b_2, \dots, b_m).$$

Typically only one function  $\Phi_m$  occurs (i.e. the comparison is restricted within a language and therefore called internal). This is the primary level of linguistic description as practiced already by the ancient grammarians like Pāṇini, Dionysos Thrax and Varro. It still exists in the study of language isolates (e.g. Baski) with no genetic contacts available.

§1. Despite its elementary character, the significance of an adequate internal description cannot be understated. The level, being the primary one, provides direct information about a language, and only adequate skills in the language and philological precision guarantee a satisfactory initial description. In System PIE (and the PIE Lexicon), the following steps of description are integral to internal reconstruction:

(a) *Morpheme and Stem* reconstruction is characterized by the postulation of the stems obtained by segmenting the (inflectional) endings. Thus, for example, from  $\text{Ḫi. e-ēš-mi}$  and  $\text{Ḫi. e-ēš-zi}$  one obtains a stem

$$\text{Ḫi. eš-} \quad (\text{pr.}) \text{ 'sein' (HEG 1:76-, e-ēš-mi [1sg], e-ēš-zi [3sg]).}$$

By repeating this procedure and including segmentation all Indo-European languages can be presented as standardized horizontal lines in the matrix.

(b) *Item and Arrangement* reconstruction is added by arranging the material of a language under its own roots, to be confirmed (or rejected) by means of external data.<sup>100</sup> As an example of item and arrangement reconstruction of the material, one may cite the Old Anatolian root:

$\sqrt{\text{meḫ}}$ - 'Zeit'

$\sqrt{\text{meḫn}}$ -

$\text{Ḫi. meḫn-}$  (n.obl.) 'Zeit' (HEG 2:171,  $\text{me-eḫ-ni}$  [sgL])

$\sqrt{\text{meḫu(e)n}}$ -

$\text{Ḫi. meḫuen-}$  (n.obl.) 'Zeit' (HEG 2:171-4,  $\text{me-e-ḫu-e-ni}$  [sgL])

<sup>98</sup> If a genetic relationship is provable, the language  $f$  becomes a new Indo-European language  $\Phi_n$ .

<sup>99</sup> Kuryłowicz (1964:9) "[...] synchronic analysis of linguistic data without or before having recourse to comparison, linguistic geography and "areal linguistics", and glottochronology." For an exceptionally well-balanced description of internal reconstruction, see Campbell (2004:225-251).

<sup>100</sup> Note that within this process, as observed by Szemerényi (1977:298), "It is of course absolutely necessary to consider the whole family of a word, and not merely one representative."

Hi. meḥun- (n.obl.) ‘Zeit’ (HEG 2:171-4, me-e-ḥu-ni [sgL])

√meḥur-

Hi. meḥur- (n.) ‘Zeit’ (HEG 2:171-4, me-ḥu-ur [sgNA])

Hi. meḥuri- (n.pl.) ‘Zeit’ (HED 6:111, me-ḥur-ri<sup>HI.A</sup> [plNA])

In this manner, reconstruction displays the stems of the languages under matrices consisting of the root (√meḥ-) and its extensions (√meḥ n-, √meḥu<sup>r</sup>/n-), not unlike those of the early Sanskrit grammarians.

§2. Owing to potential historical developments like mergers, splits, PIE derivation and other factors, the internal method is not infallible.<sup>101</sup> The most noteworthy sources of errors here deserve to be mentioned:

(a) The distributive evidence concerning the morphemes is indirect, and it does not necessarily preserve the truth. Thus, despite the existence of the well-known internal distribution for the prepositions Lat. ā : ab ‘von, weg’ (cf. WH 1:1-2), it remains possible that there were two originally distinct PIE prototypes. Accordingly, rules postulated on the basis of internal evidence only<sup>102</sup> and internal reconstruction in general require external confirmation or rejection by means of the comparative method.

(b) The internal description in the usual sense is oriented to the paradigms and the grammar of the language in question. Often, if not always, this involves an unstated assumption of direct preservation of the paradigms through history. This has led to certain problems, as illustrated here by Nyman’s example (1977a:39):

“The Latin copula has been a stumbling block for students attempting to relate its present indicative paradigm (1) to the Indo-European model paradigm (2):

(1) sum, es(s), est, sumus, estis, sunt

(2) \*ésmi, \*és(s)i, \*ésti, \*smós, \*sté(s), \*sénti

Relating 1 to 2 apparently presupposes more than mere operation of sound laws. However, recourse to analogy as an explanatory principle has been shunned [...].”

Such apparent difficulties result from the conflict between the assumed PIE model paradigm (cf. Sanskrit) and the one attested in Latin. However, once one notes that the latter consists of not just one paradigm but two stems,<sup>103</sup> the problem becomes more approachable:

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<sup>101</sup> See Hock (1991:549): “[...] there is evidence which shows that occasionally the [internal] method will yield inaccurate results.”

<sup>102</sup> Indeed, one can compare Lat. ā = RV. ā ‘id’ and Lat. ab : RV. abhi (e.g. in AV. abhí (...) valga-(prA.) ‘aufwallen’ (von Wasser, WbRV. 1226)) and RV. abhi śvās-(inf.bs.) ‘aufstossen’ (vom Magen, WbRV. 1433), implying that both prepositions are externally secured.

<sup>103</sup> Compare Fox’s (1995:162) more general view of the situation: “[...] the method of Internal Reconstruction is extremely powerful in its ability to reconstruct splits, but also that some of its power may be excessive, since it is able to reconstruct a single invariant source even where the alternation is original.”

Lat. es-	(pr.) ‘to be’ (WH 2:628, in Lat. es(s), est, estis)
Lat. su-	(pr.) ‘to be’ (WH 2:628, in Lat. sum, sumus, sunt)

In order to proceed further in comparison, additional (external) evidence – in this case, it is available in Old Anatolian – is required:

Hi. eš-	(vb.) ‘to be’ (HEG 1:76f., e-eš-zi [3sg])
HLu. sa-	(vb.) ‘to be’ (CHLu. 1.1.36 etc., sa-ta, sa-tu) <sup>104</sup>

In other words, the attested Indo-European nominal and verbal paradigms are often suppletive, a feature that explains their permanent mutual disagreement. Despite the differences of the paradigms, the Indo-European stems are in regular agreement, with the result that the problems are avoided by a simple shift from the grammatical approach to morphemes and stems.<sup>105</sup>

### 1.5.3 Genetic external comparison (Paleogrammarians)<sup>106</sup>

§0. Sir William Jones’s (1786) announcement of a relationship between the Indo-Aryan and European languages marked the opening of a new domain of genetic (or external) comparison between the Indo-European languages.<sup>107</sup> The sharp distinction between Paul’s (1898:21-22) ‘Die descriptive Grammatik’, referring to the traditional activities of the philologists and ‘Die vergleichende/historische Grammatik’<sup>108</sup>, referring to the new genetic study, lies in the comparison of different languages  $\Phi_m$  and  $\Phi_n$  (Kuryłowicz 1964:9, 1973:63):

<sup>104</sup> See also the ‘suffix’ in CLu. mazala :ša- (vb2M.) ‘geduldig sein, dulden’ (HHand. 104, CLu. ma-az-za-al-la-ša-du-ua-ri [2pl]).

<sup>105</sup> In addition to the ‘morpheme and stem’ reconstruction (à la root theory) of the Sanskrit grammarians used here, compare the more commonly recognized types (viz. Word and Paradigm, Item and Arrangement and Item and Process) described by Matthews (1991:21): “In an influential article of the mid 1950s, Hockett pinpointed three models of grammatical analysis in general – three different ‘frames of reference’ (to adapt his words) within which an analyst might ‘approach the grammatical description of a language and state the results of his investigation’ (first sentence of Hockett, ‘Models’). In the terms which we are using, these are particular sets of formal principles. Of Hockett’s three, one which he called the ‘Word and Paradigm’ model, evidently referred to the traditional description of the older European languages [e.g. Greek, Latin]. Another, which he labelled ‘Item and Arrangement’, is a model in which morphemes are the basic units of meaning and in which they are arranged linearly [e.g. in Chinese]. The third (‘Item and Process’) is one in which the structure of the word is specified by a series of operations.” In an obvious manner, comparative reconstruction entails a mixture of the above types.

<sup>106</sup> For a brief summary of the Paleogrammarians, see Mallory (1989:12-18).

<sup>107</sup> Note, however, that the Hungarian Jesuits János Sajnovics and Samuel Gyarmathi proved the genetic relationship of Finnish and Hungarian, as well as the existence of the wider Finno-Ugrian group, at the end of the 18<sup>th</sup> century (see Szemerényi 1996:6fn1).

<sup>108</sup> On Sir William Jones as the founder of Indo-European linguistics, see Mayrhofer (1983:125ff.) and Hock (1991:556-7). Furthermore, note Szemerényi’s (1996:fn2) remark: “The term ‘comparative grammar’ (vergleichende Grammatik) was not, however, coined by Friedrich von Schlegel, but occurs as early as 1803 in a review by his brother August Wilhelm; see Aarsleff, *The Study of Language in England 1780-1860*, 1967, 157 n. 115.”

$$\Phi_m(a_{1-m}, x) : \Phi_n(b_{1-n}, y) \quad (\text{e.g. in Osc. sent 'they are' : Dor. (h)évti 'id.'}).$$

§1. The Paleogrammarians – including such pioneers as August Wilhelm von Schlegel, Rasmus Rask, Franz Bopp, Jakob Grimm, and August Pott – were capable of producing seminal etymological dictionaries like Curtius’s *Grundzüge der Griechischen Etymologie* (1858-1862) and Schleicher’s *Compendium der vergleichenden Grammatik der indogermanischen Sprachen* (1861-1862). As a great success was achieved in determining the historical relationships between the Indo-European languages, these developments led to the establishment of a new branch of science.

§2. Rask and Bopp had already developed the concept of systematic correspondences between the phonemes (called ‘letters’ at the time) of the cognates. With this, the study inherited a consistent starting point for its development. However, the Sanskrito-centric paradigm of the Paleogrammarians – partly explained by the transparency of the Indo-Iranian consonant system – led many pioneers to equate Sanskrit with the parent language as such.<sup>109</sup> This fallacy delayed the development of reconstruction and, at least to some degree, prevented understanding of the vowel system as a whole: because Sanskrit only possessed the vowels /a/ and /ā/ (in contrast with /ǎ/, /ě/ and /ǒ/ of the ‘European’ languages), the solution to the problem of vocalism had to wait until Brugmann and his colleagues, the Neogrammarians.

§3. The Paleogrammarian concept of ‘systematic correspondences of the letters’ is based on the comparison of objects  $x : y$  in order to establish their identity  $x = y$  (or the contrary,  $x \neq y$ ). In terms of predicate calculus, the correspondences are provable relations stating an etymological identity between the objects

$$\Phi(a_1, a_2, \dots, a_n) \equiv_{df} 'x' \quad = \quad \Theta(b_1, b_2, \dots, b_n) \equiv_{df} 'y'.$$

In such formulas, in order for the equation to be true, all the objects compared ( $a_1 = b_1, a_2 = b_2, \dots, a_n = b_n$  and ‘ $x$ ’ = ‘ $y$ ’) must be identities with possible applications of the sound laws. If any terms of the equation do not constitute a match, then the opposite holds:

$$\Phi(a_1, a_2, \dots, a_n) \equiv_{df} 'x' \quad \neq \quad \Theta(b_1, b_2, \dots, b_n) \equiv_{df} 'y'.$$

§4. During the early process of comparison, it became obvious that not all the phonemes of the Indo-European languages had been preserved as such, but some had changed according to the respective sound laws. In effect, the comparative method deals with two kinds of correspondences: the ‘identities of 1st Class’ (i.e. phonemes preserved as such) and ‘identities of 2nd Class’ (i.e. altered phonemes, requiring sound laws for their reconstruction).

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<sup>109</sup> See Koerner (1985:332): “Indo-European linguistics [...] was essentially ‘Sanskrito-centric’ (cf. Mayrhofer 1983:130-36 passim).” Ultimately the turning point came with Schleicher, who replaced the habit of quoting Sanskrit as the protolanguage with his reconstructed forms using an asterisk (\*) prefixed to the protoforms.

### 1.5.4 Sound changes and sound laws

§0. The fundamental core of Proto-Indo-European comparative reconstruction consists of the identities of 1<sup>st</sup> Class (i.e. the preserved phonemes and properties). In addition, it is required that the identities of 2<sup>nd</sup> Class (i.e. the changed phonemes) are described by regular sound laws.<sup>110</sup> The distinction between the preserved and the changed phonemes (marked with square brackets) can be illustrated by the correspondence set for PIE \*senti ‘they are’:

		1.	2.	3.	4.	5.
RV. santi	≡	Φ <sub>κ</sub> ( s	[a]	n	t	i )
Osc. sent	≡	Φ <sub>λ</sub> ( s	e	n	t	[-] )
gAv. həntī	≡	Φ <sub>μ</sub> ( [h]	[ə]	n	t	[ī] )
Do. évτι	≡	Φ <sub>ν</sub> ( [-]	é	v	τ	ι )
			↓	↓	↓	↓
PIE *senti	≡	*	s	e	n	t i

Characteristically, the identities of the 1<sup>st</sup> Class (e.g. PIE \*s ≡ RV. s = Osc. s, etc.) are directly mirrored in the proto-language based on the axiom of identity (x = x), but sound laws must be postulated for the changed phonemes (e.g. PIE \*e → RV. a, PIE \*s → gAv. h, etc.). In this sense the sound laws, describing historical sound changes, are secondary (complementary) devices used to eliminate the surface-level differences of the attested languages. Strictly speaking, they are not utilized in the reconstruction proper without any changed sounds.<sup>111</sup>

§1. Already in 1818, Rasmus Christian Rask wrote of “rules of letter changes” to explain similarities between words in the Germanic and Classical languages. The status of such rules, coined ‘Lautgesetze’ by Bopp (1825:195), was properly understood by the pioneers from the very beginning, as is obvious from Koerner’s (1982:21) account:

“Bopp, under the influence of Humboldt, spoke of ‘phonetische Gesetze’ as early as 1826, using the term ‘sound law’ (Lautgesetz) from 1824 onwards. These he described as physical and mechanical laws in the preface of his *Vergleichende Grammatik* of 1833 [...].”

A generation later, constantly speaking of the “ausnahmslos durchgreifende lautgesetze”, Schleicher (1860:170) had added the idea of the non-existence of exceptions to the concept, but the breakthrough had to wait until Leskien’s famous

<sup>110</sup> See, for instance, Hock (1991:540-1): “[...] in order to be considered successful, reconstructions (both internal and comparative) must be ‘justified’ by means of a detailed statement on the changes required to convert the reconstructed forms into their actually attested counterparts.”

<sup>111</sup> Naturally, after the sound laws have been proven by induction, the changed sounds can also be used in reconstruction (as often happens when a phoneme or a property has not been preserved in any language).

quote “die Ausnahmslosigkeit der Lautgesetze” (1876) won the day, becoming the slogan of the Neogrammarians.<sup>112</sup>

§2. It is possible that the adoption of Bopp’s term ‘sound law’ (instead of ‘rule’, preferred by Rask) has contributed to the Lautgesetz-controversy,<sup>113</sup> as it allowed the Neogrammarians (and some of their adversaries) to use the terms ‘sound change’ and ‘sound law’ as synonyms. Since this confusion still exists, I would like to use the occasion to briefly discuss the definitions (and their difference) in this connection.

(a) As a causal phenomenon of nature, sound change (Lautwechsel) operates regularly or without exceptions.<sup>114</sup> As for this, I find Katičić’s (1970:146) evaluation of the Neogrammarians still applicable today:

“The discovery by the *Junggrammatiker* of the importance of the assumption of regularity in sound change crowned the work of many decades of successful genetic research.”<sup>115</sup>

(b) Sound law (Lautgesetz), on the other hand, is a man-made model describing (or attempting to describe) the respective sound change. As they are relative to the data that is available (and used), the sound laws are potentially fallible; if so, they do allow ‘exceptions’, because the sound laws themselves can be misformulated.<sup>116</sup> This demarcation was not made by the Neogrammarians when they identified sound laws with sound changes, thus provoking the ire of their adversaries.<sup>117</sup>

§3. As for their function, the sound laws – quoting here Katičić (1970:120) – “are operators transforming phonemic strings of the older stage into phonemic strings of the younger one.” In terms of predicate calculus, the sound laws are implications of the form PIE \*x → IE y (read: ‘if PIE \*x, then IE y’) as, for example, in

PIE \*senti → RV. sánti, gAv. hǎntī, Osc. sent, Do. (h)évnti, etc.

The rules of substitution apply to all phonemes in the attached environments, and as such the sound laws are the converse of the reconstruction, consisting of implications

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<sup>112</sup> For Leskien 1876, see also Benware 1974. For the Neogrammarian doctrine in its original formulation, see Brugmann and Osthoff (1878:iii-xx) and Brugmann (Grundr<sup>2</sup> 1: 67ff.) and 1885.

<sup>113</sup> Meriggi (1966:3-4): “Mit dem Wort ‘Lautgesetze’ haben wie an einen wunden Punkt der ganzen Sprachwissenschaft gerührt, der immer noch nicht geheilt ist. Man kennt die lange, unfruchtbare Diskussion über die Ausnahmslosigkeit der Lautgesetze.”

<sup>114</sup> See Hock (1991:2): “We derive this knowledge [= the regularity of sound change] from the experience about two hundred years of research into the question of how languages change [...]”

<sup>115</sup> For the classical formulation of the view, see Brugmann & Osthoff (1878 [MU1]:xiii-xiv): “*Erstens*. Aller lautwandel, so weit er mechanisch vor sich geht, vollzieht sich nach *ausnahmslosen gesetzen*, d.h. die richtung der lautbewegung ist bei allen angehörigen einer sprachgenossenschaft, ausser dem fall, dass dialektspaltung eintritt, stets dieselbe, und alle wörter, in denen der der lautbewegung unterworfen laut unter gleichen verhältnissen erscheint, werden ohne ausnahme von den änderung erfiffen.”

<sup>116</sup> On sound laws, see Szemerényi (1996:21). See also Collinge 1985, 1995 and 1999 on Indo-European sound laws *in extenso*.

<sup>117</sup> See Fox (1995:304): “A case in point is the criticism of the Neo-grammarians’ principle of exceptionless of sound laws by Schuchardt, who argued that this principle ignores the contribution of the individual (Schuchardt, 1885). Schuchardt is, of course perfectly right.”



IE  $p \rightarrow$  PIE  $*q$ . In a properly made reconstruction, both sound laws and the reconstruction

RV. *sánti*, gAv. *həntī*, Osc. *sent*, Do. (h)évti, etc.  $\rightarrow$  PIE  $*senti$ .

hold true. Hence, the reconstruction (IE  $y \rightarrow$  PIE  $*x$ ) and the sound laws (PIE  $*x \rightarrow$  IE  $y$ ) establish a logical equivalence between the data and the proto-language (IE  $y \rightleftharpoons$  PIE  $*x$ ). Since the logical equivalence is ultimately based on the identities of 1<sup>st</sup> Class, the sound laws have no alternative but to express the scientific content.<sup>118</sup> In terms of sound changes and sound laws, note the following key issues:

(a) A sound law is considered proven if it regularly produces complete data and does not generate non-existing forms.<sup>119</sup> Once a sound law has been proven (i.e. it generates complete data and does not produce ghost forms), it equals the respective sound change and thus is its true description.

(b) The proto-language can be defined as the state in which no sound change has taken place; thus it is the immediate phase before the first sound law affected the system.<sup>120</sup> Owing to the equivalence of proto-language and the data, the comparative method does not require (or recommend) the postulation of a deep-level pre-proto-language. In such circumstances, a synchronic state of any descendant language can be defined as the conjunction (or set) of sound laws implying the synchronic system in question in addition to the preserved vocabulary.<sup>121</sup>

(c) The history of research teaches us that etymologies violating verified sound laws are doomed to fail. Thus Meillet (1894a:285fn1) challenged a proposed etymology of  $\theta\epsilon\acute{o}\varsigma$ , owing to its irregular character, as follows:

“Le rapprochement de  $\theta\epsilon\acute{o}\varsigma$  et lit. *dvāsē* a ceci contre lui que  $\theta\mathcal{F}$ - devait donner  $\sigma$ -; cf.  $\sigma\acute{e}$  de  $\tau\mathcal{F}\acute{e}$ . Si, contre toute vraisemblance,  $\theta\mathcal{F}$ - subsiste, l’initiale de  $\theta\epsilon\acute{o}\varsigma$  devrait faire position chez Homère, comme celle de  $\delta\mathcal{F}\acute{e}\sigma\varsigma$ .”

Meillet’s faithfulness to the regularity of sound laws has now been rewarded by the emergence of Linear B, where the loss of digamma is excluded in

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<sup>118</sup> See already Brugmann & Osthoff (1878:xiv): “Nur wer sich an die lautgesetze, diesen grundpfleiler unserer ganzen wissenschaft, streng halt, hat bei seiner forschung überhaupt *einen festen boden unter den füßen*.”

<sup>119</sup> Compare Brugmann’s and Osthoff’s (1878:xiii) less explicit statement, according to which sound laws can be proved ‘mechanically’ (mechanisch).

<sup>120</sup> See Dyen (1969:510): “The proto-language can be regarded as the last stage of a time-continuous language immediately preceding the appearance of daughter languages.”

<sup>121</sup> Consequently, as mentioned by Katičić (1970:99-100), “The sound laws can by definition be formulated only in terms of phonological units which in their turn have a certain distribution realized in the phonemic strings and in the suprasegmentals of the operand-language. This has as its consequence that the distribution of phonological entities in the younger language is wholly determined by the distribution of phonological entities in the older one. When a regular sound change represented by a one-to-one mapping (1a) takes place, the result is a phonemic correspondence since the old and the new phonological entity appear always in the same surroundings. [...] The same happens when the morphs of two languages are derived from the morphs of a third one by two different sets of sound laws. Here again, the distribution of phonological entities in the two new languages is wholly determined by the distribution of phonological entities in the older one.”

LinB. θεο- (m.) ‘god’ (DMGr. 409, LinB. te-o [sgA]).

In other words, θεός does not belong to Li. dvāsè. Consequently, no irregular development has taken place here.

(d) Occasionally ambiguous sound laws with two different outcomes in an identical environment have been proposed:

PIE \*p → IE q      &      PIE \*p → IE r      (where q ≠ r).<sup>122</sup>

Owing to the principle of the regularity of sound change, such propositions are not allowed, because the embedded ambiguity would lead to inconsistency.<sup>123</sup>

§4. It is a key goal of Indo-European linguistics to be in possession of a complete set of tested sound laws that generate complete data regularly without yielding non-attested (or wrong) forms.

(a) Currently the main bulk of the traditional (Neogrammarian) sound laws remain untested, especially as regards the effects of the new segment of the phoneme inventory, the laryngeal PIE \*h. This situation has not been improved by the laryngeal theory, postulated independently of the Old Anatolian data, which improperly describes the actual properties and behaviour of PIE \*h and the data in general.

(b) The urgent need for an upgraded sound law system concerning PIE \*h and its relationship to other items of the phoneme inventory will be answered in this study by a calibration of the entire traditional sound law system with the comparative method.<sup>124</sup> It is shown that most of the problems of the traditional sound laws (see Collinge 1985) are caused by the missing link of the proto-phoneme inventory, PIE \*h. Once this is solved, the sound laws can be harmonized with the requirements of the enlarged data.<sup>125</sup>

(c) In terms of the procedure of testing the sound laws, Nyman (1982:19) writes:

“a [...] rule can be falsified either by showing that it fails to generate all the correct forms of the language (cf. completeness), or by pointing out that it generates incorrect forms as well (cf. soundness).”

Owing to the highly advanced stage of the study of Indo-European sound laws, it is very rare that entirely new sound laws are found (this study being no exception to that). Rather it is the already existing sound laws that can be improved, based on our

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<sup>122</sup> The most notorious ambiguity is the alleged two-fold outcome of the syllabic liquids Neogr. \*l̥ \*r̥ → PCelt. \*li ri and PCelt. \*al ar, which are now outdated by the emergence of the ‘a-colouring laryngeal’ of Hittite.

<sup>123</sup> See Katičić (1970:60): “There is one more restriction imposed on the operator of regular sound change. According to the assumption of regularity, no disjunction is allowed on the right side of the rules.”

<sup>124</sup> The testing of sound laws includes the elimination of erroneous laws by a counter-example procedure. Thus, for instance, the so-called ‘Lex Eichner’ (according to which LT \*h<sub>2</sub> did not colour PIE \*ē) is shown to be false by equations with a short vowel (PIE \*e) equally lacking colouring (e.g. in Gr. ἐσθλό- (a.) ‘tüchtig, brav, edel’ (GEW 1:574) : Ἡι. ḥašteli- (c.) ‘Held’ (HHand. 46, HEG 1:203)).

<sup>125</sup> In practice, the supportable sound laws range from ‘irregularities’ to tentative formulations of sound laws to (confirmed) sound laws with conditions restricting their application.

capability to master the data. Accordingly, if an early sound law is incomplete or unsound, and if the comparative method implies a sound and complete rule (or improvement), then an upgrade of the early sound law is allowed. Since there is no need to change the well-established names of the sound laws, the sound laws upgraded in this study will be attached with the tag ‘II’ (e.g. ‘Fortunatov’s Law II’) to distinguish between the historical formulation and its upgraded version.<sup>126</sup>

§5. In order to illustrate the process in practice, I quote a discussion related to the so-called Nyman’s Law that treats the assimilation of PIE dental+liquid clusters in Latin (for the general settings of the law and a discussion thereof, see Collinge 1985:355):

(a) According to the traditional sound law, the voiceless dental develops into velar if followed by a lateral:

PIE \*tl                   →     Lat. cl, Osc. cl, etc.     (Leumann 1977:153-4).<sup>127</sup>

According to Nyman (1977b:177), however, “[...] we have to posit a new sound law for Latin, viz. assimilation of -t- to following -l- [...] -tl- > -ll- [...]”

It can be readily stated that multiple factors favour Nyman’s suggestion:

1. Development PIE \*tl → Lat. ll can be claimed for Nyman’s (1979:141) own example: “As far as pullus is concerned, I am convinced [...] that its customary equation to Skt. putrá- ‘boy, son’ [...] is correct.” Similar observations hold for the other examples as well.

2. As pointed out by Nyman (1977b:178), the voiced dental assimilates similarly: “-dl- > -ll- (e.g. \*sedla > sella ‘seat’)”. Furthermore, the failure of \*dhl to behave identically is explained by its early fricativization (PIE \*dhl → Lat. fl); this is to say, the rule can be generalized to the class of dental stops that occur after the fricativization.

3. The assimilation PIE \*tl- → PItal. \*ll- → Lat. l- is certain for the initial position, since no Italic <sup>†</sup>cl- appears in:

Umbr. tlatio-	(a.) ≈ ‘breit’ (WH 1:770, Umbr. agre tlatie)
Lat. latio-	(ONn.) ‘Latium’ (WH 1:770, Lat. latium [sgNA])
Lat. latīno-	(a.) ‘zu Latium gehörig, lateinisch’ (WH 1:770)

In other words, the development PIE \*tl- → Lat. l is actually proven, while the early hypothesis PIE \*tl → Lat. cl is not.

4. In general, Pisani’s (1979) objections are artificial. One may instead refer to Collinge’s (1995:35) favourable evaluation of Nyman’s Law: “But as Hamp (1983:134) accepts NYMAN as a ‘Lautgesetz’, and as Nyman himself remains adamant (1984), the law’s title is justified and handy.”

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<sup>126</sup> Numerous alternatives for marking an upgraded sound law (e.g. Fortunatov II, Fortunatov +, Fortunatov revised, Fortunatov upgraded) were considered. The tag ‘II’, being the simplest, was ultimately chosen for this purpose in System PIE (a practice to be followed also in the PIE Lexicon).

<sup>127</sup> The examples include especially Lat. pōculo- ‘Trinkgefäß’ : OInd. pátra- ‘id.’ and Osc. puclō- ‘Sohn’ : OInd. putrá- ‘id.’; see Sommer (1948:228).

(b) Owing to the availability of the enriched material, the story does not end with scholars taking sides for and against Nyman's Law. When tested against the material, the critical examples Lat. *pōculo-* and Osc. *puclo-* reveal that both dental and velar extensions are paralleled, as a result of which the early assumption PIE \**tl* → Lat. *cl* can no longer be upheld. The situation is clear in both key examples of Nyman's Law:

1.  $\sqrt{\text{peḡ-}}$  'trinken' (P. 839-40)

$\sqrt{\text{peḡ-}}$

RV. pra ·pá-	(f.) 'Tränke' (WbRV. 876, prapá [sgN])
RV. pá-	( $\sqrt{\text{pr.}}$ ) 'trinken' (WbRV. 800-1, pāhí [2sg])
RV. papā-	(pf.) 'trinken' (WbRV. 802, papātha [2sg])

$\sqrt{\text{peḡk-}}$

Gr. πέπωκ-	(pfA.) 'trinken' (GEW 2:542)
OInd. taila ·paka-	(PNm.) 'oil-drinking' (MonWil. 455)
Lat. pōculo-	(n.) 'Becher' (WH 2:329, Lat. pōculum)

$\sqrt{\text{peḡt-}}$

Go. pōto-	(n.) 'Trinken, Trank' (GEW 2:540)
Lat. pōto-	(m.) 'Trinkbecher' (WH 2:351, pōtus)
gAv. vīspo ·pa'ti-	(a.) 'all-tränkend' (AIWb. 1468)
RV. páttra-	(n.) 'Trinkgefäss' (WbRV. 805)

2.  $\sqrt{\text{peu-}}$  'Geburt' (P. 843-4)

$\sqrt{\text{pu-}}$

Cret. πη(Ϝ)ῖσχο-	(m.) 'Sohn, Nachkomme' (GEW 2:526, πηῖσχος)
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$\sqrt{\text{puḱ-}}$

LAv. pusa-	(m.) '-(?)-, cf. below' (AIWb. 911) <sup>128</sup>
Pahl. pus-	(sb.) 'son' (MPahl. 2:163, KEWA 2:304)
MidPers. pws-	(sb.) 'son' (MPahl. 2:163)
ModPers. pus-	(sb.) 'son' (MPahl. 2:163)

$\sqrt{\text{puḱlo-}}$

Pahl. pusar-	(sb.) 'son' (MPahl. 2:163)
Pael. puclō-	(m.) 'Sohn, Kind' (WH 2:386, puclōis [plI])
TochA. puḱl-	(sb.) 'annus' (Poucha 183) <sup>129</sup>

$\sqrt{\text{puḱu-}}$

LAv. pusva-	(m.) 'son' (?) (AIWb. 911, pusvanhō [plN])
TochA. puḱul	(pl.f.) 'annus : Jahr' (Poucha 183, puḱul [sgN])

<sup>128</sup> See LAv. hvāñhō puθrāñhō pusañhō bavainti 'The(se) kids become -(?)-', for which the meaning 'son' (figura etyologica) yields a meaningful translation.

<sup>129</sup> For 'Sohn' : 'Jährling' : 'Jahr', see OInd. vatsa-, Lat. uetus, etc. (P. 1175).

√put-

OInd. put ·gala-	(m.) ‘body, man, usw.’ (KEWA 2:305)
Lat. putillo-	(m.) ‘Knäblein’ (WH 2:394)

√putlo-

Lat. pullo-	(a.) ‘jung’ (m.) ‘Tierjunges, usw.’ (WH 2:385, pullus)
RV. putrá-	(m.) ‘Sohn’ (WbRV. 821, KEWA 2:304)
gAv. puṭra-	(m.) ‘Sohn, Kind, Tierjunge’ (AIWb. 909-10)
OPers. puça-	(m.) ‘son’ (OldP. 197, puça [sgN])
Pahl. puhr	(m.) ‘son’ (MPahl. 162, puhr [sgN])

In this case, the early sound law was based on an erroneous identification of dentals and velars, both of which are now independently secured. Accordingly, Nyman (1977b:176) is very likely correct in “[r]ecognizing \*capitlos as the historically underlying form of capillus”, as well as in his proposal as a whole.

Throughout this study, a similar checking is done on the key (Proto-)Indo-European sound laws; they are tested against the enriched data in order to ensure their correctness.

### 1.5.5 Reconstruction and the principle of postulation

§0. August Schleicher’s greatest invention, the reconstruction (represented by the symbol \*), is the culmination point of the development of the comparative method. In a nutshell, Schleicher’s innovation consists of the realization that the systematic correspondences of the letters have consequences, which have been referred to as reconstructions ever since. As Koerner (1982:1) put it, Schleicher’s “[...] theory of language represented something like a ‘paradigm’ or ‘disciplinary matrix’ (Kuhn 1970: 184) for historical-comparative linguistics.” Therefore, the foundations of the concept are presented here.

§1. With his postulation of proto-phonemes and proto-language, Schleicher outlined the study as a natural science, characterized by implications, typically of the form:

$\Phi(x)$	=	$\Theta(y)$	→	PIE *z	
Osc. s	=	Lat. s	→	PIE *s	(1)
Osc. es-	=	Lat. es-	→	PIE *es-	(2)
Osc. sent	=	Osc. est	→	PIE √s-	(3)
Osc. sent	=	Do. <sup>(h)</sup> ἐντι	→	PIE *senti	(4) <sup>130</sup>

§2. In all examples, the reconstruction is an immediate consequence of the principle of postulation, which allows conclusions to be drawn when the criterion of truth has been satisfied. In this study, the principle of postulation is referred to as ‘Fick’s rule’

<sup>130</sup> Note that the level of reconstruction is determined through the objects compared. Thus, for instance, in the table in (1) a phoneme, in (2) a stem, in (3) a root, and in (4) a word is reconstructed.

of ‘two witnesses’, which served as the motto of Fick’s *Vergleichendes Wörterbuch der indogermanischen Sprachen* (1870):

*Durch zweier Zeugen Mund wird alle Wahrheit kund* (Fick’s rule)

The principle is correctly explained by Pedersen (1962:274) to mean that:

“If a word [or an object of any level] is found in the two branches, then it was also to be found in the original language which divided into these branches.”

In other words, reconstruction requires at least two independent pieces of evidence that point to the item being postulated. In this connection it should be noted that:

(a) All conclusions (reconstructions) must ultimately be consequences of the principle of postulation, except for unambiguous features allowing the postulation based on one group alone (the principle of the family consistency).

(b) In his *Introduction*, Meillet (1937:340) proposed that a minimum of three witnesses should be required to constitute a regular correspondence set. Though it is generally true that the more witnesses are available the better it is for the reconstruction, a more satisfactory view has been presented by Fox (1995:68):

“In practice, therefore, the reliability of reconstruction may increase with the number of witnesses, but it is not really possible to stipulate how many witnesses are actually required [...]”

Fox is correct in that the issue is not the number of branches attested, but whether the resulting reconstruction is unambiguous or not. Therefore, a reconstruction is regular if only verified sound laws have been applied in its postulation, regardless of how many branches are involved. Separately, the reconstruction is unambiguous if the comparative method implies one (and only one) reconstruction based on the fully attested material. In other words, two witnesses are sufficient for reconstruction, but the exact number of cognates required to eliminate ambiguity depends on the data at hand.

(c) As for the limits of postulation, the objections against over-reconstruction of the proto-language have been answered satisfactorily by Anttila (1969:34):

“Patterns change, and it is here that one runs the danger of attributing too many of the attested patterns into Proto-Indo-European (cf. Puhvel EFL<sup>1</sup> 8). Ultimately the final verdict rests on comparative evidence [...]”

Indeed, precisely as many morphemes are postulated by the comparative method as implied by Fick’s rule to accomplish the primary goal of the study, the completion of the Proto-Indo-European morpheme inventory.<sup>131</sup>

(d) Portions of internal reconstruction are acceptable in reconstruction, according to the lines sketched by Mikko Korhonen (1974:122):

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<sup>131</sup> See Campbell (2004:122-3): “The aim of reconstruction by the comparative method is to recover as much as possible of the ancestor language (the proto-language) from a comparison of the related languages, the descendants of the original language and to determine what changes have taken place in the various languages that developed from the proto-language.”

“Für eine bestimmte Grundsprache lassen sich nur die Wechsel rekonstruieren, die wenigstens in zwei Tochtersprachen auftreten, sowie jene in einer Tochtersprache erscheinenden Wechsel, die sich in der inneren Rekonstruktion, verglichen mit einem solchen Wechsel, der durch die vergleichende Methode für die besagte Grundsprache rekonstruiert werden kann, als gleichaltrig oder älter erweisen.”

§3. The key objects reconstructed by the comparative method are: (a) the proto-phonemes as items; (b) the proto-phoneme inventory; (c) the proto-morphemes as items; and (d) the proto-morpheme inventory. For each, respectively, note the following:

(a) According to Meillet’s classic account (1934<sup>7</sup>:44), a reconstruction phoneme is defined by a set of correspondences.<sup>132</sup> In terms of predicate calculus, the comparative functions  $\Phi_1(a)$ ,  $\Phi_2(b)$ , ...,  $\Phi_n(n)$  imply the reconstruction through the preserved identities of 1<sup>st</sup> Class, when available. Primarily, therefore, the comparative method does not make hypotheses concerning the reconstructed phonemes, but projects the preserved sounds (or clusters of their features) onto the proto-language as such.<sup>133</sup>

(b) The comparative postulation of a primary phoneme inventory (as the minimal set of proto-phonemes) has been a key goal of PIE phonology ever since the emergence of the Old Anatolian languages. In essence, this task will be performed in this study through comparative postulation of the proto-phonemes and a segmental analysis of traditional items.<sup>134</sup>

(c) The reconstruction of morphemes focuses on the segmentation and identification of the roots and their ablaut variants.<sup>135</sup> This procedure, leaving the simplest inferable segment as the root, consists of a sequence of at least one radical phoneme.<sup>136</sup> An example of a PIE root and its ablaut bases (including the root) is contained in

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<sup>132</sup> Discussing the correspondence sets from yet another angle, Katičić (1970:78) writes: “Every correspondence becomes then a unit composed by other units arranged in a fixed order. In mathematics such units are called vectors and it is most convenient to think of phonemic correspondences as vectors.”

<sup>133</sup> Campbell (2004:132-3) explains: “We attempt to achieve as much phonetic realism as possible by observing what phonetic features are shared among the reflexes seen in each of the daughter languages in the sound correspondence. We determine which phonetic features are common to the reflexes in the daughter languages (and features which can be derived from others by the known direction of sound changes [...]) and then we attempt to reconstruct the proto-sound by building into it these shared phonetic features.”

<sup>134</sup> For the items of the inventory, see Campbell (2004:132): “We attempt to reconstruct the proto-sound with as much phonetic precision as possible; that is, we want our reconstruction to be as close as possible to the actual phonetic form of the sound as it was pronounced when the proto-language was spoken.”

<sup>135</sup> Campbell (2004:123) adds: “The work of reconstruction usually begins with phonology, with an attempt to reconstruct the sound system; this leads in turn to reconstruction of the vocabulary and grammar of the proto-language.”

<sup>136</sup> Compare Anttila’s (1969:15) summary of the Neogrammarian definition of the root: “He [Brugmann] defines the base and the root even more clearly in the second edition of the *Grundriss*: roots are the actually occurring forms of the etymologically connected words (231.86 [1913]).”

√s- ‘sein’ (P. 340-342):

*s-	≡	Av. zdī [2sg], OInd. stha [2sg], TochB. star [2sg], etc.
*es-	≡	Ḫi. ešzi, RV. ásti, Lat. est, Gr. ἐστί, Ven. est, Go. ist, etc.
*os-	≡	CLu. ašta, HLu. asta, OPr. ast, Ḫi. ašanzi, Northumbr. arun
*s-	≡	Osc. sent, Do. évri, RV. sánti, gAv. həntī [3pl]
*s-	≡	OCS. sŏtī, Li. sánti [pt.], OHG. sand, HLu. sa-tu [3sg]

(d) The PIE morpheme inventory consists of the totality of Indo-European root morphemes and their ablaut bases, compared and arranged under the PIE root matrices. Once the entire material has been reconstructed, the conditions for taking the proto-language \* $\mathcal{C}$  as the object of investigation have been created on phonetic, phonological, morphological, semantic, pragmatic and syntactic levels.

### 1.5.6 Non-genetic external comparison (typology)

§0. Typology, the comparison of the external relations of languages, can be said to have begun with the Biblical story of Babel and Adam’s language, where (in modern terms) a typological universal concerning all languages of the world was presented.<sup>137</sup> Since then, modern advances in the description of the languages of the world have resulted in the formal study of mutual similarities of languages; typology is now an acceptable tool in Indo-European linguistics, providing support, restrictions and external means of testing for reconstructions. Some of the typologies presented by Møller, Szemerényi, Jakobson, Gamkrelidze and Ivanov have already dealt with critical features of the Proto-Indo-European phoneme paradigm, meriting a brief discussion of the study and its applications here.

§1. Typological features at any level can be presented as parallels to support (or weaken) a reconstruction. Potentially fallible typological positions and arguments of a non-genetic nature are considered non-obligatory, because exceptions may represent real counter-examples to the alleged universals. Despite this, typological support is highly desirable for any theory, owing to the scientific realism provided by an existing parallel in a language.<sup>138</sup>

§2. In typology, the quantifiers of predicate calculus deal with the languages and phonemes simultaneously. This results in typological statements being typically of the forms ‘there is a language  $f$  such that  $x$ ’ or ‘for all languages  $f$ ,  $x$ ’. From such statements it is possible to proceed to pure typology that no longer involves any particular language. Thus, for instance, we may write  $a \ni f$  ‘ $a$  belongs to  $f$ ’ (e.g. VOICED(d)  $\ni$  gAv. ‘voiced d belongs to the phoneme inventory of Gathic Avestan’). From this we may infer that ‘there exists a language  $f$  with a voiced dental stop  $d$ ’

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<sup>137</sup> On typology in general, see Comrie 1981.

<sup>138</sup> See also Bybee’s (1985:210) remark: “We owe to the many works of Joseph Greenberg the idea that there must be a diachronic component to any explanation of language universals.”



(written  $\exists\Phi(\text{VOICED}(d) \ni \Phi)$  and derive a typological statement  $\exists\Phi\exists x(\text{VOICED}(x) \ni \Phi)$  (i.e. ‘some languages have voiced phonemes’).<sup>139</sup>

§3. Owing to their non-genetic character, typologies never have the same obligatory status as the conclusions based on the primary (genetic): in the case of different language families (or languages), it cannot ultimately be expected that the rules of one group would always function in another, because the genetic relation is absent. This can be illustrated by the best-known typological hypothesis in the field of Indo-European linguistics so far, the laryngeal theory, concerning which Szemerényi (1967:92-93) correctly observes that:

“[...] there is no intrinsic reason why we should attempt to reduce all [P]IE ‘roots’ to a single tri-phonemic pattern of the CVC-type [...]. On the contrary, it is clear that such notions were due to a double influence from Semitic linguistics: (a) in Semitic all words begin with a consonant; (b) in Semitic the general root-shape is tri-radical. But, of course neither feature is binding for [P]IE.”<sup>140</sup>

A comparative consensus on the matter, as mentioned by Pokorny (1969:3), was reached long ago:

“Schon Holger Pedersen hatte, obwohl er durch seinen Abhandlung über das ‘präidg. g’ (Kelt. Gramm. I 176f.) neben Kuryłowicz und Benveniste als einer der ersten Laryngalisten gelten muß, vor allem dagegen protestiert, daß jedes mit einem Vokal anlautende idg. Wort im Anlaut einen Laryngeal verloren haben soll. Szemerényi schließt (aaO. S. 12) seine Bemerkungen über die Laryngale mit dem Hinweis, daß das Hethitische keineswegs geeignet sei, die von De Saussure postulierten Laryngale zu erweisen: ‘This does not mean that de Saussures laryngeals must disappear; they are probably here to stay, but on a far less lavish scale than recent discussion would have us to believe, and on purely structural grounds, not on the strength of Hittite evidence.’”

Generally, before accepting a typology it is vital to secure its correctness, exclude *a priori* typologies from the theory-forming process, and restrict the study to its proper task (i.e. supporting the paralleled reconstructions and casting doubt on others). As long as these principles are upheld, the application of typology is quite acceptable, because not only can typologies be used to test reconstructions but the reconstructions can be used to test the typologies. In this manner, the comparative method is capable of correcting misused typologies, as illustrated within this study.<sup>141</sup>

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<sup>139</sup> As every typological statement (e.g.  $\forall\Phi\exists x(\text{CONS}(x) \ni \Phi)$ ), ‘All languages  $\Phi$  have consonants’, etc.) can be obviously be formulated in predicate calculus, an actual demonstration of this is not necessary here.

<sup>140</sup> Note also that Szemerényi’s arguments can be repeated as such for Møller’s laryngeals also typologically based on the Semitic phoneme inventory.

<sup>141</sup> In addition to Møller’s typology (see Chapter 2), the most relevant problems in the field are the four-place system of plosives Neogr. \*T, Th D Dh (or the ‘Taihun-Decem isogloss’) and the three-place velar system Neogr. \*k ḳ k<sup>h</sup> (or the ‘Centum-Satem isogloss’), both of which are discussed in Chapter 4.

### 1.5.7 Non-genetic internal comparison (metalanguage)

§0. The non-genetic internal relation  $\Phi_m(a) : \mu(b)$  refers to the comparison of data and metalanguage (represented by the symbol  $\mu$ ). The term non-genetic is self-explanatory because no genetic relationship exists between PIE and the metalanguage; as the (correct) meta-statements are analytically obtained from data, they are essentially internal.

§1. The relevance of metalanguage lies in its explicit (and formal) character and the formulation of generalizations concerning high-level objects. Although not necessarily attested in data as such, these are still legitimate when correctly obtained from the data. Some examples of metalanguage can be offered here:

- (a) Auxiliary symbols for classes of objects (and their properties), especially including, for example, V R C for phonemes<sup>142</sup> and  $\Pi \mathfrak{R} \Delta \Sigma \sigma$  for morphemes.
- (b) Concepts, definitions and other meta-expressions characteristic of the study (e.g. ABLAUT  $\equiv$  \*  $\bar{e}$  e  $\emptyset$  o  $\bar{o}$ , etc.).
- (c) Logical symbols, axioms (e.g.  $x = x$ ) and rules of inference (see Chapter 5).<sup>143</sup>

§2. Since metalanguage may contain terms not attested as such, the definition of concepts (and concept formation in general) must follow strict principles of natural science. In particular, the correct postulation of a metalanguage must exclusively consist of measurable objects and features of the material. The correct procedure can be exemplified with the following meta-statements concerning obstruent structures of a PIE root:

Ḥi. ešzi, RV. ásti, Lat. est, Gr. ἐστί, etc.	$\Leftrightarrow$	*es-	$\equiv_{df}$	eC
CLu. ašta, HLu. asta, Ḥi. ašanzi, OPr. ast	$\Leftrightarrow$	*os-	$\equiv_{df}$	oC
RV. sánti, HLu. sata, Do. <sup>(h)</sup> εντί, gAv. həntī	$\Leftrightarrow$	*s-	$\equiv_{df}$	C-

In other words, the comparative method of reconstruction is confined to a pure description of the data also in the usage of metalanguage, only allowing descriptively true statements. Despite the pivotal attempts to apply abstract symbolism,<sup>144</sup> the concept of metalanguage has played a minor role in Indo-European studies so far. This is explained partly by the incomplete state of the PIE phoneme and morpheme inventories, partly by metalanguage itself (which, in order to be effectively used, requires digital technology). As both limitations are being overcome, metalanguage can be expected to make a major breakthrough in the future.

<sup>142</sup> From a functional point of view, the PIE phonemes belong to V (vowels) R (resonants) and C (obstruents). The vowels alternate in terms of quantity (V : V:), resonants in terms of syllabicity (R : R), and obstruents in terms of voice (T : D) and aspiration (Th : Dh).

<sup>143</sup> Compare Nyman (1982:45): “CM is apt to establish an axiomatic system for proving a unity behind a more or less apparent diversity.”

<sup>144</sup> Among ‘metastudies’ focusing on the comparison of structural features of the roots, one may cite, for instance, Steensland 1973 and, in particular, Meillet’s and Magnusson’s root constraint theory (see Chapter 4).

§3. Unfortunately, the most widespread application of metalanguage in Indo-European linguistics, the laryngeal theory, is far from satisfactory. Starting from Møller's (and Cuny's) Indo-Semitic hypothesis, the pioneers of the laryngeal theory turned Semitic typology into a meta-axiom  $C_1eC_2 \cdot (C_3)$ , which was added to the Indo-European languages for the postulation of laryngeals.<sup>145</sup> This violation of the accepted limits of typology and the rules of natural science have given metalanguage a bad reputation among some proponents of the comparative method.

### 1.5.8 The comparative method of reconstruction

§0. The comparative method of reconstruction in its modern sense is comprised of a simultaneous application of all auxiliary sciences presented above (viz. phonetics, phonology, morphology, internal (philological) reconstruction, external (diachronic) reconstruction, sound laws, typology, metalanguage added with various special methodologies related to the data (e.g. dialectography, etc.)).<sup>146</sup> In the process of reconstruction, dubbed 'reconstructive systematization' by Nyman (1982:43), the comparative method accepts only such propositions that are simultaneously true in all auxiliaries; as such they yield highly accurate descriptions and predictions of the data.

§1. Comparative reconstruction is comprised of consistent system of identities based on complete data. When properly applied, the comparative method establishes a comparative reconstruction PIE \* $\mathcal{C}$  as the epistemological equivalent (' $\Leftrightarrow$ ') of the data<sup>147</sup> (direction ' $\leftarrow$ ') and the sound laws (direction ' $\rightarrow$ ') as expressed in the formula

$$\text{PIE } * \mathcal{C} \quad \Leftrightarrow \quad \Phi(a) \times \Theta(b).^{148}$$

The equivalence is the ultimate reason for the understanding of comparativists like Fox (1995:11):

“‘Reconstruction’ is thus to be taken literally, as the *re-creation* of an actual word in a real language, and when we ‘derive’ attested forms from such a reconstruction, we are likewise claiming that this is a real historical process.”<sup>149</sup>

<sup>145</sup> On the Indo-Semitic root axiom  $C_1eC_2 \cdot C_3^- : C_1C_2 \cdot eC_3$ , see Szemerényi (1990:131-132 [wL]), Benveniste (1935:150-161), Anttila (1969:22, 36-51), and Lindeman (1997:51-52, fn43).

<sup>146</sup> Compare Korhonen's (1974:113) slightly different, but essentially identical list of the comparative method: “Für die Erforschung der Vergangenheit der Sprachen kommen ja bekanntlich in erster Linie die folgenden Vier in Frage: 1. die philologische Forschung, 2. die innere Rekonstruktion, 3. die vergleichende Methode 4. die Dialektgeographie.”

<sup>147</sup> See Bammesberger (1984:11): “Das postulierte linguistische System der Grundsprache resultiert aus den strukturellen Übereinstimmungen der Tochtersprachen.”

<sup>148</sup> In terms of the two directions, see also Nyman (1982:45): “Comparative linguistics involves two functions, viz. (1) predicting cognates and (2) predicting the past, which methodologically correspond to relational and reconstructive systematization, respectively.” Nyman (1982:46) continues, “Prediction of the past is done by means of comparative reconstruction, which establishes the protoforms [...]”

<sup>149</sup> Compare also Campbell (2004:124): “[...] every protolanguage was once a real language, regardless of whether we are successful at reconstructing it or not.”

Indeed, comparative reconstruction projects the unaltered phonemes and features of 1<sup>st</sup> Class for reconstruction as such ('re-creation'), then generates ('derives') the changed phonemes of the 2<sup>nd</sup> Class through sound laws that remove the surface-level differences of the languages. For this reason, the comparative method is capable of reconstructing the proto-language in a coherent manner,<sup>150</sup> as shown by Korhonen's self-explanatory comment (1974:124):

“Vor allem die vergleichende Methode und die durch sie erzeugten Rekonstruktionen haben die Gesichte der Sprachen und auch der geistigen Kultur so weit zurückverfolgen können wie keine andere Wissenschaft. Die komparative Linguistik [...] ihre historische Beweiskraft aus der Isomorphie der synchronen und der diachronen Entwicklung erhält.”

By arranging all Indo-European stems under the root matrices and choosing the nodes preserved by two branches, the resulting system coincides with the (preserved) structure of the proto-language as such. As postulated from external data, Proto-Indo-European itself is a legitimate object of independent study.<sup>151</sup> Here the comparative method is the most economic description of the Indo-European family in existence, not only in terms of reconstructing the languages, but also the proto-language and the sound laws by which its phonemic strings are regularly transformed into those of its descendants.<sup>152</sup>

§2. The meaning of the term 'reconstruction' has become somewhat blurred, owing to its different applications in connection with historical (external) and static (internal) and comparative reconstructions (internal and external). The occasionally heated discussion on the topic is a result of misunderstanding caused by unsatisfactory definitions, and I would like to comment on the situation briefly.

(a) Historical linguistics is sometimes understood as an independent science (and not the x-axis of the comparative method), a platform for unrestricted hypothetico-deductive models. This line of thought is exemplified by a quote from Kümmel (2012:291), who opens his paper with the statement:

“When we reconstruct a proto-language, we produce a hypothesis about a non-attested synchronic state and about the changes leading from it to the attested languages.”

1. From the comparative point of view, associating reconstruction with forming hypotheses is not acceptable. Rather than making hypotheses, the comparative method results in proto-phonemes, discovered empirically and experimentally, based on correspondence sets defined by the data.

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<sup>150</sup> Thus, as Korhonen (1974:123) puts it, “Die vergleichende Methode deckt nur auf, welche Wechsel in der Grundsprache wenigstens nachzuweisen sind.”

<sup>151</sup> After such arrangement, the digitalized material can be displayed according to the ablaut bases (alternation \*ē : e : Ø : o : ō) or the extensions (or both).

<sup>152</sup> Consequently, as mentioned by Korhonen (1974:121), “Das Resultat der vergleichenden Methode ist weniger abstract und sagt mehr auch über die Oberflächenstruktur der zu rekonstruierenden Ursprache aus als die bloße innere Rekonstruktion.”

2. Every correspondence set defining a proto-phoneme must be reconstructed based on preserved phonemes and features (i.e. identities of the 1<sup>st</sup> Class). In this process, hypotheses are not formed, because the unambiguous portion of the data is analytically projected onto the proto-language through the axiom of identity  $x = x$  (e.g. in RV.  $s = \text{PIE } *s$ ).

3. According to Schleicher's original definition (see 1861:11 anm \*\*), the reconstruction star \* (asterisk) designates inferred forms ('bezeichnet erschlossene formen')<sup>153</sup> obtained through comparison with the Indo-European data.<sup>154</sup> The idea that there is "no written evidence for its existence"<sup>155</sup> is not entirely true either, because written evidence of the unchanged phonemes and properties exists, and precisely it is this that forms the core of the reconstruction. In this sense, comparative reconstruction is analytical and directly obtained from the preserved data.<sup>156</sup> From a logical point of view,<sup>157</sup> Proto-Indo-European therefore exists in the unchanged phonemes and features of the descendants, and it is the goal of the comparative method to restore that language through reconstruction.<sup>158</sup>

(b) Occasionally internal (synchronic and/or structural) reconstruction has been set in opposition to the comparative method. From the comparative point of view, by understanding internal comparison as the y-axis complementing the external x-axis the dispute has an artificial flavour. Nonetheless, as the misunderstandings have deep roots in the research history, I would like to offer a few moderating words:

1. The dispute, which is usually traced back to Saussure, began with the Neogrammarians, who at the height of their power claimed the historical dimension of the comparison to be the only scientific one, as illustrated here with a quote from Brugmann and Streitberg (1892:viii):

"Wer es unternimmt, eine Sprache wissenschaftlich zu gründen, dem steht nur eine einzige Methode zur Verfügung: die historische."<sup>159</sup>

Though the comment is understandable in the sense that historical comparison provides a higher-level environment for the testing of internal reconstruction, its

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<sup>153</sup> For a research history of the 'reconstruction star', see Koerner 1975.

<sup>154</sup> The hypothetical constructions whether 'expected' (in opposition to 'attested') or 'impossible' are designated with the symbol † (*crux critica*) to indicate their secondary character, never with \* (asterisk), which is reserved for comparatively postulated objects.

<sup>155</sup> Chrystal (1980:37) writes: "In historical linguistics, asterisks are used to indicate a form which has been reconstructed, there being no written evidence for its existence, as in the sounds and words postulated for Indo-European, e.g., \*penk<sup>w</sup>e 'five'. See Robins 1971: Ch. 8."

<sup>156</sup> For this idea, compare Hock (1991:568): "[...] reconstructions are nothing but [...] summarizing our understanding of the linguistic relationship between given languages."

<sup>157</sup> For the logical (or 'achronic') existence of Proto-Indo-European, see Katičić (1970:99): "[...] comparative linguistics is usually thought of as a historical and diachronical discipline, whereas in itself it is descriptive and achronic since its basic assertions are such."

<sup>158</sup> Szemerényi (1996:32) explains: "A reconstructed form [...] is the reality [or rather: 'the description of the reality'] which underlies the forms in the individual languages, from which all of them have developed in accordance with their own sound laws."

<sup>159</sup> For a discussion on this, see Nyman (1982:36).

formulation was an unnecessary provocation: the comparative method depends heavily on a reliable basic linguistic description, initially set forth by internal reconstruction, which is correct as such in the great majority of cases.<sup>160</sup> Although internal reconstruction can (and occasionally does) fail in a diachronic context, the main bulk of philological and/or internal reconstruction remains correct to the end in comparative tests, thus confirming its scientific character beyond any doubt.<sup>161</sup>

2. Such exaggerations resulted in a backlash against the Neogrammarians and the comparative method in general, with a regrettable split of the study into opposite camps. Furthermore, this split is often traced back to Saussure, whose *Cours de linguistique générale* – as felt later by Szemerényi (1967:67) – “[...] insisted on a strict separation of synchronic and diachronic studies [...]”. As for Saussure’s actual part in this dispute (which rather involved his followers), I would like to quote Koerner’s (1985:328) comment on the matter:

“Perhaps it should be stated in the present context that the critical edition of the *Cours*, carefully compiled by Rudolf Engler, contradicts affirmations in the text as edited by Bally and Secheyave, including those frequently attacked ones according to which synchrony and diachrony are supposed to be regarded as two subjects apart.”

3. A moderating view has been proposed by Hoenigswald (1974:189), according to whom:

“The division between ‘internal’ reconstruction and the so-called comparative method has certainly been overstressed. In particular, there is no good reason to insist that the former must, in execution, precede in the application of the latter.”

From the comparative point of view, the method does not prioritize internal or external reconstruction but treats them as the two axes by means of which a single coordinate, the reconstruction, is postulated.<sup>162</sup> In this sense, the occasionally emotional discussion concerning the demarcation line between internal and external reconstructions is a costly diversion of our resources: *the comparative method gives no priority for internal or external comparison, but seeks an arrangement of the material that results in simultaneously true internal and external propositions in a sound and complete (i.e. valid) reconstruction.*

§3. With such strict commitments to the comparative method, I support the conservative tradition of Indo-European linguistics, which began with such names as

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<sup>160</sup> Campbell (2004:362) clarifies: “[...] philology is understood as the scholarly activity which attempts to get systematic information about a language from written records.”

<sup>161</sup> Note especially Katičić (1970:99): “[...] comparative reconstruction not only presupposes description but also contributes very substantially to its completion by stating the interrelationships of the data obtained by the description of single languages. This being so, comparative research is not different in kind and scope from descriptive linguistics.”

<sup>162</sup> Thus, I prefer the view presented by Campbell (2004:225): “Internal method is like the comparative method but applied to a single language.”

Rask and Bopp and, in particular, Schleicher.<sup>163</sup> Today the comparative method of reconstruction in Indo-European linguistics does not essentially differ from the empirical, explicit and exact science of the pioneers, except in its increased sophistication brought about by the advancement of comparison, methodologies and auxiliary disciplines. Reconstructing Proto-Indo-European as an object of its own right for the purposes of linguistic analysis belongs to the primary goals of the study.<sup>164</sup>

### 1.5.9 On regular and irregular sound changes

§0. A demarcation line between regular sound changes (described with sound laws) and irregular changes (called analogy, in a broad sense) was drawn by the leading Neogrammarians, especially Brugmann, in the 19<sup>th</sup> century. It has often been noted that in so doing, the Neogrammarians abandoned the principle of regularity of sound changes and opened the door for irregular explanations still continuing the Indo-European literature. The developments which led to the situation and recommended solutions will be briefly discussed below.

§1. In addition to regular sound changes, the Neogrammarians accepted irregular sound changes that could be accounted for by means of analogy. The historical development can be understood against the following background:

(a) From the point of view of research history, the Neogrammarian reconstruction theory was fragile, primarily owing to apparent exceptions, which are neatly summarized by Hock (1991:36):

“[...] the regularities predicted by the neogrammarian hypothesis more often than not seem to be contradicted by numerous exceptions. The neogrammarians were keenly aware of this fact.”

(b) In order to account for problematic exceptions, Brugmann and Osthoff (1878:xiii-xiv) decided to extend the scope of analogy by generalizing the situation of the modern languages to their precedents:

“*Zweitens*. Da sich klar herausstellt, dass die formassociation d. h. die Neubildung von sprachformen auf dem wege der analogie, im leben der *neueren* sprachen eine sehr bedeutende rolle spielt, so ist diese art von spracherneuerung unbedenklich auch für die *älteren* und *ältesten* perioden anzuerkennen, und nicht nur überhaupt hier anzuerkennen, sondern es ist dieses erklärungsprincip auch in derselben weise zu verwerthen, wie zur erklärang von spracherscheinungen späterer perioden [...]”

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<sup>163</sup> I agree with Schleicher on the existence of Proto-Indo-European, but instead of the analogy of a biological organism, I prefer a logical explanation: PIE is derived analytically (by induction) from the directly preserved Indo-European phonemes of the 1<sup>st</sup> Class, and so is reconstruction as their linear sequences. Hence also the proto-language, consisting of directly preserved phonemes at least in some languages, exists according to the rules of logic.

<sup>164</sup> Compare Schleicher (for the translation, see Lehmann 1993:26), who already writes: “In the present work an attempt is made to set forth the inferred Indo-European original language side by side with its really existent derived languages.”

(c) Furthermore, Brugmann (1879a:6) went as far as to insist that analogy should be used automatically if the sound laws failed:

“In allen anderen fallen, in denen wir abweichung vom allgemeingiltigen gesetz finden, haben wir eine association (analogie) zu statuieren.”

In so doing, Brugmann and the scholars following him agreed upon a very broad agenda for the allowance of analogy in explanation.

§2. The Neogrammarian concept of analogy has been strongly criticized:

(a) The Neogrammarian postulation of analogy involves a *contradictio in definitione*: If the sound changes are regular (and they are), it is not possible that they are also irregular.<sup>165</sup> By introducing this double standard, an unfavorable situation emerged, as Katičić (1970:51-2) points out:

“But while claiming that sound laws are exceptionless, the Junggrammatiker provided in their very theory a place for exceptions by introducing the concepts of analogy, dialect borrowing and individual sound change due to assimilation, dissimilation, haplology, paretymology, etc.”

(b) Brugmann’s rationale for the expansion of analogy does not fit with the historical facts.<sup>166</sup> Owing to sound changes taking place, entropy (information contained in a segment) increases. Accordingly, the level of analogy of modern languages is certainly not on the same level as that of their genetic ancestors.<sup>167</sup> Quite the opposite, it is rather to be assumed that the further comparative reconstruction advances, the further use of analogy will be reduced (until approaching virtual nil).

(c) As recognized already by the Paleogrammarians, the Neogrammarian analogy did not account for the possibility of human error in their own sound laws and comparisons, which may have offered a correct explanation of irregularities (rather than analogy). With vastly larger qualitative and quantitative material at our disposal today, checking problematic correspondences and upgrading sound laws (instead of automatically using analogy) has become urgent.

(d) From a broader perspective, the issue of human error masks a wide spectrum of inherent factors in the Neogrammarian system:

1. The incompleteness of data available for the Neogrammarians, in particular Old Anatolian and its laryngeal. Though no specific figures are available at the moment, the early reconstruction theories utilized fragmentary data (compared to the entire bulk of data now at our disposal). Accordingly, several exceptions can be shown to be regular simply by comparing items to their proper Indo-European counterparts.

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<sup>165</sup> The milder interpretation of Brugmann’s view, consisting of the idea that the sound changes are regular or irregular, is a tautology.

<sup>166</sup> By comparison, Szemerényi (1996:29-30) offers a much better explanation: “[...] in early times society was itself much smaller, more united and, owing to measures of central control, much more strongly cohesive than today, the language situation also was much more unified.”

<sup>167</sup> Korhonen (1974:124): “Je mehr Zeit vergangen ist, desto mehr hat es in den Tochttersprachen zu einer phonemischen und morphophonemischen Restrukturierung kommen können und desto weniger bleibt von der ursprünglichen Struktur der Grundsprache sichtbar.”



2. The incompleteness of the Neogrammarian phoneme inventory, especially in terms of the presence of PIE \*h, had consequences. Without PIE \*h, the Neogrammarians had to create complicated rules to account for its reflects, which are all now explainable on a regular basis.

3. Numerous irregularities of the Neogrammarian sound law system reflect defects caused especially by the absence of PIE \*h (although other factors are also involved). By setting forth analogy as the universal remedy for exceptions, the Neogrammarians turned their focus from a calibration of sound laws to irregular explanations, with the result that much improvement remains to be done with the Indo-European sound laws.

§3. In hindsight, the subsequent stagnation of the Neogrammarian movement<sup>168</sup> can be seen to have partially been caused by the exaggerated use of analogy. By replacing the self-correcting procedure of science with analogy, the Neogrammarians failed to improve their own system.

§4. In order not to repeat these errors, I recommend that the following improvements are upheld in System PIE and the PIE lexicon (and indeed, they are recommended for the study in general):

(a) As pointed out by Brugmann, the exceptions to the sound laws do not contest the general principle of the regularity of sound change.<sup>169</sup> Accordingly, Brugmann's views concerning the sound laws in general (1876b:380) are acceptable:

“[...] ich glaube die Lautgesetze müssen noch weit strenger beobachtet werden als es bisher im grossen Ganzen der Fall gewesen ist.”

(b) Should the material conflict with the sound laws, no automatic analogy should be presented, but improvements in comparison and in the sound law system should be sought until the regular explanation has been achieved. This protocol leads to the desirable situation described by Fox (1995:89):

“The greater the range of data accommodated by the reconstruction, and the fewer the anomalies and exceptions, the more coherent and plausible will be the reconstruction.”

Through this practice, a maximal output of languages also allows for maximal regularity as irregularities can be replaced with regular comparisons.<sup>170</sup> In this task, the general policy of proceeding systematically towards the goal of Bybee (1985:207) is accepted:

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<sup>168</sup> See Szemerényi (1977:289): “[...] the work of the 19<sup>th</sup> c., centred on phonology and morphology, was coming to a standstill, that the problems were either exhausted or had reached a deadlock.”

<sup>169</sup> Brugmann & Osthoff (1878:xv): “Dass die ‘junggrammarische’ richtung heute noch nicht in der lage ist, alle ‘ausnahmen’ von den lautgesetzen zu erklären, kann natürlich keinen einwand gegen ihr princip begründen.”

<sup>170</sup> I have illustrated this point elsewhere by replacing a random set of fourteen irregular etymologies with regular ones; see Pyysalo 2011.

“[N]o explanation for linguistic phenomena is complete until a causal relation can be shown to exist between the principle proposed as explanation and the linguistic phenomena to be explained.”

The task of testing irregularities and pushing them to an absolute minimum is therefore twofold:<sup>171</sup>

1. Present the primary phoneme inventory of Proto-Indo-European and the upgraded sound law system, such that they require no irregular explanations whatsoever.
2. Present a completely reconstructed PIE morpheme inventory in order to be able to generate the Indo-European data in a regular manner.

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<sup>171</sup> Of course, the agenda should not be understood as a denial of the existence of analogy altogether (see the undeniable analogical levelling in Gr. ἔπεται ‘he follows’ and Lat. labor ‘labour’ (Campbell 2004:107)). The goal is instead to: (a) ensure that all the data is checked for regular explanations before irregular ones, (b) prevent the use of analogy in justifying the inconsistencies of the theories, and (c) draw a clear demarcation line between the regular and the irregular changes.

## 2 PIE \*h̥ and the Indo-European vowel system

### 2.1 Indo-European vowel system and Hi. h̥

§0. The Indo-European vowel system discussed in this chapter is restricted to those vowels defined as non-radicals from the point of view of root-formation, thus referring to phonemes that unlike resonants (PIE \*i u ɹ̥ ...) do not have functionally defined consonantal counterparts (PIE \*i̯ u̯ ɹ̥ ...). In practice, vowels will therefore be designated by cover symbols Neogr. \*ə, \*a, \*ā, \*ā̃, \*o, \*ō, \*e, \*ē and their PIE counterparts (to be defined).<sup>172</sup>

#### 2.1.1 The problem of OAnat. h̥ and the IE vowel system

§1. The most prominent problem in Indo-European linguistics is the comparative interpretation of Old Anatolian h̥ (Hi. h̥, Pal. h̥, CLu. h̥, HLu. h̥) and its compatibility with the reconstruction of the attested vocalisms of the Indo-European languages.

§2. The three key reconstruction theories – the Neogrammarian (Neogr.), the laryngeal theory (LT) and the monolaryngealism of Szemerényi (= SZ) – have suggested the following proto-vowels for Proto-Indo-European:

Neogr.	*e	*ē	*a	*ā	*o	ā̃	*ō	*ə
LT <sup>173</sup>	*h <sub>1</sub> e	*eh <sub>1</sub>	*h <sub>2</sub> e/-	*eh <sub>2</sub>	*h <sub>3</sub> e/-	–	*eh <sub>3</sub>	*h <sub>2</sub>
SZ	*e	*ē	*a	*ā	*o	–	*ō	*ə

These models (and their key variants) will be studied and tested by setting them against the enriched data, and the comparative solution extracted on the basis of the correct answers contained both in the models and the data itself.

<sup>172</sup> See Koerner (1985:332): “The i/u/a vowel triad, however, had been codified in Schleicher’s Compendium of 1861 (pp. 134-35), and was widely accepted for several years after Schleicher’s death in 1868.” For the development of the (Proto)-Indo-European vowel system up to the Neogrammarians, see Benware 1974. A history of the research on Indo-European vocalism in 1868-1892 is provided in Davis 1972.

<sup>173</sup> For three-laryngealism, see Eichner’s 1973, 1978, 1980, 1988 slogan “Die uridg. Grundsprache besitzt drei Laryngal(phonem)e (Symbole: H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>), nicht mehr und nicht weniger.” Lindeman similarly supports six laryngeals (1997:25): “In its commonly accepted form the ‘Laryngeal Theory’ assumes the existence in Early Indo-European of (at least) three ‘laryngeal consonants’.”

## 2.1.2 Brugmann's system of eight proto-vowels<sup>174</sup>

§0. The reconstruction of the Indo-European vocalism, starting with the Sanskrit-centric Paleogrammarians, reached its high point in Brugmann's (Grundr<sup>2</sup> 1:1-178) system of cover symbols for vowels:

Neogr. \*e : ē        :        Neogr. \*ə : a : ā        :        Neogr. \*â : o : ō.

Even today this system is superior to all its rivals, including the modern ones, as it consists of all eight correspondence sets actually defined by the data. By thus fulfilling the requirement of completeness, this system provides the sole option as the starting point for a comparative reconstruction of PIE vocalism.

§1. As shown by his reconstruction, Schleicher (1861/2, 1868) took the Sanskrit vowel system (OInd. a, ā) to reflect the Proto-Indo-European situation. However, already Benfey (1837)<sup>175</sup> had questioned how the two items OInd. ā can reflect a more original state than Greek and its display of six distinctions (Do. ε α ο η ᾱ ω), a criticism which was quite appropriate (*ex nihilo nihil*). The Paleogrammarian Sanskrito-centrism began to falter when Curtius (1864) proved that the European languages preserved a 'vowel e' in an identical position:

\*e        :        Arm. e : Gr. ε : Lat. e : Go. i : Li. e : OCS. e : OIr. e, etc.

However, Curtius still believed that the European branch had innovated the \*e, from a split of the original \*a to \*e (Gr. ε) and \*a (Gr. α).

§2. Finally, as Szemerényi (1996:134) notes, "It was not until 1871 that Arthur Amelung came to realize that the European e as opposed to Sanskrit a represented the original situation, though this view did not win general acceptance until later, with Brugmann's famous article of 1876."

§3. Brugmann's reconstructive aims, however, extended far beyond Neogr. \*e. Starting with his replacement of Schleicher's \*a with Neogr. \*a<sub>3</sub>, \*a<sub>2</sub>, \*a<sub>1</sub> (= Do. α, ο, ε) and Schleicher's \*ā with Neogr. \*ā, \*ō, \*ē (= Do. ᾱ, ω, η), Brugmann brought – quite correctly – the Italo-Greek system of six distinctions into the reconstruction of the proto-language. Furthermore, Brugmann included Fick's 'schwa indogermanicum' (Neogr. \*ə) and finally Neogr. \*â ('non-ablauting o') in his vowel system, with the result that in its widest form (c. 1880) it consisted of the actual set of existing eight correspondence sets for the vowels, viz.:

Neogr.        \*ə        \*a (= \*a<sub>3</sub>)        \*ā        'a-vocalism'        (2.2.)

Neogr.        \*â        \*o (= \*a<sub>2</sub>)        \*ō        'o-vocalism'        (2.3.)

<sup>174</sup> See Brugmann (Grundr<sup>2</sup>), Hübschmann 1885 and Hirt 1921, Pedersen (1931:240-310), Szemerényi (1964:2-6) and Wyatt (1964:141-144).

<sup>175</sup> Benfey (1837:911) writes: "Von diesem – bloss lautlichen – Standpunkt aus muss man z.B. als entschieden fraglich betrachten, ob nicht das Griechische, indem es α, ε, ο, ι, υ als kurze Vokale darbietet, den älteren Sprachstand treuer bewahrte, als in dieser Rücksicht ärmere Sanskrit. Und diese Frage kann nicht dadurch geschlichtet werden, das sie nur vom bloss lautlichen Standpunkt uns zu zeigen sucht, dass ε, ο Trübungen von α sind."

Neogr. – \*e (= \*a<sub>1</sub>) \*ē ‘e-vocalism’ (2.4.)

§4. The distinguishing features of Brugmann’s eight-vowel system are:

(a) The six vowels Neogr. \*e, a, o : ē, ā, ō replace the early ablaut Paleogr. \*a : ā and the typology of Sanskrit as the proto-language. The monolaryngealist systems of Zgusta (not mentioning Neogr. \*ə) and Burrow (rejecting schwa) – and especially the laryngeal theory – are essentially confined to the six items only and therefore incomplete.

(b) The six vowels plus schwa are included in the monolaryngealist system of Szemerényi, whose theory thus consists of seven correspondence sets and works slightly better than those mentioned above.

(c) The only system with two separate vowels Neogr. \*o and \*ā is that of Brugmann, however; his system is thus the only one that covers the eight attested distinctions. As no one to date (including the author) has been capable of consistently defining a ninth correspondence set, Brugmann’s achievement is likely to remain, and it is accepted here as the basis of System PIE.

### 2.1.3 On Anatolian languages, corpus and laryngeal

§0. Hrozný’s discovery (1915) and demonstration (1917) of the Indo-European character of Hittite<sup>176</sup> not only gave birth to Anatolian linguistics, the most important development of Indo-European linguistics in the 20<sup>th</sup> century, but also brought to light the segmental laryngeal, Hittite *ḫ*, which had disappeared from all Indo-European languages known to the Neogrammarians.

§1. The Anatolian corpus can be split in two main groups:

(a) The Old Anatolian (OAnat.) group, including Hittite (Hi.), Palaic (Pal.), Cuneiform Luwian (CLu.),<sup>177</sup> Hieroglyphic Luwian (HLu.),<sup>178</sup> and Cappadocian names (Cpd.). The characteristic linguistic feature of this group is the preservation of the segmental laryngeal as such: Hi. *ḫ* ≡ Pal. *ḫ* ≡ CLu. *ḫ* ≡ HLu. *ḫ*.<sup>179</sup>

(b) The Late(r) Anatolian (LAnat.) group: in addition to the scarcely attested languages – Lydian (Lyd.)<sup>180</sup> Lycian (Lyc.)<sup>181</sup>, Carian (Car.), Sideti (Sid.) and Pisidi (Pis.) – some sporadic glosses (by Hesychius, for example) have been preserved. Owing to the later attestation of this data, the counterpart of Hi. *ḫ* has disappeared in the rest of the Indo-European languages, except Old Anatolian.

<sup>176</sup> For an account of the interpretation of Hittite, see Eichner (1980:120-129).

<sup>177</sup> For Cuneiform Luwian, see Laroche 1959 and Melchert 1993.

<sup>178</sup> For Hieroglyphic Luwian, see Hawkins 2000.

<sup>179</sup> In order to underline the original unity of OAnat. *ḫ*, the Hieroglyphic Luwian. *h* will also be written HLu. *ḫ* in the phonetic approximations of this study.

<sup>180</sup> For Lydian, see Gusmani 1964, 1975, 1980, 1982 and 1986.

<sup>181</sup> For Lycian with dialects LycA. (= ‘Lycian’) and LycB. (= ‘Milyan’), see Neumann 1961-75 and Melchert 2004.

§2. Whether cuneiform (Hi., Pal., CLu.) or hieroglyphic (HLu.), Old Anatolian is attested in syllabic script. The most important peculiarities<sup>182</sup> of the orthography can be outlined as follows:

§3. No (watertight) distinction between voiced and voiceless stops was made in Old Anatolian script. The so-called Sturtevant's rule (1951<sup>2</sup>:3),<sup>183</sup> according to which a cuneiform gemination reflects a voiceless stop and a non-gemination a voiced stop, is controversial in the comparative context for the following reasons:

(a) As already noted by Bergsland (1938:272-5), there is widespread variation between geminated and non-geminated writing within the roots (e.g. Hi. a-ki [3sg] 'dies' and Hi. ak-kán-du 'let them die' [ipv3pl]), which do not allow an unambiguous definition of 'voiced' and 'voiceless' roots in the first place.

(b) In examples like Hi. ne-ku-uz-zi [3sg] 'es wird Abend/dunkel, es dämmert' (HEG 2:302-7) without gemination, the application of Sturtevant's rule leads to false conclusions. The alleged voiced starting point <sup>†</sup>nek<sup>u</sup>- (Mayrhofer, 1986:108-9) is contradicted by the voiceless labiovelar in items like:

PIE  $\sqrt{\text{nek}}^u$ -,  $\sqrt{\text{nok}}^u$ - 'night, darkness' (P. 762-3)

RV. ropa ṅákā- (f.) 'nightingale, blackbird' (WbRV. 1186)

Li. nakó- (vb.) 'die Nacht zubringen' (LiEtWb. 481, nakóti [inf.])

Thus, contrary to Benveniste's claim (1962:7, 107), Sturtevant's rule is not a failproof method to determine the voice of the Old Anatolian obstruents. Instead of attempting to decide the character of Indo-European stops based on Old Anatolian, Indo-European plosives – which preserve distinctions – should be used to provide confirmation for the voiced or voiceless nature of the Old Anatolian stops.

§4. Vowel quantity is not indicated in the Old Anatolian syllabic script (see Sturtevant 1951:23). In particular, the plene writing (e.g. CLu. a-a-aš-ša- (n.) 'Mund', Pal. ḥa-a-a- (vb.) 'heiß, warm sein') does not represent quantity, but a lost glide PIE \*i in the intervocalic position (Sturtevant 1951:18 & n23). This is proven by the presence of \*i/j in etymologically related forms like:

(a)  $\sqrt{\text{is}}$ - 'Mund' ( $\sqrt{\text{ios}}$ -,  $\sqrt{\text{ies}}$ -, P. 784-5)<sup>184</sup>

Hi. a iēš- (n.) 'Mund, Maul' (HEG 1:6-8, OHi. a-i-iš [sgNA])

Lat. dē ierā- (pr1.) 'heilig beschwören' (WH 2:274-5, PItal. \* iēsā-)

Lat. pe ierā- (vb1.) 'falsch schwören' (WH 2:274-5, peierāre [inf.])

CLu. a;aša- (n.) 'Mund' (DLLAdd. 45, DLL. 33, a-a-aš-ša-(a-ti)

<sup>182</sup> For an introduction to the numerous problems of Anatolian notation and orthography, see Rosenkranz 1959 and Laroche 1978.

<sup>183</sup> Sturtevant's rule (1942:34) was adopted from Speiser's work on Hurrian (1940:319-40). For literature on Sturtevant's rule, see Szemerényi (1996:56n8).

<sup>184</sup> Pedersen's (1938:47f.) tentative etymology of Hi. iš- 'Mund', which was accepted by Pokorny, is incompatible with the lack of glide in Lat. ōs- 'Mund' (RV. ás- 'id.'). Gr. ἄσθματ- (n.) 'schweres, kurzes Atmen, Keuchen, Asthma' (GEW 1:161-2) and Gr. δι(φ)·αἰτί (adv.) 'in the language of Zeus' (LSJ. 413). Being incompatible, the root  $\sqrt{\text{hēs}}$ -,  $\sqrt{\text{hōs}}$ - should be separated from  $\sqrt{\text{is}}$ -,  $\sqrt{\text{ies}}$ - (Hi. iš-, Lat. ierā-); see Pyysalo 2003.

Hi. iš-	(n.) ‘Mund, Maul’ (HEG 1:371, Hi. iš-ša-aš [sgG])
Gr. γοῶν -ιστί	(adv.) ‘in Greek (language)’ (LSJ. 358-9)
RV. iṣṭāni-	(a.) ‘rauschend’ (WbRV. 228)

(b) √hi- ‘brennen’ (√hoi-, √hei-, P. 11-2)

Pal. ḥa <sub>i</sub> -	(vb.) ‘heiß, warm sein’ (DPal. 53, ḥa-a-an-ta [3pl])
LAv. ay-	(pf.) ‘schimmern’ (AIWb. 11, aēta- ‘schimmernd’)
Hi. ḥaḥima-	(c.) ‘Dämon der sommerlichen Erstarrung’ (HEG1:123)
OIcl. eim-	(m.) ‘Feuer, Rauch, Dampf’ (ANetWb. 96, eimr [sgN])
gAv. ayan-	(n.) ‘Tag’ (AIWb. 157, gAv. ayaṇ [sgG])
gAv. ayar-	(n.) ‘Tag’ (AIWb. 157, ayarō [sgNA])
Go. air	(adv.) ‘frühe’ (GoEtD. 18, air þis dagis)
Hom. ἤρι	(adv.) ‘früh, in der Frühe’ (GEW 1:643, ἤρι [sgL])
Lat. aes-	(n.) ‘Erz, Bronze, Kupfer, Geld’ (WH 1:19-20)

In this study, examples of this lost PIE \*ī will be indicated by the subscript <sub>i</sub> (CLu. a<sub>i</sub>ša-, Pal. ḥa<sub>i</sub>-, etc.).

§5. The attested syllabic forms of Old Anatolian (e.g. Hi. e-eš-zi) are generally referred to with their phonetic approximations (Hi. ešzi), which vary from researcher to researcher. Such phonetic approximations, strictly speaking, consist of a special form of crude (or elementary) reconstruction, and the possibility of error should be taken into account when dealing with them.

## 2.1.4 Hi. ḥ and the reconstruction of PIE \*ḥ

§0. The key properties of Hi. ḥ, CLu. ḥ, HLu. ḥ and Pal. ḥ are sketched out here in order to establish a basis for further reconstruction of their PIE counterpart.

§1. Hi. ḥ is a phoneme that appears in minimal pairs. To cite just a single example, Hi. ḥaša- ‘Feuer(stelle)’ (HEG1:197) decisively differs from Hi. aša- (n.) ‘Sitz’ (HHand. 25, Hi. ALAM ašan ‘Sitzbild’ to Hi. √aš-, √eš- ‘sitzen, sich setzen’, HEG 1:77).<sup>185</sup>

§2. Hi. ḥ was written systematically by the Hittite and Luwian scribes: the phoneme /ḥ/ appears in all positions without signs of complementary distribution, leaving the early hypothesis of its phonetic parasite status (Kronasser 1956:§101ff.) untenable.<sup>186</sup>

§3. Hi. ḥ corresponds systematically to CLu. ḥ, HLu. ḥ, Pal. ḥ in etymologically secure isoglosses like:

Hi. ḥuidar-	(n.) ‘animal, fauna’ (HEG 1:269-70, ḥu-i-ta-ar [NA])
HLu. ḥuidar-	(n.) ‘wild animals’ (CHLu. 4.4.10 (BESTIA)HWI-tar <sup>a</sup> / <sub>i</sub> )
Pal. ḥuidumar-	(n.) ‘Lebe, Lebewesen’ (DPal. 56)
CLu. ḥuidumar-	(n.) ‘Lebe(nwesen)’ (DLL 47, ḥu-u-i-du-mar)

<sup>185</sup> See Puhvel (1965:87, fn21) and Lindeman (1987:32).

<sup>186</sup> For the ‘antilaryngealism’, see Szemerényi (1990<sup>4</sup>:134).

OIcl. vitni- (m.) ‘creature’ (HED H:352-5, vitnir [sgN])

Such correspondences verify a unified Old Anatolian phoneme /h/ in identical position, which is thus not restricted to Hittite alone.

§4. The appearance of 𐎶i. h initially surprised the traditional scholars, and attempts were made (for these, see Puhvel 1965:79-80) to compare a plosive or a spirant of the Neogrammarian system (e.g. Neogr. \*k̂). However, even before these tentative attempts it had been correctly understood by Kuryłowicz (1927a) – and independently Sturtevant – that the counterpart of OAnat. h was lost in the rest of the group. The situation of 𐎶i. huitar : OIcl. vitni- is repeated thorough the vocabulary, for example, and a couple of examples suffice here:

(a) √hēst-, √hōst- ‘Knochen’ (P. 783)

𐎶i. haštai-	(n.) ‘Knochen’ (HEG 1:237f., ha-aš-ta-a-i [sgNA])
gAv. ast-	(n.) ‘Knochen, stofflicher Leib’ (AIWb. 211-2, astəm)
RV. an·asthá-	(a.) ‘knochenlos’ (WbRV. 54, anasthás [sgN])
TochB. āst-	(n.) ‘Bone’ (DTochB. 45, āsta [plNA])
Gr. εἰσ·ώστη-	(f.) ‘Beinhaus (?)’ (GEW 3:84)
Gr. ὀστέο-	(n.) ‘Knochen, Kern einer Frucht’ (GEW 2:436-7)
Gr. ἀστακό-	(m.) ‘Meerkrebs’ (GEW 1:169, ἀστακόζ)
Gr. ὀστακό-	(m.) ‘Meerkrebs’ (GEW 1:169, ὀστακόζ)

(b) √pēhs-, √pōhs- ‘protect : schützen’ (P. 787+839)<sup>187</sup>

𐎶i. paḥš-	(vbM.) ‘seek protection’ (CHD P:2f., pa-aḥ-ša [3sg])
TochA. pās-	(vbM.) ‘custodire, tueri’ (Poucha 168, pāsantrā [3pl])
OCS. pas-	(vb.) ‘weiden’ (Sadnik √633, OCS. pasti [inf.])
RV. pári (...) pās-	(s.ao.) ‘rings schützen’ (WbRV. 800, pári pāsati [conj.])
LAv. pāh-	(s.ao.) ‘sorgen für’ (AIWb. 855, pāḡhahe [conj.2sg])
Lat. pāstōr-	(m.) ‘Hirt’ (WH 2:260, pāstor [N], pāstōris [G])

The number of correspondences that imply the loss of the laryngeal outside Old Anatolian are now counted in the hundreds, with the result that the correct comparative conclusion is no longer in doubt.<sup>188</sup>

§5. In order to account for the Old Anatolian laryngeal, it is necessary to reconstruct at least one proto-phoneme, marked preliminarily with the cover symbol

PIE \*h̥ = 𐎶i. h, CLu. h, Pal. h, HLu. h : Gr. Ø, OInd. Ø, etc.<sup>189</sup>

<sup>187</sup> Burrow (1949:51n2): “The root appears both as *pā* and *pō*, and since the same variation (Lat. *dās* : Gk *δίδομι*) appears in the root meaning ‘to give’, there seems to be no necessity to assume two synonymous IE roots.”

<sup>188</sup> Seebold (1988:497-8) writes: “Nun kann aber dem unvoreingenommenen Betrachter nicht zweifelhaft sein, daß dieses Phonem [= das hethitische h] nicht von Himmel gefallen sein kann: Es muß einen historischen Grund haben. Es ist einerseits klar an bestimmte Wörter gebunden, die es enthalten; während es in anderen bei sonst gleicher Lautumgebung nicht auftritt – es kann also nicht in irgendwelchen Stellungen sekundär angetreten ein.”



At this stage, no a priori features (such as colouring, voice, glottal/velar) are assigned to PIE \*h, apart from it being a non-anterior fricative.<sup>190</sup> The properties of PIE \*h will be inferred from the data as implied by the comparative method.

§6. The preservation of the segmental laryngeal, the counterpart of Old Anatolian h, has been suggested for a number of languages, including Albanian, Armenian, Germanic and Lycian. All attempts are failures, except for a possible /h/ in some Italic words, owing to the discrepancy between the general loss of laryngeal PIE \*h → Ø and its alleged preservation (the regularity of sound change). These attempts can be exemplified by Pedersen's early interpretation (1945), according to which Lyc. x corresponds with OAnat. h. Prominent experts like Laroche and Tischler have repeatedly cautioned against the idea, owing to the absence of Lyc. x in correspondences with Old Anatolian h. Some examples are:

(a) PIE \*h<sub>1</sub>ap<sub>r</sub>- 'Handel (treiben)'

Ḫi. ḫapar-	(N.act.) 'Handel, Kaufpreis' (HHand. 40, ḫa-ap-pár)
Ḫi. ḫapari-	(vb1.) 'Handel treiben, verkaufen' (HEG 1:161-)
Pal. ḫapari-	(vb.) 'übergeben' (DPal. 54, ḫapariši)
Lyd. afari	(sb.) 'Verkaufserklärung' (LydWb. 52)
Ḫi. ḫaprie-	(vb.) 'trade, sell, deliver' (HEG 1:161f., ḫa-ap-ri-ez-zi)
Lyc. eprie-	(vb.) 'Verkaufen' (Laroche, Comp1:171f., eprieti)

(b) PIE \*oraḥ- 'border, area' (P. 854-7, HEG 1:52,56)

Lat. ōrā-	(f.) 'Rand, Grenze, Region, usw.' (WH 2:218)
Ḫi. arahza-	(adv.) 'ringsum, außerhalb' (HHand. 20, a-ra-ḫa-za)
Ḫi. arḫa-	(c.) 'Grenze, Gebiet (Sum. ZAG)' (HHand. 21, ar-ḫa)
Ḫi. arḫai-	(vb.dn.) 'die Runde machen' (HHand. 21)
Ḫi. arḫita	( <sup>URU</sup> .) 'Grenze/Gebiet-TA' (OGH. 31, ar-ḫi-ta)
Lyc. eri-zāna	(sb.) 'eri-ZANA' (Laroche, Comp1. 177-78)

There is no sign of Lyc. x corresponding with PIE \*h. That is to say, Lycian has gone through the loss of PIE \*h → Ø like other languages (e.g. Lydian and Latin), implying that Lyc. x must have some other origin than PIE \*h (*ex nihilo nihil*).

At the same time, the suggested comparisons of Lyc. /x/ : OAnat. /h/ such as Lyc. xuga- : Ḫi. ḫuḫa- 'grandfather' (Lat. auus) and Lyc. xawa- : CLu. ḫau- 'sheep' are ambiguous. Instead of comparing Lyc. x to the Old Anatolian laryngeal, the phoneme can be set to correspond to Indo-European velar:

(c) Instead of Lyc. xuga- : Ḫi. ḫuḫa-, one can compare Lyc. x to Gr. κ/γ in:

Hes. κουκᾶ-	(m.) 'grandfather' (LSJ. 986, πάππων)
Hes. γυγαί	(m.pl.) 'grandfather' (LSJ. 361, γυγαί : παπποί)

<sup>189</sup> Seebold (1988:498) explains: "Es besteht also kein Zweifel daran, daß die traditionelle Darstellung des indogermanischen Lautsystems [...] in diesem Punkt zu ergänzen ist."

<sup>190</sup> Burrow (1949:59) clarifies: "The phoneme *H* [...] is not to be classed with the nasals, liquids, etc., which can by themselves make a syllable; it is to be classed with *s*, which is incapable of this function [...]."

Lyc. xuga-	(c.) ‘grandfather’ (Lyk&Ḫi. 25)
Mil. xugasi-	(a.gen.) ‘of grandfather’ (LuPG 59, kugasi, [sgN])
Lyc. xugah-	(a.gen.) ‘of grandfather’ (Lyk. xugaha [plD])
Lyc. epñ xuxa-	( <sup>1</sup> .) ‘-(?)’ (LuPG 116, epñxuxa)

(d) Instead of Lyc. xawa- : CLu. ḫauī-, one can compare Lyc. x to Gr. κ = Car. κ = Lat. c in:

Car. κῶ-	(sb.) ‘πρόβατον : sheep’ (Athenaios XIII:580, κῶς)
Lyc. xawa-	(sb.) ‘lamb’ (HEG 2:230, xawa [sgA])
Gr. κῶσ-	(n.) ‘Schaffell, Vlies’ (GEW 2:368, κῶσ)
Lat. caula-	(f.pl.) ‘Schafhürden’ (WH 1:187, Lat. caulae [plN.])

§7. A prefix PIE \*ḫ (or several such items) can be postulated on the basis of existing material. Some examples of roots with and without the prefix are:

(a) PIE \*meharǵ- (P. 722 + 738)

RV. sám (...) márij-	(pr.) ‘hell machen, schüren’ (WbRV. 1056)
AV. mamarj-	(pf.) ‘reinigen, putzen, streichen’ (EWA 2:324)
Gr. ἄ-μέρογο-	(pr.) ‘abpflügen, auspressen’ (GEW 1:91, ἄ-μέρογω)
Gr. ἄ-μόρογη-	(f.) ‘mulches Masse der außgepreßten Oliven’ (P. 738)
Gr. ὀ-μόρογνυ-	(prA.) ‘abwischen, abtrocknen’ (P. 738, ὀμόρογνυμι)
Gr. μόροξα-	(s.a.o.) ‘wipe’ (LSJ. 1146,1227, μόροξαντο)

(b) PIE \*ḫei-, ḫoi-, ḫi- ‘liegen’ (P. 539f.)

Gr. κει-	(pr.) ‘liegen, sich befinden’ (GEW 1:809, κείται [3sg])
RV. śáy-	(ao.) ‘liegen, am Boden liegen, ruhen’ (KEWA 3:303)
Ḫi. kei-	(vb.) ‘liegen, gelegt sein’ (HEG 1:568-9, ki-it-ta-ri [3sg])
Gr. κοιτή-	(f.) ‘Lager, Bett, Netz, Kiste’ (GEW 1:809)
Gr. ἄ-κοιτι-	(f.) ‘Gemahlin, Gattin, Lagergenossin’ (GEW 1:54)

The existence of a prefix PIE \*ḫ- means that the root-initial laryngeal (reflected in ‘a-vocalism’) does not necessarily prove that the root itself began with the laryngeal.

§8. A suffix PIE \*ḫ- (former Neogr. \*ḫ-) was already identified by Brugmann (Grundr<sup>2</sup> 1:500), who explained the simultaneous appearance of one- and two-syllabic (a.k.a. anit and set) roots:

“Oft schwankt dieselbe Wurzel zwischen ‘Ein-’ und ‘Zweisilbigkeit’ hin und her, ohne dass dies als etwas rein lautmechanisches betrachtet werden kann [...]. Die einfachste Erklärung dieses Schwankens ist jedenfalls die, dass der sog. ‘Wurzelauslaut’ ḫ ein ‘suffixaler’ Zusatz war.”

In the laryngeal theory, the Proto-Indo-Semitic root shape (C<sub>1</sub>C<sub>2</sub>C<sub>3</sub>) was accepted. Consequently, Brugmann’s morphological analysis was rejected, a move that Anttila would later follow (1969:78):<sup>191</sup>

<sup>191</sup> In the range of laryngealist literature on the topic, see Anttila (1969:59): “[...] there are thought to be some cases where the same root is both monosyllabic and disyllabic, e.g., Skt. stīr-ḡá- ‘scattered,’ str̥-

“[...] píparti ‘fills’ [...] Brugmann thinks \*pi-pel-mi original (MU 1.44, Grdr 231.178), with plē- from the weak grade (cf. §6.2.6.). It is hard to see what happened to the laryngeal.”

According to Szemerényi’s comment, Indo-European linguistics does not accept Møller’s non-genetic typology as normative. Pokorny’s comparative postulation of the root and extensions (see P. 798ff. for \*pel- and \*pel-ə- ‘gießen,...’) is favoured instead, because the traditional doctrine can be shown to be correct for Brugmann’s example:

RV. pípar- (pr.) ‘(an)füllen’ (WbRV. 775, píparti, pipartana)

As proven in Chapter 3, this stem never had a root-final laryngeal due to the absence of cerebralization (see Fortunatov’s Law II); in this case, the root was PIE \*pel-. Simultaneously, the laryngeal extension PIE \*pleaḥ- is implied by the Rig-Vedic hiatus and Gr. α in:

RV. prá’- (ao.) ‘füllen, anfüllen’ (WbRV. 886, práas [2sgConj.])  
 RV. kaksīa ·prá’- (a.) ‘den Leibgurt füllend’ (WbRV. 309, kaksīaprāam)  
 Gr. πίμ πλά- (pr.) ‘füllen’ (GEW 1:537-8, πίμπλαμεν [1pl])

In general, both aniḥ and seḥ roots (type PIE \*pl- \*plaḥ-) are now attested in paralleled formations of Old Anatolian, such as:

(a) PIE \*pr- \*por- \*per- ‘treiben, jagen fliegen : Fuß’ (P. 816f.)

CLu. par- (vb1.) ‘treiben, jagen’ (?) (DLL. 77, pár-du)  
 RV. pípar- (pr.) ‘hinüberführen’ (WbRV. 777-8, píparti [3sg])  
 CLu. para- (vb.) ‘treiben, jagen’ (?) (HHand. 120, DLL. 77)  
 HLu. para- (sb.) ‘foot’ (CHLu. 10.14.9, (“PES”)pa+ra/i-za)  
 OCS. pero- (vb.) ‘emporfliegen, sich erheben’ (Sadnik 639, perq)  
 CLu. parḥa- (vb.) ‘treiben, jagen’ (HHand. 122, CHD P:143f.)  
 Gr. περῶω (pr.) ‘durchschreiten, -fahren, -dringen’ (GEW 2:510)

(b) PIE \*son- \*sen- ‘suchen’ (P. 906)

HLu. šana- (vb.) ‘to seek’ (CHLu. 11.1.e19, (“\*69”)sa-na-tu)  
 Ĥi. šanaḥ- (pr.) ‘(ver)suchen’ (HEG 2:818f., ša-an-aḥ-mi)

(c) PIE \*mol- \*mel- ‘mahlen, zerkleinern, zerbrechen’ (P. 716f.)

Ĥi. mal- (vb2.) ‘mahlen, zerkleinern’ (HEG 2:102, ma-al-li [3sg])  
 Lat. molā (f.) ‘Mühlstein, Mühle, Opferschrot’ (WH 2:104)  
 Lat. in ·molā- (pr.) ‘opfern’ (WH 2:105, immolāre [inf.])  
 CLu. mamalḥ- (vb.) ‘zerdrücken, zerbrechen’ (HHand. 98)  
 Lat. in ·molāu- (pf.) ‘opfern’ (WH 2:105, immolāuit [3sg])  
 CLu. malaḥu- (vb.) ‘zerdrücken, zerbrechen’ (DLL. 65)

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tá- ‘thrown down’, Gr. γίγνομαι, Skt. jā-tá- (See Saussure Mém 260, Flensburg 101-102, Kuryłowicz ÉI 66, AP. 172, 198; Möller ZfdPh 25.383, Persson 680, Specht Ursprung 288, Hirt Abl 73, Maurer Lg 23.15, Cowgill EFL<sup>2</sup> 148, 155, 159, Adrados Estudios 159, Strunk MSS 17.77-108, Narten 278, 281 [...]).”

Due to the preservation of the laryngeal in Old Anatolian, no laryngeal could have been lost, whence the alternation is derivational (suffix).<sup>192</sup> Thus, Persson (Beitr. 631-648) was already correct in defending Brugmann's view when he stated that multiple Sanskrit roots appear both in *seṭ* and in *aniṭ* forms:<sup>193</sup>

“Wie ich zu zeigen versucht habe, gibt es auch mehrere Tatsachen, welche direct dafür sprechen, dass manche *Seṭ*-Basen im Ausgang eine suffixale (formantische) Erweiterung erfahren haben. [...] Brugmanns Lehre von einem ‘verbalen Suffixe’ *ā* (*ā ē ö*) haben Hirt u. a. Gelehrte mit Unrecht ganz verworfen.” (Persson, Beitr. 704)

The existence of parallel *seṭ* and *aniṭ* roots is therefore an empirical problem that is decided for every stem on the basis of the data, not by an aprioristic concept of the root structure.

### 2.1.5 *Ḫi. ḫ* and vocalism Neogr. \**ə* a *ā*

§0. Despite the loss of PIE \**h*, the languages that preserve distinctions of vowel quality indicate a dominance of Neogr. \**ə* a *ā* in correspondence sets with OAnat. *ḫ*, a feature first identified and explained by the laryngeal theory with ‘a-colouring’ of the laryngeal \**h*<sub>2</sub>.

§1. Some examples of the Neogr. \**ə* a *ā* that appear in connection with *Ḫi. ḫ* are:<sup>194</sup>

(a) *√ḫelu-* ‘Höhlung’ (P. 88)

<i>Ḫi. ḫalu-</i>	(a.) ‘tief’ (sb.) ‘Höhlung’ (HEG 1:135-6)
OInd. <i>ālu-</i>	(f.) ‘small water-jar’ (KEWA 1:80, EWA 3:25)
Lat. <i>aluo-</i>	(m.f.) ‘Höhlung, Wölbung, Unterleib’ (WH 1:34)

(b) *√ḫen-* ‘Großmutter’ (P. 36-37)

<i>Ḫi. ḫana-</i>	(c.) ‘Großmutter’ (HEG 1:145-6, <i>ḫa-an-na-aš</i> [sgN])
OHG. <i>ana</i>	(f.) ‘(Ur)großmutter, Ahne’ (WP 1:56-)
Lat. <i>anū-</i>	(f.) ‘altes Weib’ (WH 1:49-50, <i>anus</i> [N], <i>anūs</i> [G])

(c) *√ḫen-* ‘schöpfen’ (P. 901)

<i>Ḫi. ḫan-</i>	(vb2.) ‘schöpfen’ (HEG 1:144-5, <i>ḫa-a-ni</i> [3sg])
<i>Ḫi. ḫan-eša-</i>	( <sup>DUG</sup> c/n.) ‘Schöpfgefäß’ (EHS 513)
Gr. <i>ἄν τλο-</i>	(m.) ‘Kielwasser’ (GEW 1:114 [diff.])

<sup>192</sup> Similarly for the roots ending in obstruent there is an unextended root (AV. *ví ánu papāt-* ‘durchfliegen’, WbRV. 761, *papāta* [3sg]), a vocalic extension (Gr. *πέτο-* ‘fliegen’, GEW 2:521, *πέτομαι* [1sg]) and a laryngeal extension (Gr. *πέτα-* ‘fliegen’, GEW 2:521, *πέταμαι* [1sg]).

<sup>193</sup> For an identification of suffixes, see Brugmann (KVG:148A2): “Die Vokallängen [d. h. die auslautenden Vokale der *Seṭ*-Basen] mögen vielfache Suffixe oder, was dasselbe besagt, Determinative in dem Sinne gewesen sein, dass dieselbe ‘Wurzel’ schon vor der Wirksamkeit der ablautschaffenden Faktoren mit verschiedener Suffixbildung vorlag.”

<sup>194</sup> Catalogues for *Ḫi. ḫ* are provided by Tischler (HEG H), Puhvel (HED H), Zgusta (1951:455-456), Oettinger (1979:546-550) and Seebold (1988:514-519).

(d) √h<sub>ent</sub>- ‘Stirn, Front, vor, vorne’ (P. 48, WP. 1:67)

Ḫi. ḫant-	(c.) ‘Vorderseite, Stirn’ (HEG 1:149, ḫa-an-za [N])
Ḫi. ḫantei	(adv.) ‘vorne’ (HEG 1:149, ḫa-an-ti-i [sgDL])
Lat. ante	(adv.) ‘vor, vorher’ (WH 1:53, ante [adv.])
Gr. ἀντί	(prep.) ‘angesichts, gegenüber, anstatt’ (GEW 1:113-4)

(e) √h<sub>endh</sub>- ‘hervorsprießen, blühen’ (P. 40-41)

Ḫi. ḫandeiaša-	(a.) ‘männlich (?)’ (HEG 1:157, EHS 189)
MidIr. a <sup>1</sup> nder	(f.) ‘married woman, virgin’ (DIL 139)
HLu. ḫa(n)dara-	(sb.) ‘life’ (CHLu. 1.1.49, ha-tà+r <sup>a</sup> / <sub>i</sub> -ti-i)
Gr. ἄνθρωπο-	(m.) ‘Mensch’ (GEW 1:110-1, also LinB. a-to-qo)

(f) √h<sub>ep</sub>- ‘fügen’ (P. 50-51)

Ḫi. ḫap-	(vb1.) ‘gefügig machen’ (HEG 1:158-9, ḫa-ap-zi [3sg])
OLat. ape-	(pr.) ‘prohibe, compesce’ (WH 1:56, ape [2sg])
OLat. ape-	(pr.) ‘binden, im Zaume halten’ (WH 1:56, apere [inf.])
Lat. apto-	(pt.) ‘angefügt, verbunden’ (WH 1:57, aptus [sgN])
CLu. ḫaḫapatar/n-	(n.) ‘Bindung : binding’ (HHand. 34, CLuLex. 46)

(g) √h<sub>er</sub>- ‘zerstoßen, zerreiben, verderben’ (P. 62, ar- ‘pfügen’, HEG 1:169-70)

Ḫi. ḫara-	(vb.) ‘zerstoßen, zerreiben’ (HEG 1:169-70)
Gr. ἄρη-	(f.) ‘Verderben, Schaden, Unheil’ (GEW 1:136-)
Gr. ἄρη-	(pf.) ‘harm’ (Hom. ἄρημένος : βεβλαμμένος)

(h) √h<sub>es</sub>- ‘erfüllen, sättigen’ (P. –)<sup>195</sup>

LAv. upa (... ) āh-	(prM.) ‘erfüllen’ (AIWb. 345, upa āhīša [opt2sg.])
Gr. ἄ(h)-	(ao.) ‘sich sättigen’ (GEW 1:159, ἄμεναι [inf.])
Pal. ḫaša-	(pr.) ‘sich satt trinken/essen’ (DPal. 46, ḫa-ša-an-ti)
Gr. ἄ(h)ε/o-	(pr.) ‘sich sättigen’ (GEW 1:159 ἄεται [3sg])
Ḫi. ḫašik-	(vb1.) ‘sich sättigen, sich satt trinken’ (HEG 1:200)
Ḫi. ḫašik-	(GIŠn.) ‘ein Obstbaum und seine Frucht’ (HHand. 46)

Statistically Neogr. \*ə a ā is attested in the great majority of the examples of Old Anatolian ḫ, thus supporting a connection between the phenomena and casting doubt on the versions of monolaryngealism without such distribution.

§2. In the laryngeal theory, Saussure’s coefficient \*A has been replaced with \*h<sub>2</sub>, for which an ‘a-colouring effect’ on environment \*e, ē is generally assumed (see Mayrhofer 1986:132-40 & 2004:27-8). Though the general idea of the connection is backed by the material, the supposition of a ‘colouring laryngeal’ (LT h<sub>2</sub>) is untenable: (a) The phoneme PIE \*h is a consonant (an obstruent), which as such does not necessarily have a colouring component. Owing to co-articulation (or glottal

<sup>195</sup> Note the existence of the root PIE \*seh<sub>2</sub>- ‘fill, satisfy’ (Ḫi. šaḫ- (vb2.) ‘vollstopfen’ (HEG 3:690, ša-a-ḫi [3sg]) : Gr. ἄ- (vb.) ‘πληροῦται’ (LSJ. 267, ἄται [3sg]) with a similar meaning. Apparently both items have merged (or nearly so) in Greek into a single root.

movement), a glottal may change the pronunciation of the preceding vowel (e.g. Hind. *mīhr* [meh<sup>ɐ</sup>r], Hind. *šāhr* [šeh<sup>ɐ</sup>r]), but the change of /e/ to /a/ as a result of a consonantal segment's colouring property does not satisfy the requirements of scientific method.

(b) Phonetically the distinctions between the (cardinal) vowels are produced in the mouth cavity, not in the larynx, as assumed by the laryngeal theory.

Due to these problems, the idea of a 'colouring laryngeal' (equated with the vowel Neogr. \*ə) cannot be taken as self-evident. Consequently, an interpretation is needed to explain the connection between PIE \*h̥ and Neogr. \*ə a ā within the framework of comparative reality and scientific method.

### 2.1.6 The Monolaryngeal school (Zgusta, Szemerényi)

§0. Monolaryngealism<sup>196</sup> avoids the pitfalls of the 'colouring laryngeal' by reconstructing a single laryngeal \*H (= Ḥi. ḥ) without any colouring effect.

§1. Already Zgusta (1951) questioned the connection between \*H and vowel quality, claiming that the phoneme had no indisputable colouring effect in PIE.<sup>197</sup> Thus Zgusta postulated the vowels \*a, \*e, \*o<sup>198</sup> as original, and by adding the rule of compensatory lengthening he ended up with the inventory

\*e, \*a, \*o;                      \*eH, \*aH, \*oH                      \*H                      (ZG).<sup>199</sup>

§2. Another step beyond the laryngeal theory was taken by Szemerényi (1996:36-39), who questioned the rule of compensatory lengthening due to the existence of original *vṛddhi* (Occam's razor).<sup>200</sup> Thus, postulating schwa \*ə (1996:40) and one laryngeal \*H, Szemerényi's (SZ) system can be presented as follows:

\*a, \*e, \*o                      \*ē, \*ā, \*ō                      \*ə                      \*H                      (SZ).

<sup>196</sup> For 'monolaryngealism' (as coined by Eichner 1988), see Szemerényi (1996:139-40n7).

<sup>197</sup> Zgusta (1951:472) writes: "Il y avait seulement un *H*. Il n'avait rien de commun avec la qualité des voyelles."

<sup>198</sup> Zgusta (1951:444) adds: "[...] si l'on prouvait qu'il existait au degré plein la voyelle *a* ou, le cas échéant, *o* originaires, ou, si, en d'autres termes, la supposition qu'elles tirent son origine l'influence d'une laryngale n'était pas, au moins, vraisemblable, cela ne pourrait modifier que les considérations du problème, s'il existait plus de laryngales, et lesquelles, mais une telle découverte ne pourrait contester la base de la théorie laryngale [...]".

<sup>199</sup> Zgusta (1951:472) explains: "[...] en indo-européen, il y avait un phonème, que nous pouvons écrire *H*, qui avait dans le système des phonèmes une place analogue à celui des sonantes, dont la qualité exacte n'est pas sûre, mais qui était similaire au *h*. Entre les consonnes le *H* est en état de voyelle (*H* = ə) ainsi que les sonantes. En hittite, ce phonème (quand il n'était pas en qualité de voyelle) se changea en *h*, évidemment sous l'influence des langues avec lesquelles les Hittites vinrent en contact en Asia Mineure."

<sup>200</sup> Szemerényi (1996:137) notes: "It is just as questionable whether all long vowels are to be derived from combinations of short vowel with laryngeal."

§3. In essence, the monolaryngealists – including Zgusta (1951), Szemerényi (1970), Burrow (1979:vi), Tischler (1980) and myself – agree on the following rule concerning the reconstruction of the segmental laryngeal:

If there is a laryngeal in Old Anatolian, PIE also had a laryngeal, and if there is no laryngeal in Old Anatolian, Proto-Indo-European also had no laryngeal.<sup>201</sup>

§4. While the reconstruction based on one \*H has found noteworthy supporters,<sup>202</sup> it has not won general acceptance because of the following problems:

(a) The requirement of a ‘non-colouring’ laryngeal PIE \*h, though phonetically accurate, results in the loss of connection between OAnat. h and Neogr. \*ə a ā. This is contradicted by strong statistical counterevidence.<sup>203</sup>

(b) To date, the sound laws for laryngeal have been formulated for Old Anatolian alone, but its reflexes in the rest of the group (e.g. in Vedic hiatus) and the theory in general remain sketchy. Consequently, the monolaryngealism needs to be developed, especially in terms of the features implying PIE \*h in other cognates, its features (e.g. the place of articulation) and its relationships with the other items of the phoneme inventory.

§5. There is only a handful of comparisons in which Neogr. \*ə a ā (Lat. a, Gr. α, OIr. a, etc.) allegedly matches Hī. a without laryngeal (Hī. h). For examples of the so-called independent Neogr. \*a (Tischler 1980:501-2, fn.31 & 504-5) and its laryngealist counterpart (h<sub>4</sub>),<sup>204</sup> alternative etymologies can be presented.<sup>205</sup> The general situation can be illustrated with the key examples:

(a) Hī. apa ‘zurück’ : Gr. ἀπό ‘weg, von’ were compared already by Kuryłowicz (1935:75). However, the meanings do not agree, and an alternative etymology without Neogr. \*ə a ā has been presented for Hittite:

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<sup>201</sup> Tischler (1980:509): “Da es ein Ziel wissenschaftlicher Forschung sein muß, möglichst einfache Theorien zu erstellen [...] sollte man die Lösung des Problems in der schon von Zgusta (1951) und Szemerényi (1967) vorgeschlagenen Richtung suchen und sich auf nur einen idg. Laryngal, der nichts mit Vokalfärbung zu tun hat, beschränken und diesen einen Laryngal eben nur da ansetzen, wo er im Hetitischen als h belegt ist; dies zumindest für diejenige Phase des Indogermanischen, die der Ausgliederung des Anatolischen unmittelbar vorangeht.”

<sup>202</sup> For the single laryngeal PIE \*h ≡ Hī. h, see Szemerényi (1967:90 and 1985:59, fn3), Vaillant (1936:111f- and 1950:241-246), Gusmani (1979:63-71), Kammenhuber (1985:459) and Laroche 1986, Jonsson (1978:48ff.), Szemerényi 1990<sup>4</sup>:147), Tischler (1980:498), Szemerényi (1967:90), and Beekes (1969:5).

<sup>203</sup> Apparently only Burrow’s (1973:85-86) version of monolaryngealism recognizes that “another effect of h, observable in languages other than Sanskrit, is the coloration of a succeeding vowel by h, producing notably a change from e to a”.

<sup>204</sup> LT <sup>h</sup>h<sub>4</sub>, an a-colouring laryngeal allegedly ‘lost’ in Old Anatolian, was suggested by Kuryłowicz (1935:75f., 254f. and 1956:166-71) in his construction of <sup>h</sup>ə<sub>4</sub> (≡ <sup>h</sup>A<sub>2</sub> of Puhvel 1960:35, 1965:92). See also Hendriksen (1941:42), Schmitt-Brandt (1967:5), Schmitt-Brandt (1967:108-9), Szemerényi (1990:130) [wL.] and Lindeman (1997:48-49). For more recent supporters, see Mallory and Adams 1997 and Anttila 2000.

<sup>205</sup> For examples of Hī. a : Gr. α, Lat. a, OIr. a, etc., see Kuryłowicz (1935:75), Eichner (1988:132-133) and Tischler (1980:504, fn44).

PIE  $\sqrt{\text{op-}}$  ‘(da)nach zurück, usw.’ (\*pi-, \*epi-, \*opi-, etc.)

Ḫi. apa	(prep.adv.) ‘danach, zurück’ (HEG 1:41)
LinB. opi	(prepD.) ‘around, upon, after’ (DMycGr. 402, o-pi)
Gr. ὀπίσσω	(adv.) ‘nach hinten, hernach’ (GEW 2:404, ὀπίσσω)
Ḫi. apizia-	(adv.) ‘hinterer, letzter, geringer’ (HEG 1:46)
Gr. π-	(pref.) (GEW 1:535, in Gr. π-έξω, π-υχή)
OInd. pi-	(pref.) (in OInd. pi-dṛbh-, pi-nah-, pi-dhāna-)
Gr. ἔπι	(prep.adv.) ‘dazu, dabei, auf, an, bei’ (GEW 1:535)
RV. ápi	(adv.) ‘auch, dazu’ (WbRV. 75-6)

(b) Ḫi. auan ‘-(?)’ and Lat. au- ‘fort’ were similarly compared by Kuryłowicz (1935:75). Yet again, however, a better semantics is available in the following:

PIE  $\sqrt{\text{uon-}}$   $\sqrt{\text{un-}}$  ‘weg, -los, ohne, alleinstehend’

Ḫi. uan-umia-	(a.) ‘kinder-, elternlos, alleinstehend’ (HHand. 194)
Pal. uan-danguar-	(n.) ‘ohne Dunkel’ (HHand. 194)
Go. wan-	(n.) ‘Mangel’ (GoEtD. 394, wan [sgN])

(c) Ḫi. maglant- ‘mager’ : Gr. μακρός ‘lang’ (Tischler 1980:504). Since not all ‘thin’ objects are ‘long’, the semantic bridge can fail, leaving Neogr. \*a in doubt. If one compares Ḫi. maglant- directly to its translation (ModHG. mager) and the respective Germanic items (OIcl. magr- ‘mager’ ANEtWb. 375, etc.), PIE \*o can be postulated for the items without Neogr. \*ə a  $\bar{a}$ .<sup>206</sup>

(d) Ḫi. lap- ‘glühen’ : Gr. λάμπω ‘glänzen’ (Tischler 1980:504). Despite the acceptable semantics, the items do not constitute a morphological match (owing to the absence of nasal in Old Anatolian). This problem is obviated if one compares Hittite with Gr. λοφνίδ- ‘Fackel’ (GEW 2:139) and postulates Neogr. \*lobh- (or \*loph-) ‘glänzen’ for both.

(e) Ḫi. taia- ‘stehlen’ : OCS. taji- ‘verbergen’ were already compared by Kuryłowicz (1935:75) with a provable Neogr. \*ā in Do. τᾰτάω- (vbM.) ‘entbehren, darben, beraubt sein’, GEW 2:895. Semantically, the forms belong to the same root, but the possibility of derivational variation was not taken into account by Kuryłowicz. As set against the data, the following root matrix (without  $\dagger h_4$ ) is implied by the comparative method:

PIE  $\sqrt{\text{t-}}$  ‘fassen, nehmen, (be)stehlen, usw.’ (P. 1010)

$\sqrt{\text{te/o-}}$

Ḫi. ta-	(vb.) ‘take’ (HEG 3:5-11, da-a-i [3sg]) <sup>207</sup>
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<sup>206</sup> Kuryłowicz’s comparison Ḫi. alpa- ‘Wolke’ and Lat. albus ‘weiß’ is similarly based on questionable semantics: as clouds are not always ‘white’ in the real world, there is no parallel for such development in the Indo-European vocabulary. Instead, since the Indo-European words for ‘cloud’ are usually derived from the meaning ‘water, moisture, liquid, etc.’, it is more natural to compare Hittite with Gr. ὄλη- (f.) ‘Ölflasche’ (GEW 1:503) and Gr. ἔλπος- (n.) ‘Öl, Fett’ (GEW1:503), because the latter lack initial aspiration and therefore hardly belong to Go. salbō- (vb.) ‘salben’ (GoEtD. 293).

<sup>207</sup> For Ḫi. ta- ‘take’, see Puhvel (1960:73) and Schmitt-Brandt (1967:63, fn59).



OInd. ta-	(m.) ‘thief’ (MonWil. 431, Lex. taḥ [sgN])
Li. tè-	(vb.) ‘nehmen’ (LiEtWb. 1071, Li. tè [ipv2sg])
√teḥ-	
Gr. τή τη-	(f.) Hes. = ‘ἀπορία, ἔνδεια, στέρησις’ (GEW 2:895)
√teḥi-	
Do. τατάο-	(vbM.) ‘entbehren, darben, beraubt sein’ (GEW2:895)
ORus. tajī	(a.) ‘heimlich’ (sb.) ‘Geheimnis’ (REW 3:69)
√tei- √toi-	
Ḥi. tai-	(vb1.) ‘stehlen, bestehlen’ (HEG 3:24-, ta-a-iz-zi)
Ḥi. taia-	(vb1.) ‘(be)stehlen’ (HEG 3:24f., da-a-i-ia-zi [3sg])
gAv. taya-	(m.) ‘Dieb(stahl)’ (AIWb. 638)
gAv. taya-	(a.) ‘verstohlen, heimlich’ (AIWb. 638)
OInd. maṇ ṭáya-	(cs.) ‘sich wie ein Vermittler benehmen’ (KEWA 2:557)
Gr. τέο-	(vb.) ‘take’ (GEW 2:890, in τῆ [2sg], τῆτε [2pl])
LAv. aiwi ti-	(a.) ‘sich befassend mit [G]’ (AIWb. 91, aiwiḍyō [pIN])
√toti- √teti-	
HLu. ARHA tàti-	(vb.) ‘take away’ (CHLu. 2.9.27, ARHA tà-ti-i [3sg])
Li. tèti-	(vb.) ‘nehmen’ (LiEtWb. 1071, tèti-te [ipv2pl])

Diagnostically speaking, a monoliteral root √t- is accompanied with laryngeal √teḥ- and palatal √tei- extensions; accordingly, Neogr. \*ā is not confirmed for Hittite.

In the absence of unambiguous examples of Indo-European /a/ matching with Old Anatolian ḥ, there is a complementary distribution according to which the Neogr. \*ə a ā and Ḥi. ḥ imply each other. In this regard, the monolaryngealism needs to be improved (as discussed below).

### 2.1.7 PIE \*ḥ in syllabic position and Neogr. \*ə

§0. A common problem of all historical theories is the treatment of \*H in syllabic position CHC (where C is a consonant or zero), and the relation of the phenomenon to the Neogrammarian vowel \*ə (= DS \*A).

§1. Saussure’s coefficient sonantique \*A, interpreted as a laryngeal, was adopted by Cuny (1912:102f.),<sup>208</sup> according to whom \*A (= H<sub>2</sub>) becomes sonorous (i.e. \*A) in a non-sonorous environment; the author thus ended up explaining the ablaut with LT \*seAḡ- (Att. ἦγ, Do. ἄγ-) and LT \*sAḡ (Lat. sag-).

§2. In Eichner’s laryngeal theory (1988:125ff.), the idea is adapted into an assumption that the laryngeals h<sub>1</sub> h<sub>2</sub> h<sub>3</sub> have vocalic allophones LT ə<sub>1</sub> ə<sub>2</sub> ə<sub>3</sub>, which allegedly

<sup>208</sup> For a detailed analysis of Cuny’s work, see Szemerényi 1973:12f.

produce the syllabic reflexes (e.g., in Lat. pater- ‘father’ : OInd. pitár- ‘id’ ← \*pə<sub>2</sub>ter- and so forth).<sup>209</sup>

§3. The unavoidable problem of the syllabic hypothesis raised by Wyatt (1964:148) is that “[...] it is difficult to see how an essentially consonantal element can be vocalized”. Indeed, the laryngeal is non-sonorous and has no syllabic properties. Furthermore, for phonetic reasons the idea of its vocalization does not satisfy the requirements of scientific realism..<sup>210</sup>

§4. The dead end of the vocalic allophone of the laryngeal has led scholars to seek an explanation for the syllabic reflexes from the domain of vowels. It was Karl Oštir (1913:167) – followed by Kuryłowicz (1935:29 & fn2, 55f.) and Sturtevant (1941:184) – who suggested that \*H was accompanied by schwa secundum \*ɚ in diphonemic \*ɚH and \*Hɚ. A similar suggestion but based on an anaptyctic vowel has been recently discussed by Tischler (1981:322).<sup>211</sup>

§5. Although the idea of explaining the vocalization associated with the laryngeal by means of vowels is definitely superior to the impossible syllabicization of PIE \*H, problems remain. Of greater importance than Zgusta’s apophony-related objection<sup>212</sup> is Lindeman’s (1987:84, 98ff.) remark concerning the dubious character of the schwa secundum (and anaptyxis). This is indeed a concern, because according to scientific rules the reconstruction phonemes can only be postulated if implied by the comparative method. Clearly the schwa secundum and/or an anaptyctic vowel do not satisfy this condition, because the items cannot be defined for the proto-language in a consistent manner.

### 2.1.8 Ți. ȥ in environment Neogr. \*e \*ē

§0. Despite the existing statistics, the connection between PIE \*ȥ and Neogr. \*ə a ā is not self-evident, because the comparative method confirms clusters Ți. eȥ, ȥe with etymological PIE \*ě. In such examples, the lack of a-colouring challenges a key assumption of the laryngeal theory and the hypothesis of a single laryngeal PIE \*ȥ (on which, see Tischler 1980:496),<sup>213</sup> unless a hitherto unknown distribution can be uncovered

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<sup>209</sup> Eichner (1973:86, fn13) writes: “Die Laryngale hatten im Uridg. m.E. vokalische Allophone (ə<sub>1</sub> ə<sub>2</sub> ə<sub>3</sub>), wenn ihnen aufgrund der uridg. Sonantizitätregeln in der Phonemkette die Rolle von Sonanten zufiel.”

<sup>210</sup> Tischler (1980:515) adds: “[...] der hier vorliegende L[aryngal] H<sub>2</sub>, der ja ein Konsonant ist, nicht einfach ‘vokalisiert’ werden kann (wie z.B. Rix 1976, § 86 annimmt [...]).”

<sup>211</sup> For G. Schmitt’s (1973) similar treatment with ‘ein überkurzer Sproßvokal’, see also the summary of Mayrhofer (1986:138-9).

<sup>212</sup> Zgusta (1951:438) writes: “M. Oštir, M. Kuryłowicz, M. Sturtevant enseignent que ə < ɚH ou Hɚ. Mais cette hypothèse est très précaire, car par là nous renonçons au parallélisme de l’apophonie, qui est la raison fondamentale pour accepter la théorie laryngale.”

<sup>213</sup> Burrow (1973:88) suggests: “For all practical purposes it is possible to operate with a single, undifferentiated H.”

§1. In order to solve this problem, Pedersen (1938:179-181)<sup>214</sup> suggested that there are two different laryngeals, both preserved as Hittite  $h^{215}$ : a non-colouring  $*H$  (e.g.  $\text{Ḫi. ue-eh̄-zi}$  ‘sich wenden’ [3sg]) and an a-colouring  $*H_a$  (e.g.  $\text{Ḫi. ḫanti}$  ‘frons’ : Lat. ante).<sup>216</sup> In addition, Pedersen’s system only includes the cardinal vowels  $*e$  and  $*o$  (and the rule of compensatory lengthening), with the result that it is economic and capable of explaining the ablaut Neogr.  $*ā : *ō$  based on  $*H_a e : *H_a o : *eH_a : *oH_a$  (a property that is missing from the multilaryngeal theories with only  $*e$ ).

§2. Despite this partial success, under closer inspection Pedersen’s reconstruction falls short. Neither  $*H$  nor  $H_a$  can be reconstructed for the roots with ablaut Neogr.  $*ā : ē$ , since the non-colouring  $*H$  is precluded by the forms in  $*ā$  (e.g. Lat. agō) and the a-colouring  $*H_a$  by the forms in  $*ē$  (e.g. Lat. ēgī). In the Old Anatolian data, the non-colouring  $*H$  solves the ablaut  $\text{Ḫi. ueḫ-, uaḫ-} \leftarrow *uēḫH-, *uōḫH-$ , but the vocalism of Gr. (Ϝ)άινω ‘winnow’ (GEW 1:41) and Lat. uannus ‘Getreide- oder Futterschwinge’ (WH 2:731) reveals the contradiction in Pedersen’s  $*H$  and  $*H_a$ . Since it is not uncommon that all three qualities (Neogr.  $*ē : ḫ : ā$ ) appear within one root (Lat. ēgī : Gr. ὄγμος : Lat. agō etc.), Pedersen’s reconstruction is disproved: adding laryngeals does not solve the problems at hand.

§3. More recently, a new proposal concerning the ablaut Neogr.  $*ē : ā$  was put forth by Eichner (1973:53, 71f.),<sup>217</sup> according to whom the ‘a-colouring laryngeal’  $*h_2$  had no colouring effect on an adjacent PIE  $*ē$ . The following remarks show, however, that ‘Lex Eichner’ should not be considered a sound law:<sup>218</sup>

(a) It is questionable to posit a sound law depending on an scientifically unverifiable condition, in this case the Old Anatolian quantity, a feature not expressed in cuneiform writing.

(b) The Indo-European forms related to the parade example of Lex Eichner (i.e.  $\text{Ḫi. meḫur/n-}$  (n.) ‘time, noon’ (HEG 2:171-4,  $\text{Ḫi. me-e-ḫur}$  [sgN], me-e-ḫu-na-aš [sgG] (OAnat.  $\sqrt{mēḫ-}$ )) are sufficient to prove that the lack of colouring is not related to quantity. Eichner’s idea can be illustrated with the following correspondences:

<sup>214</sup> On Pedersen’s reconstruction, see also Polomé (1965:19).

<sup>215</sup> Pedersen (1938:180) proposes: “Da es aber zwei verschiedene Färbungen der Grundstufe gibt, müssen wir zwei verschiedene Laryngale annehmen, die man  $H_1$  und  $H_2$  schreiben kann;  $\bar{e}$  ist aus  $eH_1$ ,  $\bar{a}$  aus  $eH_2$  entstanden; der Unterschied der beiden Laryngale besteht also darin, dass  $H_1$  auf die Färbung des vorgehenden e keinen Einfluss ausübt, während  $H_2$  das e in a verwandelt. [...]  $H_2$ , das einem vorhergehenden e die a-Färbung gegeben hat, auch ein folgendes e in a verwandelt hat.”

<sup>216</sup> Since Pedersen does not postulate unattested ‘laryngeals’, the (Semitic) monovocalism or root axiom are not upheld. Therefore, his theory is not a proper laryngeal theory, but a version of monolaryngealism.

<sup>217</sup> Eichner (1973:72) writes: “Trotz der – wie nicht anders zu erwarten – geringen Zahl von sicheren Beispielen (mēhur, šēhur, hēkur,  $\bar{e}$ hištā-,  $\bar{L}U$ hippara-) dürfte die Folgerung, das uridg.  $\bar{e}$  neben  $H_2$  ( $\bar{e}H_2$ ,  $H_2\bar{e}$ ) seine Qualität bis ins Hethitische halten konnte, unausweichlich sein, Vorbilder, aus denen das lange  $\bar{e}$  dieser Wörter analogisch bezogen sein könnte, fehlen völlig.” For additional examples and discussion and literature, see Mayrhofer (1986:132-133, 2004:27fn114) and Szemerényi (1996:139).

<sup>218</sup> Eichner (1973:72) adds: “Die Annahme der Erhaltung von uridg.  $\bar{e}$  in dieser Position ist prinzipiell unbedenklich, da Langvokale erfahrungsgemäss durch benachbarte Konsonanten nicht in demselben Mass verändert werden wie die entsprechenden Kurzvokale.”

Ĥi. meĥn-	(n.obl.) ‘Zeit’ (HEG 2:171, me-eĥ-ni [sgL])
Lat. mānī	(adv.) ‘am Morgen’ (WH 2:25, mānī [adv.])
Lat. mānicā-	(pr1.) ‘früh aufstehen’ (WH 2:25, mānicāre [inf.])

where the difference of colourings Ĥi.  $\sqrt{meĥn-}$  : Lat.  $\sqrt{mān-}$  allegedly reflects the original difference of quantity: EICH. \* $mēh_2n-$  : \* $meh_2n-$ . That the quantity does not explain the absence of ‘a-colouring’ is evident on the basis of the short PIE \*e in Gothic:

Go. aldo-min-	(m./n.) ‘γῆρας : old age’ (GoEtD. 25)
Ĥi. meĥn-	(n.obl.) ‘Zeit’ (HEG 2:171, me-eĥ-ni [sgL])

The alternative extensions of the root PIE \* $meh_2-$  ‘Zeit, usw.’ imply that the actual ablaut alternation is far more complicated. Thus the extension PIE \* $mēh_2l-$  appears with Neogr. \*e and \*ē but without ‘a-colouring’ in:

Li. tuo·mēl-	(adv.) ‘in einem fort’ (LiEtWb. 430, tuomēl [sgNA])
Go. mēl-	(n.) ‘Stunde, Zeit’ (GoEtD. 250, mel [sgNA])
Oicl. māl-	(n.) ‘Zeit, Termin, Mahlzeit’ (ANetWb. 376, māl [NA])

In this manner, Lex Eichner succeeds no better than Pedersen’s \*H : \*H<sub>a</sub>. Since Zgusta’s idea that a connection between the ‘a-vocalism’ and PIE \* $h_2$  is missing altogether is not tempting either, Neogr. \*ē in environment Ĥi.  $h_2$  remains unexplained, and the true solution needs to be inferred based on the comparative method.

### 2.1.9 Diphonemic PIE \* $h_2a$ and PIE \* $ah_2$

§0. All attempts to solve the problem of the syllabic reflects of the laryngeal, the relation between Ĥi.  $h_2$  and Neogr. \*ə a ā and the appearance of Ĥi.  $h_2$  in environment Neogr. \*ē have proven unsuccessful. On Christmas Eve 1998, I briefed my future mentor, Bertil Tikkanen, on the situation with data related to the root Neogr. \* $kəu-$  \* $kāu-$  ‘schlagen, usw.’ (P. 535,  $kāu-$   $kəu-$ ):

$\sqrt{kāu-}$	
Li. káu-	(vb.) ‘schlagen, hauen, vernichten’ (LiEtWb. 232)
Latv. kaû-	(vb.) ‘schlagen, hauen, stechen, usw.’ (LiEtWb. 232)
TochA. kāw-	(vb.) ‘occidere, necare’ (Poucha 85, kāwe(ñc) [3pl])
Li. kovà-	(f.) ‘Kampf, Schlacht’ (LiEtWb. 232, kovà [sgN])

$\sqrt{kəu-ii-}$	
Li. kúja-	(f.) ‘Stelze : pale, stake’ (LiEtWb. 232)
Li. kúji-	(.) ‘schwerer Schmiedehammer’ (LiEtWb. 232)
RusCS. kyĭ	(.) ‘Hammer, Knüttel’ (LiEtWb. 232)

$\sqrt{kəu-d-}$  :  $\sqrt{kāu-d-}$

Lat. cūd-	(pf.) ‘schlagen, klopfen, stampfen, prägen’ (WH 1:300)
Lat. caud·ec-	(m.) ‘Baumstamm, gespaltenes Holz’ (WH 1:136)
Latv. pa·kūdī-	(vb.) ‘antreiben’ (Sadnik √434)
√khu·d-	
RV. khudá-	(vb.) ‘hineinstossen : thrust into’ (WbRV. 374)
√kheu·d-	(P. 955)
RV. coda-	(pr.) ‘in Bewegung setzen, antreiben’ (WbRV. 456)
RV. códa-	(m.) ‘Werkzeug zum Antreiben, Peitsche’ (WbRV. 458)
RV. codáya-	(cs.) ‘schärfen, wetzen’ (WbRV. 457)

This data contains material that is critical for the solution of the laryngeal question, as it includes simultaneously all the problems:

(a) The ‘a-vocalism’ Neogr. \*ə a ā is attested in languages preserving the quality. Thus Neogr. \*kāu- is directly represented by Li. √kov- ≡ Lat. √cau-. At the same time, Neogr. \*kəu- is indirectly preserved in the quantity of Li. √kú- ≡ RusCS. √ky-, which reflects the assimilation and lengthening of \*ə+u → \*ū (see Chapter 3).

(b) The segmental laryngeal PIE \*h̥ is implied by the Baltic accent in Li. √káu- ≡ Latv. kaû- and Li. √kú-, and it is directly confirmed by tenuis aspirata in RV. √khud-.

(c) Thus both the laryngeal and the schwa are comparatively proven, but neither the laryngeal nor the schwa as such provides a coherent reconstruction. The reasons for this are explicated below:

1. If one opts for the traditional reconstruction Neogr. \*kəu·(Σ)-, it is no longer possible to reconstruct the root variants with laryngeal (RV. √khud-), because it makes no sense that a vowel \*ə would be a consonant PIE \*h̥.

2. If one opts for laryngeal reconstruction with PIE \*h̥ (in LT \*khu·Σ-), it is no longer possible to reconstruct the vocalic variants (Li. √kú-), as it makes no sense to reconstruct a syllabic obstruent <sup>†</sup>H̥.

§1. In a subsequent discussion, Tikkanen and I agreed that the solution had to be sought from the direction of both vowel and laryngeal being present (instead of either alone). Through our joint efforts, mine on the comparative side and his in phonetics, we arrived at the sole existing solution, effectively dealing with all problems:

(a) Tikkanen initially suggested a parallel in Hebrew with the so-called ‘pataḥfurtivum’, a short sub-phonemic [a] which appears anaptyctically before a laryngeal /h/, /h̥/, or /ʕ/ (e.g. Hebr. rū<sup>a</sup>ḥ ‘wind, spirit’). This suggestion raised, however, the weaknesses of schwa secundum and/or anaptyxis in a form of the sub-phonemic [a]. Consequently, the idea had to be abandoned in favour of a diphonemic combination of the vowel Neogr. \*ə and the laryngeal PIE \*h̥: the root Li. √kú- represents PIE \*kəhu- (with accented schwa \*é) and the root RV. √khu- represents PIE \*kəhu- (with unaccented schwa \*ə). Thus the diphonemic \*əḥ allows for the reconstruction of both variants necessary for a complete theory.

(b) When I pointed out the existence of examples requiring post-laryngeal schwa \*ḥə, Tikkanen suggested a phoneme surrounded by vowels \*əḥə (q.d. Hebr. <sup>†</sup>aḥ<sup>a</sup>). I

abandoned this as too strong, as the resulting unrestricted colouring would be identical to that of LT  $h_2$ , which no longer allows the quality  $*\check{e}$  attested in RV.  $\sqrt{\text{cod-}}$  ← PIE  $*k\check{e}h\text{eud-}$ . In order to include PIE  $*\check{e}$ ,  $*h\check{e}$  also has to be posited; this leads to diphonemic  $*h\check{e}$  and  $*\check{e}h$ , for which Tikkanen in this connection had already suggested the value Neogr.  $*\check{a} \equiv \text{PIE } *a$ .<sup>219</sup>

§2. For the solution of the laryngeal problem, it is necessary and sufficient to *combine* PIE  $*h$  (=  $\check{H}i. h$ ) and the cover symbol Neogr.  $*\check{a}$ , reinterpreted as vowel PIE  $*a$ , in diphonemic PIE  $*h\check{a}$  and PIE  $*a\check{h}$ .

From the following sketch, it can be readily seen that the solution answers all existing problems:

(a) The problem that the laryngeal PIE  $*h$  cannot be vocalized<sup>220</sup> can be answered by the simple fact that it does not have to: the syllabicity is caused by the vowel PIE  $*a$  adjacent to PIE  $*h$  in PIE  $*h\check{a}$   $*a\check{h}$ .

(b) The problem of the scientifically unsatisfactory character of schwa secundum and/or an anaptyctic/epenthetic vowel is answered by the fact that the vowel accompanying PIE  $*h$  is the well-defined schwa indogermanicum (Neogr.  $*\check{a}$ ), for which the phonetic value PIE  $*a$  can be demonstrated. Since Neogr.  $*\check{a}$  was already comparatively proven by the Neogrammarians, it has to be included in the reconstruction anyway.

(c) Neogr.  $*\check{a} \equiv \text{PIE } *a$  has a well-known double treatment: in addition to the development Lat.  $a \equiv \text{OInd. } i$ , schwa was lost in all dialects except for traces of Vedic meter in examples like

RV.  $\text{p}\check{a}ri\text{-j}\check{m}\check{a}$ -            (m.) ‘Umwandler, Herumwandler’ (WbRV. 785)

requiring a four-syllabic scansion. The explanation for the loss and the preservation of a vowel PIE  $*a$  can only be sought from an original difference between an accented PIE  $*\acute{a}$  and an unaccented PIE  $*a$ . An unaccented PIE  $*a$  was lost (e.g. PIE  $*u\check{e}h\check{a}$  →  $\check{H}i. ueh\text{-}$  and PIE  $*u\check{o}h\check{a}$  →  $\check{H}i. uah\text{-}$ ), but it may remain indirectly measurable in variants in which PIE  $*a$  was assimilated in PIE  $*\check{e}$  before its loss (e.g. PIE  $*u\check{e}h\check{a}\text{-}\check{e}n\text{-}$  → Gr.  $\sqrt{\text{f}\alpha}\nu\text{-}$  ‘winnow’).<sup>221</sup>

(d) The vowel PIE  $*a$ , not PIE  $*h$ , is the source of the so-called ‘colouring effect’ in the environments with PIE  $*\check{e}$ , which readily addresses the non-realistic assumption of a ‘colouring laryngeal’.

(e) The vowel PIE  $*a$  (Neogr.  $*\check{a}$ ), not the vocalization of the laryngeal (PIE  $*h$ ), is the origin of the syllabicity in the zero grade (e.g. in PIE  $*pa\check{h}ter\text{-}$  ‘father’).

(f) The alternation between ‘a-quality’ and ‘e-quality’ in environment PIE  $*h$  is caused by alternation of the position of PIE  $*\check{e}$ : the forms without direct contact between PIE

<sup>219</sup> Confirmation of the idea, necessitating a solution for the problem of the vowel Neogr.  $*a$ , took place some years later.

<sup>220</sup> Tischler (1980:514) writes: “Von Kuryłowicz’s Nachfolgern wird der Unterschied zwischen dem vocalischen Schwa und den konsonantischen Laryngalen jedoch oftmals vernachlässigt und mit leichtfertigen Papiererklärungen wie ‘silbisches Allophon’ u.dgl. abgetan.”

<sup>221</sup> As a consequence of the loss of PIE  $*h$  and contractions, not only PIE  $*u\check{h}a\check{e}\text{-}$  but any vocalization of PIE  $*u\check{e}h\check{a}\check{e}\text{-}$  could underlie Gr.  $\text{f}\alpha\nu\text{-}$  (Neogr.  $*u\check{a}n\text{-}$ ).

\*ě and \*PIE \*a (e.g. *Ḫi. meḥn-* ← PIE \*mēḥa·n-) do not indicate a-vocalism, while those in direct contact do (e.g. Lat. *mānī* ← PIE \*mēḥa·ēn-).

(g) Consequently, only a single laryngeal appearing in PIE \*ḥa and PIE \*aḥ suffices for the reconstruction of Proto-Indo-European, and no distinction between colouring and non-colouring laryngeals (Pedersen) should be made. The vowel PIE \*a, not the laryngeal, is responsible for the ‘colouring effect’, which is actually an assimilation of PIE \*ě+a, PIE \*a+ě → Lat. *ā*, etc. followed by afairesis of the unaccented PIE \*a.<sup>222</sup> In this manner, a single cover symbol PIE \*ḥ solves the Proto-Indo-European laryngeal problem without any of the problems caused by multiple such items.

(h) The difference between PIE \*ḥa : \*aḥ is distinctive (i.e. PIE \*ḥa ≠ \*aḥ in all environments): the vowel PIE \*a does not alter its position (or ‘schwebeablaut’) like PIE \*e/o (possibly), but it stands in a fixed position either before or after the laryngeal and thus behaves functionally as a root radical.<sup>223</sup> As Indo-European linguistics is an empirical science, there are no aprioristic rules for determining whether PIE \*aḥ or \*ḥa needs to be reconstructed for a root; the correct alternative must be chosen based on the measurable features of the data. Thus, for example, PIE \*meḥa- ‘time, noon’ has PIE \*ḥa (based on the lack of colouring in *Ḫi. meḥ·ur-*), whereas PIE \*paḥter- has PIE \*aḥ (based on Gr. *πάτερ-* ‘father’) without tenues aspirata and so forth.<sup>224</sup>

§3. The rules of the laryngeal theory that allow PIE \*ḥ (h<sub>2</sub>) to be inferred from ‘a-colouring’ and ‘a-colouring’ from the Old Anatolian laryngeal are acceptable, because PIE \*ḥ and PIE \*a form an equivalence pair, PIE \*ḥa aḥ. The following rules of inference apply for these:

Neogr. \*ə a ā (Gr. α, Lat. a, etc.) → PIE \*ḥ (*Ḫi. ḥ, Pal. ḥ, etc.*) (1)

PIE \*ḥ (*Ḫi. ḥ, Pal. ḥ, CLu. ḥ, HLu. ḥ*) → Neogr. \*ə a ā (Gr. α, etc.) (2)

As for these rules, note in particular that:

(a) The first rule, which has been widely used ever since the appearance of the laryngeal theory (‘the colouring rule of h<sub>2</sub>’), allows us to reconstruct PIE \*ḥ based on Neogr. \*ə a ā even when the correspondence is not confirmed by Old Anatolian, compensating considerably for the loss of the laryngeal.

(b) The second rule allows for the reconstruction of Neogr. \*ə a ā (i.e. PIE \*a) based on the Old Anatolian laryngeal, thus providing an auxiliary hypothesis, according to which one can anticipate ‘a-vocalism’ in the Indo-European languages when Old Anatolian indicates PIE \*ḥ.

<sup>222</sup> The afairesis is a part of the general loss of unaccented PIE \*a (Neogr. \*ə).

<sup>223</sup> Note, however, that roots can naturally be affixed both with *ḫ·aḥ* or *ḫ·ha*, thus resulting in alternation formally resembling schwebeablaut. Thus, for example, in Li. *pagynā-* (f.) ‘Beendigung, Ende’ (LiEtWb. 152) a suffix *·éaḥ* appears and in Li. *pa·gyné-* (vb.) ‘ein wenig treiben, beendigen, vollenden’ (LiEtWb. 152) a suffix *·éḥa* appears. Here and in similar examples, there are two distinct suffixes instead of schwebeablauting vowel PIE \*a changing its position with respect to PIE \*ḥ.

<sup>224</sup> Due to the loss of material, it is not always possible to infer whether PIE \*aḥ or \*ḥa is to be reconstructed. Even in such cases, however, at least PIE \*ḥ can be confirmed.

(c) Upgrading the monolaryngealism with these rules solves Zgusta's problem of the absence of a connection between PIE \*h̥ and Neogr. \*ə a ā based on the single laryngeal PIE \*h̥, a feature henceforth added to System PIE.

§4. It is possible to seek the establishment of a diphonemic connection between PIE \*h̥ and PIE \*a from the general existence of the ablaut PIE \*ē : Ø : ō. The ablaut mechanism would have faced enormous difficulties in zero-grade ChC (shape CCC) had PIE \*h̥ not been accompanied by the vowel PIE \*a.<sup>225</sup> The diphonemic connection between PIE \*h̥ and PIE \*a allowed roots with PIE \*h̥ to behave in a similar manner as the resonants, except not being either 'a vowel or a consonant' (= R̥/R), but 'a vowel (PIE \*a) and a consonant (PIE \*h̥)' in PIE \*ah̥ and PIE \*ha.

§5. Finally, it should be noted that since both Neogr. \*ə (PIE \*a) and PIE \*h̥ (= OAnat. h) are based on well-defined correspondence sets, the proto-language was bound to contain their combinations PIE \*a+h̥ and PIE \*h̥+a (i.e. PIE \*ah̥ and PIE \*ha), whence the reconstruction of diphonemes is acceptable also from the point of view of actually attested forms.

### 2.1.10 On properties of the cover symbol PIE \*h̥

§0. In terms of the properties of the cover symbol PIE \*h̥, several key features can be inferred based on the material:

§1. In the laryngeal theory it has been suggested that H̥i. h̥ = PIE \*h̥ was a voiceless velar fricative /x/ (see, for example, Mayrhofer 2004:25fn102).<sup>226</sup> Regarding this interpretation, one should observe the following:

(a) The assumed velar fricative articulation of PIE \*h̥ is based on the transcription of the (sole) laryngeal of the cuneiform script (Sum. h̥ = Akd. h̥ = H̥i. h̥, etc.) in the Latin alphabet. However, we could write Sum. h = Akd. h = H̥i. h for the laryngeal instead (i.e. H̥i. h̥ can stand equally well for a glottal fricative /h/, just as the cuneiform H̥i. š stands for PIE \*s (= IPA /s/) despite its value Sum. š = Akd. š).

(b) In connection with the assumed voiceless character of H̥i. h̥ and its PIE counterpart, it should be noted that the cuneiform script made no distinction between the voiceless and the voiced laryngeal. Though by means of segmental analysis the voiceless value can be demonstrated for some examples (e.g. OInd. √sth- < \*stah-), this does not exclude the possibility of H̥i. h̥ also standing for a voiced item.

§2. Consequently, the phonetic values PIE \*h : f̥ and PIE \*x : γ (or both) are possible for the cover symbol PIE \*h̥. Although no further conclusions can be drawn on the basis of the one-dimensional surface level of H̥i. h̥, it can be readily mentioned that

<sup>225</sup> Note, however, that this argument – being essentially structural – lacks rigour, unless the general impossibility of the shape CCC is demonstrated for Proto-Indo-European.

<sup>226</sup> The various attempts of the laryngeal theory to explain the colouring in terms of different articulatory properties of the different 'laryngeals (e.g. x̥, x, x<sup>v</sup>) fail due to the non-existence of the items h<sub>1</sub> and h<sub>3</sub>.



analysis of the taihun-decem isogloss (see Chapter 4) reveals that at least the value PIE \*h (glottal fricative) can be proven for the cover symbol PIE \*ḥ. In addition, the glottal fricative alternates in terms of the voice (i.e. the cover symbol \*ḥ stands for PIE \*h : ɦ of the proto-language).

§3. The compatibility of the diphonemic interpretation of PIE \*ḥa, aḥ with the Old Anatolian laryngeal (Ḫi. ḥ) and Brugmann's vowel system will be demonstrated for the 'a-vocalism' in Section 2.2, for 'o-vocalism' in Section 2.3, and for 'e-vocalism' in Section 2.4. Taken together, these constitute a general solution for the ablaut problem and Ḫi. ḥ.

## 2.2 Vowels Neogr. \*ə \*a \*ā and Ḫi. ḥ

### 2.2.1 Introduction and definitions

§1. In Brugmann's system, three correspondence sets Neogr. \*ə, Neogr. \*a (= \*a<sub>3</sub>), and Neogr. \*ā are defined as the cover symbols for the 'a-vocalism'. In this chapter, Neogr. \*ə a ā will be shown to be consistent with the diphonemic interpretation of PIE \*ḥa, aḥ by deriving the upgraded values for Neogr. \*ə a ā in System PIE.

### 2.2.2 Reconstruction of Neogr. \*ə ≡ Gr. α : OInd. i<sup>227</sup>

§0. Following the analysis of Paleogr. \*a ā into the six cover symbols Neogr. \*a ā e ē o ō, problematic correspondence sets remained. The most famous of these is the cover symbol Neogr. \*ə, 'schwa indogermanicum', discussed here.

§1. The term was introduced into Indo-European linguistics by Fick (1879:157-165) in his article *Schwa indogermanicum*,<sup>228</sup> using the following definition:

“Dieses ursprüngliche e, o, das ich der Kürze wegen Schwa nenne, erscheint im Sanskrit meist als *i*, *i̇* (vor und hinter Labialen auch als *u*, *ū*), im Zend als *ə*, *i*, im Griechischen vorwiegend als *α*, im Deutschen als *o* (got. *u*).”

§2. The Neogrammarians accepted Fick's schwa (written Neogr. \*ə), but with a restriction stated by Brugmann (Grundr.<sup>2</sup> 1:170); according to this, Av. ə and Go. u should be treated differently.<sup>229</sup> In Brugmann's canonical formulation, the schwa produces a short /a/ in all languages except Indo-Iranian, where the resulting vowel is /i/:

<sup>227</sup> For the Neogr. \*ə ('schwa indogermanicum'), see Szemerényi (1990:134-135, 1996:40-41), Burrow 1949, 1979 and Wyatt 1964, 1970.

<sup>228</sup> For a critical discussion on Fick's views, see Tischler (1980:513 & fn57).

<sup>229</sup> Brugmann (Grundr.<sup>2</sup> 1:177): “Dass uridg. ə im Germanischen lautgesetzlich auch als u erscheine, nach Streitberg (IF. Anz. 2, 47f., Urgerm. Gr. S. 47) in nichthaupttoniger Silbe, ist mir unerwiesen. Vgl. Noreen Abriss 10 f. (ə in zweiter Silbe darf nicht in ahd. anado 'Kränkung' und nhd. dial. sam(p)t 'sand' = ahd. \*samat gesucht werden.)”

Neogr. \*ə       ≡       OInd. i, Av. i : Gr. a, Lat. a, OIr. a, Arm. a, etc.<sup>230</sup>

For schwa, Brugmann (Grundr.<sup>2</sup> 1:170-178, KVG 80-82) provided, inter alia, the following examples:

OInd. pitár- :       Arm. hair, Gr. πατήρ, Lat. pater, OIr. athir, Go. fadar  
OInd. sthitá- :       Gr. στατός, Lat. status, Go. stafs, Li. stataũ, etc.  
OInd. ·dita- :       Lat. datus, Arm. ta-mk' [1pl.], Alb. daše [1sg]

§3. Brugmann (Grundr.<sup>2</sup> 1:51) characterized schwa phonetically,

“Eine Mittelstellung zwischen Vollstimme und Flüsterstimme nimmt die Murmelstimme (nach Sievers' Bezeichnung [= 1893<sup>4</sup>]) ein. [...] Statt Murmelvocal sagt man auch Schwa. Von den uridg. Vocalen gehört hierher der, den wir mit ə darstellen.”

Later on, Brugmann (KVG:33) provided a more precise formulation:

“Murmelvokale (nach Sievers' Bezeichnung) sind solche Vokale, bei deren Hervorbringung die Stimmbänder so weit auseinander stehen und der Expirationsdruck so schwach ist, dass sich dem Stimmton Flüster- und Hauschgeräusche beimischen. Bei ihnen fällt der Klangunterschied wenig ins Ohr, und meist wird auch die spezifische Artikulation weniger korrekt ausgeführt als bei vollstimme. Im Nhd. wird e oft als Murmelvokal gesprochen, z. B. in *name*, *gethan*. Von den uridg. Vokalen scheint ə hierher zu gehören (§ 37, 127f.).”

§4. Brugmann<sup>231</sup> and the Neogrammarians set the schwa (Neogr. \*ə) in ablaut alternation with the long vowels Neogr. \*ā ē ō. The resulting system

Neogr. \*ā : ə           Neogr. \*ō : ə           Neogr. \*ē : ə

thus stands in a clear contrast with the basic ablaut pattern PIE \*e : Ø : o.

§5. A famous re-interpretation of the ablaut scheme Neogr. \*ə : ā was presented by Saussure (1878), according to whom:

(a) The ablaut schema Neogr. \*ə : ā is derived from \*A : eA (≈ Neogr. \*ə : eə). The ablaut behaviour of \*A, lacking zero grade, suggests that it belongs to the class of functionally (or structurally) defined ‘coefficients sonantiques’, which ablaut according to the pattern \*eA : \*A, \*ei : \*i, etc.,<sup>232</sup> not according to Neogr. \*e : Ø : o.

(b) Saussure's ablaut schema \*A : \*eA (for Neogr. \*ə : ā) implied not only a common denominator \*A, but a coefficient with a colouring effect on the preceding vowel (\*eA → aA) and compensatory lengthening (aA → ā).<sup>233</sup>

<sup>230</sup> Brugmann (Grundr.<sup>2</sup> 1:170) writes: “Idg. ə [...] fiel in allen Sprachzweigen ausser dem arischen mit uridg. a zusammen. Im Arischen erscheint ə als i [...]”

<sup>231</sup> Brugmann (KVG:80) writes: “Uridg. ə [...] eine Schwächung von ē, ō, ā (§ 213,1).”

<sup>232</sup> According to Wyatt (1970:10-11), Saussure understood \*A as a vowel, not a consonant, but it is generally agreed that for him \*A was a resonant-like ‘coefficient’.

<sup>233</sup> Möller (1906:xiv-xv) generalized E, A, Ō accordingly: “Die langen indogermanischen Wurzelsvokale ē, ā, ō sind aus dem kurzen Wurzelsvokal und einem ursprünglich folgenden Kehllaut, semitischen Kehllaut entsprechend, entstanden.”

§6. Møller (1880:492, fn2 & 1906:vi)<sup>234</sup> took this a step further by suggesting a phonetic interpretation of the ‘coefficient \*A’, which according to him was a guttural of the Semitic type (i.e. a consonant for which he later coined the term ‘laryngeal’).<sup>235</sup>

§7. In his interpretation of Hittite,<sup>236</sup> Kuryłowicz (1927a:95-104,<sup>237</sup> 1935:28-30) identified \*A, now interpreted as a laryngeal, directly with Hi. ḫ, as; see, for example,

\*ə<sub>2</sub>ent- → Hi. ḫantei ‘frons’ (HEG 1:149) : Lat. ante (WH 1:53).

The laryngeal theory followed Kuryłowicz, whose equation Neogr. \*ə = \*A = \*h<sub>2</sub> resulted in a complete reversal of the phonetic interpretation of the schwa. The item originally defined as a vowel (Neogr. \*ə) was understood as a sonant by Saussure (DS. \*A) and finally as a consonant by Møller and Kuryłowicz (LT \*h<sub>2</sub>).

### 2.2.3 Problems of the reconstruction of Neogr. \*ə

§0. Despite the early acceptance of schwa, the correspondence set Neogr. \*ə has caused constant difficulties ever since its postulation.

§1. Tischler (1980:514) suggests rejecting Neogr. \*ə, which according to him is not an autonomous phoneme, but a mere cover symbol for some unconnected comparisons.<sup>238</sup> This is certainly true for the majority of the alleged examples of Neogr. \*ə → OInd. i (Av. i), which actually contain Neogr. \*i. Among these, one can mention the classical example of schwa \*ə in:

RV. sthitá- : Gr. στατός, Lat. status, Go. staþs, Li. stataũ, etc.

In order to reconstruct the root P. 1004-1010, it is important to correctly note the following:

<sup>234</sup> Møller (1906:vi) explains: “Als Ferdinand de Saussure seine glänzende Entdeckung der von ihm sogenannten ‘phonèmes A und Ô machte [...], sprach ich alsbald (1879) die Vermutung aus, dass diese wurzelhaften Elemente, denen ich ein drittes hinzufügte, konsonantische und zwar Kehlkopflaute gewesen sein [...] und behauptete (1880) ‘Es waren ... wahrscheinlich Gutturale von der Art der semitischen.’”

<sup>235</sup> Møller (1880:492n2): “Ueber die consonanten A, E vgl. Engl. stud. II, 150f. Es waren consonanten von der art, wie wir sie in historischer zeit ganz gewöhnlich mit dem vorhergehenden vocal verbunden in einem langen vocal sich verlieren sehen (z.b. h oder gutturales r), wahrscheinlich gutturale von der art der semitischen, A = älef, der tonlose gutturale verschlusslaut, und E wahrscheinlich der entsprechende tönende verschlusslaut.”

<sup>236</sup> Kuryłowicz 1927, Cuny 1927 and Sturtevant 1928 recognized the Hittite ḫ independently; see Szemerényi (1990<sup>4</sup>:130, 1996:124).

<sup>237</sup> Kuryłowicz 1927 [*non vidit*] for the “ə indo-europeen et ḫ hittite” and articles by Kuryłowicz from the 1920s (Polomé 1965:61-62 and Szemerényi 1973:15) are included in Kuryłowicz (1935:27-76). For a modern evaluation of Kuryłowicz’s interpretation, see Szemerényi (1973:15-19).

<sup>238</sup> See Tischler (1980:514): “Es wird dabei überstehen, daß dieses Schwa als eigenständiger Laut überhaupt nie existiert hat, sondern nur als Decksymbol für die beiden phonetisch sonst nicht vereinbaren Vertretungen i und a gedacht war.” He further adds (1980:516): “Es ist daher nochmals festzuhalten, das ə nur eine Cover-Symbol für arisch i und westidg. a darstellt; es hat keine reale historische oder vorhistorische phonetische Realität und kann keinen Hinweis auf die Art der Entstehung von arisch i geben.”

1. The dentals of RV. *sthi-* : Gr. *στα-* do not match (RV. *th* ≠ Gr. *τ*), with the result that their vocalisms also do not necessarily match.

2. The primary starting point of Sanskrit is the unaspirated root surviving in AV. *nari-ṣṭhā-* (f.) ‘Scherz, Geplauder’ (EWA 2:22), which is identical with Do. *στᾶ-* ≡ Li. *stó-* ≡ Lat. *stā-* ≡ PIE *\*stēaḥ-*.

3. The root RV. *√sth-*, the zero grade of PIE *\*stēaḥ-* (AV. *stā-* ≡ Li. *stó-*), surviving in the reduplication

RV. *ta-sth-* (pf.) ‘stehen’ (WbRV. 1600, *tasthús* [3pl])

has been derived from PIE *\*staḥ-* with loss of the unaccented PIE *\*a*.

4. From the base PIE *\*staḥ-* (RV. *sth-*), several derivatives have been formed. In addition to

OInd. *nari-ṣṭhā-* (f.) ‘Scherz, Geplauder’ (KEWA 2:140, *√sthā-*),

the extension PIE *\*staḥ-i-* is attested in three quantities:

(a) PIE *\*stēaḥi-* (*\*ē*-grade)

Li. *stója-* (vb.) ‘sich stellen, treten’ (LiEtWb. 914, *stóju* [1sg])

OPers. *ava-stāya-* (pr.) ‘set down, place’ (OldP. 210, *avāstāyam* [1sg])

LAv. *ā-stāya-* (pr.) ‘einsetzen’ (AIWb. 1602, *āstāya* [1sg])

OCS. *staja-* (vb.) ‘sich hinstellen/hintreten’ (Sadnik *√875*, *stajati*)

(b) PIE *\*steaḥi-* (*\*e*-grade)

Gr. *σταῖ-* (ao.) ‘stehen’ (GEW 1:739, LSJ. 1633, *σταῖεν* [opt.3pl])

LAv. *staya-* (pr.) ‘aufhalten in’ (AIWb. 1601, *stayaṭ* [3sg])

OCS. *stoja-* (vb.) ‘stehen, aushalten’ (Sadnik *√875*, *stojati* [inf.])

(c) PIE *\*staḥi-* (*∅*-grade)

RV. *sthi-* (*√pf.&ao.*) ‘stare’ (WbRV. 1601, *ásthita*)

RV. *tasthi-* (pf.) ‘statum esse’ (WbRV. 1600, *tasthimā* [1pl])

RV. *sthirá-* (a.) ‘fest, haltbar, stark’ (WbRV. 1604)

RV. *sthitá-* (pt.) ‘sich nahen’ (WbRV. 1603 *api sthitá-*)

§2. Despite the examples actually containing PIE *\*i* rather than Neogr. *\*ə*, Burrow’s (1973:89) claim that Neogr. *\*ə* is without justification is too strong. This is proven by the fact that in addition to the standard development OInd. *i* ≡ Av. *i* ← PIE *\*i*, there are certain examples of ‘non-palatalizing’ OInd. *i*<sub>2</sub> ≡ Av. *i* ← Neogr. *\*ə*. This is confirmed by the neutrality of the vowel OInd. *i*<sub>2</sub> in the second palatalization in examples such as:

(a) PIE *\*kaḥln-* (Neogr. *\*kəln-*) ‘Schwiele, harte Haut’ (P. 523-4)

OInd. *kiṇa-* (m.) ‘Schwiele’ (KEWA 1:208, EWA 3:90, *kiṇaḥ*)

Lat. *callo-* (n.) ‘Schwiele, dicke Haut’ (WH 1:139, *callum* [sgNA])

Lat. *calleō* (vb.) ‘eine dicke Haut haben’ (WH 1:139, *calleō* [1sg])

(b) PIE \*gahl- (Neogr. \*gəl-) ‘Maus, Wiesel’, (P. 367)<sup>239</sup>

Lat. mi·galē	(f.) ‘Spitzmaus’ (ACSS. 2:86)
OInd. giri-	(f.) ‘Maus’ (KEWA 1:336, EWA 1:488, girih [sgN])
Lat. mī·galino-	(a.) ‘rostbraun’ (WH 2:86)
Gr. γαλέη	(f.) ‘Wiesel, Marder’ (GEW 1:284-5, Gr. γαλέη [sgN])
Lat. galeā-	(f.) ‘Helm aus Leder’ (WH 1:579, galea [sgN])
Gr. γαλέο-	(m.) ‘Haifisch’ (GEW 1:285, γαλέος [sgN])
OInd. girikā-	(f.) ‘Maus’ (KEWA 1:336, EWA 1:488, girikā [sgN])

§3. The examples of the non-palatalizing OInd.  $i_2 \equiv \text{Gr. } \alpha^{240}$  stand in contrast to OInd.  $i_1 \equiv \text{Gr. } \iota$ , and they are numerous enough to establish the ‘schwa indogermanicum’. Hence the monolaryngeal systems with Neogr. \*ə (e.g. Szemerényi) are complete and therefore valid.

§4. Tischler (1980:513-514)<sup>241</sup> criticizes Kuryłowicz for changing the original vowel Neogr. \*ə into a consonant LT \*h<sub>2</sub>. This is in order, because Kuryłowicz made none of the necessary corrections to the Neogrammarian system when reinterpreting \*ə (PIE \*a) as a consonant. Subsequently, ‘la théorie du ə consonantique’ led to the phonetically irrational thesis of consonants yielding vowels (PIE \*h → Gr. α, etc.), as well as the fallacy of a syllabic laryngeal.<sup>242</sup>

## 2.2.4 Neogr. \*ə ≡ PIE \*a

§0. The phonetic interpretation of Neogr. \*ə ≡ PIE \*a ≡ IPA /a/ can be proven for the schwa indogermanicum on the basis of the following arguments:

§1. Burrow (1949:28-29) considered the Neogrammarians’ double treatment of Neogr. \*ə → Gr. α vs. OInd. i problematic due to the phonetic distance of the terms /ə/ : /a/ : /i/. This is accurate in the sense that the development of a featureless middle vowel /ə/ into two separate cardinal vowels /a/ and /i/ is next to impossible, phonetically speaking, and unacceptable from the point of view of scientific realism.

§2. Burrow’s problem can only be solved by changing the phonetic interpretation of the cover symbol schwa. In practice this can be done by replacing the item with the proper phoneme. The obvious candidate for a non-frontal (→ Gr. α) and a non-

<sup>239</sup> For Lat. glīs- ‘dormouse’, see Lat. gliscō (vb.) ‘entglimmen, entbrannt sein von etwas’ (WH 1:607).

<sup>240</sup> For the non-palatalizing OInd. i ī y, see Wackernagel (AIGr. 1:141-3 = §123) and Güntert (1916:97).

<sup>241</sup> Tischler (1980:514) writes: “Zu diesem weit verbreiteten Irritum kam noch ein zweiter, als Kuryłowicz im hethitischen h den Vertreter der idg. Laryngale erkannte bzw. erkennen wollte, und dieses h genau an den Stellen auftrat, an denen sonst ein ə angesetzt wurde. Kuryłowicz selbst sah zwar sogleich, daß der Laryngal H bzw. ə, der ja ein *Konsonant* ist, nicht mit dem *vokalischen Schwa* identisch sein kann [...]”

<sup>242</sup> Burrow (1973:106) notes: “[...] the whole presentation of LT has continued to be vitiated by the original error of the invention of ‘schwa’ [...] H could not function as vowel and is certainly not represented in Sanskrit by Skt. i.”

palatalizing (→ OInd. *i*<sub>2</sub>) proto-vowel underlying Neogr. \*ə is PIE \*a (i.e. the vowel /a/). The phonetic plausibility of the interpretation can be shown by the following:

(a) Trivially, one obtains the European /a/ from an original PIE \*a (with accent):

PIE \*a → Gr. α, Lat. a, OIr. a, Go. a, Arm. a, etc.

Burrow's problem has been resolved, as no sound change is required at all.

(b) The sound change PIE \*a → OInd. *i*<sub>2</sub> (with accented PIE \*a) results in a vowel neutral in the second palatalization, therefore suggesting an intermediate phase:

PIE \*a → PIIr. \*ə → OInd. *i*, Av. *i*, etc.<sup>243</sup>

§3. In other words, the sound law for schwa can be preserved in its early form, except for PIE \*a which now stands for Neogr. \*ə:

PIE \*a → Gr. a, Lat. a, OIr. a, ... & OInd. *i*, Av. *i*, ... (System PIE)

§4. As is well known, PIE \*a (Neogr. \*ə) has a twofold outcome (OInd. *i* vs. Ø). In the absence of any other explanation, the alternation must depend on whether the vowel was originally accented (PIE \*á) or not (PIE \*a).

(a) The originally accented vowel PIE \*á equals the classical concept of 'schwa indogermanicum', as defined above.

(b) The originally unaccented PIE \*a was lost in all dialects, except for occasional traces in the surrounding PIE \*e and \*ē assimilated into Lat. a, ā, etc.<sup>244</sup>

§5. Regarding the initial position, the so-called prothetic languages (especially Greek and Armenian) are generally accepted as counter-examples of the loss of schwa (i.e. PIE \*a). The reason is that in the prothetic languages, Gr. α = Arm. a (accompanied by Hi. ʰ, etc.) appear against the zero grade in the rest of the group. Some examples are:

(a) √ḥastr- 'star' (P. 1027-8, WP 2:635-)

Hi. ḥaštert-	(c.) 'star' (HEG 1:204-, ḥa-aš-te-er-za [sgN])
Gr. ἀστέρ-	(m.) 'star' (GEW 1:170-1, ἀστήρ, ἀστέρως [sgG])
LA. star-	(m.) 'Stern' (AIWb. 1598, starasča)
gAv. str-	(m?) 'Stern' (AIWb. 1598, strəmčā [plG])
RV. str̥-	(f?) 'Stern' (EWA 2:755-, str̥bhíš [plI])
Lat. stēllā-	(f.) 'Stern' (WH 2:587-8, stēlla [sgN])

(b) √ḥaue/ont- 'Wind' (P. 81-4)

Hi. ḥuant-	(pt.) 'Wind' (HEG 1:328f, ḥu-u-ua-an-te-eš [plN])
Gr. ἄ(φ)εὔτ-	(sb.) 'Wind' (GEW 1:26, ἄέντες [plN])
Lat. uento-	(m.) 'Wind' (WH 2:751-2, Lat. uentus [sgN])
TochA. want	(f.) 'ventus' (Poucha 285, want [sgN])

<sup>243</sup> The change PIE \*a → PIIr. \*ə → OInd. *i*, Av. *i* takes place in all environments except for \*u, where the resulting phoneme is assimilated into a labial yielding OInd. *u*, Av. *u* (see Chapter 3).

<sup>244</sup> On the related loss of schwa in medial position, see Szemerényi (1996:88-9).

(c)  $\sqrt{\text{haru-}}$  ‘sun, red’ (P. 302-4)<sup>245</sup>

Arm. arev	(sb.) ‘Sonne’ (ArmGr 1:424, arev [N], arevu [G])
OInd. ravi-	(m.) ‘sun(-god)’ (EWA 2:440, raviḥ [sgN])
OInd. aru-	(m.) ‘Sonne’ (EWA 3:13, aruḥ [sgN])
RV. aruṇá-	(a.) ‘rötlich, goldgelb’ (EWA 2:113, WbRV. 107)
Ḥi. ḥarunai-	(vb1.) ‘(sich) aufhellen’ (HEG 1:190, ḥa-ru-na-iz-[zi])
RV. aruṇí-	(f.) ‘Kuh’ (f.) ‘Morgenröte’ (WbRV. 107)

§6. The preservation of the initial PIE \*a in the prothetic languages remains ambiguous, however:

(a) Owing to the productivity of the ablaut in PIE, it is possible that the prothetic vowel of Gr. ἀστήρ : Arm. astl ‘Stern’ (ArmGr. 1:421) etc. represents an original \*e-grade PIE \*ḥaester- instead of zero PIE \*ḥaster-. In other words, it is equally possible that the loss of the unaccented PIE \*a holds true for all languages in all positions, since we may always account for the the ‘prothetic a-’ with PIE \*e.

(b) The existence of prothetic forms in ‘non-prothetic’ languages confirms that such \*e-grade roots are necessary. This is shown by comparisons like

PIE \*ḥaeuel- → Cymr. awel (f.) ‘ventus’, Gr. ἄ(Ϝ)εῖλλα (f.) ‘Windstoß’

where the Celtic items could not have preserved the ‘prothetic a’ (unless reflecting an original PIE \*e). Identical circumstances apply to Lat. astro- (n.) ‘Stern, Gestirn’ (WH 2:587-8, astrum [sgN]), which is not necessarily a loan from Gr. ἄστρο- (n.) ‘Gestirn’, because PIE \*ḥaestro- (n.) ‘Gestirn’ can be reconstructed for both. As both PIE \*ḥa and \*ḥae → Gr. a, Arm. a, the root-initial is ambiguous: the derivation of prothetic vowels in Gr. ἀστήρ, Gr. ἄ(Ϝ)εντ-, Arm. arev etc. is possible based on PIE \*e and the zero grade.<sup>246</sup>

§7. Following the Sanskrit grammarians, the roots ending with Neogr. \* -ə- (i.e. PIE \* -ḥa- and \* -aḥ-) are occasionally called ‘seṭ’ in order to indicate a root-final OInd. -i-.<sup>247</sup> The terminology is only acceptable as a convention, and it is vital to note the following restriction: the term seṭ, traced back to internal considerations of the Sanskrit grammarians, does not account for the external distinction between two different phonemes in Indo-Iranian, OInd.  $i_1$  = Gr. ι (= PIE \*i) and OInd.  $i_2$  = Gr. α (= PIE \*ḥa or \*aḥ). Automatically taking seṭ-roots to reflect an original root-final laryngeal is a mistake, because PIE \*i (= OInd.  $i_1$ ) is also possible and, in most cases, etymologically correct.<sup>248</sup> Despite this, since Saussure (Rec. 225, OInd. pavi- : pū-)<sup>249</sup>

<sup>245</sup> Pokorny’s etymology (Neogr. \*el-, \*ol-, OHG. elo ‘braun, gelb’, Lat. alnus ‘Erle, Eller’, etc.) is inferior to that of Hübschmann (ArmGr. 1:424) and Eichner (1978:144-162) with PIE \*r.

<sup>246</sup> Since the reconstruction of the root radicals is not problematic, however, this is only a minor problem for the reconstruction.

<sup>247</sup> Szemerényi (1996:90) writes: “[...] the Old Indic grammarians, often followed by their western successors, speak of roots without i (an-iṭ) and with i (sa-iṭ > sēṭ).”

<sup>248</sup> For some examples of a genuine suffix PIE \* -i-, see Burrow (1949:48): “It is generally admitted that the participle of the verbal stems in -aya- (causatives, etc.) was in the Indo-European -ito. This

several theoreticians have taken liberties in choosing the ambiguous OInd.  $i \leftarrow * \text{ə}$  as the basis of their theories, thus violating the rule of ambiguity. Such efforts are illegitimate at best, and an extensive comparative study of the actual data that makes the necessary distinctions between OInd.  $i_1$  and OInd.  $i_2$  is urgently needed.

## 2.2.5 Reconstruction of Neogr. $*a \equiv \text{Gr. } \alpha : \text{OInd. } a$

§0. The assignment of the value PIE  $*a$  to Neogr.  $*\text{ə}$  necessitates an examination and reinterpretation of Brugmann's cover symbol Neogr.  $*a (= *a_3)$ , which can no longer be identified with PIE  $*a$  due to the principle of the regularity of sound changes.<sup>250</sup>

§1. Historically, Brugmann (Grundr<sup>2</sup> 1:158) postulated a cover symbol  $*a_3$  for the short vowel /a/, as defined by the correspondence set:

Neogr.  $*a \quad \Leftrightarrow \quad \text{Gr. } \alpha, \text{ Lat. } a, \text{ OIr. } a, \text{ Arm. } a, \text{ OInd. } a, \text{ Av. } a, \dots$

Brugmann's (KVG 77-78, Grundr<sup>2</sup> 1:158-163) examples of the vowel Neogr.  $*a_3$  include the items:

OInd. ájāmi	:	Arm. acem, Lat. ago, OIr. agat [3pl], OIcl. aka
OInd. tatá-	:	Gr. τᾶτα, Alb. tate, Lat. tata, Corn. tat <sup>251</sup>
LAv. masyā	:	Gr. μαρός, μάσσω

The Neogrammarians interpreted the cover symbol  $*a_3$  phonetically as the cardinal vowel /a/, the counterpart of the vowels Neogr.  $*e, *o$  in terms of quantity. Despite the clear-cut definition of the proto-phoneme, both the correspondence sets and its phonetic interpretation lacked a satisfactory ablaut pattern from the very beginning: patterns for Neogr.  $*e : \emptyset : o$  and Neogr.  $*\text{ə} : \bar{a}, * \text{ə} : \bar{e}, * \text{ə} : \bar{o}$  exist in Brugmann's system, but these leave Neogr.  $*a$  isolated.<sup>252</sup>

§2. Saussure's *Mémoire* notoriously has no reconstruction of Neogr.  $*a$ , and it is absent from his system as a whole. The defect is a direct result of Saussure's (Rec. 127) scansion of the Neogrammarian ablaut pattern  $*\text{ə} : \bar{a}$  as  $*A : *eA$ ,<sup>253</sup> with the basic ablaut alternation (Rec. 128) of his theory being:

conclusion is reached from the agreement of Sanskrit (gamitá-, etc.) and Germanic (Goth gatarhiþs : gatarhjan, wasiþs : wasjan, etc., Brugmann, Grundriss II.<sup>2</sup> i, 399)."

<sup>249</sup> Note that Szemerényi's view expressed in (1996:90) is too strong: "It is clear that in these instances OInd.  $i$  cannot represent IE  $i$ , since if it had done so it could not have been lost. It must therefore represent IE schwa." The schwa, however, was lost when unaccented, a phenomenon with far more generality than currently understood.

<sup>250</sup> On the cover symbol Neogr.  $*a$ , see Szemerényi (1996:135-6).

<sup>251</sup> RV. tatá- 'Vater' is ostensibly an onomatopoetic word, but as it is Brugmann's own example I have accepted it here.

<sup>252</sup> Compare Szemerényi (1996:135): "[...] whereas the vowel  $e$  and its ablaut variant  $o$  have an extremely important function in all fields of the morphology, the vowel  $a$  is hardly used at all for such purposes."

<sup>253</sup> Accordingly, Møller (1880:493n2) writes: "Es verhalten sich also wie  $ei : oi : i, er : or : r$ , so  $\bar{a} : \bar{o} : A, \bar{e} : \bar{o} : E$  (s. F. de Saussure, Syst. prim. 136f.)."



DS. *stA-	→	Gr. στατός : Lat. stātum : OInd. sthitáh	(Rec. 141)
DS. *steA-	→	Gr. στάμων : Lat. stāmen : OInd. sthāman-	(Rec. 129)

This kind of system has \*A ≡ \*ə and \*eA ≡ \*ā, but – as pointed out already by Bechtel<sup>254</sup> – it lacks a reconstruction for the vowel Neogr. \*a, and therefore it is permanently incomplete.

§3. A partial response to the problem was suggested by Møller (1879:150), according to whom the prothetic roots Neogr. \*aC are of the form \*AeC- (i.e. the laryngeal \*A has coloured the following \*e into \*a). Indeed, such an analysis is both sufficient and necessary in an explanation of the ablaut patterns \*a- : Ø- with examples like:

*Aeĝ-	Lat. agmen-	(n.) ‘Treiben, Zug, Marsch’ (WH 1:22)
*Aĝ-	RV. jmán-	(m <sup>?</sup> .) ‘Bahn’ (WbRV. 502, jmán [sgL])

§4. Møller’s reconstruction gained general acceptance by proponents of the laryngeal theory (cf. LT \*h<sub>2</sub>eĝ- \*h<sub>2</sub>ĝ-, etc.), in spite of its incompleteness in cases where an initial laryngeal cannot be postulated.

## 2.2.6 Problems of the reconstruction of Neogr. \*a

§0. The monolaryngeal systems are capable of reconstructing Neogr. \*a by taking it at face value, but with the high cost of losing all ablaut patterns. On the other hand, the incomplete treatment of the vowel Neogr. \*a marked an impasse for the laryngeal theory.<sup>255</sup> With both main theories facing difficulties, the problem of the cover symbol Neogr. \*a requires a comparative solution.

§1. In monolaryngealism, which lacks the counterparts of the colouring rules of the laryngeal theory, the vowel Neogr. \*a is taken at face value as simply the vowel /a/. Though this allows the reconstruction of the vowel in all positions (SZ \*a), owing to the unanswered question concerning the PIE ablaut patterns in general, it does not constitute a rigorous solution and the theory needs to be seriously improved.

§2. The laryngeal theory, directly mirroring Saussure’s and Møller’s early ideas, is incapable of reconstructing Neogr. \*a, and no satisfactory starting point can exist until the remaining difficulties have been solved. The problem rests with roots with Neogr. \*a (shape C<sub>1</sub>aC<sub>2</sub>), which are divided into three subclasses based on the properties of C<sub>1</sub>. In this regard, there are three relevant possibilities:

1. C<sub>1</sub> is a laryngeal (Lat. agō). This case has been partially solved by Møller, whose suggestion allows a reconstruction of \*h<sub>2</sub>eĝ- for Lat. agō and so forth.

<sup>254</sup> For a discussion of Bechtel’s criticism, see Burrow (1979:10).

<sup>255</sup> For the root CaC, see Kuryłowicz (1956:187ff.), Wyatt (1970:29ff.), Mayrhofer (1986b:170), Lubotsky (1989:53), Kuryłowicz (1956:174), Saussure (1879 = *Mém.* 55f.), Wyatt (1970:60ff.), Jonsson (1978:110-111), Meillet (1934<sup>7</sup>:99, 166ff.), Schmitt-Brandt (1967:96-7), Beekes (1969:128), and Brugmann (*Grundr*<sup>2</sup> 1:120-121).

2. C<sub>1</sub> is a resonant (LAv. *masyá*). Though one could in theory reconstruct \**ṃh<sub>2</sub>eḱ-* for Av. *Masyá*, the current rules for the syllabic resonants require \**ṃh<sub>2</sub>eḱ-* → \**ah<sub>2</sub>eḱ-* → \**a'eḱ-* → Av. *†ās-* (i.e. the reconstruction, producing unattested ghost forms, is unsound).

3. C<sub>1</sub> is a plosive (OInd. *tatá-*). Some externally confirmed examples of Neogr. \**a* ≠ LT \**h<sub>2</sub>e* belonging to this category are:

(a) Neogr. *kal-* 'schön' (P. 524)

OInd. <i>kalyá-</i>	(a.) 'gesund, gerüstet, geschickt' (KEWA 1:184)
RV. <i>kalyāṇa-</i>	(a.) 'schön, lieblich' (WbRV. 318, <i>kalyāṇa-</i> )
Gr. <i>κάλλοσ-</i>	(n.) 'Schönheit' (GEW 1:766, Grundr <sup>2</sup> 1:308)
Boiot. <i>καλφó-</i>	(a.) 'schön, edel, gut' (GEW 1:766-7, <i>καλφός</i> [sgN])

(b) Neogr. \**kan-* 'jung, neu' (P. 563-4)

RV. <i>kaná-</i>	(f.) 'Jungfrau, Mädchen' (WbRV. 312)
LAv. <i>ka<sup>1</sup>nī-</i>	(f.) '(unverheirates) Mädchen' (AIWb. 439)
Gr. <i>καίνο-</i>	(a.) 'neu(erfunden)' (GEW 1:754)
RV. <i>kaníā-</i>	(f.) 'Mädchen, die Jungfrau' (WbRV. 313)

In this category of correspondences Møller's treatment Neogr. \**a* ≡ \**Ae* is not available: †*Ch<sub>2</sub>eC* is impossible owing to the distinction between unaspirated and aspirated stops *C* ≠ *Ch* in Indo-Iranian and Greek. Since the sole remaining theoretical prototype LT *Ceh<sub>2</sub>C-* would yield a long vowel through compensatory lengthening (LT \**eh<sub>2</sub>* = Neogr. \**ā*), the vowel Neogr. \**a* cannot be reconstructed in the laryngeal theory.<sup>256</sup>

§3. The internal failure of the laryngeal theory has resulted in a wide range of *ad hoc* explanations, including the supposition of a 'secondary *a*',<sup>257</sup> denying the vowel Neogr. \**a*,<sup>258</sup> and other equally unacceptable propositions.<sup>259</sup> The bottom line is that, due to the bulk of well-defined examples, no reconstruction theory can do without the cover symbol Neogr. \**a*. Consequently, a real solution to the problem is needed.

§4. Another approach was attempted by Pedersen (1900a:74ff.), who drew attention to the identical outcome of Neogr. \**ə* and Neogr. \**a* in the 'western' subgroup (where both items collided in Gr. *α*, Lat. *a*, OIr. *a*, etc.). According to Pedersen, no separate phonemes need to be reconstructed for Neogr. \**a* and \**ə*, since Neogr. \**a* is the

<sup>256</sup> In Szemerényi's words (1996:135): "The elimination of *a* by means of a laryngeal is not a complete solution: internal *a* cannot in this way be removed without trace. The attempt has certainly been made to explain various instances of the type *CaT* by assuming *CH<sub>2</sub>eT* and to derive *Ca<sup>1</sup>T* from *CeH<sub>2</sub>iT*. In a considerable number of cases, however, this way of escape is [...] without foundation [...]."

<sup>257</sup> A 'secondary *a*' has made its way into literature by postulating a pre-*proto-language* (LT \*\**h<sub>2</sub>e*) and a *proto-language* (LT \**h<sub>2</sub>a*), the latter supposedly being the source of the 'secondary \**a*' which spread analogically to roots with Neogr. \**a*. It will be shown below that such explanations can be replaced with the regular one.

<sup>258</sup> See Lubotsky 1989, *Against a Proto-Indo-European Phoneme \*a*, and Beekes (1995:138-9).

<sup>259</sup> Kuryłowicz (1976:127f.) suggested that Neogr. \**a* was a combinatory variant of \**o*, but was, of course, unable to posit the conditions of the alternation.

reduction of the Neogr. \*ā.<sup>260</sup> Furthermore, according to Pedersen, the difference in the accentuation of Neogr. \*a (marked below as PED \*á, \*a) explains the Indo-Iranian twin development:

PED *á (= Neogr. *a <sub>3</sub> )	→	OInd. a, Av. a, Gr. α, Lat. a, OIr. a, etc.
PED *a (= Neogr. *ə)	→	OInd. i, Av. i, Gr. α, Lat. a, OIr. a, etc.

Brugmann's skepticism concerning the accentuation<sup>261</sup> is well founded, since all Pedersen's attempts (1905:398-402, VGK 1:30, 1926:27) to define the criterion for the accent difference PED \*á vs. PED \*a have been in vain.<sup>262</sup> As Wyatt's (1970:8,15f.) defense of Pedersen does little to change the fact that actually PIE \*á [= \*ǵ] → OInd. i : Gr. α and PIE \*a → OInd. Ø : Gr. Ø, the difference between the cover symbols Neogr. \*ə and Neogr. \*a<sub>3</sub> cannot be solved through accent alternation.

### 2.2.7 Neogr. \*a ≡ PIE \*h<sub>2</sub>ae or PIE \*eah

§0. Despite its problematic formulation, Pedersen's idea of a connection between Neogr. \*ə : \*a<sub>3</sub> is based on a correct observation of their identical outcome in 'western' languages (Gr. α, Lat. a, etc.). By replacing Pedersen's mistaken condition with a truly common factor, the cover symbol Neogr. \*a can be expressed in terms of well-defined items of the phoneme inventory and lead to a solution of the problem.

§1. Møller's analysis of Neogr. \*a = \*A+e indicates that the assimilation of the vowels

PIE *a+e	→	Gr. α, Lat. a, OIr. a, OInd. a, Av. a,...
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resulted in a short vowel in all cognates (Lat. agō, RV. ájati, LAv. azaiti, etc.). In this context, it is natural to ask what the true (comparative) outcome of the combination PIE \*e+a = DS \*e+A = Neogr. \*e+ə might be.

§2. Ever after Saussure, the laryngeal theory taught that the sequence e+A results in a long vowel (Neogr. \*ā) through the rule of compensatory lengthening. However, it has been correctly pointed out by Schmitt-Brandt that Saussure's analysis is by no means necessary.<sup>263</sup> The rule of compensatory lengthening has not been proven,<sup>264</sup> and in fact no proof is possible, because its opposite is true:

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<sup>260</sup> In Burrow's words (1979:11): "H. Pedersen (KZ 36 (1900), pp. 75-86) maintained that in IE *a* was the reduced grade of the original long vowels [...] and that in Sanskrit this *a* developed in some cases to *a* and in some cases to *i*."

<sup>261</sup> Brugmann (1904:80) writes: "Anm. Pedersen's Ansicht (KZ 36, 1ff.), dass man überhaupt mit uridg. a auskomme, das im Ar. teils a geblieben, teils zu i geworden sei, überzeugt mich nicht."

<sup>262</sup> On reasons for separating Neogr. \*a<sub>3</sub> and \*ə, see also Hendriksen 1941.

<sup>263</sup> Schmitt-Brandt (1967:2) writes: "In der Tat ist es auch keineswegs zwingend, aus einem Ablautverhältnis \*ej : \*i und \*ē : \*ə auf \*eə zu schließen [...]."

<sup>264</sup> Szemerényi (1996:122) adds: "It is considerably more speculative to assert that the long vowels are really combinations of this same *e* and modifying elements with which it was contracted."

PIE \*e+aḥ results in short vowel Lat. a, OInd. a, etc. in all environments.

§3. The proof for PIE \*eaḥV → Neogr. \*āV (OInd. a, etc.), the absence of compensatory lengthening before vowel (V), is exemplified here by the root PIE √paḥ- (Neogr. \*pā-) ‘protect’ (P. 839) with the following reconstructive properties:

(a) The laryngeal PIE \*aḥ is confirmed by the \*s-enlargement in which both the laryngeal (Ḥi. ḥ) and ‘a-vocalism’ (Lat. ā) are simultaneously present:

PIE √paḥs- ‘schützen’ (P. 839)

Ḥi. paḥš-	(vb.) ‘to protect’ (CHD P:2f., pa-aḥ-ši [2sg])
Hi. paḥaš-	(vb.) ‘to protect’ (CHD P:2f., pa-aḥ-ḥa-aš-ši [2sg])
TochA. pās-	(vbM.) ‘custodire, tueri’ (Poucha 168, pāsantrā [3pl])
RV. pári (...) pās-	(s.ao.) ‘rings schützen’ (WbRV. 800, pári pāsati [conj.])
Lat. pāstōr-	(m.) ‘Hirt’ (WH 2:260, pāstor [N], pāstōris [G])

The unextended root appears in verbal and nominal stems, such as

PIE √paḥ- ‘schützen’:

RV. pá-	(vb.) ‘schützen, behüten’ (WbRV. 798, páti [3sg])
RV. tanū pá-	(a.) ‘protecting self/body’ (WbRV. 520).

(b) It was already shown by Kuryłowicz’s (1935:34-35)<sup>265</sup> prosodic analysis that the loss of PIE \*ḥ is not complete in the Rig-Veda, since the Vedic meter reveals a hiatus (marked RV. ’) and thus preserves a trace of the segmental laryngeal. This is the case, for instance, with the disyllabic scansion required by Rig-Vedic meter in:

RV. pa’-	(vb.) ‘schützen, behüten’ (WbRV. 798, paánti [3pl])
RV. tanū pá’-	(a.) ‘protecting self’ (WbRV. 520, tanū páam [sgA])

Indo-Iranian confirms the laryngeal of Ḥi. √paḥ-, but even more remarkably *the short quantity of RV. pa’- proves that the laryngeal PIE \*ḥ was lost without compensatory lengthening before a vowel.*

(c) The loss of PIE \*ḥ without compensatory lengthening of the Rig-Vedic hiatus class (CeahV) is widespread in Rig-Vedic meter and therefore readily confirmed:

RV. yá’-	(vb.) ‘gehen, wandern’ (WbRV. 1103, yáanti [3pl])
RV. vá’ar-	(n.) ‘Wasser’ (WbRV. 1260, vá’ar [sgNA])
RV. vá’ar-	(m.) ‘Beschützer’ (WbRV. 1260, váar [sgN])
RV. ná’u-	(f.) ‘Schiff’ (WbRV. 756, ná’uḥ [sgN] <sup>266</sup> )
RV. da’iṣṭhá-	(sup.a.) ‘aufs beste gebend’ (WbRV. 638)
RV. va’ata-	(m.) ‘Wind’ (WbRV. 1257, váatas [sgN])
RV. bhá’as-	(n.) ‘Licht, Schein’ (WbRV. 934, bháas [sgNA])

<sup>265</sup> For the type RV. paánti, RV. yaánti, etc., see already Kuryłowicz (1927b, 1935:35, 1948, 1968) and Lindemann (1987:45-56, 1997:59).

<sup>266</sup> For the hiatus, see Szemerényi (KZ 73:185f.).

Furthermore, the phenomenon is not restricted to Sanskrit: PIE \*h̥ is lost before vowels without compensatory lengthening in all cognates, as confirmed by correspondences like:

1. PIE \*deah<sub>1</sub>uer- ‘brother-in-law’ (P. 179):

RV. devár-	(m.) ‘Bruder des Gatten’ (WbRV. 638, deváram [sgA])
Gr. δαήρ-	(m.) ‘Bruder des Gatten, Schwager’ (GEW 1:338-9)
Li. dieverì-	(m.) ‘Schwager’ (LiEtWb. 94, dieveris [sgN])

2. PIE \*keah<sub>1</sub>ik- ‘blind, squinting, one-eyed’ (P. 519-20):

Lat. caeco-	(a.) ‘blind, unsichtbar, dunkel’ (WH 1:129, caecus)
OInd. kekara-	(a.) ‘schielend’ (KEWA 1:264, EWA 3:120)
Go. haih-	(a.) ‘one-eyed’ (GoEtD. 169, haihamma [sgD])

In general, the measurable short quantity before the laryngeal proves beyond any doubt that the rule of compensatory lengthening did not apply in the antevocalic position PIE \*eah<sub>1</sub>V.

§4. The proof for the short outcome of PIE \*h̥ in the anteconsonantal position PIE \*eah<sub>1</sub>C is even simpler. The root Neogr. CaC with Neogr. \*a, when not traced back to PIE \*h̥ae, should be reconstructed with PIE \*Ceah<sub>1</sub>C, which also confirms the lack of compensatory lengthening before a consonant. Thus, the root of RV. pa<sup>2</sup>- (vb.) ‘to protect’ (proven above to contain a laryngeal) appears before a consonant in

PIE \*peah<sub>1</sub>i- ‘beschützen’:

OPers. paya-	(prM.) ‘to protect’ (OldP. 194, apayaiy [1sg])
LAv. ni·paya-	(pr.) ‘beschützen’ (AIWb. 886, nipayeimi [1sg])

Based on measurable features of the data, no compensatory lengthening has taken place in PIE \*eah<sub>1</sub>C. Similarly, Neogr. kal- ‘schön’ (P. 524), Neogr. \*kan- ‘jung, neu’ (P. 563-4) and other examples of CaC- (= PIE \*Ceah<sub>1</sub>C-) display a common short vowel Neogr. \*a:

(a) PIE \*keah<sub>1</sub>n- ‘sing’ (P. 525-6)

Lat. canō	(pr3.) ‘singen, ertönen, spielen’ (WH 1:154, canō [1sg])
Gr. καν·αχή-	(f.) ‘Geräusch, Schall’ (GEW 1:776, καναχή)
Go. hana(n)-	(m.) ‘Hahn : cock, rooster’ (GoEtD. 176)

(b) PIE \*keah<sub>1</sub>d- ‘to excel’ (P. 516-517)

RV. śáśad-	(pf.) ‘sich auszeichnen, hervorragen’ (WbRV. 1377)
Gr. κέκαδ-	(pf.) ‘sich auszeichnen’ (GEW 1:811, κεκαδμένος)

(c) PIE \*peah<sub>1</sub>ǵ- ‘fest, festmachen’ (P. 787-8)

RV. pajrá-	(a.) ‘gedrungen, feist, derb, kräftig’ (WbRV. 759)
Gr. πήγνυ-	(vb.) ‘befestigen, feststecken’ (GEW 2:525, πήγνυμι)

(d) PIE \*peah<sub>1</sub>st- ‘fest’ (P. 789)

RV. pastía-	(n.) ‘Behausung’ (WbRV. 797, KEWA 2:242)
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OIcl. fast-	(a.) ‘fest, hart, stark’ (ANetWb. 113, fastr [sgN])
Arm. hast	(a.) ‘fest’ (ArmGr. 1:464, hast [sgN])

The high number of examples belonging to the correspondence set Neogr. \*aC = PIE \*eaḥC is well known: OInd. kark·aṭa- (m.) ‘crab’ (KEWA 1:169) : Gr. κάρκ·ίνος ‘Krabstier, Krabbe’ (GEW 1:789), OInd. kark·ara- (a.) ‘hard, firm’ (KEWA 1:179) : Hes. κάρκαροι · τραχεῖς (GEW 1:789, 796), RV. kakúbh- (f.) ‘Gipfel, Höcker’ (WbRV. 309) : Lat. cacūmen- (n.) ‘Spitze, Gipfel’ (WH 1:127), OInd. śamñī- (prM.) ‘arbeiten, sich mühen’ (EWA 2:610-1) : Gr. κάμνω (pr.) ‘sich mühen’ (GEW 1:773), OInd. paṭiya- (vb.) ‘feed (on), nourish’ (Burrow 1979:44) : Gr. πατέομαι ‘id.’, and so forth.<sup>267</sup>

§5. The outcome of PIE \*eaḥ is short both in PIE \*eaḥV and in PIE \*eaḥC (i.e. in all environments, independently of the following phoneme). Hence the comparative rule for PIE \*e+aḥ, which replaces Saussure’s compensatory lengthening, can be formulated for System PIE in the following form:

$$\text{PIE } *eaḥ(C/V) \rightarrow \text{Gr. } \alpha, \text{ Lat. } a, \text{ OIr. } a, \text{ Arm. } a, \text{ OInd. } a, \text{ Av. } a, \text{ etc.}$$

§6. Since at the same time Møller’s colouring rule \*Ae ≡ Neogr. \*a (properly speaking, an assimilation) is comparatively acceptable, the following definition holds for the traditional cover symbol

$$\text{Gr. } \alpha, \text{ Lat. } a, \text{ OInd. } a, \dots \equiv \text{PIE } *ḥae \vee *eaḥ \quad (\equiv \text{Neogr. } *a).^{268}$$

As readily seen, the cover symbol Neogr. \*a is expressed by means of the well-defined terms PIE \*e \*a and \*ḥ, with the result that no independent phoneme Neogr. \*a is postulated in System PIE.<sup>269</sup>

§7. In terms of research history, Saussure’s ‘deconstruction’ went wrong when he posited DS \*eA ≡ Neogr. \*ā and assumed a compensatory lengthening *a priori*. Consequently, the correct definition DS \*eA ≡ Neogr. \*a was no longer possible, leading to the absence of the vowel in the laryngeal theory. On the other hand, Pedersen’s idea of a connection between Neogr. \*ə and Neogr. \*a contains a seed of truth in the sense that the relation of phonemes can be defined in terms of ablaut \*e : Ø (instead of accent) as follows:

$$\begin{array}{lllll} \text{PIE } *ḥa aḥ & \equiv & \text{Neogr. } *ə & \text{DS } *A & \text{LT } *h_2 \\ \text{PIE } *ḥae eaḥ & \equiv & \text{Neogr. } *a & \text{DS } - & \text{LT } *h_2e/- \end{array}$$

<sup>267</sup> If Osc. karā- (vb1.) ‘sich ernähren’ (WbOU. 370, karanter [3pl]), Osc. caria : quam Oscorum lingua panem esse dicunt, and Osc. carenses : pistorum are related to Ḥi. NINDA<sup>A</sup>kaḥari- (c.) ‘eine Brotsorte’ (HEG 1:460), the short \*a is matched with Old Anatolian ḥ.

<sup>268</sup> On 16 January 2001, I presented counter-examples of a confirmed laryngeal with no compensatory lengthening to my supervisor Bertil Tikkanen. After a long discussion, Tikkanen asked the obvious question, “What if the compensatory lengthening doesn’t take place?” providing a typological parallel in which where ‘h’ was lost without lengthening.

<sup>269</sup> Naturally, this doesn’t mean the elimination of the phoneme /a/, which appears as PIE \*a replacing the former Neogr. \*ə in System PIE.

## 2.2.8 Reconstruction of Neogr. \*ā ≡ Do. ā : OInd. ā

§0. In addition to the Neogr. \*ə and \*a, yet a third cover symbol for the long grade vowel Neogr. \*ā was inferred from the correspondences actually already posited by the Paleogrammarians.

§1. Brugmann (Grundr.<sup>2</sup> 1:163-170, KVG 78-79) defined a cover symbol with an identical outcome in Indo-Iranian and the European languages, as follows:

Neogr. \*ā      ≡      Do. ā, Lat. ā, OLi. ā (= Li. o),...      : OInd. ā, Av. ā.

The correspondence set is illustrated here by Brugmann's own examples, including:

OInd. mātár- :	Do. μάτηρ, Lat. māter, OIr. māthir, OHG. muoter
OInd. sthāna- :	Av. stānəm, Li. stónas, OCS. stanŭ, etc.
OInd. kāla- :	Att. κηλίζ, OCS. kalŭ, etc.

§2. Saussure's miscalculation in his compensatory lengthening rule ultimately lay in his mechanical (structural) replacement of the Neogrammarian ablaut pattern Neogr. \*ə : \*ā with \*A : eA. Since DS \*eA (= LT \*eh<sub>2</sub>) is *de facto* identical with Neogr. \*ā, strictly speaking the laryngeal theory does not provide a reconstruction for the long vowel Neogr. \*ā either.

§3. Early monolaryngealism operating with original long vowels (à la Szemerényi) was able to reconstruct Neogr. \*ā at face value. This is hardly satisfying, however, owing to the connection between the 'a-colouring' and the laryngeal PIE \*h, in terms of which the theory also requires calibration.

## 2.2.9 Problems of the reconstruction of Neogr. \*ā

§0. As for the 'a-vocalism', the key difficulty of the Neogrammarian (and the laryngeal) ablaut theory is the problematic (or unaccounted) relation between the cover symbols Neogr. \*ə : \*a<sub>3</sub> : \*ā. As already mentioned above, Neogr. \*ə and \*a can be expressed in terms of PIE \*h<sub>a</sub>, a<sub>h</sub> and PIE \*e : Ø (ablaut); on the basis of this, by adding the remaining ablaut grade PIE \*ē, the long vowel Neogr. \*ā can be analyzed as PIE \*h<sub>a</sub>ē, \*ēa<sub>h</sub>.

§1. The Neogrammarian ablaut pattern Neogr. \*ā : ə did not express the relation of the terms to the third 'a-quality' vowel of the system, Neogr. \*a. This defect in the ablaut patterns of the Neogrammarians (including those advanced by Saussure) was actually contradicted by the facts from the very beginning, since such a pattern is not uncommon in the material. The ablaut Neogr. \*a : \*ā was correctly noted, for instance, by Wackernagel (AiGr 1:5-6), who held Neogr. \*a as a reduction of the vṛddhi Neogr. \*ā. In other words, the ablaut patterns Neogr. \*ə : ā and Neogr. \*a : ā belong together, forming a single pattern Neogr. \*ə : a<sub>3</sub> : ā (e.g. in RV. jmán : Lat. agō

: Lat. amb·āgēs, etc.).<sup>270</sup> This ‘Wackernagel-ablaut’ represents the true pattern instead of the defective one recognized by Brugmann and his colleagues (Neogr. \*ə : ā). That Saussure picked the latter instead of Wackernagel’s Neogr. \*ə : a : ā suggests that Saussure relied too strongly on the Neogrammarian patterns, rather than on the material.

§2. As for the enduring contributions of Saussure, he should be credited as being the first to express the connection between Neogr. \*ə and \*ā by postulating a common phonetic factor (\*A) for both sides of the equation. In so doing, however, Saussure lacked the means to properly accomplish the segmental analysis. The basic error lay in Saussure’s immature view that the Proto-Indo-European ablaut consisted of only two terms \*i : ei, \*A : aA, etc. Against this simplification, the true Proto-Indo-European pattern contains three terms (as was already understood, for instance, by the Sanskrit grammarians). The correct ablaut pattern with three grades (e.g. PIE \*i : ei : ēi) can be exemplified here by the root

PIE \*lik<sup>u</sup>- ‘lassen’ (P. 669-70):

*lik <sup>u</sup> -	Gr. λίπο- (ao.) ‘(ver)lassen’ (GEW 2:99-100, ἐλίπων [1sg])
*leik <sup>u</sup> -	Gr. λείπο- (pr.) ‘laisser’ (DELG. 628-9, λείπω [1sg])
*lēik <sup>u</sup> -	RV. raikṣ- (s.ao.) ‘überlassen’ (WbRV. 1165, āraik [3sg])

§3. Had Saussure or Møller been capable of understanding the correct ablaut pattern PIE \*Ø : e : ē, they would also have obtained the proper pattern for the coefficient/laryngeal \*A, viz.

*A : eA : ēA (Saussure II)	*A : Ae : Aē (Møller II).
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The correct analysis would have created a unified interpretation for the ‘a-vocalism’ by providing a single ablaut pattern for Neogr. \*ə : a : ā, thus hugely improving the transparency of the reconstruction.

## 2.2.10 Neogr. \*ā ≡ PIE \*ḥaē or PIE \*ēaḥ

§0. With the values of the cover symbols Neogr. \*ə ≡ PIE \*a (zero grade) and Neogr. \*a<sub>3</sub> ≡ PIE \*ḥae v \*eaḥ (\*e-grade) solved above, Neogr. \*ā can only represent the respective long vowel PIE \*ē with PIE \*ḥa, \*aḥ, as formulated in the definitions:

PIE *ēaḥ	→	Lat. ā, Do. ā, OLi. ā, OIr. ā, OInd. ā, etc.
PIE *ḥaē	→	Lat. ā, Do. ā, OLi. ā, OIr. ā, OInd. ā, etc.

Accordingly, the cover symbol Neogr. \*ā is replaced with the rule:

<sup>270</sup> Wackernagel, as pointed out by Burrow (1979:10), accepted two reduced grades: “In his *Altindische Grammatik*, I, pp. 5-6, J. Wackernagel also accepted -a- as the reduced grade of original long vowels, as an alternative treatment to -i-, in a considerable number of cases [...].”



Neogr. \*ā ≡ PIE \*ḡaē v PIE \*ēaḡ (PIE \*ē-grade).<sup>271</sup>

§1. The proof for PIE \*ēaḡ- → Neogr. \*ā is preserved in examples of ablaut PIE \*ēaḡ : \*eaḡ (Neogr. \*ā : a), reflecting the original alternation of quantity PIE \*ē : \*e. Some examples of this are:

(a) PIE √paḡ- ‘protect’ (P. 839)

\*pēaḡ- RV. páti [3sg] (LAv. pā’ti), tanū ·pá-, Ḥi. paḡš-  
 \*peaḡ- RV. paánti [3pl], tanū ·páam [sgA], Ḥi. paḡšaš-

(b) PIE √daḡ- ‘geben’ (P. 223-6)

\*dēaḡ- Lat. dā- ‘give’, Arm. ta- ‘geben’, Li. dovanà [sgN]  
 \*deaḡ- Lat. dāre [inf.], Gr. δάvoς ‘Gabe’, gAv. daidyāi [inf.]

(c) PIE √naḡ- ‘Schiff’ (P. 755-6)

\*nēaḡu- RV. nāvam [sgA] ‘Schiff’, Lat. nāuis [sgN] ‘Schiff’, etc.  
 \*neaḡu- LAv. nav ·āza- ‘Schiffer’, RV. ná’uḡ [sgN] ‘Schiff’

§2. The proof for PIE \*ḡaē → Neogr. \*ā is contained, for instance, in roots ḡeC. The following examples illustrate the ablaut PIE \*e : ē:

(a) PIE √ḡam- ‘Jahr, Frühling, Month, Tag’ (P. 35)<sup>272</sup>

Arm. am- (sb.) ‘Jahr’ (ArmGr. 1:416, am [sgN])  
 Ḥi. ḡamišḡa- (c.) ‘Frühling’ (HEG 1:143-4, ḡa-me-eš-ḡa-an [A])  
 Arm. amis- (sb.) ‘Monat’ (ArmGr1. 417, amis [N], amsoy [G])  
 Hom. ḡμαρ- (n.) ‘Tag’ (GEW 1:635-6, ḡμαρ, Arc. ḡμαρ [sgNA])  
 Do. ἀμέρα (f.) ‘Tag’ (GEW 1:635, Do. ἀμέρα [sgN])

(b) PIE √ḡap- ‘Wasser’ (P. 51-2)

Ḥi. ḡap- (f.) ‘Fluß’ (HEG 1:159-60, Ḥi. ḡa-pa-a, ḡa-ap-pa)  
 RV. ap- (f.) ‘Wasser’ (WbRV. 70-1, ápas [plA])  
 gAv. ap- (f.) ‘Wasser’ (AIWb. 325-9, apasčā [plA])  
 TochB. ap- (f.) ‘water, river’ (DTochB. 44, a[pām] [plObl/A])  
 RV. áp- (f.) ‘Wasser’ (WbRV. 70-1, ápas [plN])  
 TochB. āp- (f.) ‘water, river’ (DTochB. 44, āp [sgN])  
 Umbr. āpa- (f.) ‘Wasser(leitung)’ (WbOU. 42-43, aapam [sgA])  
 Do. ἀπά- (f.) ‘Peloponnesos’ (P. 51) (Do. ā- = Umbr. aa-)

(c) PIE √ḡap- ‘treiben, stoßen, schlagen, verletzen’ (P. 801-2)

<sup>271</sup> Naturally, contractions following the loss of PIE \*ḡ can also account for some long quantities: in theory, not only PIE \*ēaḡ and PIE \*ḡaē but any outcomes of PIE \*ēaḡē and PIE \*ēḡaē result in Neogr. \*ā (e.g. Lat. mān ī ← PIE \*mēḡaēn-, etc.).

<sup>272</sup> Hübschmann’s (ArmGr. 1:416) etymology Arm. am ‘Jahr’ : OInd. sámā ‘Sommer’, repeated by Pokorny (P. 35), is dubious due to the absence of the expected initial h- in Armenian (Arm. am vs. †ham). The PIE \*ḡam- required by Armenian (according to the sound laws) coincides with Ḥi. ḡam- and Do. ἀμ-, so that it is possible to add the items to the root P. 35 √am- in order to treat the forms regularly.

Li. opà	(f.) ‘eiternde Wunde, Geschwur’ (LiEtWb. 517)
Gr. ἄπελος-	(n.) ‘Wunde’ (GEW 1:120, ἄπελος [sgNA])
Ἡι. ἡpalašai-	(vb1.) ‘verletzten’ (HEG 1:160, EHS 480, 555)
Lat. pellō	(pr3.) ‘drive, shoot, move, exile, strike’ (WH 2:276-7)

(d) PIE  $\sqrt{h}ad-$  ‘Haut, usq. ; schliessen’ (P. 322)

Li. óda	(f.) ‘Haut, Leder’ (LiEtWb. 515-6)
Latv. āda	(f.) ‘Haut, Balg’ (LiEtWb. 515-6, Latv. āda)
Ἡι. ἡadk-	(vb2.) ‘(Tür) schliessen’ (HEG 2:225-6)
LAv. aṭ.ka-	(m.) ‘Oberkleid, Mantel’ (AIWb 61, aṭ.kəšča, aḍkəṃ)
RV. átka-	(m.) ‘Gewand, Hülle, Schleier’ (WbRV. 30)

§3. The traditional vocalism Neogr.  $*ə$  :  $*a$  :  $\bar{a}$  can thus be expressed by three variables: the ablaut PIE  $\emptyset$  :  $*e$  :  $*\bar{e}$ , the diphonemic PIE  $*h_a$  :  $*ah$ , and the accent PIE  $*\acute{a}$  :  $*a$ . In sum, these result in four distinct correspondence sets:

PIE :		INDO-EUROPEAN :		Neogr.
1. $*h_a$ , $*ah$	≡	OInd. $\emptyset$ , Gr. $\emptyset$ , Arm $\emptyset$ , etc.	≡	$\emptyset$
2. $*h\acute{a}$ , $*\acute{ah}$	≡	OInd. i, Gr. $\alpha$ , Arm. a, etc.	≡	$*\acute{e}$
3. $*hae$ , $*eah$	≡	OInd. a, Gr. $\alpha$ , Arm. a, etc.	≡	$*a$
4. $*ha\bar{e}$ , $*\bar{e}ah$	≡	OInd. $\bar{a}$ , Do. $\bar{a}$ , Arm. a, etc.	≡	$*\bar{a}$

The column PIE consists only of the terms PIE  $*h$ , PIE  $*a/\acute{a}$  and PIE  $*e$   $*\bar{e}$ , with the result that Neogr.  $*a$  and Neogr.  $*\bar{a}$  are analytical sequences of well-defined PIE phonemes.

## 2.3 Vowels Neogr. $*o$ $*\acute{a}$ $*\bar{o}$ and Ἡι. $h$

### 2.3.1 Introduction

§1. Three cover symbols indicating ‘o-vocalism’ – Neogr.  $*o$   $*\acute{a}$   $*\bar{o}$  – were included in the Brugmannian eight-vowel system. With these three cover symbols, the system closely resembles ‘a-vocalism’, but is not identical in all regards. The comparative interpretation of Neogr.  $*o$   $*\acute{a}$   $*\bar{o}$ , as well as the relation of ‘o-vocalism’ to Ἡι.  $h$  and (P)IE ablaut in general, will be discussed in this chapter.

### 2.3.2 The reconstruction of Neogr. $*o$ ≡ Gr. o : OInd. $\bar{a}$ and Brugmann’s Law

§0. Brugmann (1876b:363ff.) posited the cover symbol Neogr.  $*o$  (=  $*a_2$ ) as the basic vowel /o/ used in Neogrammarian reconstructions.<sup>273</sup> In this way, Brugmann (1876b:367) intended for the vowel to stand in ablaut with  $*e$  [=  $a_1$ ]:

<sup>273</sup> For the vowel  $*o$ , see Szemerényi (1967:68-70).

“Wir wollen der Kürze wegen denjenigen Vokal, als dessen regelrechte Fortsetzung aind. a, griech. lat. slav. e anzusehen ist, mit a<sub>1</sub>, den Grundlaut aber von aind. ā, griech. lat. slav. o mit a<sub>2</sub> bezeichnen.”

§1. According to Brugmann (1879a:2ff.), Neogr. \*o is ‘half-long’ and stands in ablaut relation (1904:145-6) to Neogr. \*a<sub>1</sub> (= \*e) and zero grade in the pattern Neogr. \*o : e : Ø, as exemplified here by the following items:

*o (*a <sub>2</sub> )	≡	Gr. δέδορκα [1sg] ‘voir’ (DELG 264-5)
*e (*a <sub>1</sub> )	≡	Gr. δέρομαι [1sg] ‘ansehen, blicken’ (GEW 1:368)
Ø (zero)	≡	RV. dṛṣṭá- [pt.] ‘gesehen’ (WbRV. 628)

§2. The characterization of Neogr. \*o as half-long was motivated by Brugmann’s Law,<sup>274</sup> according to which Neogr. \*a<sub>2</sub> (= \*o) yields a long OInd. ā = Av. ā in an Indo-Iranian open syllable, when the European languages point to a short vowel instead:

Neogr. \*a<sub>2</sub>CV → OInd. ā, Av. ā : Gr. o, Lat. o, Arm. o, OIr. o, etc.<sup>275</sup>

For this development, Brugmann (Grundr.<sup>2</sup> 1:138-146, 168) provided, among others, the following examples (chosen from the Rig-Veda):

Go. satja-	:	RV. sādāya- (WbRV. 1458) (LAv. ni-šādāya-)
Gr. πόδα	:	RV. pādám (WbRV. 770) (LAv. pādəm)
Gr. δόρυ	:	RV. dāru (WbRV. 595-6) (Av. dā <sup>u</sup> ru)
Gr. γόνυ	:	RV. jānu (WbRV. 483)
Gr. γέγονε	:	RV. jajāna [3sg] (WbRV. 467)
Gr. δοφέμαι	:	RV. dāvāne [inf.] (WbRV. 586)
Gr. δοτήρα	:	RV. dātāram [sgA] (WbRV. 593)

§3. In addition, according to Brugmann (Grundr.<sup>2</sup> 1:138-146), the development of Neogr. \*o (= a<sub>2</sub>) in closed syllables results in short quantity in Indo-Iranian as well:

Neogr. \*oC(C) → OInd. a, Av. a : Gr. o, Lat. o, Arm. o, OIr. o, etc.

Brugmann supports his hypothesis with correspondences where the Indo-Iranian short quantity coincides with the European one:

Gr. δέδορκε	:	RV. dadārśa [3sg]	(WbRV. 626)
Go. band	:	AV. babāndha [3sg]	(EWA 2:208)
Li. vartýti	:	RV. vartāya- (cs.)	(WbRV. 1332)
Lat. torreō	:	OInd. ví-tarṣaya- (cs.)	(EWA 1:635)

<sup>274</sup> For an early canonization of ‘Brugmann’s Law’, see Osthoff (1878:207ff.). A detailed account of the reception and impact of Brugmann’s Law is provided by Collinge (1985:13-21). On its literature, see Szemerényi (1996:38n2).

<sup>275</sup> As a matter of historical interest, it is worth mentioning that Brugmann’s Law can actually be traced back to Osthoff, who in (1876:40-41) wrote: “[...] gedehntes wurzelhaftes ā griechischen o (in τέ-τοκ-α, κέ-κλοφ-α), germanischen kurzem a (in got. sat, hlaf = κέ-κλοφ-α) entgegenstellt: pa-pāc-a, pa-pāt-a, sa-sād-a = got sat u.s.w., nicht etwa bloss ja-gām-a = got. qam vor einem nasal, ba-bhār-a = got. bar vor einer liquida.”

Gr. γόμφοϛ	:	RV. jámbhaḥ [sgN]	(WbRV. 478)
Go. gadars	:	RV. dadharṣa [3sg]	(WbRV. 694)

Consequently, Brugmann's Law for Neogr. \*o is of the form:

Neogr. \*oCV → Gr. o : Iir. ā      Neogr. \*oCC → Gr. o : Iir. ǎ.

### 2.3.3 Problems of Neogr. \*o and Brugmann's Law

§0. Brugmann's Law has been controversial ever since its publication on account of acute problems, which are summarized here.<sup>276</sup>

§1. Some of Brugmann's comparisons are disputed on the basis of the ablaut of the proto-language, which makes several examples of assumedly lengthened RV. ā ambiguous. In theory, almost all examples could reflect an original vṛddhi PIE \*ē ō instead of Neogr. \*o. This applies, for example, to the following comparisons:

(a) The Neogr. \*o in Go. satja- (cs.) 'set, place, determine' (GoEtD. 296) is not necessary identical with RV. sādāya-, as the latter could have an original vṛddhi like

OCS sadi- (vb.) 'setzen, pflanzen, anbauen' (Sadnik 795, saditi [inf.]).

(b) The Neogr. \*o in Gr. πόδα [sgA] does not necessarily correspond to the vṛddhi in RV. pádam (LAv. pādəm). From the Indo-Iranian point of view, [sgA] is a strong case associated with [sgN], with the result that the quantity can be set to match the nominative stems Lat. pēd- or Do. πωδ-.

(c) In general, the possibility of an original long vowel Neogr. \*ā, \*ē, \*ō → Iir. \*ā is a restriction on Brugmann's Law that must be accounted for in all applications.

§2. Yet another problem was brought to light by Schmidt (1881),<sup>277</sup> who presented a catalogue of examples with 'European \*o' (Gr. o, Lat. o, OIr. o, Arm. o, etc.) that correspond to short OInd. a = Av. a in an open syllable. These circumstances are not uncommon, and the externally paralleled formations are clearly well-defined:

RV. ánas- 'Lastwagen' (WbRV. 54)	≡	Lat. onus- 'Last' (WH 2:210)
RV. ápas- 'Arbeit' (WbRV. 74)	≡	Lat. opus 'Arbeit' (WH 2:217)
RV. ávi- 'Schaf' (WbRV. 129)	≡	Do. öfi- 'Schaf' (GEW 2:367)
RV. páti- 'Herr' (WbRV. 764)	≡	Gr. πόσι- 'Gatte' (GEW 2:584)
RV. patáya- 'fliegen' (WbRV. 762)	≡	Gr. ποτέομαι 'id.' (GEW 2:522)

§3. On paper, the counter-examples could be explained by claiming an original PIE \*e for Indo-Iranian and PIE \*o for the European languages. Ultimately, however, this does not solve the problem, since Neogr. \*e is impossible before an Indo-Iranian velar in:

<sup>276</sup> For early criticism of Brugmann's Law, see Collitz (1878:291ff., 1886a:2ff., 1886b:215), Fick (1880:423-433), Bechtel (1892:46ff.), and Delbrück (1894:132).

<sup>277</sup> Hirt (1913) presented no less than 67 counter-examples against Brugmann's Law; while some of these were unacceptable, several still stand.

Gr. πότερο-	(a.) ‘wer, welcher von beiden’ (GEW 2:586)
LAv. katara-	(a.) ‘wer, welcher von beiden’ (AIWb. 433)
RV. katará-	(pron.) ‘welcher von zweien’ (KEWA 1:148)

§4. No better solution was achieved by Kleinbans, according to whom (apud Pedersen 1900a:87) the consonant C in Brugmann’s condition (\*oCV) should be specified as R and the rule written in form \*oRV → Iir. āRV (where R ≡ \*l, r, m, n). This does not solve the problem either, because in counter-examples like RV. ánas- : Lat. onus with R = \*n no lengthening appears.

### 2.3.4 Reconstruction of Neogr. \*â ≡ Gr. o : OInd. a

§0. Acknowledging the counterarguments, Brugmann presented a solution consisting of the postulation of another \*o-quality vowel, Neogr. \*â. This was intended for Schmidt’s counter-examples with short Proto-Indo-Iranian \*a (RV. a, gAv. a), corresponding to ‘European o’, thus presenting the eighth and final correspondence set of the Neogrammarians vowel system.

§1. Brugmann (Grundr<sup>2</sup> 1:153-158)<sup>278</sup> responded to Schmidt’s criticism by distinguishing between two correspondence sets, Neogr. \*o (see above) and Neogr. \*â, with the latter standing for a short /o/ in open syllables of Indo-Iranian.<sup>279</sup> In addition, the correspondence set Neogr. \*â was characterized by an abnormal ablaut Arm. a : Gr. o, according to Brugmann:

Arm. a	:	Gr. o, Lat. o, OInd. a, Av. a <sup>280</sup>
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For this, Brugmann provided the following examples:

Arm. akn ‘Auge’	:	Gr. ὄψομα, Lat. oculus (WH 2:200-2)
Arm. ateam ‘hasse’	:	Lat. odium ‘Hass, Widerstreben’ (WH 2:202-3)

According to Brugmann, Neogr. \*â is therefore distinct from Neogr. \*a<sub>2</sub> (= \*o) by virtue of the following additional conditions:

- (a) Unlike Neogr. \*o, Neogr. \*â does not ablaut with Neogr. \*e.<sup>281</sup>
- (b) Neogr. âCV → Iir. āCV yields a short vowel (in contrast to Neogr. \*o), resulting in Brugmann’s Law.<sup>282</sup>

<sup>278</sup> For the non-ablauting \*o, see Bartholomae (1891:91-103), Pedersen (1900:86-103), Polomé 1965, Schmitt-Brandt (1967:7, 114-130), Beekes (1969:139-141), and Lindeman (1997:23ff.).

<sup>279</sup> Brugmann (Grundr<sup>2</sup> 1:92-93) writes: “Der o-Laut war in der idg. Urzeit vermutlich in zwei Qualitäten vorhanden, deren eine man als â [...] d. h. als sehr offene o [...] bezeichnet.”

<sup>280</sup> Brugmann (Grundr<sup>2</sup> 1:140): “Man beachte: uridg. o = arm. o, uridg. â = arm. a (§ 160).”

<sup>281</sup> Brugmann (Grundr<sup>2</sup> 1:153) explains: “Mit â bezeichnen wir den nicht mit e ablautenden uridg. o-Vocal, der im Armenischen als a und im Arischen in offener Silbe wahrscheinlich als a erscheint.”

<sup>282</sup> Brugmann (Grundr<sup>2</sup> 1:140) adds: “Im arischen sind uridg. o und â, wie es scheint, dadurch geschieden geblieben, dass â auch in offener Silbe als a erscheint.”

§2. Saussure (Rec. 91) agreed with Brugmann's reconstruction of an extra phoneme for the correspondence set Arm. a : Gr. o (Arm. akn : Lat. oculus). The phoneme in question represents Saussure's original definition of 'coefficient sonantique' \*ô (i.e. h<sub>3</sub>).<sup>283</sup> This made Saussure's system inconsistent from the beginning, because he defined \*ô in two mutually contradicting correspondence sets, viz.<sup>284</sup>

\*ô → Gr. o, Lat. a, OInd. i : (Gr. δατό-, Lat. datum, OInd. ·dita-)  
 \*ô → Gr. o, Lat. o, OInd. a : (Gr. ὄφι-, Lat. ovi-, OInd. ávi-)

§3. Møller's (1880:492-4n2, 1906:vi) interpretation of \*ô as a laryngeal enabled the elimination of Saussure's inconsistency in the initial position by introducing a laryngeal for the roots oC = ôeC. This is found, for instance, in:

\*ôeϕi- → Gr. ὄφι-, Lat. ovi-, RV. ávi- 'sheep', etc. (\*e-grade)

Despite this, the interpretation runs into a dead end with roots Neogr. \*CoC-, where an insertion of h<sub>3</sub> is impossible (cf. Gr. √πoτ- 'fliegen') in exactly the same manner as the roots Neogr. \*CaC- discussed above.

§4. After the discovery of Hittite, Kuryłowicz (1927, 1935) identified DS \*ô with a laryngeal (\*h<sub>3</sub>). According to Benveniste (1935), this phoneme was preserved as Ḫi. ḫ (= CLu. ḫ, Pal. ḫ) in the correspondence type

LT \*h<sub>3</sub>est- 'Knochen' → Ḫi. ḫaštai-, Gr. ὄστέον 'id'.

§5. Brugmann's correspondence set characterized by Arm. a : Gr. o has essentially remained as the basis for the reconstruction of h<sub>3</sub>, here quoted in Mayrhofer's formulation (1986:142):

"Eine weitere Quelle für \*/h<sub>3</sub>/ ist die Position vor [-syll], wo im Griechischen ein dem 'o-färbenden' /H/ entsprechender prothetischen Vokal /o-/ entsteht, im Armenischen hingegen die dort übliche Fortsetzung jedes '\*ə' nämlich /a-/ (s. 5.2.1.2.2. mit Anm. 115). Vgl. gr. ὀνειδος 'Tadel, Schmähung', armen. anicanem 'fluche' gegenüber ved. nidáná-'getadelt', got. ga-naitjan 'schmähen'; gr. ὄφελος n. 'Förderung, Nutzen', armen. -awel- in y-awel-ow- 'hinzufügen' (s. Klingenschmitt, Verbum 236, E. P. Hamp, Glotta 60 [1982] 229f.), idg. \*/h<sub>3</sub>bhel-/ (vgl. noch \*/ḡ-b<sub>3</sub>bhel-/ in myken. /nōpheleha/ < no-pe-re-a<sub>2</sub> >, verdeutlicht zu ἀνωφελής 'nutzlos'); \*/h<sub>3</sub>k<sup>h</sup>ih<sub>1</sub>/ 'die beiden Augen' in gr. ὄσσε, armen. ač'k', worüber weiteres o. S. 127 Anm. 118."

### 2.3.5 Problems of the reconstruction of Neogr. \*â

§0. The problems of Neogr. \*â (and LT h<sub>3</sub>) can be summarized as follows:

§1. According to Pedersen (1900a:86-103) and Meillet (1893/4:153-165), the 'non-ablating' vowel Neogr. \*â never existed.<sup>285</sup> The accuracy of this criticism is shown by

<sup>283</sup> See Saussure (1878, Rec.106): "[...] puis Ôwi 'mouton', à cause de l'a bref du skr. ávi; pÔti 'maitre'; mÔni 'joyau', skr. māñi; sÔk<sub>2</sub>i 'compagnon, skr. sákhi. D'après cette analogie, on devra ajouter: Ôsti 'os', klÔuni 'clunis' (?), kÔni 'poussiere', nÔkti 'nuit'."

<sup>284</sup> Saussure's attempt to explain the inconsistency by means of analogy (Rec.106) is not helpful.

<sup>285</sup> See also Schmitt-Brandt (1967:7, fn18).

examples of the supposed non-ablauting \*ǎ, which actually ablauts with Neogr. \*ě or with Neogr. \*ǎ.

§2. In contrast with Brugmann's definition, Neogr. \*ǎ actually ablauts with \*e in examples like:

(a) Neogr. \*pât- 'Herr, Gatte' (P. 842, WP. 2:77f.):

RV. páti-	(m.) 'Schützer, Herr, Gebieter, Gemahl' (WbRV. 764)
Gr. πόσι-	(m.) 'Ehemann, Gatte, Gemahl' (GEW 2:584, πόσις)
OLi. pati-	(m.) 'Ehemann, Gatte, Gemahl' (LiEtWb. 551, patís)
Li. pàt-	(adv.) 'selbst, sogar, eben, just' (LiEtWb. 551, pàt)
Ḫi. pat	(ptcl.) 'eben/gerade der, ebenfalls' (HHand. 127, BAD)
Lat. com ·pot-	(a.) 'teilhaftig' (WH 2:350-1, compos [sgN])
Pael. hos ·put-	(m.) 'Gastherr' (WH 1:660-1, hospus [sgN])

The respective \*e-grade is preserved in:

Lat. hos ·pet-	(c.) 'Gastfreund' (WH 1:660-1, hospes, hospitis [G]).
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(b) Neogr. \*pât- 'fly' (P. 825-6). The causative without lengthening in Indo-Iranian open syllables (i.e. Brugmann's Neogr. \*ǎ) appears in:

RV. patáya-	(cs.) 'fliegen' (WbRV. 762, patáyanti [3pl])
Gr. ποτέο-	(cs.) 'flattern' (GEW 2: 2:522, Gr. ποτέομαι [1sg])

The formation ablauts with Neogr. \*e in:

Gr. πέτο-	(prM.) 'fliegen' (GEW 2:522, πέτομαι [1sg])
Ḫi. pēta-	(vb1.) 'fliegen' (HHand. 133, pí-d-a-an-zi [3pl])

The ablaut Gr. ε : ο = Lat. e : o strongly suggests that Neogr. \*ǎ should have been interpreted as the basic vowel PIE \*o, rather than Neogr. \*a<sub>2</sub> (= Neogr. \*o), and the reason for the lengthening in Brugmann's Law should have been sought elsewhere.

§3. Brugmann's criterion (Grundr<sup>2</sup> 1:154) based on the assumed identity of vocalisms Arm. a : Gr. o is misstated. It is comparatively provable that the 'a-vocalism' is not restricted to Armenian, but rather that it is a feature shared by all languages preserving the distinction. Thus, in reality the ablaut Neogr. \*ǎ : \*a extends far beyond Brugmann's definition (Armenian only), as is seen from examples like:

(a) Arm. ač'-k' 'eye-s' with Arm. a-, allegedly corresponding to Neogr. \*ǎ- in Gr. ὄπ- (Neogr. \*ok<sup>u</sup>- 'sehen', P. 775-7, WP. 1:169ff.), is actually paralleled by:

Gr. ὄπτο-	(n.) Hes. ὄπτον · τὸ πρόσωπον (LSJ. 299).
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(b) The ablaut Neogr. \*ǎ : a reappears in connection with Old Anatolian ḫ in the data P. \*oui- 'sheep' (P. 784, WP 1:167). Neogr. \*ǎ is confirmed by Italo-Greek:

CLu. ḫai-	(c.) 'Schaf' (DLL 45, HEG 1:230, ḫa-a-ú-i-iš [sgN])
HLu. ḫai-	(c.) 'lamb' (CHLu. 1.1.48, (OVIS.ANIMAL)ḫá-wá/i-i-sá)
Gr. ὄφι-	(c.) 'Schaf' (GEW 2:367, Argiv. ὄφινς [plA])
Lat. oui-	(c.) 'Schaf' (WH 2:229, ouis [sgN])

RV. ávi- (m.) ‘Schaf’ (EWA 1:135, KEWA 1:59, áviḥ)

The corresponding ‘a-vocalism’ is preserved in Lat. auillus [sgN] ‘agnus recentis partus’ (WH 1:84) and in Lat. au·bubulcus [sgN] ‘pastor ouium’ (WH 1:79).<sup>286</sup>

§4. Since the ablaut gr. \*ǎ : a is paralleled by the European languages (Greek, Latin, Celtic, etc.), the a-vocalism is not exclusively an Armenian feature; it belongs rather to Neogr. \*a (i.e. Proto-Indo-European):

PIE \*ḥae, eaḥ ≡ Arm. a = Gr. α = Lat. a = OIr. a, OInd. A.

In other words, the Armenian a-vocalism stems from PIE \*e (in the environment PIE \*ḥae, eaḥ), not from non-ablauting \*ǎ (= PIE \*o).

### 2.3.6 Neogr. \*ǎ ≡ PIE \*o

§0. Facing growing criticism and accumulating problems, Brugmann (1904:74-5) withdrew his reconstruction of the two vowels Neogr. \*o ≠ \*ǎ<sup>287</sup> and renounced his law. I find Brugmann’s reaction exaggerated, because both correspondence sets Neogr. \*ǎ (RV. páti- : Gr. πόσι-) and Neogr. \*o (RV. dǎru- : Gr. δόρυ-) can now be unambiguously defined and Brugmann’s Law rescued by the means outlined below.

§1. The critical problem of Brugmann’s reconstruction of the ‘o-vocalism’ is identical with that of the ‘a-vocalism’. In both cases, Brugmann chose the more complex cover symbols Neogr. \*a<sub>3</sub> (= \*a) and Neogr. \*a<sub>2</sub> (= \*o) to represent the basic vowels instead of the simpler items (Neogr. \*ə and \*ǎ) at hand. By changing this for Neogr. \*ǎ in the manner already presented in connection with Neogr. \*a, the comparative solution results.

§2. Most of the difficulties of Brugmann’s Law could have been avoided had Brugmann chosen the simpler (i.e. non-lengthening) ‘o-quality’ vowel (Neogr. \*ǎ) as the basic vowel of his reconstruction. It is possible that without Old Anatolian at his disposal, Brugmann lacked the transparency to settle the obvious PIE \*o for Neogr. \*ǎ in correspondence sets such as

PIE √pot- ‘Herr, Gatte’ (P. 842, WP. 2:77f.):

RV. páti-	(m.) ‘Schützer, Herr, Gebieter, Gemahl’ (WbRV. 764)
Gr. πόσι-	(m.) ‘Ehemann, Gatte, Gemahl’ (GEW 2:584, πόσις)
OLi. patì-	(m.) ‘Ehemann, Gatte, Gemahl’ (LiEtWb. 551, patis)
Li. pàt-	(adv.) ‘selbst, sogar, eben, just’ (LiEtWb. 551, pàt)

<sup>286</sup> Pokorny (P. 9) accepts the traditional reconstruction uridg. \*ag<sup>h</sup>inā- → Umbr. habina ‘agnas’, comparing the form with Lat. auillus (as if \*ag<sup>h</sup>inlo-) but this would leave Umbr. h- irregular. One does better by noting the semantic parallel Lat. pecus ‘sheep’ (Umbr. habina ‘id’) : Lat. pecūnia ‘money, property’ (Go. gabei ‘Reichtum’), which connects the Umbrian form to the root P. 407-9 \*ghabh- ‘fassen, nehmen’ and Lat. auillus to Lat. oui-.

<sup>287</sup> Brugmann (1913:191n2) writes: “Die Ansicht, dass es im Uridg. zwei qualitativ verschiedene o-Vokale gegeben habe (Gr. I2 S. 138, 153, 156), steht auf schwachen Füßen. S. Meillet Mém. 8, 153ff., Pedersen KZ. 36, 86ff. 101ff.”



Hī. pat	(ptcl.) ‘eben/gerade der, ebenfalls’ (HHand. 127, BAD)
Lat. com ·pot-	(a.) ‘teilhaftig’ (WH 2:350-1, compos [sgN])
Pael. hos ·put-	(m.) ‘Gastherr’ (WH 1:660-1, hospus [sgN])

This problem can be avoided by replacing Brugmann’s basic vowel for /o/, according to the definition:

PIE \*o (≡ Neogr. ā) → Gr. o, Lat. o, Arm o, Hī. a, OInd. a, etc.

The key properties of the vowel PIE \*o (≡ Neogr. \*ā) will be discussed next.

§3. As noted by Schmidt, PIE \*o does not cause lengthening in Indo-Iranian open syllable. This is confirmed by the class of counter-examples to Brugmann’s Law with PIE \*o systematically resulting in a short vowel:

PIE *h <sub>2</sub> ak <sup>u</sup> -	:	Gr. ὄπ-, Lat. oculus, OCS. oko, etc.
PIE *h <sub>2</sub> ao <sub>i</sub> -	:	CLu. h <sub>2</sub> auī-, Gr. ὄφτ-, Lat. oui-, RV. ávi-, etc.
PIE *k <sup>u</sup> otero-	:	Gr. πότερο-, RV. katará-, LAv. katara-
PIE *polu-	:	Gr. πολύ-, OPers. paru, LAv. po <sup>u</sup> ru-
PIE *pote <sub>i</sub> /o-	:	RV. patáya-, Gr. ποτέο-
PIE *poti-	:	RV. páti-, Gr. πόσι-, OLi. patī-, etc.

§4. The vowel PIE \*o ablauts with PIE \*e and zero-grade Ø, as shown by the alternation Gr. πετ- : ποτ-, πτ- and numerous similar cases (e.g. Gr. √φειδ-, √φοιδ-, √φιιδ- ‘know’, etc.).

§5. Unlike PIE \*e, PIE \*o is not assimilated (or ‘coloured’) in the environment PIE \*a. Thus, PIE \*h<sub>2</sub>ak<sup>u</sup>- yielded a simple /o/ in Gr. ὄπ-, Lat. oculus, etc. after the loss of unaccented PIE \*a.

§6. In direct contact with PIE \*a (in PIE \*h<sub>2</sub>a, ah<sub>2</sub>), the original ablaut PIE \*e : o results in ablaut Gr. α : ο (= Lat. a : o, etc.). Thus PIE \*h<sub>2</sub>ao<sub>i</sub>- (CLu. h<sub>2</sub>auī-) has PIE \*o in Gr. ὄφτ- (Lat. oui-), but PIE \*h<sub>2</sub>ae<sub>i</sub>- has PIE \*e reflected in Lat. auillus [sgN] ‘agnus recentis partus’ (WH 1:84), and so forth.

§7. Szemerényi (1967:84) mentions a class of roots with PIE \*o (see, for example, √bhos- [P. 163], √ghos- [P. 452], √klou-ni- [P. 607], √kōks- [P. 611], √konkh- [P. 614]) without attested \*e-grade. As underlined by Szemerényi, such vocalizations confirm the existence of PIE \*o. There is no need to posit anything but PIE \*o, since the ablaut is defective (i.e. without preserved/derivationally formed PIE \*e).

### 2.3.7 Neogr. \*o ≡ PIE \*oah<sub>2</sub>, \*o<sub>h</sub>a (Brugmann’s Law II)

§0. With PIE \*o being set as the basic ‘o-vocalism’, Brugmann’s interpretation of the cover symbol \*a<sub>2</sub> as Neogr. \*o (= PIE \*o) cannot be upheld due to the principle of the regularity of sound change. However, another value can be inferred for Neogr. \*o based on the measurable properties of the examples of Brugmann’s Law.

§1. The exact matches of Brugmann’s Law, including items like

Cypr. δoφέναι [inf.] ‘to give’                   ≡           RV. dāvāne [inf.] ‘to give’,

confirm that Brugmann’s Law (Neogr. \*a<sub>2</sub>CV → Iir. āCV) has been operational, making the correspondence set distinct from the regular short quantity of

PIE \*o                   →           RV. a, gAv. a, Gr. o, Lat. o                   (Neogr. ā).

§2. The common feature (or distribution) of the roots affected by Brugmann’s Law can be stated as follows: *Brugmann’s Law was operational when the root contained PIE \*o followed by PIE \*h in the open syllable of Indo-Iranian.*

In other words, Brugmann’s Law can be corrected by upgrading it to the form

PIE \*o<sub>h</sub>aCV, \*o<sub>h</sub>CV →           Gr. o, Lat. o, RV. ā, Av. ā           (BRUG. II).

Hence, the real value of Brugmann’s cover symbol Neogr. \*a<sub>2</sub> can be expressed as

Neogr. \*a<sub>2</sub> (= Neogr. \*o)           ≡           PIE \*o<sub>h</sub>a v \*o<sub>h</sub>.

In terms of mixed notation, using both Brugmann’s \*ā (= PIE \*o) and the laryngeal PIE \*h, one obtains the value Neogr. \*o ≡ \*ā<sub>h</sub>a v \*ā<sub>h</sub>.

§3. Despite the loss of PIE \*h, the roots with Brugmann’s lengthening are constantly associated with ‘a-vocalism’ or other criteria pointing to PIE \*h<sub>a</sub> \*a<sub>h</sub>. Some examples of the connection of Brugmann’s Law II and PIE \*h<sub>a</sub> \*a<sub>h</sub> are:

(a) Cypr. δoφέναι = RV. dāvāne ≡ PIE \*do<sub>h</sub>uV. The respective ‘a-vocalism’, implying PIE \*h, appears in Lat. dā ‘give’, Arm. ta-m ‘I give’, Gr. δάνοϛ ‘gift, loan’, Li. dovenà ‘gift’, and so forth.

(b) Gr. δόϛυ = RV. dāru ≡ PIE \*do<sub>h</sub>arV. The respective ‘a-vocalism’ appears in OIr. da<sup>ur</sup> ‘Eiche’ (DIL 175-6) from PIE \*d<sub>h</sub>aeru- (schwebeablaut).

(c) Gr. γέγον·ε, RV. jaján·a ≡ PIE \*gēgo<sub>h</sub>an·e [3sg]. The respective ‘a-vocalism’ appears, for instance, in Gr. πελι·γάν· (m.pl.) ‘οἱ ἔνδοξοι, βουλευταί’ (GEW 2:498) and in Do. γέγα<sub>h</sub>κειν [pf.inf.] ‘geboren werden’ (LSJ. 340) with an alternative extension.

§4. Brugmann’s Law II can now be confirmed with an example from Old Anatolian, containing a preserved PIE \*h after PIE \*o in examples like

(a) PIE \*h<sub>a</sub>ur- \*h<sub>a</sub>uor- \*h<sub>a</sub>uer- ‘schmücken’ (P. -):

H <sub>i</sub> . h <sub>u</sub> ara-	(vb1.) ‘schmücken’ (HEG 1:332, h <sub>u</sub> aranzi [3pl])
LAv. gaošāvara-	(m.) ‘Ohrschmück, Ohrgehänge’ (AIWb. 486) <sup>288</sup>
H <sub>i</sub> . h <sub>u</sub> ra-	(vb1.) ‘schmücken’ (HEG 1:229f., h <sub>u</sub> rair [3pl])
H <sub>i</sub> . ištama·h <sub>u</sub> ra-	(c.) ‘Ohrring, Schmuckring (?)’ (HEG 1:423)

(b) PIE \*se<sub>h</sub>au- \*so<sub>h</sub>au- \*sh<sub>u</sub>au- ‘brennen, glänzen; Sonne, Lampe’ (P. 881-2, 1045)

LAv. hu-	(vb.) ‘schmoren, rösten’ (AIWb. 1782-3, huyārəš)
LAv. hū-	(n.) ‘Sonne, Sonnenball, Sonnenlicht’ (AIWb. 1847)
LAv. hāvaya-	(cs.) ‘rösten’ (AIWb. 1782, hāvayeiti [3sg])

<sup>288</sup> Bartholomae’s early etymology (OInd. ā·bharāṇa- ‘Schmück’, AIWb. 486) is unacceptable, because Av. v ≠ OInd. bh.

Go. sauil-	(n.) ‘sun’ (GoEtD. 297, sauil [sgN])
CLu. šehual-	(n.) ‘Lampe (?)’ (HEG 2:1090-1, še-ḥu-ya-a-a[l]) <sup>289</sup>

§5. Owing to Brugmann’s interpretation of Neogr. \*a<sub>2</sub> as the basic ‘o-quality’ vowel of his system, the item was reconstructed (passim) instead of the actually attested Neogr. â (= PIE \*o). Consequently, Neogr. \*a<sub>2</sub> (= Neogr. \*o) must not be automatically replaced with PIE \*oah<sub>2</sub>, \*oḥa, as this would overgenerate laryngeals. Brugmann’s Law II requires at least one another diagnostic feature implying PIE \*ah<sub>2</sub> or PIE \*ḥa. Thus, for instance, the direct comparison of causatives of the formation P. 762, \*nek̂-, \*nok̂- ‘Tod’ (cf. Lat. nec- (f.) ‘gewaltsame Tod, Mord’) in

Lat. noceō	(cs.) ‘schaden’ (WH 2:153-5, noceō [1sg])
RV. vi (...) nāśáya-	(pt.) ‘vertilgen, zerstören’ (WbRV. 718)
OPers. vi nāḥāya-	(cs.) ‘injure, harm’ (OldP. 193, vināḥāyatiy) <sup>290</sup>

makes Neogr. \*o = PIE \*oḥa possible. However, not a single attested form implies PIE \*a or PIE \*ḥ. In such settings, it remains possible that the Indo-Iranian quantity is identical with PIE \*ō, ē<sup>291</sup> in the following:

Gr. νῶκ αῖ	(n.) ‘Totenschlaf’ (GEW 2:300, νῶκ αῖ)
OIr. nās	(m.) ‘Tod’ (LEIA N-3, nās .i. bās; PCelt. *nōks-)
LAv. nāš-	(s.ao.) ‘verschwinden’ (AIWb. 1055, nāšaita [3sg])

Unless the Old Anatolian stem excluding PIE \*ḥ

Ḫi. nakiu-	(c.) ‘Art Unterweltsgottheit’ (HEG 2:261-2)
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belongs here, a laryngeal remains possible, but it is not proven.<sup>292</sup>

§6. In addition to Brugmann’s Law II, its converse also applies in reconstruction. Owing to the preservation of PIE \*ḥ in Old Anatolian, the alleged examples of Brugmann’s Law lacking Ḫi. ḥ are bound to contain original PIE \*ē, ō instead of Neogr. \*o (= PIE \*oḥa, oah<sub>2</sub>). Thus RV. pádam (LAv. pādəm) contains an original PIE \*ō (Do. πῶδ-) or PIE \*ē (Lat. pēd-), because the Old Anatolian has no laryngeal in:

Ḫi. pada-	(c.) ‘foot, leg’ (Sum. GÌR, HHand. 127, CHD P:231f.)
CLu. pada-	(c.) ‘foot’ (DLL. 81, pa-ta-a-aš)
HLu. pada-	(sb.) ‘foot’ (CHLu. 1.1.22, (“PES”)pa-tà-za)

<sup>289</sup> Note, however, that Starke’s (KLuN. 342f.) translation ‘Lampe’ is possibly wrong, as the competing suggestion ‘Dolch’ seems more acceptable based on context. Regardless of Luwian, however, the reconstruction (and the argument) remains the same.

<sup>290</sup> The perfect RV. nanāśa [3sg] ‘verschwinden, sich davon machen’ (WbRV. 717-8) and gAv. vi.nānāsā [3sg] ‘dem Untergang verfallen sein’ (AIWb. 1055-6) could also contain Neogr. \*ō as Gr. γέγωνε ‘make(s) oneself heard’ (LSJ. 340), etc.

<sup>291</sup> The causative in PIE \*ō is confirmed, for instance, by Gr. (F)ώθέω ‘stoßen, drängen, treiben’ (GEW 2:1144): gAv. vādāya- (pr.) ‘zurückstoßen’ (AIWb. 1410, vādāyōiš [opt]).

<sup>292</sup> Ḫi. nakiu- (c.) ‘Art Unterweltsgottheit’ closely resembles the (thematic) stems Lat. nocīuo- (a.) ‘schädlich’ (WH 2:153, nocīuus [sgN]) and the \*e-grade in Lat. inter-necīuo- (a.) ‘mörderisch, tödlich’ (WH 2:153), both of which have meanings that fit an underworld god. If this etymology is accepted, then the root had no laryngeal and the Indo-Iranian quantity reflects the original state of affairs.

In this manner, the converse of Brugmann's Law II often proves the lack of PIE \*h, which can be equally important in the elimination of underlying ambiguities.

§7. As is the case with PIE \*eḥ, the laryngealist rule of compensatory lengthening for PIE \*oḥ (see Møller (1880:493n2): “\*eA wird aA, \*oA wird ō”) is overstated. Instead of the ubiquitous lengthening, the cluster PIE \*oḥ results in a long quantity only in Indo-Iranian open syllables (Brugmann's Law II), but remains short elsewhere.

§8. In this connection it should be noted that the difference in the resulting quantity of the outcomes of PIE \*oḥ and \*eḥ in Indo-Iranian open syllables

$$\text{PIE } *eḥ\text{CV} \quad \rightarrow \text{Iir. } a\text{CV} \qquad \text{PIE } *oḥ\text{CV} \quad \rightarrow \text{Iir. } \bar{a}\text{CV}$$

provides an independent confirmation of the existence of two originally different vowels PIE \*o ≠ PIE \*e implied by the second palatalization.<sup>293</sup> This proves false the assumption of a PIE monovocalism (i.e. the doctrine of ‘Proto-Indo-Semitic \*a’), also known as the ‘fundamental vowel \*e’ of the laryngeal theory (Benveniste, 1935:149),<sup>294</sup> which was put forth by Saussure and Møller.<sup>295</sup>

§9. In his early article, Kuryłowicz (1927a:103) reconstructed the following paradigm for the perfect forms of the Sanskrit-root √kṛ- ‘machen’:

$$\begin{array}{llll} \text{OInd. cakāra} & \leftarrow & *k^w ek^w \acute{o}r \cdot h_2e & [1\text{sg}] \\ \text{OInd. cakāra} & \leftarrow & *k^w ek^w \acute{o}r \cdot e & [3\text{sg}] \end{array}$$

As explained by Lindeman (1997:67), Kuryłowicz assumed that

“the \*-o- of the 3 sg. had become Skt. -a- in an open syllable (according to Brugmann's Law), the radical short -a- of the 1 sg. was supposed to be the regular outcome of an IE \*-o- in an originally closed syllable. The same phonetic development was assumed for causative formations like janáyati (: jan- ‘generate’) < \*g'onH-éye/o- [... ] Kuryłowicz later (in Apophonie, 330 and 336f.) withdrew this explanation [...]”

In this connection it is worth mentioning that Kuryłowicz's withdrawal might also have been premature. In Kuryłowicz's (1935:28) example RV. √jan- ‘gebären’, the root has a laryngeal (PIE \*ḡeḥan-; see above), meaning that it is possible to reconstruct exactly like Kuryłowicz except writing PIE \*oḥ for \*o:

$$\begin{array}{llll} \text{Gr. } \gamma\acute{\epsilon}\gamma\omicron\nu\alpha = \text{RV. } jajāna [1\text{sg}] & \leftarrow & \text{PIE } *ḡeḡoḥan \cdot \acute{h}ae & (oḥa\text{CC}) \\ \text{Gr. } \gamma\acute{\epsilon}\gamma\omicron\nu\epsilon = \text{RV. } jajāna [3\text{sg}] & \leftarrow & \text{PIE } *ḡeḡoḥan \cdot e & (oḥa\text{CV}) \end{array}$$

<sup>293</sup> For the ‘law of the palatals’ in detail, see Collinge (1985:133-42).

<sup>294</sup> See Kuryłowicz (1964:28) and Lindeman (1987:23-24, 1997:26-28).

<sup>295</sup> See Møller (1911:XIV): “Es gibt im Indogermanischen nur a-Wurzeln (oder, wenn man fürs Indogermanische lieber will, e-Wurzeln, was für die Sache dasselbe), den semitische a-Wurzeln entsprechend.”

Owing to the regular output after the loss of PIE \*a, Kuryłowicz’s Law II is feasible.<sup>296</sup> In order to avoid overgeneralization of Kuryłowicz’s Law II, however, the ambiguity of Brugmann’s Law must be taken into account:

(a) The alternation of quantity of the root vowel RV. a [1sg] : RV. ā [3sg] is not restricted to roots containing a laryngeal. Thus, the root √han- ‘schlagen’, which is certainly without a laryngeal (cf. \*g<sup>h</sup>hen- ‘schlagen, töten, usw.’ P. 491-3), reveals an identical ablaut:

RV. jaghán-	(pf.) ‘erschlagen, usw.’ (WbRV. 1644, jaghántha [2sg])
RV. jaghān-	(pf.) ‘erschlagen, usw.’ (WbRV. 1644, jaghāna [3sg])

(b) There is no justification for the apriorist assumption that Sanskrit (or any other language) would have inherited the proto-paradigms as such. Since no sound laws can explain the alternation RV. a : RV. ā, a suppletive alternation Neogr. \*o : ō remains the sole option for

RV. jaghán- = *g <sup>h</sup> heg <sup>h</sup> hon-	RV. jaghān- = *g <sup>h</sup> heg <sup>h</sup> hōn- <sup>297</sup>
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Because the vocalizations reflecting PIE \*o<sub>h</sub>CV : \*o<sub>h</sub>CC (Brugmann’s Law II) coincide with suppletive paradigms with PIE \*ōCV : \*oCC (suppletion/ablaut), it is unlikely that Kuryłowicz’s Law II will create revolutionary new possibilities for the reconstruction of PIE \*<sub>h</sub>.

§10. Brugmann deserves belated credit for his correct initial observation concerning the lengthening Indo-Iranian lengthening. I find the fact that Brugmann was able to grasp this phenomenon without PIE \*<sub>h</sub> at his disposal a remarkable sign of his comparative mastery. Even today Brugmann’s efforts have not been wasted, as detailed study of Brugmann’s Law II and its converse are able to restore lost laryngeals and eliminate false positives to the extent that clarification of these problems may be resolved in the near future.

### 2.3.8 Reconstruction of Neogr. \*ō ≡ Gr. ω : OInd. ā

§0. As the lengthening of PIE \*o took place only in the environment PIE \*o<sub>h</sub>CV → IIr. āCV (Brugmann’s Law II), the laryngealist compensatory lengthening does not explain the long vowel Neogr. \*ō, which must be accounted for in a different manner. These and other key issues are discussed below.

§1. For the long ‘o-quality’ vowel, Brugmann (Grundr<sup>2</sup> 1:147) defined the cover symbol

Neogr. *ō	≡ <sub>df</sub>	Gr. ω, Lat. ō, Go. ȝ, Li. uo, Arm. u, OIr. ā, Av. ā, etc.
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<sup>296</sup> Similarly, the short vowel of the causative RV. janáya- (cs.) ‘erzeugen, gebären, schaffen zu’ (WbRV. 469, janáyatha) is regular if compared to Gr. γováω (pr.) ‘zeugen, hervorbringen’ (GEW 1:320), as was done by Kuryłowicz (1927a:103).

<sup>297</sup> For the external confirmation of the long grade, compare OCS. pro·ganja- (vb.) ‘vertreiben’ (Sadnik √214, proganjati [inf.]).

Brugmann (Grundr.<sup>2</sup> 1:147-153, KVG 76-77) provided, among other things, the following examples for this correspondence set:

OInd. dádāti :	Gr. δίδωσι, Arm. tur, Lat. dōnum, OCS. dati
OInd. dvá :	Gr. δύο, Lat. duo, OCS. dŭva
OInd. prātár :	Gr. πρῶί, Osc. pruterpan, OHG. fruo

§2. In Brugmann's system, an ablaut relation Neogr. \*ō : \*ə (KVG:141), similar to that of Neogr. \*ā : ə, was assumed. Some examples of the alternation are:

Gr. γλῶσσα :	Ion. γλάσσα (Neogr. *gləghja)
Lat. dōnum :	Lat. datum (Neogr. *dətə-)
Gr. στρωτός :	Gr. στρατός (Neogr. *strəto-)

§3. Saussure (Rec. 127) abandoned the traditional analysis of Neogr. \*ō (defined by him as "grec et latin ō") and assumed an 'o-colouring' coefficient DS \*Ô with compensatory lengthening and ablaut pattern \*ô : eÔ in

DS *dô-	→	Gr. δοτός, Lat. dātum, OInd. ·dita-	(Ø-grade)
DS *deô-	→	Gr. δίδωμι, Lat. dōnum, OInd. dānam, etc.	(*e-grade)

§4. Following Møller's interpretation of DS \*Ô as a laryngeal, Kuryłowicz (1935) identified \*ə<sub>3</sub> with Ĥi. ĥ, thus laying the basis for LT \*h<sub>3</sub>.<sup>298</sup>

### 2.3.9 Problems of the reconstruction of Neogr. \*ō

§0. The Neogrammarian postulation of the vowel Neogr. \*ō is problematic only in terms of its behaviour in the new environment PIE \*ĥ. However, Saussure's restructuring of Neogr. \*ō ≡ DS \*eô is erroneous. Beginning with its flawed strategy of eliminating PIE \*o, the path led to inconsistency and trivialization of the laryngeal theory.

§1. The colouring effect attributed to the laryngeal h<sub>3</sub> ≡ DS Ô results in an impossibility, as pointed out by Pedersen (1938:180-1):

"Vielfach nimmt man drei Formen der Grundstufe (ē, ā, ō) und damit drei verschiedene Laryngale an; es lässt sich aber wenigstens nicht streng Beweisen, dass ō je Grundstufe ist; δίδωμι lässt sich für diese Ansicht (KURYŁOWICZ Ét. 30<sup>1</sup>) nur dann verwerten, wenn man lat. dās und lit. dovanà hinwegerklärt."

In general, if LT h<sub>3</sub> has been postulated for a root, its dominant 'o-colouring' excludes the actually attested data with Neogr. \*ā and/or \*ĕ. This incompleteness, in turn, trivializes the theory, because from a comparative point of view a postulate with such an excess of material cost is of no interest.<sup>299</sup>

<sup>298</sup> For LT h<sub>3</sub>, see Beekes (1969:128, 166-168, 290) and 1972, Kuryłowicz (1956:168, 1968:205), Mayrhofer (1986:141), Melchert 1987, and Zeilfelder (1997:188f.).

<sup>299</sup> The claims of the secondary nature of paralleled root forms like Lat. dā- = Li. do- = Arm. ta- (see Cowgill 1965:145) are circular.

§2. According to Wyatt (1964:146), Saussure's equation Gr. δατός = Lat datum violates the principle of the regularity of sound change. Indeed, it is not proper to compare the colourings  $\check{a} \neq \check{o}$  in languages preserving such oppositions. The root vocalism of Lat. *dātum* is identical with that of Gr. δάτος, and the vocalism of Gr. δατός is identical with that of Fal. Douiat and Umbr. pur·douitu, with the latter corresponding to Cypr. δατέναι (= RV. *dāváne*) in terms of the extension \*·u- and vowel quality.

§3. Saussure's \* $\hat{O}$  (= LT \* $h_3$ ) was postulated with the help of incomplete ablaut bases, with the result that the postulate is automatically eliminated through the attested Indo-European vocalisms. It needs not concern us further here.

### 2.3.10 Neogr. \* $\bar{o}$ $\equiv$ PIE \* $\bar{o}$ , \* $\check{h}a\bar{o}$ , \* $\check{a}h\bar{o}$ , \* $\bar{o}h\check{a}$ or \* $\bar{o}a\check{h}$

§0. The vowel Neogr. \* $\bar{o}$  has a twofold origin in Proto-Indo-European:

(a) PIE \* $\bar{o}$  as part of the ablaut pattern PIE \* $\check{o}$  :  $\emptyset$  :  $\check{e}$  and not in environment PIE \* $\check{h}a$ , \* $\check{a}h$ .

(b) PIE \* $\bar{o}$  in environment PIE \* $\check{h}a$ , \* $\check{a}h$  (in PIE \* $\check{h}a\bar{o}$  \* $\check{a}h\bar{o}$  \* $\bar{o}h\check{a}$  \* $\bar{o}a\check{h}$ ). Following the loss of PIE \* $a$  and PIE \* $\check{h}$ , all prototypes collided with Indo-European \* $\bar{o}$  in languages sharing such changes. Based on the outcomes of the collision, PIE \* $a$  did not have a colouring effect on PIE \* $\bar{o}$  (i.e. PIE \* $\bar{o}$  was not assimilated into PIE \* $a$ ).

§1. The existence of PIE \* $\bar{o}$  as a part of the pattern PIE \* $\check{o}$  :  $\emptyset$  :  $\check{e}$  without the laryngeal is confirmed by the correspondence type Do. πῶδ- : Go. *fotu-* with Old Anatolian parallels (cf.  $\check{H}i$ . *pada-* (c.) 'foot'), excluding the laryngeal. The ablaut pattern appears, for instance, in:

(a) Neogr. \* $\bar{l}\check{o}gh-$  'liegen' (P. 658-9)

$\check{H}i$ . <i>laga-</i>	(vb2M.) 'liegen' (HEG 2:16, $\check{H}i$ . <i>la-ga-a-ri</i> [3sg])
Go. <i>lagja-</i>	(vb.) 'τιθέναι : legen' (GoEtD. 233)
Gr. <i>ναυ·λοχέω</i>	(pr.) 'to lie in harbour or creek' (LSJ. 1162)
OIcl. <i>lög-</i>	(n.) 'Lagerbestand für einen Tag' (ANetWb. 364)
OHG. <i>luog-</i>	(n.) 'Höhle, Lager' (WH 1:768, <i>luog</i> [sgN])
OCS. <i>vũ·laga-</i>	(iter.) 'hineinlegen' (Sadnik $\sqrt{444}$ , <i>vũlagati</i> [inf.])

(b) Neogr. \* $\bar{l}\check{o}dh-$  'prosper' (P. -)

HLu. ARHA <i>lada-</i>	(vb.) 'prosper (?)' (CHLu. 10.16.1, ARHA <i>la-tà-ta</i> )
OIcl. <i>lōð-</i>	(f.n.) 'Ertrag, Frucht' (ANetWb. 362, OIcl. <i>lōð</i> [sgN])
Lyc. <i>lada-</i>	(c.) 'Frau' (Pedersen 1945:15-6, <i>lada</i> [sgN])
Rus. <i>láda</i>	(c.) 'Gemahl(in)' (REW 2:5, <i>láda</i> [sgN])
Rus. <i>ládi-</i>	(vb.) 'passen, stimmen, usw.' (LiEtWb. 328, <i>ladit'</i> [inf.])

(c)  $\sqrt{pt}$ - 'fly, fall' (P. 825-6,  $\check{H}i$ . *peta-* (vb1.) 'fliegen', in  $\check{H}i$ . *píd-da-an-zi* [3pl])

PIE * $\bar{p}\check{o}t-$	Gr. <i>πυτάομαι</i> 'flattern'	: RV. <i>pātáyā-</i> (WbRV. 762)
PIE * $\bar{p}ot-$	Gr. <i>πυτέομαι</i> 'flattern'	: RV. <i>patáyā-</i> (WbRV. 762)

PIE \*pt-            Gr. ἔπτετο ‘flug’                            : LAV. ptaṭ (AIWb. 819-21)

§2. The existence of this ablaut type implies that both the Neogrammarian ablaut schemata (Neogr. \*ō : ə) and its laryngeal counterpart (LT \*eh<sub>3</sub> : h<sub>3</sub>) were not adequate: PIE \*ō also appears independently of PIE \*h<sub>1</sub>a, ah<sub>1</sub>, and PIE \*ō alone does not justify the postulation of schwa (and/or its laryngeal counterpart).

§3. PIE \*oh<sub>1</sub> resulted in a short vowel, except in Indo-Iranian open syllables (see Brugmann’s Law II). Consequently, compensatory lengthening does not explain the common Indo-European quantity in PIE \*dah<sub>1</sub>- ‘geben’ (P. 223-6):

Neogr. \*dō-        :            Lat. dōnum, RV. dāná-, OCS. danŭ, OIr. dān, etc.

In the absence of lengthening, only the quantity PIE \*ō can account for the long quantity of the cognates. Accordingly, the traditional view (supported by Szemerényi and others) is to followed.

§4. Some roots with PIE \*ō tantum, the long equivalents of Szemerényi’s roots in PIE \*o, are implied by the material. An example of such root has been preserved in

√h<sub>1</sub>āōl- ‘Zeit, Tag, Jahr, Mal’ (P. –):

Hlu. h <sub>1</sub> ali-	(sb.) ‘day’ (CHLu. 10.11.17, ha-li-i [plA])
CLu. h <sub>1</sub> ali-	(sb.) ‘Tag’ (DLL. 38, h <sub>1</sub> al-li-ia [sgD])
OInd. par āri	(adv.) ‘in the year before last’ (MonWil. 589)
Lat. ōlim	(adv.) ‘einmal, einst, zuweilen’ (WH 2:206-7, ōlim)
OInd. par āritna-	(a.) ‘belonging to the year before last’ (P. 24 [diff.])

PIE \*ō can be postulated throughout. As a separate non-ablauting \*ō would constitute a violation of the rule of the ambiguity, it should be avoided.

## 2.4 Vowels Neogr. \*e and \*ē and *H<sub>1</sub>i. h*

### 2.4.1 Introduction and definitions

§1. The Neogrammarians postulated two cover symbols for the front vowels Neogr. \*e (= \*a<sub>1</sub>) and Neogr. \*ē, referred to by means of the term ‘e-vocalism’. In this section, the comparative interpretation of the phonemes – both independently and in environment PIE \*h – will be inferred.

### 2.4.2 The reconstruction of Neogr. \*e ≡ Gr. ε : OInd. a

§0. Following the contributions of Curtius (1864) and Amelung (1871), Brugmann’s reconstruction (1876) finally established an original front vowel Neogr. \*a<sub>1</sub> (= \*e) for the proto-language.

§1. Brugmann (1876b:363ff.) defined the cover symbol \*a<sub>1</sub>:

Neogr. \*\*a<sub>1</sub>        ≡            Gr. ε, Lat. e, OIr. e, Arm. e, Li. e, OInd. a, Av. a, etc.



§2. According to Brugmann's (Grundr<sup>2</sup> 1:114-131, KVG:71-72) phonetic interpretation, the cover symbol \*a<sub>1</sub> stands for a short front vowel Neogr. \*e preserved, for example, in:

Neogr. *bherō :	OInd. bhārāmi, Arm. berem, Gr. φέρω, Lat. fero
Neogr. *ne :	OInd. ná, Lat. ne ·scio, Go. ni, Li. nè, OCS. ne
Neogr. *senti :	OInd. sánti, Arm. en, Do. éntí, Umbr. sent, Go. sind

§3. According to Brugmann, the vowel \*e stands in ablaut relation with Neogr. \*o (= \*a<sub>2</sub>) and zero-grade Ø, forming a threefold ablaut pattern Neogr. \*e : Ø : \*o (e.g. in Neogr. \*bher- 'tragen, bringen' (P. 128ff.)):

*e	*bher- :	Lat. fert, Hom. φέρτε, RV. bhárti, gAv. barətū
Ø	*bhr̥- :	LAv. bərət-, OPers. <sup>h</sup> u ·barta-, RV. bhr̥tí-
*o	*bhor- :	Go. bar, Gr. φόρος, OCS. sŭ ·borŭ, Lat. fors

§4. In the 1870s, a confirmation for Neogr. \*e was obtained through the formulation of the law of the palatals,<sup>300</sup> according to which Neogr. \*k and \*k<sup>h</sup> collided in Satem \*k. These split into a palatal and a velar, according to the historical quality ('front' vs. 'back') of the following phoneme, resulting in

OInd. c, Av. č, OCS. č, etc.	OInd. k, Av. k, OCS. k, etc.
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Owing to this complementary distribution, the Sanskrito-centric reconstruction of palatal stops (e.g. OInd. c, j, jh) practiced by some Paleogrammarian was abandoned. As a consequence of this development, it is necessary to reconstruct at least two different full-grade vowels, a palatalizing vowel PIE \*e and a non-palatalizing vowel PIE \*o in opposition (PIE \*e ≠ PIE \*o).

§5. In the Elis dialect of Greek, the pan-Hellenic Gr. ε has turned into α (see Brugmann Grundr.<sup>2</sup> 1:117-118) in a similar fashion as Indo-Iranian. This accounts for Locr. α in examples like the following:

Gr. ἴετος 'Jahr'	: Locr. ἐπί·(Ϝ)ατης	(GEW 1:583)
Do. ἄμερα 'Tag'	: Locr. ἄμαρα	(GEW 1:634)
Gr. ἐσπερίο- 'abendlich'	: Locr. ἴεσπαρίων	(GEW 1:575)
Gr. φέρω 'tragen'	: Locr. φάρω	(GEW 2:1003f.)
Gr. ἐρέσσω 'rudern'	: Locr. ἐράττω (a month)	(GEW 1:129,553)

The Old Anatolian parallels lacking a laryngeal (cf. Hi. uḫt- 'Jahr' : Gr. ἴετος 'id.') now confirm that Locr. α is not to be explained on the basis of PIE \*h<sub>2</sub>, \*ah<sub>2</sub> (and schwebeablaut), but through a separate sound law PGr. \*ε → Locr. α.

<sup>300</sup> The law of the palatals ('Palatalgesetze'), an idea that was in the air at the time, has been credited to various authors.

### 2.4.3 Problems of the reconstruction of Neogr. \*e

§0. The problems related to the laryngeal PIE \*h and its connection to PIE ablaut patterning have resulted in a situation in which the cover symbol Neogr. \*e requires additional clarifications for a successful reconstruction of the data.

§1. The fundamental (and single most difficult) problem of the (Proto)-Indo-European ablaut is the commonplace alternation Neogr. \*e : \*ə a ā<sup>301</sup> in correspondences. Up to this point, the problem has remained unsolved by all theories, despite the availability of Old Anatolian parallels.

§2. The traditional (Neogrammarian) theory lacks both functioning patterns for the description of the ablaut Neogr. \*e : \*ə a ā, as well as the reconstruction phoneme PIE \*h. As a result, the theory is outdated and can serve only as the starting point for necessary explication.

§3. The monolaryngealism has PIE \*h, but in its preliminary formulation (Zgusta) all attested vocalisms, including Neogr. \*e : \*ə a ā, are reconstructed without PIE ablaut patterning underlying the surface level of the Indo-European vocalism. Consequently, this theory also needs to be improved in terms of the ablaut.

§4. In contrast to these problems of the laryngeal theory are of internal (or self-inflicted) character:

(a) The ubiquitous colouring rule of \*h<sub>2</sub> of the three-laryngealism is in contradiction with the adjacent short PIE \*e in examples of the following type:

Hi. ueh-	(vb1A.) ‘sich wenden, usw. (HHand. 200, ú-e-eh-zi)
Umbr. ue-	(vb.) ≈ ‘wenden’ (WbOU. 835-6, uetu [3sg])

In the six-laryngealism of Puhvel (1960, 1965), this problem is obviated by adding the number of laryngeals (in this case, through the postulation of an ‘e-colouring’ laryngeal allegedly preserved in Old Anatolian). However, this modulation of Pedersen’s two-laryngealism does not suffice to solve the problem, because Neogr. \*ə a ā implying PIE \*h (≈ h<sub>2</sub>) recurs in related forms, such as:

Gr. ἄν-	(vb.) ‘winnow’ (Hes. ἄναι · περιπίσαι)
Gr. ἄνω	(vb.) ‘winnow’ (GEW 1:42, GrGr. 1:694, LSJ. 40)

(b) The compensatory lengthening of the laryngeal theory is too strong in the face of the short \*e appearing before the laryngeal in Hi. ueh- = Umbr. ue- defining PIE \*e.

(c) The inconsistencies have led some proponents of the laryngeal theory to denial of the data (e.g. Kuryłowicz (1956:174-187)). However, owing to the considerable number of examples, which sufficiently establish the phenomenon,<sup>302</sup> such tacks are

<sup>301</sup> For the ablaut Neogr. \*ě : \*ǎ, see Pedersen (1938:168-169 [wL.]), Hirt (1900:15), Lindemann (1997:80-88), Mayrhofer (1986:132-) and Kuryłowicz (1956:174-187).

<sup>302</sup> Among others, the alternation – confirmed by parallels – is attested in the comparisons Hi. raḥur/n- (n.) ‘Feuer’ (TochA. por) : OHG. fiur; Lat. iaciō ‘throw’ : Lat. iēcī (Gr. ἵκα); Lat. capiō (Gr. κάπτω) : Lat. cēpī; Lat. faciō (Phryg. ἄδακαετ) : Lat. fēcī (Gr. ἔθηκα); and Lat. magnus (MidIr. ma<sup>l</sup>ge) : Gr. μέγα (Arm. mec).

less attractive. After all, the ultimate goal is the solution of the problem, and as the comparative method is the tool designed for the purpose, one should have no doubt about proceeding in this manner instead.

#### 2.4.4 Neogr. \*e ≡ PIE \*e v \*eḥa v \*aḥe

§0. The fundamental problem of the cover symbol Neogr. \*e is its connection to the laryngeal PIE \*h and the ablaut Neogr. \*e : \*ə a ā. This problem is solvable with the following definitions for the traditional cover symbol in System PIE:

Neogr. \*e       ≡       PIE \*e v PIE \*eḥa v PIE \*aḥe.

The correctness of the solution will be demonstrated for each term of the disjunction.

§1. The subset Neogr. \*e ≡ PIE \*e represents the correspondence type characterized by the common Proto-Indo-European \*e and the absence of the Old Anatolian laryngeal (or any other criteria implying PIE \*ḥa or PIE \*aḥ in the rest of the group). The vowel referred to is preserved, for instance, in

Neogr. \*g<sup>u</sup>hen- ‘schlagen, usw.’ (P. 491-3):

Ḫi. g <sup>u</sup> en-	(vb.) ‘schlagen, erschlagen, töten’ (HHand. 81)
RV. hán-	(pr.) ‘(er)schlagen, kämpfen’ (WbRV. 1642)
gAv. jǎn-	(pr.) ‘schlagend treffen’ (AIWb. 492)

Reflecting the original Neogrammarian definition, the correspondence set Neogr. \*e ≡ PIE \*e has been correctly defined since that time and requires no further comment.

§2. The subset Neogr. \*e ≡ PIE \*eḥa represents PIE \*e (as defined above), followed by PIE \*ḥa. The following features characterize the subset:

1. In Old Anatolian the laryngeal Ḫi. ḥ has been preserved as such and the vowel PIE \*a has been lost without assimilation of the neighbouring PIE \*e.

2. In the rest of the group, both PIE \*a and PIE \*h have been lost without assimilation (or ‘colouring effect’) or compensatory lengthening of PIE \*e. In addition, the languages that preserve the oppositions Neogr. \*ə a ā often indicate this vocalism by means of the schwebeablaut.

Both treatments, which are supported by measurable features of the data, have been preserved in examples like

(a) PIE \*ueḥa- ‘wenden’:

Ḫi. ueḥ-	(vb1A.) ‘sich wenden, usw.’ (HHand. 200, ú-e-eḥ-zi)
Umbr. ue-	(vb.) ≈ ‘wenden’ (OUD. 835-6, uetu [3sg])

As can be readily seen, the Old Anatolian laryngeal has been preserved, but there is no colouring effect (Ḫi. e = Umbr. e) or compensatory lengthening (Umbr. e). In addition, the extensions \* -n- and \* -t- confirm PIE \*a in the assimilated Gr. α (Lat. a):

Ḫi. ueḥan-	(n.) ‘Wenden, Wendung’ (HHand. 191, ueḥanaš [sgG])
Gr. φᾶν-	(vb.) ‘winnow’ (Hes. φᾶναι · περιπίσαι)

Gr. $\alpha\acute{\iota}\nu\omega$	(vb.) ‘winnow’ (GEW 1:42, GrGr. 1:694, LSJ. 40)
Lat. uanno-	(m.) ‘Futterschwinge’ (WH 2:731, uannus [sgN])

In this way, the following stems can be reconstructed:

PIE *ueḥa-	→	Ḥi. ueḥ- (Ḥi. ueḥzi), Umbr. ue- (Umbr. uetu)
PIE *ueḥa-č̣n-	→	Ḥi. ueḥan- (Ḥi. ueḥanaš), Gr. $\text{ῥ}\acute{\alpha}\nu$ - (Hes. $\text{ῥ}\acute{\alpha}\nu\alpha$ )

(b) PIE \*meḥa- ‘time, noon, zenith’ (P. 703-704):

PIE $\sqrt{\text{meḥa}}$ -n-	
Ḥi. meḥn-	(n.obl.) ‘Zeit’ (HEG 2:171, me-eḥ-ni [sgL])
Go. aldo·min-	(m./n.) ‘ $\gamma\eta\rho\alpha\varsigma$ : old age’ (GoEtD. 25)
Lat. mān-	(adv.) ‘am Morgen’ (WH 2:25, mānī [adv.])

As in the previous example, the following stems can be reconstructed:

PIE *meḥa·n	→	Ḥi. meḥn- (Go. aldo·min-)
PIE *meḥa-č̣n-	→	Lat. mān- (Lat. mānī)

§3. The subset Neogr. \*e  $\equiv$  PIE \*aḥe represents PIE \*e (as defined above), following PIE \*aḥ. The following features characterize the subset:

1. In Old Anatolian the vowel PIE \*a has been lost without assimilation (or ‘colouring effect’) of the neighbouring PIE \*e, and the laryngeal Ḥi. ḥ is preserved as such.

2. In the rest of the group, both PIE \*a and PIE \*ḥ have been lost without assimilation (or ‘colouring effect’) or compensatory lengthening of PIE \*e. In addition, the languages that preserve the distinctions Neogr. \*ə a ā often indicate that vocalism.

Both treatments, which are supported by measurable features of the data, have been preserved in

PIE \*aḥeg<sup>u</sup>- ‘peak, top, stronghold, strong’ (P. 8-9):

Ḥi. ḥegu <sup>r</sup> /n-	( <sup>NA4</sup> n.) ‘peak, stronghold’ (HEG 1:235, ḥé-gur)
RV. ágra-	(n.) ‘Spitze, äußerstes ende, Gipfel’ (EWA 1:45f.)
RV. agrimá-	(a.) ‘an der Spitze stehend, erster’ (KEWA 1:18)

In addition, Lat. agrippa (WP 1:38ff.) is based on the zero grade of the root PIE  $\sqrt{\text{aḥg}}^u$ - with prothetic \*e PIE \*eaḥg<sup>u</sup>-, implying PIE \*a through assimilation.

§4. In connection with the definition

$$\text{Neogr. *e} \quad \equiv \quad \text{PIE *e } \vee \text{ *eḥa } \vee \text{ *aḥe} \quad (\text{System PIE}),$$

the following general remarks should be noted:

(a) The lack of assimilation in examples of OAnat. eḥ ḥe with etymological PIE \*e (versus PIE \*i) and other Indo-European data provides the criterion for deciding whether PIE \*ḥa or PIE \*aḥ should be reconstructed for a root: Ḥi. ueḥ- (vb.) ‘sich wenden, etc.’ implies PIE \*ḥa (rather than PIE \*aḥ), because PIE \*e has not been assimilated and the position of PIE \*á is thus confirmed.

(b) Following the loss of PIE \*a and PIE \*h, PIE \*eḥa results in a short vowel (Umbr. e, Go. i, etc.), as is the case with PIE \*eaḥ (i.e. no compensatory lengthening takes place, regardless of the mutual order of PIE \*a and PIE \*h following PIE \*e).

(c) The absence of any colouring effect (assimilation) is a regular feature in System PIE: with PIE \*h standing between PIE \*e and PIE \*a, there was no immediate contact between the vowels and assimilation was thus prevented.

(d) As they are of particular relevance for the reconstruction of the material, it should be underlined that PIE \*a and PIE \*h (i.e. diphonemic PIE \*ḥa and PIE \*aḥ) were lost practically without trace in the later Indo-European languages, as illustrated by the examples:

I : PIE	II : OAnat.	III : Later IE
PIE *ueḥa-	Ḥi. ueḥ- ‘sich wenden’	Umbr. ue- ‘wenden’
PIE *meḥan-	Ḥi. meḥn- ‘time, noon’	Go. min- ‘Zeit’

In practice, this means that the laryngeal PIE \*h can be found in practically any position where Neogr. \*e is traditionally reconstructed. A systematic and comprehensive re-evaluation of all the material, based on the measurable criteria for PIE \*h and PIE \*a in the cognates, is urgently required. In order to illustrate the identification and use of the criteria in philological and comparative inference, the root Neogr. \*seu- ‘(yellow) liquid’ (P. 912) may be cited. Within the data, five criteria for PIE \*h and \*a are attested:

1. PIE \*seḥau- ‘Soma, Urin, Schmutz’:

RV. só-	(ao.) ‘Soma pressen, keltern’ (WbRV. 1523, sóta [2pl])
Ḥi. šeḥu r/n-	(n.) ‘Urin, Schmutz’ (HEG 2:973-7, še-e-ḥur [sgNA])
Ḥi. šeḥu kaniauant-	(pt.) ‘mit Urin (šeḥu-) befleckt’ (HEG 2:972)

PIE \*eḥ is directly confirmed by Hittite, but there is no colouring effect or compensatory lengthening in the Rig-Veda.

2. PIE \*shæu- ‘Flußname’ with Neogr. \*a appears in the assimilated root vowels of

Illyr. sauo-	(m.) ‘Flußname’ (P. 912-3, Illyr. sauus [sgN])
OGaul. sauā-	(f.) ‘Flußname’ (P. 912-3, OGaul. saua [sgN]),

thus implying PIE \*ḥa for the root.

3. In PIE \*o-grade (for a perfect verb and a noun), the lengthening of Brugmann’s Law II can be claimed for Indo-Iranian in

PIE \*soḥau- ‘Soma pressen’:

RV. susáv-	(pf.) ‘Soma pressen’ (WbRV. 1523, suṣáva [3sg])
RV. sāvá-	(m.) ‘Somapreßung, Somaspende’ (WbRV. 1513)

4. PIE \*h and PIE \*a are simultaneously confirmed by the form RV. sómam [sgA], requiring a scansion CV̇V:CV in RV. 4.26.7:

RV. sā`ú ma-	(m.) ‘Soma’ (WbRV. 1579, sómam [three-syllabic])
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Hĩ. šeḥu-r/n- (n.) ‘Urin, Schmutz’ (HEG 2:973-7, še-e-ḥur [sgNA])

Here the quantity RV. *ú* points to an assimilation of the accented PIE \**á* into the following PIE \**u*: PIE \**seḥáumo-* → PIIr. \**sa<sup>h</sup>úma-*.

5. The quantity RV. *ú* is confirmed by other branches in PIE \**sháu-Σ-* ‘regnen, schütten’:

Hĩ. eṣḥuna- (vb.) ‘schütten, werfen’ (HEG 1:391, iṣ-ḥu-na-u-ua-ar)  
 TochA. sūmān- (pt.M.) ‘regnend’ (Poucha 375, sūmām [sgN])  
 Latv. sūlā- (vb) ‘siepen’ (P. 913, sūlāt [inf.]

The common Indo-European /*ū*/ ← *ú* ← PIE \**háu* reflects PIE \**á*, in contrast with the loss of unaccented PIE \**a* in PIE \**shau* (cf. RV. *susumá* [1pl], WbRV. 1523).

§5. In practice, PIE \**ha* and PIE \**aḥ* are often implied by several witnesses, all mutually supporting each other: PIE \**h* is implied by the Hittite laryngeal (√*šeḥu-*) and confirmed by Rig-Vedic hiatus (RV. √*sá’ú-*), while PIE \**a* is implied by ‘a-colouring’ (OGaul. √*sau-*) and confirmed by the long diphthong (TochA. √*sū-* : RV. √*sá’ú-*). Both PIE \**h* and PIE \**a* in PIE \**ha* are thus proven by two witnesses (Fick’s Rule). In a similar manner, the diphonemic PIE \**ha*, *aḥ* solves all irregularities within the framework of a single laryngeal PIE \**h*.

## 2.4.5 Reconstruction of Neogr. \**ē* ≡ Gr. *η* : OInd. *ā*

§0. Neogr. \**ē*, the long variant of Neogr. \**e*, replaced Paleogr. \**ā* as the eighth cover symbol for the vowels in the Neogrammarian vowel system.

§1. For the long front vowel Neogr. \**ē*, Brugmann reconstructed

Neogr. \**ē* Gr. *η*, Lat. *ē*, Go. *e*, Li. *ė*, OCS. *ě* : OInd. *ā*, Av. *ā*.

Brugmann provided the following (Grundr.<sup>2</sup> 1:131-137; KVG 72-74) examples for the correspondence:

OInd. *ádhām* : Arm. *e·di*, Go. *ga·dēþs*, Lat. *fēcī*, OCS. *děti*, ...  
 OInd. *prātá-* : Gr. *πλήτο*, Lat. *plēnus*, Alb. *pl’ot*, Arm. *li*, ...  
 OInd. *syás* : Gr. *εῖς*, OLat. *siēs* [opt2sg], ...

§2. In the Neogrammarian system, Neogr. \**ē* stood in ablaut with Neogr. \**ə* in an identical manner as the two other quantities Neogr. \**ō* and \**ā*. According to Brugmann, the pattern appears, for instance, in Neogr. \**plē-* ‘voll’ with an alleged zero grade:

\**pləist(h)o-* : Av. *fraēšta-* ‘plurimus’ : OIcl. *flestr* ‘id.’ (Grundr. 12:173).<sup>303</sup>

<sup>303</sup> Note that Brugmann’s example is ill-chosen: Gr. *πλεῖστο-* (sup.) ‘meist’ (GEW 2:556) has no schwa.

§3. In addition, according to Brugmann (Grundr<sup>2</sup> 1:174-175), the vocalism of Gr. θετός is Neogr. \*e, thus standing in ablaut with Neogr. \*ē (Gr. τίθημι) as Neogr. \*o : \*ō in Gr. δοτός : δίδωμι.<sup>304</sup>

§4. With the two coefficients A, Ô and compensatory lengthening, Saussure (1878, Rec. 133) found himself in trouble with the remaining quantity Neogr. \*ē. Saussure suggested Neogr. \*ē = \*eA (Rec. 133- = 1878:141), but having already posited DS \*eA = Neogr. \*ā, the idea violated the principle of the regularity of sound change: it is not allowed for an identical starting point to develop in two different directions in an unchanged environment.

§5. Møller (1879), seeking additional laryngeals for his Indo-Semitic hypothesis, suggested that yet another, additional item \*E was to be postulated for Neogr. \*ē = \*\*eE, patterning as:

*dheE :	Gr. τίθημι :	Lat. fēcī :	OInd. didhāti
*dhE :	Gr. θετό- :	Lat. faciō :	OInd. hitá-, etc. <sup>305</sup>

Thus, at least on paper, Møller succeeded in eliminating the long vowels Neogr. \*ā, ō, ē with compensatory lengthening and three ‘colouring’ laryngeals \*eE, eA, eO (= LT \*eh<sub>1</sub>, eh<sub>2</sub>, eh<sub>3</sub>).<sup>306</sup>

§6. In the dialect of Elis (Grundr.<sup>2</sup> 1:132), the common Greek η (Do. φρήτρα = Att. φήτρα) has turned into ā (El. φράτρα). The phenomenon does not imply PIE \*h<sub>a</sub>, ah, but corresponds to the respective development of the short vowel Gr. ε → El. α.

## 2.4.6 Problems of the reconstruction of Neogr. \*ē

§0. The problems of the reconstruction theories in the treatment of the cover symbol Neogr. \*ē closely resemble those of its short counterpart, Neogr. \*e.

§1. Though correctly postulated, the traditional (Neogrammarian) interpretation of the cover symbol Neogr. \*ē is outdated owing to the emergence of the Anatolian laryngeal (= PIE \*h<sub>a</sub> \*ah) and the defect ablaut patterns attached to the item.

(a) In particular, the Neogrammarian ablaut pattern Neogr. \*ē : ə lacks justification for the same reasons as Neogr. \*ō : ə. Nothing in Neogr. \*ē itself requires Neogr. \*ə (= PIE \*h<sub>a</sub>, ah), because the ablaut pattern PIE \*ē : e : Ø did appear without PIE \*h (i.e. the pattern Neogr. \*ē : ə overgenerates schwa). In order to illustrate this, the

<sup>304</sup> Rather than admitting this, Brugmann (Grundr<sup>2</sup> 1:174-175) sought to explain the Greek ‘e-vocalism’ by means of analogy: “In den Formen [...] liegt Umfärbung des ε im Anschluss an die Formen mit η (τίθημι) und ω (δίδωμι).”

<sup>305</sup> Møller (1879:151n1) writes: “Saussure stellt ausser dem A noch ein zweites wurzelhaftes element derselben art auf für wurzeln wie stufe 1 und 2 δω-, stufe <sup>o</sup>δο-, und er hätte für wurzeln wie stufe 1 θη- germ. dē-, 2 germ. dō-, <sup>o</sup>θε- skr. hī- lat. a in ratus, satus (s. 140ff.) nach meiner ansicht noch ein drittes aufstellen sollen. Diese wurzelhaften elementen werden als consonantische (A die tönende, E die tonlose kehlkopfspirans?, O das kehlkopf-r?) aufzufassen sein.”

<sup>306</sup> On Møller’s contribution to the laryngeal theory, see Szemerényi (1973:1-2, 5-8).

ablaut \*ē : e : Ø without schwa/laryngeal is attested in prefixed (V)C, interdigitated C(V)C and suffixed C(V) positions as follows:

1. (V)C- \*reaḥn- ‘Freude’ (with Neogr. \*ran-, \*e·ran-, \*ē·ran-):

RV. ráṇa-	(m.) ‘Ergötzen, Lust, Freude’ (WbRV. 1135-6)
Gr. ἔ·ρανο-	(m.) ‘Freundesmahl, Schmaus’ (GEW 1:547)
Gr. ἐπι·ή·ρανο-	(a.) ‘gefällig, angenehm, willkommen’ (GEW1:641)

2. C(V)C- \*ueḡh- ‘fahren, führen’ (ablaut Neogr. \*uḡh-, \*ueḡh-, \*uēḡh-):<sup>307</sup>

RV. ní (...) uh-	(aoM.) ‘zuführen’ (WbRV. 1243, ní (...) uhīta [opt3sg])
Gr. φέχο-	(vb1.) ‘bringen’ (GEW 1:604, Pamph. φεχέτω [3sg])
Lat. uēx-	(pf.) ‘fahren, führen, tragen, bringen’ (WH 2:742, uēxī)

3. C(V)- \*dhē- ‘set’ (Neogr. \*dh-, \*dhe-, \*dhē-):

RV. dadh-	(pf.) ‘einsitzen, aufrichten’ (WbRV. 670, dadhús [3pl])
Gr. θετό-	(pt.a.) ‘adoptiert’ (GEW 2:897, θετός [sgN]) <sup>308</sup>
Gr. τίθη-	(pr.) ‘setzen, legen’ (GEW 2:897-8, τίθημι [1sg]) <sup>309</sup>

The Neogrammarian ablaut schema Neogr. \*ē : ə is unacceptable because nothing in the vowel \*ē as such justifies the postulation of schwa (and/or the laryngeal).

(b) Several Indo-Iranian suffixes -i- generated by the ablaut schemata Neogr. \*ē : ə have been interpreted as automatically representing Neogr. \*ə despite the ambiguity of OInd. i (= Neogr. \*i or \*ə). In practice, however, all instances must be settled through comparison. Thus, for instance,

RV. api·dhí-	(m.) ‘Bedeckung’ (WbRV. 76, apidhín [plA])
--------------	--------------------------------------------

does not necessarily contain Neogr. \*ə (cf. Lat. faciō ‘machen, usw.’ WH 1:440-4) or <sup>h</sup>h<sub>1</sub>, owing to the comparatively confirmed PIE \*i- in:

√dhi- ‘setzen’ (ablaut \*dhei- \*dhoi-)

Ḥi. dei-	(pf.) ‘setzen, legen’ (HEG 3:19-23, de-iḥ-ḥi [1sg])
Ḥi. dai-	(pf.) ‘setzen’ (HEG 3:19, ta-it-ti [2sg])
RV. iṣu·dhay-	(m.obl.) ‘Köcher-’ (WbRV. 277, iṣudhés [sgG])
LAv. ni·ḍaya-	(pr.) ‘niedersetzen’ (AIWb. 721, niḍayeinte [3pl])
RV. iṣu·dhí-	(m.) ‘Köcher’ (WbRV. 277, iṣudhís [N], iṣudhín [plA])
RV. dadhi-	(red.pf.) ‘setzen’ (WbRV. 670, dadhimá [1pl])
OḤi. ziki-	(iter.) ‘festsetzen’ (HEG 3:19, zi-ik-ki-iz-zi [3sg])

<sup>307</sup> The lack of a laryngeal in the root is proven by HLu. uaza- (vb.) ‘carry’ (CHLu. 2.11.7, HLu. PES<sub>2</sub>(- )w<sup>a</sup><sub>1</sub>-za-ha [1sg]).

<sup>308</sup> The Greek normal grade is confirmed in RV. dhána- (n.) ‘Kampfpfeis, Beute, Schatz, Reichtum, Gut’ (WbRV. 654) with Neogr. \*dhéno- or \*dhóno-.

<sup>309</sup> Bammesberger (1984:30) clarifies: “Für die Umbildung der Paradigmata müssen in erster Linie die horizontalen Reihen betrachtet werden. Gegenüber der Wurzel ḡh- konnte 3. Pl. ḡhnt (I) den Eindruck erwecken, als läge hier ein quantitativer Ablaut ē : ě vor. In ähnlicher Weise schien das nt-Part. ḡhnt- (II) gegenüber der Wurzel ḡh- einen Ablaut ḡ : ḡ aufzuweisen. Bei der Wurzel ḡh- war der dem ā entsprechende Kurtzvokal a regelrecht im Optativ ḡh-nt- und to-Part. ḡh-nt-ós vorhanden.”



The extension has normal ablaut grades, PIE \*e in  $\check{H}i$ .  $\sqrt{dei}$ -, PIE \*o in  $\check{H}i$ .  $\sqrt{dai}$ - and zero grade in  $O\check{H}i$ .  $\sqrt{zi}$ - (= RV. *dhi*-).

§2. The monolaryngealism lacks meaningful ablaut patterns, explaining the surface-level vocalism of the Indo-European languages, and it also needs to be developed in relation to the vowel SZ \*ē.

§3. Møller's analysis of Neogr. \*ē ≡ \*\*eE (à la Saussure's eA and eÔ) and the generalization of the Neogrammarian ablaut schemata have created an inconsistency in the laryngeal theory: Compensatory lengthening did not take place in PIE \*e $\check{h}$  (see above) and there is no reason to expect a lengthening in Møller's \*eE either, especially as it contains the erroneously postulated \*E (= LT  $\check{h}_1$ ).

### 2.4.7 Neogr. \*ē ≡ PIE \*ē v \*ē $\check{h}a$ v \*a $\check{h}ē$

§0. The comparative interpretation of the cover symbol Neogr. \*ē matches that of Neogr. \*e, except for the long quantity. Accordingly, for the traditional long front vowel the following definition holds:

Neogr. \*ē ≡ PIE \*ē v PIE \*ē $\check{h}a$  v PIE \*a $\check{h}ē$  (System PIE).

In general, the treatment of the subsets is identical to the respective short ones, except that there is no confirmed quantity available in Old Anatolian. Therefore, the traditional Indo-European material is utilized in examples.

§1. The subset Neogr. \*ē ≡ PIE \*ē represents the correspondence type characterized by the continuation of PIE \*ē and the absence of an Old Anatolian laryngeal or any other criteria implying PIE \* $\check{h}a$  v PIE \*a $\check{h}$  in the rest of the group. The situation is preserved, for instance, in

RV. <i>vákṣ-</i>	(s.ao.) 'zuführen' (WbRV. 1243, <i>ávāt</i> [2sg])
Lat. <i>uēx-</i>	(pf.) 'fahren, führen, tragen, bringen' (WH 2:742, <i>uēxī</i> )
OCS. <i>věs-</i>	(s.ao.) 'fahren' (Sadnik $\sqrt{1063}$ , <i>věsu</i> [1sg])

In the absence of the laryngeal in Old Anatolian (cf. HLu. *uaza-* (vb.) 'carry' (CHLu. 2.11.7, PES<sub>2</sub>(-)*w<sup>3</sup>/i-za-ha* [1sg])), an original PIE \*ē not resulting from compensatory lengthening (LT  $\check{h}_1$ ) is reconstructed for Proto-Indo-European.

§2. The subset Neogr. \*ē ≡ PIE \*ē $\check{h}a$  represents PIE \*ē (as defined above), followed by PIE \* $\check{h}a$ . The subset is characterized by the following features: though no confirmed examples from Old Anatolian are available, in the rest of the group both PIE \*a and PIE \* $\check{h}$  have been lost without assimilation (or 'colouring effect'). In addition, the languages that reflect Neogr. \* $\check{a}$  a  $\bar{a}$  often indicate this vocalism and/or some other criteria for the laryngeal. An example of the situation is preserved in PIE \**sē $\check{h}$ amen-* 'Same, Saat' (P. 889f.):

Li. <i>sēmen-</i>	(m.) 'Leinsamen, -saat' (LiEtWb. 774, <i>sēmens</i> )
Lat. <i>sēmen-</i>	(n.) 'Same, Geschlecht, Nachkomme' (WH 2:512)

Umbr. semenia- (f.) ‘Same, Saat’ (WbOU. 662-3, seme.nies [plDAb])<sup>310</sup>

The Lithuanian acute implies the laryngeal,<sup>311</sup> which is confirmed by the ‘a-vocalism’ in PIE \*s<sub>h</sub>aeto-:

Lat. sato- (n.pl.) ‘cultivated plants, offspring’ (OxLatD. 1692)  
 OGaul. sato- (PNm.) ‘Sohn’ (ACSS. 2:1381, satus [sgN])

§3. The subset Neogr. \*ē ≡ PIE \*a<sub>h</sub>ē represents PIE \*ē following PIE \*a<sub>h</sub>. Though no confirmed Old Anatolian examples are available in the rest of the group, both PIE \*a and PIE \*<sub>h</sub> have been lost without assimilation (or ‘colouring effect’). Furthermore, the languages that reflect the quality Neogr. \*ə a ā often preserve this vocalism and/or some other criteria for PIE \*<sub>h</sub>. These circumstances can be exemplified by the isogloss

PIE \*dia<sub>h</sub>ēu- ‘Himmel, Zeus’:

RV. di’áu- (m.) ‘Himmel’ (WbRV. 604, RV. diáuṣ [N])  
 Gr. ζεύ- (d.m.) ‘sky-god, Zeus’ (GEW 1:610-1, ζεύς [sgN])

Here the Rig-Vedic hiatus, implying PIE \*<sub>h</sub>, is supported by the Dorian á in forms without the extension \*·u-:

Do. ζά- (m.) ‘Zeus’ (Schwyzer GrGr. 1:576f., ζάς [N], ζάα [A])  
 RV. dyá- (m.) ‘Himmel’ (WbRV. 604, dyám [sgA])

§4. The long vowels PIE \*ē \*ō are confirmed for Indo-European languages beyond any shadow of a doubt. Attempts to eliminate these by means of compensatory lengthening,<sup>312</sup> accent<sup>313</sup> or other processes have met with failure.<sup>314</sup> Thus, the postulation of laryngeals based on quantity (and the root axiom C<sub>1</sub>eC<sub>2</sub>·C<sub>3</sub>-) is unacceptable in the following correspondence types:

Hi. haša- (c.) ‘Feuerstelle’ (HEG 1:196, ha-aš-ša-aš [sgN])  
 OLat. āsā- (f.) ‘Aufbau zum Opfern, Altar’ (WH 1:61, āsa)

<sup>310</sup> Note that in an archaic spelling of the word Umbr. sehmenia- (f.) ‘Same, Saat’ (WbOU. 662-3, sehmeniar [sgG]), a laryngeal appears exactly in the predicted position.

<sup>311</sup> Since PIE \*e<sub>h</sub>a results in short vowel IE e without compensatory lengthening, the quantity of this class (Lat. ē, Li. ē, etc.) must represent the original state of affairs (i.e. that of PIE \*ē<sub>h</sub>a).

<sup>312</sup> From a typological point of view, Saussure’s compensatory lengthening was baseless from the very beginning, as pointed out by Lindeman (1997:24, fn3): “It should be noted in this connection that, according to St. R. Anderson *Linguistic Inquiry* 12, 1981, 516: ‘Apparently, compensatory lengthening does not arise unless a language already has distinctively long vowels and/or diphthongs [...] languages do not develop a new length contrast solely through the operation of compensatory lengthening.’”

<sup>313</sup> Streitberg (1900:305-415) postulated a compensatory lengthening of a stressed vowel in an open syllable if a following syllable was lost (e.g. <sup>†</sup>pedos → Lat. pēs). This was correctly rejected by Wackernagel (AiGr. 1:68) and Bloomfield (1895:5f.), who referred to many nouns of the \*<sup>h</sup>bhórs type that had survived without becoming <sup>†</sup>bhōrs.

<sup>314</sup> Note that Kuryłowicz (1962:113) later withdrew his earlier ideas: “Die Tatsache, daß auf Grund von Formen mit e-Vokalismus Formen mit der Schwundstufe i, u, mit der Abtönung o, mit der Dehnstufe ē usw. gebildet werden, kann nicht als Beweis gelten, daß sämtliche i, u, o, ē usw. sekundären und relativ späten Ursprungs sind.”

Since compensatory lengthening did not take place, a laryngeal  $h_1$  in LT  $^{\dagger}h_2eh_1s-$  is unmotivated and PIE  $*\text{ha}e\text{s}-$  (Hī.  $\text{ha}\check{s}-$  = OLat.  $\text{ās}-$ ) with PIE  $*\text{ē}$  (Lat.  $\text{pēd}-$ , etc.) is postulated.

## 2.5 PIE Ablaut and PIE $*\text{h}$ in System PIE

### 2.5.1 PIE $*\text{ha}$ , $*\text{ah}$ and the Proto-Indo-European ablaut

§0. The appearance of Neogr.  $*\text{ə}$  (= PIE  $*\text{a}$ ) and Hī.  $\text{h}$  (= PIE  $*\text{h}$ ) in diphenemic PIE  $*\text{ha}$  and PIE  $*\text{ah}$  leads to a breakthrough in the laryngeal problem. In the context of research history, the diphenemic PIE  $*\text{ha}$   $*\text{ah}$  represents a synthesis in which the vocalic aspect of the traditional reconstruction Neogr.  $*\text{p}(\text{ə})\text{ter}-$  ‘father’ and the consonantal aspect of the laryngealist reconstruction LT  $*\text{p}(\text{h})\text{ter}-$  ‘idem’ have been interpolated in a prototype comprised of both components in PIE  $*\text{pa}\text{h}\text{ter}-$ . As the diphenemic PIE  $*\text{ha}$   $*\text{ah}$  suffices to solve all segmental problems of the PIE phonology, the laryngeal crisis of the Indo-European linguistics promises to soon be resolved.

§1. Brugmann’s eight-vowel system

Neogr.  $*\text{ə}$      $*\text{a}$      $*\text{ā}$      $*\text{á}$      $*\text{â}$      $*\text{o}$      $*\text{ō}$      $*\text{e}$      $*\text{ē}$

and the single laryngeal reconstructed on the basis of Old Anatolian

PIE  $*\text{h}$      $\equiv$     Hī.  $\text{h}$ , Pal.  $\text{h}$ , CLu.  $\text{h}$ , HLu.  $\text{h}$

solve the laryngeal problem by combining the traditional Neogr.  $*\text{ə}$  (PIE  $*\text{a}$ ) and the modern reconstructions of PIE  $*\text{h}$  into diphenemic PIE  $*\text{ha}$   $*\text{ah}$ . A measurable trace of PIE  $*\text{a}$  is occasionally preserved in the metric scansion of Rig-Veda, not only proving PIE  $*\text{a}$  but also PIE  $*\text{h}$  with hiatus. By way of illustration, though no Old Anatolian forms of PIE  $\sqrt{\text{ha}}\text{g}\text{-}$  ‘treiben’ (P. 4ff.) have been identified, the diphenemic  $*\text{ha}$  is confirmed by the form

RV.  $\text{pāri}\cdot\text{jman}-$     (m.) ‘Umwandler, Herumwandler’ (WbRV. 785).

The stem requires a four-syllabic scansion in RV. 1.122.3, and as Grassmann’s scansion PIIr.  $^{\dagger}\text{parijamā}$  is impossible (PIIr.  $*\text{a}$  cannot be lost), PIE  $*\text{peri}\text{hag}\text{men}-$  (PIIr.  $*\text{parih}^{\text{ə}}\text{jman}-$ ) remains the sole possible prototype. Since PIE  $*\text{h}$  is required by hiatus and PIE  $*\text{a}$  by the fourth syllable, only PIE  $*\text{ha}$  can be reconstructed.

(a) Since PIE  $*\text{h}$  (= Hī  $\text{h}$ ) and PIE  $*\text{a}$  (= Lat.  $\text{a}$  : OInd.  $\text{i}$ ) are well-defined, their appearance in diphenemic PIE  $*\text{h}+\text{a}$  and PIE  $*\text{a}+\text{h}$  does not violate the comparative rules. On the contrary, just such prototypes are required in order to explain the material in a regular and consistent manner.

(b) The diphenemic synthesis allows the reconstruction of all attested Indo-European ablaut grades with the PIE ablaut  $*\text{ē}$   $\text{e}$   $\text{Ø}$   $\text{o}$   $\text{ō}$ , as indicated in:

$*\text{ha}e\text{g}\text{-}$  → Lat.  $\text{amb}\cdot\text{āgēs}$  ‘Umgang’, Do.  $\text{στρατ}\cdot\text{αγός}$  ‘Heerführer’, etc.

- \*h<sub>2</sub>aeǵ- → Lat. agō ‘(be)treiben’ Gr. ἄγω, RV. ájati, Av. azaiti, etc.  
 \*h<sub>2</sub>aǵ- → RV. jmán- ‘Bahn’, RV. párijman- ‘Umwandler’ (four-syllabic)  
 \*h<sub>2</sub>aoǵ- → Gr. ὄγμο- ‘Schwad, Reihe’, RV. ájma- ‘die Bahn, der Zug’  
 \*h<sub>2</sub>aōǵ- → Gr. ἄγ·ωγός ‘Führer’, OIcl. ōk ‘drove’ (or PIE \*h<sub>2</sub>aeǵ- ?)

In addition, the perfect in \*ē without ‘colouring effect’ is accounted for by

- \*ēh<sub>2</sub>aǵ- → Lat. eǵī ‘(be)treiben, führen’, Gr. ἤγμαι [1sg].

To address the full range of Indo-European ablaut variation, an induction hypothesis stating the existence of diphonemic PIE \*h<sub>2</sub>a \*a<sub>h</sub> is set forth, phonologically tested in this study and confirmed in extenso in the PIE Lexicon.

§2. Brugmann’s eight cover symbols Neogr. \*ə a ā â o ē have the following upgraded values in System PIE:

Neogr.:	Indo-European:	System PIE:
–	–	–
∅ [= ə]	Gr. ∅ : OInd. ∅	PIE *a (in *h <sub>2</sub> a v a <sub>h</sub> )
*ə [= ə]	Gr. α : OInd. i	PIE *á (in *h <sub>2</sub> á v á <sub>h</sub> )
*a	Gr. α : OInd. a	PIE *h <sub>2</sub> ae v ea <sub>h</sub>
*ā	Do. ā : OInd. ā	PIE *h <sub>2</sub> aē v ēa <sub>h</sub>
*o	Gr. o : OInd. āCV	PIE *o <sub>h</sub> a v oa <sub>h</sub>
*â	Gr. o : OInd. a	PIE *o v h <sub>2</sub> ao v a <sub>h</sub> o
*ō	Gr. ω : OInd. ā	PIE *ō v h <sub>2</sub> aō v ō <sub>h</sub> a v ō <sub>h</sub> a v a <sub>h</sub> ō
*e	Gr. ε : OInd. a	PIE *e v e <sub>h</sub> a v a <sub>h</sub> e
*ē	Do. η = OInd. ā	PIE *ē v ē <sub>h</sub> a v a <sub>h</sub> ē

By means of these reconstructions, the traditional eight correspondence sets have been interpreted in terms of the simple phonemes PIE \*h<sub>2</sub> \*a \*ē \*ō. Since all cover symbols can be presented in terms of System PIE, *diphonemic PIE \*h<sub>2</sub>a a<sub>h</sub> is the sufficient condition for the solution of the laryngeal problem.*<sup>315</sup> This being the case, I congratulate Zgusta, Szemerényi, Laroche, Burrow, Tischler and others for their correct postulation of the single laryngeal PIE \*h<sub>2</sub> (≡ H̥i. h̥), and for the breakthrough that this allowed in the reconstruction of Proto-Indo-European.<sup>316</sup>

§3. Since Streitberg (1900:307), ‘schwa’ and the ‘zero grade’ have been taken to indicate vṛddhi (or ‘Dehnstufe’; see Streitberg (1900:305-415)) with two different origins.<sup>317</sup> In System PIE, only one ablaut occurs, the pattern

PIE \*ō \*o ∅ \*e \*ē (ABLAUT).

From this basic pattern, the ablaut with schwa results in environment PIE \*h<sub>2</sub>a and \*a<sub>h</sub> (= ABLAUT+h̥).

<sup>315</sup> With this, Eichner’s (1988:128) criticism of the comparative method lacking theory is outdated.

<sup>316</sup> Thus, crediting Szemerényi, Burrow (1979:vi) writes: “[...] there was only one laryngeal in the original [P]IE inventory of phonemes, namely that which appears in Hittite as *h̥*.”

<sup>317</sup> For a summary of the Neogrammarian vowel/ablaut system, see Brugmann (Grundr<sup>2</sup> 1:93).

§4. The maximal ablaut consists of all permutations of PIE \**h*a, \**a*h and PIE \**ō* : *o* : *∅* : *e* : *ē*. For a single ablaut vowel in a fixed position, one obtains:

PIE	* <i>ō</i> :	* <i>o</i> :	<i>∅</i>	* <i>e</i> :	* <i>ē</i> :	≡ ABLAUT
	—	—	—	—	—	
PIE	* <i>h</i> a $\bar{o}$	* <i>h</i> a $\bar{o}$	* <i>h</i> a	* <i>h</i> a $\bar{e}$	* <i>h</i> a $\bar{e}$	≡ <i>h</i> a + ABLAUT
PIE	* <i>a</i> h $\bar{o}$	* <i>a</i> h $\bar{o}$	* <i>a</i> h	* <i>a</i> h $\bar{e}$	* <i>a</i> h $\bar{e}$	≡ <i>a</i> h + ABLAUT
PIE	* $\bar{o}$ h $\bar{a}$	* $\bar{o}$ h $\bar{a}$	*h $\bar{a}$	* $\bar{e}$ h $\bar{a}$	* $\bar{e}$ h $\bar{a}$	≡ ABLAUT + <i>h</i> a
PIE	* $\bar{o}$ a $\bar{h}$	* $\bar{o}$ a $\bar{h}$	*a $\bar{h}$	* $\bar{e}$ a $\bar{h}$	* $\bar{e}$ a $\bar{h}$	≡ ABLAUT + <i>a</i> h

All Indo-European ablaut patterns (e.g. Neogr. \**e* : *∅* : \**o*, Neogr. \**ā*, \**ē*, \**ō* : \**ə*, Neogr. \**a* : *o* and Neogr. \**ā* : *e* Grundr<sup>2</sup> 1:170-178) are subsets of the table (i.e. in terms of patterning, the problem of Indo-European ablaut vocalism has been solved).

§5. Puhvel (1960:35) writes:

“Until and unless there is a proof to the contrary, we are well advised to work with reasonably broadly defined symbolism.”<sup>318</sup>

As the comparative method permits use of a single laryngeal PIE \**h* (in PIE \**h*a, *a*h) and vowels PIE \**ē* : *e* : *∅* : *o* : *ō*, it can be hoped that the most capable Indo-European linguists will be willing to reduce the number of laryngeals<sup>319</sup> by removing the items  $\bar{h}_1$ ,  $\bar{h}_3$ , ... (which contradict the existing Indo-European ablaut variation)<sup>320</sup> from the phoneme inventory.<sup>321</sup>

§6. In terms of Proto-Indo-European vowel quantity, in particular the following should be noted:

(a) Owing to the alternations PIE \**e* : *ē* and PIE \**o* : *ō*, the question of the existence of PIE \**ā*<sup>?</sup> (the long counterpart of PIE \**a*) can be posited. If PIE \**ā*<sup>?</sup> did exist, it would have collided with PIE \**ā*+*e*, *e*+*ā*. Despite my best attempts, I have so far been unable to verify or falsify PIE \**ā*<sup>?</sup>; accordingly, only PIE \**a* is reconstructed in System PIE.

(b) Quantity is sometimes understood as a suprasegmental, but the definition depends on notation. In the presentation of Indo-European languages, various conventions have been used, the most important of which are:

<sup>318</sup> Compare also Anttila (1969:69): “[...] until the triple full-grade outcome CeRa/e/o can be solved with one H without assuming other nonexisting root shapes, I must go on writing E, A, and O.”

<sup>319</sup> Compare Tischler (1980: 498): “Angesichts all dieser Schwierigkeiten ist man versucht, eine Lösung nicht in Richtung einer *Vermehrung*, sondern vielmehr in einer *Reduzierung* der Zahl der Laryngale zu suchen, wie dies auch tatsächlich schon mehrfach, so von Zgusta (1951) und Szemerényi (1967) vorgeschlagen worden ist.”

<sup>320</sup> See also Tischler (1980:500): “Nun verstößt zwar der Ansatz von Lauten, die überall geschwunden sind und nirgends Spuren hinterlassen haben, nicht gegen die Gesetze der Logik, er ist aber insofern unwissenschaftlich im Sinne der Empirie, als er weder verifizierbar noch falsifizierbar ist.”

<sup>321</sup> Such loss is by no means critical, of course, because it has been admitted by Puhvel (HED 3:v): “‘Laryngeals’ do not have the same confirmed epistemological standing in established Indo-European grammar as do the traditionally posited phonemes.”

1. The suprasegmental convention, favouring an indicator above the vowel (e.g. OIcl. *é*, Li. *è*, OCS. *ě*, PIE *\*ē*, etc.).

2. The segmental convention, representing quantity with two successive short vowels (e.g. Osc. *aa* = /a:/ and Gr. *ω* standing for two successive omikrons).<sup>322</sup> As for correct notation, the matter has at least been pondered. As Koerner (1985:335) points out, already “Saussure had considered *a<sub>1</sub>a<sub>1</sub>* (*ee*) ‘parallèle aux combinaisons *a<sub>1</sub>A*, *a<sub>1</sub>i*, *a<sub>1</sub>n* [i.e. *\*eA*, *ei*, *en*] etc.’, but he argued in fact that this would lead to ‘contresens’ (Mémoire p. 141).”

Here and in the PIE Lexicon, a notation with macron PIE *\*ē* *\*ō* is used instead of PIE *\*ee* *\*oo*. The matter may be more than just a convention, because PIE *\*ee* and *\*oo* allow more distinctions of accent (PIE *\*ée* vs. *eé*, etc.) than PIE *\*ē* (only PIE *\*é*), and it may yet turn out that the change of notation is necessary.

### 2.5.2 Ablaut PIE *\*ō* : *\*o* : *∅* : *\*e* : *\*ē*

§0. The ablaut alternation PIE *\*ō* : *\*o* : *∅* : *\*e* : *\*ē* is well-attested in Indo-European data and thus secured beyond doubt.<sup>323</sup> The alternation discussed in this paragraph can be exemplified with the root *\*legh-* ‘(sich) legen’ (P. 658-9), preserving all five ablaut grades in:

(a) PIE *\*lōgh-* (*\*ō*-grade)

OIcl. <i>lōg-</i>	(n.) ‘Lagerbestand für einen Tag’ (ANetWb. 364)
OHG. <i>luog-</i>	(n.) ‘Höhle, Lager’ (WH 1:768, OHG. <i>luog</i> )
OCS. <i>vŭ-laga-</i>	(iter.) ‘hinelegen’ (Sadnik 444, <i>vŭlagati</i> [inf.])

(b) PIE *\*logh-* (*\*o*-grade)

Hi. <i>laga-</i>	(vb2M.) ‘liegen’ (HEG 2:16, <i>la-ga-a-ri</i> [3sg], – or <i>*ō</i> ?)
Go. <i>lagja-</i>	(vb.) ‘legen’ (= <i>τιθέναι</i> ‘lay’, GoEtD. 233)
Gr. <i>ναυ-λοχέω</i>	(pr.) ‘to lie in harbour or creek’ (LSJ. 1162)

(c) PIE *\*lgh-* (zero grade)

TochA. <i>lalku</i>	(pt.) ‘iactus’ (Poucha 267, <i>lalku</i> [sgN])
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(d) PIE *\*legh-* (*\*e*-grade)

Gr. <i>λέγ-</i>	(aoM.) ‘lay down’ (GEW 2:110-2, Gr. <i>λέκτο</i> [3sg])
OCS. <i>leg-</i>	(vb.) ‘sich legen’ (LiEtWb. 350, <i>ležti</i> [inf.])

(e) PIE *\*lēgh-* (*\*ē*-grade)

Li. <i>lég-</i>	(vb.) ‘niederlegen’ (LiEtWb. 350, Li. <i>légti</i> [inf.])
OIcl. <i>lāg-</i>	(a.) ‘niedrig, gering, unbedeutend’ (ANetWb. 344, <i>lāgr</i> )
OHG. <i>lāga</i>	(.) ‘Lage, Lager, Hinterhalt’ (ANetWb. 344)

<sup>322</sup> For Pāṇini and Latin and Greek authors on quantity, see Allen (1953:15-6).

<sup>323</sup> For examples of the ablaut *\*ē* : *e* : *∅* : *o* : *ō*, see Szemerényi (1996:84-7).

§1. Similar examples of the ablaut PIE \*ō : \*o : Ø : \*e : \*ē can easily be extracted from the data:

(a) √ped- ‘Fuß(boden), Platz’ (vb.) ‘gehen, fallen’ (P. 790-2)

- \*pōd- : Do. πώς [sgN], Go. fatus [sgN] (= RV. pādú-)  
 \*pod- : Gr. ποδά [sgA], Li. pādas [sgN], Hī. padaš [sgN]  
 \*pd- : Gr. ἐπίβδαι [plN], LAv. fra ·bda-, LAv. a ·bda- (AIWb. 96)  
 \*ped- : Gr. πεδά [prep.], Arm. het [sgN], Lat. pedis [sgG]  
 \*pēd- : Lat. pēs [sgN], Li. pėdà [sgN], Gr. πηδάω [1sg]

(b) √bher- ‘bringen, tragen, usw.’ (P. 128-32)

- \*bhōr- : Gr. φύρ ‘Tief’, RV. bhārá- (m.) ‘Bürde, Last’ (WbRV. 933)  
 \*bhor- : Gr. φόρος, Go. bar, OCS. sū ·borŭ, Lat. fors  
 \*bhr- : Gr. δέ ·φορος, LAv. bərət-, OPers. hu ·barta-, RV. bhṛtī-  
 \*bher- : Hom. φέρτε [2pl], Lat. fert, RV. bhárti, gAv. barətū  
 \*bhēr- : Go. berum (GoEtD. 57), RV. á bhārṣ- (WbRV. 961)

(c) √ueġh- ‘bewegen, ziehen, fahren’ (P. 1118-20)

- \*uōġh- : OInd. vāháyati (or with PIE \*ē as in MidHG. wāgen ?)  
 \*uoġh- : Gr. (Ϝ)όχέω [1sg], Go. ga-wagian [inf.], OIcl. vagn [sgN])  
 \*uġh- : RV. ní (..) uh- (WbRV. 1243, ní (...) uhīta [opt3sg])  
 \*ueġh- : Lat. uehō, Pamph. φεχέτω, Li. vežù, LAv. vaza-  
 \*ueġh- : Go. weg-, Lat. ueġī, RV. ávāt, OCS. vēšŭ

There is no laryngeal in Old Anatolian (see Hī. lag-, Hī. pada-, HLu. uaza- respectively) or any other factor that could explain the common Indo-European quantity and quality, except the ablaut PIE \*ē : e : Ø : o : ō itself, which must therefore reflect the original state of affairs.

§2. Some of the vowels of the full ablaut PIE \*ō : \*o : Ø : \*e : \*ē may be absent from the attested data. Thus, for instance, the root P. \*sek<sup>u</sup>- ‘sehen’ (897-8) has the vocalizations PIE \*ē (Go. sehup), PIE \*e (Go. saiġvan ‘sehen’), PIE Ø (OIr. ro ·sc (m.) ‘Auge, Blick’) and PIE \*o (Go. sah). The existence of PIE \*ō remains unproven, because the root vowel of Hī. šakua- [plNA] (n.) ‘Augen’ is ambiguous (either PIE \*o or \*ō). In order to account for such gaps, the complete solution for the ablaut problem, consisting of the rules governing the alternation PIE \*ō : \*o : Ø : \*e : \*ē, is required in the future.

§3. Ever after the Sanskrit grammarians,<sup>324</sup> numerous attempts have been made to derive the ablaut vowels from each other.<sup>325</sup> As pointed out already by Courtenay (1894:53f.), the accent must be excluded as the cause of PIE \*o-grade (see also

<sup>324</sup> Szemerényi (1996:111) writes: “[...] the Indian grammarians in their theory of vowel gradation started from the zero grade as the basic form and accounted for the other two grades as arising from it by successive additions of *a*.”

<sup>325</sup> The term ‘ablaut’, coined by Jacob Grimm, suggests a removal and/or replacement of vowel in the root and should, therefore, be understood as a convention only.

Szemerényi 1996:121). Generally speaking, the existence of the five distinctions (PIE \*ē ≠ \*e ≠ Ø ≠ \*o ≠ \*ō) does not offer any possibility of reducing the system; this is because no reduction has happened. The only view that does not lead to inconsistency is the originality of the ablaut PIE \*ō : \*o : Ø : \*e : \*ē, since no violation of *ex nihilo nihil* ensues: the zero grade is not a ‘weakening’ (Schwächung) of PIE \*e, nor does PIE \*o replace PIE \*e under any conditions, but the five vocalizations reflect the original state of affairs.<sup>326</sup>

§4. As is obvious from Szemerényi’s (1996:92n1) recent comment concerning the absence of any purely descriptive account of the Proto-Indo-European ablaut, the current state of research remains far from its goals in this particular regard.<sup>327</sup> As the main obstacle – the laryngeal problem – has been solved, the corner has also been turned in terms of the analysis of the PIE ablaut. In order to illustrate the resulting transparency, I quote a couple of well-known words with PIE \*ō : \*o : Ø : \*e : \*ē:

(a) PIE \*paḥ-ter- ‘father’ (P. 829, Neogr. \*pāter, LT \*ph<sub>2</sub>ter). The full ablaut PIE \*ō : \*o : Ø : \*e : \*ē has been preserved for the suffix, as indicated in:<sup>328</sup>

*paḥ-tēr-	*paḥ-ter-	*paḥ-tr-	*paḥ-tor-	*paḥ-tōr-
πατήρ	πατέρες	πατρός	εὐπάτορες	εὐπάτωρ

For the root PIE \*paḥ- (usually only compared in terms of the vocalisms Lat. pater : RV. pitár-), numerous other ablaut vocalizations are actually attested:

PIE *peaḥ-	gAv. patar- (m.) ‘Vater’ (AIWb. 905, patarēm [sgA])
PIE *proaḥ-	Osc. δι·ποτερι- (m.) ‘Iuppiter’ (WbOU 185-6, διποτερες)
PIE *pē/ōaḥ-	TochB. pācer- (sb.) ‘father’ (DTochB. 365, pācera [NA])
PIE *pē/ōaḥ-	TochA. pācar- (m.) ‘pater’ (Poucha 165) <sup>329</sup>
PIE *paḥ-	gAv. fədr- (m.) ‘Vater’ (AIWb. 905, fədrōi [sgD])

(b) PIE \*ek̑o- ‘horse’ (P. 301-2). In addition to the oft-quoted vocalism PIE \*e (Lat. equus : RV. áśvaḥ), there is an \*o-grade root form PIE \*ōku- confirmed by multiple witnesses:

Li. ašvā-	(f.) ‘Stute’ (LiEtWb. 20, ašvā [sgN])
HLu. ašua-	(c.) ‘Pferde’ (CHLu. 10.42.4, (EQUUS)á-sù-wa/i-za)
Thrac. οὐτ·άσπιο-	(PNm.) ‘-(?)’ (P. 301, οὐτ·άσπιος [sgN])
OPr. aswina-	(n.) ‘Kobilmilch’ (LiEtWb. 20, aswinan [sgNA])

The corresponding vřddhi is attested in PIE \*ōku- ‘Roß’:

<sup>326</sup> Szemerényi (1996:83) writes: “Vowel alternations of this kind [= PIE \*ē : e : Ø : o : ō] are found in the other Indo-European languages also. As they correspond exactly in their basic scheme and cannot be explained within the histories of the individual languages, they must necessarily be *inherited from Indo-European*.”

<sup>327</sup> For basic problems of the ablaut in the literature, see Szemerényi (1996:83n1).

<sup>328</sup> See also, for example, PIE \*hanr- ‘man, person’ in Gr. ἀνήρ : ἀνέρα : RV. nř- : ἀνορέα : ἀγήνωρ (GEW 1:107-8).

<sup>329</sup> Lat. papāt- (m.) ‘Erzieher’ (WH 2:249) implies the base PIE \*peaḥ-, which could also be contained in TochAB. pā- (and for which PIE \*pōaḥ- also remains possible, however).



RV. āśú-	(m.) ‘Roß’ (WbRV. 187-8, āśúṣ [N], āśum [A])
HLu. asu-	(sb.) ‘horse’ (CHLu. 1.1.8, EQUUS.ANIMAL-sù)
Ḫi. ašu ṣani-	(LÚc.) ‘Pferdetrainer (of Kikkuli-)’ (HHand. 28)

If the quality PIE \*e of OPers. asa ·bāra- (m.) ‘horseman’ (OldP. 173) matches with the corresponding long vowel in

OPers. ḫu āsa ·bāra- (m.) ‘good horseman’ (OldP. 177, uvāsabāra [sgN]),

the stem \*ēku- is also documented. Finally, the zero-grade root is attested in

LAv. čaḍwarə ·spa- (m.) ‘EN. eines Gläubigen’ (AIWb. 578).<sup>330</sup>

Thus, as with the root PIE \*paḡ-, remnants of practically all five ablaut vocalizations have been preserved.

§5. Laroche (DLL 134 [§16.]) mentions the alternation Ḫi. e : CLu. a in Old Anatolian: “Le louvite a le vocalisme a, en face du hittite e/i dans les mots: aš- ‘être’ : hitt. eš-. – waš- ‘vêtir’ : Hitt. weš- [...]” While Laroche’s observation is admittedly correct, it does not warrant positing of the sound law PIE \*e, ē → CLu. a, HLu. a.

(a) There are Hittite forms with /a/ directly corresponding to the Luwian ones (cf. Ḫi. aš- ‘sein’ = CLu. aš-, Ḫi. uaš- ‘bekleiden’ = CLu. uaš-, etc.). The Hittite forms cannot be explained with a sound law because forms with Ḫi. e are simultaneously preserved (respectively, Ḫi. eš-, ueš-).

(b) There are Luwian forms with preserved PIE \*e and/or PIE \*ē:

CLu. šeḡual-	(n.) ‘Lampe’ (?) (HEG 2:977, 1090 oder ‘Dolch’ ?)
HLu. eṣatara-	(sb.) ‘throne’ (CHLu. 1.1.16, (“THRONUS”)i-sà-tar <sup>a</sup> /i-ti)
HLu. ARHA leša-	(vb.) ‘separate, delimit’ (CHLu. 5.2.2, li-sa-ha [1sg])

In these examples, CLu. e (= HLu. e) is also paralleled by Ḫi. e:

Ḫi. eša-	(vb.) ‘sich setzen’ (HEG 1:77, e-ša)
Ḫi. leša-	(vb.) ‘(auf)lesen, sammeln, aufräumen’ (HEG 2:64)

In such circumstances, Lu. a = Ḫi. a and Lu. e = Ḫi. e; no sound law PIE \*e, ē → CLu. a, HLu. a can be postulated. Luwian had a tendency to preserve roots with PIE \*ō instead of PIE \*ē (as is the case, for instance, in Aeolian Greek), but even this remains uncertain, owing to the relatively small corpus of Luwian.

§6. Szemerényi (1996:41) supports the suggested development PIE \*e → Lat. o before PIE \*u in

OLat. nouos ‘new’ : Gr. νε(Ϝ)ός ‘new’ (P. 769).

Despite the undeniable Lat. o : Gr. ε, it is noteworthy that Lat. o is paralleled by multiple languages that also imply PIE \*o, namely:

OCS. novŭ (a.) ‘neu’ (Sadnik √583, novŭ [m], novo [n.], nova [f.])

<sup>330</sup> For the border of segmentation in LAv. čaḍwarə ·spa- compare LAv. čaḍwarə.zangra- (a.) ‘vierfüßig’ (AIWb. 578).

TochB. nawāke	(m.sg.) ‘novice’ (DTochB. 331, nawākem)
OGaul. nouio ·dūno-	(URUn.) ‘Neuenburg, Neustad’ (LiEtWb. 488)
Li. nauja-	(a.) ‘neu’ (LiEtWb. 487, naujas [sgN])

Since PIE \*e is excluded, it is simpler (viz. Occam’s razor) to understand Lat. o as original and explain the alternation PIE \*neuo- : \*nouo- with an ablaut. Such an alternation, resulting in root variants that only differ in terms of PIE \*e/o, is commonplace in the all Indo-European languages that preserve such distinctions:

(a) √leu-, √lou- ‘waschen, baden, usw.’ (P. 692)

LinB. λεφοτρο χοφο-	(m.) ‘bath-pourer’ (GEW 2:138, re-wo-to-ro-ko-wo)
Hom. λοφετρο-	(n.) ‘das Bad, der Badeort’ (GEW 2:138, λοετρον)

(b) √leuk-, √louk- ‘leuchten’ (P. 687-690)

OGaul. leucetio-	(m.) ‘mars l. = G. des Blitzes’ (ACSS. 2:194)
OGaul. loucetio-	(m.) ‘mars l. = G. des Blitzes’ (ACSS. 2:194)

(c) √teku-, √toku- ‘fliessen, laufen’ (P. 1059)

OCS. tečenije	(n.) ‘das Fliessen, Fluss, Lauf, Gehen’ (Sadnik √953)
OCS. točenije	(n.) ‘das Fliessen, Fluss’ (Sadnik √953)

The provability of two distinct vowel qualities PIE \*e ≠ PIE \*o in all languages (in Indo-Iranian through the second palatalization) is now confirmed by Brugmann’s Law II, necessitating PIE \*o in PIE \*o<sub>h</sub>CV → Iir. \*āCV. Accordingly, study of the PIE vowel system is shifting from the laryngealist pre-*proto-language* with a fundamental \*e<sup>331</sup> to the full ablaut PIE \*ē : e : Ø : o : ō.

### 2.5.3 Prothetic ablaut PIE \*ō : \*o : Ø : \*e : \*ē<sup>332</sup>

§0. The term ‘prothetic vowel’, conventionally referring to the alternation of vowels in root-initial position, has been outdated ever since the emergence of Old Anatolian. Properly speaking, the term erroneously connects two distinct subsets:

(a) The prothetic vowels proper, referring to root-initial vowels PIE \*ē· Ø· \*ō· without a laryngeal (i.e. roots \*ē·C-, Ø·C \*ō·C-), and

(b) The roots beginning with the laryngeal PIE \*<sub>h</sub> of the shape \*<sub>h</sub>ēC-, \*<sub>h</sub>C- \*<sub>h</sub>ōC-.

The necessary distinction between the subsets is drawn in this study by restricting the term ‘prothetic vowel’ only to the roots (a) and by using the descriptive term ‘laryngeal root’ for the items belonging to (b).

<sup>331</sup> Møller (1906:xiv) writes: “Es gibt im Indogermanischen nur a-Wurzeln (oder, wenn man fürs Indogermanische lieber will, e-Wurzeln, was für die Sache dasselbe), den semitischen a-Wurzeln entsprechend.”

<sup>332</sup> For the prothetic vowels, see Szemerényi (1996:129-30), Schwyzler (GrGr. 1.411-413) and Anttila (1969:89).

§1. According to a convention dating back to the Neogrammarians, the prothetic vowels are prefixes. The prothetic vowels (see Szemerényi 1996:§6.4.7.3) have been preserved especially in Armenian (Grundr<sup>2</sup> 1:433) and in Greek (Grundr<sup>2</sup> 1:436), but scattered remnants appear practically in all branches. The outdated Neogrammarian terminology, occasionally allowed to refer to prothetic \*a as well, can be corrected by restricting the prothetic vowels (symbol π·) to the pure vocalic prefixes without a laryngeal, as expressed by the definition

$$\pi \cdot \equiv \text{PIE } *e \cdot v \ *ē \cdot v \ *o \cdot v \ *ō \cdot \quad (\text{'}\pi \text{ is a prothetic vowel'}).$$

As for key features of the prothetic vowels, note the following:

(a) In Greek (the language with the most documentation of prothetic vowels), an internal alternation between prothetic vowels and zero ( $\pi : \emptyset$ ) is commonplace: Gr. χθές = ἐ·χθες; Gr. κέλλω : ὀ·κέλλω : Gr. θέλω : ἐ·θέλω, Gr. ἐ·κείνους : κείνους (see Schwyzer (GrGr. 413) for these and additional examples). This is to say, the prothesis represents the prefix by definition.

(b) The alternation  $\pi : \emptyset$  is externally confirmed by the disagreement of Armenian and Greek prothetic vowels. Thus, on one hand, the prothetic vowel Arm. e· appears without any corresponding reflex in Greek:

PIE  $\sqrt{g^hah}$ - 'gehen, usw.' (P. 463-5)

Gr. βά-	(vb.) 'walk, step, etc.' (LSJ. 302, βάτην [3du])
Li. γό-	(vb.) 'gehen' (LiEtWb. 161, góti [inf.])
Arm. ek-	(sb.) 'Ankunft' (ArmGr. 1:441, *i-stem)
Arm. ek	(sb.) 'προσήλυτος, arrived at' (ArmGr. 1:441)

On the other hand, Greek can have a prothetic vowel without a corresponding item in other prothetic languages:

PIE  $\sqrt{lah}$ - 'treiben, fahren, gehen' (P. 306-7)

$\sqrt{leah}$ -

H <sub>i</sub> . lah-a-	(c.) 'Feldzug, Reise' (HEG 2:8, la-a-ah-ḥa [Dir.])
TochB. la-	(vb.) 'exit house' (Krause 1952:192, lat [2sg])
TochB. la-	(vb.) 'emerge, come out' (DTochB. 552, lam [3sg])
Arm. l-	(ao.) 'hinausgehen, hervorgehen' (ArmGr. 441, el [3sg])

$\sqrt{elah}$ -

Arm. el-	(sb.) 'Ausgang, Aufgang' (ArmGr. 441)
Do. ἐ·λά-	(vb.tr.) 'treiben' (GEW 1:482, Cos. ἐλάτω [3sg])
MidCymr. e·lw-	(vb.) 'gehen' (MidCymr. elwynt [conj.3pl.])

Diagnostically there is no laryngeal (or any trace of a vowel) in Old Anatolian, which secures the traditional interpretation of prothetic vowels.

§2. A competing explanation for the prothetic vowels emerged when Møller (1880) suggested that the traditional roots Neogr. \*eC-, oC-, aC-, reflecting the Proto-Indo-Semitic root structure C<sub>1</sub>C<sub>2</sub>·(C<sub>3</sub>), must contain two radical consonants and be of the

form LT EeC-, AeC-, and ÔeC-.<sup>333</sup> According to this interpretation, the prothetic vowels provide direct evidence of the “laryngeals” h<sub>1</sub> h<sub>2</sub> h<sub>3</sub>. Though true of the roots Neogr. \*aC- (i.e. PIE \*h<sub>2</sub>aeC, \*eah<sub>2</sub>C), the automatic replacement of prothetic vowels PIE \*ĕC, C, ōC<sup>334</sup> with the laryngeals †h<sub>1</sub> and †h<sub>3</sub> is erroneous:

(a) Szemerényi (1967:92-93) is correct in stating that “[...] there is no intrinsic reason why we should attempt to reduce all [P]IE ‘roots’ to a single tri-phonemic pattern of the CVC-type [...]”. He also does well to deny that the Semitic typology “is binding for [P]IE.”

(b) The replacement of prothetic vowels with †h<sub>1</sub>eC and †h<sub>3</sub>eC is a violation of the rule of ambiguity: as PIE \*eC, \*oC (without laryngeal) is possible, no reconstructive postulates like †h<sub>1</sub> and †h<sub>3</sub> are allowed (because this would lead to inconsistency).

(c) The postulation of the laryngeals †h<sub>1</sub> and †h<sub>3</sub> based on the prothetic vowels is a violation of *ex nihilo nihil*, because in the midmost term (zero grade) of the prothetic pattern PIE \*ĕC, C, ōC there is no trace of a laryngeal or vowel in prothetic languages including Old Anatolian; the “laryngeals” †h<sub>1</sub> and †h<sub>3</sub> are falsified by the data. The root PIE √s- ‘be’ (P. 340-2), which appears with the prothetic stem PIE \*es-, is written LT †h<sub>1</sub>es- on the basis of the Proto-Indo-Semitic root hypothesis. Against this, however, it may be noted:

1. In Greek (a prothetic language), there is no trace of an initial laryngeal in the identity correctly reconstructed already by Walde and Hoffmann:

\*senti → Do. (h)évtí, Umbr. sent : Go. sind : RV. sánti (WH 2:628-9).

2. In Old Anatolian, a prothetic vowel is likewise absent in Hieroglyphic Luwian:<sup>335</sup>

HLu. sa- (vb.) ‘to be’ (CHLu. 2.34.1, sa-tú [3sg], 10.17.6, sa-ta [3pl], etc.).

In these contexts, the laryngealist rule is of the unacceptable form Ø → †h<sub>1</sub>. And in this connection it should be noted that following the discovery of the Old Anatolian languages, it was immediately obvious that Møller’s \*E (= \*h<sub>1</sub>) had no counterpart in Anatolian. Since Kuryłowicz (1927), the laryngeal theory has interpreted<sup>336</sup> the scenario as a ‘loss’ of the laryngeal

†h<sub>1</sub> → H<sub>1</sub>. Ø            H<sub>1</sub>. e-eš-zi ‘is’ (HEG 1:76) = Gr. ἐστí ‘is’ (P. 340-342),

<sup>333</sup> Benveniste (1935:152) writes: “La ‘prothèse vocalique’ du grec et de l’arménien a donc, au moins en partie, un fondement étymologique: c’est le reste d’une initiale ə- antéconsonantique dans une racine suffixée à l’état II.”

<sup>334</sup> See Messing apud Anttila (1969:89): “[...] one cannot rely on the prothetic vowel to always reflect a laryngeal (e.g. Messing 191).”

<sup>335</sup> Note that in most of the examples belonging here, there is no ‘initial-a-final’, but the prothetic vowel is entirely absent. See Hawkins (2003:159-161).

<sup>336</sup> Eichner (1973:53) writes: “Uridg. H<sub>1</sub> wird in den anatolischen Sprachen in allen überzeugenden Etymologien lediglich durch Null.” For examples, see Eichner (1973:54-55).

but in the face of the reverse IE  $\emptyset \rightarrow \acute{h}_1$  it must be noted that  $\acute{h}_1$  was incorrectly postulated.<sup>337</sup>

(d) The laryngealist postulation of  $\acute{h}_1$  and  $\acute{h}_3$  is based on a misinterpretation of incomplete data through a direct comparison of unequal ‘prothetic’ and ‘non-prothetic’ forms. In this procedure, the prefixed and prefixless forms are directly compared in spite of the existence of prothetic vowels in ‘non-prothetic’ languages as well. To illustrate this point, one may cite the LT construction for a present participle of the root \*s- ‘to be’:

Gr. ἐόντ- (LinB. e<sup>(h)</sup>o<sup>nt</sup>-) = RV. sánt- (gAv. hant-) → LT \*h<sub>1</sub>sónt-.

However, both the prefixed (PIE \*esont-) and prefixless (PIE \*sont-) participles are paralleled by at least two witnesses, and therefore they are genuine:

PIE \*sont- Gr. <sup>(h)</sup>όντ- (pt.), RV. sánt- (pt.), gAv. hant-, OLi. santī (pt.f.)  
 PIE \*esont- Gr. ἐ<sup>(h)</sup>όντ-, LinB. e-o [sgN], e-o-te [pLN], Li. ēsaīti (pt.f.)

(e) From the comparative point of view, the laryngeal theory overgenerates quasi-roots with obsolete root radicals, thus systematically misleading the etymology. In order to illustrate this, I offer some three-laryngealist constructions obtained through the Semitic root axiom:

Ḥi. amiant-	(pt.a.) ‘small’	: CeC·Σ-	→	LT $\acute{h}_3em\text{-}i$
HLu. aḥuli-	(c.) ‘hammer’	: CeC·Σ-	→	LT $\acute{h}_{1/3}eh_2\text{-}u$
Ḥi. adeš-	(n.) ‘axe’	: CeC·Σ-	→	LT $\acute{h}_3dh\text{-}es$
CLu. elḥa-	(vb.) ‘wash’	: CeC·Σ-	→	LT $\acute{h}_1el\text{-}h_2$
Ḥi. aladari-	(.) ‘Obstküchen?’	: CeC·Σ-	→	LT $\acute{h}_3eT\text{-}oTori$

The generation of the quasi-roots LT  $\sqrt{h_3em}$ -  $\sqrt{h_{1/3}eh_2}$ -  $\sqrt{h_3edh}$ -  $\sqrt{h_1el}$ -  $\sqrt{h_3eT}$ - is completely misleading, because such items suggest that problems are being solved while in reality the real (comparative) etymologies are left unstudied. The latter, however, can be achieved by segmenting the prothetic prefixes:

1.  $\sqrt{mi}$ - ‘klein, schwach’ (P. 711)<sup>338</sup>

LAv. maya-	(pr.) ‘zu Grunde richten’ (AIWb. 1141, mayat [3sg])
Ḥi. a meiant-	(pt.a.) ‘klein, schwach’ (HEG 1:22, a-mi-ia-an-za [sgN])
Osc. min-	(a.) ‘klein’ (WH 2:92, min [sgN])
Gr. μινύωγο-	(a.) ‘kurze Zeit lebend’ (GEW 2:242, μινύωρος)
Gr. μινύθω	(vb.tr.) ‘verkleinern, vermindern’ (GEW 2:242)

2.  $\sqrt{haul}$ - ‘schlagen, kämpfen; Hämmer, Hammer’

Ḥi. ḥula-	(vb.) ‘schlagen, bekämpfen’ (HEG 1:275, ḥu-ul-la-i)
HLu. a ḥuli-	(c.) ‘hammer’ (CHLu. 12.1.4, (“MALLEUS”)á-hu-li-na)

<sup>337</sup> Hendriksen (1941:43) explains: “Bei den Beurteilung der ḥ-losen Wörter könnte man auf den Gedanken kommen, dass sie keinen Laryngal enthalten haben.”

<sup>338</sup> For this etymology, Seebold (1988:510) writes: “Heth. amijant- ‘klein’ gehört wohl zu. 1. minus usw., so daß trotz gr. min von \*(e)mi- ‘klein(er), mind(er)’ auszugehen ist.”

- OPr. ūlin- (cs.) ‘kämpfen’ (APrS. 453, ūlint [inf.], HEG 1:275)
3. √dhes- (sb.) ‘Axt, Beil’ (a.) ‘scharf, spitz’ (P. 272)
- Ĥi. a ·deš- (<sup>(URUDU)</sup>n.) ‘Axt, Beil’ (HEG 1:94, HHand. 29)
- OEng. a ·desa (m.) ‘addice, adze, ascia’ (ASaxD. 7)
- Gr. θο(η)ό- (a.) ‘scharf, spitz’ (GEW 1:678, θοός [sgN])
- OInd. dhāsa- (m.) ‘Berg’ (EWA 3:278 dhāsa [sgN])
- Gr. τεθό(η)ω- (pf.) ‘zuspitzen’ (GEW 1:678, τεθοωμένος [pt.])
4. √lodh- ‘Frau, geburt, Frucht, Erfolg, usw.’
- Ĥi. a ·ladari- (<sup>(NINDAc.)</sup>) ‘Obstküchen?’ (HEG. 1:15)
- Ĥi. ladari- (<sup>(NINDAc.)</sup>) ‘Obstküchen’ (HEG. 1:15)
- HLu. ARĤA lada- (vb.) ‘prosper, be good to’ (CorpHLu. 10.16.1, la-tà-ta)
- OIcl. lōð- (f.n.) ‘Ertrag, Frucht’ (ANetWb. 362, lōð [sgN])
- Lyc. lada- (c.) ‘Frau’ (Pedersen 1945:15-6, lada [sgN])
- Rus. láda (c.) ‘Gemahl(in)’ (REW 2:5, láda [sgN])
5. √lah- ‘waschen, gießen, schütten’ (HEG 2:3-8)
- CLu. e ·lĥa- (vb.) ‘(rein)waschen’ (DLL 36, e-el-ĥa-a-du [3sg])
- Ĥi. lah- (vb.) ‘gießen, schütten’ (CHD L:4, la-a-aĥ [2sg])
- Ĥi. laĥu- (vb.) ‘gießen, schütten’ (HEG 2:15, la-ĥu-uĥ-ĥi)
- Lat. lāu- (pf.) ‘waschen, reinigen’ (WH 1:773ff., lāui [1sg])

In this manner, the laryngeal theory misleads the Indo-European etymology. Better results are gained by following the comparative method.

§3. The prothetic vowels can be understood as a special case of ablaut PIE \*ē : \*e : ∅ : \*o : \*ō in root-initial position, illustrated here with the prothetic bases of the root

PIE √s- ‘to be’:

- PIE \*ēs- Gr. ἦσθα [2sg], Lyc. ηστο [3sg], RV. ása [3sg], gAv. āṅharə [3pl]
- PIE \*es- Ĥi. ešzi [3sg], Gr. ἐστί, Li. ēsti, OPr. est, Umbr. est, Go. ist
- PIE \*ōs- CLu. ašta [3sg], HLu. asta, OPr. asmai, ast, Northumbr. aron [3pl]
- PIE \*s·(C) gAv. hvā [1du], TochB. ste [3sg], RV. smáh [1pl], Lat. siēs [2sg]
- PIE \*s·(e) Dor. ἐντί [3pl], Umbr. sent [3pl], Go. sind, RV. sánti, gAv. hantī
- PIE \*s·(o) HLu. satu, Lat. sunt, OCS. sōtī [3pl], Gr. ὄντ- [pt], OLi. santī [pt.]

§4. Some additional examples of the prefixes PIE \*ē : \*e : ∅ : \*o : \*ō (without a laryngeal) are:

(a) √su- ‘gut’ (ablaut \*su-, \*ēsu, \*ōsu, P. 342 & 1037-8)

- Ĥi. ašu- (a.) ‘gut’ (n.) ‘Hab und Gut’ (HEG 1:87, a-aš-šu)
- Gr. ἐ(η)ϋ̂- (a.) ‘gut, wacker, tüchtig’ (GEW 1:594-5, ἐϋ̂ς [sgN])
- Gr. ἐϋ̂·hν̄ητο- (a.) ‘gut gesponnen’ (Gr. ἐϋ̂ννητος [sgN])
- Gr. ἦϋ̂- (a.) ‘gut, wacker, tüchtig’ (DELG 338-9, ἦϋ̂ [sgNA])
- Ĥi. šu·ĥmili- (a.) ‘wohlgeordnet’ (HEG 2:1135, šu-uĥ-mi-li-iš [sgN])
- RV. sú- (pref.) ‘gut, wohl, recht, schön’ (EWA 3:478-80)

(b) √r- ‘erheben’ (ablaut \*r-, \*or-, \*er-, P. 326-32)

Gr. ἔρῳ-	(vb.) ‘sich erheben’ (GEW 2:422, ἔρετο [3sg])
Ἡ. ara-	(vb.) ‘sich erheben’ (HEG 1:52, a-ra-a-i [3sg])
Gr. ὄρωρ-	(pf.) ‘sich erheben’ (GEW 2:422, ὄρωρα [1sg])
RV. ṛṣvá-	(a.) ‘erhaben, hoch, emporragend’ (WbRV. 294)

(c) √s- ‘sitzen’ (ablaut \*s- \*ōs- and \*(ē/ō)sēs- \*(ē/ō)sōs-, P. 342-3)

Ἡ. eš-	(vb.) ‘sitzen, sich setzen’ (HEG 1:110-1, e-ša [3sg])
Gr. κατ-έθ-	(vb.) ‘sitzen’ (GEW 1:633-4, κατ-έαται [3pl])
HLu. as-	(vb.) ‘to sit’ (CHLu. 2.11.10, (SOLIUM)á-sa-tá [3pl])
RV. ás-	(pr.) ‘sitzen’ (EWA1:181, WbRV. 188-9, ásate [3pl])
LAv. aṇha-	(m.) ‘Lager, Lagerstätte’ (AIWb. 106, aṇhat [sgAbl])
Gr. ἦσ-	(vb.) ‘sitzen’ (GEW 1:633-4, ἦσται [3sg] ← PIE *sēs-)
Ἡ. ašaš-	(vb.) ‘setzen lassen’ (HHand. 26, a-ša-aš-ḥi [1sg])
Ἡ. ašeš-	(vb.) ‘setzen lassen’ (HHand. 26, a-še-ša-an-zi [3pl])
Ἡ. ešeš-	(vb.) ‘setzen lassen’ (HEG 1:110f., e-še-šer [3pl])
HLu. ęsatar-	(sb.) ‘throne’ (CHLu. 1.1.16, (“THRONUS”)i-sà-tar <sup>a</sup> / <sub>i</sub> -ti)
Ἡ. ašatar-	(N.act.) ‘das Sitzen, Sitz’ (HHand. 26, a-ša-tar [sgNA])

(d) √rġh- ‘Hode’ (ablaut \*orġh-, \*erġh-, \*rġh-, P. 782, WP. 1:83)

Ἡ. argi-	(c.) ‘Hode’ (HEG 1:60, ar-ki-i-eš-kán)
Gr. ὄρχι-	(m.) ‘Hode’ (GEW 2:433-4, ὄρχις [sgN])
Arm. orji-	(a.) ‘nicht kastriert’ (pl.) ‘Hoden’ (ArmGr1:483, orji-k’)
Li. ařžila-	(m.) ‘Hengst’ (LiEtWb. 123-4, ařžilas [sgN])
Li. eřžila-	(m.) ‘Hengst’ (LiEtWb. 123-4, eřžilas [sgN])
LAv. ərəzi-	(m.) ‘Hodensack’ (du.) ‘Hoden’ (AIWb. 352)

(e) √rk<sup>u</sup>- ‘singen, beten, bitten’ (ablaut \*ork<sup>u</sup>-, \*erk<sup>u</sup>-, \*rk<sup>u</sup>- P. 340)

Ἡ. arkuai-	(vb1.) ‘beten, bitten’ (HEG 1:60-1, ar-ku-ua-it [3sg])
Ἡ. arkuar-	(n.) ‘Gebet’ (HEG 1:60-1, ar-ku-ua-ar [sgNA])
RV. árcā-	(pr1.) ‘(lob)singen, usw.’ (WbRV. 110, árcati [3sg])
RV. řk-	(f.) ‘Lied’ (KEWA1:50, 118, WbRV. 278, řcam [A])
RV. řkva-	(a.) ‘singend’ (WbRV. 277)

(f) √pi- nahe, hinter, hinten’ (ablaut \*pi- \*opi, \*epi-, P. 323-5, HEG 1:41-43)<sup>339</sup>

LinB. opi	(prepD.) ‘around, upon, after’ (DMycGr. 402, o-pi)
Gr. ὀπίσσω	(adv.) ‘nach hinten, hernach’ (GEW 2:404, ὀπίσσω)
Ἡ. apizia-	(adv.) ‘hinterer, letzter, geringer’ (HEG 1:46-7)
Gr. π-	(pref.) (GEW 1:535, in Gr. π-έξω, π-υγή)
OInd. pi-	(pref.) ‘api’ (MonWil. 44, in pi-dṛbh-, pi-nah-, pi-dhā-)
Gr. ἔπι	(prep.adv.) ‘dazu, dabei, auf, an, bei’ (GEW 1:535)

<sup>339</sup> The unextended root PIE √p- (\*ep-, \*op-, \*ēp-, \*ōp-) appears with \*o-grade in Ἡ. apa ‘hinter, zurück’ (Li. ap-) and Osc. op (prepAbl.) ‘bei’ (WbOU. 799-800).

RV. ápi (adv.) ‘auch, dazu’ (WbRV. 75-6)

(g) √r- ‘gelangen, ankommen, kommen zu’ (ablaut \*er-, \*or-, \*r-, P. 326-329)

Ĥi. er- (1.) ‘gelangen nach, kommen zu’ (HHand. 20, e-ru-e-ni)  
Ĥi. ar- (vb2.) ‘gelangen, ankommen’ (HEG 1:48-9, a-ar-ĥi)  
RV. úd (...) ar- (aoM.) ‘sich bewegen’ (WbRV. 98-101, úd (...) ārta)  
RV. ra- (vbM.) ‘sich bewegen’ (WbRV. 98-101, ranta [3pl])

(h) √erġh-, orġh- ‘bewegen’ (P. 328 & 339)

Ĥi. arga- (vb2M.) bespringen’ (HEG1:59, ar-ga-ru [3sg])  
Gr. ὀρχέο- (pr.) ‘tanzen’ (GEW 2:433, ὀρχέομαι [1sg])  
OIr. erg- (vb) ‘gehen’ (DIL 268 & 584f., eirg [ipv2sg])  
Alb. erdha (pret.) ‘Ich kam’ (Meyer 1896:96, erdha [1sg])  
Gr. ἔρχομαι (pr.) ‘kommen, gehen, wandern’ (GEW 1:572)

(i) √r-(s)- ‘Hinterer, After, Gesäß’ (ablaut \*ers-, \*ors-, \*ros-, P. 340)

Ĥi. ara- (UZUc.) ‘After, Gesäß’ (HEG 1:51-2, ar-ra-an [sgA])  
Ĥi. arša (adv.) ‘nach hinten’ (HHand. 25)  
Gr. ὄρσο- (m.) ‘Hinterer, After’ (GEW 2:427, Ion. ὄρσο- [cpd.])  
OIcl. ars (m.) ‘Arsch, After’ (ANetWb. 14, ars [sgN])  
Arm. or (sb.) ‘Arsch’ (ArmGr. 1:482, or, or-k [pl.])  
OIr. err (f.) ‘Schwanz, Ende’ (VGK 2:101, PCelt. \*ersā-)  
OIcl. ras- (m.) ‘Arsch, After’ (ANetWb. 14, rass [sgN]) ← \*roso-

## 2.5.4 Ablaut PIE \*ō : \*o : Ø : \*e : \*ē with PIE \*ĥa, \*aĥ

§0. The ablaut Neogr. \*ā : \*ō<sup>340</sup> is a subset of the ablaut PIE \*ē : Ø : \*ō in environment PIE \*ĥa \*aĥ. This ablaut type has caused severe difficulties both for the Neogrammarians lacking the pattern and for the extreme laryngeal theories without PIE \*o. However, it may be noted:

§1. The ablaut Neogr. \*a : o was recognized, but explained as an irregular assimilation by Brugmann (Grundr<sup>2</sup> 1:153) in examples like

Hom. ὄναρ ‘Traum’ : Cyrp. ἄναρος ‘Traum’, Arm. anurj ‘Traum’.

This neglects to take into consideration, however, that Greek regularly never assimilates the vowels α and ο (cf. Schwyzler, GrGr 2:254-6). In addition, the ablaut Neogr. \*ā : ō is definitively attested with the phenomenon being a regular (and not

<sup>340</sup> For the ablaut ‘a : o’, see Peters (1980:1ff.), Hirt (1921:§§190-1), Kuryłowicz (1935:111-112; 1956:167-), Pedersen (1938:179-82), Lindeman (1997:45-48), Beekes 1972 and 1976, Cowgill (1965:145f.), Lindeman (1982:22f.), Saussure (Mém. 135), Martinet 1953 and (1955:212-234), Hirt (1900:161-163; 1921:185-186), Schmitt-Brandt (1967:36-38), Szemerényi (1967: 83-84), Polomé 1950 and Schwyzler (GrGr. 1:340).



sporadic) development.<sup>341</sup> For the Neogrammarians, therefore, the problem was the absence of an ablaut pattern governing the alternations of ‘a- and o-vocalisms’ (except for Neogr. \*ō : ə and \*ā : ə).

§2. In his early article of 1877, Saussure had hinted at a connection between the ablaut Gr. ἄγω : ὄγμος and the coefficient \*A (see Rec. 384). In his *Mémoire* (1878), however, he discarded this correct supposition and ended up with the two ‘coefficients’ \*A, Ô and the fundamental vowel \*e. This would have far-reaching consequences for the study as a whole. Whether caused or not by the unavailability of the colouring rules (subsequently presented by Møller), the fact remains that Saussure did not posit \*Aeĝ- : \*Aoĝ- for Gr. ἄγω : ὄγμος etc., which would have solved the ablaut problem with a single coefficient \*A.<sup>342</sup>

§3. The laryngeal theory with the fundamental vowel \*e is unable to reconstruct the ablaut Neogr. \*ā : \*ō, owing to the absence of the original PIE \*ō. An example of this is included in Benveniste’s (1935:149) postulation of the traditional root \*ost- ‘Bein’ (P. 783) with LT ‘ə3est-’ in:

Hi. ḥaštai-	(n.) ‘Knochen, usw.’ (HEG 1:237-, ḥa-aš-ta-a-i [sgNA])
Gr. ὀστέο-	(n.) ‘Bein’ (GEW 2:436, ὀστέον [sgNA])

However, ‘ə3’ is impossible here, due to Neogr. \*a in Gr. ἄστακός ‘Meerkrebs’, OIr. asnai ‘ribs’, as well as other forms implying PIE \*ḥa and PIE \*e : o for the root.<sup>343</sup>

§4. Alleged examples of \*h<sub>3</sub>, if not belonging to the ablaut Neogr. \*ě : Ø : \*ō without a laryngeal, can be shown to ablaut according to the pattern Neogr. \*ā : \*ō. This distribution implies that the laryngeal LT <sup>†</sup>h<sub>3</sub> does not exist, with the consequence that the *o-vocalism of the Indo-European languages always reflects PIE \*o, ō*. This rule substantially simplifies the reconstruction of the PIE vocalism in a manner detailed below.

§5. In terms of System PIE, the early ablaut \*ā : \*ō can be defined as the outcome of the ablaut PIE \*ō : \*o : Ø : \*e \*ē and PIE \*ḥa \*ah, as expressed in the formula:

$$\text{ABLAUT} + *ah/\hbar \quad \equiv \quad (*\tilde{o} : *o : \emptyset : *e : *e)ah/\hbar (*\tilde{o} : o : \emptyset : *e : *e).$$

<sup>341</sup> For the alternation α : o as a Greek phenomenon cf. also Gr. ἄψιον : τὸ πρόσωπον as Arm. ač’-k’ : Gr. ὄπ- ‘Auge’, etc.

<sup>342</sup> On the other hand, according to Møller (1880:486), Saussure accepted Neogr. \*ō = oA: “Nach dem aber, was wir von F. de Saussure, Syst. prim. 138, gelernt haben, dass sich ā zu ō verhält wie e+cons. zu a+cons. [...] das -ā- des feminins ist entstanden aus -eA-, das -ō aus -oA.” Clearly, ambiguity is caused by the identical outcome of DS. \*eO = \*oA. This was explained correctly by Møller (1880:493n2): “Saussures element Ô hat in den meisten der wörter, denen er das Ô beilegt, sicher nicht bestanded, und vielleicht hat das element Ô und also eine ablaureihe ō : ō : o überhaupt nicht existiert. In den weitaus meisten fällen gehört nämlich dieses Ô in die A-reihe und ist nichts anderes als das von Saussure selbst s. 113 f. in erwägung gezogene, aber schliesslich abgewiersene, ‘une simple altération gréco-italique de A.’”

<sup>343</sup> Seebold (1988:519) writes: “Im falle der Weiterbildung erscheint das damit vorausgesetzte (ha-) im Hethitischen als ha-, im Griechischen und Armenischen als protetisches a-, in den übrigen Sprachen als ø. Das in einigen Gleichungen erscheinende o- der außer-anatolischen Sprachen läßt sich am einfachsten auf eine Abtönungsstufe o zurückführen.”

The remnants of the original pattern are still visible in cognates that preserve the distinctions Neogr. \*ā : \*ō, as shown in the table below:

*a	*o	*ā	*ō
—	—	—	—
Hī. ḥa, aḥ	Hī. ḥa, aḥ	Hī. ḥa, aḥ	Hī. ḥa, aḥ
Gr. α	Gr. ο	Do. α Ion. η	Gr. ω
Ital. a	Ital. o	Ital. ā	Ital. ō
Arm. a	Arm. o	Arm. a	Arm. u
Celt. a	Celt. o	Celt. ā	Celt. ā
Li. a	Li. a	Li. o	Li. uo
Latv. a	Latv. a	Latv. ā	Latv. uo

Examples of the ablaut PIE \*ō : o : Ø : e : ē in connection with PIE \*aḥ, \*ḥa (such as PIE \*ōaḥ, \*oaḥ, \*aḥ \*eaḥ, \*ēaḥ and PIE \*ḥaō, \*ḥao, \*ḥa \*ḥae, \*ḥaē) will be presented below.

### 2.5.5 PIE \*aḥ in ablaut PIE \*ōaḥ \*oaḥ \*aḥ \*eaḥ \*ēaḥ

§0. The root PIE Caḥ- in ablaut PIE \*ō : o : Ø : e : ē is exemplified by the root PIE √daḥ- ‘geben, schenken’ (P. 223-6). The five ablaut bases preserved by the Indo-European languages reflect PIE \*daḥ- \*deaḥ- \*doaḥ- \*dēaḥ- \*dōaḥ- directly.

§1. PIE \*deaḥ·(Σ)- ‘geben’ (ablaut: PIE \*e)

Lat. dā-	(vb.) ‘geben, gewähren’ (WH 1:360-3, dare [inf.])
gAv. da-	(vb.) ‘geben’ (AIWb. 678, da’dyāi [inf.])
Arm. ta-	(vb.) ‘geben’ (ArmGr 1:496, ta-mk’ [1pl])
RV. dá’a-	(vb.) ‘geben’ (WbRV. 590, daam, dáas, daat [1-3sg])
Gr. δάvoσ-	(n.) ‘Gabe, Darlehen’ (GEW 1:347, δάvoσ [sgNA])
OInd. dīdapa-	(ao.) ‘geben’ (MonWil. 474, adīdapat [3sg])
Lat. dāto-	(pf.pt.) ‘gegeben’ (WH 1:360-3, datum = Fal. datu ‘id.’)

The base PIE \*deaḥ·(Σ)- results, as expected, in a common Indo-European /a/ in Neogr. \*dā- without compensatory lengthening.

§2. PIE \*doaḥ·(Σ)- ‘geben’ (ablaut: PIE \*o)

RV. draviṇo ·dá-	(m.) ‘Gut gebend’ (WbRV. 645)
Gr. δοί-	(ao.) ‘geben’ (GEW 1:388f., δοίην [1sg])
OInd. dāpaya-	(cs.) ‘cause to give’ (MonWil. 474, with BRUG. II ?)
Gr. ἀντί·δοοσ-	(f.) ‘antidote’ (GEW 1:388, ἀντίδοοσ [sgN])
RV. havyá ·dāti-	(f.) ‘Opfergabe’ (WbRV. 1657, with BRUG. II ?)
RV. dāti ·vāra-	(a.) ‘gern gebend’ (WbRV. 592-3)
LAv. dāiti-	(f.) ‘Geben, Schenken, Gewährung’ (AIWb. 727)
Fal. douī-	(vb.) ‘geben, gewähren’ (WH 1:363, douiad [conj.3sg])
Umbr. pur ·douī-	(vb.) ‘porricitō’ (WH 1:363, pur ·douitu [3sg])

Cypr. δοϕέναι	(n.) ‘zu geben’ (GEW 1:389, δοϕέναι [inf.])
RV. dāvāne	(n.) ‘zu geben’ (WbRV. 596, dāvāne [inf.])

The base PIE \*doah₂- (Neogr. \*do-) results in a short vowel, except in Indo-Iranian open syllables (BRUGMANN’S LAW II).<sup>344</sup>

§3. PIE \*dēah₂-(Σ)- ‘geben’ (ablaut: PIE \*ē)

Lat. dā-	(vb.) ‘geben’ (WH 1:360, dā [ipv2sg], dās [pr2sg])
Arm. ta-	(vb.) ‘geben’ (ArmGr 1:496, tam [1sg])
Latv. dāva-	(vb.) ‘anbieten, schenken’ (LiEtWb. 112, dāvāt [inf.])
Li. dovanà-	(f.) ‘Gabe’ (LiEtWb. 112, dovanà [sgN])

§4. PIE \*dōah₂-(Σ)- ‘geben’ (ablaut: PIE \*ō)

OLi. dúo-	(vb.) ‘geben’ (LiEtWb. 111-2, dúomi [1sg])
Arm. tu-	(ao.) ‘geben’ (ArmGr 1:496, etu, Godel 1975:72)
Gr. δίδω-	(vb.) ‘geben’ (GEW 2:388-9, δίδωμι [1sg])
Lat. dōno-	(n.) ‘Gabe, Opfer’ (WH 1:360, dōnum [sgNA])
RV. dāna-	(n.) ‘Gabe, Geschenk’ (WbRV. 593, dānam [sgN])
Gr. δῶρο-	(n.) ‘Gabe, Geschenk’ (GEW 1:430, δῶρον [sgN])
Lat. dōt-	(f.) ‘Mitgift, Gabe’ (WH 1:360, dōs [N], dōtis [G])

The root PIE \*dōah₂-(Σ)- (Neogr. \*dō-) is clearly recognizable, based on the common European quantity /ō/. This vocalism can be seen in multiple Indo-Iranian forms like:

RV. tvá·dāta-	(a.) ‘given by you’ (WbRV. 566)
LAv. para·dāta-	(a.) ‘verlobt’ (AIWb. 854)

However, these forms remain ambiguous as they could reflect the “European” participles Gr. δοτό- (\*doah₂to-), Lat. man·dāto- (\*dēah₂to-), or Li. duotá- (\*dōah₂to-).

§5. PIE \*dah₂-(Σ)- (Ablaut: PIE Ø)

RV. dh·iṣ-	(f.) ‘Opfer·lust, Lust zu geben’ (WbRV. 683, dhiṣá [I])
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The stem RV. dh·iṣ- is a compound of the roots PIE \*dah₂- ‘geben’ and RV. √is- ‘suchen, begehren’ (WbRV. 223f.).<sup>345</sup> In zero grade, the unaccented PIE \*a of PIE \*dah₂- was lost, resulting in RV. dh̥- (media aspirata). Thus, the laryngeal in the hiatus RV. dá’- (vb.) ‘geben’ and PIE \*a (Lat. da-, dā-) and the lengthening of the glide in

RV. dú-	(f.?) ‘Gabe’ (WbRV. 623, dúvas [plN]) ← PIE *dāhu₂-es)
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are accompanied by a directly preserved laryngeal in RV. √dh- ‘geben’, properly containing /d̥h/ (i.e. a voiced glottal fricative (see Chapter 4)).

<sup>344</sup> The quantity of IIr. ā can be also accounted for with PIE \*ō and/or \*ē. Thus it is not obvious, for instance, that OInd. dātāram [sgA] is identical with Gr. δοτήρ-, because the item could be compared to Gr. δωτήρ- or Lat. man·dātōr- (WH. 2:24-5) as well.

<sup>345</sup> For this formation, compare RV. gav·iṣ- (WbRV. 389), RV. paśu·iṣ- (WbRV. 797) and so forth.

§6. In Old Anatolian, the ablaut PIE \*ō : o : Ø : e : ē of root Cah·(Σ)- resulted in the preservation of the laryngeal adjacent to OAnat. a, accompanied by ablaut ā : õ in Indo-European parallels:

(a) √mēah₁-, √mōah₁- (P. -) ‘Wein’

Hī. maḥla-	(GIŠc.) ‘Weinrebe’ (HEG 2:89-90, ma-a-aḥ-la-aš)
TochB. māla	(sb.) ‘a kind of intoxicating drink’ (DTochB. 449)
Lyd. μῶλακ-	(c.) ‘Wein’ (HEG 2:89, μῶλαξ · λυδοὶ τὸν οἶνον)
Maced. μιμαλλόν-	(f.pl.) ‘αὶ βάρκααι’ (LSJ. 1135, μιμαλλόνες [plN])
TochB. mālatsai	(a.) ‘drunken’ (DTochB. 449)

(b) √pēah₁-, √pōah₁- ‘schützen’ (P. 787+839)

RV. pa²-	(vb.) ‘schützen, behüten’ (WbRV. 798, paánti [3pl])
Gr. ποιμήν-	(m.) ‘Hirt, Lenker, Gebieter’ (GEW 2:573)
Gr. πῶν-	(m.) ‘Schafherde’ (GEW 2:573)
RV. pāyú-	(m.) ‘Hüter, Beschützer’ (WbRV. 804)
Hī. paḥš-	(vbM.) ‘seek protection’ (CHD P:2f., pa-aḥ-ša [3sg])
Lat. pāstōr-	(m.) ‘Hirt’ (WH 2:260, pāstor [N], pāstōris [G])

The reconstruction of ablaut is unproblematic in System PIE and requires no further comment.

## 2.5.6 Prothetic ablaut Neogr. \*a : \*o and Hī. ḥ

§0. The ablaut Neogr. \*āC- : õC- is the prothetic counterpart of the roots Ceḥa- (PIE \*seḥa- ‘liquid’) and Ceah₁- (PIE \*deah₁- ‘give’) for the roots beginning with laryngeal, PIE \*ḥaeC- and PIE \*aḥeC-.

§1. The ‘colouring rules’ apply for the root ḥeC as formulated in the laryngeal theory except for the colouring component being PIE \*a, not the laryngeal:

(a) When in immediate contact with PIE \*a, PIE \*ē is assimilated into the latter:

Lat. a (Lat. auillus, au-bubulcus), etc. (Neogr. \*ā).

After the assimilation, PIE \*a is lost and the quantity of the vowel PIE \*ē prevails.

(b) PIE \*õ is not assimilated into PIE \*a:

Lat. o (Lat. oui-, CLu. ḥai-, Do. öft-), etc. (Neogr. \*õ).

Subsequently PIE \*a was lost and the quantity and quality of PIE \*õ remain.

§2. The root shape √ḥeC- with Old Anatolian parallels is exemplified by:

(a) √ḥal- ‘Höhlung’ (P. 88)

OInd. āra-	(m.) ‘Höhlung’ (EWA 3:23, KEWA 1:77)
Li. olà-	(f.) ‘Höhle, Grube’ (LiEtWb. 516, olà [sgN]) <sup>346</sup>

<sup>346</sup> Thus, the alleged loan from MidLG. hol ‘Höhle, Grube’ is not necessary. See Fraenkel (LiEtWb. 516).

Gr. ἄλι-	(c.) ‘shallow vessel, saucer’ (LSJ. 66, ἄλιϙ [sgN])
Gr. ἀλί·βατο-	(a.) ‘high, steep, deep, abysmal’ (LSJ. 768, ἀλίβατος)
Hi. ḥalu-	(a.) ‘tief’ (sb.) ‘Höhlung’ (HEG 1:135-6)
Lat. aluo-	(f.) ‘Höhlung, Wölbung’ (WH 1:35, aluus [sgN])

(b) √ḥan- ‘evil, bad’ (P. 779), in √ḥanaḥ-, √ḥani- and √ḥanid- (P. 760)

MidIr. on	(n.) ‘blot, stain, disgrace, etc.’ (DIL 490, on [pl])
Gr. ὄνο-	(pr.) ‘schelten, tadeln’ (GEW 2:397, ὄνομαι)
MidIr. ana-	(vb.) ‘blemish’ (DIL 41, anaid [3sg])
Gr. ὄνα-	(ao.) ‘ἀτιμάζεται’ (GEW 2:397, Hes. ὄναται [3sg])
CLu. ḥanḥaman-	(n.) ‘-(?)’ (DLL. 39, ḥa-an-ḥa-ma-an [sgNA])
OCymr. anamou	(sb.) ‘mendae’ (P. 799)
MidBret. anaff	(sb.) ‘Makel, Fehler’ (P. 779)
CLu. ḥania-	(a.) ‘malum’ (?) (HHand. 38, ḥaniati [sgI?])
CLu. ḥanḥania-	(vb.) ‘tadeln (?)’ (DLL. 39, ḥa-an-ḥa-ni-ia-i [3sg])
HLu. haniada-	(a.) ‘evil, bad’ (CHLu. 1.1.12, (“MALUS <sub>2</sub> ”)ha-ní-ia-ta)
Gr. ὄνειδοο-	(n.) ‘Vorwurf, Schmähung, Schmach’ (GEW 2:394)
Arm. anicane-	(vb.) ‘fluchen’ (P. 760, anicanem [1sg])
RV. níd-	(f.) ‘Spott, Schmähung, Verachtung’ (WbRV. 730)
Go. ga·naitja-	(vb.) ‘treat shamefully’ (GoEtWb. 146)

(c) √ḥap- ‘Reichtum’ (P. 780)<sup>347</sup>

Hi. ḥap-	(vb1.) ‘reichlich vorhanden sein’ (HEG 1:157f., ḥapzi)
Lat. op-	(f.) ‘Reichtum’ (WH 2:215, Lat. ops [sgN])
RV. ápnas-	(n.) ‘Besitz, Habe, Reichtum’ (WbRV. 78)
OIr. an-	(m.) ‘richness, property’ (DIL 40, anai [plN])
OIr. anae	(m.) ‘Reichtum’ (LEIA A-72 [OIr. ā-])
Cymr. anaw	(sb.) [Mg.] ‘Reichtum’ (VGK 2:585)
OIr. ane·denmid	(.) ‘gl. ‘opifice’ (LEIA A-72-73)

(d) √ḥěrg-, √ḥōrg- ‘gerade richten, usw.’ (P. 854f., HEG 1:176)

Gr. ἀργό-	(a.) ‘schnell beweglich’ (GEW 1:132, ἀργός)
Hi. ḥarganau-	(n.) ‘Sohle, Ferse?’ (HHand. 42, ḥar-ga-na-ú [sgN])
RV. řjiant-	(pt.) ‘vorwärtsschießend’ (WbRV. 280)
LAv. ərəzu-	(m.) ‘Finger’ (AIWb. 353, ərəzuš [sgN])
RV. řjú-	(a.) ‘gerade, recht, richting, gerecht’ (WbRV. 279)
RV. řju·hásta-	(a.) ‘die Hand ausstreckend’ (WbRV. 280)
Gr. ὄργυια-	(f.) ‘Klafter’ (GEW 2:412)

(e) √ḥěrs-, √ḥōrs- ‘Wasser’ (P. 1003 [diff.])<sup>348</sup>

<sup>347</sup> For the root, see Szemerényi (1954:275f.).

<sup>348</sup> The etymology of Pokorny (P. 1003) and Godel (1975:71) on RV. srótas ‘Strom’ was already in doubt by Hübschmann (ArmGr. 1:420-1). According to the confirmed rule PIE \*sr > Arm. r (e.g. Arm.

Arm. aṛu	(sb.) ‘Canal, Bach, Strom’ (ArmGr. 1:420-1)
Arm. aṛoge-	(pr.) ‘benetzen’ (Arm. arogel [inf.], Beekes 1969:21)
Arm. oṛoge-	(pr.) ‘irrigate’ (Godel 1975:71, orogel [inf.])
Hi. ḥaršumna-	(n.) ‘Quellgebiet’ (HEG 1:187-8, ḥaršumna [plNA])

(f) √ḥēs-, √ḥōs- ‘birth, origin’ (HED 3:217ff.)

Hi. ḥaš-	(vb.) ‘zeugen, gebären’ (HEG 1:191f., ḥa-aš-ta [3sg])
Hi. ḥaša-	(c.) ‘Enkel’ (HHand. 45, ḥa-aš-ša-aš [sgN])
HLu. ḥaša-	(vb.) ‘to beget’ (HED 3:217, CHLu. 1.1.56, ha-sá-tu)
OEng. ōr-	(n.) ‘spring, origin, beginning’ (ASaxD. 763, ōr [sgN])
LAv. āṛhairī-	(f.) ‘Gebälerin’ (AIWb. 358, āṛhairyō [plN])
Hi. ḥašatar-	(n.) ‘Zeugung, Familie’ (HHand. 45, ḥa-aš-ša-tar)
Gr. χηρ ὠσαῖ	(m.pl.) ‘Seitenverwandte’ (GEW 2:1096)
HLu. ḥašu-	(n.?) ‘birth, family’ (CHLu. 1.1.15, ha-su-‘ [sgD])

(g) √ḥast - ‘Knochen, Bein’ (P. 783)

TochB. āst-	(n.) ‘bone’ (DTochB. 45, āsta [plNA])
Gr. εἰσ ὠστη-	(f.) ‘Beinhaus (?)’ (GEW 3:84)
Hi. ḥaštai	(n.) ‘Knochen’ (HEG 1:202-3, ḥa-aš-ta-i [sgNA])
Gr. ὀστέο-	(n.) ‘Knochen’ (GEW 2:436-7, ὀστέον [sgNA])
Gr. ὀστακό-	(m.) ‘Meerkrebs’ (GEW 1:169, ὀστακός [sgN])
Gr. ἀστακό-	(m.) ‘Meerkrebs’ (GEW 1:169, ἀστακός [sgN])
RV. an ‘asthá-	(a.) ‘knochenlos’ (WbRV. 54, anasthás [sgN])
AV. asthn-	(n.obl.) ‘Knochen’ (WbRV. 158, asthnás [sgG])
OIr. asn-	(pl.) ‘côte’ : ‘rib’ (LEIA A:94-5, asnai [plN], asna [G])

(h) √ḥaēd-, √ḥaōd- ‘Krieg, Kampf, Haß, Widerstreben’ (P. 773)

Lat. ōd-	(pf.) ‘Widerwillen haben, hassen’ (WH 2:202, ōdī)
OIcl. at	(n.) ‘Kampf’ (ANetWb. 17, at [sgNA])
Lat. ad ὄρια-	(f.) ‘Kriegsruhm’ (WH1:14 & WH 1:655-6)
Lat. odio-	(n.) ‘Widerstreben, Haß, Ekel’ (WH 2:202)
Arm. atea-	(vb.) ‘hassen’ (ArmGr. 1:422, ateam [pr1sg])
OIcl. etja	(f.) [Mg.] ‘Kampf’ (ANetWb. 106, etja [sgN])
Hi. ḥad ‘eištant-	(pr.) ‘verzaubert, verflucht’ (Hi. ḥa-te-iš-da-a-an-te-eš)
Hi. ḥad ‘eištanteia-	(pr.) ‘fluchen’ (HEG 1:222, ḥa-te-iš-ta-an-ti-ja-aš)
Arm. ateli	(a.) ‘verhasst, feindlich’ (ArmGr. 1:422)
Lat. ōso-	(pf.pt.) ‘hated’ (WH 2:202-3, ōsus sum)
Aiol. ἄσα-	(f.) ‘surfeit, loathing, nausea’ (LSJ 255, ἄσα)
Gr. ἀσάω	(pr.) ‘feel loathing, nausea’ (LSJ 255, ἀσάω)

§3. Examples of the root ḥC-, ḥēC-, ḥōC without Old Anatolian, for instance, are:

(a) √ḥēit-, √ḥōit- ‘Anteil, Schicksal’ (P. 10-11, WP. 1:2, WH 1:408, 2:848)

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ariun ‘Blut’ : OInd. asra- (n.) ‘Blut’), Arm. ṛ < PIE \*rs. As the ablaut Arm. a : o suggests an initial laryngeal, the required root PIE \*ḥars- provides an exact match with Hi. ḥarš-umna- ‘Quell-gebiet’.

Gr. οἶτο-	(m.) ‘Schicksal’ (GEW 2:370, Gr. οἶτος [sgN])
LA.v. aeta-	(m.) ‘Strafe’ (du.) ‘Schuld und Strafe’ (AIWb. 11-12)
Osc. aeti-	(f. <sup>2</sup> ) ‘pars’ (WbOU. 55-6, aeteis [sgG])
Gr. αἶσα	(f.) ‘Anteil, Schicksal’ (GEW 1:44, αἶσα [sgN])
Lesb. ἴσσα-	(s.aοM.) ‘cast lots’ (GEW1:738, ἴσσασθαι [inf.])

(b) √hĕg-, √hōg- ‘wachsen’ (P. 773)

Li. ág-	(vb.) ‘wachsen’ (Grundr <sup>2</sup> 1:211, águ [1sg])
Arm. aĉe-	(vb.) ‘wachsen’ (EtDiArm. 43, aĉem [1sg])
Li. úoga-	(f.) ‘Beere, Kirsche’ (LiEtWb. 1165, úoga [sgN])
Latv. uōga	(f.) ‘Beere, Blatter, Pocke’ (LiEtWb. 1165)
OIr. āsi-	(vb.) ‘wachsen’ (P. 787 [diff.], ásid, if PCelt. *āgse/o-)
OCS. agoda	(f.) ‘καρπός : Frucht, Beere’ (Sadnik √4A)

(c) √hĕk-, √hōk- ‘scharf, spitz’ (P. 18-22)

Lat. ācer-	(a.) ‘scharf’ (WH 1:7, ācer, ācris)
OLat. ocric-	(m.) ‘steiniger Berg’ (WH 2:199, ocric, ocric)
Gr. ὄρι-	(m.) ‘Spitze, Ecke’ (GEW 2:374, ὄρις)
Gr. ἄρι-	(f.) ‘Berggipfel’ (GEW 1:59, ἄρις, ἄριος)
RV. catur aśri-	(a.) ‘vier Kanten habend’ (WbRV. 433)

(d) √hĕk-, √hōk- ‘schnell’ (P. 775)

Lat. ōcior-	(comp.) ‘schneller’ (WH 2:198, Lat. ōcior, ōcius)
Lat. acu pedio-	(a.) ‘schnellfüssig’ (WH 1:11, acupediū [sgN])
RV. āśiṣṭha-	(sup.) ‘schnellste, rascheste’ (WbRV. 187)
Gr. ὀξύ-πουν-	(a.) ‘schnellfüssig’ (GEW 2:1146)
Gr. ὠκύ-	(a.) ‘schnell, geschwind’ (GEW 2:1145-6, ὠκύς)
RV. āśú-	(a.) ‘rasch, schnell’ (WbRV. 187-8)
OCymr. di auc	(a.) ‘träge’ (i.e. “un-schnell”; see P. 775)

(e) √hĕg-, √hōg- ‘sprechen, sagen’ (P. 290-1)

Gr. ἄν-ωγ-	(pf.pr.) ‘befehlen’ (GEW 1:115, ἄνωγα [1sg])
Arm. aĉ ac	(vn.) ‘adagium, proverbium’ (P. 290, aĉac [sgNA])
Gr. ἄν-ωγή-	(f.) ‘Befehl’ (GEW 1:115, ἄνωγή [sgN])
Lat. ad agio-	(n.) ‘Sprichwort’ (WH 1:12, ad agium [sgNA])
Lat. ad agiōn-	(f.) ‘Sprichwort’ (WH 1:25, adagiō, adagiōnis [G])

(f) √hĕk<sup>u</sup>-, √hōk<sup>u</sup>- ‘Auge(n)’ (P. 775-7)

Gr. ὀπ-	(f.) ‘eye, face’ (GEW 2:407, LSJ 1282, ὀπα [sgA])
Arm. aĉ’-	(sb.) ‘Auge’ (ArmGr. 1:413, aĉ’-k’ [plN])
Gr. πρόσ-ωπο-	(n.) ‘Gesicht, Antlitz = ἄψιον’ (GEW 2:602)
Gr. ὄψι-	(f.) ‘appearance’ (LSJ 1282-3, ὄψις)
Gr. ἄστρ-άψι-	(f.) ‘Blitz’ (GEW 1:173, Suid. ἄστράψις)
Gr. ἄψιο-	(n.) ‘Hes. ἄψιον · τὸ πρόσωπον’ (LSJ 299)

RV. <i>ánika-</i>	(n.) ‘Angesicht, Glanzerscheinung’ (WbRV. 57)
LAv. <i>aiwi āxšaya-</i>	(iter.) ‘wachen über’ (AIWb. 310, <i>aiwyāxšayeinti</i> [3pl])
Li. <i>úoksau-</i>	(vb.) ‘ansehen, ausspionieren’ (LiEtWb. 1166, <i>úoksauti</i> )

(g) *√hēl-*, *√hōl-* ‘flammen, brennen, glänzen’ (P. 28)

OSwed. <i>ala-</i>	(vb.) ‘lodern, flammen’ (P. 28, <i>ala</i> [inf.])
OInd. <i>alāta-</i>	(n.) ‘Feuerbrand, Kohle’ (EWA 3:15, <i>alātam</i> [sgN])
OGaul. <i>alato-</i>	(PNm.) ‘Bunt, Scheckig’ (LEIA A:59), <i>alatos</i> [sgN])
MidIr. <i>alad</i>	(a.) ‘bunt, scheckig, gestreift’ (LEIA A:59, <i>alad</i> [sgN])
ModIr. <i>aladh</i>	(m.) ‘Forelle’ (P. 28, <i>aladh</i> [sgN])
Lat. <i>ad·oleō</i>	(cs.) ‘verbrennen (bes. Opfer)’ (WH1:13, <i>adoleō</i> [1sg])
Gr. <i>ἀλοιμό-</i>	(a.) ‘polishing, plastering’ (LSJ. 72, <i>ἀλοιμός</i> )

(h) *√hēl-*, *√hōl-* ‘ernähren, wachsen’ (P. 26-7)

OEng. <i>ōl-</i>	(pret.) ‘nourish, grow, produce’ (ASaxD. 33, <i>ōl</i> [3sg])
Lat. <i>alō</i>	(pr3.) ‘(er)nähren, aufziehen, pflegen’ (WH 1:31, <i>alō</i> )
OIr. <i>ali-</i>	(pr.) ‘nähren’ (LEIA A:57, GOI 577, <i>alim</i> [1sg])
Lat. <i>in·olē-</i>	(f.) ‘natürliche Anlage’ (WH 2:702, <i>inolēs inolis</i> )
Lat. <i>sub·olē-</i>	(f.) ‘Nachwuchs, -kommenschaft, Sproß’ (WH 2:14)
Gr. <i>νε(φ)·αλέσ-</i>	(a.) ‘frisch, kräftig, ausgeruht’ (GEW 2:295, <i>νεαλής</i> )

(i) *√hēm-*, *√hōm-* ‘Rot, Rost’ (P. 777-8)

OEng. <i>ōm</i>	(m/n. <sup>?</sup> ) ‘rubigo’ = ‘rust’ (ASaxD. 744, <i>ōm</i> [sgN])
ModHG. <i>ohm</i>	(sb.) ‘Kornbrand, Rotlauf’ (P. 778, <i>ohm</i> [dial.])
OEng. <i>ōmig-</i>	(a.) ‘rusty, rust-coloured, inflammatory’ (ASaxD. 744)
OIr. <i>umae</i>	(n.) ‘Kupfer’ (DIL. 628, Cymr. <i>efydd</i> )
Lat. <i>amā-</i>	(f.) ‘Feuereimer’ (WH 1:35, <i>ama</i> [sgN])

(j) *√hēm-*, *√hōm-* ‘roh, ungekocht’ (P. 777-8, WP. 1:179)

Gr. <i>ὠμό-</i>	(a.) ‘roh, ungekocht’ (GEW 2:1149, Gr. <i>ὠμός</i> )
RV. <i>āmá-</i>	(a.) ‘roh, ungekocht’ (WbRV. 181, <i>āmás</i> [sgN])
OIr. <i>om-</i>	(a.) ‘roh’ (VGK 1:32, <i>om</i> [sgN] = Cymr. <i>of</i> )
Gr. <i>ὠμο·φάγο-</i>	(a.) ‘blutgierig, unmenschlich’ (GEW 2:1149)
RV. <i>āmá-</i>	(a.f.) ‘die Kuh als die rohe’ (WbRV. 181, <i>gáus amá</i> )
Lat. <i>amāro-</i>	(a.) ‘roh’ (WH 1:35, Lat. <i>amārus</i> [sgN])

(k) *√hēms-*, *√hōms-* ‘Schulter’ (P. 778)

Umbr. <i>onso</i>	(m.) ‘umerus’ (Meiser 1986:63, <i>onse</i> [L])
Gr. <i>ὤμο-</i>	(m.) ‘Schulter’ (GEW 2:1148, <i>ὤμος</i> [sgN])
Go. <i>ams-</i>	(m.) ‘shoulder’ (GoEtD 30, <i>amsans</i> [plA])
RV. <i>ām̐sa-</i>	(m.) ‘Schulter’ (WbRV. 2, EWA1:37, WH 2:815)
Lat. <i>umero-</i>	(m.) ‘Schulter’ (WH 2:815, <i>umerus</i> [sgN])
Gr. <i>ἀμέσω</i>	(du.) ‘Schulterblatt’ (Hes. <i>ἀμέσω·ὠμοπλάται</i> )

(l) *√hēnk-*, *√hōnk-* ‘biegen’ (P. 45-48)



Gr. ὄγκο-	(m.) ‘Wiederhaken’ (GEW 2:347, ὄγκος [sgN])
Lat. unco-	(m.) ‘Haken’ (a.) ‘gekrümmt’ (WH 2:816, uncus [sgN])
RV. aḱká-	(m.) ‘Haken’ (WbRV. 13, EWA 1:47)
Lat. anco-	(a.) ‘with crooked arms’ (WH 1:46, ancus [N])
Gr. ἄγκών-	(m.) ‘Ellenbogen’ (GEW 1:11, ἄγκών)
RV. áḱkas-	(n.) ‘Biegung, Krümmung (des Pfades)’ (EWA 1:47)
Gr. ἀγκόσ-	(n.) ‘Bergschlucht, Felsental’ (GEW 1:11)

(m) √hēbhel-, √hōbhel- ‘fegen, kehren’ (P. 772)

Arm. avelu-	(pr.) ‘fegen’ (P. 772, avelum [1sg])
Gr. ὄφελλω	(pr.) ‘fegen, kehren’ (GEW 2:452, ὄφελλω)
Gr. ὄφελμα	(n.) ‘Besen’ (GEW 2:452)
Gr. ὄφελτρο-	(n.) ‘Besen’ (WP. 1:178, ὄφελτρον · κάλλυντρον)

(n) √hēbhṛ-, √hōbhṛ- ‘Braue’ (P. 172)

Gr. ὄφρῦ-	(f.) ‘Braue’ (GEW 2:454, ὄφρῦς, ὄφρῦος)
MidIr. abrait-	(plN.) ‘Augenlider, Brauen’ (P. 172, Bret. abrant)
OMaced. ἀβροῦτ-	(c.) (ἀβροῦτες · ὄφρῦς, Beekes 1969:21)
RV. bhṛú	(f.) ‘Braue’ (WbRV. 967, bhruvós [du])
OIr. for ·brū-	(.) ‘supercilia’ (P. 172, forbru [plA], forbrū [plG])
SCr. òbrva	(f.) ‘Braue’ (P. 173, Gr. ὄφρούα (f.) ‘Erhöhung’)

(o) √hēru-, √hōru- ‘vox’ (P. 781)

Arc. κάτ ·αροφο-	(a.) ‘cursed’ (GEW 127, WP 1:182)
Phryg. οοφενο-	(pt.) ‘prayed’ (Phryg. 128, οοουενος [sgN])
Phryg. οοφα-	(f.) ‘prayer’ (Phryg.128, οοουαν [sgA])
Gr. ἄρ(φ)ά-	(f.) ‘prayer’ (Hom. ἀρή, Att. ἀρά)
Gr. ἀράο-	(prM.) ‘beten, verwünschen’ (GEW 1:127, ἀράομαι)
Gr. ἀρούω	(vb.) ‘sprechen, rufen’ (LSJ. 251, GEW 1:158)
Gr. ἄρε(φ)η-	(f.) ‘Vervünschung, Drohung’ (GEW1:135)
Gr. ἄρε(φ)ιάω	(vb.) ‘drohen’ (GEW 1:135)

(p) √hēs-, √hōs- ‘Mund, Mündung, Rand’ (P. 784-5)

Lat. ōs-	(n.) ‘Mund, Anlitz, Rand, Saum’ (WH 2:224-5)
RV. ās-	(n.) ‘Mund’ (WbRV. 190, āsás [sgAb])
gAv. āh-	(n.) ‘Mund, Öffnung’ (AIWb. 345, āhō [sgG])
Lat. ōra-	(f.) ‘Saum, Rand’ (WH 2:218 ōra [sgN] ← *ōsā-)
OEng. ōra	(m.) ‘border, edge, margin, bank’ (ASaxD. 763, ōra)
Lat. ārae	(f.pl.) ‘Strandbänke, Klippen’ (WH 1:61 [diff.])
RV. āśia-	(n.) ‘Mund, Rachen’ (WbRV. 191)
Gr. ῥα-	(f.) ‘Saum’ (GEW1:1143, ῥά, ῥα, ῥα)
Gr. ὑπερ ῥα-	(f.) ‘Gaumen’ (GEW 2:969, LSJ 1871, DELG 1158-9)
Do. ἀήτων-	(f.) ‘Strand, Ufer’ (Do. *ἀίων, Hom. ἡίων, ἡϊόνος)
Lat. ōsculo-	(n.) ‘Kuß’ (WH 2:227, ōsculum [sgN])

Gr. ξξ·αστισ-	(f.) ‘Rand eines Gewebes, Franse’ (GEW 528)
Gr. ἄσθματ-	(n.) ‘schweres, kurzes Atmen, Keuchen’ (GEW 1:161)
Gr. ἄσθμαίνω	(vb.) ‘schwer atmen, keuchen’ (= ἰσθμαίνω [Hes.])

The patterns with and without the Old Anatolian are identical, and PIE \*h<sub>2</sub>a, ah<sub>2</sub> can be reconstructed even in the absence of Old Anatolian Hi. h<sub>2</sub>, Pal. h<sub>2</sub>, CLu. h<sub>2</sub>, HLu. h<sub>2</sub>.

### 2.5.7 Schwebeablaut and PIE \*h

§0. The schwebeablaut,<sup>349</sup> representing the alternation of the position of the ablaut vowels PIE \*ē : e : Ø : o : ṍ within the root, was already recognized by the Sanskrit grammarians (Pāṇini).<sup>350</sup> The major Indo-European theories explaining this alternation were developed by the Paleo- and the Neogrammarians in the 19<sup>th</sup> century. With the emergence of the Old Anatolian laryngeal, both theories became outdated, because the lost PIE laryngeal implies different etymological origins for numerous examples of the alleged schwebeablaut. This factor, caused by the fact that the schwebeablaut is inextricably linked to the phoneme inventory, necessitates restrictions regarding the use of the mechanism.

§1. The term ‘schwebeablaut’ (see Anttila 1969:13) dates back to the Neogrammarian period:

“In 1888 K.F. Johansson (...) proposed the current name for this alternation between two full grades: gleichgewichts- oder schwebeablaut. He called it balance ablaut because the different forms tended to have a balance in sharing two moras: gēn - gene - gnē (BB 13.116, 15.308-309).”

In more modern discussions, the focus of schwebeablaut has shifted from mora length<sup>351</sup> to the alternation of the position of the root vowel. This is described by Anttila (1969:1):

“There are a number of roots, however, which show (or appear to show) an alternation in the position of the full-grade vowel. The vowel alternates around a root-medial resonant (or sometimes a consonant).”

In the explanation of the schwebeablaut, two main schools have emerged, which may be roughly characterized as follows:

<sup>349</sup> For a detailed account of the Schwebeablaut, see Anttila 1969 (to which a debt is owed, particularly in regard to the background information presented here) and Szemerényi (1996:133, ‘Secondary ablaut’).

<sup>350</sup> See Allen (1953:13): “samprasāraṇa (lit. ‘extension’), whereby a sequence of type va, i.e. v+syllabicity, alternates with u, i.e. ‘syllabic v’ (cf. Pr. Ind. svapiti : P.P. supta-, etc.). Pāṇini uses the term both for the process and for the resultant vowel, but we find neither the term nor any discussion of the process in the phonetic works.”

<sup>351</sup> See Johansson 1888 and 1890.

(a) The uniform school, which postulates a single underlying root  $C_1C_2(C_3)$  with alternating interdigitations  $C_1eC_2 \cdot (C_3) : C_1C_2 \cdot (eC_3)$ , has been supported by scholars such as Saussure, Møller, Cuny, Hirt, Benveniste and others.

(b) The segmental school, which reconstructs the bases as attested (e.g.  $C_1o-$ ,  $C_1eC_2$ ,  $C_1\bar{o}C_2$ ,  $C_1C_2C_3$ ), keeps the schwebeablaut variants distinct. According to this school, the bases are considered original rather than reducible to each other through an underlying form (or mechanism).

§2. The theories of the uniform school assume that schwebeablaut variants can be connected without severe problems, regardless of whether an underlying prototype (allowing the derivation of variants) is actually postulated or not. The most prominent versions of this line of thought are summarized as follows:

(a) As explained by Anttila (1969:3), the Paleogrammarians in general favoured metathesis as the mechanism of derivation for connecting the root variants:

“Metathesis is the standard explanation for schwebeablaut from the 1840’s onwards, supported by the biggest names of the day, Benfey, Bopp, Pott, Schleicher, etc. (for references see Curtius, Grundzüge<sup>5</sup> 179 and 747).”

(b) Anttila (1969:10) further describes the pioneers of the laryngeal theory:

“Saussure (...) was (...) left with two full grades: Skt. *ámbhas* ‘rain water,’ *nábhhas* ‘mist, cloud’ (Mém 280-281: cf. §9.45). He calls the first one where the vowel occurs before the resonant *premier cas*, and the second one *deuxième cas* (Mém 280).”

Saussure’s idea found support soon enough:

“Møller sides with Saussure and Kretschmer in thinking that *seṭ* roots have two full grades, which can be combined into one earlier shape (vorindogermanisch) as shown. Actually he had done this already in the same famous footnote where he added the third laryngeal \*E to Saussure’s two (1880:151<sup>1</sup>), suggesting further that such shapes should best be written according to the Semitic fashion: \**diu* instead of \**dajava*, etc.” (Anttila 1969:17)

(c) A more cautious version of the theory held a connection between the different vocalizations of the root, but postulated no underlying form (i.e. only surface-level alternation exists). According to (Anttila 1969:21):

“Notably only Benveniste (following Meillet) does not establish or suggest a deeper level of invariance, which is a basic principle of linguistic analysis, and which was reached in this case already by Saussure: e.g., \**dor-éu-* > *dór-u*, *dr-éu* (Mém 222).”

§3. Though perhaps not generally understood, the problems of the uniform school became aggravated after the emergence of the PIE laryngeal:

(a) Most importantly, the hypothesis of an underlying root, whether postulated or not, is relative to the phoneme inventory at our disposal. In particular, the possibility that the laryngeal PIE \**h* and the vowel PIE \**a* were lost in non-Anatolian languages has led to a situation where numerous examples of the alleged schwebeablaut actually reveals roots with and without the laryngeal (i.e. they are not schwebeablaut variants

at all).<sup>352</sup> In order to illustrate the situation, I quote Benveniste's (1935:156) laryngealist reconstruction of the traditional root Neogr. \*ubh- : \*uebh- 'weben, flechten' (P. 1114):

I: \*ə<sub>2</sub>eu ·bh- (gr. ὑφαίνω) II: \*ə<sub>2</sub>u ·ebh- (vha. weban).

For this data, the comparative method implies two etymologically different roots, one with a laryngeal and one without:

PIE \*h<sub>1</sub>aubh- 'weben'

H<sub>1</sub>i. h<sub>1</sub>upar- (G<sup>ADA</sup>c.) 'ein Gewebe/Kleidungsstück' (HHand. 55)  
 Gr. ὑφαίνω (pr.) 'weben, usw.' (GEW 2:976f.)  
 LAV. ubdaena- (a.) 'aus Webstoff, aus Zeug gemacht' (AIWb. 401)

PIE \*uebh- 'weben'

H<sub>1</sub>i. ueb- (vb.) 'weben' (HHand. 201, uepta [3sg])  
 H<sub>1</sub>i. ueba- (c.) 'Webstück, Gewebe' (HHand. 201, uepuš [plA])  
 RV. āurṇa ·vābhá- (a.) 'von der Spinne stammend' (WbRV. 307)

In terms of roots with and without the laryngeal H<sub>1</sub>i. h<sub>1</sub> : H<sub>1</sub>i. Ø, the traditional approach reconstructs too few laryngeals (Neogr. \*ubh- : \*uebh-) and the laryngeal theory overgenerates them (LT \*ə<sub>2</sub>eu ·bh- : \*ə<sub>2</sub>u ·ebh-).

(b) As an example in which Hittite confirms the absence of the laryngeal (but the rest of the language group implies it, necessitating two separate roots), I quote Saussure's comparison of Skt. ámbhas 'rain water' : Skt. nábhas 'mist, cloud' (Mém 280-281: cf. §9.45), which actually appears with and without the laryngeal:

PIE \*nebh- 'Himmel, Wolke, Gewölk' (P. 315-6)

H<sub>1</sub>i. nebia- (c/n.?) 'Himmel' (HEG II:310-5, ne-pi-aš [sgG])  
 RV. abhi ·nabhyá- (n.) 'Wolkennähe' (WbRV. 84)  
 OInd. nabhya- (a.) 'cloudy, moist, foggy' (MonWil. 528)

PIE \*h<sub>1</sub>aembh- 'rain, water'

Arm. amb- (sb.) 'Wolke' (ArmGr. 1:417, o-stem)  
 RV. ámbhas- (n.) 'Regenwasser, Wasser' (WbRV. 96)  
 Osc. an<sup>a</sup>fri- (.) 'Regengottheiten' (Meiser 1986:70)  
 RV. ambhṛṇá- (a.) 'nebelhaft, feucht' (WbRV. 96)

(c) A hitherto unidentified laryngeal is occasionally found in roots considered to be examples of the schwebeablaut. This is the case of the aforementioned 'Pre-Proto-Indo-European' ('vorindogermanisch') tri-literal root \*diu : \*dajava of Møller (1880:151<sup>1</sup>). For this item, the laryngeal is implied by Rig-Vedic hiatus and PIE \*a by

<sup>352</sup> Thus, in Li. tuo ·mēl (adv.) 'in einem fort' (LiEtWb. 430, tuomēl [sgNA]) and Go. mel- (n.) 'Stunde, Zeit' (GoEtD. 250, Go. mel [sgNA]), both PIE \*h<sub>1</sub> and PIE \*a were lost, nor is there any compensatory lengthening. Nonetheless, H<sub>1</sub>i. √meh<sub>1</sub>- 'time, noon' (in √meh<sub>1</sub>-ur-, √meh<sub>1</sub>-un-) reveals a root shape C<sub>1</sub>eC<sub>2</sub>·Σ ≡ PIE \*mehal-.

Do.  $\bar{\alpha}$ , the two witnesses implying diphonemic PIE \*aḥ for PIE \*diaḥ- ‘sky, sky-god’ (P. 183-7):

PIE \*diēaḥ-

Do. ζά- (m.) ‘Zeus’ (GEW 1:610; ← PIE \*diēaḥ-)  
 RV. dyá- (m.) ‘Himmel’ (WbRV. 601-4, dyám [sgA])

PIE \*diaḥē-

Lat. diē- (f.) ‘Tageslicht, Tag’ (WH 1:349, diēs [N], diem)  
 RV. diá- (m.) ‘Himmel’ (WbRV. 601-4, diám [sgA])

Structural inferences (like the Indo-Semitic root hypothesis) do not necessarily reflect the actual state of affairs: RV. diáu- (m.) ‘Himmel’ (WbRV. 604, RV. diáuṣ [N]) = Gr. ζεύ- (m.) ‘sky-god, Zeus’ (GEW 1:610ff., Gr. ζεύς) has four radicals (C<sub>1</sub>C<sub>2</sub>C<sub>3</sub>ēC<sub>4</sub>), not three (vorigd. †dajava). Though the theory of the uniform school can be credited for aiming at regular patterning, its tools are outdated: Indo-European linguistics is an empirical science and the lost laryngeals cannot be recovered by a priori means. In its current form, the laryngeal theory succeeds only in the reconstruction of \*h<sub>2</sub> (PIE \*ḥ), and its tools overgenerate even that.

§4. The segmental school prefers a straightforward reconstruction of attested vocalizations (as implied by the data), and no underlying roots are postulated. The most important scholars and ideas related to this view can be summarized as follows:

(a) As Anttila (1969:10) points out, the idea of ‘double roots’ can historically be traced back to the time of the Paleogrammarians:

“As early as 1870 E.Kuhn (KZ 19:308) pointed out that the problem of schwebeablaut can be resolved through “double roots,” \*ank/\*nak, \*ambh/\*nabh, \*angh/\*nagh-, which would avoid all the difficulties of deriving one form from the other.”

Due to this precaution, the segmental approach avoids the merging of distinct roots during reconstruction, and for this reason it is the preferred choice of the comparative method. Noting the criteria for the presence (or absence) of the laryngeal in a finite procedure, which then can be used to decide whether a schwebeablaut is apparent or not, can be developed based on the segmental interpretation.

(b) Instead of approaching morphemes as non-analyzable entities, the segmental school tends to apply linguistic analysis to the data. Thus, Anttila (1969:5) explains that Brugmann:

“(…) in MU 1:55 (1878) reasons against general metathesis and reintroduces Fick’s suffix ā with more rigor to take care of the doublets like skt. prā : par (§9.48) śrā : śar (§9.39), yā : e (§5.3.1; WW 91).”

This approach is also recommendable in comparative contexts, because the surface level (which does not necessarily preserve all original features) is not naïvely taken as primary.

(c) As Anttila writes (1969:11), the ultimate conclusions based on the regularity of sound change were drawn by:

“Persson in his book on root extensions (1891) [...who] contests the prevalent doctrine of metathesis, anaptyxis, and prothesis in Greek (WW 99f., 217-8, 224, 245, etc.) [...:] metathesis is impossible [...] and thus all such full grades would best be taken as equally original (100).”

With the reservation that the Neogrammarian cover symbols can also conceal lost laryngeals (Neogr. \*e ≡ PIE \*eha v \*e v \*ahe, etc.), it has been obvious ever since the Brugmannian sound law system that no metathesis (or its alternative, à la Benveniste) can be consistently presented. This is another way of stating Persson’s general conclusion, namely that the schwebeablaut as an actual mechanism deriving the root forms from each other never existed. Rather, the interdigitations of the vowels and their alternations were caused by the rules of the proto-language, and the sole possible way to decipher these is to describe the attested vocalizations, restore the lost phonemes (in particular, the laryngeal) and differentiate the rules governing the alternation from those of the the proto-language herself.

§5. Despite the superior nature of the (non-uniform) segmental theory, it is also not without its problems.

(a) The works of the leading theoreticians are based on the Neogrammarian reconstruction, which is now outdated, particularly in terms of the laryngeal PIE \*h̥a \*ah̥. Any attempt to proceed with the non-uniform course must therefore begin with a compilation and testing of all the traditional roots for diagnostic features that imply PIE \*h̥a \*ah̥ in all positions.

(b) The traditional approach, if satisfied only by the description of the attested (or at least the externally paralleled) vocalizations, will not ultimately result in the desired scientific means of predicting the schwebeablaut. Consequently, the approach needs to be developed by making the entire surface level of the Indo-European languages transparent in terms of the presence or absence of PIE \*h̥. In the next phase, a digital function capable of calculating all the attestations of the ablaut vowels of the PIE root(s) C<sub>1</sub>...C<sub>n</sub>

$$(II) \cdot C_1 \dots C_n \cdot (\Sigma) \quad \equiv \quad (*\delta \emptyset \tilde{\epsilon}) \cdot C_1 (*\delta \emptyset \tilde{\epsilon}) C_n \cdot (*\delta \emptyset \tilde{\epsilon})$$

needs to be presented in order to fully predict the alternations.

(c) Finally, there is the problem of the absence of a comparative etymological dictionary in which the entire Indo-European data can be stored and which would allow the extraction of a set of rules governing the schwebeablaut (and ablaut in general). The PIE Lexicon Project aims to solve this problem.

### 2.5.8 Osthoff’s Law for Anatolian, Tocharian and Greek

§0. Osthoff’s Law, which involves the shortening of long diphthongs before a cluster of a resonant and a consonant (except in Indo-Iranian), is among the most successful

sound laws ever postulated for the Indo-European languages. Accordingly, only minor improvements (mainly concerning Anatolian, Tocharian, and Greek) are required by the enriched material now at our disposal.<sup>353</sup>

§1. In *Philologische Rundschau* (1881b:1593f.), Osthoff claimed a shortening of long vowels before a resonant and a consonant in Indo-European languages except Indo-Iranian: the ‘non-Aryan’ languages had gone through the simplification

PIE \*V:RC → VRC (Osthoff’s Law).<sup>354</sup>

Thus, for instance, the short Gr. α owes its short quantity to Osthoff’s Law,<sup>355</sup> standing in contrast to the Indo-Iranian /ā/ in the following:

Gr. γαμ βρῶ-	(m.) ‘Schwiegersohn, Eidam, usw.’ (GEW 1:287)
LA. v. zāma ·oya-	(m.) ‘Bruder des Schwiegersohns’ (AIWb. 1689)
RV. jámātar-	(m.) ‘Eidam’ (WbRV. 484)
LA. v. zāmātar-	(m.) ‘Eidam, Schwiegersohn’ (AIWb. 1689)

§2. The most significant new development related to Osthoff’s Law is the existence of sequences V:RC in both Tocharian A and B. Based on abundant examples, it is virtually certain that Tocharian did not go through the shortening, and hence its dialects should be grouped with Indo-Iranian.

(a) The absence of Osthoff’s Law can be proven for the nasals PIE \*m \*n and the liquids PIE \*l \*r in a straightforward manner due to the ample stock of attested clusters TochAB. āmC, ānC, ālC and ārC attested as such. Some examples include:

1. TochAB. āmC

TochA. āmpi	(num.du.m.) ‘ambo’ (Poucha 22)
TochB. yām-	(vb.) ‘do, make, effect’ (DTochB. 490-1, yāmtsi [inf.])
TochA. wāmpu-	(pret.pt.) ‘ornare, comere’ (Poucha 286, wāmpu)

2. TochAB. ānC

TochB. klānk-	(vb.) ‘ride, go by a wagon’ (DTochB. 220, klānka)
TochA. spānte	(a.indecl.) ‘confidens’ (Poucha 386)
TochB. a ·mānt ·atte	(a.) ‘not evil-minded’ (DTochB. 18)
TochA. wānt-	(pt.) ‘vehens’ (Poucha 14, wānt, wāntam)
TochA. lām̄ts-	(f.) ‘regina’ (Poucha 265, TochA. lām̄ts)
TochB. lāntso	(f.) ‘Queen’ (DTochB. 548)
TochB. kānta	(vb.) ± ‘rub, polish’ (DTochB. 151, kāntatsi [inf.])
TochB. kāntsa-	(vb.) ± ‘sharpen, file’ (DTochB. 151, kāntatsi [inf.])

<sup>353</sup> For literature on Osthoff’s Law, see Collinge (1985:127-131), Schwyzler (GrGr 1:279) and Szemerényi (1996:93).

<sup>354</sup> Osthoff (1884:84-5) writes: “jeder lange vokal ist in der stellung vor sonorlaut [...] und einem weiteren consonant innerhalb desselben wortes urgriechisch verkürzt worden.”

<sup>355</sup> Collinge (1985:127) describes how the theory of a loss of quantity was initially not ascribed to Osthoff in the Germanic world. Nevertheless, as Collinge points out, “elsewhere it is ‘Osthoff’s Law’ [...]”, and accordingly this terminology is used also in this study.

3. TochAB. ālC:

TochB. lālyi	(f.) ‘zeal’ (DTochB. 546)
TochB. lāñe	(f.) ‘flood’ (DTochB. 547)
TochA. kāltañk-	(sb.) ‘n. cuiusdam instrumenti musici’ (Poucha 61)
TochB. tsālta-	(vb.) ‘chew’ (DTochB. 732)
TochB. sālka-	(vb.) ‘pull out, produce’ (DTochB. 689, sālkaṃ)
TochB. śpālmen-	(sup.) ‘excellent, superior’ (DTochB. 643, śpālmen)
TochB. sāl-la-	(vb.) ‘throw down’ (DTochB. 686, sāl-la)

4. TochAB. ārC:

TochA. myārśa-	(vb.) ‘ver · gessen’ (Poucha 226, myārśatai)
TochB. ārte	(m.sg.) ‘(raised) aqueduct, feeder canal’ (DTochB. 51)
TochA. ārṣal	(MUŠEN.) ‘vermis venenosus’ (Poucha 25-6, ārṣal)
TochB. ārcan-	(vb.) ‘be obliged to’ (DTochB. 50, ārcantār [3sg])
TochB. ār-	(vb.tr.) ‘leave (behind), forsake’ (DTochB. 47, ārtsi)
TochB. ārse-	(vb.) ‘cease’ (DTochB. 47, ārsen-ne)
TochA. ārwar	(adv.) ‘paratus : ready, readily’ (Poucha 25, ārwar)
TochB. ārwer	(a.indecl.) ‘ready, of horse: saddled’ (DTochB. 53)
TochB. wawārpau	(pt.) ‘surrounded’ (DTochB. 587, wawārpau)
TochB. wārwāṣṣ-	(vb.) ‘prod, urge, spur on’ (DTochB. 587, wārwāṣṣim)
TochA. kārme	(a.) ‘Wahrheit’ (a.) ‘wahr’ (Poucha 60)
TochB. ārkwi-	(a.) ‘white’ (DTochB. 23-4)
TochA. ārki ·śoṣi-	(n.) ‘mundus’ (Poucha 24)
TochA. ārt-	(m.) ‘procus, sponsus’ (Poucha 24, ārt [sgN])
TochA. kārna-	(pr.A.) ‘descendere’ (Poucha 60, kārnat̪si [inf.])
TochA. kārpa	(vb.) ‘descendere’ (Poucha 60, kārpa)
TochB. kārpa-	(vb.) ‘descend, step down’ (DTochB. 154, kārpat̪si)
TochA. sār̪yā-	(vbM.) ‘serere, seminare’ (Poucha 365, sār̪yāt [3sg])
TochA. sār̪m-	(sb.) ‘semen’ (: ‘seed’) (Poucha 364, sār̪mntu [oblplN])
TochB. śārka-	(vb.) ‘surpass, go beyond’ (DTochB. 655, śārkat̪ai)
TochA. kār̪yap-	(sb.) ‘incommodum, detrimentum’ (Poucha 60-1)

When available, external etymologies indicate that the Tocharian quantity matches the Indo-Iranian *vṛddhi*. An uncontested example of an identical quantity in the Rig-Veda and in Tocharian B has been preserved in:

TochB. ārkwi-	(a.) ‘white’ (DTochB. 23-4)
RV. ārjunejā-	(m.) ‘Nachkomme des ārjuṇa-’ (WbRV. 185)

Identically, the long quantity of Tocharian A coincides with the Vedic *vṛddhi* in:

TochA. kālta ·ñk-	(sb.) ‘some musical instrument’ (Poucha 61)
AV. ā ·ghāṭā-	(m.) ‘Zimbel’ (EWA 1:159 + Fortunatov’s Law II)
RV. ā ·ghāṭī-	(c.) ‘Cymbeln’ or ‘Klappern’ (WbRV. 172)



The Tocharian and Indo-Iranian long vowels are identical. Their original quantity being the simplest hypothesis (Occam's razor), it replaces the earlier explanations of Tocharian quantity, especially accent (Krause-Thomas 1960:42ff.) and/or schwa (Krause-Thomas 1960:53ff.). The ostensible difference in quantity between Tocharian and 'non-Aryan languages' can be accounted for with Osthoff's Law (PIE \**h̥aēmbhi-*) as long as the general restriction of the law is noted.<sup>356</sup> Examples include:

TochA. <i>āmpi</i>	(num.du.m.) 'ambo' (Poucha 22)
Gr. <i>ἀμφί</i>	(adv.) 'herum, auf beiden seiten' (GEW 1:98)
Lat. <i>ambi</i>	(pref.) 'herum, um, ringsum' (WH 1:36)

(b) The archaism of the Tocharian group is, however, broken down in the long diphthongs PToch \**āiC* and \**āuC*. As a rule, the long diphthongs have been preserved in dialect B, while in dialect A only short ones appear:

TochB. <i>āiC</i>	:	TochA. <i>eC</i>		TochB. <i>āuC</i>	:	TochA. <i>oC</i> . <sup>357</sup>
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The reason for the lack of a sound law accounting for this development seems to be the tendency in the laryngeal theory to avoid discussion of *v̥ddhi* (except for Saussure's compensatory lengthening). However, it is possible to advance an interpretation of the situation that does not present any difficulties. Instead of two quantitative grades (cf. Saussure \**e/o* : *Ø*), the parent language had three oppositions (PIE \**ē/ō* : \**e/o* : *Ø*), which are preserved in Tocharian B. Some examples of alternation TochB. *ai* : *e* : *i/y* and TochB. *au* : *o* : *u/w* are included here:

1. \**h̥aiġ-* 'sehen, wissen : Auge' (with TochB. *ai* : *e* : *y*)

TochB. <i>po-yśi-</i>	(a.) 'all-knowing = Buddha' (DTochB. 402, <i>pośi</i> )
Gr. <i>αἶγ-ωγαία-</i>	(f.) 'Auge' (LSJ. 35, Hes. <i>αἶγ-ωγαίαν·ὄφθαλμός</i> )
OHG. <i>eihha-</i>	(vb.) 'zuerkennen' (WP. 1:11, GoEtD. 2, <i>eihhan</i> [inf.])
TochB. <i>eka-</i>	(vb.) 'know' (DTochB. 101, <i>ekasta</i> [2sg])
TochB. <i>aike-</i>	(pr.) 'know, recognize' (DTochB. 101, <i>aikemar</i> [1sg])
TochA. <i>eśe</i>	(adv.) 'aspectabiliter, manifeste' (Poucha 41)
TochB. <i>aiśai yām-</i>	(vb.) 'take care, handle, treat' (DTochB. 106)

Here the identity TochB. *aiśai* ≡ TochA. *eśe* proves that TochA. *eśe*, unlike its equivalent in dialect B, has been shortened (Osthoff's Law). No shortening took place in TochB. *aiśai*, with the result that the root TochB. *√ek-* in

TochB. <i>eka-</i>	(vb.) 'know' (DTochB. 101, <i>ekasta</i> [2sg])
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reflects the normal grade PIE \**e/o* (in contrast with PIE \**ē/ō* in TochB. *√aik-*).

<sup>356</sup> Osthoff's Law is somewhat ambiguous, owing to the possibility of an original ablaut of the proto-language, which could potentially account for some differences of quantity. Thus, for example, the alternation TochA. *āmpi* : Gr. *ἀμφί* could reflect quantitative ablaut (PIE \**h̥aēmbhi-* : *h̥aembhi-*, etc.) rather than Osthoff's shortening.

<sup>357</sup> For such alternations, cf. TochB. *ai-* (vb.) 'give' (DTochB. 100-1, *aitsi* [inf.]) : TochA. *el-* (sb.) 'donum' (Poucha 37-8, 40) and TochB. *śaul-* (n.) 'life' (DTochB. 636-7) : TochA. *śol-* (sg.m.) 'vita' (Poucha 327-8), etc.

2. For the u-diphthong, the ablaut TochB. au : o : u/w is documented. This can be seen, for example, in:

TochB. rautka-	(vb.) ‘move away’ (DTochB. 538, rautkaṃ)
TochB. rotkā-	(vb.) ‘move (away)’ (DTochB. 538, rotkāṛ)
TochB. rutkā-	(vb.) ‘take off’ (garment) (DTochB. 538, rutkāte)

The three simultaneously preserved ablaut grades prove that no shortening has taken place in Tocharian B, thus signalling agreement with the conservative Indo-Iranian group.

3. Practically speaking, the differences between Tocharian A and B have significance for internal and external comparisons, since the recognition of three starting points for Tocharian B provides a regular explanation for alternations that are currently felt to be difficult,<sup>358</sup> seen in such examples as:

Gr. αἴνο-	(m.) ‘Rede, Lobrede’ (GEW 2:40, αἴνος [sgN])
TochA. enäs-	(prM.) ‘iubere, punire’ (Poucha 38, enäsmām [pt.])
TochB. enäs-	(cs.prM.) ‘instruct’ (DTochB. 81, enästäṛ [3sg])

(c) For the aforementioned reasons, the restriction of Osthoff’s Law’s should be expanded into Tocharian,<sup>359</sup> except for the long diphthongs shortened in dialect A.

§3. Owing to the unmarked quantity in cuneiform script, Osthoff’s Law is not strictly verifiable in Old Anatolian. Scattered hints of a possible lack of shortening are, however, possibly present in the use of the Greek alphabet by Later Anatolian. Thus, the clusters ηRC and ωRC are preserved at least in some Carian names collected by Sundwall (e.g. Car. Αρτημιος (1913:76), Car. υβαρηλδος (1913:81), Car. καρυσωλδος (1913:97) and Car. κασβωλλυς (1913:98)). Based on *ex nihilo nihil*, the forms can hardly represent anything but an original long grade. Accordingly, it is relatively safe to assume that Old Anatolian had long diphthongs, too. An instance of an original PIE \*ō can be postulated *de facto* for Old Anatolian on the basis of the isogloss

HLu. rua-	(lc.) ‘Rua’ (NOMS. 1069, CHLu. 10.9.1, ru-w <sup>a</sup> / <sub>i</sub> -sá)
Hī. naḥi rua-	(mc.) ‘-’ (NOMS. 843, na-ḥi-ru-ua-aš(-ša) [sgN])
Cil. ρω ζρουμερι-	(c.) ‘-’ (Sundwall 1913:97, ρωζρουμερις [sgN])

The base Cil. ρ(ϕ)ω is also documented with a nasal extension (PIE \*ruō·n-) in Cil. ρων ζρουμερις (Sundwall 1913:97), which is unaffected by Osthoff’s Law. It is possible that the law did not apply in Old Anatolian either, but the material is sparse and the

<sup>358</sup> The contemporary problem, outlined by Lane (1960:76), is not the equation TochB. aiC = Toch A. eC, but TochB. e = TochA. e: “The analysis of TochB. ke-t(ε) with ke- = TochA. ke goes against the rule that B ai = A e, though one might assume reduction of ai to e in unaccented forms, and there are other instances where the equation seems to hold (cf. B enäsk- ‘instruct’, A enäs- ‘command’, punish’, B eñk-, A ents- ‘seize’).”

<sup>359</sup> Note also the ambiguity of TochB. e. In addition to the correspondence of short diphthongs (PIE \*oi, etc.), TochB. e also corresponds with TochA. a (e.g. TochA. pats (m.) ‘maritus’, Poucha 163 : TochB. petso (sb.) ‘husband’ (DTochB. 401)).

absence of quantity in Old Anatolian means that the problem may forever remain ambiguous.

§4. Some counterexamples of Osthoff's Law have been identified in Greek (e.g. Gr. ἠῦχται). Tested against the data, these exceptions reveal that the environment of Osthoff's Law (V:RC) was not present, because Proto-Indo-European had a laryngeal in the middle of the diphthong of the traditional reconstruction (shape PIE \*V:hRC). The presence of this laryngeal can be demonstrated in terms of the key exceptions as follows:

(a) PIE \*h<sub>2</sub>augh- 'verkünden, usw.' (P. 348, cf. √ἠῦχ-)

Ἡi. h <sub>2</sub> ug-	(vb1.) 'beschwören' (HEG 1:255-7, hu-uk-zi)
Gr. εῦχ-	(prM.) 'verkünden' (GEW 1:595-6, εῦχτο [3sg])
gAv. aog-	(pr.) 'verkünden, sprechen' (AIWb. 37-8, aogəda [3sg])
Gr. ἠῦχ-	(pf.) 'to have prayed' (LSJ. 739, ἠῦχται, ἠῦχθαι [inf.])
Gr. αὐχέω	(pr.) 'sich rühmen, prahlen' (GEW 1:192)

Both Ἡi. h<sub>2</sub>- and ablaut Gr. α : ε : η are clearly present, and the bases allow only a single reconstruction: PIE \*h<sub>2</sub>a<sub>2</sub>ēug- → Gr. √αῦχ-, PIE \*h<sub>2</sub>aug- → Ἡi. √h<sub>2</sub>ug-, PIE \*ēh<sub>2</sub>augh- → Gr. √εῦχ- and PIE \*ēh<sub>2</sub>augh- → Gr. √ἠῦχ-. In particular, √ἠῦχ- had no original diphthong (PIE \*ēh<sub>2</sub>augh-); for this reason, Osthoff's Law does not apply to the form.

(b) The 'a-quality' in Gr. ναῦς [sgN] and hiatus in RV. ná'us [sgN] imply PIE \*neah<sub>2</sub>- for both (for the root of Lat. nāuis [sgN], see P. 755-6). The ostensible violation of Osthoff's Law by the long diphthong of Hom. νηύς can therefore be explained by it being based on the laryngeal (PIE \*nēah<sub>2</sub>-). Thus, by arranging the material under two comparatively confirmed ablaut bases, regularity is restored:

PIE *neah <sub>2</sub> -	→	Gr. ναῦς, RV. ná'us, etc.
PIE *nēah <sub>2</sub> -	→	Hom. νηύς, Lat. nāuis, etc.

(c) Neogr. \*mēn- 'moon, month' (P. 731) The 'a-vocalism' pointing to PIE \*h<sub>2</sub> within the root is reflected in

Arm. mahik	(sb.) 'μηνίσκος : Mondsichel' (ArmGr. 1:191). <sup>360</sup>
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PIE \*mēh<sub>2</sub>an- (vs. †mēah<sub>2</sub>n-) is confirmed by the Lithuanian e-vocalism and acute in

Li. mėna-	(m.) 'Monat, Mond' (LiEtWb. 435, mėnas [sgN])
Li. mėnuo	(m.) 'Mond, Monat' (LiEtWb. 438, mėnuo [sgN])

We may thus reconstruct PIE \*mēh<sub>2</sub>ans- for

Aiol. μῆνν-	(m.) 'Monat, Mondsichel' (GEW 2:227, μῆννος).
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Here again the secondary long diphthong explains the exception of Osthoff's Law.<sup>361</sup>

<sup>360</sup> According to Hübschmann (ArmGr. 1:191), Arm. mahik is an Iranian loan (for an \*i-extension, see LAv. nava.māhya- (a.) 'neun Monate dauernd', AIWb. 1046). Since the assumed source of Armenian (Pahl. †māhik) is hypothetical and Armenian has a derivate (Arm. mahik-ełjür 'Mond-horn'), these factors support the genuineness of Arm. mahik.

(d) In general, the secondary long diphthongs in Greek are conditioned by the presence of PIE \*h and can be accounted for with this upgrade, which simultaneously provides an additional criterion for PIE \*h.<sup>362</sup>

§5. In the 19<sup>th</sup> century, Osthoff's Law contributed to the proof that vṛddhi was not an Indo-Iranian innovation, but an original Proto-Indo-European feature that was lost to a degree in European languages. Tocharian and possibly Anatolian today add to this an independent confirmation, increasing our capability to restore lost quantity.<sup>363</sup> Owing to limits of space here, it has been possible to present only a sketch of the most critical phenomena, but I wholeheartedly agree with Collinge's (1985:130) wish to see a dissertation written on Osthoff's Law.<sup>364</sup>

### 2.5.9 Evaluation of historical theories and System PIE

§0. Having thus dealt with the problem of Indo-European vocalism, its relation to the Old Anatolian laryngeal and their reconstruction, I finally present a brief survey of how the respective theories perform.

§1. Brugmann's eight-vowel system is a masterpiece of comparative reconstruction. Owing to its strictly empirical content, the comparative theory can be inductively inferred from it by means of a simple addition of the single laryngeal PIE \*h (Zgusta, Szemerényi, Tischler, etc.), which appears in diphonemic PIE \*ha ah.

§2. The laryngeal theory, in turn, can be credited for the following:

(a) Saussure's segmental analysis of the ablaut schema Neogr. \*ə : ā through \*A : eA is pivotal and continues to be of value, due to the common denominator \*A of the 'a-vocalism', which is absent in the schema Neogr. \*ə : ā.<sup>365</sup> By means of three simple changes – adding quantity to Saussure's defect vowel inventory, replacing DS \*A with PIE \*a, and postulating PIE \*h (in environment PIE \*ha/ah) – Saussure's system can be changed to match that of System PIE:

Saussure \*e \*o \*A                    :                    System PIE \*ě \*ō \*ha/ah.

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<sup>361</sup> In terms of a relative chronology, one may add that the double treatment of the long diphthongs in Greek implies that Osthoff's Law took place before the loss of PIE \*h.

<sup>362</sup> Note, however, that even this upgrade does not resolve all 'dialectal' counterexamples (cf. Thera-Melian ζηύς [sgN] vs. Gr. ζεύς = RV. dyáus [sgN]).

<sup>363</sup> As the contractions suggested by Saussure (\*eA, eO) and Møller (\*eE) did not take place, vṛddhi appears in positions where the laryngeal theory postulates LT \*eH, with the result that the long vowels are far more commonplace than currently thought.

<sup>364</sup> Broadly speaking, there appears to have been a large-scale distribution, according to which the 'Aryan languages' (including Tocharian) lost the oppositions of quality and the 'non-Aryan' (or 'European') languages lost the oppositions of quantity (Osthoff's Law).

<sup>365</sup> See Saussure (1879 [= Mém.]:119f. Anm2) and Tischler's comment (1990:91 & fn117) on Saussure's assumption that "ein Zusammenhang zwischen Vokalfarbe und Gutturaltyp [or rather: coefficient] besteht".

(b) Møller's colouring rule<sup>366</sup> Neogr. \*a ≡ \*Ae (≈ Neogr. ‘\*æ’) – that is to say, the assimilation of PIE \*e to the preceding PIE \*a resulting in the short vowel Neogr. \*a – is correct. Though System PIE also contains the laryngeal in sequence PIE \*h<sub>2</sub>ae, the principle of assimilation remains the same:

PIE \*h<sub>2</sub>ae      →      Hī. h<sub>2</sub>a, Lat. a, Gr. a, OInd. a, etc.

(c) The laryngeal theory as a whole can be credited for the establishment of the connection between OAnat. h<sub>2</sub> and Neogr. \*a ā (‘a-vocalism’) through LT \*h<sub>2</sub>, despite the fact that the idea of the laryngeal itself could ‘colour’ surrounding vowels<sup>367</sup> and Kuryłowicz's identification (Hī. h<sub>2</sub> ≡ A) are, strictly speaking, erroneous: LT \*h<sub>2</sub> ≡ Neogr. \*a ≡ PIE \*a.

(d) Finally, the laryngeal theory can be credited for making the idea of the laryngeal of the proto-language generally accepted. Though multiple aspects of the mainstream laryngeal theory need to be scaled back, certainly the corner has been turned regarding the idea that a laryngeal phoneme, the reconstructive counterpart of Hī. h<sub>2</sub>, once belonged to the PIE phoneme inventory.<sup>368</sup>

§3. As a whole, however, the laryngeal theory did not fare as well as the theory advanced by the comparativists. Its disappointing performance can be traced back to a chain of errors made during the critical phase of theory formation. By order of appearance, the errors can be catalogued as follows:

(a) Saussure's failure in the analysis of the Indo-European ablaut left him with a two-phased ablaut pattern DS \*Ø : \*e/o instead of the correct ablaut PIE Ø : \*e/o : \*ē/ō with three distinctions. The error manifested immediately, as Saussure had to re-create quantity by assuming for the fallacious compensatory lengthening (DS \*eA → Neogr. \*ā), which in turn left his system without any possibility of reconstruction for the cover symbol Neogr. \*a.<sup>369</sup>

(b) Saussure's postulation of the second ‘coefficient’ \*ō (e.g. Lat. datum ≡ Gr. δατόζ, Rec. 141) went astray because of his previous errors.<sup>370</sup> After his assumption of ubiquitous compensatory lengthening, it could no longer occur to Saussure that the difference of Lat. datum : Gr. δατόζ could be accounted for by PIE \*deahtō- and PIE \*doahtō- (i.e. ablaut PIE \*e ≠ \*o); accordingly, he postulated †ō for both. In relation to this detail, Brugmann's evaluation (1879d:774) of Saussure's *Mémoire* as a purely

<sup>366</sup> For an analysis of Møller's equation Neogr. \*ag- as \*Aeg, cf. Szemerényi (1973:6).

<sup>367</sup> Seebold (1988:519) writes: “Die Ansätze der Laryngalhypothese haben sich bei der Annahme bestätigt, daß grundsprachliches h- eine Umfärbung zu ha- bewirkt hat.”

<sup>368</sup> See Nyman's evaluation (1982:39): “Saussure's abstract representations were later in part confirmed by the Hittite findings. Strictly speaking, however, this ‘confirmation’ consisted in the fact that the Hittite data rendered some reconstructions less abstract.”

<sup>369</sup> These errors were inherited by Møller (1879:150): “Dasselbe lange ā enthält λίθω, zu dem sich alsdann ἔλαθον verhält genau so wie zu λεπὼ ἔλιπον, zu φεῖγω ἔφρυγον.”

<sup>370</sup> See Mayrhofer (1986:101), Schmitt-Brandt (1967:117), Bammesberger (1984:112), Frisk (GEW 1:347), Chantraine (DELG 1:251), Beekes (1969:182-5), Rix (1976:71-2) and Lindeman (1970:90-91).

aprioristic construction is correct:<sup>371</sup> Though Saussure's \*A fares better than Brugmann's \*ə in terms of segmental analysis, Saussure's system contained a "radical error" (Osthoff) because of the second coefficient †Ô.<sup>372</sup> The inadequacy of †Ô was well known to such contemporaries as Møller (1880:494n2):

"Ich sehe indessen kein wort, für welches die annahme dieses dritten elementes [= Ô] notwendig und die erklärung des o durch geänderten ablaut unmöglich wäre."

The inconsistency of †Ô in the face of the existing bases Neogr. \*da-, dā- was known to Møller (1880:518):

"Das griech. hat δατήρ, voc. δώτορ, aus den starken, δατήρ aus den schwachen casus (ō : o tritt für ā : a ein indem das griech. die stufe dā aufgibt und dō nach δίδωμι verallgemeinert. Sonst hat die wurzel Saussures Ô [...]. Das a aber zeigt gr. δάνοϛ."

(c) At this critical juncture, in spite of knowing that Saussure's †Ô (= †h<sub>3</sub>) was erroneous, Møller (1880:493n2) paved the way for the postulate by arguing for an analogy:

"In griech. δω- : δo- aus dā : dō : dA hätte also das griechische die stufe dā aufgegeben und dann den ablaut δω : δa in δω : δo geändert."

Møller's reference to analogy instead of the regular explanation (Gr. α = Lat. a and Gr. o = Lat. o) seems to have been motivated by his assumption of a genetic relation between Indo-European and Semitic languages (1906, 1911), which first and foremost required the addition of laryngeals (here †Ô) for Indo-European. Møller's questionable actions resulted in the use of a non-existent †h<sub>3</sub> in the reconstruction of Proto-Indo-European. At the same time, the postulate †h<sub>3</sub> was redundant, as the alleged examples of †h<sub>3</sub> belonged to one or the other of the categories:

1. The o-vocalism in ablaut with a-vocalism points to PIE \*h<sub>a</sub>, \*ah<sub>3</sub>, making 'h<sub>3</sub>' impossible; see Eichner (1978:162, fn77):

"Von den in der Literatur für anatol. h- ← \*h<sub>3</sub>- genannten Beispielen ist keines sicher, alle können auch mit \*h<sub>2</sub>- angesetzt werden (Material bei F. O. Lindeman, Einführung in die Laryngalthorie, Berlin 1970, § 27)."<sup>373</sup>

The examples belong to the ablaut PIE \*ē : e : Ø : o : ō with PIE \*h<sub>a</sub>, \*ah<sub>3</sub>.

<sup>371</sup> See Koerner (1985:324): "Indeed, Brugmann (1879d:774) felt that Saussure had proposed a purely aprioristic scheme (rein aprioristische Construction), which did not hold water [...]", as well as his accompanying discussion.

<sup>372</sup> See Koerner (1985:324): "Hermann Osthoff [...] expressed himself in a much more hostile manner to Saussure's theories in several articles published in volumes 2 and 4 of *Morphologische Untersuchungen* in 1879 and 1881, qualifying them as a 'total failure', 'radical error', and the like (cf. Redard 1978:35 for details)." For Osthoff's critique (1879b:125f., 1881a:215f., Anm. 1, 279, 331 ("radicaler irritum"), 346ff.), see also Mayrhofer (1983:141). In order to better understand Osthoff's attitude, it is worth noting that while he was working to establish the PIE long grade through his law and other inductive means, Saussure was deductively proceeding to opposite goals.

<sup>373</sup> See also Mayrhofer (1986:142-143, fn182): "[...] wo \*/h<sub>3</sub>/ durch heth h vertreten sein soll, bei denen ich mich frage, ob in ihnen nicht \*/h<sub>2</sub>o/ angesetzt werden darf." See also Mayrhofer (1986:135).

2. The roots with ‘o-vocalism’ in ablaut with ‘e-vocalism’ point to ablaut PIE \*ē : e : Ø : o : ō without PIE \*h<sub>3</sub>, ah. Here ‘h<sub>3</sub>’ is impossible, owing to the ‘e-quality’ and zero grade, both of which exclude †h<sub>3</sub>. That said, Eichner’s (1978:162, fn77) own examples of †h<sub>3</sub> mistakenly replace PIE \*o with †h<sub>3</sub>:

“Hingegen ist die Vertretung von \*h<sub>3</sub>- durch anatol. ø- wegen heth. artari ‘steht’ (Wurzel \*H<sub>3</sub>er, s. H. Rix MSS 27, 1969, 92f.) m.E. gesichert.”<sup>374</sup>

As a rule, a more detailed look at the data reveals PIE \*ē : \*e : Ø to be related, at least in some forms, to the alleged †h<sub>3</sub>:

Ḫi. ar-	(vbM.) ‘(da) stehen, sich stellen’ (HEG 1:49-, ar-ta)
RV. sam (... ) ára-	(aoM.) ‘zu Stande kommen’ (WbRV. 98-101)
Gr. ἰχθυ ἠρόδ-	(a.) ‘aus Fisch(en) bestehend’ (GEW 2:746)

According to the general distribution, LT †h<sub>3</sub> is excluded either by ‘a-vocalism’ (PIE \*ē : e : Ø with PIE \*h<sub>3</sub>, \*ah) or ‘e-vocalism’ (PIE \*ē : e : Ø), with the result that no such phoneme existed in the proto-language.

(d) Strictly speaking, Saussure’s interpretation of the vowel Neogr. \*ə as a coefficient sonantique \*A (a sonorant) is wrong, since the real value is PIE \*a = \*A (a vowel). Even more erroneous was Møller’s interpretation of \*A as a laryngeal (a consonant). The same can be said of Kuryłowicz’s identification of PIE \*a with the Old Anatolian laryngeal:

LT \*h<sub>2</sub> → Gr. α, Lat. a, OInd. i, ... : Ḫi. ḫ, CLu. ḫ, ...<sup>375</sup>

The confusion of vowels and consonants in the laryngeal theory can be corrected through a postulation of separate sound laws for the vowel and the laryngeal:

PIE *á →	Gr. α, Lat. a, RV. i, ...	:	Ḫi. a, CLu. a, ...
PIE *ḫ →	Gr. Ø, Lat. Ø, RV. ’/Ø, ...	:	Ḫi. ḫ, CLu. ḫ, ...

(e) In yet another mistake, Møller’s structural postulation of †E (1880:492n2.) repeats Saussure’s errors with \*A and †Ō (i.e. the vowels Neogr. \*e : \*ē (in Gr. θεε- : θη-) are replaced with consonants in †E : †eE). This is particularly disappointing since Møller (1880:523) knew that †E would not solve the problematic ablaut Neogr. ä : ě:

“[...] griech. ἄτιμός [...]. Das A dieses wortes, das mit vorhergehendem e langes ē giebt, muss ein anderer laut gewesen sein, als das A, das sich mit vorhergehendem e zu langem ā vereinigt, s. o. s. 493 anm.”<sup>376</sup>

<sup>374</sup> For the lack of Ḫi. ḫ corresponding to \*h<sub>3</sub> in Old Anatolian, see Mayrhofer (1986:132, fn141).

<sup>375</sup> Compare Burrow’s (1949:28) analysis: “[...] the validity of the evidence for the existence of a vocalic laryngeal, Ḫ. It is precisely in this point that the laryngeal theory connects with the earlier prevailing theory of the apophony of the long vowels, since Ḫ is nothing but schwa in new guise, and both are founded on the same basis. The two theories have this in common, and historically it is assumption of this reconstructed IE vowel which has given rise to the manifold ramifications of the laryngeal theory.”

<sup>376</sup> For the forms Neogr. \*ə : ē in OIr. athach : OEng. æðm (RV. ätmán-), see P. 345.

As mentioned by Zgusta (1951:438), the laryngeal theory favoured the simple solution E : eE, A : eA, Ō : eŌ at the cost of *reconstructio difficilior* (i.e. the ablaut Neogr. \*ā : \*ǫ̃ : \*ē̃). It is possible that Møller was not aiming to solve the problems of Indo-European vocalism as much as he was tempted by the opportunity of the two laryngeals \*A and †Ō to propose yet a third one †E, thus creating a system similar to the Semitic laryngeals ‘ ’ ḥ h. In reality, it is not allowed to reconstruct a segment for the proto-language that does not have an unambiguous reflex in at least one daughter language. Owing to the errors in its postulation, the laryngeal †h<sub>1</sub> can be eliminated; see the following distribution:

1. Bases with ‘e-vocalism’ without PIE \*h<sub>2</sub>a, aḥ point to ablaut \*ō : o : Ø : e : ē. Here †h<sub>1</sub> is eliminated by the data in the absence of any reflect of a ‘laryngeal’ (i.e. vowel) in zero grade. Thus, Benveniste’s (1935:149) “\*ǵ<sub>1</sub>es- → eš-(zi) ‘il est’ : \*ǵ<sub>1</sub>s-(onti) → aš-anzi ‘ils sont’ [...]” does not signal the absence of any reflect of a laryngeal in

PIE \*s-                    →        HLu. sa- (vb.) ‘to be’, Gr. (h)έ̃ντι ‘they are’.

Any attempt to derive †ǵ<sub>1</sub>s from PIE \*s- (HLu. s-, Gr. h-) would be a violation of *ex nihilo nihil*, resulting in an inconsistency.

2. Roots with e-vocalism in ablaut with Neogr. \*ǵ, a, ā reveal PIE \*h<sub>2</sub>a, aḥ instead of †h<sub>1</sub>. The a-vocalism, OAnat. ḥ or other criteria implying PIE \*h<sub>2</sub>a or \*aḥ eliminate †E in the subset. Thus, in Møller’s own example (OEng. æðm : OIr. athach), not †E but \*A is attested (for Neogr. \*a in OIr. athach, see also Gr. ἀτμός).

Excluded by the zero grade (ablaut PIE \* ē : e : Ø : o : ō) or ‘a-vocalism’ (ablaut PIE \* ē : e : Ø : o : ō with PIE \*h<sub>2</sub>a, \*aḥ), LT †h<sub>1</sub> is non-existent.

(f) Møller’s (1879:492) other mistake lies in his generalization of the Proto-Semitic root structure CC·(C) for Proto-Indo-European:<sup>377</sup>

“Die ursprüngliche gestalt der indogermanischen wurzel, d. h. natürlich des indogermanischen wortes, genauer nomens war die: die wurzel war zweisilbig mit innerem vocal a und auslautendem vocal a, nach den consonanten biliteral wie B’aRa (träger) oder trilateral (mit innerem i, u, r oder nasal cons., oder A, E) vor oder nach cons.) wie DaRCa (blickend), VaIDa (sehend), DaIVa und DIaVa (glänzend, himmel), DaMAa (bändigend).”

It has been pointed out by Schmitt-Brandt<sup>378</sup> and Szemerényi<sup>379</sup> that the Proto-Indo-European roots are not of general form C<sub>1</sub>C<sub>2</sub>·(C<sub>3</sub>), but confirm a varying number of

<sup>377</sup> According to Møller (1911:v-vi, x), many Semitic ‘trilateral’ root shapes were originally biliteral, implying CC·C for ‘Proto-Indo-Semitic’.

<sup>378</sup> Schmitt-Brandt (1967:9) writes: “Bei einer durch Rekonstruktion gewonnenen Sprache läßt sich meist nicht mit Sicherheit feststellen, welche Ableitungen einer und derselben Epoche der Sprachgeschichtliche angehören, so daß sich auch nicht sagen läßt, welche Wurzelgestalten gleichzeitig existierten. Die an lebenden oder schriftlich bezeugten Sprachen gemachten erfahrungen lassen jedenfalls für alle Epochen einer Sprache die gleichzeitige Existenz mehrerer Wurzelgestalten erwarten, so daß a priori der Ansatz einer einzigen Wurzelform K<sub>1</sub>eK<sub>2</sub> äußerst unwahrscheinlich ist.”

<sup>379</sup> Szemerényi (1996:132) clarifies: “[...] it is well known that the theory contradicts some obvious facts, since there are certainly longer roots such as \*leik<sup>w</sup>- ‘to leave’ (‘quadlitière’) and \*sneig<sup>w</sup>h- ‘to snow’ (‘quinquitière’), and also shorter, e.g. \*es- ‘to be’ (‘bilitère’).”



radical consonants ranging from  $C_1$  to  $C_1C_2\dots C_n$ .<sup>380</sup> Being non-genetic, the Semitic typology is not binding (Szemerényi 1967:92-93), and as it conflicts with the data, it should be abandoned rather than normatively applied to the material (as is done within the framework of multilaryngealism).<sup>381</sup> The Proto-Indo-Semitic root hypothesis  $CaC \cdot (C)$ <sup>382</sup> has led to a situation where the non-existent laryngeals  $\dagger h_1$  and  $\dagger h_3$  are added to the roots with a single consonant (e.g. PIE  $\sqrt{i}$ - ‘gehen’ and PIE  $\sqrt{s}$ - ‘sein’), as if they contained two such items (LT  $\dagger h_1ey$ -<sup>383</sup> and  $\dagger h_1es$ -). In this process, the comparison of Indo-European data (and only that) has been replaced with comparison of data and the Proto-Semitic root axiom

$$\text{PISem. } C_1eC_2\text{-: } \text{H}i. e\check{\text{š}}\text{-} \quad \rightarrow \quad \text{PISem. } \dagger h_1es\text{-}$$

despite the warnings of Bammesberger<sup>384</sup> and others. Ultimately such tautologies, containing Proto-Indo-Semitic on both sides of the equation, are not products of sound scholarship,<sup>385</sup> as was already pointed out by Møller’s contemporaries.<sup>386</sup> With this move, Møller abandoned the agenda set forth by Sir William Jones (i.e. the genetic relationship between the Indo-European languages) and failed as a responsible actor in the reconstruction of Proto-Indo-European.

(g) For the third mistake of Møller, I would like to quote his monovocalism hypothesis (1906:xiv), which also hearkens back to an alleged genetic relationship with the Semitic languages:

“Es gibt im Indogermanischen nur *a*-Wurzeln (oder, wenn man fürs Indogermanische lieber will, *e*-Wurzeln, was für die Sache dasselbe) den semitische *a*-Wurzeln entsprechend.”

In retrospect, this was also a setback for the development of the reconstruction of the Indo-European vowel system. Despite his suggestion of the ‘fundamental vowel  $*e$ ’, Saussure admitted the existence of PIE  $*o$ , standing in ablaut relationship with PIE  $*e$  (Mém. 127). The real content of PIE  $*o$  in Saussure’s system is secure because he

<sup>380</sup> Note in particular that Szemerényi (1996:132) is right in claiming that “[...] it can be proved that not all IE roots having the structure  $eC$  go back to a more primitive form  $*HeC$ , i.e. there were not only suffixes but also roots with the structure  $eC$ ”. Thus,  $*s$ - ‘sein’ is confirmed by HLu.  $\check{s}a$ - ‘to be’ and  $*i$ - ‘gehen’ by H*i*. *i*- ‘id’.

<sup>381</sup> Lindeman (1997:51) adds: “Most ‘laryngealists’ assume [...] that the parent language had no (verbal) roots with an initial vowel. This assumption is based on Benveniste’s theory of the IE root according to the IE root consisted of two consonants that took the vowel  $*e$  [...]”

<sup>382</sup> See Møller (1879:492): “die Wurzel war [...] mit innerem Vocal *a* [...] nach den Consonanten bilitteral.”

<sup>383</sup> Bammesberger (1984:36-40) writes: “Auch die Wurzel für ‘gehen’ muß nach Benvenistes Theorie als  $*\check{\text{e}}_1ey$ - (BENVENISTE 1935:156) angesetzt werden.”

<sup>384</sup> Bammesberger (1984:36-40) further explains: “In den Paradigmata von  $*es$ - und  $*ed$ - kommen Formen vor, die mit der Annahme eines anlautendes Laryngals  $\check{\text{e}}_1$  nicht vereinbar sind.”

<sup>385</sup> Boretzky’s (1975:49) criticism of the idea that “Vielfach wird behauptet, daß die LT mit den Methoden der IR arbeite” is justified: the laryngalist reconstruction is not internal, but uses Semitic typology embedded as axioms in the laryngeal theory.

<sup>386</sup> See Koerner (1985:336): “[Møller’s] 94-page monograph on the laryngeal consonants of Indo-European and Semitic was not regarded as sound in scholarship.”

(Rec. 159) accepts Brugmann’s Law, presupposing that vowel. By abandoning this, Møller fell back to the Paleogrammarian monovocalism hypothesis, replacing the Sanskrito-centric typology (Paleogr. \*ǎ) with a Semitic one (LT \*e). Consequently, the Neogrammarian effort to renovate the PIE vowel system, culminating in Brugmann’s system of eight vowels, was forgotten, though not lost. This was unfortunate, seeing that the resulting costly detour could have been avoided; Møller was aware of the existence of at least two different proto-vowels \*e ≠ \*o, as implied by his early statements like “\*eA wird aA, woraus ā, \*oA wird ō” (1880:493n2). That Møller (1906:v-vi) later on came to favour the \*o-elimination (a.k.a. monovocalism), which was called a ‘well-known phonological fallacy’ by Kuryłowicz (1964:28), is obvious from his statement:

“Der Satz ‘Es gab und gibt im Indogermanischen nur a-Wurzeln’, an dem ich [...] ohne einen einzigen Moment des Schwankens oder Zweifels beständig festgehalten habe, während er von vielen Seiten, u.a. alsbald von Osthoff bestritten worden ist.”

(h) For his final error, Møller chose an incomplete starting point of six vowels for his theory, instead of the correct eight cover symbols of Brugmann (Møller 1879:151):

“Es gab in der letzten periode der grundsprache zu den drei kürzen a<sub>1</sub> a<sub>2</sub> a (mit Collitz e o a) drei entsprechende längen ā<sub>1</sub> ā<sub>2</sub> ā (ē, ō, ā).”<sup>387</sup>

Though equating the ablaut Dor. α ε ο ᾱ η ω, this approach was not sufficient for the reconstruction of the Proto-Indo-European, because Indo-Iranian necessitates two more correspondence sets (viz. Neogr. \*ə and Neogr. \*ā̄). Without these, Møller’s theory never had a chance to solve the problem of Indo-European vocalism, and given his focus on entities defined by colouring (Ee : Ae : Ôe) and lengthening (eE : eA : eÔ) – that is to say, the ‘laryngeals’ E : A : Ô – it can be doubted whether Møller had the Indo-European problem in his mind at all. Accordingly, the laryngeal theory has been criticized for its aprioristic approach at the cost of empiricism from the beginning.<sup>388</sup> The results are particularly poor, as Møller knowingly chose Saussure’s inconsistent theory as the basis of his deductions.<sup>389</sup> The situation did not improve when Kuryłowicz and Benveniste uncritically continued Møller’s deductive approach in the interpretation of Hittite. Instead of using empirical induction<sup>390</sup> and

<sup>387</sup> See also Schmitt-Brandt (1967:4): “Møller hatte aus Saussures zwei sonantischen Koeffizienten drei Laryngale gemacht, so daß den drei Vokalqualitäten des Meillet’schen Vokalsystems \*e, \*a, \*o, \*ē, \*ā, \*ō je drei laryngale Konsonanten \*H<sub>1</sub>, \*H<sub>2</sub>, \*H<sub>3</sub>, entsprachen.”

<sup>388</sup> See Tischler’s (1980:498) skepticism towards the deductive approach of Saussure, Møller and Cuny. See also Meid’s related discussion (1988:341).

<sup>389</sup> Krahe (1958:97) writes: “Die ‘Laryngaltheorie’ kann aber weder in ihrer Substanz noch in ihrer Methodik als gesichert gelten.”

<sup>390</sup> See Tischler (1980: 498): “Im übrigen liegt ja die Annahme nahe, daß Kuryłowicz selbst gar nie auf die Idee gekommen wäre, das hethitische *h* auf mehr als einen idg. Laut zurückzuführen, weil er *induktiv* vom sprachlichen Material ausgegangen wäre. Kuryłowicz ging dagegen *deduktiv* von den Theorien de Saussures und Cunys aus und wollte im Hethitischen nur die Bestätigung für diese Theorie finden.”

comprehensive material,<sup>391</sup> the authors presented Möller's theory without its programmatically Semitic typology by replacing 'Proto-Indo-Semitic \*a' with 'fundamental vocal \*e', laryngeals E : A : Ô with schwas \*ə<sub>1</sub> ə<sub>2</sub> ə<sub>3</sub> and the Proto-Indo-Semitic root CäCä·Cä with schemata C<sub>1</sub>eC<sub>2</sub>·Σ- (thème I) : C<sub>1</sub>C<sub>2</sub>·eΣ- (thème II).<sup>392</sup> Unfortunately, no amount of analysis will reach the right conclusion if the paradigm is wrong.

§4. As an empirical science,<sup>393</sup> Indo-European linguistics is fundamentally based on empiric data, genetic relationships and family consistency.<sup>394</sup> It is these factors that allow the study to overcome the laryngeal crisis. As demonstrated in this study, the Proto-Indo-European laryngeal problem is solvable as the two comparatively proven phonemes Neogr. \*ə (= PIE \*a) and PIE \*h (= H<sub>i</sub>. h) are combined into diphonemic PIE \*ħa, \*ah. In the resulting system, the values of Brugmann's eight cover symbols have an interpretation in the most economic system of proto-phonemes to date, PIE \*ě ő a ħ. As a comparative reconstruction exists and it can be supported by a digital proof that generates the data, the success of the comparative method is certain. The simultaneous appearance of the PIE Lexicon, its compatibility with the other digital dictionaries and the fact that the problems of the laryngeal theory have not been generally forgotten<sup>395</sup> mean that this breakthrough can be rigorously explored in the

<sup>391</sup> See Tischler (1980:495): "Obwohl Kuryłowicz seine Theorie auf der schmalen Basis von lediglich 24 Wortvergleichen errichtete, von denen sich nachträglich noch dazu eine ganze Reihe als verfehlt erwiesen, wurde schon bald klar, daß diese Theorie mit den vorliegenden Fakten nicht in Einklang zu bringen ist."

<sup>392</sup> Benveniste (1935:170) writes: "La racine indo-européenne est monosyllabique, trilitère, composée de la voyelle fondamentale e entre deux consonnes différentes. [...] La racine fournit, avec un suffixe, deux thèmes alternants: I racine pleine et tonique + suffixe zéro; II racine zéro + suffixe plein et tonique." For Benveniste's 'thème I' and 'thème II', see Möller (1880:506): "Ursprünglich dreisilbige wurzeln (wie *dajava* s. 492, woraus *daiv* und *djau* [...])."

<sup>393</sup> See Boretzky (1975:61): "Die historische Sprachwissenschaft ist jedoch eine empirische Wissenschaft, die nicht allein mit logischen Grundsätzen auskommen kann [...]."

<sup>394</sup> For 'family consistency', see Trask (DHCL 120). Note also that Trask's restriction to the application of the rule does not hold, because his sole counterexample is the laryngeal theory, which must be regarded as a failure.

<sup>395</sup> To assist in an understanding of the ambiguity of the laryngeal theory, I quote an entry from the first article of the published entry of *Altlitauisches etymologisches Wörterbuch* (HU Berlin), linked to the TITUS program's desktop:

"**nà, nù** int., prt. 'fürwahr; na': MzG<sub>II</sub> 565<sub>5</sub> *Widui smertis na mums kerfchiy / Pelkla karfchtu vgnimi* '(Mitten in dem tod anficht / uns der hellen rachen)'; BrG [22]<sub>v15</sub> *Widui smerties nu mums kerfchi* '(Mitten in dem tod anficht)'; SaC 729 *Interjectiones .. Comminantis, ut: Nu/ nu.*

LKŽ belegt beide Varianten der Interjection und Partikel *nà* und *nù* für das ganze lit. Sprachgebiet. Die Variante *nà* ist vermutlich entlehnt aus nhd., nndd. *na* int. '(Ausdruck des Zögerns, des Unglaubens, der Ungeduld)', das trotz relativ später Bezeugung (16. Jh.) wohl nicht zu trennen ist von an. *na* part. in *hér-na* 'hier, hierhin', *par-na* 'da, dahin', *nú-na* 'jetzt eben' etc. Die germ. Lexeme lassen sich mit gr. (ion., att.) *νή* 'fürwahr, wahrlich, ja', lat. *nē* 'ja, fürwahr' zusammenstellen, was die Rekonstruktion einer bereits uridg. Part. \**néh<sub>1</sub>* oder \**nē* nahelegt (vgl. EWDS 642). – Die variante lit. *nù* macht den Eindruck einer übernahme aus dem Poln. oder Ostslav. Vgl. poln. *nu, nu-że*, russ. *nu, nú-ka, nu že*, wruss. *nu, nú-ka, nuž*. Diese Int. des Aufforderns ist nach Ausweis der süd[s]lav. Vergleichsformen wie skr. *nù, nùto* oder sln. *nù, nùj* zumindestens bereits urslav. Alters (vgl. REW

future. A new era in Indo-European linguistics has begun, one of natural science, empiricism and digital technology.

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1.230, ÉSSJ. 26.30-33). Sie entstand wahrscheinlich durch Zusammenrückung von uridg. \**néh<sub>1</sub>* bzw. \**né̃* mit der Prt. \**h<sub>2</sub>u* ‘und, auch, ferner’ (ved. *u*, gr. *αὐ̃*). eh”

The entry is not only philologically and comparatively oriented (versus deductive), but conservative as for the laryngeals: \**h<sub>2</sub>* is reconstructed (in \**h<sub>2</sub>u* for Gr. *αὐ̃*), but neither the compensatory lengthening nor the ‘e-colouring’ laryngeal are strictly speaking bought, as the ambiguity is properly noted in the reconstruction (\**néh<sub>1</sub>* oder \**né̃*).

### 3 PIE \*h̥ and resonants PIE \*i u l r m n

#### 3.1 On theories and problems of the resonant system

##### 3.1.1 Introductory remarks on resonants

§0. The main features of the PIE resonants (or sonorants) – the semi-vowels PIE \* $\underset{h}{i}$  \* $\underset{h}{u}$  (= U), liquids PIE \*l \*r (= L) and nasals PIE \*m \*n (= N) – will be studied in this chapter both independently and in environments PIE \* $\underset{h}{a}$  \* $\underset{h}{a}h$ , based on the comparative method of reconstruction.<sup>396</sup>

§1. The Proto-Indo-European resonants had a consonantal and a syllabic variant:

PIE	* $\underset{h}{i}$	$\underset{h}{u}$	m	n	l	r	(‘non-syllabic R’)
PIE	*i	u	$\underset{m}{m}$	$\underset{n}{n}$	$\underset{l}{l}$	$\underset{r}{r}$	(‘syllabic R’)

The alternation R :  $\underset{h}{R}$  is conditioned by the environment (i.e. the surrounding phonemes) as expressed in the following formula:

$$VRV \quad CRV \quad V\underset{h}{R}C \quad C\underset{h}{R}C \quad (\text{‘alternation R : } \underset{h}{R}\text{’}).$$

Fundamentally, the alternation depends only on the phoneme following the resonant, with the result that the antevocalic resonants were non-syllabic (RV) and anteconsonantal syllabic ( $\underset{h}{R}C$ ), regardless of the preceding phoneme (C or V).<sup>397</sup>

§2. As for the resonants (R) and their subclasses (U, L, N), note the following preliminary observations:

(a) The main problems of the theory of semi-vowels U (PIE \*i, u) have been solved in the traditional reconstruction with the rules for \* $\underset{h}{a}$ +U and \* U+ $\underset{h}{a}$  (except for Sturtevant’s interpretation of Sievers’s Law), allowing for the replacement of the former prosodic condition with a phonetic one.

(b) A more complex problem is found in the Neogrammarian ‘Sonantentheorie’ of the co-called syllabic sonants,<sup>398</sup> or the syllabic liquids Neogr. \* $\underset{l}{l}$   $\underset{r}{r}$  and the syllabic nasals \* $\underset{m}{m}$   $\underset{n}{n}$ , postulated by Osthoff and Brugmann. This theory dominates the field of PIE resonants and is given special attention in what follows, owing to the new interpretation necessitated by the emergence of the segmental laryngeal.

<sup>396</sup> In this chapter, the term resonant R refers to the phonemes that can function either as vowels  $\underset{h}{R}$  (syllabic) or consonants R (non-syllabic).

<sup>397</sup> This original state of affairs is still preserved in the Baltic languages where the sequences  $V\underset{h}{R}C$  are diphthongs regardless of the character of the resonant  $\underset{h}{R}$ .

<sup>398</sup> In order to avoid confusion, the term ‘sonant’ is used to refer to Brugmann’s and Osthoff’s theory of syllabic sonants.

### 3.1.2 On the theories of PIE syllabic resonants

§0. In the domain of problems best highlighted through Osthoff's and Brugmann's syllabic sonants, three primary theoretical approaches have emerged in the explanation of data, described here in terms of their general features.

§1. The theory of syllabic sonants (die Sonantentheorie) was presented by Osthoff and Brugmann. The idea of the theory is that the syllabic sonants developed an epenthetic (svarabhakti) vowel in 'non-Aryan' languages (except for the syllabic nasal), resulting in a vowel in Indo-Iranian and Greek.<sup>399</sup> Thus, the following well-known equations were set forth for Neogr. \*r̥ and \*ŋ̥:

Neogr. *r̥	→ OInd. ṛ, Av. əṛ	: Gr. αῤ, Li. ir, Go. ur, Lat. or, etc.
Neogr. *ŋ̥	→ OInd. a, Gr. α	: Li. in, Go. un, Lat. en, etc.

In this manner, the syllabic sonants were assumed to have developed full vowels (Gr. α, BSl. i, Germ. u, Ital. o/e, etc.) characteristic of the individual subgroups.

§2. The 'schwa secundum school' includes such scholars and theoreticians as Schmidt, Bechtel (1892:127-43 & 151-3), Güntert (1916), and Schmitt-Brand (1967). Though less appreciated, this theory was highly influential in the 20<sup>th</sup> century as Walde's etymological dictionary formed the core of Pokorny's *Indogermanisches etymologisches Wörterbuch*, a hybrid of the Sonantentheorie and schwa secundum. Characteristically, the schwa secundum school accepts the correspondences defined by Brugmann and Osthoff, but explains the svarabhakti vowels by means of schwa secundum \*ɥ, as indicated in:

SSec. *ɥr̥	→ OInd. ṛ, Av. əṛ	: Gr. αῤ, Li. ir, Go. ur, Lat. or, etc.
SSec. *ɥŋ̥	→ OInd. a, Gr. α	: Li. in, Go. ur, Lat. en, etc.

§3. Finally the comparative theory may be mentioned, as it is occasionally employed in the reconstruction of various scholars like Verner. This approach compares the svarabhakti vowels of certain languages to identical ones in other branches, and when two witnesses confirm a vowel, that item – rather than syllabic sonants or the schwa secundum – is reconstructed.

§4. These three theories will be analyzed, evaluated and tested against the material now at our disposal.

### 3.1.3 The theory of syllabic sonants (Sonantentheorie)

§0. The Neogrammarian theory of syllabic sonants has a twofold origin:

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<sup>399</sup> The Neogrammarians used various terms, in both the singular and the plural, to designate the vowels allegedly originating in the syllabic resonants. In addition to the term 'svarabhakti', designations like 'das Residuum des Vokals', 'Gleitlaut', 'Stimmgleitlaut' and 'volle Vocale' were used. For the sake of simplicity, exclusively the term 'svarabhakti' will be used in this study.

(a) The two ablaut schemata of the Neogrammarian system (Neogr. \*e : Ø : o and Neogr. \*ə : ā ē ō) did not suffice for a regular explanation of the attested Indo-European vocalisms. Consequently, needing additional means of derivation, Brugmann and Osthoff chose syllabic sonants for this purpose.

(b) In his phonology, Sievers (1876:24-5) had demonstrated that liquids and nasals can function as consonants and as vowels, thus providing the phonetic, typological and theoretical framework for the theory of syllabic sonants.

Against this background, Osthoff and Brugmann set themselves the goal of accounting for the irregular vocalisms by explaining them as svarabhakti vowels resulting from syllabic sonants.<sup>400</sup>

§1. During the revision of the Paleogrammarian vowel system, Osthoff (1876:52-53) claimed the existence of syllabic liquids for the proto-language. Immediately afterwards, Brugmann (1876a:303-4) made a similar conjecture for syllabic nasals.<sup>401</sup> These suppositions were combined by Brugmann (1879a:3) into a general statement of syllabic sonants, marking the birth of the general theory:

“Die gemeinsam indogermanische grundsprache besass aller wahrscheinlichkeit nach ein vocalisches r und l und eben so vocalische nasale [...]”

As for the svarabhakti vowels (i.e. the alleged outcomes of the syllabic sonants), Pedersen (1983:68) illustrates the plan with the following (slightly modified) table:<sup>402</sup>

	1	2	3	4
	–	–	–	–
Sanskrit	a	a	a	i u
Greek	ε	ο	α	α (o?)
Latin	e, i	o, (u)	a	e o
Celtic	e	o	a	i (a)
Gothic	i	a	a	u
ONorse	e, i	a	a	u/o
Lithuanian	e	a	a	i
Slavic	e	o	o	ĩ
	–	–	–	–
Paleogr.	*a	*a	*a	a, [e, o], i, u

<sup>400</sup> See Brugmann (1876a:303): “E. Sievers in seinen trefflichen ‘Grundzügen der Lautphysiologie’ setzt S. 24 ff. auseinander, das die liquidae r und l und die nasals n, n, m eben so gut Vocale sein können wie Consonanten.”

<sup>401</sup> See also Pedersen (1983:71): “The following year (1876) Brugmann wrote an article entitled *Nasalis sonans in der indogermanischen Grundsprache* in which he maintained that there must have been syllables without vowels in the parent language of our language family, syllables in which an *n* or an *m* made up the syllable; similarly, he assumed syllables with r (l) as syllabic nucleus.” Note that Pedersen credits Brugmann for the syllabic liquids; this is inaccurate, strictly speaking, as the syllabic liquids were originally suggested by Osthoff.

<sup>402</sup> Columns 1, 2 and 3 indicate the vowels Neogr. \*a, e, o, etc. (see Chapter 2) and column 4 indicates the svarabhakti vowels explained by the leading Neogrammarians by means of ‘syllabic sonants’ (Neogr. \*ṃ ṇ ḷ ṛ, etc.).

Neogr.                    \*e                    \*o                    \*a                    \*ṁ ṇ ḷ ṛ

§2. The key features of the theory are:

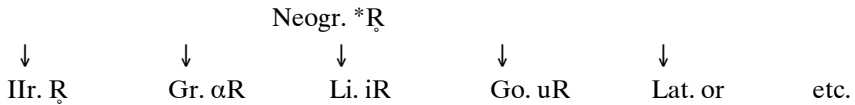
(a) In the formation of their theory, Brugmann (and Osthoff) borrowed from the conceptual framework of the Sanskrit grammarians in several respects:

1. The svarabhakti (a.k.a. epenthetic) vowel of the Sanskrit grammarians was turned into a theoretical means of explaining the vocalisms of the individual subgroups (Lat. e, Li. i, etc.).<sup>403</sup>

2. The syllabic liquid of the Sanskrit grammarians (OInd. r ṛ ṝ etc.) was accepted and generalized for the lateral and nasals of Proto-Indo-European.

3. The variation of the Sanskrit-roots √tar- √tir- √tur- was subordinated to unattested underlying roots (Neogr. √tṛ- etc.) equaling their theoretical counterparts in Sanskrit (OInd. √tṛ- etc.).

(b) The Neogrammarians postulated proto-sonants \*R̥, assumedly preserved in Indo-Iranian zero grade as such (except for the nasal), but displaying svarabhakti vowels derived by excrecence in the rest of the subgroups:



In modern terms, Brugmann and Osthoff implied a distribution according to which ‘a-vocalism’ was typical for Greek, ‘i-vocalism’ for Balto-Slavonic, ‘u-vocalism’ for Germanic and so forth.<sup>404</sup> The Sanskrito-centric basic idea of the reconstruction is reflected in Brugmann’s and Osthoff’s conclusion of Indo-Iranian representing the original state of affairs, whereas the rest of the group is considered to have innovated the svarabhakti vowels.

(c) Brugmann and Osthoff shared the ‘uniform hypothesis’ in its absolute form, according to which for every object there is one (and only one) representative in the proto-language (as in Brugmann’s German dialect). Accordingly, it was assumed that a single uniform prototype existed (for instance, for the word meaning ‘hundred’) in the proto-language (Neogr. \*ḱm̥to-), just as there is a single word in German (ModHG. hundert).

§3. In contact with the material, the simple theory including Neogr. \*m/ṁ \*n/ṇ \*l/ḷ \*r/ṛ ran into difficulties. Soon Osthoff (1879a:421)<sup>405</sup> had to suggest the existence of Neogr. \*ḷ̥ ṛ̥ ṇ̥ ḷ̥ṁ ṇ̥ṁ (a.k.a. ‘antevocalic syllabic liquids and nasals’) in order to account for the svarabhakti vowels attested in antevocalic position:

<sup>403</sup> For the ‘svarabhakti’ in action, see Brugmann (1876a:305): “Für die europäische Grundsprache können wir Formen etwa wie pād̥m [...] aufstellen, d. h. die in der Anlage schon vorhandene Svarabhakti hatte eine e-färbung.”

<sup>404</sup> Consequently, the testing of the theory depends on whether such distributions are provable by the comparative method or not.

<sup>405</sup> See also Osthoff (1879b:14-16).



“Diese stellung der griechischen sprache erhellt besonders klar auch aus folgendem seitens Brugmans noch nicht verzeichneten beispiele für die nasalis sonans: griech. τανυ- in den bahuvrīhis τανύπτερος u. a. [...] wie skr. tanú- adj., aber lat. tenu-i-s, abulg. tīnū-kū, ahd. dunni, alle von der grundform indog. \*tǵnú-. Mit diesem so angesetzten indogermanischen adjectiv \*tǵnu- verhält es sich mit der viersilbigkeit des Sievers’schen musterbeispielen nhd. be-rit-tn-(n)e.”

(a) In order to provide a theoretical framework, Brugmann (Grundr<sup>2</sup> 1:399) defined the ‘prevocalic syllabic nasals and liquids’ as parallel to the glides: “Hinter Consonanten entspricht der Wechsel  $\eta^n$  : n dem von  $i\ddot{i}$  :  $\ddot{i}$ ,  $u\ddot{u}$  :  $\ddot{u}$ ,  $r^r$  : r,  $l^l$  : l, s. §282 S. 264.” The irregularity of the explanation was, however, immediately recognized and criticized for that. For example, Møller (1893:370) writes:

“Indem Bechtel (wie Joh. Schmidt) reducierten vokal + m, n, r, l vor vokal für die grundsprache annimmt, stelt er sich in einen gegensatz gegen ‘die anhänger der sonantentheorie’ (s. 131), die den wurzelvokal beseitig sein lassen und der grundsprache die lautgruppen  $m^m$ ,  $\eta^n$ ,  $r^r$ ,  $l^l$  zuschreiben. ‘Gegen derartige ansätze erhebt das germanische protest, wie Paul (PBB. 6, 109 fg.) gezeigt hat’, dem Bechtel (s. 132) sich anschließt, obwohl Paul, ohne das von ihm selbst früher vorgebrachte zu widerlegen, seinen einwand hat fallen lassen (6, 409). In got. baurans, numans, skulum, munum usw. ‘kann niemals der vokal vor nas.-liq ganz geschwunden gewesen sein’, es müste sonst ‘skullum heissen gerade wie hullum’.”

(b) Szemerényi (1996:51) later attempted to improve the situation, noting that

“[...] it is customary to speak of syllabic nasals and liquids in prevocalic position (denoted by  $m^m$  or  $\eta^m$ , etc.), which in fact involves a contradiction, as these sounds can become syllabic only between the consonants. [...] Since the denotation  $m^m$  is misleading – giving the impression of a syllabic followed by a consonantal m – we shall use  $m$ ,  $\eta$ , etc. for the prevocalic position also.”

While Szemerényi is correct in rejecting the notation Neogr.  $*m^m \eta^n$ , etc., writing  $*mV$ ,  $*\eta V$ , etc. instead does not resolve the contradiction: “these sounds can become syllabic only between the consonants.”

(c) Saussure attempted to solve the problem with segmental analysis by defining Neogr.  $*R^R \equiv DS *RA$ . This idea (written CRHV) is accepted by the mainstream laryngeal theory with the following rules:

Neogr.  $*(C)\ddot{I}HV$        $(C)rHV$        $(C)mHV$        $(C)\eta HV$ .

On paper, such analysis provides a phonological motivation for the syllabification, but it should be noted already here that this was a notational change that did not critically evaluate the postulates Neogr.  $m^m \eta^n r^r l^l$  and their actual behaviour in the data.

§4. Finally, a fourth series of resonants – the long syllabic sonants Neogr.  $*\bar{r} \bar{i} \bar{m} \bar{\eta}$  – were postulated by Brugmann (Grundr.<sup>2</sup> 1: 417-423).<sup>406</sup> From the outset, this series was considered as shorthand for the earlier diphonemic clusters  $R+\text{ə}$  (= Saussure

<sup>406</sup> For the long syllabic sonants, see Mayrhofer (1987:103), Schwyzer (GrGr1: 259-63), Kuryłowicz (1956:166-208), Schmitt-Brand (1967:32), Hirt (1900:32ff.) and Brugmann (Grundr<sup>2</sup> 1:490ff.).

$R_+A^{407}$ ) in environment  $CR_+C$  ( $\equiv LT CR_+HC$ ).<sup>408</sup> The idea of the reconstruction is neatly explained by Burrow (1949:35):

“It is supposed, in the case of this root [=  $\sqrt{tr-}$ ], that the weakened  $\bar{a}$  which forms the second element becomes  $\bar{a} > Skt. i$  in forms like *taritum*, but that where there is complete reduction, the two elements combined to form in Indo-European a long vocalic  $\bar{i}$  which develops in Sanskrit to  $\bar{i}r$ ,  $\bar{u}r$ , and variously in other languages. The same relation is held to exist between *pārīman-* ‘abundance’, *prātā-*, and *pūrṇā-* ‘full’ (IE  $\bar{i}$ ), *bhāvītum* and *bhūtā-* (IE  $e\bar{w}a : \bar{u}$ ); likewise IE  $\bar{i}$  in *nītā-* ‘lead’,  $\bar{n}$  in *sātā-* ‘obtained’ (: *sanitum*),  $\bar{m}$  in *dāntā-* ‘tamed’ (: *damitī-*). The laryngeal theory substitutes the usual duality of vocalic and consonantal :  $*\bar{t}ér-H-tum : tṛHnó-$ .”

Brugmann’s interpretation was soon attacked by Johannes Schmidt (1895), according to whom Neogr.  $*\bar{a}$  is a vowel and therefore could not possibly syllabicate (and lengthen) the preceding sonant. In Saussure’s system, however, the coefficient  $*A$  (= Neogr.  $*\bar{a}$ ) was understood as a sonant; Saussure’s  $C\bar{r}AC^{409}$  could, at least in theory, overcome the difficulty, especially after  $*A$  was interpreted as a (laryngeal) obstruent.<sup>410</sup>

### 3.1.4 The problems of Sonantentheorie

§0. The problems of the sonant theory culminated in its complexity: instead of two resonants in simple alternation  $R : R_+$ , four series were ultimately postulated:

$$\text{Neogr. } R : R_+ : R_+^R : \bar{R} \quad \equiv \quad \text{LT } RV : RC : R_+HV : R_+HC.$$

Owing to the absence of the Old Anatolian laryngeal at the time of the postulation, the alleged analytical shapes were never more than structural guesses, which would become outdated with the emergence of the new material. The presence of PIE  $*\bar{h}$  necessitates an inductive check of the real behaviour of the sequences  $*\bar{h}+R$  and  $R+\bar{h}$ , during which more general problems may also be critically discussed.

§1. The series  $R_+ \equiv *m \bar{n} \bar{l} r$  – that is to say, the simple syllabic sonants in environment  $(C)R_+C$  – is now widely accepted. Yet serious problems, forgotten to some degree by now, have plagued the theory from the beginning:

<sup>407</sup> For Neogr.  $*\bar{n} = *nA$  and so forth, see Saussure (*Mém.* 250) and Schmitt-Brandt (1967:3).

<sup>408</sup> See Brugmann’s (*Grundr.* 1:393) structural statement: “In morphologischer Hinsicht entsprechen unsere  $\bar{m}$ ,  $\bar{n}$ ,  $\bar{l}$ ,  $\bar{r}$  dem  $\bar{i}$  und  $\bar{u}$ , s. §547.” For the literature on Neogr.  $*\bar{l} \bar{m} \bar{n} \bar{r}$  and/or the  $CR_+C/CR_+HC$ -rule, see Lindeman (1982:13, 1997:94ff.), Mayrhofer (1986:144-145), Schmitt-Brandt (1967:3ff.) and Szemerényi (1996:49-50). For Schmidt’s ‘Kritik der Sonantentheorie’ (1895:167ff.) and other criticisms, see Anttila (1969:68).

<sup>409</sup> See, for instance, Anttila’s (1969:67) perspective: “This was Saussure’s view of the long syllabic resonants:  $R_+A$ ,  $R_+E$ ,  $R_+O$  (*Mém.* 271).”

<sup>410</sup> See Szemerényi (1996:123): “[...] as Möller’s pupil H. Pedersen recognized, that the long syllabic sonants (4.3.5, 5.3.5) are fusions of syllabic sonants with non-syllabic laryngeals:  $\bar{i}$ ,  $\bar{u}$ ,  $\bar{l}$   $\bar{m}$   $\bar{n}$  are  $iH$ ,  $uH$ ,  $rH$   $\bar{l}H$   $\bar{m}H$   $\bar{n}H$ .”

(a) Immediately after its delivery, it was recognized that the Sonantentheorie was not verifiable in terms of its content (viz. the emergence of svarabhakti vowels). Thus, to quote Møller (1893:371):

“Dass aber die uns vorliegenden vokale griech. α, germ. u, usw. vor m, n, r, l notwendig aus sonantischen m, n, r, l erwachsen sind, kann nicht bewiesen werden [...]”

The obvious reason for this state of affairs is that the svarabhakti vowels Gr. α, OCS ĭ, Go. u, etc. of the Neogrammarians can always reflect the original vowels Neogr. \*a e i o u and so forth, with the result that the theory is ambiguous and, strictly speaking, does not support the rules of theory creation advanced by Osthoff and Brugmann.<sup>411</sup>

(b) The environment suggested for the svarabhakti vowels – occurrence with (syllabic) sonants – does not hold true either, as was already pointed out by Güntert (1916:viii):

“[...] derselbe überkurze, reduzierte Vokal, den viele bis jetzt nur vor oder nach Nasal und Liquida annahmen, begegnet auch sonst in beliebiger konsonantischer Umgebung [...]”<sup>412</sup>

Indeed, the svarabhakti vowels appear independently of the environment, as is the case in:

Lat. tepeō	(pr2.) ‘warm, mild sein’ (WH 2:667-8, tepeō)
Umbr. tap·istenā-	(f.) ‘caldariola ?’ (WH 2:668)

Thus the phenomenon exists, but it is more general than Brugmann’s and Osthoff’s original vision, which was restricted to the syllabic sonants.<sup>413</sup>

(c) Methodically the assumption of svarabhakti vowels violates the *ex nihilo nihil* principle. By simplification of R̥/R on both sides, the derivation

Neogr. \*R̥ → Gr. αR      Li. iR      Go. uR      etc.

is equal to PIE Ø → IE a e i o u. In other words, the theory assumes that all five cardinal vowels were uniformly derived from nothing (instead of the primary (attested) Indo-European vowels available for explanation).

(d) The Neogrammarian sound laws are dependent on the assumption that syllabic sonants produce vowels in Indo-European languages. This assumption has also been

<sup>411</sup> Since Neogr. \*a e i o u were already present in the proto-phoneme inventory, they were primary compared to the svarabhaktis emerging from the Neogrammarian ‘syllabic resonants’, making the assumption of epenthetic vowels and syllabic sonants superfluous (‘entia non sunt multiplicanda praeter necessitatem’).

<sup>412</sup> See also Güntert (1916:68): “[...] im Italischen und Keltischen nicht nur die Vertretung des ʷ durch a in diesen Sprachen ergeben, sondern uns auch gezeigt, daß ʷ bei Nasal und Liquida geradeso vertreten ist, wie bei reinkonsonantischer Umgebung.” See also Güntert (1916:68): “Die Hauptsache bleibt aber dabei, daß dieser Vokal ʷ um den genannten Verbindungen auch sonst in jeder anderer Stellung begegnet und keineswegs nur an die unmittelbare Nachbarschaft von Nasal und Liquida gefesselt ist.”

<sup>413</sup> As Güntert points out, the irregular vowels appear to be connected to the ablaut rather than to the syllabic resonants (1916:89): “Bartholomae BB. 17 (1888), 9f ff. hat auf auffällige Beispiele aufmerksam gemacht, bei denen im Armenischen a in der ‘e-Reihe’ stand.”

questioned, at least by Schmitt-Brandt (1967:67n69), who correctly points out that the outcomes are consonantal (for instance, in Slavonic):

“Die anlautende Liquida oder Nasalis muß deshalb vor Ausfall des \*H nicht silbisch gewesen sein, vgl. tschech. mhla ‘Nebel’ und mzda ‘Lohn’, poln. rtęc ‘Quecksilber’ etc.”

A similar situation exists in Greek, where the secondary ‘syllabic liquidas’ (Gr.  $\dot{\rho}$  = /rh/, Gr.  $\lambda h$  = /lh/) are attested, not unlike in Tocharian and Later Anatolian, as discussed below.<sup>414</sup>

(e) Finally, Brugmann had already realized that the outcomes of the syllabic nasals were actually consonants, not vowels. In the section of *Grundriss* that deals with the consonantal nasals (§387), Brugmann (Grundr<sup>2</sup> 1:342) writes:

“[...] *m* in Anlaut. [...] Anteconsonantisch, vor *n* und vor Liquidae. – Ai. ā-mnāyatē ‘er wird erwähnt’, arm. mna-m ‘ich bleibe, erwarte’, Gr. μνήσαι ‘erinnern’. – Ai brū-hi av. mrūidi ‘sprich’; got. brūp-s ‘Braut’ aus \*mrūti- ‘Versprechung’? – Gr. βρόμω ‘ich brause, dröhne’, Lat. fremō, ahd. brima ‘ich brümme, brülle’, zu ai. marmara-s ‘rauschend’. – Ai. mlāya-ti ‘er erschlaft, wird weich, schwach’, gr. βληχρός ‘schwach’.”

Leaving aside impossible etymologies (got. brūp-s ‘Braut’, etc.), a nasal before consonant (shape NC) appears in the proto-language. By definition the nasal was syllabic NC, not consonantal <sup>†</sup>NC (i.e. the forms contain PIE \*mr-, PIE \*ml-, and PIE mn-, which resulted in mr-, ml-, mn- in the Indo-European languages). In other words, the outcome of syllabic nasals were consonantal without yielding svarabhakti vowels, which together with the opposite assumption constitutes a violation of the principle of the regularity of sound change.<sup>415</sup>

(f) As the traditional reconstruction only had a handful of counterexamples, the matter was of little relevance before the emergence of the Old Anatolian laryngeal. Following the discovery of the laryngeal, however, the reconstruction of PIE \*h̥ has resulted in hundreds of examples of PIE \*h̥RC and PIE \*CRh̥ (of the general shape CRC) in which the outcome of syllabic nasals was consonantal without svarabhakti vowels. Since the principle of regularity of sound change does not permit two different outcomes for a prototype in an identical environment, the historical explanation needs to be revised in relation to post-Anatolian Indo-European theory.<sup>416</sup>

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<sup>414</sup> Also in Prakrits, the sequences /mh/ and /nh/ emerge without syllabification (a situation typologically paralleled by Thai and Maradhi, for example).

<sup>415</sup> For the identical outcome of PIE \*nC, see Brugmann (Grundr<sup>2</sup> 1:344): “Die Gruppe nr- (in ai. nachved. nr-ē, nr-asthi- ‘Menschenknochen’ und Gr. δρώψ : ἄνθρωπος (Hes.) aus \*vq war in uridg. Zeit, wenn sie damals überhaupt schon bestand, wahrscheinlich nicht im Absoluten Anlaut ins Leben getreten.”

<sup>416</sup> Note Brugmann’s (Grundr<sup>2</sup> 1:342) explanation: “Anm. Die Gruppen mn-, mr-, ml- sind vielleicht alle in uridg. Zeit nicht im absoluten Anlaut ins Leben getreten, sondern im bedingten und zwar postsonantisch (vgl. §282,3 S. 265 über ai. mriyá-tē). Sie kamen dann sekundär in der Satzanfang zu stehen.” This is not acceptable, because the examples like PIE \*mri- are also comparatively confirmed.

§2. As regards the series  $\mathbb{R}^R \equiv *m^m n^n l^l r^r$  (CRHV), without repeating the general problems (ambiguity, etc.) mentioned above, the following obstacles should be noted: (a) It has been obvious from the very beginning that the CRHV rule does not generate data regularly.<sup>417</sup> Attested forms are left outside the reconstruction (resulting in the error of incompleteness), and ghost forms are produced (resulting in unsoundness).

(b) At the time, the postulation of the series Neogr.  $*m^m n^n l^l r^r$  was a structural guess and comprehensive proof was never provided. Simultaneously, the attempts to explain the considerable discrepancy between the data and the theory by means of analogy have not been successful. What is actually needed is an observation-based theory inductively inferred from the data.<sup>418</sup>

(c) The very definition of the series  $\mathbb{R}^R \equiv CRHV$  involves a contradiction: Since  $H \equiv C$ , the formula is actually of the shape  $CRVC(V)$ , and it thus identical with  $CRVC$ . As it is not allowed for an identical environment to yield two different outcomes (due to the principle of regularity of sound change), the outcomes must be identical with those of  $CRVC$ .

§3. The series  $\mathbb{R} = *m^m n^n l^l r^r$  ( $\equiv LT CRHC$ ) is equally problematic. Again without repeating the issues already noted, one may observe that:

(a) The alleged outcomes of the long syllabic sonants are ambiguous. Already in the Paleogrammian system, the related Indo-European long vowels were reconstructed with a genuine PIE quantity, as indicated in:

Paleogr.  $*CRV:C$  (\*tlāto-) → IE  $CRV:C$  (Do. τλᾱτό-).

In this context, Brugmann's and/or Saussure's rule

Neogr.  $*CR\grave{a}C-$  ( $\equiv LT CRHC$ ) → IE  $CRV:C$

is redundant: one finds an artificial ambiguity that should have never been created (or accepted). A genuine quantity has always been the choice of specialists of the European languages, as seen in the example of the classical philologists favoring the original vocalism (Gr.  $\rho\omega$ ,  $\lambda\alpha$ , etc.) in a manner made evident by Szemerényi (1996:50):

“Beekes, *Laryngeals* 186f., and others hold that Greek never had long syllabic sonants. This view was held long before by F. Bechtel, who, in his important study *Die Hauptprobleme der idg. Lautlehre seit Schleicher* (1892), also maintained (p. 217) that Saussure had not managed to prove in *Mémoire* 247f. (= Recueil 231f.) that long sonants existed in IE.”

To this I would like to add Anttila's (1969:68) narrative:<sup>419</sup>

<sup>417</sup> See Anttila (1969:5): “[...] the difficulty in the laryngeal bases, pointed out by Saussure [...], that the zero grade of, say,  $\tilde{g}nE + \tilde{a}$  should give Gk  $*gan\tilde{e}$  (*Mém* 271).”

<sup>418</sup> Szemerényi (1996:142) writes: “The [prevocalic syllabic liquids and nasals] can also in part be due to the analogical transfer of certain preconsonantal developments (i.e. occurring before a laryngeal) to prevocalic position. Thus  $g^wH\tilde{e}$ - could give Gr.  $\beta\alpha\lambda\text{-}\eta\text{-}$ , and as this new form continued alongside the old  $\beta\lambda\eta\text{-}$ , a new  $\mu\alpha\nu\eta\text{-}$  could be formed analogically to the old  $\mu\eta\text{-}$ .”

<sup>419</sup> Note, however, Anttila's anachronism, writing eH for quantity.

“Scholars have tended to explain such ambiguous Greek material (Rā/ē/ō) with an original state two \*ReH, e.g., Persson WW 292. Hirt mentions that Greek ρω might always be a full grade (Abl 66) [...] Chantraine (Morphologie historique) does not even mention the possibility of a zero grade. Schwyzler, who does point to the two possible origins of Greek Rā/ē/ō, is not really interested in distinguishing the original zero and full grades. However, he at least reminds us of the facts by labeling the Greek result with ‘III’ (I.360; Adrados 121-122, with a tendency to interpretate it as full grade [128], as is done by Burrow TPS 1949:38).”

Scientifically speaking, the original long-grade Neogr. \*ā ē ō is correct, because no ambiguity is created, no violation of *ex nihilo nihil* is made and the principle of economy is followed.<sup>420</sup>

(b) If the schemata CRHC is assumed, the resulting system becomes incomplete since the actually attested roots CRaC with a short vowel can no longer be accounted for. This constitutes a major problem for all reconstruction theories,<sup>421</sup> because neither \*ə (Neogr.) nor \*H (LT) can be reconstructed (see Nyman 1985:55-61 for Gr. λήγω : λογάζ : λᾱγᾶρός etc.).<sup>422</sup> It is not difficult to provide examples for such a vocalism:

Gr. πίμπλᾱ-	(pr.) ‘füllen’ (GEW 1:537-8, πίμπλαμεν [1pl])
Gr. τέθνᾱ-	(pf.) ‘sterben’ (GEW 1:653, τέθναμεν [1pl])
Gr. τέτλᾱ-	(pf.) ‘suffer, endure, dare’ (LSJ 1800, τέτλαθι, P. 1060)

The comparative data reveals the artificial character of the problem and the absence of any need for analogy.<sup>423</sup> The etymological value of the vocalism is defined by Greek α and the Vedic hiatus in PIE \*pleaḥ- ‘fill’:

Gr. πίμ πλα-	(pr.) ‘füllen’ (GEW 1:537-8, πίμπλαμεν)
RV. prá’-	(ao.) ‘füllen, anfüllen’ (WbRV. 886, práas [conj.2sg])
RV. kakṣia prá’-	(a.) ‘den Leibgurt füllend’ (WbRV. 309, kaksiaprāam)

As we can reconstruct the attested forms with PIE \*CReaḥC and PIE \*CRḥaeC, the problem is caused by the erroneous initial foundation of the Neogrammarian theory, which recognizes only two ablaut grades (\*ə : ā) instead of (the correct) three.

§4. The problems of the theory can be summarized as follows:

<sup>420</sup> For the consequences of accepting the ambiguity of Gr. λᾱ, ρᾱ, λω, ρω, see Anttila (1969:34): “Considerable confusion has arisen from the fact [read: assumption] that in most subgroups zero-grade vocalism merges with full-grade vocalism in some environments [...]” For the ambiguity in general, see Persson (1912:633).

<sup>421</sup> For some additional examples of (C)RaC in the cognates, see Burrow (1979:15). In this connection it should be noted that the phenomenon is not restricted, but occurs everywhere (Gr. ἠλάθι, Aigin. λḥᾱβόν, etc.). For Celtic CRāC, see Schrijver (1991:201) and Joseph 1982. For Italic CRāC, see Schrijver (1991:161ff., 184).

<sup>422</sup> Nyman (1985:56-57) writes: “Neither \*(s)lōg nor \*(s)lHg- can be reconstructed [...] the root variants \*(s)lēg- / \*slōg- / \*(s)lag- point to an IE. ablaut type ē/ō/a [...]. It is not difficult to find more evidence for such an ablaut type [...]”

<sup>423</sup> According to Anttila (1969:79-80): “There is general agreement that the CRV forms are secondary [...], although there is also a minority believing the opposite, i.e., τέθνηκα after ἔστηκα/ἔσταμεν (Hirt Abl 186, Maurer Lg 23.9, Adrados 134). The CRV forms occur in the active plural perfect, middle perfect, and active plural present (also middle present: πίμπλαντο).”

(a) The theory was initially rejected by Paul (1880:110), who pointed out that Brugmann’s table of reflexes (Grundr<sup>1</sup> 1:453) did not account for all the evidence (incompleteness) and left several irregularities (unsoundness).<sup>424</sup> Today the new data has made this situation only worse, given the inconsistency resulting from the reconstruction of the laryngeal and Tocharian vocalism, which does not fit the patterns of the Neogrammarian theory.

(b) In order to explain the numerous exceptions, the Neogrammarians resorted to analogy in their theory formation. As an example, Brugmann’s (1879b:276) discussion concerning the bases of the root OInd. √jā- ‘gebären’ may be quoted here:

“Aind. jāti- ‘geburt, stand’ und das davon abgeleitete jātya ‘edel, echt’ können nicht getrennt werden von lat. nātio d. i. \*ǵnāti-o, got. knodi- und dem genau dasselbe wie jātya- bedeutenden γνήσιος [...] Vielleicht ist jñā́tī- m. ‘blutsverwandter’ noch jenes \*jñā́titi- = jāti- (vgl. B.-R.).”<sup>425</sup>

Here Brugmann reconstructed †ǵnā́titi- (an impossibility) in order to account for RV. jñā́tī-, despite the fact that the latter obviously belongs to PIE \*ǵnēaḥti- : \*ǵnaḥēti- (schwebeablaut).<sup>426</sup>

RV. jñā́tī-	(m.) ‘(naher Bluts)verwandter’ (WbRV. 502)
Lat. prae·gnāti-	(a.) ‘schwanger, trüchtig, voll, strotzend’ (WH 2:354)
Lat. (g)nātiō(n)-	(f.) ‘Geburt, Erzeugung, Schlag, Rasse’ (WH 1:598)
Gr. γνήσιο-	(a.) ‘echtbürtig, vollbürtig’ (GEW 1:307)

By reconstructing an underlying syllabic nasal for OInd. jāti- (allegedly Neogr. \*ǵñti- ≡ \*\*gnəti-), Brugmann had to separate RV. jñā́tī- from its direct parallels and explain it through analogy. Had Brugmann followed the proper procedure of external comparison, he might have noticed that the absence of the nasal is not purely an Aryan feature, but also extends to the European languages:

Lat. indi·get-	(a.) ‘eingeboren, einheimisch’ (WH 1:693)
Gr. τηλύ·γετο-	(a.) ‘spät-geboren’ (GEW 2:893)
RV. jā́tá-	(m.) ‘Sohn, lebendes Wesen’ (WbRV. 482)
LAv. zā́ta-	(a.) ‘geboren’; ‘jetzt vorhanden, jetztig’ (AIWb. 1689)

For these reasons, I agree with Burrow’s (1949:38) analysis of the Neogrammarian theory:

“This is the theory that seeks to explain out of [P]IE \*ñ, ñ̥, ǵ, ǵ̥, such forms as Lat. gnātus ‘born’, strātus, grānum, lāna, and Greek στρωτός, τλητός, θνητός, νεόδματος, etc. These combinations consist obviously of liquid or nasal followed by long ā, or occasionally

<sup>424</sup> Brugmann (Grundr<sup>2</sup> 1:397n1) writes: “Wenn Hirt S. 160 sagt, es sei unbedingt nötig, dass an die Stelle der reinen Induktion die Deduktion trete, so möchte ich es für unbedingt nötig erklären, dass man erst einmal aus allen idg. Sprachen das in Frage kommende Material in einiger Vollständigkeit sammle.”

<sup>425</sup> Similarly, Saussure (Mém. 272 = Rec. 254) writes: “Tout le monde accorde que γνήσιος correspond au skr. jātya.”

<sup>426</sup> The view that “[...] γνητός is regular zero grade of the full grade in γενε-τήο” (Anttila 1969:10) is an unnecessary complication, as it produces an unmotivated ambiguity.

some other vowel, and there is no reason to believe that they ever consisted of anything else. The reason that they were made out to represent original long sonant nasals or liquids was partly a desire to find forms corresponding to Sanskrit *ī*, *ū*, etc., at all costs. The argument would apply only if such ‘roots’ were really indissoluble, but since it is certain that we are dealing with suffixes, the suffixes may be allowed to vary.”

(c) As mentioned by Koerner (1985:334), Saussure’s reconstruction (and, consequently, Brugmann’s equivalent) was to a large extent internal:

“No doubt, Saussure operates with what we nowadays refer to as ‘underlying forms’, deriving the actual attested forms through specific rules. By the same method, Saussure (Mémoire p. 248) sets up the rule ‘Le groupe sonante +A, précédé ou placé au commencement du mot, se change en sonante longue, quel que soit le phonème qui suit’ (italics in the original), so that *ī* and *ū* as well as the long sonorants  $\bar{n}$   $\bar{m}$   $\bar{l}$  are derived from  $i^A$ ,  $u^A$ ,  $\bar{n}^A$ ,  $\bar{m}^A$ , and so on, or, in notation suggested by Saussure only in 1891 (cf. Recueil 603), sonant plus shwa.”

The most troubling feature of Koerner’s (1985:334) summary (“In effect [...] Saussure was operating with hypothetical constructs and indirect (distributional) evidence.”)<sup>427</sup> is not only the semi-internal character of the reconstruction, but the fact that no comparative reconstruction, the main objective of Indo-European linguistics, has been presented to this day.

### 3.1.5 The schwa secundum school

§0. The main critics of the Neogrammarians proved not to be the Paleogrammarians with their limited contribution in the ‘war of monographs’, but the schwa secundum school. In this theory, the svarabhakti vowels are recognized as the problem, but they are derived from an original vowel called schwa secundum (or several such items). Despite some improvements (compared to the Neogrammarians), there are also insurmountable problems for this view.

§1. The most noteworthy contemporary challenger of the Sonantentheorie was Johannes Schmidt (1877, 1889 and 1895). According to this scholar, the syllabic sonants never existed, but were accompanied by original reduced vowels  $*_e$  and  $*_o$ , later referred to as schwa secundum by Güntert (1916).<sup>428</sup> From a theoretical point of view, Schmidt (1895:50) understood the schwa secundum(s) as ‘reductions’<sup>429</sup> of  $*_e$ - and  $_o$ -grades<sup>430</sup> (similar to the way in which Neogr.  $*_ə$  was the reduced grade of

<sup>427</sup> For an example of Brugmann’s similar (structural/distributional) argumentation, see his comparison of paradigms: “*ai*. *i-más y-ánti* : *é-tum*, *ju-hu-té jú-hv-ate* : *hótum*, *ha-thá ghn-ánti* : *hántum*, *á-kṛ-ta á-kr-ata* : *kár-tum*” (Grundr<sup>2</sup> 1:499).

<sup>428</sup> Similarly, according to Güntert (1916:100): “[...] das ‘Residuum des Vokals’ (Brugmann K.vgl.Gr. 121) ist nichts anderes als ein auch in jeder anderen Stellung erscheinender, zweiter Murmelvokal der idg. Grundsprache.”

<sup>429</sup> See Güntert (1916:viii): “[...] Schwa secundum [...], das bei der Vokalschwächung aus den kurzen Vokalen *a*, *e*, *o* entstanden war.” Sturtevant (1942:90) writes  $*_ь$  (cf. Lat. *sarpō* ‘prune, trim’; 1943:304) for the schwa secundum.

<sup>430</sup> Schmidt (1895:50) uses the expression “die Reduktion von *erzu*  $əʳ$ ”.



Neogr. \*ē ā ō).<sup>431</sup> Subsequently, Hirt postulated three schwa secundums, thus ending up with a vocalic counterpart of the three-laryngealism.<sup>432</sup> The best-known version of the theory is that of Güntert (1916), which is restricted to one schwa secundum \*ə.<sup>433</sup> As noted by Güntert,<sup>434</sup> Schmidt's critique was somewhat too strong (as was Hirt's). Accordingly, I have chosen to review Güntert's version of the theory here.

§2. In comparison with Brugmann's and Osthoff's zero grade, the advantages of the schwa secundum in the explanation of svarabhakti vowels can be summarized as follows:

(a) The chief contribution of the schwa secundum school<sup>435</sup> to Indo-European linguistics lies in the replacement of the Neogrammarian *deus ex machina*, the emergence of svarabhakti vowels from nowhere, with an actual proto-phoneme schwa secundum.<sup>436</sup> Regardless of the questionable nature of the schwa secundum itself (see below), the more fatal problem of *ex nihilo nihil* was avoided (to a degree, at least).

(b) Güntert's (1916:68) call to "Ansätze wie ʔr, rʔ, ʔl, lʔ, ʔm, mʔ, ʔn, nʔ anzuerkennen" is reasonable in yet another sense. In this reconstruction the actual position of the reconstructed vowel(s) is identical with that attested in the data. This increased the descriptive accuracy of the theory and avoided the ambiguity problem plaguing the Neogrammarian system, in which syllabic resonants have unpredictable (and hence unacceptable) double outcomes:

Neogr. \*R̥ → Gr. αR v Rα, Go. uR v Ru, etc. (Grundr<sup>2</sup> 1:463).<sup>437</sup>

In so doing, the schwa secundum school abandoned the straightforward Sanskritocentrism of the Neogrammarians in favor of *lectio difficilior* with a healthy dose of realism (in comparison with the practices of Brugmann and Osthoff).<sup>438</sup>

<sup>431</sup> Bertil Tikkanen pointed out to me that Schmitt's idea appears to have been borrowed from the Semitic languages: in Hebrew the vowels e a o have a reduced 'schwa-grade' /ə/ caused by accent shift.

<sup>432</sup> See Hirt (1900:5-6): "[...] es ist [...] selbstverständliche Voraussetzung, dass jedem Langvokal ein besonderes Schwa entsprechen muss, und wir deshalb ein e-Schwa, a-Schwa, o-Schwa anzusetzen haben. [...] Reduktionsstufe (R.) zu idg. ē, ā, ō = idg. e, a, o."

<sup>433</sup> Güntert (1916:viii) wrote 'ə' for the schwa secundum (rather than for the schwa itself). In order to avoid confusion, I use ʔ (with upper index) for the schwa secundum and ə (without index) for the schwa indogermanicum.

<sup>434</sup> See Güntert (1916:78): "dieser Gelehrte [J. Schmidt] hatte mit seiner übertriebenen Kritik der Liquida und Nasalis sonans das Kind mit dem Bad ausgeschüttet."

<sup>435</sup> Güntert (1916) assumes one (\*ə), Schmidt two (\*e, o) and Hirt (1900:6) three schwa secundums (\*e, o, a). Hirt's theory was bluntly rejected by Brugmann (1904:80): "Nocht weniger aber [überzeugt mich] die Ansicht von Hirt (Ablaut 6f.), dass ausser ə noch drei andre schwache Vokale für das Uridg. anzusetzen seien, sie er e, o, a schreibt (vgl. Hübschmann IF. Anz. 11, 38ff.)."

<sup>436</sup> See Güntert (1916:92): "[...] statt r̥ʔ, l̥ʔ, n̥ʔ, m̥ʔ vielmehr idg. ʔr, ʔl, ʔm, ʔn anzusetzen sind, einerlei, ob Vokal oder Konsonant folgt [...]."

<sup>437</sup> Brugmann (1879b:258fn2) already wrote: "Im griechischen erscheint die ursprachliche liquida sonans (r<sub>1</sub> und r<sub>2</sub>), vgl. zeitschr. XXIV 17) bald als ρα und λα, bald als αρ und αλ." For Lat. rā and Gr. ρᾶ ← Neogr. \*r̥, see also Brugmann (Grundr<sup>2</sup> 1: 274-) and, in general, Schmitt-Brand's views (1967:38). Due to the principle of the regularity of sound change, such rules are not allowed by the comparative method.

(c) As their third improvement, the schwa secundum school provided a wider perspective of the overall problem by also handling the svarabhakti vowels appearing in consonantal (non-sonorant) environments. This made the theory more general and explanatory than its Neogrammarian competitor, which was artificially limited to vowels surrounding the sonants (and thus did not address the deep-level problem at all).

§3. Despite its undeniable advantages, the schwa secundum contains problems that are as equally serious as those of the Neogrammarians.<sup>439</sup> The key among these, notwithstanding overlapping with the problems of the Neogrammarians, can be summarized as follows:

(a) The key reconstructive postulate of the theory, the schwa secundum \*ə, is ill-defined. Güntert's definition (1916:viii & 19-20)<sup>440</sup> of the schwa secundum in the correspondence Lat. magnus : OGaul. magio-rix : RV. majmán- reveals that the phoneme being referred to is nothing other than Neogr. \*a (= PIE \*h<sub>2</sub>ae \*eah). In this manner, the theory replaces the well-defined vowels Neogr. \*a e i o u with the schwa secundum, and in the process causes them to lose their distinctions. This is admitted by Güntert (1916), at least to a degree, when he says that it is impossible to distinguish between the short vowels Neogr. \*e : a : o and their reductions \*e, o, a.<sup>441</sup> The bottom line is that renaming well-defined phonemes as schwa secundums is also a *ex nihilo nihil* violation.

(b) Petersen (1938:39-59) rejected Hirt's reduced vowels between normal and zero grade, because reflexes of the alleged 'Mittelstufe' vowels vary considerably, both between and within the languages. Admittedly, there is no regularity in how the vowel qualities develop from \*ə, with the result that the theory is highly inaccurate and hardly usable in reconstruction.

(c) From a phonetic point of view, the schwa secundum, which is assumedly capable of producing the five cardinal vowels from a single starting point, would involve the assumption of a superphoneme that does not exist in the strict framework of scientific realism.<sup>442</sup> Rather than explaining the problematic residue of the vowels /a/, /e/, /i/,

<sup>438</sup> Brugmann's (1895:1726-7) review of Schmidt (1895), in which he refers to the difference between \*r and \*er as 'Finessen', does not satisfy as the difference is real, owing to the *ex nihilo nihil* problem with Neogr. \*r.

<sup>439</sup> On Brugmann's examples and his views on the schwa secundum, see his treatment of the vowel (Grundr<sup>2</sup> 1:393, bzw. 452 and 395-6). See also Antila (1969:15).

<sup>440</sup> On Güntert's definition of the schwa secundum as OInd. a = Av. a = Arm. a = Gr. α = Lat. a = Celt. a = Alb. a, see his analysis (1916:127).

<sup>441</sup> This is also admitted by Schmitt-Brandt, according to whom there is no difference between the guṇa-vowels and schwa secundum in the cognates (1967:4): "Bei der Behandlung dieses Lauts wurde jedoch meist nicht unterschieden zwischen den Fällen, bei denen *Schwa sec.* in den Einzelsprachen mit dem jeweils zugehörige Vollstufenvokal gleichlautete (Hirt, Ablaut S. 11 ff. : ai. paktáh, [...] gr. πεπτός < \*pek<sup>u</sup>tó-)." Based on Occam's razor, entities are not to be multiplied in situations where the standard values (Neogr. \*a, e, i, o, u) are sufficient.

<sup>442</sup> Thus, Güntert derives OInd. ir, ur ← \*ə (1916:93), Gr. α, Lat. a ← \*ə and so forth, explaining "griech. μάρτυρα spiegelt altes \*m<sup>n</sup>jatai (s. auch Hirt IF 7, 146, Ablaut 18 u. sonst)" (1916:99) and "[...] statt ἦ<sup>n</sup>, ἦ<sup>m</sup> wäre dann ἠ<sup>n</sup>, ἠ<sup>m</sup> anzusetzen, und dies könnte lat. nur zu *an, am* führen" (1916:67).

/o/, /u/, the schwa secundum results in five lost distinctions; in essence, it thus resembles the Neogrammarian theory.<sup>443</sup> This is explained by the fact that the schwa secundum school did not question the basis of Brugmann's and Osthoff's attempt to reduce the attested Indo-European vowel variation, but rather was satisfied with rewriting the Neogrammarian analysis in the following form:

Neogr. Ø → IE a e i o u : SchwaSec. \*<sup>ɔ</sup> → IE a e i o u.

(d) In the period before the Old Anatolian data was available, both the Neogrammarians and the schwa secundum school relied on an assumption of an unproblematic zero grade of vowels, characterized by Güntert (1916:72)<sup>444</sup> as follows:

“[...] denn *κάρτα* hat auf alle Fälle in got. *hardus*, aisl. *harðr*, ags. *heard*, as. *hard*, ahd. *hart(i)* ‘hart’ eine Stütze, so daß demgegenüber die Frage, wie *κρέτος* entstanden sei, nur von untergeordnetem Interesse ist [...]”<sup>445</sup>

However, the emergence of Old Anatolian changed the situation decisively: the non-existence of Saussure's compensatory lengthening implies that an original PIE \**h* can be postulated for every Neogr. \**a*, as exemplified with the following equations for Greek

Gr. αR ≡ PIE \**h*aer v \**eah*R Gr. Rα ≡ PIE \**Reah* v \**Rhae*.

That PIE \**h* is actually present in Güntert's example can be proven by Fortunatov's Law, requiring an additional condition according to which PIE \**h* must also be present for the sound law to take effect in Indo-Iranian. Thus, examples like Gr. *κάρτα* : OInd. *kāthara-* (a.) ‘hard’ (MonWil. 244) imply Gr. α ← PIE \**eah*, thus eliminating the possibility of accounting for Gr. α (and the ‘a-vocalism’ in general) with syllabic sonants or the schwa secundum. Since PIE \**h* was present, a root PIE √*ka<sub>h</sub>rt-* must be postulated rather than Neogr. \**k<sub>h</sub>rt*.<sup>446</sup>

(e) The weaknesses of the theories left both incapable of producing an etymological dictionary, the ultimate proof of success. Only after Walde based the theory on the syllabic sonants but added the schwa secundum (when Osthoff's and Brugmann's theory did not suffice to cope with the data) did it become possible to compile Pokorny's *Indogermanisches etymologisches Wörterbuch*, and even this work never won unreserved acceptance, owing to the reconstructive liberties that it took.

<sup>443</sup> For such an assumption, see Güntert (1916:77): “[...] Vokal <sup>ɔ</sup> ist nicht aus dem Stimmton des einstigen *r, l* erwachsen, sondern er ist das auch sonst in jeder beliebigen Stellung erscheinende Schwa secundum [...]”

<sup>444</sup> On further examples of Gr. αR : Rα, see Güntert (1916:69-73).

<sup>445</sup> Similarly, Brugmann and Osthoff derived the twofold attestations (type *κάρτα* : *κράτος*) from a single prototype according to the formula αR ← Neogr. \**R* → Rα.

<sup>446</sup> Assuming a laryngeal metathesis (see Anttila 1969:99) for alternations of this type (Lat. *armus* : *rāmus*, Lat. *tarnes* : *trāmes*, etc.) is pointless due to the existence of different roots (*passim*).

### 3.1.6 The comparative theory of syllabic resonants

§0. The third reconstructive approach of the svarabhakti vowels, though existing in the pre-Neogrammarian period and occasionally practiced by scholars like Grassmann, Verner, Meyer<sup>447</sup> and Whitney, has never been formulated as a full-scale theory. Despite this, the common denominator of the reconstruction is straightforward: instead of deriving the svarabhakti vowels from syllabic resonants or a schwa secundum, the reconstruction is based on an external comparison of attested vowels, which have been proven to exist by the comparative method through a confirmation by two branches (Fick's Rule).

§1. Historically the comparative solution was preferred by some Paleo- and Neogrammarians reconstructing the Indo-European vocalisms /a i u e o/, with confirmation depending on at least two branches. In order to illustrate the solution, I cite some reconstructions based on this mode of thought:

(a) Verner's equation (1877:125)

PIE \*pulno- ≡ RV. pūrṇá-, Go. full-, ORus. pŭlnŭ, etc.

is an example of a clear-cut comparative reconstruction. The reconstruction is based on the common Indo-European vocalism here shared by several branches, while the output of the comparative method, PIE \*u, is postulated for the proto-language as such. In the face of a direct match, the secondary (internal) postulates (here Neogr.  $\uparrow$ ŭ ≈ Schwa sec. \*<sup>3</sup>l) and the supporting sound laws are unnecessary (due to Occam's razor).

(b) From the point of view of root theory, pure comparative reconstruction has characteristically been practiced by some Sanskrit philologists (like Grassmann and Whitney (*Roots* 64-5)), who typically favoured attested root variants (e.g.  $\sqrt{\text{tar}}$   $\sqrt{\text{tir}}$   $\sqrt{\text{tur}}$ , etc.) instead of hypothetical deep-level roots ( $\sqrt{\text{t}}_{\text{r}}$ , etc.).

(c) When tested against the new material, the comparative method implies that the svarabhakti vowels are genuine (i.e. paralleled by at least two branches throughout), leaving historical theories on the secondary origin of the svarabhakti vowels in doubt. As an example illustrating the test, one may refer to the traditional reconstruction of the items Lat. decem '10' and centum '100':

Neogr. \* $\hat{\text{k}}\text{mto}$ - → RV. śatá- (Gr. ἑκατό-), Li. šimta-, Go. hunda, etc.

In general, the Neogrammarians assumed a single starting point for Proto-Indo-European based on the (absolute) uniform hypothesis, then explained the variation of the attested root vowels (RV. a : Gr. α : Lat. e : Li. i : Go. u, etc.) based on the svarabhakti vowels emerging from syllabic sonants. In the complete data now at our disposal, no distribution organized according to the subgroups exists, because all

<sup>447</sup> For Meyer, see Brugmann (1879b:257): "Gustav Meyer a. a. o. s. 7. zerlegt tanu- in ta-nu-, in dem glauben, das particip ta-tá- sowie die griechischen formen τέταρα, τέταμαι, ἑτάθην, τατός erwiesen aufs deutlichste die existenz einer vokalischen wurzel ta."

vocalisms are externally paralleled, thus confirming their Proto-Indo-European status. Thus, for the quoted data there are several externally confirmed isoglosses:

1. The Neogr. \*a in RV. śatá- (Gr. ἑκατό-) is now paralleled by Tocharian with

TochA. kät- (num.card.) ‘centum’ (Poucha 66-7, kät [316 b 7]).

Since a nasal cannot be lost in Tocharian, the suggested traditional reconstruction with Neogr.  $\hat{m}$  is impossible. Simultaneously, the comparative method implies PIE \* $\hat{k}eahto-$  (= Neogr. \* $\hat{k}ato-$ ) for the forms in question.

2. The ‘i-vocalism’ of Li. šimta- (also in Balto-Slavonic) is externally confirmed in Tocharian:

OPr. de ·simto- (num.) ‘zehn’ (APrS. 320, dessimton)  
 OLi. de ·šimtì- (num.) ‘Dekade, zehn’ (LiEtWb. 91, dēšimtis [sgN])  
 OCS. de ·seṭī (num.) ‘zehn, Dekade’ (Sadnik √139)  
 TochA. taryā ·kiñci- (num.ord.) ‘tricesimus’ (Poucha 116)

3. The ‘u-vocalism’ of Go. hunda [n.pl.] is also confirmed as genuine by two witnesses:

Go. tai ·hun- (num.card.) ‘δέκα : zehn’ (GoEtD. 339)  
 Arm. ere ·sun- (num.) ‘dreissig’ (ArmGr. 1:491)  
 Go. hunda- (n.pl.) ‘hundert’ (GoEtD. 194-5)  
 Go. taihunda- (num.ord.) ‘tenth’ (GoEtD. 339)

In this manner, the problems of the Neogrammarians and the schwa secundum theory are caused by the idea of the secondary character of the svarabhakti vowels, which are actually proven genuine by means of comparison.

§2. The procedure sketched out here can be applied for the data in general with the result that the comparative method implies the genuineness of the svarabhakti vowels throughout.<sup>448</sup> By processing the entire data through external comparison, we are left with isoglosses of the svarabhakti vowels Gr. α, OCS. ĭ, Go. u and so forth, all of confirmed PIE origin.<sup>449</sup> The criteria for establishing a genuine PIE item instead of a secondary svarabhakti vowel resulting from a syllabic sonant (or schwa secundum) can be summarized as follows: *If a vowel of a subgroup (Gr. α, Lat. e/o, PGerm. \*u, BSl. \*i, etc.) is directly paralleled by an identity in another subgroup then the vowel in question reflects a genuine PIE vowel.*

§3. In a fully explicit manner, if at least one of the following criteria is present, then a respective PIE vowel is to be reconstructed instead of a syllabic sonant (or schwa secundum):

(a) ‘Svarabhakti a’ (RV. a, gAv. a, Gr. α, etc.) does not reflect a syllabic sonant, but Neogr. \*a (= PIE \* $\hat{h}ae$  or \* $\hat{e}a\hat{h}$ )

<sup>448</sup> The full proof including entire data will be presented in the PIE Lexicon.

<sup>449</sup> Understandably, the possible candidates for ‘full vowels’ stemming from syllabic resonants will remain ambiguous, because the parallels may have been lost.

1. if the vowel in question stands in quantitative ablaut (e.g. IIr.  $\bar{a} : a : \emptyset$ . Gr.  $\eta : \alpha : \emptyset$ , Li.  $o : a : \emptyset$ , etc.). This is the case, for example, in

PIE	Indo-European:	Neogr.
*g <sup>u</sup> aḥ	RV. g-	[incomplete]
*g <sup>u</sup> eah-	RV. ga'- (hiatus), Gr. βᾶ-	*g <sup>u</sup> m-
*g <sup>u</sup> ēah-	RV. gā-, Do. βᾶ-, Li. gó-	*g <sup>u</sup> ā-

2. if the velar preceding RV.  $\check{a}$  (= gAv.  $\check{a}$ , etc.) has gone through the second palatalization, then PIE \* $\check{e}$  is to be postulated instead of a syllabic sonant.

3. If the vowel participates in Indo-European ablaut  $\check{a} : \check{e} : \check{o}$ , then it does not reflect a syllabic sonant. Thus, for instance, the qualitative ablaut Gr.  $\alpha : o$  reveals an original PIE \* $\check{h}a$  or \* $\check{a}h$ , which cannot be traced back to a syllabic resonant.<sup>450</sup> *Exemplii gratia*, instead of Neogr. \*g<sup>u</sup>rú-s 'schwer' (= Schmidt \*g<sup>u</sup>cú-s) we are to reconstruct ablaut \* $e : \emptyset : o$  for the items

PIE \*g<sup>u</sup>aḥru- 'schwer, groß, machtvoll' (P. 476-7):

$\emptyset$ :	Go. kauru-	←	PIE *g <sup>u</sup> aḥru-	(cf. Gr. $\sqrt{\pi\tau}$ -)
* $e$ :	Gr. βαρῦ	←	PIE *g <sup>u</sup> eahru-	(cf. Gr. $\sqrt{\pi\epsilon\tau}$ -)
* $o$ :	Gr. βόρη-	←	PIE *g <sup>u</sup> oahru-	(cf. Gr. $\sqrt{\pi\omicron\tau}$ -)

4. If a criterion for PIE \* $\check{h}$  and/or PIE \* $\check{a}$  is secured by the cognates, then Neogr. \* $a$  (= PIE \* $\check{h}ae$  or \* $\check{eah}$ ) is confirmed instead of a syllabic sonant. This enables us to eliminate well-known ambiguity problems of the Neogrammarian theory, like the illegitimate double development assumed for the syllabic resonants in the Celtic branch.<sup>451</sup>

<sup>450</sup> In the early Neogrammarian accounts, a dialectal development Aiol.  $o \leftarrow$  Neogr. \* $m$ , \* $\eta$  and Aiol.  $o\lambda$ ,  $o\omicron$   $\leftarrow$  Neogr. \* $\check{r}$ ,  $\check{r}$  was assumed. However, the distribution Aiol.  $o : Gr. \alpha$  does not exist, because this Gr.  $o$  is not restricted to Aiolian (and Doric), but represents a common Greek feature (as in Aiol. εἴκοσι '20' = Att. εἴκοσι (GEW 1:453)). Therefore, the alternation \* $e/o$  with PIE \* $\check{h}a$  \* $\check{a}h$  replaces Brugmann's (1879a:66) outdated suggestion of a double treatment of syllabic sonants: "Zunächst macht der spurlose wegfall des nasals schwierigkeiten. Man denkt freilicht vielleicht, es läge derselbe fall vor, wie in ἄκμοσι von stamm ἄκμων- oder εἴκοσι = lat. vīginti, aber bei genaueren zusehen erscheint diese parallele als unzulässig. ἄκμοσι geht mit aind. áśmasu auf ein ursprachliches akmṣvá zurück und entsprechend εἴκοσι mit boeot. φῖλατι, lat. vīginti, aind. vimśatí auf ein vikṣti wie ἑκατόν mit aind. śatám auf ein kṣtá-m. Statt δαίμοσι hätte man lautgesetzlich \*δαίμοσι zu erwarten, das  $o$  is aller wahrscheinlich nach erst durch die analogie der übrigen kasus erzeugt worden [...]." In this regard, compare also Osthoff's views (1879a:424): "Noch bleibt us eine frage aufzuwerfen und zu beantworten übrig. Wir haben gesege, dass  $\epsilon$  nicht der griechische vertreter der nasalis sonans in tieftoniger silbe sein kann. Könnte nicht vielleicht griech.  $o$  auf diesen rang neben dem  $\alpha$  für einige fälle anspruch machen? Man würde sich, um dies zu behaupten, auf solche fälle wie att. διακόσιοι neben dor. διακατίοι, att. εἴκοσι neben boeot. dor. φῖλατι, φεῖλατι, lakon. βεῖλατι, wie arkad. δεκόταν, ἐκοτόμβοια neben att. δεκάτην ἑκατόμβη berufen dürfen. Das griech.  $o$  an stelle der nasalis sonans würde an sich dann gar nichts auffälliges haben, wenn es in einem oder in einigen griechischen dialekten so aufträte und zwar als alleiniger acteur in dieser rolle. Das ist aber, wie die angeführten beispielen zeigen, nicht der fall."

<sup>451</sup> See Güntert (1916:64): "Es ist bekannt, daß man idg.  $r \mid$  im Keltischen zweierlei Vertretungen zuschreibt, s. Thurneysen Handb. 128, § 214, Pedersen Vgl. Gr. I, 42ff. Einmal sollen  $r$ ,  $\mid$  zu urkelt  $ri$ ,  $li$  geworden sein, aber in anderen Fällen erscheint  $ar$ ,  $al$ ." and (1916:63): "Viele dieser Fälle bringt Pedersen Vgl. Gr. I, 44 zum Beweise für die Gleichung kelt.  $ar$ ,  $al$ , an usw. = idg.  $r$ ,  $\mid$ ,  $\eta$  : aber nicht mit

5. If Gr.  $\alpha$  (= OInd. a) appears both before consonant and vowel (i.e. in all environments), then Gr.  $\alpha$  = PIE \* $\text{h}ae$  or \* $\text{eah}$ . Thus, for instance, the ostensibly ambiguous Gr.  $\alpha$  in

Gr. $\beta\acute{\alpha}$ -	(vb.) ‘walk, step, etc.’ (LSJ. 302, $\beta\acute{\alpha}\tau\eta\nu$ [3du])
gAv. ga-	(vb.) ‘kommen’ (AIWb. 494, $ga^1d\bar{i}$ [2sg])
RV. ga-	(vb.) ‘kommen’ (WbRV. 380, $gadhi$ [ipv.2sg])
Gr. $\beta\acute{\epsilon}\beta\alpha$ -	(pf.) ‘walk, step, etc.’ (LSJ. 302, $\beta\epsilon\beta\acute{\alpha}\mu\epsilon\nu$ [inf.])

is confirmed to reflect PIE \* $\text{eah}$  (versus Neogr. \* $\text{m}/\text{n}$ ) by the vocalic extension \* $\text{-us-}$

Gr. $\beta\epsilon\beta\alpha\upsilon\acute{\alpha}$ -	(pf.pt.f.) ‘walk, step, etc.’ (LSJ. 302). <sup>452</sup>
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(b) ‘Svarabhakti e’ (typically Lat. e) does not reflect a syllabic resonant (or schwa secundum) if it is paralleled (Fick’s Rule) and/or alternates with Indo-European /a/ or /o/.

(c) ‘Svarabhakti i’ (typically BSl. \*i, PIr. \*i or PCelt. \*i) does not reflect a syllabic resonant (or schwa secundum) if it is externally paralleled and/or appears in ablaut alternation PIE \* $\text{ōi} : \text{ēi} : i : i\acute{e} : i\check{o}$ .

(d) ‘Svarabhakti o’ (typically Latin \*o (in PItal. \*ol, \*or)) does not reflect a syllabic resonant (or schwa secundum) if it is paralleled by another subgroup or appears in ablaut alternation with Indo-European /e/ or /a/. Thus, for instance, Lat. o does not justify a syllabic liquid for the Italic subgroup in

Lat. fort-	(f.) ‘blinder Zufall, Ungefähr’ (WH 1:534, fors [sgN])
Gr. $\varphi\acute{o}\rho\tau\omicron$ -	(m.) ‘Last, Ladung’ (GEW 2:1004, $\varphi\acute{o}\rho\tau\omicron\varsigma$ [sgN])
Gr. $\varphi\omicron\rho\tau\acute{\iota}$ -	(f.) ‘Lastschiff’ (GEW 2:1004)

because of the direct match Lat. o  $\equiv$  Gr. o  $\equiv$  PIE \*o (Occam’s razor).

(e) ‘Svarabhakti u’ (typically PGerm. \*u or RV. u) does not reflect a syllabic resonant (or schwa secundum) if it is paralleled by another subgroup and/or appears in ablaut PIE \* $\text{ōu} : \text{ēu} : u : u\acute{e} : u\check{o}$ .<sup>453</sup>

§4. The above criteria will now be applied to Brugmann’s examples of syllabic sonants in Grundriss in order to demonstrate that svarabhakti vowels are implied by the comparative method by at least by two witnesses, and are therefore genuine. Similar results are obtained for syllabic sonants of any origin, proving that the postulation arrived at by means of the comparative method reflects the methodologically strictest and the most economical theory in existence.

Recht [...]” and (1916:64-5): “[...] idg.  $\text{r}, \text{l}$  ist im Keltischen nur durch  $\text{ri}, \text{li}$  vertreten, dagegen sind die Formen mit  $\text{ar}, \text{al}$  die Fortsetzung von idg.  $\text{ʀr}, \text{ʀl}$  [...]”

<sup>452</sup> For the \*u-extension paralleling Greek, see OInd.  $\text{g}\acute{a}\nu\text{-}$  (prM.) ‘to go’ (MonWil. 356,  $\text{g}\acute{a}\nu\text{ate}$  [3sg]).

<sup>453</sup> As the Neogrammarians’ assumption was restricted to Sanskrit, the Iranian  $\text{ir}$  and  $\text{ur}$  forms (for some examples of these, see Güntert 1916:94-5) are acceptable as parallels.

### 3.2 Semivowels PIE \*ɷ and \*j and vowels PIE \*u and \*i

§0. The vowels PIE \*i and PIE \*u – and their consonantal counterparts, the semivowels PIE \*j and \*ɷ (a.k.a. palatal and velar glides)<sup>454</sup> – were already included in Schleicher’s reconstruction. The most relevant properties of the proto-phonemes and their developments in environment PIE \*h<sub>a</sub> \*ah<sub>1</sub> will be dealt with in this chapter.

(a) As already mentioned by Brugmann (Grundr<sup>2</sup> 1:256), the semivowels PIE \*j and \*ɷ appear side by side with the corresponding vowels PIE \*i and \*u in etymologically connected words:

“[...] i und j, u und ɷ standen seit uridg. Zeit oft in etymologisch identischen Gebilden nebeneinander, indem nur die benachbarten Laute und die Betonungsverhältnisse dafür massgebend waren, ob der Vocal als Sonant oder als Consonant gesprochen wurde.”<sup>455</sup>

(b) As for the derivation (and the primarity of the phonemes), it has been correctly pointed out by Szemerényi (1996:136),

“The existence of [the phonemes \*i and \*u] is not in dispute, but they are treated as allophones of the consonants y, w. This position is phonetically untenable as i u and y w are fundamentally different sounds, vowels and spirants respectively.”

The laryngeal theory, rejected by Szemerényi in his comment, started from the primary items PIE \*j ɷ instead of the proper PIE \*i \*u, being motivated by the monovocalism hypothesis. The correct allophonism can be achieved by setting the vowels PIE \*i and \*u as primary and defining PIE \*j and \*ɷ as their allophones in a vocalic environment.<sup>456</sup>

(c) In addition to Neogr. \*u : \*ɷ and Neogr. \*i : \*j, their long counterparts Neogr. \*ū and \*ī were postulated in the Neogrammarian system. They are treated separately below.

#### 3.2.1 Neogr. \*ɷ = PIE \*ɷ

§0. Under the influence of the Sanskrito-centric ideas of the time,<sup>457</sup> Schleicher (*Compendium* 1861-2) reconstructed a fricative Paleogr. \*v (= OInd. v) for the proto-language. Schleicher’s initial mistake was soon corrected, and ever since

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<sup>454</sup> Trask (DPhPh. 320) defines SEMIVOWEL as “a non-syllabic segment which has the phonetic characteristics of a vowel but the phonological behaviour of a consonant.”

<sup>455</sup> In so doing, Brugmann not only established the allophones PIE \*i : j and PIE \*u : \*ɷ, but removed Schleicher’s erroneous (Sanskrito-centric) place of articulation /v/ from the earlier proto-phoneme inventory.

<sup>456</sup> On the phonemic status of /i/, /u/ rather than /j/, /ɷ/, see Mayrhofer (1986:§7.1.9).

<sup>457</sup> Costello (1995:10) writes: “Schleicher reconstructed a fricative v, rather than a resonant w, which may be interpreted as another example of his belief that Indic, with its v, accurately reflected the protolanguage. (However, cf. the sandhi change of āu alternating with āv – tau ubhau > tāv ubhau ‘these two’ – which clearly points to the earlier bilabial resonant nature of Skt. v.)”



Brugmann (Grundr<sup>2</sup> 1:293-341) a bilabial resonant Neogr. \*u = /w/ (preserved as such by English, Latin and Old Iranian) has been correctly reconstructed.<sup>458</sup>

§1. Comparison with newly discovered languages confirms that PIE \*u was preserved both in Old Anatolian and in Tocharian:

(a) Brugmann (Grundr<sup>2</sup> 1:293) reconstructed Neogr. \*ueghō ‘vehō’ for “ai. váhāmi, gr. pamph. Imper. φεχέτω (?), alb. vjeđ Aor. voda (‘ich entführe, stehle’), lat. uehō, got. ga-wiga, lit. vežù, aksl. vezq.” The preservation of PIE \*u in Old Anatolian (here Luwian) is confirmed by the related stem

HLu. uaza- (vb.) ‘carry’ (CHLu. 2.11.7, PES<sub>2</sub>(-)w<sup>a</sup>/<sub>i</sub>-za-ha [1sg]).

(b) Brugmann (Grundr<sup>2</sup> 1:294) reconstructed Neogr. \*neuo-s ‘neu’ for “ai. náva-s, gr. νέφο-ς, lat. nouo-s, aksl. novū.” The preservation of PIE \*u in Hittite and Tocharian (both A and B) is confirmed by the correspondences

Hi. neua-	(a.) ‘frisch, neu’ (HEG 2:320, ne-e-ua-an)
TochA. ñu-	(a.) ‘novus’ (Poucha 111)
TochB. nawāke	(m.sg.) ‘novice’ (DTochB. 331)
Poln. nowak	(m.) ‘Neuling’ (LiEtWb. 488)

(c) Brugmann (Grundr<sup>2</sup> 1:295) reconstructed Neogr. \*duōu \*duō ‘zwei’, \*dui- ‘zwei’ for “ai dvāu dvā, dvi-pád- ‘bipes’, gr. δω-δεκα ‘zwölf’ δί-πους, lat. bi-pēs, air. dāu, dau, dō ‘zwei’, got. twai ‘zwei’, ags. twi-fēte ‘bipes’, lit. dvi F. ‘zwei’ aksl. dva ‘zwei’”.<sup>459</sup>

§2. In Old Mycenaean Greek the counterpart of digamma Gr. ɸ<sup>460</sup> is preserved throughout as LinB. w. This has provided several confirmations for PIE \*u (e.g. LinB. wa-na-ka-te [sgD] ‘to the king’ = Phryg. φανακτεi (DMycGr. 411) and LinB. we-to [sgA] ‘year’ = Cypr. φέτος ‘id’), as well as for its absence. As of yet, however, the problem of the etymology of Linear B has not been completely solved, and some early mistakes also remain uncorrected. Thus, LinB. ru-ko ‘wolf’ (DMycGr. 96) confirms a root

√luk- (vb.) ‘teilen, brechen, usw.’ (sb.) ‘Wolf’

Gr. λύκο-	(m.) ‘Wolf’ (GEW 2:143-4 = LinB. ru-ko)
Hi. luka-	(URU.) ‘-’ (HEG 2:69-70, OGH. 249-50, lu-uq-qa)

<sup>458</sup> See Szemerényi’s (1996:44) account: “In the case of w, however, the original bilabial articulation (as in Eng. w) was already replaced in the earliest tradition of many languages by labiodental (as in Eng. v, Grm. w). The old pronunciation was retained in classical Latin and Old Iranian.” The evidence is now added with Tocharian, distinguishing between the inherited TochAB. w and TochAB. v in loan words from Sanskrit (e.g. TochA. vidhyādhare ‘nomen semidaemonum’, Poucha 281 = TochB. vidhyādhare ‘a kind of supernatural being’, DTochB. 570).

<sup>459</sup> A sound change PIE \*d+u → Toch. w (in TochA. we ‘duae’, Poucha 304 and TochB. wi, wī ‘two’, DTochB. 598) has been suggested (see already van Windekens 1976:566). The rule is redundant, however, owing to the direct correspondence between Do. ɸt xatu ‘20’ (GrGr. 1:591), Lat. uī ginti ‘20’ (WH 2:788-9), LAv. vīsaiti ‘20’ (AIWb. 1458) and the Tocharian items (Occam’s razor).

<sup>460</sup> For the traces of ɸ in Greek, see Brugmann (Grundr<sup>2</sup> 1:305-15).

Pal. luki-	(vb.) ‘teilen’ (HEG 2:66, DPal. 62, lu-ki-i-it [3sg])
Lyc. λυκία-	(ON.) ‘Lykien’ (HEG 2:82, Lyc. λυκία [sgN])
OGaul. luchto-	(m.) ‘Teil’ (?) (P. 686, OGaul. luchtos [sgN])

The absence of initial \*u- is confirmed by several groups, with the result that the root is not identical with the other item meaning ‘wolf’ (P. 1178-9 \*u<sup>h</sup>lk<sup>h</sup>-):

TochB. walkwe-	(sb.) ‘wolf’ (DTochB. 582, walkwe, MA. 646-7)
RV. vṛka-	(m.) ‘Wolf’ (WbRV. 1325)
LAv. vəhrka-	(m.) ‘Wolf’ (AIWb. 1418)
OPers. varka zana-	(a.) ‘eight month ≈ werewolf’ (OldP. 207)

§3. In Tocharian a secondary loss of PIE \*u has resulted from palatalization before a front vowel. Thus, for instance, an \*e-grade with a short quantity confirmed by Osthoff’s Law II

Lat. uento-	(m.) ‘Wind’ (WH 2:751-2, uentus [sgN])
TochB. yente	(sb.) ‘wind’ (DTochB. 505, yente [sgN])

has lost the initial labial through PToch. \*wyanta-. The contrast with PIE \*o, leaving the preceding PIE \*u unaffected, is clear in:

Ḫi. ḫuant-	(pt.c.) ‘Wind’ (HEG 1:328, ḫuanteš [plN])
TochA. want-	(sb.f.) ‘ventus’ (Poucha 285, want [sgN])

§4. The sound law PIE \*u → Arm. g (Godel 1975: §4.353) is ambiguous owing to the standard development PIE \*gh → Arm. g. As for the development PIE \*u → Arm. g, it should be noted that it is possible to distribute the examples in a manner that makes the rule PIE \*u → Arm. g redundant. Thus, for example, the stem

Lat. lauō	(pr.) ‘baden, waschen, spülen’ (WH 1:773-)
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is usually compared with

Arm. logana-	(pr.) ‘sich baden’ (ArmGr. 1:453, loganam [1sg]).
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Yet the root Arm. √log- can be directly compared with the Germanic formation

ModNorw. laga-	(vb.) ‘mit Wasser übergießen’ (ANetWb. 344)
OIcl. lagask-	(vb.) ‘rinnen, strömen’ (ANetWb. 344)
OEng. lagu	(m.) ‘sea, water’ (ASaxD. 615)
OIcl. lög-	(m.) ‘Nass, Wasser, See’ (ANetWb. 373, lōgr [sgN])

Similarly, Arm. git- (ao.) ‘finden’ (ArmGr. 437, egit [3sg]) is not necessarily related to RV. √vid- ‘finden’ (WbRV. 1270-4, RV. vidánti [3pl]), the conventional etymology. Instead, a match with an original Neogr. \*gh (→ Arm. g) is possible in:

Go. bi ·gat-	(pret.) ‘find’ (GoEtD. 69, bigat)
Go. bi ·gita-	(st.vb.) ‘erlangen, finden’ (GoEtD 69, bigitan [inf.])
Li. gādy-	(vb.) ‘sich ereignen, treffen’ (P. 423-4)
OIcl. geta	(vb.) ‘schaffen, erreichen, erzeugen’ (ANetWb. 165)
OSax. bi ·geta-	(vb.) ‘ergreifen’ (ANetWb. 165)

In order to confirm whether the rule PIE \*u → Arm. g remains valid, a complete reevaluation of examples is required.<sup>461</sup>

### 3.2.2 Neogr. \*u = PIE \*u

§0. The vowel PIE \*u (Neogr. \*u) was correctly reconstructed already by Schleicher, and little new concerning the postulate has emerged.

§1. Brugmann's (Grundr<sup>2</sup> 1:103-111) examples of Neogr. \*u, when compared with Old Anatolian and Tocharian, confirm the general preservation of PIE \*u in the latter groups:

(a) Brugmann (Grundr<sup>2</sup> 1:103) reconstructed “W. sup-, Schwundstf. der W. sʷep- ‘schlafen’ : ai. suptá-s ‘eingeschlafen, schlafend’, [...] gr. ὕπνο-ς [...] air. suan (565,2) aksl. sǔnǔ ‘Schlaf’.” In Old Anatolian the root appears in

Ḫi. šup- (vbM.) ‘schlafen’ (HEG 2:1175, šuptari [3sg])

with PIE \*u preserved as such.

(b) Brugmann (Grundr<sup>2</sup> 1:103) reconstructed “\*k̑un-, schwache Form des St. k̑un- k̑uṷon- ‘Hund’ : Gen. Sg. ai. sún-as gr. κυν-ός air. con lit. šuñs.” The respective forms as attested in Old Anatolian and Tocharian are

HLu. šuani- (c.) ‘dog’ (CHLu. 2.28.10, sù-wa/i-ni-i-sá)  
TochA. ku- (sb.) ‘canis’ (Poucha 76)

This confirms the preservation of PIE \*u for both.

(c) Brugmann (Grundr<sup>2</sup> 1:103) reconstructed Neogr. \*nu ‘nun’ for “ai. nú, gr. νὺ νὺ-v, lat. nu-diūs, air. nu no, ahd. nu no, lit. nù nù-gi aksl. nǔ.” In Old Anatolian the conjunction appears in an identical form:

Ḫi. nu (conj.) ‘nun, und’ (HEG 2:345).

§2. In Tocharian a loss of unaccented PIE \*u has taken place in examples like TochB. tkācer (f.) ‘daughter, girl’ (DTochB. 312), which can be compared to gAv. dugədar- ‘id’.<sup>462</sup> This rule should not, however, be applied automatically when the vocalism TochAB. a (and/or AB. ä) is attested in the position where PIE \*u was assumedly lost. Thus, for example, the words

TochB. mäsce (f.) ‘fist’ (DTochB. 443)  
TochB. maścitsi (sb.) ‘mouse, rat’ (DTochB. 443)

do not necessarily correspond with RV. muṣṭí- (m.f.) ‘die geschlossene Hand, Faust’ (WbRV. 1052) and RV. múṣ- (m.f.) ‘Maus’ (WbRV. 1054), because the Tocharian words can be connected with the \*u-less forms of Hittite:

<sup>461</sup> On the complex developments of Armenian, see Brugmann (Grundr<sup>2</sup> 1:303-5).

<sup>462</sup> Tocharian syncope is directly paralleled in Armenian where the nominative Arm. dustr ‘Tochter’ is accompanied with Arm. dster- (ArmGr. 1:440).

Īi. maštiga-	(f.c.) ‘auteur de rituels’ (NOMS. 782, ma-aš-ti-ig-ga) <sup>463</sup>
Īi. maš·hūilua-	(m.c.) ‘PÍŠ.TUR-wa = kleine Maus’ (HEG 2:157-8)

In other words, the possibility of morphological (or derivational) variations in the proto-language must be taken into account before the application of the sound law.

§3. A recurring theme in Indo-European linguistics, nowadays known as ‘Lex Stang’, concerns the paradigms of the items

RV. dyáu-	(m.) ‘Himmel’ (WbRV. 603, dyáuṣ [sgN])
RV. gáu-	(m.) ‘Rind, Stier, Kuh’ (WbRV. 407, gáuṣ [sgN])

(cf. Gr. ζεύς and Gr. βούς). These stems are supplemented with themes without final \*u in examples such as:

RV. gá-	(m.) ‘Rind, Stier, Kuh’ (WbRV. 407, gám [sgA])
RV. dyá-	(m.) ‘Himmel’ (WbRV. 604, dyám [sgA])

Already Brugmann sought to provide an explanation on the basis of phonology (Grundr<sup>2</sup> 1:259):

“In 233 S. 203 ff. haben wir gesehen dass [...] u in den Langdiphthongen unter gewissen Bedingungen schon in uridg. Zeit geschwunden sind, z.B. [...] \*g<sup>h</sup>ám ‘bovem’ aus \*g<sup>h</sup>áu-m.”

Similarly, Szemerényi (1996:181) explained:

“The original forms must rather have been \*dyeus dyeum; the acc. then became dyēm by absorption of u and compensatory lengthening, and the long vowel was in Aryan carried over into the nom. also.”

Several arguments can be presented against the phonological explanation:

(a) No sound law stating the loss of \*u can be postulated without causing inconsistency, because the well-known sound laws demand the preservation of the vowel \*u in the languages in question.

(b) The existence of the \*u-less form is externally confirmed by parallels:

RV. gám [sgA] ≡ Do. βῶν [sgA] <sup>464</sup>	RV. dyám [sgA] ≡ Gr. ζάυ [sgA]
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(c) Both Sanskrit and Greek confirm internally the existence of double stems. Thus, two accusatives RV. gás [plA] and RV. gávas [plA] ‘cows’ are attested, just as there are two stems in Greek:

Do. ζά-	(m.) ‘Zeus’ (Schwyzer GrGr. 1:576f., ζάς [sgN])
Gr. ζεύ-	( <sup>d</sup> m.) ‘sky-god, Zeus’ (GEW 1:610-1, ζεύς [sgN])

In such circumstances, the comparative method implies two different prototypes in the parent language.

<sup>463</sup> Īi. maštiga- (f.c.) ‘auteur de rituels’ could refer to a ‘handler of rituals’, containing a root meaning ‘hand, fist’, thus corresponding with Tocharian.

<sup>464</sup> For the \*u-less root in Greek, cf. Gr. ἐκατόμ·βη- ‘Opfer von 100 rinder’ (GEW 1:474-5).

§4. Finally it may be noted that the clusters of the plain velars PIE \*k, g, ... followed by an unaccented PIE \*u turned into the labiovelars (Neogr. \*k<sup>u</sup> = PIE \*k+u, etc.) in the manner detailed in Chapter 4 (cf. the Centum-Satem isogloss).

### 3.2.3 Neogr. \*ū ≡ PIE \*háu, \*áhu, \*uhá, \*uáh, \*uu

§0. The long vowel Neogr. \*ū, unaccounted for by Schleicher, was added to the reconstruction by Curtius (for example, see Benware 1974:78-9) and, following him, the Neogrammarians.<sup>465</sup> Though the postulation is correct in the sense that correspondences confirm a common Indo-European vowel /ū/, the material now at our disposal implies a segmental origin for Neogr. \*ū. Three main subsets can be distinguished in Proto-Indo-European.

§1. **SUBSET I.** Neogr. \*ū ≡ PIE \*háu- or PIE \*áhu. The phased sound change consists of the assimilation of PIE \*á, the loss of PIE \*h and contraction expressed in the formula:

PIE \*háu- \*áhu      → húu, úhu      → úu      → RV. ū, etc.

In other words, PIE \*á+u was first assimilated (→ ú+u), then contracted into the respective long vowel (RV. ū, etc.) with the loss of the laryngeal during the process. An example of the sound change is contained in the data

√paḥu(r)- ‘Feuer’ (P. 828, CHD P:12)

CLu. paḥur-	(n.) ‘Feuer’ (DLL. 77, pa-a-ḥu-u-ur [sgNA])
Ḫi. paḥur-	(n.) ‘Feuer’ (HHand. 115, pa-aḥ-ḥu-ur [sgNA])
TochA. por-	(n.) ‘ignis’ (Poucha 189-90, por [sgN])

This <sup>e</sup>/<sub>o</sub>-grade root has a respective zero grade in

PIE \*páhu- ‘Feuer’

Gr. πῦρ	(n.) ‘Feuer’ (GEW 2:627-9, πῦρ [sgNA])
TochB. puwar	(n.) ‘= Skt. agnim’ (DTochB. 393)

The lack of spiritus asper in Greek (Gr. π- vs. †φ-) and circumflex resulting from contraction prove an earlier dissyllabic form PGr. \*πύρ ← \*puḥur ← PIE \*páhu(r). PIE \*páhu(r)- resulted in TochB. puwar, reflecting the development before PIE \*u.<sup>466</sup> The research history of the subset stands as follows:

(a) In his analysis of the sequence Neogr. \*əu, Brugmann (KVG:80) asserted:

“Uridg. ə [...] ist von uridg. a nur im Ar. geschieden geblieben, doch sind auch hier die diphthongischen [...] aṽ und [...] əṽ in [...] aṽ zusammengefallen (§ 134 ff.).”

Elsewhere, however, Brugmann (Grundr<sup>2</sup> 1:498) contradicts this:

<sup>465</sup> For Brugmann’s examples of Neogr. \*ū, see Grundr<sup>2</sup> 1:111-4.

<sup>466</sup> A dissyllabic form Gr. πύρ (n.) ‘fire’ has actually been preserved. Based on the etymology, the scansion is not necessarily just a ‘distraction’, as claimed by Liddell and Scott (LSJ. 1555).

“Folgten [...] u auf ē etc., so erscheint in der Schwundstufe vor dem Hauptton teils [...] əu, teils anteconson. [...] ū, anteson. [...] uɥ. [...] Gr. δάω ‘ich brenne’ aus \*δαϜω (əu) : ai. dūná-s [...]”

The partial inconsistency of the Neogrammarian reconstruction is caused by the defective ablaut pattern Neogr. \*ē ā ō : \*ə, which did not allow the normal grade Neogr. \*a (= PIE \*h<sub>2</sub>ae, ea<sub>h</sub>) between schwa and the long grade. The problem can be resolved by distinguishing all of the attested treatments:

Neogr. *əu	≡	PIE *h <sub>2</sub> áu v PIE *áh <sub>2</sub> u	(Gr. πῦρ-, TochB. puwar-)
Neogr. *au	≡	PIE *h <sub>2</sub> aeu v PIE *ea <sub>h</sub> u	(H <sub>1</sub> . paḥur-, TochA. por-)

In this way, the artificial ambiguity of the Neogrammarian system is replaced with the systematic and complete alternative of Wackernagel’s ablaut Neogr. \*ā : a : ə, consisting of three actual distinctions (see Chapter 2).

(b) Following the erroneous identification of Schwa \*ə with H<sub>1</sub>. h, Kuryłowicz (1935:41,71) attempted to explain Neogr. \*ū by assuming a reduced vowel (or schwa secundum) attached to a laryngeal (i.e. \*e<sub>h</sub>u → ū). Though the explanation is agreeable in terms of the reconstruction Gr. πῦρ-, TochB. puwar-, etc., the side-effect of the schwa secundum can be avoided through the postulation PIE \*a (in PIE \*a<sub>h</sub>u), as done throughout in System PIE.<sup>467</sup>

(c) In the mainstream laryngeal theory (for example, see Mayrhofer 1986:174-5 and fn 324), a laryngeal metathesis (LT \*\*Hu → \*uH) and subsequent compensatory lengthening (LT \*uH → Neogr. \*ū) are often assumed in order to produce Neogr. \*ū. While avoiding the schwa secundum, the metathesis theory only allows long quantities, which in turn contradicts the established alternations Neogr. \*u : ū in the data. Therefore, the laryngeal metathesis is too strong a hypothesis, and one does better with the simple assimilation and contraction detailed above.<sup>468</sup>

§2. Brugmann (Grundr<sup>2</sup> 1:504) sought an explanation for the alternation Neogr. \*u : ū from the difference in the accentuation of the root:<sup>469</sup>

“Wie sich dazu die Fälle wie gr. μῦς ai. mŭş Pl. mŭs-as : muş-ká-s, ai. gúha-ti : guhád-avadya, stŭpa- : stupá-, gr. στῦφω : στυφελός verhalten, ist unklar; nur so viel ist einigermassen deutlich, dass hier der Wortaccent ein ū bewahrte, das in schwachtoniger Silbe zu u geworden ist (vgl. § 547,, 9).”

Brugmann’s ‘word accent’ is not sufficient, because a short vowel with root accent is attested in examples like RV. gúhā ‘im Verborgenen, geheim’ (WbRV. 404). Accordingly, a distinction between accented and unaccented PIE \*á ≠ \*a is necessary

<sup>467</sup> In this connection, Hendriksen (1941:91) names Møller (Sem. u. Idg. 264) as the inventor of the schwa secundum.

<sup>468</sup> In Old Anatolian the cluster hu is stable both before a vowel (e.g. H<sub>1</sub>. la<sub>h</sub>u-u<sub>h</sub>-hi [1sg] = Lat. laui [1sg]) and a consonant (e.g. H<sub>1</sub>. le<sub>h</sub>ua- (vb2.) ‘ausgießen’ (HEG 2:57, le-el-hu-ua-i)), which does not support the idea of a metathesis.

<sup>469</sup> For the alternation Neogr. \*u : ū, see Brugmann (Grundr<sup>2</sup> 1:487).

in order to explain the alternation Neogr. ū : ũ. With the addition of this additional condition, the outcomes become fully regular, for instance, in the pair:

PIE \*máhus- (→ múhus-) → RV. mús- (m.) ‘Maus’ (WbRV. 1054)  
 PIE \*mahus- (→ m̥hus-) → RV. muṣé (inf.) ‘rauben’ (WbRV. 1051)

In other words, the alternation of the quantity can be traced back to the alternation of the accent of PIE \*a and PIE \*á. When accented, PIE \*áhu and \*háu assimilated with the following \*u (→ \*úhu, húu), finally resulting in long quantity Neogr. \*ū (= RV. ū, etc.). An unaccented PIE \*a, on the other hand, was lost without lengthening:

PIE \*ahu, \*hau → Hi. hu, RV. ũ, etc. (= Neogr. \*ū).

The typical ablaut pattern Neogr. \*āu : ōu : ū : u can thus be expressed in Proto-Indo-European terms as follows:

PIE \*haōu \*haōu \*háu \*hau                      PIE \*ahu \*áhu, \*ěahu, \*ōahu

Numerous examples of the alternation exist, and some have been chosen here to illustrate the general behaviour of the ablaut type:

(a) √hau- ‘Schaf’ (P. 784)

CLu. hauī-	(c.) ‘Schaf’ (DLL. 44, ha-a-ú-i-iš [sgN])
Gr. ὄψι-	(c.) ‘Schaf’ (GEW 2:367, Arg. ὄψις [plA])
Li. avi-	(4.) ‘Schaf’ (LiEtWb. 28, avis [sgN])
Lat. auillo-	(m.) ‘agnus recentis partus’ (WH 1:84)
OIr. u·gaire	(m.) ‘shepherd’ (DIL 485, sub ‘oegaire’)
Lat. ū·piliō(n)-	(m.) ‘Schafhirt’ (WH 2:211)

(b) √haug-, √haueg- ‘wachsen’ (P. 84-5)

Li. pasi·ūgé-	(vb.refl.) ‘groß werden’ (LiEtWb. 24, pasiūgétis)
Li. áug-	(vb.) ‘wachsen, größer werden’ (LiEtWb. 24, áugti)
Lat. augeo-	(pr2.) ‘vermehrten’ (WH 1:85f., augeō [1sg])
gAv. ugra-	(a.) ‘stark, kräftig’ (AIWb. 380)
Gr. αὔξω	(pr.) ‘mehren, fördern; wachsen’ (GEW 1:187)
Hom. ἄ(φ)έξω	(prA.) ‘mehren, fördern; wachsen’ (GEW 1:187)
Hi. huęgatar-	(n.) ‘Haufen, Getreidesilo’ <sup>?</sup> (HEG 1:264)

(c) √hauk- ‘rufen, sprechen, lärmern’ (P. 1103)

LAv. aočaya-	(cs.) ‘sprechen zu-, anreden’ (AIWb. 36-7)
Go. auhjō-	(vb.) ‘lärmern’ (GoEtD. 48, auhjōn [inf.])
Li. úkau-	(vb.) ‘zurufen, schreien, lärmern’ (LiEtWb. 1160)
Li. áukter-	(vb.) ‘aufschreien’ (LiEtWb. 25, áukterti [inf.])

(d) √haukh- ‘Kochtopf, Pfanne, usw.’ (P. 88)

RV. ukha·chid-	(a.) ‘den Topf zerbrechend’ (WbRV. 245)
RV. ukhá-	(f.) ‘Kochtopf, der Pfanne’ (WbRV. 246)
Go. auhn-	(m. <sup>?</sup> ) ‘κλίναβος = oven’ (GoEtD. 49)

- Lat. aullā- (f.) ‘Topf, Hafen’ (WH 1:84)  
 Lat. auxillā- (dim.f.) ‘olla parvula’ (WH 1:84)
- (e) √h<sub>1</sub>aul- ‘kämpfen, schlagen, brechen’ (P. 1144)
- H<sub>i</sub>. h<sub>1</sub>ula- (vb.) ‘(nieder)schlagen’ (HEG 1:273-6, h<sub>1</sub>u-ul-la-a-i)  
 OPr. ūlin- (cs.) ‘kämpfen’ (APrS. 453, ūlint [inf.]  
 Gr. αὐλ·ακ- (.) ‘Furche’ (GEW 1:77, Hes. αὐλαξ, αὐλακες)
- (f) √h<sub>1</sub>aur- ‘Wasser, Regen, Fluss’ (P. 80-1)
- OIcl. ūr- (n.) ‘Feuchtigkeit, feiner Regen’ (ANEtWb. 635)  
 Gr. ἄν·αυρο- (a.) ‘Gießbach, Strom’ (GEW 1:103, ἄναυρος)  
 Thrac. αὐρα- (m.) (a river) (Lindeman 1997:60, αὐρας [sgN])  
 Pal. h<sub>1</sub>uarnina- (vb.) ‘besprengen’ (?) (HHand. 58, DPal. 56)
- (g) √h<sub>1</sub>aus- ‘brennen’ (P. 86-7)
- RV. viús- (f.) ‘das Aufleuchten, Hellwerden’ (WbRV. 1360)  
 Gr. αῦθω (vb.) ‘Feuer holen’ (GEW 1:193, Gr. αῦθ)  
 RV. úsri- (a.) ‘morgendlich’ (WbRV. 270)  
 Gr. αὔριον (adv.) ‘morgen’ (GEW 1:189, PIE \*h<sub>1</sub>ausrio-)  
 LAv. viusa- (pr.) ‘aufleuchten, aufflammen’ (AIWb. 1394, viusaiti)  
 AV. ūšman- (m.) ‘Hitze, Dampf’ (WbRV. 276)
- (h) √h<sub>1</sub>aud- ‘vox’ (P. 76-77)
- Gr. ἐν·αυδο- (a.) ‘speaking’ (LSJ. 557, ἐναυδος)  
 Gr. αὐδή- (f.) ‘(menschliche) Stimme, Laut, Rede’ (GEW 1:184)  
 Gr. ὕδω (pr.) ‘besingen, verherrlichen’ (GEW 2:956)  
 Li. ūdy- (vb.) ‘keifen, schelten, murren, usw.’ (LiEtWb. 1157)  
 RV. uditá- (pt.) ‘gesprochen, gesagt’ (WbRV. 1201, uditám)
- (i) √h<sub>1</sub>aud- ‘Wasser, Quelle, usw.’ (P. 78-80)
- Hom. ὕδατ- (n.obl.) ‘Wasser’ (GEW 2:957, Il. 21.300)  
 RV. an·ūdaka- (n.) ‘want of water, aridity’ (MonWil. 41)  
 Hom. ὕδωρ (n.) ‘Wasser’ (GEW 2:597, ὕδωρ, Il. 15.37)  
 Li. ūdra (f.) ‘Fischotter’ (LiEtWb. 1157-8)  
 Rus. výdra (f.) ‘Fischotter’ (GEW 2:957)  
 LAv. aoda- (m.) ‘Quelle’ (AIWb. 42, aodaēšu [pIL])

In this manner, the cover symbol Neogr. \*ū provides an outer-Anatolian criteria for the restoration of PIE \*h<sub>1</sub> through PIE \*á, which is reflected in the Indo-European long quantity ū = PIE \*h<sub>1</sub>áu or \*áhu. Consequently, Brugmann’s (Grundr<sup>2</sup> 1:483)<sup>470</sup>

<sup>470</sup> See Brugmann (Grundr<sup>2</sup> 1:483): “Nur diejenigen erst im einzelsprachlichen Leben neu aufgekomenen Verschiedenheiten des sonantischen Elementes sind mit heranzuziehen, welche durch analogische Nachahmung uridg. Ablautverhältnisse entsprungen sind, wie z. B. gr. ἰκέτευσ· ἰκετεῦσ, ἕμεναφουν ἕμειναιῶ, wo ī : i, ū : u dem uridg. Verhältnis ē : e in hw : esti u. dgl. nachgebildet worden sind (II S. 864).”



analogical explanation of ablaut Neogr. \*ū : ū can be replaced with a phonological condition, the alternation of accent in PIE \*háu ≠ hau and PIE \*áhu ≠ ahu.

§3. **SUBSET II.** Neogr. \*ū, uə ≡ PIE \*uáh, uhá with accent on PIE \*á. As with the subset \*h+u, an assimilation of PIE \*a, the loss of PIE \*h and a contraction took place in the subset as indicated in:

PIE \*uáh \*uhá → uúh \*uhú → uú → RV. ū.

The research history shows that the subclass has been reconstructed almost correctly by all theories that accept either Neogr. \*ə or PIE \*h. Already the Neogrammarians accepted a contraction of \*u+ə → RV. ū, Lat. ū, etc., as implied by the following quote from Brugmann (Grundr<sup>2</sup> 1:495):

“[...] ī, ū dürften öfters durch Contraction von ə mit i, u entstanden sein. Z.B. \*trī ‘tria’ (ved. trī lat. trī-gintā air. trī lit. trý-lika aksl. tri) aus \*tri-ə, vgl. ai. bhárant-i gr. φέροντ-α; \*p̥l̥ū ‘multa’ (ved.) aus \*p̥l̥u-ə.”

Similarly, Saussure (1879:239 = Rec. 231-2) suggested an analysis Neogr. \*ū ≡ \*uA for the seṭ-roots of the type OInd. pavítar : pūtá-. This view, reinterpreted as compensatory lengthening caused by a lost laryngeal (\*\*uH → Neogr. \*ū), is now dominant in the laryngeal theory. Strictly speaking, however, the quantity of Neogr. \*ū (≡ PIE \*uáh, \*uhá) is not caused by compensatory lengthening, because this – as a dominant feature – would preclude the attested alternations of quantity RV. ū : ū, etc. Instead, the alternation is conditioned by means of accent according to the rules

PIE \*uáh, \*uhá → RV. ū, etc.                      PIE \*uah, \*uha → RV. ū, etc.

where PIE \*á stands for an accented and PIE \*a for an unaccented vowel. In this case Neogr. \*ū also provides an additional criterion for PIE \*ha, ah (otherwise lost in the daughter languages). In order to illustrate this, Hittite ḫ and Rig-Vedic hiatus imply PIE \*há with two different quantities, according to the accent PIE \*á vs. PIE \*a in the data:

√puḫal-‘Tor, Tür, Pforte, Burg’ (P. 799)

PIE \*puḫal-

RV. púr-	(f.) ‘Burg, Fester Platz’ (WbRV 823-4, púras [sgG])
Ḫi. puḫla-	(c.) ‘Stadtter’ (CHD P:370, HHand. 134)
Gr. ἑπτὰ πυλο-	(a.) ‘siebentorig’ (GEW 1:624)
Gr. πύλη-	(f.) ‘Tür-, Torflügel’ (pl.) ‘Tor, Pforte’ (GEW 2:623-4)

PIE \*puḫál-

RV. pu’ur-	(f.) (ein Gott) (WbRV. 823, púr [zweisilbig])
RV. púr-	(f.) ‘Burg, Fester Platz’ (WbRV 823-4, púr [sgN])

§4. The accent alternation PIE \*há : h́á with ablaut PIE \*ē : e : Ø results in a theoretical maximum of four root variants in the Indo-European languages. An example of the system of four distinctions is fully preserved in

√suḥad- ‘sweet’ (P. 1039-40)<sup>471</sup>

RV. sam ·súd-	(inf.bs.) ‘geniessen’ (WbRV. 1533, samsúde [inf.])
RV. havya ·súd-	(a.) ‘die Opfertränke süssig machend’ (WbRV. 1657)
RV. su’áda-	(pr.) ‘mit Lust geniessen, gut schmecken’ (WbRV. 1622)
RV. svāda-	(prM.) ‘sich freuen’ (WbRV. 1636, svādate [3sg])

The explicit reconstruction is of the form:

PIE *súḥad- (RV. súd-)	PIE *suḥád- (RV. súd-)	(zero grade)
PIE *suḥaed- (RV. su’ád-)	PIE *suḥaēd- (RV. svād-)	(*e/ē grade)

Thus, the diphonemic PIE \*ḥa, aḥ is required in order to account for simultaneous traditionally irregular features, such as the ‘a-colouring’, the hiatus in RV. su’ád- and the alternation of quantity Neogr. \*u : ū.

§5. Occasionally in Greek, but also in Italic and in Celtic, an unassimilated Gr. υα, appears (cf. Gr. κύαλο- ‘Blaustein’, GEW 2:37, etc.).<sup>472</sup> The difference between Neogr. \*uə and Neogr. \*ū caused a dispute between Brugmann and Schmidt, as is apparent in Brugmann’s (Grundr<sup>2</sup> 1:495) comment:

“Formen wie gr. τρά, γούνα aus \*γούνα waren einzelsprachliche Neubildungen. Die Ansicht J. Schmidt’s (zuletzt Kritik 22f.), dass ia, uə, falls sie den Formen wie ved. trí zu Grunde gelegen haben, noch nicht in der Zeit der idg. Urgemeinschaft zu ī, ū verschmolzen waren, ist kaum haltbar. Siehe Verf. M. U. 5, 58ff., Wackernagel Al. Gr. I 104.”

The disagreement is of lesser relevance, since an ablaut difference (i.e. Neogr. \*a vs. \*ə) can be singled out as the explanation, when the proper three ablaut grades of Wackernagel’s ablaut (PIE \*ueāḥ \*ueaḥ \*uaḥ) are taken into account.

§6. **SUBSET III.** In addition to the clusters PIE \*ḥ+u (**SUBSET I**) and PIE \*u+ḥ (**SUBSET II**), there are other minor reconstructive starting points for Neogr. \*ū, characteristically containing PIE \*u twice. This category consists of analytical prototypes like

Neogr. \*ū           ≡           PIE \*uu, uaḥu, uḥau, etc.

This type of secondary Neogr. \*ū appears, for instance, in:

(a) Neogr. \*ū ≡ PIE \*u ·u (reduplication). The quantity of a perfect stem RV. ūc- (pf.) ‘sagen, aussprechen’ (WbRV. 1192), ūcús [3pl] is explained by reduplication (i.e. RV. ūc- = \*u ·uk<sup>h</sup>- (cf. P. 1135, √uek<sup>h</sup>- ‘ἔπειρος’)). In this subset, PIE \*a (and the laryngeal) are not involved in the quantity, but Neogr. \*ū = PIE \*uu.

(b) Neogr. \*ū = uaḥu. The unique ablaut of the root P. √bheu- ‘sein’ (P. 146-150) is caused by a difference between the unextended (PIE \*bheu-) and extended (PIE

<sup>471</sup> PIE \*ḥ is confirmed by hiatus in RV. su’áda- (pr.) ‘angenehm, genussreich machen’ (WbRV. 1622, su’ádanti [3pl]) and PIE \*a by colouring of Boiot. φάδο- (prM.) ‘sich freuen’ (Boiot. φάδομη = Att. ἡδομαι [1sg]). It is likely that the traditional root is actually the compound PIE \*su ḥad- = ‘wohl-essen’.

<sup>472</sup> Cf. also Gr. κύαθος ‘Schöpgefäß, Hohlmass’ (GEW 2:36), Gr. κύαμος ‘Bohne’ (GEW 2:36-7), etc.

\*bhu ·aḥ and \*bhu ·aḥ ·u-) root forms, the latter explaining the ‘overlong’ quantities of RV. babhúva (WbRV. 946), LAv. bvāva (AIWb. 932) and OCS. byvati ‘sein’.

§7. There are no general a priori rules by which a correct segmental analysis of Neogr. \*ū could be mechanically decided. Therefore, the choice of the proper alternative from the list of alternatives

Neogr. \*ū           ≡       PIE \*háu, áḥu, uáh, uḥá, uu, uaḥu, uḥau, etc.

must be decided individually for each correspondence based on the measurable properties of the data. Owing to the provably analytic character of Neogr. \*ū, in the great majority of examples it is, however, likely that PIE did not possess a long vowel /ū/ as the long counterpart of PIE \*u.

### 3.2.4 Neogr. \*ĩ ≡ PIE \*ĩ

§0. Neogr. \*ĩ ≡ PIE \*ĩ (= IPA /j/) was already present in Schleicher’s reconstruction. Little new information has emerged concerning the glide, and the main developments can be briefly summarized as follows:

§1. Brugmann’s (Grundr<sup>2</sup> 1:261-293) examples of Neogr. \*ĩ include, inter alia, the items:

- (a) Neogr. \*jek<sup>u</sup>en- ‘Leber’ (Grundr<sup>2</sup> 1:261-2): “ai. yákr̥t Gen. yakn-as av. yākarə, gr. ἥπαρ, -ατ-ος, lat. jecur jecinor-is, lit. jeknos Pl.”
- (b) Neogr. \*torséje/o- ‘dürsten’ (Grundr<sup>2</sup> 1:262): “ai. taršáyāmi ‘ich lasse dürsten’, lat. torreō, ahd. derriu ‘ich dörre’.”
- (c) Neogr. \*k<sup>u</sup>ieu- ‘treiben’ (Grundr<sup>2</sup> 1:262-3): “ai. cyáva-tē ‘er regt sich, rührt sich’, gr. äol. σεύω ‘ich treibe, schwinge, jage’.”

§2. In Old Anatolian, PIE \*ĩ was occasionally lost in between vowels. Diagnostically, in such cases there is a connection between etymologically related root variants with and without PIE \*ĩ : \*ĩ. The glideless forms are often written with the (overlong) plene script (OAnat [C]a-a-a[C]), which does not refer to quantity but to the loss of intervocalic PIE \*ĩ/ĩ in Old Anatolian:<sup>473</sup>

PAnat \*aja → Ḥi. a-a-a, CLu. a-a-a, Pal. a-a-a, etc. (Starke KLuN:101).

This sound law was identified already by Sturtevant (1951:18 and fn 23),<sup>474</sup> and its verification consists of lexical comparisons of forms with the plene alternating with forms containing an original PIE \*ĩ : ĩ. Some examples of the development both in Old and Later Anatolian are:

- (a) √i- ‘glow, burn, warm (up)’

<sup>473</sup> The overlong plene script is often transcribed with /ā/, but it is likely that the middlemost plene vowel -a- should be read as spiritus, a secondary ‘laryngeal’ (OAnat. ’) from PIE \*ĩ. Both here and in the PIE Lexicon, a neutral ‘subscript’ notation (OAnat. a;a) will be adopted.

<sup>474</sup> A similar value for ‘plene writing’ is attested in Akkadian. See also Kronasser (VFLH 50) and Tischler (HEG 1:3-4).

- Ți. aa- (vb2.) ‘warm, heiß sein’ (HEG 1:3-4, a-a-ri, a-a-an-ta)<sup>475</sup>  
 Ți. aant- (pt.) ‘heiß, warm’ (HEG 1:3-4, a-a-an-za, a-a-an-te-it)  
 Ți. inu- (cs.) ‘heiß machen; kochen’ (HEG 1:363, i-nu-zi [3sg])
- (b)  $\sqrt{\text{vi-}}$  ‘machen’
- CLu. aia- (vb.) ‘machen’ (CLu. a-a-ja-ši [2sg], KLuN. 101, fn256)  
 CLu. aa- (vb.) ‘machen’ (CLu. a-a-ta [3sg])
- (c)  $\sqrt{\text{tali-}}$  ‘ein Gefäß’
- Ți. dalai- (DUG<sub>n</sub>.) ‘Gefäß (für Feinöl)’ (HEG 3:56, tal-la-i [sgN])  
 CLu. talaa- (GIŠ<sub>c</sub>.) ‘ein Gefäß’ (DLL 89, ta-la-a-an-za [plA])  
 CLu. dalai mi- (DUG<sub>c</sub>.) ‘ein Gefäß’ (DLL 89, da-la-i-mi-iš [sgN])
- (d)  $\sqrt{\text{tarpei-}}$  ‘(zer)treten’ (HEG 2:203f.)
- CLu. tarpaa- (vb.) ‘(zer)treten’ (HHand. 169, tar-pa-a-tar [3sg])  
 CLu. tarpei- (vb.) ‘(zer)treten’ (DLL 93, tar-pí-ħa)  
 HLu. tarpaa- (vb.) ‘treten’ (CHLu. 5.1.22, tara/i-pa-a-ti)
- (e)  $\sqrt{\text{uli-}}$  ‘Wiese : grünen’
- Pal. ulaana- (sb.) ‘Wiese, Dicklicht?’ (DPal. 76, ú-la-a-an-na [sgL])  
 Ți. ulilia- (vb.dn.) ‘grünen, sprossen?’ (HHand. 185)  
 Pal. uliliantik- (dc.) ‘a class of gods’ (DPal. 76 ú-li-li-an-ti-ga-aš [plD])
- (f)  $\sqrt{\text{si-}}$  ‘Lieb, Wohlwollen, Gunst’.
- Ți. ašeia- (vb1M.) ‘lieb, beliebt sein’ (HEG 1:81-83)  
 Lyd. ašaa- (c.) ‘Gunst, Wohlwollen’ (?) (LydWb. 66, ašaaav)
- (g)  $\sqrt{\text{mliu-}}$  ‘Teil, Urteil(er), usw.’
- OInd. mleva- (vb.) ‘to serve, worship’ (MonWil. 838, mlevate)  
 Lyd. qaλ mλu- (c.) ‘König’ (LydWb. 179, qaλmλuλ [sgD], Lyd. λ ← \*l̥i)  
 Lyd. mλola- (c.) ‘Teil’ (LydWb. 166, mλola [sgN])  
 Lyd. mλvēnda- (sb.) ‘cf. above (?)’ (LydWb. 166-7, mλvēndañ [pl?D])  
 Lyd. mλvēsi- (c.) ‘Schicksal (?)’ (LydWb. 167, mλvēsi [sgN])  
 Lyc. mlejeusi- (lc.) ‘-(?)’ (VLFH 93, mlejeusi [sgN])  
 Lyc. mλaavsi- (lc.) ‘-(?)’ (VLFH 93, mλaavsi [sgN])

The inadequacies of the Anatolian syllabic script prevent an exact formulation of the conditions of the loss of PIE \* $\text{i}$  unless (or until) a complete theory of the Proto-Indo-European ablaut patterns has been advanced, which could provide some additional hints for the Old Anatolian as well.<sup>476</sup>

<sup>475</sup> For these stems, see also Oettinger (1976:136).

<sup>476</sup> The change \* $\text{V}\text{i}\text{V} \rightarrow \text{V}\text{Ø}\text{V}$  is possibly an areal feature. Appearing in Anatolian (Ți., HLu., CLu., Lyd., Lyc., Pal.), the Hellenic world, (Ion., Att., etc.), the Balkans (Phryg. εδασε ‘posuit’, cf. Ți. da-a-iš, P. 236) and Italic with an obvious connection to the genesis of palatovelars, the loss of unaccented \* $\text{i}$  played a significant role in the post-PIE period.

§3. Old Mycenaean has preserved PIE \**ǰ* (= LinB. *j*), which is otherwise lost in Greek (see DMycGr. 78-9).<sup>477</sup> This has provided a degree of confirmation for PIE \**ǰ* in Greek (for some early examples of LinB. *j*, see DMycGr. 394-5 and passim), which is problematic owing to the simultaneous loss of iota, sigma and digamma in the classical language.

§4. In addition to the standard development PIE \**ǰ* → TochAB. *y*, the Tocharian palatalization has given birth to a non-organic TochAB. *y*, emerging before the front vowels PIE \**e* \**ē*. The sound change went through an approximately sketched proto-Tocharian stage, yielding a secondary palatal glide as indicated in:

TochAB. *y*, *ya*                      ←            PToch. \**j<sub>e</sub>*, *je*                      ←            PIE \**e*, \**ē*.

This development is suggested by the root PIE √*shar*- ‘Blut, Saft’ (P. 343), where the equations TochB. *ya* ≡ Gr. *η* and TochAB. *y* ≡ Gr. *ε* hold true, as indicated in:

CLu. <i>ašhar-</i>	(n.) ‘Blut’ (HHand. 26, <i>a-aš-ḥar-ša</i> [sgNA])
Hĭ. <i>ešhar-</i>	(n.) ‘Blut’ (HHand. 33, HEG 1:112-15, <i>e-eš-ḥa-ar</i> )
Hes. <i>ḥαϞ-</i>	(n.) ‘Blut, Saft’ (GEW 1:432, <i>ḥαϞ</i> [sgNA])
TochB. <i>yasar-</i>	(n.) ‘blood’ (DTochB. 487, <i>yasar</i> [sgNA])
Gr. <i>ξαϞ-</i>	(n.) ‘Blut, Saft’ (GEW 1:432, <i>ξαϞ</i> [sgNA])
TochA. <i>ysār-</i>	(m.) ‘cruor, sanguis’ (Poucha 253)
TochB. <i>ysāra-</i>	(n.) ‘blood’ (DTochB. 487)

Consequently, the ambiguity of TochAB. *y* (from PIE \**ǰ* or PIE \**e*, \**ē*) must be taken into account in etymological considerations. The reconstructive situation thus resembles Old Anatolian with vacillation between PIE \**e* and PIE \**i*.

§5. In order to explain the initial Gr. *ζ*- through comparison to an Indo-European glide (RV. *y*-, Lat. *i*-, etc.), Brugmann (Grundr<sup>2</sup> 1:793-5) postulated a second glide Neogr. \**j* (≠ Neogr. \**ǰ*). Thus, for instance, Gr. *ζ* allegedly reflects Neogr. \**j* in Gr. *ζυγός* : RV. *yugá-* (n.) ‘das Joch, Gespann, Geschlecht, Generation’ (WbRV. 1114-5) = Lat. *iugum*. The outcome *ζ* is, however, restricted to Greek, and consequently the reconstruction of an independent phoneme cannot be confirmed. The result of this is that Brugmann’s idea has not found followers. Because a twofold outcome of a single prototype (as in PIE \**ǰ* → Gr. *h* (spiritus) ≠ Gr. *ζ*) would violate the principle of the regularity of sound change, a hitherto unutilized approach (a prefix? or a redistribution of the correspondences ?) is required to explain the phenomenon.<sup>478</sup>

§6. An unaccented PIE \**ǰ* was lost after a velar (PIE \**k*, etc.) in the Centum group during an intermediate stage of palatovelars Neogr. \**k̂* *kĥ* *ĝ* *gĥ* required by Greek and Tocharian, but developed into \**ć* *č* *ǰ* *ǰĥ* in the Satem group. In this manner, the

<sup>477</sup> According to Ventris and Chadwick (DMycGr. 78): “The loss of I.-E. -*j*- in intervocalic position is proved by the first component of a man’s name *a-e-ri-ḡo-ta* [...]” As the only potential example of the loss of \**ǰ*, and in a personal name, the loss is not guaranteed, because PIE \**s* is equally possible.

<sup>478</sup> The problem could be solved on a segmental basis by postulating two distinct starting points (with Gr. *ζυγός* = Neogr. \**d̂* *ǰugó-*, etc.), but it should be noted that other approaches also remain possible.

palatovelars Neogr. \*k̄, kh̄, ĝ, ĝh are polyphonemic clusters of plain velars followed by PIE \*i. These are explained in detail with definitions (PIE \*k+i = Neogr. \*k̄, etc.) in Chapter 4.

### 3.2.5 Neogr. \*i ≡ PIE \*i

§0. Only minor corrections and additions concerning the vowel PIE \*i (Neogr. \*i = PIE \*i) have emerged since Schleicher's reconstruction. Although few in number, the most relevant topics are summarized below.

§1. Brugmann's examples of Neogr. \*i (Grundr<sup>2</sup> 1:94-101) included:

(a) Neogr. \*i- (Grundr<sup>2</sup> 1:94): "Schwundstufenform der W. ei- 'gehen': 1. Pl. ai. i-más gr. ἴμεν, lat. itum" (P. 293-297).

(b) Neogr. \*uid- (Grundr<sup>2</sup> 1:94): "Schwundstf. der W. uēid- 'sehen, wissen': 1. Pl. ai. vid-má hom. ἴδμεν got. witum, [...] lat. videō, air. fíiss 'das Wissen', lit. pa-vidulis 'Ebenbild'" (P. 1025f.).

(c) Neogr. \*uidheuā 'Witwe' (Grundr<sup>2</sup> 1:94): "ai. vidhāvā, gr. ἡθήεος 'Junggesell', lat. vidua viduos, air. fedb, got. widuwō, aksl. vīdova" (P. 1127-8).

There is no need for major changes in the general picture already presented by the Neogrammarians, which are well-established by now. However, the following new items can be mentioned in this connection:

§2. In Hittite (and generally in Old Anatolian), there is a widespread confusion between the vowels PIE \*e and \*i (also including the diphthongs PIE \*ei, ēi, etc.). This phenomenon was recently characterized by CHD L-N:XII as follows<sup>479</sup>:

"It is well-known that the vowels *e* and *i* often interchange in the spelling of Hittite words. In the earliest texts scribes clearly sought to maintain a distinction. What consistency underlies later usage and whether the post-OH spelling conventions also reflect a continuing distinction between *e* and *i* are matters of controversy."

From a comparative point of view, external reconstruction remains the sole trustworthy method for distinguishing between etymological PIE \*e and PIE \*i in Old Anatolian.<sup>480</sup>

§3. On suppletive paradigms with and without an \*i-extension, Brugmann (Grundr<sup>2</sup> 1:259) writes:

"In 233 S. 203 ff. haben wir gesehen dass *i* [...] in den Langdiphthongen unter gewissen Bedingungen schon in uridg. Zeit geschwunden sind, z.B. \*rēm 'rem' aus \*rēi-m [...]."

<sup>479</sup> For the fluctuation between  $\text{Ḫi. i}$  and  $\text{Ḫi. e}$ , see Sturtevant (1951:18-19).

<sup>480</sup> The internal reconstruction of the alternation  $\text{Ḫi. i} : \text{Ḫi. a} \leftarrow \text{PIE } *ē : *ō$  is not entirely reliable. Owing to the vast vocabulary of the protolanguage, this structural approach may fail, because PIE \*i may be externally provable in some examples.

Such a view would lead to a major inconsistency caused by supposed proto- and pre-proto-languages. Furthermore, since the Vedic variation is externally paralleled,<sup>481</sup> arguments similar to those in connection with \*u-stems apply.

### 3.2.6 Neogr. \*ī ≡ PIE \*hái, \*áhi, \*ihá, \*iáh, \*ii

§0. The long vowel Neogr. \*ī, absent from Schleicher's system, was first reconstructed by Curtius (Benware 1974:78-9). The Neogrammarians followed Curtius, but also suggested a segmental analysis of Neogr. \*ī similar to Neogr. \*ū. In its full form, the cover symbol Neogr. \*ī consists of three main subsets that are structurally identical with those of Neogr. \*ū:

§1. **SUBSET I:** Neogr. \*ī ≡ PIE \*hái, \*áhi (with accented PIE \*á). The phased sound change leading to the secondary long vowel /ī/ can be stated as follows:

PIE \*hái, áhi → hīi, ihī (assimilation) → íi (\*h-loss) → RV. ī, etc.

The key developments in the research history of the subset are:

(a) On \*əi as a possible starting point of \*ī, Brugmann (Grundr<sup>2</sup> 1:498) wrote:

“Folgten *i̇* [...] auf *ē* etc., so erscheint in der Schwundstufe vor dem Hauptton teils *əi̇* [...] teils anteconson. *i̇* [...] anteson. *i̇i̇* [...]. \*dhəi- ‘säugen’ ai. dhaya-ti dhenú-§ (§ 193) S. 171 f.): dhī- ai. dhī́tá-s : dhēi- ai. dhāyú-§ [...]. Ai. pītá- ‘erfreut, geliebt’ priyá-s got. frijōn : gr. πρᾶύς aus \*πρᾶiυ-ς av. frāyō [...].”

As with Neogr. \*ū, Brugmann (KVG:80) contradicts himself by writing:

“Uridg. *ə* [...] ist von uridg. *a* nur im Ar. geschieden geblieben, doch sind auch hier die diphthongischen *ai̇* [...] und *əi̇* [...] in *ai̇* [...] zusammengefallen (§ 134 ff.) und die heterosyllabischen *ai̇* und *əi̇* in *ai̇*.”

(b) Brugmann's latter suggestion was contested by Hirt (1900:33ff.), who preferred the first-mentioned treatment \*ə+i → Neogr. \*ī.<sup>482</sup> Hirt's reconstruction was accepted by Benveniste (1935:167f.), who additionally postulated a syllabic schwa (1935:168) as an allophone of the laryngeal in this context:

“[...] \*peə<sub>3</sub>-y+t+o- devient \*pə<sup>0</sup>-i-to- (en notant par ə<sup>0</sup> un ə syllabique en hiatus devant i), lequel s'assimile en \*pi-i-tó- → skr. pītáḥ; de même \*pə<sup>0</sup>-i-n-o- > \*pi-i-no- > gr. πίνωv.”

Against Benveniste, Schmitt-Brandt correctly (1967:34) argued:

“Phonetisch völlig unhaltbar ist endlich die Erklärung von \*pī- (gr. πίνω) aus \*pH-i-. Ist \*H ein Konsonant, so kann es nicht silbisch werden [...] ist \*H ein Sonant, so wird es gerade in

<sup>481</sup> In this case, the stem RV. rá- (f.) ‘Gut, Schatz, Reichtum’ (WbRV. 1184, ráam [sgA]) is comparatively confirmed by Lat. rē- (f.) ‘Sache, Besitz’ (WH 2:430-1, rēs [sgN], rem [A]), and the stem RV. ray- (m.) ‘Reichtum’ (WbRV. 1183, rayé [sgD]) by Lat. reī [sgG].

<sup>482</sup> As pointed out by Güntert (1916:107), Hirt's solution involves accented schwa \*á, corresponding to PIE \*á in System PIE: “[...] finden wir [Hirt's] Ablaut 14, Handb. d. gr. Laut- u. Formenl.<sup>2</sup> 117, § 120 diese Angabe dahin erweitert, daß idg. əi und əu als ī und ū erscheinen hatten, wenn sie im Idg. sekundär den Ton erhalten hatten.”

dieser Stellung gewiß nicht silbisch (\*pri-, nicht \*p̥ri-), nur ein reiner Vokal könnte mit folgendem \*i, \*u zu einem Diftong verschmelzen und an Vokalen gibt es nach Benveniste im Indogermanischen nur einen, nämlich \*e.”

In addition, an extra difficulty mentioned by Burrow (1949:42) must be taken into account:

“[...] Benveniste [...] retains the theory that  $\bar{i}$  can develop out of  $-ai-$ , or  $Hi$  [...]. This creates extraordinary difficulties. Even if it were admitted that H could function as a sonant it ought not to do so before a vowel.”

These problems, as well as those caused by the schwa secundum (Møller 1906:264) and Kuryłowicz (1935:41), can be avoided by reconstructing diphonemic PIE \* $\text{h}_a$  and \* $\text{a}_\text{h}$ . Thus, for Gr.  $\pi\bar{i}$ - (ao.) ‘trinken’ (Gr.  $\pi\bar{i}\theta\iota$  [2sg] = OCS.  $\pi i$ -) PIE \* $\text{pá}_\text{h}i$ - is postulated exactly as for PIE \* $\text{h}_a\bar{u}$  and PIE \* $\text{á}_\text{h}u$ .

(c) The laryngeal metathesis \*\* $Hi \rightarrow *iH \rightarrow$  Neogr.  $\bar{i}$  has been offered as an explanation of quantity in the laryngeal theory (Mayrhofer 1986:174-5). Strictly speaking, this is not consistent, because compensatory lengthening would exclude the attested alternation of quantity Neogr. \* $i : *i$  (Brugmann, Grundr<sup>2</sup> 1:487) and lead to the incompleteness (and invalidity) of the reconstruction. The examples of the type “[Neogr.] \* $\text{síd}$  ‘sitzen’ ai.  $\text{sída-ti}$  russ.  $\text{sidēt}$  av.  $\text{hiḍaiti}$  gr.  $\text{ιδούω}$  [...]” (Brugmann Grundr<sup>2</sup> 1:504)<sup>483</sup> can only be accounted for by reconstructing a difference in the accentuation, with PIE \* $\acute{a}$  leading to long glides and PIE \* $a$  (unaccented) to short ones, as indicated in

PIE \* $\text{h}_a\bar{i}$ ,  $\text{á}_\text{h}i \rightarrow$  RV.  $\bar{i}$ , etc. (and) PIE \* $\text{h}_ai$ ,  $\text{a}_\text{h}i \rightarrow$  RV.  $\bar{i}$ , etc.

§2. Some examples of PIE \* $\text{á}_\text{h}i$ ,  $\text{h}_a\bar{i} \rightarrow$  RV.  $\bar{i}$ , etc. (Neogr. \* $\bar{i}$ ) are readily available in correspondences with the attested ablaut  $\acute{a}i : \acute{o}i : \bar{i} : i$ , typical in cognates for the proto-sequences PIE \* $\text{h}_+i$  in connection with ablaut PIE \* $\acute{e} : e : \emptyset : o : \bar{o}$ :

(a)  $\sqrt{\text{h}_ai}$ - (or  $\sqrt{\text{a}_\text{h}i}$ ) ‘this, that (here)’ (P. 285)

gAv. $\bar{i}$	(ptcl.) ‘Part. der Hervorhebung’ (AIWb. 363)
OIcl. $\bar{i}$ dag	(adv.) ‘heute’ (ANetWb. 282, $\bar{i}$ dag)
RV. $\bar{i}$ $\text{d}í\acute{s}$ -	(dem.pron.) ‘ein solcher’ (WbRV. 231, $\text{id}í\acute{s}e$ [sgD])
Gr. $\text{o}\acute{\upsilon}\tau\text{o}\sigma\acute{\iota}$	(deict.ptcl.) ‘demonstrativ-stärkend’ (GEW 1:701)
OInd. $\bar{a}i$ $\text{śámah}$	(adv.) ‘heuer : in the present year’ (KEWA 1:130)

(b)  $\sqrt{\text{h}_ai\acute{g}}$ - ‘regen, bewegen, treiben’ (P. 13-14)

RV. $\acute{a}pa$ (...) $\text{íja}$ -	(vbM.) ‘wegtreiben’ (WbRV. 230, $\acute{a}pa$ (...) $\text{íjate}$ [3sg])
Gr. $\text{aí}\gamma$ -	(c.) ‘Meereswogen’ (GEW 1:31, $\text{aí}\gamma\epsilon\varsigma \cdot \tau\acute{\alpha} \kappa\acute{\upsilon}\mu\alpha\tau\alpha$ )
RV. $\acute{e}ja$ -	(prA) ‘sich bewegen, sich regen’ (WbRV. 297, $\acute{é}jati$ )
Gr. $\text{í}\xi\text{-}\alpha\lambda\text{o}$ -	(a.) ‘springing (?), bounding’ (LSJ. 831)

(c)  $\sqrt{\text{h}_ai\acute{g}}$ - ‘Ziege’ (P. 13)

<sup>483</sup> The commonplace reconstruction  $\text{†sisd-} \rightarrow$  Lat.  $\text{sīd-}$  is erroneous, because the corresponding RV.  $\text{sída-}$  (pr.) does not have a retroflex and there is no trace of a voiced sibilant in Av.  $\text{hiḍa-}$  either.



Gr. αἴγ-	(c.) ‘Ziege(nbock)’ (GEW 1:41-2, αἴξ, αἰγός)
Arm. aic	(sb.) ‘Ziege’ (ArmGr. 1:417)
LAv. izaēna-	(a.) ‘aus Leder, ledern’ (AIWb. 373, izaena-)
LAv. izaēna-	(a.) ‘aus Leder, ledern’ (AIWb. 373, izaēna-)
Gr. ἰξᾰλῆ	(f.) ‘Ziegenfell’ (GEW 1:728)

(d) √haim- ‘Bild(ung), Nachbildung, Gestalt, usw.’ (P. 10ff.)

Ḫi. ḫima-	(c.) ‘Nachbildung, Substitut’ (HEG 1:245, ḫi-im-ma-aš)
TochB. ime-	(m.) ‘consciousness, awareness, thought’ (DToch. 66)
Arm. imana-	(pr.) ‘vormuten’ (WH 1:17, imanam [1sg])
Lat. imāgōn-	(f.) ‘Bild, Abbild, Schein, Gestalt’ (WH 1:680)
OLi. aimù-	(a.) ‘von schönen Gestalt’ (LiEtWb. 2)
Lat. aemulo-	(a.) ‘nacheifernd, wetteifernd’ (WH 1:17, aemulus)

(e) √hair- ‘brennen’ (P. 12)

Go. air	(adv.) ‘frühe’ (GoEtD. 18)
gAv. ayar-	(n.) ‘Tag’ (AIWb. 157, ayarō [sgNA])
LAv. uz :ayara-	(n.) ‘Nachmittagzeit’ (AIWb. 409)
LAv. uz :irah-	(n.) ‘Nachmittag’ (AIWb. 410)
Ḫi. ḫirina-	( <sup>UDUN</sup> m.) ‘Schmelzofen’ (HEG2:237, ḫi-ri-na-aš)
Gr. ἀέριστο-	(sb.) ‘Frühstück’ (Hom. ἀέριστον [in V 124])

(f) √hair- ‘schneiden, enzwei gehen, trennen’ (P. 333)

Li. ìr-	(vb.) ‘sich auflösen, enzwei gehen’ (LiEtWb. 15)
Li. yra-	(vb.) ‘sich auflösen, trennen’ (LiEtWb. 187. yrù)
Li. pa :ira-	(a.) ‘locker’ (P. 333, paíras [sgN])
Gr. αἴρα-	(f.) ‘Axt, Beil’ (GEW1:43, Hes. αἴρα · ἀξίϋνη)
OInd. ilī-	(f.) ‘eine Art Schwert’ (EWA 3:28)
OInd. īlī-	(f.) ‘eine Art Schwert’ (EWA 3:28)
OEng. iring-	(a.) ‘sectum’ (ASaxD. 599, iringes weg)

(g) √hair- ‘SPRECHEN’ (P. –)

CLu. ḫiru-	(n.) ‘oath’ (HEG 1:252, DLL 45, ḫirun [NA])
Go. airu-	(m.) ‘Bote’ (GoEtD. 19, airus [sgN])
OIcl. ira :st-	(pr.) ‘gesagt, -flüstert, erzählt werden’ (ANetWb. 287)

(h) √hais- ‘binden; Deichsel’ (P. 298)

Ḫi. ḫiša-	( <sup>GIŠ</sup> .) ‘Deichsel’ (HEG 2:252f, HED. 3:318, ḫi-eš-ši)
RV. ṛṣá-	(f.) ‘Deichsel’ (WbRV. 238, ṛṣá)
Gr. οἶακ-	(m.) ‘Griff des Steuerruders, Steuerruder’ (GEW1:356)
CLu. ḫišḫia-	(vb1.) ‘lier, ceindre’ (DLL. 46, ḫi-iš-ḫi-ia-an-ti [3pl])

Generally the cover symbol Neogr. \*ī (RV. ṛ, etc.) reflects a lost PIE \*h<sub>1</sub>, indirectly preserved through PIE \*á in the quantity resulting from PIE \*hái or \*áhi. The ablaut

Neogr. \*ī : \*i can be regularly explained on a phonological basis (PIE \*hái ≠ hai and PIE \*áhi ≠ ahi).

§3. **SUBSET II:** Neogr. \*ī ≡ PIE \*iáh, ihá. A successive series of sound changes took place, as expressed in the formula:

PIE \*iáh, ihá → iih, ihi (assimilation) → ii (h-loss) → RV. ī etc.

This subset has been reconstructed more or less correctly by all theories that accept Neogr. \*ə or PIE \*h, as shown by the research history:

(a) Already Brugmann (Grundr<sup>2</sup> 1:495) recognized the segmental possibilities of Neogr. \*ī:

“[...] ī, ū dürften öfters durch Contraction von ə mit i, u entstanden sein. Z.B. \*trī ‘tria’ (ved. trí lat. trī-gintā air. trí lit. trý-lika aksl. tri) aus \*tri-ə.”

(b) After Saussure’s (1879:239 = Rec. 231-) analysis of Neogr. \*ī ← \*iA, the laryngeal theory shifted from assimilation to compensatory lengthening in its explanation of the phenomenon. This cannot be correct, however, because the sole resulting quantity Neogr. \*ī implied by the compensatory would contradict the existing forms with Neogr. \*ī, leaving the accent as the single reconstructive option.

(c) A disagreement between Brugmann (1900<sup>3</sup>:102, 1890:58f.) and Schmidt (1885:291, 309, 1889:59f.) arose concerning the treatment of the sequence Neogr. \*iə, due to observable differences between Sanskrit and Greek in correspondences like:

RV. trí ‘drei’	:	Gr. τρία ‘id’
RV. patní ‘Herrin’	:	Gr. ποτινία ‘id.’
RV. kṛīta- ‘gekauft’	:	Gr. πρίατο [3sg] ‘bought’

As can be readily seen here, Greek has not assimilated ι+α, leading Brugmann (Grundr<sup>2</sup> 1:495) to explain the forms as innovations:

“Formen wie gr. τρία, γούνα aus. \*γονφα waren einzelsprachliche Neubildungen. Die Ansicht J. Schmidt’s (zuletzt Kritik 22f.), dass iə, uə, falls sie den Formen wie ved. trí zu Grunde gelegen haben, noch nicht in der Zeit der idg. Urgemeinschaft zu ī, ū verschmolzen waren, ist kaum haltbar. Siehe Verf. M. U. 5, 58ff., Wackernagel AI. Gr. I 104.”

Owing to a possible ablaut difference between the languages (i.e. PIE \*iáh vs. \*ieáh, etc.), the problem remains ambiguous. In any case, the issue is generally of lesser importance, since PIE \*h and \*a can be reconstructed on the basis of the data anyway.

(d) A distinction between an accented PIE \*á, assimilating and contracting with PIE \*i, and an unaccented PIE \*a disappearing without any trace is required to explain the Indo-European ablaut ī : i. The alternation is regulated by the formula

PIE \*iáh, \*ihá → RV. ī, etc. (and) PIE \*iáh, ihá → RV. i, etc.

§4. **SUBSET III.** In addition to the sequences \*h+i (SUBSET I) and \*i+h (SUBSET II), there are other reconstructive starting points for Neogr. \*ī, including items such as

Neogr. \*ī ≡ PIE \*ii, \*iahi, \*ihai, etc.

A segmental Neogr. \*ī ≡ PIE \*i+i appears, for example, in the reduplicated perfect stem RV. īṣ- (pf.) ‘erlaben, fördern, erquicken’ (WbRV. 222, īṣus [3pl]), which is related to the root noun RV. íṣ- (f.) ‘Saft, Trank, Labetrunk, Labung, etc.’ (WbRV. 224-5) with short quantity.

§5. Mechanical rules that would allow correct segmental reconstruction from the alternatives

Neogr. \*ī ≡ PIE \*hái, áhi, íáh, ihá, ii, iaḥi, iḥai, etc.

do not exist. Here the segmental analysis must be done individually for every correspondence on the basis of the measurable features of the material. In most cases, the presence and position of a laryngeal can be identified. Accordingly, Curtius’s long vowel \*ī, just like Neogr. \*ū, provides an additional criterion for the reconstruction of PIE \*ha, aḥ. Owing to the analytic character of Neogr. \*ī in most examples, it is likely that PIE did not possess an original long vowel /ī/ as a quantitative counterpart of PIE \*i.

### 3.2.7 On Sievers’s Law and Sturtevant’s analysis<sup>484</sup>

§0. In the phonological Indo-European sound laws is included an essentially prosodic law, formulated by Sievers, according to which PIE \*i/u followed by a vowel V becomes a consonant after a short syllable (CiV → CyV, CuV → CvV) and a vowel after a long syllable (CCyV → CCiV, CCuV → CCuV). Following the emergence of Old Anatolian, Sturtevant proposed a change of the interpretation of the law according to which the alternations, not duly accounted for by Sievers’s condition, are actually caused by the presence of the laryngeal and/or an accompanying schwa secundum. Sturtevant’s interpretation is shown below to be correct when the idiosyncrasies of his presentation are replaced with the PIE phonemes proper.

§1. In 1878, Sievers formulated a sound law which has become known under his name. According to Sievers (1878:129), in the Rig-Vedic language “unbetontes (nicht svaritiertes) *i* oder *u* vor einem vokal ist consonant nach kurzer, vocal nach langer silbe ohne rücksicht auf die sonstige accentlage des wortes”.<sup>485</sup> The rule is supposed to hold after a consonant, whereas intervocalic *i*, *u* are to appear always as RV. *y*, *v*.<sup>486</sup> In addition, an extra condition mentioned by Edgerton (1934:235-6) is to be taken into account: “Also after a single consonant absolutely initial in the speech-unit, the result is the same as after a heavy syllable.”

<sup>484</sup> On Sievers’s Law, see Sievers 1878, Edgerton 1934, 1943, 1962, Mayrhofer (1986:164-7), Szemerényi (1996:106-8) and Collinge (1985:159-78).

<sup>485</sup> On the possible examples of Sievers’ Law in Avestan, see Hübschmann (1879:362ff.).

<sup>486</sup> See Edgerton (1934: 235n1): “In this paper the terms ‘heavy’ and ‘light’ (syllable) will be used in the sense of *guru-* and *laghu-* as used by the Hindu metricians: viz., a ‘heavy’ syllable is one containing a long vowel or diphthong, or a short vowel followed by more than one consonant; other syllables are ‘light’.”

§2. There are several problems related to Sievers's law:

(a) Sievers did not apply sufficient external comparisons in the formulation of his law. This has resulted in ambiguities, especially with regard to Germanic. Thus, for instance, the stem Go. *lagja-* (GoEtD. 233) does not necessarily contain the suffix †*jo-*, because PIE \**-ejo-* (the standard causative morpheme) remains equally possible. This is indeed confirmed by Gr. *ναυ·λοχέω* 'to lie in harbour or creek' (LSJ. 1162).<sup>487</sup> Similar problems are found in several of Sievers's others examples, in which the alleged parallelism between Sanskrit and Germanic is not watertight.

(b) As admitted by Edgerton (1934:252), Sievers's Law does not always agree with the attested Rig-Vedic distribution either:

“The pronunciation *diyaús*, *díyaus* (nom. and voc. of *div-*, *dyu-*), ‘heaven, day’, occurs invariably initially or after a heavy syllable. The pronunciation *dyaús* occurs 27 times after a light syllable. According to the traditional text it seems to occur also 17 times after a heavy syllable and 6 times initially.”

More seriously, there are comparatively paralleled Rig-Vedic examples that contradict the law, raising questions about its validity overall.<sup>488</sup>

(c) In his criticism, Sturtevant (1942:32n2) points out that Edgerton “preferred to write *iy* and *uw* for the vocalic member of these pairs”.<sup>489</sup> It is understandable that Edgerton wanted to explain the alternation on a phonological basis,<sup>490</sup> but this practice has undesirable side effects: RV. *iy* (in RV. *mriyase* [2sg], WbRV. 1054, etc.) and RV. *uv* (in RV. *suvita-*, WbRV. 1551, etc.)<sup>491</sup> are actually written in the Rig-Vedic orthography, suggesting that the dissyllabic scansion must have been something different. In order to avoid confusion, Grassmann's notation (RV. *diaús*, etc.) is preferred in connection with Rig-Vedic hiatus.<sup>492</sup>

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<sup>487</sup> On Germanic examples, see Edgerton (1934:236): “Sievers was indeed led to its discovery by a study of Germanic conditions. The Germanic *-ja-* ([P]IE *-yo-*) stem nouns point to [P]IE *-y-* after a light syllable but *-iy-* after a heavy; Gothic *harjis*, but *hairdeis*. So also verbs containing the same suffix (*-y-* also after a vowel): Gothic *satjip*, *hafjip*, *stojip*, but *tandeip*, *sokeip*.”

<sup>488</sup> Edgerton (1934: 262-3) provides some examples: “[...] the forms and derivatives of [...] *svād-* occur almost always initially or after a heavy syllable, and seem never to be pronounced *suv-*. So the stem *dvár-* ‘door’ frequently occurs after a heavy syllable and initially, and is rarely read *duv-* [...]. Another word which ignores the law is the sacrificial exclamation *sváhā*.”

<sup>489</sup> For his view on the issue, see Edgerton (1943:92-3n26): “[...] I write *duvā* and *siyoná-*, §17, and waste no words over the fact that the texts write only *dvā* and *syoná-*. All Vedists would agree, except that many write *duá* (intending two syllables) and *sioná-* (three syllables). I follow Wackernagel (see footnote 10) and others.”

<sup>490</sup> See Edgerton (1934:235): “IE prevocalic *iy* and *y*, *uw* and *w*, after a consonant, were each a single phoneme, varying automatically under fixed phonetic conditions (essentially, *y* and *w* after a light syllable, *iy* and *uw* after a heavy).”

<sup>491</sup> Compare Edgerton's (1934:249) comment: “Even the traditional writing shows always *suv-itá-* (§12), and so the word is always pronounced.”

<sup>492</sup> For this reason, I agree with Edgerton (1934: 241) when he says: “[...] H. Güntert (Indogerm. Ablautproblems 97 [1916]) shows a complete lack of comprehension of it when he argues that *tuvám* must have been different from the ‘ordinary *u*’ because it is not written as *u* in Vedic orthography (which writes *tvám*).” However, the reason for not writing RV. *tuám*, etc. seems to have been the problematic ‘hiatus’, for which there was apparently no proper expression.

§3. Sievers's Law was put into an entirely new perspective by Sturtevant (1942:32), according to whom the following conclusions can be drawn after the appearance of the Old Anatolian laryngeal:

(a) “[S]ince IH Ъ [= Schwa secundum] must be reconstructed in any case, it is convenient to assume it in reconstructing the dissyllabic forms required by Sievers's Law” (1942:§25d).

(b) “In other cases an IH laryngeal has to be assumed within the group that later yielded the conditions requisite for Sievers's Law” (1942:32fn2).

Sturtevant squarely shifts from Sievers's prosodic explanation to a phonetic one by accounting for the hiatus with ‘Indo-Hittite’ \*Ъ and \*H. To this, Edgerton presented the following objections:

1. Edgerton's arguments (1943:120) against Sturtevant's “Indo-Hittite” (a dubious entity indeed) and Ъ (schwa secundum) are correct. However, both of these problems can be avoided by reconstructing Proto-Indo-European instead of Indo-Hittite and PIE \*a (in diphonemic PIE \*h̥a ḁ) instead of schwa secundum.

2. Against Sturtevant's laryngeals, Edgerton (1943:120) argued:

“I am not aware that Sturtevant or anyone else has proved anything about the phonetic values of the ‘laryngeals’, or their place in the phonemic pattern, which would justify relating them to the principles here set forth about the IE semivowels.”

However, these doubts can be dealt with, because only one laryngeal PIE \*h̥ with glottalic fricative value and voiceless and voiced variants (PIE \*h̥/h̥) can be reconstructed for the proto-language. Furthermore, this PIE \*h̥/h̥ appears in diphonemic PIE \*h̥a, ḁ, explaining its semivowel-like behaviour already noted by Saussure with his term ‘coefficient sonantique’. Moreover, Sturtevant's two rules, which deal separately with the schwa secundum and laryngeal(s), can be combined into a single rule for PIE \*h̥a, ḁ.

(c) Edgerton's scepticism<sup>493</sup> about whether laryngeals “would make any difference in the application of Sievers's Law” can be countered with a distribution according to which PIE \*h̥a, ḁ coincides with the Vedic hiatus in all instances of Sievers's Law. However, as I do not favour “assuming” laryngeals à la Sturtevant, the presence (or absence) of PIE \*h̥a, ḁ is a lexical problem that must be confirmed individually for every correspondence.

§4. The shift in explanation may be readily defended by noting that PIE \*h̥a, ḁ can be comparatively proven through their presence in the instances of Sievers's Law.<sup>494</sup> Therefore, Sturtevant's basic assertion concerning Sievers's Law – replacing Sievers's uw, iw with schwa secundum or H – needs only a slight adjustment, with the laryngeals and schwa secundum being replaced with diphonemic PIE \*h̥a, ḁ in PIE \*i+h̥, PIE

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<sup>493</sup> See Edgerton (1943:121n70): “I reply that Sturtevant would first have to prove that the presence of a laryngeal [...] would make any difference in the application of Sievers's Law. His own remarks, op. cit. §74, tend to support the negative.”

<sup>494</sup> Collinge 1985 does not mention of Sturtevant's interpretation in his account of Sievers's Law.

\*u+h PIE \*h+i and PIE \*h+u. When PIE \*a is added, one obtains the following starting points for the hiatus of Sievers's Law:

PIE \*iaḥ iḥa PIE \*aḥi ḥai PIE \*uaḥ uḥa PIE \*aḥu ḥau.

Some provable examples of PIE \*ḥa, \*aḥ corresponding to the Rig-Vedic hiatus can be extracted from the material to illustrate the situation:

(a) The Old Anatolian laryngeal (Ḫi. ḥ) has been directly preserved in place corresponding to the Rig-Vedic hiatus, as in:

PIE \*saḥie/o- 'binden, fesseln'

Ḫi. eṣḥia-	(vb1.) 'binden, fesseln' (HEG 1:385, iṣ-ḥi-ia-zi [2sg])
RV. ví (...) sia-	(pM.) 'frei machen' (WbRV. 1514, ví (...) siasva [2sg])

Thus PIE \*aḥ+i results in Rig-Vedic dissyllabic scansion à la Sievers's Law, phonetically reflecting two original syllables of the proto-language.

(b) √diaḥ- 'glänzen; Himmel' (P. 183-7) confirms PIE \*a:

PIE *diaḥ-	≡	RV. didī- (pr.) 'herbeistrahlen' (WbRV. 609, didīhi)
PIE *diēaḥ-	≡	Do. ζά- (m.) 'Zeus' (GEW 1:610, ζάς [N], ζάv [A])
PIE *deieaḥ-	≡	Hom. δέα- (vb.) 'scheinen' (GEW 1:354, δέατο [3sg])

In addition, the Rig-Vedic hiatus (reflecting PIE \*ḥ) is confirmed in:

PIE \*diaḥēu- ≡ RV. diáus (WbRV. 604) ≡ Gr. ζεύς (GEW 1:610-1).

§5. The dissyllabic scansion can result both from PIE \*h+i and PIE \*i+h, as well as PIE \*h+u and PIE \*u+h, regardless of whether \*ḥ = PIE \*ḥa or PIE \*aḥ. From the reconstructive point of view, there are no a priori rules which would settle the mutual order of PIE \*ḥ and PIE \*a. Hence, they must be decided comparatively for each root. Either way, the Rig-Vedic examples of Sievers' Law like “\*diēu- [...] neben \*dīēu-” (Grundr<sup>2</sup> 1:265) indicate a lost PIE \*ḥa or \*aḥ, where PIE \*a and PIE \*ḥ are the immediate cause of the disyllabic scansion (i.e. hiatus). In such circumstances, Edgerton's warning<sup>495</sup> against regarding the laryngeal as the explanation is outdated, and the priority of our study is to allow the restoration of PIE \*ḥ on the basis of measurable criteria outside of Old Anatolian. Taken that a proof *in extenso* is successful and it is fully demonstrated that the hiatus indeed always reflects the laryngeal,<sup>496</sup> this naturally does not lessen Sievers's achievement as the original discoverer of the phenomenon.

§6. In support of Sturtevant's idea that the Vedic dissyllabic scansion appears in conjunction with \*l/H (or rather PIE \*ḥa, \*aḥ), it should be finally noted that the

<sup>495</sup> Edgerton (1943:108) writes: “[...] I would, however, caution against operating, even speculatively, with IE or IH ə and laryngeal ‘consonants’ in terms of my results for the six proved semivowel phonemes.”

<sup>496</sup> Note that some lack of resolution concerning Sievers's Law may trouble us for some time, for as recognized by Edgerton (1934:262), “[...] Vedic meter (our only reliable guide) often allows alternative interpretations.”

converse of Sievers-Sturtevant’s law is functional as well: *If there was no PIE \*ḥa aḥ in a root, there is no dissyllabic Rig-Vedic scansion despite Sievers’s Law.*

Thus, for instance, the root PIE \*sup- suep- suop- ‘sleep’ (P. 1048-9, HEG 2:1175) never had a laryngeal, as proven by its absence in Old Anatolian:

Ḫi. šup- (vb1M.) ‘schlafen’ (HHand. 155, šuptari [3sg]).

Consequently, the Rig-Vedic bases of the root including items such as

RV. siṣvap- (cs.ao.) ‘in Todesschlaf versenken’ (WbRV. 1626)

RV. svapa- (ao.) ‘entschlafen, sterben’ (WbRV. 1626)

RV. ni (...) svāpaya- (cs.pr.) ‘in Todesschlaf versenken’ (WbRV. 1626)

never display Sievers’s scansion, whether appearing in a long or short syllable (i.e. RV. †suvāp- does not exist). This and similar exceptions of Sievers’s Law are readily solvable when the condition of the law is changed to reflect the presence of the laryngeal, as suggested by Sturtevant.

### 3.2.8 Summary of PIE \*i, \*u and PIE \*ḥa, \*aḥ

§0. It is necessary and sufficient to reconstruct two short vowels PIE \*i, \*u and their consonantal allophones, PIE \*i̯, \*u̯ for the proto-language. The other traditional items, especially Neogr. \*ī and Neogr. \*ū, have a segmental origin.

§1. With the addition of PIE \*i and \*u to the vowels PIE \*e \*o \*a (see Chapter 2), the reconstructed Proto-Indo-European vowel system consisted of the five cardinal vowels of the vowel triangle, approximately IPA /a/ /e/ /i/ /o/ /u/.

§2. The long vowels Neogr. \*ī, \*ū, unless derived from PIE \*i+i and \*u+u, reflect PIE \*á in terms of quantity as a result of assimilation and contraction. In this manner, the long vowels Neogr. \*ī, \*ū provide a criterion for the reconstruction of PIE \*ḥ through its diphenemic connection with PIE \*á. If a complete reconstruction of the data demonstrates that Neogr. \*ī and \*ū can always be analyzed by segmental means, there is no need for independent long vowels /ī/ and /ū/ in the proto-language. There is no mechanical (or structural) a priori procedure for deciding whether PIE \*ḥi or \*iḥ and PIE \*ḥu or \*uḥ are to be reconstructed for Neogr. \*ī, \*ū. Every correspondence must be reconstructed individually.

§3. In the Rig-Vedic meter, the hiatus of Sievers’s Law can be proven to reflect earlier PIE \*ḥa and \*aḥ in a manner suggested by Sturtevant. In so doing, yet another extra-Anatolian criterion for the laryngeal (or its absence)<sup>497</sup> can be comparatively confirmed.

<sup>497</sup> Roots with PIE \*i, \*u not ablauting with \*ī, \*ū (e.g. √luk- glänzen’) or pointing to any other criterion for the laryngeal can be assumed not to have contained a laryngeal in the first place (with a very slight margin of error that can always be corrected, should the comparison prove otherwise).

### 3.3 Liquids PIE \*l \*r

#### 3.3.1 General remarks on PIE liquids

§0. The reconstruction of the Proto-Indo-European liquids, PIE \*l \*r (= L), is straightforward. This and more complex questions related to the number, properties and relationships of liquids to other phonemes in the inventory (especially PIE \*h) will be discussed in this chapter. In terms of these, it should be readily noted that from a historical point of view the theory of PIE liquids was never fully satisfactory, due to later appearance of Fortunatov's Law and Sievers-Edgerton's Law for liquids. While these issues constitute a complex problem, by testing them against the data they can be solved comparatively.

#### 3.3.2 Fortunatov's Law and PIE \*h<sub>1</sub> \*a<sub>h</sub>

§0. The most serious problem concerning the liquids PIE \*l r is the unexplained retroflex (a.k.a. cerebral or lingual) in Sanskrit (OInd. ṭ ṭh ḍ ḍh ṇ ṣ) and its counterpart in Iranian (Av. š).<sup>498</sup> Fortunatov's attempt to solve the problem with the law now bearing his name did not win the day due to the defective material at the disposal of the contemporary scholars, in particular the Neogrammarians. Today the comparative method implies that the reconstructive counterpart of the Old Anatolian laryngeal, PIE \*h<sub>1</sub>, is an additional condition required by Fortunatov's Law, by means of through which a fully regular treatment can be presented.

§1. According to Fortunatov's original formulation of the law (1881), in the group l+dental in Sanskrit, the liquid disappeared and the dental was changed to a lingual (see also Burrow 1972: 531).<sup>499</sup> With this suggestion Fortunatov sought to explain the problematic retroflexes in Sanskrit as the regular outcomes of PIE \*l+T. His idea was plausible in the sense that comparisons often suggest PIE \*l in connection with a Sanskrit retroflex, but simultaneously many problems emerged.<sup>500</sup>

§2. As pointed out by Burrow (1972: 534), "The principal objection against the theory is that there exists a certain number of words in Sanskrit in which the combination of *l* followed by dental is not treated according to Fortunatov's rule, but results instead in the combination of *r* + dental." Indeed, original sequences of PIE \*l+dental are confirmed beyond doubt by isoglosses like  
(a) √mul-dh- 'Schädel, Haupt, Kopf, Gipfel' (P. 725)

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<sup>498</sup> The term 'unexplained retroflex' refers here to the items not conditioned by the RUKI-rule (in Indo-Iranian) and the internal assimilation of the retroflex in Sanskrit.

<sup>499</sup> Fortunatov (1881:215) writes: "In der gruppe 'l+dental' im Altindischen schwindet das l und dental geht in Lingual über."

<sup>500</sup> Compare Burrow's evaluation (1972:531): "Fortunatov's theory provided an explanation for the remarkable fact that whereas in all Indo-European languages outside the Aryan group combinations of *l* followed by dental are quite common, they are, with rarest of exceptions, absent in Sanskrit, even though the consonant is quite common."



RV. mürdhá(n)	(m.) ‘Schädel, Haupt, Kopf, Gipfel’ (WbRV. 1053)
OEng. molda(n)-	(m/f.) ‘the top of the head’ (ASaxD. 695)

(b) √h<sub>1</sub>aul-n- ‘Wolle’ (P. 1139)

Ĥi. ĥulana-	(ĤD.) ‘SÍG : Wolle’ (HEG 1:278f., OGH. 529-30)
RV. úrñā-	(f.) ‘Wolle’ (WbRV. 274)
OIcl. ull-	(f.) ‘Wolle’ (ANEtWb. 633)

In addition, at least one undeniable example of OInd. ·lt· has been preserved as such:

Pāṇ. pra ·phulta-	(a.) ‘blooming’ (MonWil. 683)
Pāṇ. pra ·phulti-	(f.) ‘blooming, blossoming’ (MonWil. 683)

§3. Despite these problems, Fortunatov gained support from Bechtel. He had a different agenda, however. Bechtel hoped to prove the early existence of Neogr. \*l in Indo-Iranian by quoting the difference of Neogr. \*l ≠ \*r, allegedly reflected in Fortunatov’s Law.<sup>501</sup> But instead of successfully proving the difference, Bechtel drew heavy criticism from Bartholomae (1894:157-97), who – to quote Burrow (1972:535-6) – reasoned as follows:

“The other objection to Fortunatov’s theory, developed at length by Bartholomae, was based on a list of words in which the same change is said to have taken place in combinations of *r* followed by dental, e.g. kaṭu- ‘bitter’ (Lith. karštùs), kaṭa- ‘mat’ (Gr. κάταλος ‘basket’, etc.), kaṣ- ‘to scratch’ (Li. kařšti).”

Though some Bartholomae’s comparisons are dispensable, both his argument and the main bulk of examples remain solid. Consequently the early comparativists faced a situation where Fortunatov’s Law had to be abandoned or reformulated.

§4. At this juncture, Brugmann (Grundr<sup>2</sup> 1:427) chose to reject Fortunatov’s Law:

“Die schon in der ersten Auflage von mir bestrittene Fortunatov’sche Regel, dass in der uridg. Gruppe l+Dentalis im Ai. l geschwunden und die Dentalis in Cerebralis übergegangen sei, während sich uridg. r+Dentalis erhalten habe (BB. 6, 215ff.), darf heute als abgethan gelten, s. Bartholomae IF. 3, 157ff., J. Schmidt Kritik S. 1 f., Wackernagel Ai. Gr. I 171. 194.”

§5. At the same time, however, Brugmann understood that the phenomenon referred to did exist. Elsewhere (Grundr<sup>2</sup> 1:459) he suggests that the Proto-Indo-Iranian syllabic \*r̥ before a dental also results in a Sanskrit retroflex:

<sup>501</sup> Møller’s (1893:393-4) review of Bechtel 1892 provides a contemporary interpretation of the main idea: “Das letzte 10. kapitel (s. 380-390) lehrt in der überschrift: ‘l gehört der ursprache an’. Dies folgt aus ‘Fortunatov’s regel’ (Bezz. beitr. 6, 215-220), nach welcher l + dental im sanskrit mit schwund des l durch den lingual vertreten wird (añi- ‘achsennagel’ aus alni-, ahd. lun; paṭala- ‘dach, hülle, decke, schleier’ aus pelt-, gr. πέλτη, altn. feldr ‘decke’; puṭa- ‘falte’ aus p̥lto- oder Bechtels p̥lto-), während r + dental im skr. unverändert bleibt. Ausnahmen von der regel sucht Bechtel auf den letzten seiten 385ff. zu erklären, entweder durch geschene dialektmischung innerhalb des indischen oder durch systemzwang (wie wenn das part. pūrṇā- ‘voll’ das r seines wurzelwebs, präś. pīparmi ‘fülle’ festgehalten hat.”

PIIr. \*rt, rn, rš → OInd. at, aṅ, aṣ (Av. aš)<sup>502</sup>

Thus, despite his ostensible denial of Fortunatov's Law, Brugmann actually presented a scenario in which not only PIE \*l (Fortunatov) but PIE \*r (Bartholomae) were involved in the sound change.

§6. Brugmann's maneuver maintained that it was possible to explain the Sanskrit cerebrals on the basis of sound laws and simultaneously account for Bartholomae's criticism. However, this was not enough to resolve the problem, as there remained an issue with the preservation of OInd. rt, rn, rš and their counterparts with Neogr. \*l in Indo-Iranian:

(a) PIIr. \*rt- 'passend, recht, wahr' (P. 56)

RV. rtá-	(a.) 'passend, gehörig, recht' (WbRV. 282-3)
OPers. arta-	(m.) 'Law, Justice' (OldP. 170)
LAv. an arəta-	(a.) 'gesetzlos, dem heiligen Recht feind' (AIWb. 120)
Pahl. artāy-	(a.) 'righteous, good' (MPahl. 2:30)

(b) PIIr. \*rs- 'stossen, stechen' (P. 335)

AV. rṣa-	(pr.) 'stossen, stechen' (WbRV. 292, rṣati [3sg])
gAv. əraši-	(f.) 'Neid' (AIWb. 356)
OIcl. err-	(n.) 'Narbe' < PGerm. *arsi- > (P. 338)
OInd. arṣaṅí-	(f.) 'stechender Schmerz' (KEWA 1:53)

(c) PIIr. \*rn- 'Schuld, Sünde' (P. -, EWA 1:254)

RV. rṇá-	(n.) 'Schuld, Verschuldigung, Sünde' (WbRV. 281)
Sogd. 'rn	(sb.) 'Schuld' (KEWA 1:121)
LAv. arənat.čəēša-	(a.) 'avenging debts' (?) (EFL 154-5, AIWb. 195)
Khot. ārra-	(sb.) 'Schuld' (KEWA 1:121)

In the face of these counterexamples, Brugmann's suggestion does not explain the Indo-Iranian phenomena any better than Fortunatov's original law, as both violate the principle of regularity of sound change.<sup>503</sup>

(d) To my knowledge, no progress has been made on Fortunatov's Law beyond this point.<sup>504</sup> This is disturbing because Brugmann's expanded version of Fortunatov's Law, including both liquids, is backed by solid correspondences that place the existence of the phenomenon beyond doubt. The solution to the problem, essentially

<sup>502</sup> For contemporary comments and examples, see Brugmann (Grundr<sup>2</sup> 1:429-30).

<sup>503</sup> Note also that cerebralization is not conditioned by the presence of a syllabic resonant (as was suggested by Brugmann), because the irrelevance of quantity is shown by the counterexamples with PIIr. Ø : \*a : \*ā, in RV. rṣī- (f.) 'Speer, Spiess, Dolch' (WbRV. 293), LAv. aršti- (f.) 'Speer, Lanze' (AIWb. 295) and OPers. āršti-ka- (m.) 'spearman' (OldP. 172). Here and in other similar items PIIr. \*r is preserved throughout and the phenomenon is therefore not caused by syllabic sonants.

<sup>504</sup> Brugmann's leaning towards a methodic solution is understandable, since the other option (presented later in Burrow 1971 as 'spontaneous retroflexion' in Sanskrit) is not scientifically acceptable (*ex nihilo nihil*).

an explanation<sup>505</sup> capable of accounting for the Indo-Iranian double development, will be formulated next.<sup>506</sup>

§7. *Fortunatov's Law II*. Based on the data now at our disposal, the missing condition of Fortunatov's Law can be inferred as follows:

(a) Neither PIE \*l+T nor PIE \*r+T can be the cause of cerebralization, because these sequences were preserved as such (cf. OInd. *praphulti-*, RV. *ṛṇá-*, etc.). Accordingly, this state of affairs has to be formulated as the basic rule

$$\text{PIE } *l+T, *r+T \quad \rightarrow \quad \text{RV. } rT, \text{ Av. } rT.$$

(b) The sequences L+T preserved in Indo-Iranian contrast with the cerebrals that must have had a different phonetic starting point, as required by the principle of the regularity of sound change. A similar conclusion was already drawn by Fortunatov in his reevaluation (1900). As Burrow (1972:535) notes, Fortunatov

“[...] attempted to account for the above-mentioned developments of [P]IE *l*, both in contact with following dental and in other positions, by assuming two original [P]IE sounds, a *l* which remained in Sanskrit and a *l* which was converted to *r*, and thus fell together with [P]IE *r*.”

As pointed out already by Petersson (1911:12-13), Fortunatov's attempt to postulate another phoneme <sup>†</sup>λ (≠ PIE \*l) cannot be accepted as such.<sup>507</sup> However, Fortunatov's idea to mark the distinction between 'cerebralizing' and 'non-cerebralizing' liquids can be used, at least temporarily, in the formulation of the cerebralization problem.

(c) In the following treatment, the temporary cover symbols “λ” and “ϑ” will be used to designate the 'cerebralizing liquids' of Proto-Indo-Iranian, which stand in contrast to the 'non-cerebralizing' liquids PIE \*l and PIE \*r. The real values of the cover symbols λ and ϑ can be determined through the general solution of the laryngeal problem presented in Chapter 2. Based on phonological shape, the 'irregular' Indo-Iranian cerebrals are divided into three subsets:

(d) **SUBSET I** (Lat. *palma*, etc.) is characterized by cerebralization in Sanskrit and the vocalism Neogr. \*ā \*ã \*ə (= PIE \*ē : e : Ø + \*aḥ) within the root. The diphonic connection between PIE \*a and PIE \*ḥ implies the following (first) set of real values for the cover symbols λ and ϑ:

$$\lambda \equiv \text{PIE } *aḥl \quad \quad \quad \varrho \equiv \text{PIE } *aḥr \quad \quad \quad (\text{SUBSET I}).$$

<sup>505</sup> Regarding Brugmann's awareness of the lacking condition(s) for the cerebralization, see (Grundr<sup>2</sup> 1:429): “In einem nicht näher zu bestimmenden Teil des ai. Sprachgebietes wurden auch *t*-Laute durch vorausgehendes *r* cerebralisiert und schwand [...]”

<sup>506</sup> The progress of Dravidian studies led to an attempt to explain the Sanskrit retroflexes as Dravidian loans (and/or influence). As mentioned by Burrow (1972:533), however, “[...] it has become increasingly clear that the problem of unexplained cerebrals in Sanskrit was not going to be solved by the assumption of Dravidian loans [...] since etymologies in Dravidian were not available.”

<sup>507</sup> Fick's Rule requires that in order to postulate \*λ, another Indo-European language should confirm the item, which is clearly not the case.

(e) **SUBSET II** (Lat. *gelum*, etc.) has a retroflex that is identical to SUBSET I, but ‘a-colouring’ is absent and ‘e/o-vocalism’ is attested instead. This implies diphonemic PIE \*ḡa; this is to say, the second set of real values for the cover symbols λ and ρ is:

λ ≡ PIE \*ḡal                      ρ ≡ PIE \*ḡar                      (SUBSET II).

(f) **SUBSET III** (OInd. *lašati*, etc.). External comparisons confirm that not only Ḥ+L+T (= SUBSET I+II), but also L+Ḥ+T resulted in retroflex in Sanskrit. The third set of real values for cover symbols λ and ρ are thus:

λ ≡ PIE \*laḥ, lḡa                      ρ ≡ PIE \*raḥ, rḡa                      (SUBSET III)

These three assignments of the real values to λ and ρ allow the substitution of the cover symbols with well-defined Proto-Indo-European phonemes as follows:

λ ≡ PIE \*aḥl, \*ḡal, \*laḥ, \*lḡa                      ρ ≡ PIE \*aḥr, \*ḡar, \*raḥ, \*rḡa.

These clusters, followed by a dental T, express the missing condition, the presence of diphonemic PIE \*ḡa aḥ before or after a liquid followed by a dental. In what follows, this is referred to as Fortunatov’s Law II.

(g) The early results of Fortunatov, Bartholomae and Brugmann can be harmonized with the upgrade of the law: the original proto-sequences V+H+L+T and V+L+H+T explain regularly the Indo-Iranian cerebrals, but allow for the sequences V+L+T to be preserved as such.

(h) The solution is seen to hold true in light of the data, which provides criteria for diphonemic PIE \*ḡa, aḥ appearing in connection with each subset, as indicated below.

§8. PIE \*aḥLT (SUBSET I) is characterized by ‘a-quality’ (Neogr. \*ə \*a \*ā) and the absence of an initial Ch (tenues aspiratae) confirming a diphonemic \*aḥ (vs. \*ḡa). Some examples of this subset are:

(a) √kaḥl- ‘treten, gehen; Schuh’ (P. 928 \*(s)kel). The root appears in various extensions (e.g. Lat. *calcā-* (pr1.) ‘treten, betreten, stampfen, kelteren’, WH 1:136 and TochA. *kalka-* (conjA.) ‘ire’, Poucha 32-3) with an unambiguous Lat. a. According to Fortunatov’s Law II, the dental extension has a retroflex in Indo-Iranian as expected:

PIE \*kaḥlt- ‘gehen : Schuch’

OInd. <i>kaṭa-</i>	(vb.) ‘to go’ (MonWil. 243, Dhātup. <i>kaṭati</i> [3sg])
Tarent. <i>κάλτο-</i>	(m.) ‘horseshoe’ (WH 1:136, <i>κάλτοι</i> [plN])
Tarent. <i>κάλτιο-</i>	(n.) ‘Schuh’ (WH 1:136, <i>κάλτιον · ὑπόδημα</i> )

(b) √kaḥl n- ‘Schwiele, harte Haut’ (P. 523-4 [\*kal-], WP 1:357). Neogr. \*ə ≡ PIE \*aḥ is confirmed by zero grade in Latin and Sanskrit and the absence of initial aspiration in Indo-Iranian (OInd. k, not †kh):

PIE \*kaḥlno- ‘Schwiele, dicke Haut’

OInd. <i>kiṇa-</i>	(m.) ‘Schwiele’ (KEWA 1:208, EWA 3:90, <i>kiṇaḥ</i> ) <sup>508</sup>
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<sup>508</sup> Note especially how the ‘non-palatalizing’ OInd. *i₂* = Lat. a (≡ Neogr. \*ə) implies PIE \*a and PIE \*ḡ, which is in turn confirmed by the cerebral (Fortunatov’s Law II).

Lat. callo-	(n.) ‘Schwiele, dicke Haut’ (WH 1:139, callum [sgNA])
Lat. calleō	(vb.) ‘eine dicke Haut haben’ (WH 1:139, calleō [1sg])

(c) √kaḥr- ‘drehen, flechten, binden’ (P. 257). The ablauting root forms PIE \*kaḥr- (in OInd. kil-iñja- ‘mat’, with OInd. i<sub>2</sub> ≡ PIE \*a) and PIE \*keaḥr (OInd. kal-iñja- ‘mat’)<sup>509</sup> are accompanied with Gr. α in the dental extension with an attested cerebral in Sanskrit:

PIE √kaḥrt- ‘binden, usw.’

OInd. káṭa-	(m.) ‘Geflecht, Matte’ (KEWA 1:141)
OPr. korto-	(f.) ‘der gehegte Wald’ (APrS. 361, korto)
OInd. káṭaka-	(m.n.) ‘Armband, Ring’ (KEWA 1:140)
Gr. κάταλλο-	(m.) ‘Korb’ (GEW 1:794, κάταλλος [sgN])

(d) √kaḥrs- ‘kratzen, usw.’ (P. 532-3). The unambiguous Lat. a = OInd. a → PIE \*eaḥ is confirmed by retroflex in Sanskrit:

Li. karš-	(vb.) ‘(Wolle) kämmen, hecheln, riffeln’ (LiEtWb. 224)
OInd. káṣa-	(vb.) ‘reiben, kratzen’ (KEWA 1:190, kaṣati, kaṣate)
Lat. carrō	(pr3.) ‘(Wolle) krämpeln’ (WH 1:173ff.)
OInd. kaṣaṇa-	(n.) ‘das Reiben’ (KEWA 1:190)
OCS. krasta	(f.) ‘Kruste, Schorf, Räude’ (Sadnik √388)

(e) √kaḥrt- ‘bitter, scharf, beissend’ (P. 941-2). Neogr. \*r (vs. \*l) is confirmed by Baltic, which corresponds with the cerebral in Sanskrit:

OPr. kārta-	(a.) ‘bitter’ (APrS. 353, kārtaī [plN])
Li. kartù-	(a.) ‘bitter’ (LiEtWb. 225, kartùs [sgN])
OInd. kaṭu-	(a.) ‘pungent, acid, sharp, fierce’ (MonWil. 244)
RV. káṭuka-	(a.) ‘scharf, beissend’ (WbRV. 310, EWA 1:143)

(f) √keaḥrt- ‘Stein; hard’ (P. 531). The root has a laryngeal implied by the ‘a-vocalism’ in Greek (in Gr. α → PIE \*eaḥ):

Gr. κάττα	(adv.) ‘stark, sehr’ (GEW 1:793)
Gr. κατερό-	(a.) ‘stark, mächtig, gewaltsam’ (GEW 2:9)
Go. hardu-	(a.) ‘hart, streng’ (GoEtD. 177, hardus [sgN])

As anticipated, the root with extension PIE \*kaḥrt-h- appears with a cerebral in Sanskrit:

OInd. kāṭha-	(n.) ‘Stein, Fels’ (KEWA 1:196, MonWil. 269)
OInd. kaṭhara-	(a.) ‘hard’ (MonWil. 244)
OInd. kaṭhalya-	(a.) ‘gravel’ (MonWil. 244)
OInd. kaṭhina-	(a.) ‘hart, fest, steif’ (MonWil. 244)
OInd. kaṭhora-	(a.) ‘hard, solid, stiff, sharp, piercing’ (MonWil. 224)

<sup>509</sup> An original PIE \*r (vs. \*l) is likely (see OInd. karaṇḍa- (n.) ‘Korb’ KEWA 1:164).

(g) √*keahl-* ‘cover’ (P. 553 [4. *kel-*]). PIE \**aḥ* is confirmed by Gr. *α* and the absence of initial *ʰkh* in:

Dhātup. <i>śala-</i>	(vb.) ‘to cover’ (KEWA 3:311, <i>śalate</i> [3sg])
AV. <i>śālā-</i>	(f.) ‘Hütte, Haus, Gemach, Gebäude’ (KEWA 3:328-9)
AV. <i>ā-śāra-</i>	(m.) ‘Oberdach, Schutz’ (MonWil. 157)
Gr. <i>καλιά-</i>	(f.) ‘Hütte, Scheune, Nest’ (GEW 1:764)
Gr. <i>καλύπτω</i>	(pr.) ‘umhüllen, verbergen’ (GEW 1:768-9)

The liquid has disappeared and turned the dental into a cerebral in the extension √*kaḥlt-*, which is preserved in:

OInd. <i>śāṭa-</i>	(m.) ‘kind of skirt/petticoat’ (MonWil. 1063).
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(h) √*neaḥr-* ‘Rohr, Narde’ (P. –). The unextended root has been preserved in:

OInd. <i>nalā-</i>	(m.) ‘Rohr, Rohrschilf’ (EWA 2:7)
OInd. <i>nala-</i>	(m.) ‘Name eines Königs der Niṣadhas’ (KEWA 2:141)

The dental extension PIE \**neaḥrd-* with Gr. *α* = Lat. *a* has a cerebral in Sanskrit:

RV. <i>naḍá-</i>	(m.) ‘Schilfrohr, Rohr’ (EWA 2:7, WbRV. 705)
Gr. <i>νάροδο-</i>	(f.) ‘indische Narde’ (GEW 2:289, <i>νάροδος</i> [sgN])
Lat. <i>nardo-</i>	(m.) ‘Nardostachys Jatamansi’ (WH 2:143, <i>nardus</i> )

(i) √*paḥl-* ‘Hand’ (P. 806). PIE \**eaḥ* is confirmed by Gr. *α* = Lat. *a* in:

Gr. <i>παλάμη-</i>	(f.) ‘flache Hand, Handhabe, Mittel’ (GEW 2:466)
Lat. <i>palamo-</i>	(m.) ‘Hand (Längenmass), Spanne’ (WH 2:240)
Lat. <i>palmā-</i>	(f.) ‘flache Hand, Gänsefuß’ (WH 2:240, <i>palma</i> [sgN])

The dental extension PIE \**peaḥlni-* has the expected retroflex in Sanskrit:

RV. <i>pāṇi-</i>	(m.) ‘der Geizige’ (WbRV. 760)
RV. <i>pāṇi-</i>	(m.) ‘die Hand, das Huf (des Rosses)’ (WbRV. 805)
OInd. <i>pāṇini-</i>	(ENm.) ‘Pāṇini’ (MonWil. 615)

(j) √*paḥl-* ‘stone’ (P. 807). Corresponding to PIE \**peaḥl-es-* with PCelt. \**a*

OGaul. <i>alesia-</i>	(ON.f.) ‘La Roche’, LEIA A-30)
OHG. <i>felis-</i>	(m.) ‘Felsen, Teil eines Berges, Felsabhang’ (P. 807)

the zero grade suffix PIE \**peaḥl-s-* has a cerebral in Sanskrit:

MidIr. <i>all-</i>	(n.) ‘Stein, Klippe’ (LEIA A-61)
OInd. <i>pāṣāṇa-</i>	(m.) ‘a stone’ (MonWil. 624, Burrow 1972:97)
RV. <i>pāśīa-</i>	(n.) ‘Stein(bollwerk), Pressstein’ (WbRV. 810)

(k) √*paḥl-* ‘split, schneiden, usw.’ (P. 986), unextended root, is attested in Slavonic:

Rus. <i>raz-poló-</i>	(pr.) ‘entzweischneiden’ (P. 986, <i>raspolót</i> [inf.])
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The dental extension PIE √*paḥl-t-* with Neogr. \**a* in Celtic has a cerebral in Sanskrit:

OCS. <i>platū</i>	(m.) ‘ράκος : Fetzen’ (P. 986)
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OInd. paṭa-	(vb.) ‘to split’ (KEWA 2:189, paṭati [3sg])
OInd. pāṭaka-	(m.) ‘a splitter, divider’ (MonWil. 614)
Ir. altan-	(f.) ‘rasoir : Schermesser’ (LEIA A-34)
OInd. pāṭana-	(n.) ‘splitting, dividing, tearing up’ (MonWil. 615)
OInd. pāṭavá-	(m.) ‘des Paṭu-’ (KEWA 2:191)

(l) √uaḥl- ‘Baum, Stab, Pfeil’ (WH. 2:730). The unextended root

OInd. vala-	(m.) ‘Balken, Stange’ (KEWA 3:162)
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is best known for the extension PIE \*ueaḥl u- with Gr. α → PIE \*eaḥ:

Go. walu-	(m.) ‘ῥάβδος = Stab’ (GoEtD. 393, walus [sgN])
OIcl. vql-	(m.) ‘runder Stab’ (ANetWb. 673, vqlr [sgN])
El. ἄλυτα-	(m.) ‘elische Polizeibehörde’ (GEW 1:80, ἄλυτας)

As expected, the dental extension PIE \*uēaḥl n- is attested with a cerebral in Sanskrit:

Gr. ἄλλο-	(m.) ‘nail’ (LSJ. 337, in Hes. γάλλοι ἤλοι [Aiol.])
Lat. uallo-	(m.n.) ‘Pfahl(werk)’ (WH 2:730, uallus, uallum)
RV. vāṇá-	(m.) ‘Pfeil’ (WbRV. 1256)
RV. vāṇī-	(f.) ‘Rohr, Rohrstab’ (WbRV. 1256)

The extension PIE \*uēaḥlt- (P. 1139-40) has also left a cerebral in Sanskrit:

OInd. vāṭa-	(a.) ‘made of Indian fig-tree’ (MonWil. 939)
OInd. vāṭa-	(m.) ‘fence, enclosure, wall, garden’ (MonWil. 939)
OHG. wald	(m.) ‘Wald’ (Kluge 1975:774, wald [sgN])
OEng. weald	(m.) ‘wood, forest’ (ASaxD. 1171)

(m) PIE \*g<sup>h</sup>hēahl t-, an alternative extension of the root Neogr. \*g<sup>h</sup>h-en- ‘schlagen’ (P. 491-3), is now paralleled by Tocharian, revealing PIE \*l as the liquid lost in Sanskrit:

AV. ā·ghāṭá-	(m.) ‘Zimbel’ (EWA 1:159)
OInd. dārv ā·ghāṭá-	(m.) ‘Baumhacker, Specht’ (EWA 1:160)
TochA. káltañk-	(sb.) ‘instrumentum musici’ (Poucha 61)
RV. āghāṭí-	(c.) ‘Cymbeln’ oder ‘Klappern’ (WbRV. 172)

(n) √kaḥl- ‘Rahm, Milch’ (P. –). The root with ablaut \*e/o is based on the forms:

OInd. śara-	(m.) ‘saurer Rahm’ (KEWA 3:305, śarah)
OInd. śáras-	(n.) ‘Rahm, Haut auf gekochter Milch’ (KEWA 3:305)
Lat. colostrá-	(f.) ‘Biestmilch’ (WH 1:247f.)

The dental extension PIE \*kēaḥlto- has resulted in retroflex in Sanskrit:

OInd. śaṭa-	(a.) ‘sauer’ (KEWA 3:291).
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Thus the root contains PIE \*ḥ, revealed by Fortunatov’s Law II.

§9. PIE \*VḥaLT (SUBSET II). In this subset, cerebralization has taken place in Sanskrit, but in contrast with SUBSET I (with PIE \*aḥ) no Neogr. \*ə a ā is visible, and

the root has ablaut \*e : o. The shape PIE \*e/oh̥aL is, however, proven by the acute in Lithuanian, implying PIE \*h̥. Thus, for instance, the Lithuanian acute (and Latvian broken tone) is present in:

√geḥal- ‘bind’

OEng. cel-	(sb.) ‘a basket’ (ASaxD. 150, cel, celas [pl])
AV. jála-	(n.) ‘Netz, Kampfnetz, Fangarn’ (EWA 1:588)
Gr. ἐ γέλα-	(n.pl.) Hes. ‘χαλινοί : bridle, bit’ (LSJ. 469)
Li. žėlė-	(f.) ‘Siele, Pferdegeschirr’ (LiEtWb. 1296)
Latv. zēle-	(f.) ‘Siele, Pferdegeschirr’ (LiEtWb. 1296)

In the dental extension PIE \*gēḥalt-, the liquid has been lost in Sanskrit with the anticipated OInd. ṭ in:

OInd. jáṭā-	(f.) ‘Flechte, verflochtenes Haar’ (KEWA 1:413)
OInd. jaṭālā-	(a.) ‘Flechten tragend’ (KEWA 1:413)
OInd. jaṭī-	(f.) ‘Haarflechte’ (KEWA 1:413)
OInd. jaṭilā-	(a.) ‘Flechten tragend’ (KEWA 1:413)

On the other hand, the subset is characterized by the ablaut PIE \*ě : \*ǭ. Thus, the \*ě-grade is contained in:

PIE \*gĥěḥalt- ‘Gold’

OstLi. žėlta-	(a.) ‘golden, goldgelb, blond’ (LiEtWb. 1296-7, žėlta)
Thrac. ζηλτα-	(f.) ‘Gold’ (?) (P. 429, ζηλτα [sgN])

The respective \*o-grade is secured by Slavonic:

PIE \*gĥǭḥalt- ‘Gold’

Rus. zóloto	(n.) ‘Gold’ (REW 1:460)
OCS. zlato	(n.) ‘Gold’ (REW 1:460, zlato [sgNA])

Whether reflecting PIE \*ě or PIE \*ǭ, Sanskrit has a cerebral pointing to PIE \*ḥa in

OInd. hāṭaka-	(n.) ‘Gold’ (EWA 3:535, hāṭakam [sgNA]).
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Some additional examples of SUBSET II with an etymology are:

(a) √geḥal-, √goḥal- ‘kalt, Kälte, Frost’. The unextended root is attested in

Lat. gelo-	(n.) ‘Eiskälte, Frost, Eis’ (WH 1:585-6, gelum [sgNA])
OEng. cala-	(pret.) ‘to be(come) cold, cool’ (ASaxD. 143, calan)
Osc. γελα-	(f.) ‘Steph. Byz. γελαν · πάχνην’ (WH 1:586)

The dental extension PIE \*geḥald(h)- is accompanied by a retroflex in Sanskrit:

OInd. jaḍa-	(a.) ‘cold, stiff, dull’ (KEWA 1:414, EWA 1:565)
OCS. žlědica	(f.) ‘gefrorener Regen’ (WH 2:586)
RV. jáḍhav-	(a.) ‘stumpfsinnig’ (WbRV. 465, jáḍhavas)



(b)  $\sqrt{\text{ge}}\text{halth-}$  ‘puer, infans’ (P. 473).<sup>510</sup> Germanic cognates confirm PIE \*l for the liquid lost in Sanskrit:

OEng. cild-	(n.) ‘puer, infans : child, infant’ (ASaxD. 154)
Go. in ·kilþo-	(a.) = ἔγκυος ‘pregnant’ (GoEtD. 218)
Go. kilþei(n)-	(f.) = γαστήρ ‘womb’ (GoEtD. 218)
RV. jāṭhāra-	(n.) ‘der Mutterleib, Bauch, Magen’ (WbRV. 464-5)
RV. jāṭhara-	(m/n.) ‘Leibesgrösse’ (WbRV. 465, EWA 1:565)
OEng. cildru-	(st.n.pl.) ‘children’ (ASaxD. 154)

(c)  $\sqrt{\text{ke}}\text{hal-}$ ,  $\sqrt{\text{ko}}\text{hal-}$  ‘einäugig’ (P. 545, 2. kel-). The root, postulated by Pokorny without a laryngeal, has a retroflex in Sanskrit implying PIE \*ḥa in:

AV. kāṇá-	(a.) ‘durchstoehen, -löchert, einäugig’ (WbRV. 322)
Gr. κελλά-	(a.) Hes. κελλάς · μονόφθαλμος (GEW 1:817)
OIr. coll-	(a.) ‘luscum’ : ‘einäugig’ (LEIA C-159)
RV. káñī-	(a.) ‘ausgestoehen, duchtbohrt, einäugig’ (WbRV. 322)

(d)  $\sqrt{\text{ke}}\text{har-}$  ‘neck, etc.’ (P. 576). The \*ē-grade is attested in Italo-Greek:

Lat. ceruīc-	(f.) ‘Nacken’ (WH 1:207. ceruīx, ceruīcis [sgG])
Gr. κέρνα	(f.pl.) ‘transverse processes of the vertebrae’ (LSJ 943)

The corresponding \*ō-grade in PIE \*kōhart- is confirmed by the lack of palatalization in Sanskrit where cerebralization has taken place:

OInd. kakāṭikā-	(f.) ‘Teil des menschlichen Hinterkopfes’ (WbRV. 308)
RV. reṇú ·kakāṭa-	(a.) ‘staubbedeckten Nacken habend’ ? (KEWA 1:135)

(e)  $\sqrt{\text{me}}\text{hal-}$  ‘young, youth(ful)’. The root appears in various extensions including:

Gr. μέλακ-	(a.) Hes. μέλακες · νεώτεροι (LSJ. 1098)
TochB. malyakke-	(a.m.) ‘youthful, puerile’ (DTochB. 442)

The dental extension PIE \*meḥaln- is confirmed by Greek and Sanskrit, where the cerebral of the latter implies PIE \*ḥa:

Gr. μέλλακ-	(m.) ‘junger Knabe’ (GEW 2:202, LSJ. 1098)
OInd. māṇava-	(m.) ‘a youth, lad, youngster’ (MonWil. 806)

(f)  $\sqrt{\text{pe}}\text{hal-}$  ‘Menge, Masse; Decke, Schild’ (P. 803). The root, appearing in various extensions, reflects Fortunatov’s Law II when augmented with a dental:

Gr. πέλτη-	(f.) ‘kleiner Schild aus Flechtwerk’ (GEW 2:501)
OInd. paṭa-	(m.) ‘woven cloth, blanket, garment’ (MonWil. 579)
OIcl. feld-	(m.) ‘Schafpelz, Mantel’ (ANetWb. 116)

<sup>510</sup> The group was correctly connected to OSax. kind ‘Kind’, OHG. kint ‘proles’ (PIE \*geḥan; cf. P. 373 gen- ‘erzeugen’) already by Bosworth and Toller (ASaxD. 154). The unextended root (PIE \*geḥa-) is attested in RV. eka jā- (a.) ‘einzeln geboren’ (WbRV. 296, ekajám [sgA]) and multiple related items.

(g)  $\sqrt{\text{peḥar-}}$ ,  $\sqrt{\text{poḥar-}}$  ‘einhandeln, kaufen’ (P. 817). The root is attested in several extensions, including the dental one, in:

PIE  $*\text{peḥarn-}$  ‘einhandeln, kaufen : Dirne, Hure’

Gr. πορνό-	(m.) ‘Buhlknabe, Buhler : paramour’ (GEW 2:581)
OInd. páṇa-	(vbM.) ‘einhandeln, kaufen’ (KEWA 2:194)
OInd. paṇa-strī-	(f.) ‘meretrīx, πόρνη’ (EWA 2:69)
Gr. πέρνα-	(prM.) ‘zum Verkauf ausführen’ (GEW 1:516-7)
Ion.-Att. πόρνη-	(f.) ‘feile Dirne, Hure’ (GEW 1:581, πόρνη [sgN])

The retroflex is manifest in OInd. paṇa- (= Gr. πορνό-), implying PIE  $*\text{ḥa}$ .<sup>511</sup>

§10. PIE  $*\text{VLḥT}$  (SUBSET III). This subset, characterized by PIE  $*\text{ḥ}$  between a liquid and dental, consists of two starting points,  $\text{VLahT}$  and  $\text{VLḥaT}$ , both resulting in a cerebral in Sanskrit. Some examples of SUBSET III are:

(a) PIE  $\sqrt{\text{lah-}}$  ‘gehen, treiben’ (P. 306-7). Both the laryngeal and PIE  $*\text{a}$  are present in the unextended root:

Hī. laḥa-	(c.) ‘Feldzug, Reise’ (HEG 2:8-11, la-a-aḥ-ḥi)
Gr. ἐλά-	(vb.) ‘treiben’ (GEW 1:482-3, Cos. ἐλάτω [ipv3sg])

The root with a dental extension (PIE  $*\text{e-laḥt-}$ ) is confirmed by the equation:

OInd. áṭa-	(pr.) ‘herumschweifen’ (EWA 1:56, áṭati) <sup>512</sup>
OInd. āṭa-	(a.) ‘going (after)’ (MonWil. 133)
Gr. ἐλατήρ-	(m.) ‘Treiber, Wagenlenker’ (GEW 2:482)
Gr. ἐλασία-	(f.) ‘Ritt, Marsch’ (GEW 2:481)

(b) PIE  $\sqrt{\text{lahs-}}$  ‘verlangen, begehren’ (P. 654,  $*\text{las-}$ ). The  $*\text{e}$ -grade root PIE  $*\text{leahs-}$  has a certain Neogr.  $*\text{a}$  ( $\rightarrow$  PIE  $*\text{ḥ}$ ) implied by the European languages:

OInd. lālasa-	(a.int.) ‘heftig verlangend nach’ (KEWA 2:99-100)
Gr. λαλα(h)το-	(prM.) ‘heftig begehren, verlangen’ (GEW 2:123)
Lat. lascīuo-	(a.) ‘geil, usw.’ (WH 1:766, lascīuus [sgN])
OIr. lainn-	(a.) ‘gierig’ (WH 2:766, lainn [sgN]) $\leftarrow$ PCelt. $*\text{lasni-}$

In the reduplication PIE  $*\text{lelahso-}$ , PIE  $*\text{a}$  was lost and the cluster  $*\text{lḥs}$  replaced with a retroflex in Sanskrit:

OInd. laṣa-	(pr.) ‘begehren, Verlangen haben nach’ (KEWA 3:95)
OInd. abhi-laṣita-	(a.) ‘begehrt, gewünscht’ (KEWA 3:95)

(c) The loss of liquid and the cerebral in Sanskrit are now also documented for the reduplication PIE  $*\text{lolaḥtu-}$  (from PIE  $*\text{lah-}$  ‘gehen, treiben’), which appears in:

TochA. laltu-	(pret.pt.) ‘exitus’ (Poucha 268, laltu [sgN])
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<sup>511</sup> Note the ‘a-colouring’ in the schwebeablaut variant of PIE  $*\text{peḥar-}$   $\equiv$  Gr.  $\sqrt{\text{πέρ-}}$  ‘verkaufen’ in PIE  $*\text{phaer-}$   $\equiv$  Lat.  $\sqrt{\text{par-}}$  ‘kaufen’.

<sup>512</sup> It is possible to analyse SV. av-áṭa- (m.) ‘well, spring’ (WbRV. 125) as ‘Wasser+Lauf’ and connect the suffix to the root OInd.  $\sqrt{\text{at-}}$  ‘gehen, usw.’.

OInd. *laṭva-* (m.) ‘dancing boy’ (KEWA 3:95, Lex. *laṭvaḥ* [sgN])

§11. Fortunatov’s Law II has the following restriction in Sanskrit: *If a zero-grade cluster PIE \*HLT, LH̄T was not preceded by a vowel V = OInd. a, ā, ī, ī, u, ū, then the liquid L became syllabic and cerebralization did not take place.*

The restriction is based on confirmed examples of PIE \*h without cerebralization in Sanskrit (where OInd. *ṛ* has been preserved before a dental in the zero grade). Some examples of this are:

(a) PIE \*haldh- ‘wachsen, gedeihen’ (P. 27). The laryngeal is based on Gr. *ἄλθομαι* and the retroflex in Sanskrit:

RV. <i>ṛdh-</i>	(ao.) ‘gedeihen’ (WbRV. 289, <i>ṛdhat</i> [conj3sg])
gAv. <i>arəd-</i>	(ao.) ‘gedeihen lassen, fördern’ (AIWb. 193, <i>arədat</i> )
Go. <i>ald-</i>	(f.) ‘generation, age : <i>αἰών, γενεά, βίος</i> ’ (GoEtD. 26)
OInd. <i>ādhya-</i>	(a.) ‘rich, wealthy’ (KEWA 1:71-72, *ā+ <i>h̄</i> dhya-)

In the zero-grade RV. *ṛdh-*, however, the liquid has been preserved. This variation can be reconstructed regularly by the following prototypes:

I	zero grade	II
$\sqrt{ādh-} \leftarrow *e/_o haldh-$	$\sqrt{ṛdh-} \leftarrow *haldh-$	$\sqrt{ardh-} \leftarrow *h̄a/_o ldh-$

(b) PIE \*nahRt- ‘tanzen, drehen’ (P. 975f.) appears in:

OInd. <i>nāṭa-</i>	(vb.) ‘tanzen’ (KEWA 2:127, <i>naṭati</i> [3sg])
OInd. <i>nāṭa-</i>	(m.) ‘Schauspieler’ (KEWA 2:127)
RV. <i>ṅ (...)</i> <i>nṛt-</i>	(ao.) ‘tanzend herbeispringen zu [A]’ (WbRV. 751)
AV. <i>nṛt-</i>	(f.) ‘Tanz’ (EWA 2:21, <i>nṛt-</i> )
RV. <i>nartāya-</i>	(cs.) ‘tanzen lassen, drehen’ (WbRV. 751, <i>nartāyan</i> )
RV. <i>nartiṣ-</i>	(is.ao.) ‘tanzen’ (WbRV. 751, <i>ánartiṣus</i> [3pl])

In an identical fashion, the alternation can be reconstructed regularly by positing:

I-A	zero grade	I-B
$\sqrt{naṭ-} \leftarrow \text{PIE } *n/_o aḥRt-$	$\sqrt{nṛt-} \leftarrow \text{PIE } *nahRt-$	$\sqrt{nart-} \leftarrow \text{PIE } *nah/_o Rt-$

Evidently there is no cerebralization in zero-grade  $\sqrt{nṛt-}$ , which proves the restriction.

§12. Given the relevance of the schwebeablaut for the alternation in Sanskrit, yet another example of a root and its bases may be provided:

PIE \*g<sup>u</sup>aḥl- ‘drip, drop, etc.’ (P. 471-2, 2. g<sup>u</sup>el-)

(a) PIE \*g<sup>u</sup>eahl- (P. 471-2). PIE \*aḥ is implied by Gr. *α* in:

OInd. <i>gála-</i>	(vb1.) ‘drip, drop, ooze’ (MonWil. 350, <i>galati</i> [3sg])
OInd. <i>gagala-</i>	(n.) ‘venom (of serpents)’ (MonWil. 341)
Gr. <i>βαλανεύς-</i>	(m.) ‘Bader’ (GEW 1:212-3, <i>βαλανεύς</i> [sgN])

The \*e-grade root is matched with \*o-grade PIE \*g<sup>u</sup>oaḥl- in:

Gr. ἀμβολᾶδην (adv.) ‘bubbling up’ (LSJ. 79, ἀμβολᾶδην).<sup>513</sup>

(b) The root with a dental extension PIE \*g<sup>u</sup>eah<sub>2</sub>ld- has resulted in the retroflex in Sanskrit (Fortunatov’s Law II):

Dhatup. gaḍa-	(pr1.) ‘distil, drop’ (MonWil. 342, gaḍati [3sg])
OInd. gaḍa-	(m.) ‘a kind of gold-fish’ (MonWil. 342)
OInd. gaḍayitnu-	(m.) ‘a cloud’ (MonWil. 342)
OInd. gaḍera-	(m.) ‘cloud, torrent’ (MonWil. 342, KEWA 1:328)
OInd. gaḍayantā-	(m.) ‘Wolke’ (KEWA 1:328)

(c) On the other hand, the schwebeablaut base PIE \*g<sup>u</sup>aḥold- did not satisfy the condition of Fortunatov’s Law II and no cerebralization took place in examples like:

RV. gáldā-	(f.) ‘das Absehen (des Soma)’ (WbRV. 388)
OInd. gardayitnu-	(m.) ‘Wolke : cloud’ (KEWA 1:328)

Thus, the apparently chaotic alternation of the retroflex is regular.

§13. Avestan has preserved some twenty examples of Av. ṣ, the outcome of Fortunatov’s Law in the language, carefully catalogued and discussed by Hoffmann (1986).<sup>514</sup> To show its compatibility with Fortunatov’s Law II, a short but comprehensive review of the Avestan material will follow.

(a) Generally the development of Avestan is identical with that Sanskrit, except for being restricted to voiceless dental stops. Accordingly, in external comparisons Neogr. \*ə a ā, the Old Anatolian ḥ or some other criterion for PIE \*ḥ appears with Av. ṣ. Thus, for instance, the root PIE \*ḥal- ‘mahlen’ has an initial PIE \*ḥ proven by Gr. ᾰ- in

Gr. ᾰλέω (pr.) ‘mahlen’ (GEW 1:70).

In the respective dental extension PIE \*ḥalt-, Av. ṣ corresponds to Indo-Aryan ṭ in

√ḥalt- ‘mehl, gemahlen’ (P. 28-9):

LAv. aṣa-	(pt.) ‘gemahlen (vom getreide)’ (AIWb. 230)
OInd. aṭṭa-	(n.) ‘boiled rice, food’ (MonWil. 11)
Hind. āṭā-	(f.) ‘Mehl’ (EWA 1:55, āṭā [sgN] ← *āṭṭā-)

(b) Owing to the existence of a segmental explanation (PIE \*ḥ) for Av. ṣ, the early suprasegmental theory (see Hoffmann 1986) should be reconsidered. The assumption of an Iranian accent in the syllable preceding Av. ṣ – as inferred from Sanskrit – is weak at best, and yet it often does not reflect the facts. Thus, for instance,

LAv. vouru.kaṣa- (a.) ‘mit weit Buchten’ (AIWb. 1429)

<sup>513</sup> The \*o-grade of Greek is paralleled by OHG. quall- (pret.) ‘hervorquellen, schwellen’, possibly also appearing in OInd. gāla- (m.) ‘flowing, liquefying’ (MonWil. 350), if this is indeed an example of Brugmann’s Law II.

<sup>514</sup> For technical reasons the difference between Av. ṣ and Av. ṣ was not notified by Bartholomae in his dictionary (AIWb.). Naturally, the development Av. ṣ ← \*rt was known by the Neogrammarians (see Grundr<sup>2</sup> 1:431) and their contemporaries.

had an accent on the last syllable, if it is justified to infer this from Sanskrit:

RV. kātá- (m.) ‘Grube, Tiefe’ (WbRV. 322, KEWA 1:197).

However, we cannot conclude that an accent would account for Av.  $\xi$  = OInd.  $\xi$ , because

RV. kartá- (m.) ‘Grube, Loch’ (WbRV. 316)

is accented identically, but Fortunatov’s Law II has not occurred. In such circumstances, it is natural to apply the same criteria throughout Indo-Iranian.

(c) Occasionally Av.  $\xi$  and Av.  $\text{ə}\text{r}\text{ə}\text{T}$  appear side by side (as is the case in Sanskrit) and the alternation is explained with a schwebeablaut. An example of this is preserved in the data:

√suaḥl- ‘swallow’ (P. 1045 1.  $\text{s}\text{u}\text{e}\text{l}$ - ‘schlingen’)

LAv.  $\text{k}\text{ə}\text{r}\text{ə}\text{f}\check{\text{s}}\text{-x}^{\text{v}}\text{ar-}$  (a.) ‘Leichen-, Aas-fressend’ (AIWb. 469,  $\text{k}\text{ə}\text{r}\text{ə}\text{f}\check{\text{s}}.\text{x}^{\text{v}}\text{ar}\text{ō}$ )

LAv.  $\text{x}^{\text{v}}\text{ara-}$  (pr.) ‘geniessen’ (AIWb. 1865,  $\text{x}^{\text{v}}\text{araiti}$  [3sg])

OIcl.  $\text{soll-}$  (m.) ‘Spültrank für Schweine’ (ANetWb. 529)

In the dental extension PIE \*sueahlto-, the liquid was lost in Iranian with Av.  $\xi$ :

LAv.  $\text{x}^{\text{v}}\text{ā}\check{\text{s}}\text{a-}$  (n.) ‘Essen’ (AIWb. 1879)

LAv.  $\text{x}^{\text{v}}\text{ā}\check{\text{s}}\text{ār-}$  (m.) ‘Trinker’ (AIWb. 1879,  $\text{x}^{\text{v}}\text{ā}\check{\text{s}}\text{ār}\text{əm}$  [sgA])

On the other hand, the schwebeablaut variant PIE \*suaḥolto- did not satisfy the condition of Fortunatov’s Law II, and therefore the law did not take place in:

LAv.  $\text{x}^{\text{v}}\text{ar}\text{ə}\text{ta-}$  (vb.) ‘geniessen, trinken’ (AIWb. 1868,  $\text{x}^{\text{v}}\text{ar}\text{ə}\text{t}\text{ə}$  [inf.]).

Similarly, a schwebeablaut is required to explain the alternation Av.  $\xi$  : Av.  $\text{Vr}\text{ət}$  in

PIE √ḥalt- ‘Lohn’:

Gr.  $\acute{\alpha}\lambda\tau\acute{o}$ - (m.) ‘Lohn’ (LSJ. 73, Hes.  $\acute{\alpha}\lambda\tau\acute{o}\varsigma \cdot \mu\text{i}\sigma\theta\acute{o}\varsigma$ )

gAv.  $\text{a}\check{\text{s}}\text{i-}$  (f.) ‘Anteil, Lohn, Verdienst, Belohnung’ (AIWb. 241)

LAv.  $\text{ār}\text{ə}\text{iti-}$  (f.) ‘Anteil, Lohn, Verdienst, Belohnung’ (AIWb. 192)

Gr.  $\acute{\alpha}\lambda\tau\text{ρ}\acute{o}$ - (m.) ‘Lohn, usw.’ (LSJ. 73, Hes.  $\acute{\alpha}\lambda\tau\text{ρ}\acute{o}\varsigma \cdot \mu\text{i}\sigma\theta\acute{o}\varsigma$ )

(d) In addition to *morphology*, the Proto-Indo-European derivation accounted for some doublets with dental and retroflex/sibilant in Indo-Iranian. The data are characterized by the appearance of both the plain root  $\text{ṛ}$  and the laryngeal extension  $\text{ṛ} \cdot \text{h}$ . With a further dental suffix  $\cdot\text{T}$ -, extensions  $\text{ṛ} \cdot \text{T}$  and  $\text{ṛ} \cdot \text{h} \cdot \text{T}$  appear. While the former gives no indication of Fortunatov’s Law II, the latter does. An example supported by Old Anatolian is now available in:

1. \*pr- ‘gehen; Fuß’ ( $\equiv \text{ṛ}$ ). The unextended root is well-documented in Luwian:

CLu.  $\text{para-}$  (vb.) ‘chase, hunt’ (DLL 77,  $\text{pa-ra-ad-du}$  [3sg])

HLu. ARHA  $\text{para-}$  (vb.) ‘hunt’ (CHLu. 7.2.1.fr6 ARHA (PES2)\*501+RA/I-ha)

HLu.  $\text{para-}$  (sb.) ‘foot’ (CHLu. 10.14.9, (“PES”)  $\text{pa} + \text{ra}/\text{i-za}$ )

RV.  $\text{purv}\check{\text{a}} \text{-par}\acute{\text{a}}$ - (a.) ‘nachfolgend’ (WbRV. 846-7)

2. PIE \*prtu- ‘Durchgang’ (≡ ʁ·T-). Directly built on the unextended root without a laryngeal, Fortunatov’s Law II took place in:

gAv. pərətu- (m.f.) ‘Durchgang, Pforte, Furt, Brücke’ (AIWb. 892).

3. PIE \*praḥ- \*poraḥ- \*peraḥ- ‘treiben, jagen’ (≡ ʁ·aḥ). The laryngeal extension is attested in Old Anatolian (CHD P:143f.):

Ḫi. parḫa- (vb2.) ‘treiben, jagen’ (HHand. 121, p̄ar-ḫa-i [3sg])

CLu. parḫa- (vb.) ‘treiben, jagen’ (DLL. 78, p̄ar-ḫa-ad-du [3sg])

4. PIE \*praḥtu- ‘Durchgang, Furt’ (≡ ʁ·aḥ·T-). Following the loss of PIE \*a, Fortunatov’s Law II took place and Av. ʃ appears in:

LAv. pəʃu- (m.) ‘Durchgang, Furt’ (AIWb. 897)

LAv. pəʃu.pāna- (a.) ‘Brückenwächter’ (AIWb. 898)

(e) This morphological variation is paralleled by the root √pr- ‘Kampf; schlagen’ (P. 818-9). Here the extension PIE \*pr·t ≡ ʁ·T preserves an unaltered cluster L+T in:

LAv. pərət- (f.) ‘Kampf, Streit’ (AIWb. 891, p̄ərətasča)

RV. pṛt- (f.) ‘Kampf, Streit’ (WbRV. 854, pṛtsú [plL])

Simultaneously, however, the extension \*praḥ·th- ≡ ʁ·ḫ·T (with Gr. *á* implying the laryngeal) has resulted in Av. ʃ in:

LAv. pəʃana- (n.) ‘Kampf, Schlacht’ (AIWb. 896-7)

LAv. pəʃanā- (f.) ‘Kampf, Schlacht’ (AIWb. 896-7)

Gr. πρῶθο- (ao.) ‘zerstören, verwüsten’ (GEW 2:512)<sup>515</sup>

(f) PIE √pel-, √pol- ‘law; judge’ (P. –). The unextended root is now attested in Tocharian:

TochA. pal- (sb.) ‘lex (religiosa)’ (Poucha 163)

TochB. pele (m.sg.) ‘law ; prison’ (DTochB. 398)

Directly from this root are formed the dental extensions PIE \*plno- and \*plto-:

LAv. pərənav- (vb.) ‘verurteilen : judge’ (AIWb. 850)

gAv. p̄ərəḫa- (n.) ‘Ausgleichung, Sühne, Strafe’ (AIWb. 892)

LAv. āp̄ərə·ti- (f.) ‘Ausgleich, Sühne’ (AIWb. 329)

In contrast, the extension √plaḥ-, augmented with a dental, is revealed by Av. ʃ (AIWb. 898) in:

gAv. pəʃō.tanū- (a.) ‘des Leib verwirkt, dem Gericht verfallen ist’

LAv. pəʃō.sāra- (a.) ‘des Haupt verwirkt, dem Gericht verfallen ist’

(g) PIE √pel-, √pol- ‘breit, weit, etc’ (P. 833). The extension \*plaḥ- (\*pelaḥ- \*polaḥ-) is now attested in Old Anatolian (CHD P:66):

Ḫi. palḫa- (<sup>DUG</sup>) ‘Kessel’ (HHand. 117, pal-ḫa-aš)

<sup>515</sup> The ‘laryngeal’ extension is confirmed by Gr. *α* ← PIE \*(e)aḫ.

Ḫi. palḫi- (a.) ‘breit, weit’ (HHand. 117, pal-ḫi [NA])

The root augmented with a dental reveals the simultaneous presence of Ḫi. ḫ, Gr. α and Av. š in:

Gr. πλατύ- (a.) ‘weit, breit, flach, eben’ (GEW 2:553, πλατύς)  
 Ḫi. palḫatar- (n.) ‘DAGAL : Breite : width’ (CHD P-65, pal-ḫa-tar)  
 LAv. pəšō.parəna- (a.) ‘mit weiter Flügelspannung’ (AIWb. 898)  
 LAv. pəšō.čingha- (a.) ‘mit gespreizten Klauen’ (AIWb. 897)

(h) Proto-Indo-European derivation also accounts for some alternations of Av. ərət and Av. š (= OInd. ṭ), ultimately tracing back to monoliteral roots with and without a laryngeal (as in the above examples). Another example is found in the matrix of the root

√m- ‘(make) disappear, die, destroy, kill’:

Ḫi. ma- (vb1.) ‘disappear’ (CHL L/N 99, ma-du [3sg]).

The best-known extension of the root, PIE \*mr- (cf. Ḫi. mer-, mar- (vb1&2.) ‘verschwinden, verlorengelien, absterben’, HEG 2:199, mar-ta [3sg]), preserves \*r+t as such in Indo-Iranian:

Lat. mort- (f.) ‘Tod, Erlöschen’ (WH 2:112, mors [N], mortis [G])  
 Gr. μορτό- (a.) ‘man, mortal’ (LSJ. 1147 = ἄνθρωπος, θνητός)  
 RV. mártā- (m.) ‘Sterblicher, Mensch’ (WbRV. 1008-9)  
 gAv. marəta- (m.) ‘Sterblicher, Mensch’ (AIWb. 1148)

On the other hand, a feminine PIE \*mēaḫ- (ablaut \*meaḫ- \*maḫ-) was built on the monoliteral root √m- in:

OInd. mā- (f.) ‘death’ (MonWil. 771).

Furthermore, this base formed an \*r-extension with a dental extension, resulting in Fortunatov’s Law II:

PIE \*meaḫrt- ‘sterben’

OIr. mart- (m.) ‘tuerie, massacre, victime’ (LEIA M-21)  
 gAv. maša- (m.) ‘Sterblicher, Mensch’ (AIWb. 1164)  
 gAv. a·məša- (a.) ‘unsterblich’ (AIWb. 145-6)  
 AV. maṭ·maṭá- (m.) ‘ein bestimmter Dämon’ (KEWA 2:554)

(i) PIE \*u<sup>c</sup>/<sub>o</sub>aḫr- ‘treiben, führen, bewegen’ (P. 1160) can be postulated on the basis of the forms:

Li. varý- (pr.) ‘treiben, führen, leiten, bewegen’ (LiEtWb. 1200)  
 Arm. vari- (pr.) ‘be led, behave’ (MPahl. 2:203, varil [inf.]  
 Pahl. varišn- (sb.) ‘conduct, way of living’ (MPahl. 2:203)  
 Arm. varun- (a.) ‘beaten (track)’ (MPahl. 2:203)

Arm. a implies PIE \*ḫ, which is in turn confirmed by the dental extension resulting in Av. š:

PIE \*ueḡart- ‘Wagen’

LAv. vāša-	(m.) ‘Wagen’ (AIWb. 1418)
LAv. vāšaya-	(pr.) ‘den Wagen ziehen’ (AIWb. 1418)

(j) In a rare example, a collision of two etymologically distinct roots with Av. t and Av. ṣ is possible in Iranian. Thus we may postulate the following root:

PIE √r- ‘law, justice, right, good’ (HEG 1:50)

Ḫi. ara-	(a.) ‘according to law, appropriate’ (IE&IE 710)
OPers. arta-	(m.) ‘Law, Justice’ (OldP. 170)
RV. ṛtá-	(a.) ‘passend, gehörig, recht’ (WbRV. 282-3)
LAv. an arəta-	(a.) ‘gesetzlos, dem heiligen Recht feind’ (AIWb. 120)
gAv. dōjīr.arəta-	(PN.) ‘das Gesetz, Recht mindernd’ (AIWb. 609)
Pahl. artāy-	(a.) ‘righteous, good’ (MPahl. 2:30)

There is no laryngeal in Old Anatolian (Ḫi. ar-). Consequently, Fortunatov’s Law II has not taken place. On the other hand, there is the root PIE √ḡar- with a similar meaning in:

gAv. aša-	(n.) ‘Wahrheit, usw.’ (AIWb. 229-238)
LAv. jīr.aša-	(PN.) ‘das Gesetz, Recht mindernd’ (AIWb. 609)
Hes. ἄρσοιο-	(a.) ‘fitting, meet, right’ (LSJ. 248, ἄρσιον : δίκαιον)
Gr. ἀν-ἄρσοιο-	(a.) ‘inimical : feindlich’ (IE&IE 710)

This root has both Gr. ἄ (→ PIE \*ḡ) and Av. ṣ (→ PIE \*ḡ), and it is therefore to be differentiated from the previous root PIE \*r- without a laryngeal.<sup>516</sup>

(k) The upgraded condition of Fortunatov’s Law II is equal to a methodology for identifying etymologies. The mode of inference applied for Indo-Iranian consists of the elimination of the root-final dental, the reconstruction of the lost liquid (PIE \*r or \*l) and the postulation of PIE \*ḡa, aḡ in the proper position. This methodology can be illustrated here with an Avestan root currently lacking etymology:

LAv. √kaš- ‘warten; Wärter’

LAv. nasu.kaša-	(m.) ‘Leichenwärter’ (AIWb. 1058)
LAv. īristō.kaša-	(m.) ‘Totenwärter’ (AIWb. 1530)

The elimination of the dental and the restoration of the liquid leaves a maximal expansion \*KaḡL with K ≡ PIE \*k v \*k<sup>h</sup> and L ≡ PIE \*l v \*r. The values PIE \*k and PIE \*r yield a direct match between Avestan and the Greek items in:

Gr. νεω κόρο-	(m.) ‘Tempel-wärter’ (GEW 1:607, PGr. *νασφο-)
Gr. ζα κόρο-	(c.) ‘Tempel-diener(in)’ (GEW 1:607, ζακόρος [sgN])
Gr. σηκο κόρο-	(m.) ‘Stallknecht’ (GEW 1:919, σηκο-κόρος [sgN])

Thus, a root PIE \*keahr- \*koahr- ‘Wärter’ is obtained.

<sup>516</sup> The conditions for deciding whether roots are ultimately connected (e.g. via prefix PIE \*ḡa· = Gr. ἄ· (LSJ. 1)) must be created for the entire vocabulary before the question can be settled.



§14. In Avestan, unlike in Sanskrit, Fortunatov's Law II also applied in the zero grade (cf. LAv. pəṣana-, LAv. kəṣa-, etc.). This reflects the realization of the syllabic liquids PIE \*l̥r̥ in Avestan ər̥ (vs. RV. l̥r̥). In addition to proving the reality of Av. ə, this case is of some interest for the PIE vowel system, because it proves that Avestan developed the vowel in question (compared to Sanskrit, which lost it).

§15. According to the converse of Fortunatov's Law II, *If a sequence VLT has been preserved in Indo-Iranian,<sup>517</sup> its prototype did not contain PIE \*h̥a or \*ah̥ preceding or following the liquid.*

This principle provides a criterion for determining when a root did not have a laryngeal in the positions initiating Fortunatov's Law II. This capability is of some relevance, because the Neogrammarians and Saussure overgenerated schwa through the structural definitions

$$\text{Neogr. } \bar{L}^L \equiv \text{DS } \bar{L}AV \equiv \text{LT } LHV \quad \text{Neogr. } \bar{L} \equiv \text{DS } \bar{L}AC \equiv \text{LT } LHC.$$

Some examples of the mispostulated laryngeals<sup>518</sup> appear, for instance, in:

(a) RV. pūrṇá- (pt.) 'voll, gefüllt' (WbRV. 844). The form is traditionally reconstructed as Neogr. \*p̥l̥nó- (= LT \*pl̥H<sub>1</sub>no-). Since the cerebral is absent in Rig-Veda, the prototype did not contain a laryngeal. Simultaneously, the 'u-vocalism' of PIE \*pulno- is paralleled by Indo-Iranian (cf. Sogd. pwrn 'voll, gefüllt', KEWA 2:283), Slavonic (OCS. plūnŭ (a.) 'voll', Sadnik √672) and Germanic (Go. full- 'πλήρης = full', GoEtD. 131); therefore, it is original.

(b) PIE √til- 'erheben' (sub P. 1016 2. \*tel- 'gang'). A Vedic root √tir- (cf. RV. titir-(pf.) 'überwinden, besiegen' (WbRV. 525, titirús [3pl]) is often directly connected to the root RV. √tṛ- (PIE \*tṛ-) based on internal reconstruction (≡ Neogr. \*tr̥C-, LT \*tṛHC-). External comparison implies that the root had an original PIE \*l̥ instead of PIE †r̥ in PIE \*til-, however:

Thrac. τλε/ο-	(ao.) 'auf-, wegheben, entfernen' (WH 2:688, τλε)
RV. úd (...) tira-	(pr6A.) 'erhöhen, steigern' (WbRV. 525, úd tirāmasi)
OInd. tela-	(pr1A.) 'to go' (MonWil. 448, Dhātup. telati [3sg])

Simultaneously, the absence of a root-final laryngeal is proven by the lack of an Indo-Iranian cerebral (the converse of Fortunatov's Law II) in PIE \*tāhil-:

Li. tīlta-	(4m.) 'Brücke' (LiEtWb. 1094, tīltas [sgN])
RV. tīrthá-	(n.) 'Weg zur Tränke, Furt des Flusses' (WbRV. 537)
Thrac. τιλτια	(f.) 'Weg' (LiEtWb. 1094, τιλτια [sgN])

§16. Regarding the laryngeal theory, it should be mentioned that the converse of Fortunatov's Law II can be understood as proving numerous candidates of †h<sub>1</sub> and †h<sub>3</sub> postulated on the basis of the root axiom to be false. The simultaneous presence/absence of the PIE laryngeal and retroflex in Indo-Iranian reveals the following distribution:

<sup>517</sup> Note that the 'non-palatalizing' OInd. i<sub>2</sub> ← PIE \*á is a vowel (cf. OInd. kiṇa- = Lat. callo-, etc.).

<sup>518</sup> Numerous similar examples will be presented in the discussion concerning syllabic sonants.

1. The roots with laryngeal PIE \*h<sub>2</sub> (≈ LT h<sub>2</sub>) do have variants with gAv. š, RV. ṭ, etc.

2. The roots without laryngeal PIE \*h<sub>2</sub> but with alleged †h<sub>1</sub> and †h<sub>3</sub> do not have variants with gAv. š, RV. ṭ, etc.

Several examples of PIE \*h<sub>2</sub> (≈ LT h<sub>2</sub>) appearing with gAv. š and/or RV. ṭ have already been discussed above; therefore, it suffices to quote examples with alleged †h<sub>1</sub> and †h<sub>3</sub> with Old Anatolian proving the absence of the laryngeal PIE \*h<sub>2</sub> (≈ LT h<sub>2</sub>):

(a) √rnu- ‘in Bewegung setzen, erregen, usw.’ (P. 326f.)

Hī. arnu-	(cs.) ‘in Bewegung setzen’ (HEG 1:64)
RV. ṛṇó-	(pr.) ‘in Bewegung setzen [A]’ (WbRV. 98-101)

(b) √rn- ‘culpa’ (P. 501)

RV. ṛṇá-	(a.) ‘schuldig, sündig’ (WbRV. 281)
Sogd. ’rn	(sb.) ‘Schuld’ (KEWA 1:121)
Khot. ārra-	(sb.) ‘Schuld’ (KEWA 1:121)
LAv. arənat.čəēša-	(a.) if ‘avenging debts’ (?) (EFL 154-5, AIWb. 195)
Hī. arnu-	(vb.) ‘büßen, ersetzen’ (Tischler 1972:278)

(c) √rs- ‘fließen’ (P. 336)

Hī. arš-	(vb.) ‘fließen’ (DLL 32, HEG1:66-7, ar-aš-zi)
RV. árṣa-	(pr.) ‘fließen, herbeiströmen’ (WbRV. 119-120, árṣati)
Go. airzei-	(a.) ‘led astray, deceived, in error’ (GoEtD. 19-20)

(d) √rs- ‘Neid’ (P. 335)

LAv. arəšyant-	(a.) ‘neidisch, misgünstig’ (AIWb. 206)
Hī. aršani-	(vb.) ‘be envious, angry’ (HEG 1:67-8 ar-ša-ne-e-ši)

(e) √rdh- ‘sägen, spalten, auftrennen’ (P. 333)

Hī. ardu-	(vb.) ‘sägen’ (HEG 1:69, ar-du-me-ni [1pl])
RV. ṛdhak	(adv.) ‘(ab)gesondert, versteckt, abseits’ (WbRV. 290)
Li. ardý-	(cs.) ‘auftrennen, usw.’ (LiEtWb. 15, ardýti [inf.])

Diagnostically, the roots with alleged †h<sub>1</sub> and †h<sub>3</sub> do not display variants with cerebral/sibilant in Indo-Iranian (i.e. Fortunatov’s Law does not apply). This reflects the fact that the laryngeals †h<sub>1</sub>, †h<sub>3</sub> do not represent real consonants but are substitutes for the vowels PIE \*e (≡ LT h<sub>1</sub>) and PIE \*o (≡ LT h<sub>3</sub>).

§17. The developments of Fortunatov’s Law II are summarized as follows:

(a) Both Fortunatov’s initial observation and the improvements of Bartholomae and Brugmann are professional in terms of the identification of the class of irregular cerebrals and šibilants in Indo-Iranian. Since the ultimate *conditio sine qua non* of Fortunatov’s Law (i.e. PIE \*h<sub>2</sub>) was absent from the Neogrammarian phoneme inventory, it was more of a case of the scholars lacking the means by which to describe the sound law rather than their failing in its formulation. Fortunatov’s Law II,

upgraded as it is now, provides a regular method of reconstruction that fills the lacuna left by the pioneers.<sup>519</sup>

(b) The phonetic development required by Fortunatov's Law II is natural: the sequences PIE \**h*LT, L*h*T raise the tongue, which is further turned backwards by PIE \**l*, \**r* (palatalization). After the loss of the liquid, the clusters resulted in a sibilant (Av. §) and a retroflex in Sanskrit.

### 3.3.3 Liquids \**r* and \**l* in the Neogrammarian system

§0. Faithful to Sanskrit as the paradigm of the proto-language, Schleicher (1861-62) reconstructed only one liquid, Paleogr. \**r* (= PIE \**r*).

§1. Schleicher's initial mistake was soon corrected by the Neogrammarians, who reconstructed two liquids, PIE \**r* and PIE \**l*, with a sound law implying a general collision of the items in Indo-Iranian:

“Im Arischen dagegen scheinen die beiden Laute in der Zeit der indisch-iranischen Urgemeinschaft in *r* zusammengefallen zu sein. Dies gilt, wie für die consonantischen, so auch für die silbischen Liquidae, s. 497 ff.” (Brugmann, Grundr<sup>2</sup> 1:423)

By now it has become clear (see, for example, Szemerényi 1996:45) that the situation is more complex:

“[...] in Old Iranian *l* became *r* throughout, while in Old Indic dialect mixture has confused the original situation to such an extent that *l* and *r* can each represent [P]IE *l* or *r*.”<sup>520</sup>

§2. In the Sonantentheorie, Brugmann and Osthoff went far beyond this basic scheme, ultimately postulating the four series of liquids:

- (a) Consonantal liquids \**L* in antevocalic position Neogr. \**l*V \**r*V (§3)
- (b) Short syllabic liquids \**ḷ* in anteconsonantal position Neogr. \**ḷ*C \**r*C (§4)
- (c) Short syllabic liquids \**ḷ̥* in antevocalic position Neogr. \**ḷ̥*V \**r̥*V (§5)
- (d) Long syllabic liquids \**ḹ* in anteconsonantal position Neogr. \**ḹ*C \**r̄*C (§6)

§3. The consonantal liquids \**L*, preserved as such in most languages, are relatively unproblematic with the following minor exceptions:

- (a) In Indo-Iranian, an external confirmation for PIE \**l* or PIE \**r* is always required, owing to the collision and mixture of dialects discussed above.
- (b) The syllabic script of Linear B distinguishes only one liquid (DMycGr. 44) transliterated /*r*/, though /*l*/ could be used as well. For the reasons stated by Ventris and Chadwick, it is highly improbable that this reflects the phonetic reality of Old

<sup>519</sup> In this study, only a limited portion of the data can be discussed and numerous examples of PIE \**h* wait for their discovery and reconstruction.

<sup>520</sup> There are examples in which both RV. *r* and RV. *l* are attested for one and the same word: RV. *sahá mūra-* (a.) ‘mit der Wurzel’ (WbRV. 1498) and AV. *múra-* (n.) ‘Wurzel’ (WbRV. 1053) versus RV. *sahá mūla-* (a.) ‘mit der Wurzel’ (WbRV. 1498) and RV. *mūla-* (n.) ‘Wurzel’ (WbRV. 1054).

Mycenean.<sup>521</sup> From the comparative point of view, however, the result is similar to a sound law implying a collision (i.e. LinB. /r/ requires an outside confirmation for an original PIE \*l or PIE \*r).

§4. The most relevant issues concerning the syllabic liquids ʎ in (C)ʎC are:<sup>522</sup>

(a) The existence of the short syllabic liquids is implied by numerous reflexes of PIE \*ʎ and \*r̥, which are directly continued in Indo-Iranian. As typical examples one can quote:

1. PIE \*pʎth- ‘breit’ (with PIE \*ʎ)

RV. pṛthú-	(a.) ‘breit, weit, sich austreckend’ (WbRV. 857)
gAv. pərəθu-	(a.) ‘weit, breit’ (AIWb. 892-3)
Gr. πλέθοο-	(n.) ‘Längen- und Flächenmaß’ (GEW 2:55)
Gr. πλεθούζω	(pr.) ‘sich über etw. verbreiten’ (GEW 2:555)
LAv. fraθah-	(n.) ‘Breite’ (AIWb. 983)

2. PIE \*pṛt(h)- ‘Kampf : kämpfen’ (with PIE \*r̥)

RV. pṛt-	(f.) ‘Kampf, Streit’ (WbRV. 854, pṛtsú [pʎL])
LAv. pəṛət-	(f.) ‘Kampf, Streit’ (AIWb. 891, pəṛətasča)
Gr. πέρθω	(pr.) ‘zerstören, verwüsten’ (GEW 2:512)
Gr. ποτλί πορθο-	(a.) ‘Städte zerstörend’ (GEW 2:512)

The loss of vowels PIE \*e, o, i, u in Indo-Iranian is excluded by the sound laws stating their preservation. Furthermore, PIE \*a (in diphonemic PIE \*h̥a or PIE \*ah̥) could not have been lost either, owing to the converse of Fortunatov’s Law II (no Av. †ξ). Hence the Indo-Iranian liquid (RV. r̥, Av. əṛ) had to be syllabic already in Proto-Indo-European, and it was thus an original feature of the proto-language.

(b) The Neogrammarian attempt to generalize the syllabic liquids beyond Indo-Iranian has caused insurmountable difficulties. Osthoff’s and Brugmann’s idea that PIE \*ʎ and \*r̥ developed characteristic svarabhakti vowels in non-Aryan languages is fraught with ambiguity,<sup>523</sup> for it is always possible that the svarabhakti vowels reflect original PIE vowels, as indicated in:<sup>524</sup>

Lat. or ← PIE *ol	Go. ul ← PIE *ul	Gr. αλ ← PIE *h̥ael v *eah̥l etc.
Lat. or ← PIE *or	Go. ur ← PIE *ur <sup>525</sup>	Gr. αο ← PIE *h̥aer v *eah̥r etc.

<sup>521</sup> See Ventris & Chadwick (DMycGr. 69): “If the Mycenaeans confused the *sounds* of l and r, then their descendants could never have separated them again correctly.”

<sup>522</sup> For the syllabic r̥ and ʎ, see Allen (1953:62).

<sup>523</sup> See, for instance, Brugmann (Grundr<sup>2</sup> 1:451): “In den nichtarischen idg. Sprachen wurden, wie bei den sonantischen Nasalen (§ 430), in allen Stellungen volle Vocale aus r̥ und ʎ entwickelt.”

<sup>524</sup> As for Latin, the ambiguity was recognized by Brugmann (Grundr<sup>2</sup> 1:466): “Da im Lat. uridg. or und r̥ in or und uridg. ol, el, l̥ in ol zusammengefallen sind (§ 121, 2 S. 121), so ist die Zurückführung auf r̥, l̥ zuweilen unsicher.” Naturally the same applies to all svarabhakti vowels in general.

<sup>525</sup> Brugmann (Grundr<sup>2</sup> 1:453) was aware of the more widespread distribution of PIE \*u than just Proto-Germanic: “Im Arm., Griech., Ital., Kelt. und Balt.-Slav. ist der aus uridg. r̥, ʎ entwickelte Vollvokal zuweilen u, und es scheint, dass der specielle Anlass zu dieser unregelmässigen Vocalenfaltung in der Natur der benachbarten Laute zu suchen ist, durch die der schwache

(c) The reconstruction of PIE \* $\text{h}_2$ , an obstruent C, has resulted in the emergence of sequences \* $\text{h}_2\text{LC}$  and \* $\text{C}_2\text{h}_2$  (shape  $\text{C}_2\text{C}$ ) for the proto-forms of the “non-Aryan” languages. This decisive feature enables us to determine the true outcomes of  $\text{C}_2\text{C}$  based on the measurable features of the data. Thus, for instance, in SUBSET I of Fortunatov’s Law II, the outcomes of  $\text{C}_2\text{C}$  (in  $\text{h}_2\text{C}$ ) for non-Aryan languages are:

PIE \* $\text{u}_2\text{eah}_2\text{lt}$ - → OHG. wald, OInd. vāṭa-, etc.  
 PIE \* $\text{keah}_2\text{rs}$ - → Li. kařš-, OInd. káṣa-, Lat. carro-, etc.

The prototypes predicted by the Neogrammarian theory (PGerm.  $\text{w}_2\text{ō}^{(b)}\text{ul}_2\text{p}$ -, PLi.  $\text{ka}^{(b)}\text{ir}_2\text{s}$ - PItal.  $\text{ca}^{(b)}\text{orso}$ -) do not exist, since  $\text{C}_2\text{C}$   $\text{C}_2\text{C}$  did not develop svarabhakti vowels. Instead the development of PIE \* $\text{l}$   $\text{r}$  was identical to that of Indo-Iranian in all languages (i.e. PIE \* $\text{l}$   $\text{r}$  remained syllabic until PIE \* $\text{h}_2$  was lost, after which they turned into respective consonants):

PIE \* $\text{l}$  → RV.  $\text{l}/\text{l}$ , Li.  $\text{l}$  (← \* $\text{l}$ ), Lat.  $\text{l}$  (← \* $\text{l}$ ), Go.  $\text{l}$  (← \* $\text{l}$ ), etc. (in  $\text{h}_2\text{C}$ )  
 PIE \* $\text{r}$  → RV.  $\text{r}/\text{r}$ , Li.  $\text{r}$  (← \* $\text{r}$ ), Lat.  $\text{r}$  (← \* $\text{r}$ ), Go.  $\text{r}$  (← \* $\text{r}$ ), etc. (in  $\text{h}_2\text{C}$ )

§5. Neogr. \* $\text{l}$  and \* $\text{r}^r$ , the syllabic liquids in antevocalic position  $\text{C}_2\text{L}^r\text{V}$ , represent PIE  $\text{C}_2\text{h}_2\text{V}$ . As regards this, it is important to note the following central issues:

(a) The series  $\text{L}^r$  was initially proposed by Osthoff after it turned out that the svarabhakti vowels appeared in antevocalic position as well. Brugmann and Osthoff handled the situation of the context-free syllabic liquids by postulating Neogr. \* $\text{l}$  and \* $\text{r}^r$  before a vowel with the indexed geminates \* $\text{l}^r$  added to restore the consonantal environment. For Sanskrit the assumed svarabhakti vowel was OInd. u (= Av. a):

“Dagegen scheint sich aus  $\text{r}$  vor Sonanten (in welchem Fall  $\text{r}$  als consonantischer Übergangslaut gesprochen) schon in urar. Zeit ein Vollvokal entwickelt zu haben, z. B. ai. purá av. para.” (Grundr<sup>2</sup> 1:451)

According to Brugmann (Grundr<sup>2</sup> 1:451-2), the antevocalic syllabic liquids developed identically with Neogr. \* $\text{l}$  and \* $\text{r}$  in non-Aryan languages (i.e. they yielded the usual svarabhakti vowels Gr.  $\alpha$ , Go u, etc.):

“Die Vocalenfaltung fand in allen diesen Sprachen regelmässig vor  $\text{r}$ ,  $\text{l}$  statt, wenn diese antesonantisch standen, wie gr. βαρῦ-ς got. kauru-s (ai. gurú-ṣ) aus uridg. \* $\text{g}^u\text{r}^r\text{ú-s}$ .”

(b) In the laryngeal theory, Neogr. \* $\text{l}$  and \* $\text{r}^r$  have been replaced with \* $\text{C}_2\text{h}_2\text{V}$  and \* $\text{C}_2\text{r}^r\text{h}_2\text{V}$  where x expresses the colouring of the laryngeal. Accordingly, it is assumed that the colouring of the laryngeal contaminates the emerging svarabhakti vowel PIE \* $\text{C}_2\text{h}_2\text{V} \rightarrow \text{IE CV}_x\text{LV}$ -. Some examples for the existing laryngeal ‘ $\text{h}_2$ ’ would be:

\* $\text{g}^u\text{h}_2\text{V} \rightarrow \text{Gr. } \beta\alpha\lambda\text{-}$  (LT \* $\text{C}_2\text{h}_2\text{V}$ )    \* $\text{g}^u\text{r}^r\text{h}_2\text{u} \rightarrow \text{Gr. } \beta\alpha\rho\acute{\upsilon}\text{-}$  ( $\equiv$  LT \* $\text{C}_2\text{r}^r\text{h}_2\text{V}$ ).

While on paper the explanation may escape the Neogrammarian contradiction of syllabic liquids in a non-syllabic position, and thus it can at least in theory be used in

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unsilbische Stimmgleitlaut grossenteils wohl schon in uridg. Zeit die u-Färbung erhielt (§ 430 Anm. 3).” For further examples, see Brugmann (Grundr<sup>2</sup> 1:453-5).

reconstruction, as seen earlier the rule leads to non-existent prototypes without covering the attested root shapes; therefore, it is not an ideal general solution.

(c) To my knowledge, the real outcome of the sequence  $CL_hV$  was presented for the first time by Edgerton in articles (1934, 1943, 1962) that sought to generalize Sievers's Law for the liquids Neogr.  $*l$  and  $*r$ . Comparing Sievers's scansion  $i^y$  and  $u^w$  to Neogr.  $*l$  and  $*r$ , Edgerton quoted the following Rig-Vedic forms requiring three-syllabic scansion:

RV. $\acute{i}n \cdot dra-$	(m.) 'der Gott des Lichthimmels' (WbRV. 213-4) <sup>526</sup>
RV. $ru \cdot dr\acute{a}-$	(m.) 'der Vater des Maruts' (WbRV. 1174)

Edgerton's (1934:259) interpretation was correct in rejecting Grassmann's  $\acute{i}nd(a)ra-$  and  $\acute{i}rud(a)r\acute{a}-$ , because the bracketed PIIr.  $*a$  (or any other vowel in that position) could not have disappeared in Indo-Iranian. Therefore, it is the liquid that has to be syllabic, which in turn is possible only if it was originally followed by PIE  $*h$ . Thus, in order to explain the three-syllabic scansion of the Rig-Vedic meter, the following Proto-Indo-Iranian prototypes have to be reconstructed:

RV. $\acute{i}ndr\acute{a}-$ $\equiv$ PIIr. $*\acute{i}ndr_ha-$	RV. $rudr\acute{a}-$ $\equiv$ PIIr. $*rudr_h\acute{a}-$
-----------------------------------------------------------------	---------------------------------------------------------

These formulas contain the true (regular) development of liquid  $CL+ h$  before a vowel, namely:

PIE  $*CL_hV$   $*CL_haV$   $\rightarrow$  PIIr.  $*CL^hV$   $\equiv$  RVM.  $CrV$   $\rightarrow$  RV.  $CrV$ .

In other words, RV.  $\acute{i}ndura-$  does not exist, and the sequence  $CL_hV$  (in PIIr.  $*\acute{i}ndr_ha-$  etc.) does not produce 'svarabhakti u' in Sanskrit. Instead the laryngeal was lost (RV.  $\acute{i}ndr\acute{a}-$ ) and the liquid became a consonant in the vocalic environment (RV.  $\acute{i}ndra-$ ).<sup>527</sup> Consequently the Neogrammarian phoneme  $*L^L$

Neogr.  $*CL_\emptyset V$  ( $\equiv$  LT  $*CLHV$ )  $\rightarrow$  RV.  $CuLV$ , Gr.  $C\alpha LV$ , etc.

is not well-defined and the development noted by Edgerton should replace it in reconstruction.

§6. As for the long syllabic liquids  $\bar{L}$  (in environment  $CL_C$ ), one should observe that:

(a) The Neogrammarians assumed the phoneme Neogr.  $*\bar{r}$  from the hypothetical Sanskrit-roots (cf. OInd.  $\sqrt{p\bar{r}}$ - 'fill',  $\sqrt{t\bar{r}}$ - 'cross', etc.) and generalized the concept for Neogr.  $*\bar{l}$ .<sup>528</sup> In addition to their internal reconstruction, the long syllabic liquids were considered diphenemic by definition (Neogr.  $*\bar{l} \equiv *l_\emptyset$  and Neogr.  $*\bar{r} \equiv *r_\emptyset$ ), and

<sup>526</sup> RV.  $\acute{i}n \cdot dra-$  is derived from RV.  $\acute{i}n\acute{a}-$  (a.) 'wirksam, mächtig, stark' ("häufig von Indra", WbRV 211-2) and Lyd.  $\acute{i}n\acute{a}-$  (pret.) 'machen' (LydWb. 132, inal [3pers]). Similarly, RV.  $ru \cdot dr\acute{a}-$  (m.) 'Rudra' belongs to the root PIE  $\sqrt{lu-}$  ( $*lu-$ ,  $*leu-$ ,  $*lou-$ ; see Pyysalo 2011), which is best known for its extensions (e.g.  $\sqrt{luk-}$  (P. 687-690,  $\text{Ḥi. luk-}$  (vb1A.) 'hell werden, tagen, leuchten, zünden', HEG 2:65ff.  $\text{Ḥi. lu-uk-zi}$  [3sg]).

<sup>527</sup> The lack of 'svarabhakti' vowel is a common Indo-Iranian feature (cf. RV.  $\acute{i}ndra-$   $\equiv$  LAv.  $\acute{i}ndra-$  (m.) 'Name eines Daēva' AIWb. 367-8).

<sup>528</sup> Burrow (1979:8) adds: "[...]  $\text{t}\bar{r}\acute{n}\acute{a}-$  'crossed',  $\text{p}\bar{u}\bar{r}\acute{n}\acute{a}-$  'full';  $\text{t}\bar{r}\acute{a}s$  'across',  $\text{p}\bar{u}\bar{r}\acute{a}s$  'in front' [...]. For such roots the ancient Indian grammarians set up hypothetical weak forms with long sonant  $-\bar{r}$ -, a concept which was brought into Indo-European by Brugmann and his colleagues."

therefore they were built upon underlying forms for which the presence of schwa was never proven.

(b) In the laryngeal theory, the long syllabic liquids are represented by the rules  $Cl̥H_xC$  and  $C_r̥H_xC$ .<sup>529</sup> Regarding their interpretation in Sanskrit, one may cite Burrow's review (1949:36):

“Beginning with  $t_r̥H-$ , a perfectly regular reduced form, we must assume a development to  $tirH-$ , the vocalic  $\bar{r}$  in this position developing into a slight vowel  $r$ : whence  $tirHna > tīrṇá-$ ; similarly  $pūrṇá- < pulHnó- < p_lHnó-$ .”

(c) These early developments suggested for the sequences  $Cl̥HC$  and  $C_r̥HC$  are now contradicted by the data. The situation is manifest, for instance, in the SUBSET III of Fortunatov's Law II where the shape  $CL_hT$  appears without lengthening or intrusion of a svarabhakti vowel:

PIE  $*praht(h)-$  → Gr.  $\pi\rho\acute{\alpha}\theta o-$ , LAv.  $pə\check{s}ana-$

In other words, the outcome of  $*CL_hC$  is zero, not a (compensatory lengthened)  $v̄ddhi$  or any other vowel. Greek has instead preserved PIE  $*á$  (accented) and Avestan lost PIE  $*a$  (unaccented). Similarly, in examples such as

PIE  $*dráhk̑- : *drahk̑-$  → Gr.  $\delta\rho\acute{\alpha}\chi o-$  : RV.  $dṛṣṭá-$

Greek has preserved PIE  $*á$ , while Indo-Iranian lost PIE  $*a$  without any svarabhakti vowels emerging in the process. Thus, instead of producing long vowels (and OInd.  $i$ ,  $u$ ), PIE  $*h$  was lost in  $Cl̥_hC$  as in all other environments.

(d) According to the converse of Fortunatov's Law II, the preserved Indo-Iranian sequences  $*LT$  had no laryngeal. This is in contradiction with the early rule

Neogr.  $CL\grave{o}C$  ( $LT Cl̥H_xC$ ) → OInd.  $Ci/uLC$  vs. Gr.  $CLV:C$ , etc.

because the liquid has not been lost in RV.  $pūrṇá-$ ,  $tīrṇá-$ , etc. Therefore, as the svarabhakti vowels are not explained by the laryngeal or schwa, they have to be accounted for differently. With the extended data at hand, this does not constitute a reconstructive problem, because the svarabhakti vowels are paralleled and hence reflect the respective original vowels:

PIE  $*tāhilt̑o-$  ≡ RV.  $tīrthá-$  = Li.  $tīlta-$  = Thrac.  $\tau\iota\lambda\tau\cdot\iota\alpha-$   
 PIE  $*pulno-$  ≡ RV.  $pūrṇá-$  = ORus.  $pŭlnŭ-$  = Go.  $full-$

Since the alleged svarabhakti vowels can be proven to be original by means of comparison, the problems of the early rule  $CL\grave{o}C$  ( $LT Cl̥H_xC$ ) are fully solvable.

<sup>529</sup> On Møller's adoption of Saussure's structural analysis of long syllabic liquids, see already Møller (1880:502): “[...]  $p_lAn[o]$ - in germ.  $fulla-$ , lit.  $pilna-$  etc. = sankr.  $pūrṇá-$ .”

### 3.3.4 Neogr. \*r (consonantal trill)

§0. The consonantal trill PIE \*r was properly reconstructed already by Schleicher, who posited Paleogr. \*r (≡ Neogr. \*r ≡ PIE \*r).

§1. Brugmann's examples of Neogr. \*r included the correspondences:

(a) Neogr. \*reudh- 'rot sein' (Grundr<sup>2</sup> 1:424) for "gr. ἐρυθρό-ς lat. ruber air. ruad got. rauþ-s lit. raūda-s aksl. rūdrū ai. rudhirá-s 'rot'."

(b) Neogr. \*g<sup>h</sup>her- 'warm' (Grundr<sup>2</sup> 1:424) for "arm. ĵerm gr. θερμό-ς lat. formu-s 'warm', preuss. gorme 'Hitze' ai. gharmá-s 'Glut'."

(c) Neogr. \*trej-es 'drei' (Grundr<sup>2</sup> 1:424) for "gr. τρεῖς, alb. tre, lat. trēs, air. trī, got. þreis, lit. trīs aksl. trīje trije, ai. tráyas."

The more recent developments related to PIE \*r can be summarized as follows:

§2. As for the vocal prothesis PIE \*er- \*or-, which often appear before initial PIE \*r- in several Indo-European languages, note the following:

(a) The absence of Hittite words beginning with r- was noted already by Hrozný (1917:188<sup>6</sup>): "In den mir zugänglichen Texten findet sich kein wort, das mit r- anlauten würde."<sup>530</sup>

(b) In the laryngeal theory, this phenomenon – shared to a degree by Greek and Armenian – has been generalized into a conjecture according to which the (pre)-proto-language did not have roots beginning with PIE \*r<sup>531</sup> because the prothetic vowels reflect original laryngeals, as indicated in:

Neogr. \*er- ≡ LT \*\*H<sub>1</sub>er-

Neogr. \*or- ≡ LT \*\*H<sub>3</sub>er-

This view of prothetic vowels cannot be correct, however, for the following reasons:

1. As mentioned by Tischler (1972:269), roots \*r- without laryngeal and/or prothetic vowel exist *de facto*:

"Ein Blick in ein Wörterbuch der verschiedenen indogermanischen Einzelsprachen (ausgenommen das Griechische und Armenische, und natürlich auch das Hethitische) zeigt, welche Fülle von Wörtern mit anlautenden r- es in diesen Sprachen – und somit auch in der Grundsprache – gibt."<sup>532</sup>

2. A counterexample without a prothetic vowel is attested in Greek:

PIE \*reah<sup>ǵ</sup>- 'röten, färben, dye' (P. 854)

Gr. ῥέζω (pr.) 'dye' (Schwyzer GrGr. 1:310)

Gr. χρυσο·ρογάεσ- (a.) ' = χρυσο·βαφές' (GEW 2:647-8)

AV. rájya- (pr.) 'sich färben, sich röten, rot sein' (KEWA 3:35-6)

AV. rajaya- (cs.) 'färben, röten' (KEWA 3:35, WbRV. 1133)

<sup>530</sup> For prothetic vowels PIE \*e·ē·o·ō· before initial PIE \*r in Hittite, see Tischler (1972:267-86).

<sup>531</sup> The conjecture that there were no roots beginning with \*r in Proto-Indo-European is usually traced back to Lehmann (1951:13-17), but one may point already to Petersen's ideas dating back to 1937 (apud Tischler 1972:267).

<sup>532</sup> Note that OAnat. arC- can represent PIE r̥C with an unmarked syllabic trill, owing to the impossibility of expressing \*r̥ in cuneiform script.



3. A counterexample without a prothetic vowel exists in Anatolian:

PIE \*ruǵ- ‘Rua’

HLu. rua-	(lc.) ‘Rua-’ (CHLu. 10.9.1, NOMS. 1069, ru-w <sup>a</sup> /i-sá)
Hj. naḫi rua-	(mc.) ‘PN’ (NOMS. 843, na-ḫi-ru-ua-aš(-šša) [sgN])
Kil. ρω·ζουμερι-	(c.) ‘PN’ (Sundwall 1913:97, ρωζουμερις [sgN])
HLu. ruan	(adv.) ‘former·ly’ (CHLu. 1.1.33, rú-w <sup>a</sup> /i-na [adv.])
Kil. ρων·ζουμερι-	(c.) ‘PN’ (Sundwall 1913:97, ρων·ζουμερις [sgN])

(c) In general, when PIE \*h is not involved, the vowels before PIE \*r- belong to the prothetic vowels PIE \*e· ē· Ø· o· ō·. Whether analyzed as prefixes (PIE \*e· ē· Ø· o· ō·) <sup>533</sup> or ablaut bases of the roots (PIE \*er- ēr- r- or- ōr-), the presence of such vowels is a lexical problem, not a root constraint.

§3. Rhotacism of dental stops has been suggested for the Hieroglyphic Luwian: <sup>534</sup>

V + PIE \*t th d dh + V → HLu. VrV.

This rule is based on the internal comparison of the pairs HLu. t : HLu. r (cf. HLu. lada- ‘prosper’ : HLu. lara- ‘id.’ etc.), as well as on some external data that shows HLu. r allegedly matching a dental in the rest of the group. The establishment of such a sound law would be premature, however, as the complete external evidence contains both dental and trill extensions, indicating that the alternation depends on derivational variation instead of phonological change. Root variants with dental and trill extensions, confirmed by two witnesses, are attested for the alleged examples of Hieroglyphic Luwian rhotacism as follows:

(a) √lǵdh-, √lǵdh- ‘fruit, prosperity’ (P –)

HLu. ARHA lada-	(vb.) ‘prosper (?)’ (CHLu. 10.16.1, ARHA la-tà-ta)
Oicl. lōḏ-	(f.n.) ‘Ertrag, Frucht’ (ANetWb. 362, lōḏ [sgN])
Lyc. lada-	(c.) ‘Frau’ (Pedersen 1945:15-6, lada [sgN])
Rus. láda	(c.) ‘Gemahl(in)’ (REW 2:5, láda [sgN])
Rus. ládi-	(vb.) ‘passen, stimmen, usw.’ (LiEtWb. 328, ladit’ [inf])

The alternative extension with a trill, PIE √lǵr-, √lǵr- ‘fruit, prosperity’ (P. –), is confirmed by two witnesses in:

HLu. ARHA’ lara-	(vb.) ‘flourish’ (CHLu. 10.14.6, ARHA-’ la+ra/i-ta)
TochB. läre-	(a.) ‘beloved, dear’ (DTochB. 548)
TochB. lare-	(a.) ‘beloved, dear, friendly’ (DTochB. 548)
TochB. larañe	(m.sg.) ‘love, affliction’ (DTochB. 545)

<sup>533</sup> A rule for ‘a-prothesis’ (a counterpart of the Greek-Armenian ‘e-prothesis’) was outlined for Anatolian by Tischler (1972:271): “Das bedeutet doch wohl, daß der Vokal a überdurchschnittlich oft dann im Anlaut auftritt, wenn der erste Folgekonsonant ein r is, was für die Vermutung spricht, ursprünglich mit r- anlautende Wörter hätten einen a-Vorschlag bekommen.”

<sup>534</sup> For a more recent statement on this, see Arbeitman & Ayala 1981: “The phenomenon of rhotacism of an intervocalic dental stop is well known in Hieroglyphic Luwian.”

Rhotacism is out of question in Tocharian, where two different extensions, PIE \*lōr- and PIE \*lōdh-, are implied by the comparative method.

(b) PIE \*melit-, \*molit- ‘Honig’ (P. 723-4):

Gr. μέλιτ-	(n.) ‘Honig’ (GEW 2:200, μέλι [N], μέλιτος [G])
Ĥi. mēlit-	(n.) ‘Honig’ (HEG 2:207, mi-li-it [sgN])
CLu. malita-	(n.) ‘Honig’ (DLL 66, ma-al-li-(i)-ta-a-ti [sgI])

The parallel extension with a trill has been preserved in:

PIE \*melir- \*molir- ‘Honig’

Arm. meṛ-	(sb.) ‘Honig’ (ArmGr. 1:473, meṛ [sgN])
HLu. maliri-mi-	(pt.a.) ‘honeyed’ (CHLu. 4.4.1., ma-li-ri+i-mi-i-sá)

Rhotacism being excluded in Armenian, the trill is original in Hieroglyphic Luwian.

(c) PIE \*ped- \*pod- ‘Fuß’ (P. 790-792)

HLu. pada-	(c.) ‘foot’ (CHLu. 1.1.22, (“PES”)pa-tà-za [plD])
CLu. pada-	(c.) ‘Fuß’ (DLL 81, pa-a-ta-an-za [plD])
Ĥi. pada-	(c.) ‘foot’ (CHD P:231f., pa-ta-a-an [plG])

An original PIE \*r is externally paralleled for HLu. para- ‘foot’ in

PIE \*per- \*por- ‘Fuß, Feder : treiben, jagen, folgen; eilig’:

HLu. para-	(sb.) ‘foot’ (CHLu. 10.14.9, (“PES”)pa+ra/i-za)
CLu. para-	(vb.) ‘treiben, jagen’ (DLL. 77, pa-ra-ad-du [3sg])
RV. purvā parā-	(a.) ‘nachfolgend’ (WbRV. 846-7)
Lat. pro-pero-	(a.) ‘eilig’ (WH 2:372-3, properus [sgN])
OCS. pero	(n.) ‘Feder, Schwinge’ (Sadnik √639)

(d) The root meaning ‘essen, fressen’ is widely attested in Anatolian:

Ĥi. ed-	(vb.) ‘essen’ (HEG 1:117-119, e-te-ir [3pl])
Ĥi. ad-	(vb.) ‘essen, fressen’ (HEG 1:91, a-da-an-zi [3pl])
Pal. ad-	(vb.) ‘essen’ (DPal. 52, a-ta-a-an-ti [3pl])
HLu. ARHA ada-	(vb.) ‘eat up’ (CHLu. 10.14.33 ARHA á-tà-tu-u)

In addition, a stem with alleged rhotacism appears in

HLu. aru-	(vb.) ‘to eat’ (10.11.16, (‘EDERE’)á-ru-na).
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However, in terms of the latter, one must observe the isogloss:

PIE \*su·er- \*su·or- \*su·ōr- ‘sweet’

TochA. swār	(a.) ‘dulcis’ (Poucha 389, swār [m.sgN])
TochB. swāre	(a.) ‘sweet’ (DTochB. 725-6, swāre)
TochB. sware-	(a.) ‘sweet’ (DTochB. 726, swarem)
LAv. xʷarəzišta-	(sup.) ‘der süsseste, schmackhafteste’ (AIWb. 1874)
TochA. swārsa-	(M.) ‘se plaire à, jouir’ (LeTokh. 447, swārsantrā [3pl])
TochB. swarauññe	(sb.) ‘sweetness’ (DTochB. 726, swarauññe)

This root can be analyzed as \*su·or- (see the parallel PIE \*su·ḥad- ‘sweet = \*well+eat’, P. 1039-40, \*sūād-) and directly compared to HLu. aru- (cf. especially TochB. sw·arau·ññe), originally with PIE \*r.

(e) In general, an original PIE \*r is a more economical solution in terms of postulated sound laws. It implies twice the number of correspondences (i.e. both those with dental and trill) and it does not violate the principle of regularity of sound change with double outcomes (HLu. lada- : HLu. lara-). Simultaneously, parallels can be provided for the alleged examples of rhotacism in Hieroglyphic Luwian.<sup>535</sup> All these being the case, I recommend refraining from further use of the sound law until a comprehensive check has been accomplished.

§4. Hübschmann (ArmGr. 420) mentions a questionable sound law PIE \*sr- → Arm. ř, which was accepted, however, by Brugmann (Grundr<sup>2</sup> 1:432) and others later on. Though the sound change PIE \*rs → Arm. ř is certain, there are clear counterexamples of the alleged development \*sr- → Arm. ř (Hübschmann, ArmGr. 409), including:

PIE \*hasr- ‘Blut, Saft’ (P. 343)

OLat. aser	(n.) ‘Blut’ (WH 1:72)
Arm. arean-	(sb.obl.) ‘Blut’ (ArmGr. 1:424)
Arm. ariun	(sb.) ‘Blut’ (ArmGr. 1:424)
Latv. asin-	(.) ‘Blut’ (WH 1:72, Latv. asins [sgN], asinis [plN])

Since the assumption PIE \*sr- → Arm. ř is not consistent with the material, it is recommended to replace it with the secure rule PIE \*sr → Arm. r, which is backed up by means of comparison.

### 3.3.5 Neogr. \*ṛ (anteconsonantal syllabic trill)

§0. PIE \*ṛ, the vocalic allophone of PIE \*r in anteconsonantal position, was postulated for the Proto-Indo-European by Osthoff (= Neogr. \*ṛ). Osthoff’s part is correctly recognized by Szemerényi (1996:46):

“Osthoff was the first, in 1876, to put forward the idea that, as the relationship of the Skt. dat. s. *pítre* ‘to the father’ to the loc. pl. *pitṛṣu* suggested, the same r-sound could function at one time as a consonant, at another (between consonants) as a vowel; further, that this syllabic or sonant ṛ was retained only in Aryan and that there was an obvious correspondence between it and the sequence *qa* in Gr. *πατῆρα*.”<sup>536</sup>

§1. Brugmann (Grundr<sup>2</sup> 1:452) developed Osthoff’s initiative into a full theory summarizing the “Regelmässige Vertretung des uridg. ṛ” as follows:

<sup>535</sup> Thus, for instance, the endings HLu. ·ra [3sg], ·ri [3sg] do not necessarily reflect Ḥi. ·ta [3sg], ·zi [3sg] as much as the medium PIE \*·ro \*·ri and so forth.

<sup>536</sup> Osthoff (1876:52) writes: “Das griech. *qa* in *πατῆρα* [...] stelle ich unmittelbar dem sanskr. ṛ von *pitṛ-ṣu* gleich.”

Uridg. Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.	
ṛ+C	ṛ	ər	ar ra	αρ ρα	ri	or	ri	ur ru	īř	rī, rū

§2. As the general problems of the Neogrammarian reconstruction have already been discussed, a survey of the most critical points will suffice here:

(a) Fortunatov's Law II and Sievers-Edgerton's Law for liquids contain provable counterexamples of syllabic \*ṛ in PIE \*h<sub>1</sub>rC \*(C)r<sub>h</sub>C \*(C)r<sub>h</sub>V not producing svarabhakti vowels (e.g. Gr. αρ, OInd. ur, Li. ir, Lat. or, OIr. ri, etc.). Instead, PIE \*ṛ turns into simple PIE \*r after the loss of PIE \*h.

(b) That Neogr. \*ṛ (= PIE \*ṛ) does not produce the svarabhakti vowels IE a e i o u is not a major problem because the items can be comparatively verified by at least two witnesses (Fick's Rule).

The truth of these points can be seen from the comparative treatment of Brugmann's examples.

§3. Brugmann (Grundr<sup>2</sup> 1:455) reconstructed \*m<sub>1</sub>- 'sterben' for "ai. mṛtá- 'gestorben' mṛti-š 'Tod', Arm. mard 'Mensch', lat. mortuo-s mors, ahd. mord 'Mord', lit. mirti-s aksl. sū-mrīti 'Tod' lit. mīrti 'sterben'; av. miryeite 'er stirbt' für māryeite, lat. morior (vgl. § 514), lit. musió-miris mūs-miris, Gen. mirio, 'Fliegenpilz' ('Fliegentöter')." This material contains several derivational variants, each confirmed by two branches:

(a) PIE \*m<sub>1</sub>rto- 'gestorben'. An original syllabic PIE \*ṛ is confirmed by the absence of Av. ṣ (the converse of Fortunatov's Law II) in:

RV. mṛtá-	(pt.) 'der Todte' (WbRV. 1054)
LAv. mərəta-	(pt.) 'gestorben' (AIWb. 1142, mərətō [sgN])
gAv. a mərəta tāt-	(f.) 'Unsterblichkeit, Ewigkeit' (AIWb. 143)

(b) Arm. mard- (sb.) 'Mensch' (EDArm. 452-3). Here the PCelt. \*a = Arm. a and Indo-Iranian ṣ/ṭ confirm PIE \*meahrto- (Fortunatov's Law II):

OIr. mart-	(m.) 'tuerie, massacre, victime' (LEIA M-21)
gAv. maṣa-	(m.) 'Sterblicher, Mensch' (AIWb. 1164)
gAv. a məṣa-	(a.) 'unsterblich' (AIWb. 145-6)
AV. maṣa maṣa-	(m.) 'ein bestimmter Dämon' (KEWA 2:554)
OInd. maṣa ka-	(m.) 'Leichnam' (KEWA 2:553)

(c) PIE \*mort- with an original PIE \*o is confirmed by numerous parallels:

Lat. mort-	(f.) 'Tod, Erlöschen' (WH 2:112).
Gr. μορτό-	(a.) 'ἄνθρωπος, θηντός, Hes.' (LSJ. 1147)
RV. mártā-	(m.) 'Sterblicher, Mensch' (WbRV. 1008-9)
gAv. marəta-	(m.) 'Sterblicher, Mensch' (AIWb. 1148)
Lat. mortāli-	(a.) 'sterblich' (c.) 'Sterblicher' (WH 2:112)

The absence of Av. ṣ and RV. ṣ implies a formation without a laryngeal (the converse of Fortunatov's Law II).

(d) PIE \*murto- with an original PIE \*u (cf. OHG. mord) is confirmed by Germanic and Iranian, which preserve the root in PIE \*u:

OEng. morþ-	(m.) ‘death, destruction, murder’ (ASaxD. 698)
OIcl. morð-	(n.) ‘Tot, Mord’ (ANEtWb. 392)
Pahl. murtak-	(a.) ‘dead’ (sb.pl.) ‘the dead’ (MPahl. 2:134)

PIE \*mur- ‘sterben’, the unextended root, is preserved in Indo-Iranian:

RV. mur-	(ao.) ‘sterben’ (WbRV. 1054, muriya [opt1sg])
RV. múr-	(m.) ‘Verderber, Feind’ (WbRV. 1051, múras)
Pahl. mur-	(vb.) ‘to die’ (MPahl. 2:134, murtan [inf.])

(e) Li. mirtì-s (OCS. sŭmrĭtĭ ‘Tod’). Within this group, two root variants can be reconstructed, both of which are paralleled by Iranian.<sup>537</sup> First, the root PIE \*mir- with a short vowel is confirmed by two branches in:

Li. mīr-	(vb.) ‘sterben’ (LiEtWb. 457-9, mīrti [inf.])
OCS. mĭro-	(pr.) ‘sterben, erschöpft sein’ (Sadnik √500, mĭrŏ [1sg])
LAv. ava.mīrya-	(pr.) ‘sterben, umkommen’ (AIWb. 1142, avamiryete)
LAv. fra.mīrya-	(pr.) ‘sterben, umkommen’ (AIWb. 1142) <sup>538</sup>
Latv. mirinā-	(vb.) ‘sterben lassen’ (LiEtWb. 458, mirināt)

In addition, the root PIE \*máḥir- (with PIr. \*ī, PBSl. \*ī = PIE \*áḥi) is confirmed by two branches in:

ModPers. mīra-	(vb.) ‘sterben’ (Güntert 1916:95, mīrad [3sg])
OCS. u.mīra-	(vb.) ‘sterben, im Sterben liegen’ (Sadnik √500, umirati)
Li. mġri-	(2) ‘Sterben, Tod, Beerdigung’ (LiEtWb. 457)
LAv. ava.mīrya-	(pr.) ‘sterben, umkommen’ (AIWb. 1142, ava.mīryāite)

(f) OLat. morĭ- ‘sterben’ (WH 2:112, OLat. morĭrĭ [inf.]) is paralleled in

PIE \*mori-(Σ)-:

Ḥi. mari-	(vb1.) ‘zerstückeln, -kleinern’ (HEG 2:129, mar-ri-it-ta)
Gr. μόρτο-	(a.) ‘of burial’ (LSJ. 1146)
OCS. iz.morĭ-	(vb.) ‘töten’ (Sadnik √500, izmorĭti [inf.])
Pal. mariš-	(vb2.) ‘zerstückeln’ (?) (Carrub. 64, ma-ri-iš-ši [3sg])

§4. Brugmann (Grundr<sup>2</sup> 1:455) reconstructed Neogr. \*bhṛti- for “ai. bhṛtī-ṣ ‘Tragen, Pflege, Unterhalt’, lat. fors, forte, air. brith ‘Tragen’, got. ga-baurþs ahd. gi-burt ‘Geburt’.” Here the following correspondences are secured by comparison:

(a) Neogr. \*bhṛti-, the zero-grade root, is only preserved in Indo-Iranian:

RV. bhṛtī-	(f.) ‘Pflege, Unterhalt, usw.’ (WbRV. 964)
LAv. aš.bərəti-	(a.) ‘reichliche Darbietung’ (AIWb. 264)

<sup>537</sup> An \*e/o-grade root has possibly been preserved in LAv. mōir-ōs- (AIWb. 1176), if the form belongs here. Thus Bartholomae’s suggestion (“Vermutlich aus mahrkūš-verderbt”) is not necessary.

<sup>538</sup> Brugmann (Grundr<sup>2</sup> 1:835) backs up Bartholomae’s reconstruction by writing “airy wurde iry, z. B. miryeite, s. § 504,3”. However, this would be the only example of such a change and ultimately unnecessary owing to the direct parallelism of ‘i-vocalisms’ (Fick’s Rule).

Despite the lack of direct parallels, an original syllabic resonant PIE \*ɾ is certain in the absence of Av. § (the converse of Fortunatov's Law II).

(b) PIE \*bhort-, an \*o-grade, is confirmed by the identity of vocalisms in:

Lat. fort-	(f.) 'blinder Zufall, Ungefähr' (WH 1:534, fors feret)
Gr. φόρτο-	(m.) 'Last, Ladung' (GEW 2:1004, φόρτος [sgN])
Gr. φορτί-	(f.) 'Lastschiff' (GEW 2:1004, φορτίς [sgN])
Lat. fortunā-	(f.) 'Zufall, Geschick, (Un)Glück' (WH 1:534)

Owing to the common PIE \*o, a syllabic resonant Neogr. \*ɾ is unnecessary for Latin (Occam's razor).

(c) Neogr. \*bhri-, the \*i-extension of the zero-grade root PIE \*bhr-, is confirmed by two witnesses:

RV. babhrí-	(a.) 'tragend' (WbRV. 899)
RV. ní (...) bhri ya-	(pr.P.) 'herabkommen von [Abl.]' (WbRV. 960)
OIr. brith-	(vn.f.) 'fait de porter' (LEIA B-86-87, brith)

An original PIE \*i is required by both Celtic and Sanskrit, and Neogr. \*ɾ is not necessary for Celtic.

(d) OHG. gi ·burt (f.) 'birth' has an original PIE \*u implied by three subgroups:

LAv. fra ·bavar-	(pf.) 'zu-, übertragen, bringen' (AIWb. 490, frabavara)
Pahl. bur-	(vb.) 'carry, bring, bear, procure, remove' (MPahl. 2:50)
Lat. fūr-	(m.) 'Dieb' (WH 1:569)
Go. ga ·baurþ-	(f.) 'birth, descent, race' (GoEtD. 134)
Lat. fūrti-	(adv.) 'diebischerweise, heimlich' (WH 1:569, fūrtim)

Neogr. \*ɾ is unmotivated in the explanation of Germanic vocalism, because two other subgroups require a genuine PIE \*u as well.

§5. Brugmann (Grundr<sup>2</sup> 1:462, 464) reconstructed Neogr. \*ɾk̄p̄o- for "Arm. arj 'Bär' : ai. f̄k̄ṣa-s, gr. ἄρκτο-ς." This example is of particular interest because the Old Anatolian laryngeal has resulted in an upgrade of the reconstruction traditionally based on syllabic sonants:

√hart ·Σ- 'Bär; 'verletzend' (HEG 1:188-9)

Hi. ḥartaga-	(c.) 'ein Raubtier' (HHand. 44, ḥar-tág-ga-aš [sgN])
RV. f̄k̄ṣa-	(m.) 'der Bär' (a.) 'verletzend' (WbRV. 277)
LAv. arša-	(m.) 'Bär' (AIWb. 203, aršō [sgN])
Gr. ἄρκτο-	(m.) 'Bär' (f.) 'Bärin' (GEW 1:141-2, ἄρκτος [sgN])

For this correspondence set, \*h<sub>2</sub> (= PIE \*h<sub>2</sub>ae) is now reconstructed in the laryngeal theory instead of the elimination of Indo-European /a/ by a secondary svarabhakti vowel emerging from Neogr. \*ɾ. By way of generalization, PIE \*h̄ can also be reconstructed for the isoglosses without a direct Old Anatolian parallel.

§6. Brugmann (Grundr<sup>2</sup> 1:462) reconstructed Neogr. \*r̥to- for “Arm. ardar ‘gerecht’ : ai. r̥tá-s ‘passend, recht’.” Owing to Arm. a = Gr. α and Av. § (Fortunatov’s Law II), PIE \*h̥ (i.e. a laryngeal root) is postulated:

PIE \*h̥art- ‘wahr, recht, usw.’

gAv. aša-	(n.) ‘Wahrheit’ (AIWb. 229-238)
Gr. ἄρτιο-	(a.) ‘angemessen, richtig, bereit’ (GEW 2:155)
Gr. ἄρσιο-	(a.) ‘just, fair’ (IE&IE 710, Hes. ἄρσιον : δίκαιον)

§7. Brugmann (Grundr<sup>2</sup> 1:462) reconstructed Neogr. \*r̥gi-ṛjo- ‘Adler’ for “Arm. arciv, arcui ‘Adler’ : ai. r̥jipyá- ‘sich streckend, im Flug ausgreifend’.” The unextended root is now attested in Old Anatolian, confirming the laryngeal in initial position:

PIE \*h̥aor- ‘Adler’ (P. 325-6)

H̥i. h̥ara-	(c.) ‘Adler’ (HEG 1:170f., h̥a-a-ra-aš [sgN])
Pal. h̥ara-	(c.) ‘Adler’ (?) (DPal. 54, h̥a-ra-a-aš [sgN])

The nasal extension has been built on this, as indicated in:

PIE \*h̥aron, \*h̥arn- ‘Adler, Aar, Vogel’

H̥i. h̥aran-	(c.obl.) ‘Adler’ (HEG 1:170f., h̥a-a-ra-na-an [sgA])
Go. aran-	(m.) ‘Aar, Adler’ (GoEtD. 40, arans [plN])
CLu. h̥arani-	(c.) a bird’ (HEG 1:170f., h̥ar-ra-ni-en-za)
H̥i. h̥arani-	(c.) ‘ein Orakelvogel’ (EHS 222, h̥ar-ra-ni-iš [sgN])
Gr. ὄρνεο-	(n.) ‘Vogel’ (GEW 2:421-2, ὄρνεον)

PIE \*h̥arg̃i- ‘Adler’ (P. 854-5), an alternative extension, appears in:

Maced. ὄργιό-πουδ-	(m.) = ‘Gr. ἀετός’ (LSJ 235, ὄργιόπους [sgN])
OInd. r̥ji-ṛya-	(a.) ‘BW von šyená- Adler, Falke.’ (Beitr. 2:827)
LAv. ərəzi-ṛya-	(m.) ‘Adler’ (AIWb. 354)
Arm. arciv-	(sb.) ‘Adler : eagle’ (EtDiArm. 139)
Arm. arcui-	(sb.) ‘Adler : eagle’ (EtDiArm. 139)

Maced. ὄ = Arm. a reflects PIE \*a attached to PIE \*h̥, not a svarabhakti vowel emerging from Neogr. \*r̥.

§8. Brugmann (Grundr<sup>2</sup> 1:465) reconstructed “Alb. krimp (krimb-i) ‘Wurm’ : ai. k̥r̥mi-š air. cruim nkymr. pryf ‘Wurm’ (urkelt. k̥<sup>u</sup>rimi-s) lit. kirmélė ‘Wurm’.” (P. 649) (a) No evidence for the development Neogr. \*r̥ → OIr. ri, Alb. ri is available because Neogr. \*k̥<sup>u</sup>rim- ‘Wurm’ appears in several branches, including Indo-Iranian:

OInd. k̥rimi-	(m.) ‘Wurm, Made’ (EWA1:394)
ModCymr. pryf-	(.) ‘ver : Wurm’ (LEIA C-252, OIr. cruim)
Alb. krimb-	(m.) ‘worm’ (AlbEtD. 197, krimb [sg], krimba [pl])

(b) The development Neogr. \*r̥ → BSl. ir did not occur either, since the Balto-Slavic /i/ is also attested in Indo-Iranian (Fick’s Rule):

ModPers. kirm-	(sb.) ‘Wurm’ (Güntert 1916:95, REW 3:318)
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Li. kirmì-	(m.f.) ‘Wurm, Schlange’ (LiEtWb. 257, kirmìs [sgN])
Latv. cirimi-	(m.) ‘Wurm, Schlange’ (LiEtWb. 257, cirimis [sgN])
ORus. čīrvī-	(m.) ‘Wurm’ (REW 2:318)
Rus. červ’-	(m.) ‘Wurm’ (REW 3:318)
OCS. čīrvī-	(m.) ‘Wurm’ (Sadnik √128)

§9. Brugmann (Grundr<sup>2</sup> 1:470) reconstructed Neogr. \*t̥rn- for “Go. þaurnu-s, ahd. dorn as. thorn, ags. ðorn, aisl. þorn ‘Dorn’ : ai. t̥r̥na-m ‘Grashalm’, aksl. trīnū ‘Dorn’.” Despite this, there are several comparatively attested roots in the data:

(a) The Germanic forms belong to root PIE √tur with a common Indo-European \*u confirmed by two witnesses:

RV. túr-	(a.) ‘(durch) vordringend’ (WbRV. 541, túram [sgA])
OIcl. þura-	(f.) ‘Pfeil’ (Beitr. 2:479,956)
RV. turaya-	(cs.) ‘kräftig vordringen’ (WbRV. 541, turayante [3pl])
Go. þaurnu-	(m.) ‘thorn (plant)’ (GoEtD. 357)

(b) OCS. trīnū- (m.) ‘Dorn’ (Sadnik √998) is derived from an unextended root

PIE √tir- ‘reiben, usw.’, which is also supported by two witnesses:

OCS. tīro-	(vb.) ‘reiben’ (Sadnik √992, tīrō [1sg])
AV. tilá-	(m.) ‘Sesamum indicum’ (KEWA 1:504, tiláh [sgN])
OCS. prē-tira-	(vb.) ‘(zer)sägen’ (Sadnik √992, prētirati [inf.])
AV. tiryà-	(a.) ‘aus Sesamkörner bereitet’ (KEWA 1:504)
AV. tailá-	(n.) ‘Sesamöl, Öl’ (KEWA 1:526, tailám [sgNA])

PIE \*i (OCS. tīr-, AV. til-) has ablaut variants OCS. √tir- and AV. √tail-, which confirm the glide beyond doubt.

(c) The third root variant PIE √tern- (ablaut PIE \*trn- \*tern- \*torn- \*tērn- \*tōrn-) is also externally confirmed by two witnesses:

RV. t̥r̥na-	(n.) ‘grass’ (MonWil. 453)
Khot. tarra-	(sb.) ‘Gras’ (KEWA 1:522)
OInd. tār̥na	(a.) ‘made of grass’ (MonWil. 444)
Gr. τέρνακ-	(c.) ‘τῆς κάκτου τοῦ φυτοῦ καυλόν’ (GEW 2:881)

§10. Brugmann (Grundr<sup>2</sup> 1:470) posited Neogr. \*k̥rn- for “Got. haurn ahd. horn ‘Horn’ : ai. śr̥nga-m ‘Horn’ [...] gr. κάρνο-ς ‘Hornvieh’.” Instead of a uniform root with Neogr. \*r̥, two independent roots are confirmed:

(a) OHG. horn ← PIE \*u (not from Neogr. \*r̥) is proven by a root with derivates in four branches:

Gr. κύρω	(pr.) ‘stoßen, erreichen, treffen, eintreffen’ (GEW 2:56)
Lat. curi-	(f.) ‘Lanze’ (WH 1:315)
Gr. κυρίω	(pr.) ‘mit den Hörner stoßen’ (GEW 2:54)
Gr. κύρνα-	(n.pl.) ‘cornus mas’ (Hes. κύρνα · κρανία, LSJ. 1014)
Go. haurn-	(n.) ‘κέρας = Horn’ (GoEtD. 180)
HLu. surni-	(n.) ‘horn’ (CHLu. 11.1.f36, (“CORNU”)sù +ra/i-ni)



(b) Brugmann's comparison of the items (cf. P. 574-7)

RV. <i>śńga-</i>	(n.) 'Horn' (WbRV. 1412)
Gr. <i>κάρνο-</i>	(m.) 'βόσκημα, πρόβατον' (GEW 1:790)

remains possible since it is possible to reconstruct RV. *ś* = Neogr. *khñn-* ← PIE *\*k̑h̑rn-* where PIE *\*aḥ* is confirmed by a common Indo-European /a/ in PIE *\*k̑eaḥr-*:

Hom. <i>κάρ-</i>	(n.) 'Kopf' (LSJ. 877, GEW 1:784, <i>κάρ καρός</i> )
LAv. <i>urvī-sara-</i>	(a.) 'mit spitz zulaudendem Kopf' (AIWb. 1546)

No example of Neogr. *\*ṛ* → Gr. *αρ* is available, however.

§11. Brugmann (Grundr<sup>2</sup> 1:470) compared "Go. *fruma* 'der Erste' : gr. *πρόμο-ς* 'Forderster, Führer', zu gr. *πρόμο-ς*, umbr. *promom.*", allegedly from Neogr. *\*p̑mo-*. Based on the extended data, the comparative method implies distinct isoglosses:

(a) PIE *\*pru-* 'über – hinaus, durch – hin' (P. 810f.)

Gr. <i>πρό-τανι-</i>	(m.) 'Obmann, Prytan' (GEW 2:606)
OEng. <i>frum-</i>	(a.) 'original, first, primitive' (ASaxD. 341)
Go. <i>fruma-</i>	(sup.a.) 'der Erste' (GoEtD. 129)
Gr. <i>πρῶμνός-</i>	(a.) 'äusserst, hinterst, letzt' (GEW 2:606)
Gr. <i>δια-πρόσιον</i>	(adv.) 'weithin dringend, durchdringend' (GEW 1:386)
TochA. <i>pruccamo-</i>	(a.) 'primus, optimus' (Poucha 261)

(b) PIE *\*preaḥmo-* *\*proaḥmo-* 'Vorkämpfer, Führer'

Hom. <i>πρόμο-</i>	(m.) 'Vorkämpfer' (GEW 2:600)
Umbr. <i>promo-</i>	(adv.) 'primum' (GEW 1:588)
Gr. <i>πρόμο-</i>	(m.) 'Vorkämpfer, Führer' (GEW 1:588)
OEng. <i>fram-</i>	(a.) 'valiant, stout : strenuus' (ASaxD. 330)
Go. <i>fram-</i>	(prepD.) 'ἀπό παρόά ὑπό ἐπί' (GoEtD. 124)

The ablaut Gr. *α* : *ο* represents PIE *\*e/oaḥ*, not Neogr. *\*ṛ*.

§12. Brugmann (Grundr<sup>2</sup> 1:455) reconstructed Neogr. *\*d̑rk-* 'sehen' (P. 276) for "ai. *d̑ś-* F. 'Anblick' *d̑śtá-s* 'gesehen', gr. *δρακεῖν* 'sehen', alb. *dritë* F. 'Licht', air. *drech* F. 'Gesicht', ahd. *zoraht* as. *torht* 'hell, klar'." The comparative method implies the following bases as attested:

(a) Gr. *α* is paralleled by Celtic *a* in:

PIE *\*drah̑k-* *\*dreaḥk-* 'ansehen, blicken, usw.'

Gr. <i>ὑπό-δρα(κ)-</i>	(adv.) 'von unten her blickend' (GEW 2:972, <i>ὑπόδρα</i> )
RV. <i>upa-d̑ś-</i>	(f.) 'Anblick, Aussehen' (WbRV. 255)
Gr. <i>δρακός-</i>	(ao.) 'ansehen, blicken' (GEW 1:368, <i>δρακεῖν</i> )
MidIr. <i>air-dracht</i>	(sb.) 'spirit, phantom' (DIL. 24)
Gr. <i>ὑπό-δραξ</i>	(adv.) 'von unten her blickend' (GEW 2:972, <i>ὑπόδραξ</i> )
MidIr. <i>ar-dracht-</i>	(a.) 'solus : clair' (LEIA A-76)
OIr. <i>an-dracht-</i>	(a.) 'obscur, somber, laid' (LEIA A-76)
RV. <i>víśva-d̑śtá-</i>	(pr.) 'von allen gesehen' (WbRV. 1301)

In other words, the loss of unaccented PIE \*a resulted in the emergence of a secondary syllabic liquid in RV. √dṛś-.

(b) PIE \*h<sub>2</sub>adu- ‘glänzen; sehen’, a root beginning with a laryngeal, is attested in

√h <sub>2</sub> adu-	
AV. prādu-	(adv.) ‘in sight, forth’ (KEWA 2:377, prāduṣ [adv.])
√h <sub>2</sub> adur-	
RV. āduri-	(a.) ‘achtsam’ (WbRV. 177, ādure [sgV])
OEng. torht-	(a.) ‘bright, splendid, bright, glorious’ (ASaxD. 1003)
OSax. torht	(a.) ‘hell, klar’ (ASaxD. 1003)
OHG. zoraht-	(a.) ‘clear, evident’ (ASaxD. 1003)
√h <sub>2</sub> aduti-	
Kāth. upādútya-	(a.) ‘anzuzünden’ (EWA 1:707) <sup>539</sup>

(c) PIE \*h<sub>2</sub>adr- ‘light’, also from the root PIE √had- (cf. √had-u- above), is implied for the forms

Umbr. adro-	(a.) ‘schwarz, dunkel, finster, unheilvoll’ (WH 1:75)
Maced. ἀδραία-	(f.) ‘αἰθρία, Hes.’ (LSJ. 24) <sup>540</sup>
Alb. dritë	(f.) ‘light, luster, pupil (of an eye)’ (AlbEtD. 75)

§13. Brugmann (Grundr<sup>2</sup> 1:455) reconstructed Neogr. \*ṛ for the items “Ai. pṛchá-ti av. pərəsaiti ‘er fragt’ apers. Conj. p(a)rsātiy ‘er soll fragen’ : arm. harčanem ‘ich frage’, lat. poscō aus por[c]scō, ahd. forsca ‘Forschung, Frage’, lit. pīršti ‘für Jem. freien’, von W. prek-.” Brugmann (Grundr<sup>2</sup> 1:461) also adds “npers. pursad ‘er fragt’ [...]”. As for the formation, note that:

1. Already Wood (1912: 316f.) had suggested that that the root \*perĥ- ‘fragen’ (P. 821) is a compound of prefixes belonging to the items Lat. per, prō, etc.<sup>541</sup> Wood did not prove his segmentation, and his proposal was consequently rejected by Walde and Hoffmann (see WH 2:347). Today, however, Walde’s views have been shown to be erroneous by a parallel formation proving Wood’s segmentation:<sup>542</sup>

OHG. fors ·cō-	(pr.) ‘forschen’ (Grundr <sup>2</sup> 1:470, forscōn [inf.])
OHG. fors ·pō-	(pr.) ‘sich fragen, Überlegungen anstellen’ (Beitr. 317)

At the same time, the root morpheme PIE \*ĥ- appears both free and prefixed in:

<sup>539</sup> Note Brugmann’s Law II in \*pro ·hadus- (AV. prāduṣ) and \*upo ·hadutio- (Kāth. upādútya-) as the prefix \*upo · does not have a long variant <sup>†</sup>upō/upē.

<sup>540</sup> For Gr. αἰθρία, of unknown meaning, compare Gr. πρῶξιαιθρίαζω ‘first expose to the air’ (LSJ. 1473).

<sup>541</sup> Wood (1912) writes: “42. Posco, prex, precor, procus, etc. are referred to a root \*perĥ- ‘ask, beg’, on which see Walde<sup>2</sup> s.v. posco. I see no reason why \*perĥ- may not be an outgrowth of the root \*pere- ‘press forward, go forward’ in Lat. per, pro, portus, etc.”

<sup>542</sup> In this connection I also credit Lehmann (GoEtD. 123) for his recognition that the root is “possibly an extension of PIE [\*]per- take across”.

RV. ś-	(ao.) ‘gern, mit liebe betreiben’ (WbRV. 1227, śmasi) <sup>543</sup>
Lat. pre ·c-	(f.) ‘Gebet, Bitte’ (WH 2:346, Beitr. 560, prex [sgN])
Lat. pro ·c-	(f.) ‘bona vox’ (WH 2:346)
Go. fra ·h-	(pret.) ‘question’ (GoEtD. 122, frah [3sg])
TochB. pre ·k-	(prA.) ‘ask, question’ (DTochB. 372, preku [1sg])

Identical prefixless and prefixed formations reappear in extension PIE \*·s-:

TochA. käs-	(vb.) ‘interrogare’ (Poucha 172, käsmārā [1sg])
TochA. pra ·käs-	(prM.) ‘interrogare’ (Poucha 172, prakāsmār [1sg])
gAv. fəra ·sāh-	(f.) ‘Bitte, Wunsch, Hoffnung’ (AIWb. 1002)

2. The prefixes of the root PIE \*k̂-, which appear mostly in the short and extended forms (adding \*·s), are confirmed by two witnesses, as indicated below:

(a<sub>1</sub>) PIE \*p<sup>e</sup>/o<sup>r</sup> ·k̂ (for the prefix, cf. Lat. per ·, por ·)

TochB. par ·k-	(vb.) ‘ask, question’ (DTochB. 372, parktsi [inf.])
TochA. pār ·k-	(M.) ‘interrogare’ (Poucha 172, pārkmār [1sg])
Li. per ·ša-	(pr.) ‘jmd. ein Mädchen zufreien’ (LiEtWb. 598, peršù)

(a<sub>2</sub>) PIE \*p<sup>e</sup>/o<sup>r</sup>s ·k̂- (for the prefix, cf. Arm. heñi- (a.) ‘entfernt, fern’, ArmGr. 1:466)

RV. pṛch-	(inf.bs.) ‘fragen’ (WbRV. 853, pṛché [inf.])
Umb. pers ·clu-	(sb.) ‘supplicātionē’ (WH 2:346)

(b<sub>1</sub>) PIE \*p<sup>r</sup>e/o ·k̂ (for the prefix, cf. Gr. πρὸ ·, Lat. pre ·)

Lat. pre ·c-	(f.) ‘Gebet, Bitte’ (WH 2:346, Beitr. 560, prex [sgN])
Lat. pro ·c-	(f.) ‘bona vox’ (WH 2:346, prox [N], procis, [G])
Go. fra ·h-	(pret.) ‘question’ (GoEtD. 122, frah [3sg])

(b<sub>2</sub>) PIE \*p<sup>r</sup>e/o<sup>s</sup> ·k̂ (for the prefix, cf. Gr. πρὸς ·, πρὲς ·)

YV. paprāch-	(pf.) ‘fragen, begehren, bitten’ (EWA 2:183, papracha)
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(c<sub>1</sub>) PIE \*peaḥr ·k̂- (for the prefix, cf. Gr. πᾶρ ·)

OIr. imm ·chom ·arc-	(vb.) ‘fragen’ (LEIA A-86, immchomairc [3sg])
Cymr. archa-	(pr.) ‘bitten’ (VGK 1:44, archam [1sg])
Arm. harsn-	(sb.obl.) ‘Braut’ (ArmGr. 464, harsn [sgN])
Arm. harsin-	(sb.obl.) ‘Braut’ (ArmGr. 464, harsin [sgG])
Osc. com ·par <sup>a</sup> kini-	(sb.) ‘consiliī’ (WH 2:347, comparakineis [plN])

(c<sub>2</sub>) PIE \*peaḥrs ·k̂- (for the prefix, cf. Gr. πάρος)

Arm. harç-	(ao.) ‘fragen’ (ArmGr. 464, eharç [3sg])
Arm. harç-	(sb.) ‘Frage, Untersuchung’ (ArmGr. 464, harçi [G])
Osc. com ·par <sup>a</sup> s ·c ·us-	(2fut.) ‘cōnsultare’ (WH 2:347, comparascuster [3sg])

(d<sub>1/2</sub>) PIE \*pir ·k̂- (or PIE \*pirs ·k̂- (?); for the prefix, cf. OPr. pirschau ‘vor’)

<sup>543</sup> For RV. śmasi [1pl, RV. 2.31.31], see also Burrow (1979:5).

Li. piřš-	(pr.) ‘jmd. ein Mädchen zufreien’ (LiEtWb. 598, piřšti)
Li. piřšl̥y-	(f.) ‘Heiratsvermittler, Freierwerber’ (LiEtWb. 599)
Latv. piřslis-	(f.) ‘Freierwerber’ (LiEtWb. 599, piřslis [sgN])

(e<sub>1</sub>) PIE \*pur̥k̥- (for the prefix, cf. Go. faur, RV. purá, etc.)

Umr. pepur̥kus-	(fut.) ‘poposcerint’ (WbOU. 530, pepurkurent [3pl])
Pahl. pur̥sī-	(vb.) ‘fragen’ (MPahl. 2:163, pursītan [inf.])

(e<sub>2</sub>) PIE \*purs̥k̥- ‘forschen’ (for the prefix, cf. OHG. fors̥pō-)

OHG. fors̥cā-	(f.) ‘Forschung, Frage’ (WH 2:346, forsca [sgN])
OHG. fors̥cō-	(pr.) ‘forschen’ (Grundr <sup>2</sup> 1:470, forscōn [inf.])

§14. On the properties of PIE \*r̥ in System PIE, note that:

(a) The syllabic trill PIE \*r̥ is directly continued only in Indo-Iranian, confirming its original character through the impossibility of any other vocalic element in examples like RV. bhṛ̥tí- : LAv. aš.bārətī- or RV. mṛ̥tá- : LAv. mārəta- (the converse of Fortunatov’s Law II). Owing to this, it is allowed to postulate PIE \*r̥ for the proto-language based on the principle of family consistency (see Trask, DHCL 120).

(b) The availability of PIE \*h̥ for reconstruction reveals that the outcome of the syllabic trill was identical in all dialects:

PIE \*r̥ → RV. ṛ̥r, Av. ər̥r, Lat. \*r̥ (in Lat. r), Li. \*r̥ (in Li. r), etc.

PIE \*r̥ (in PIE \*h̥r̥ \*r̥h̥) did not produce svarabhakti vowels, with the phoneme instead turning into simple PIE \*r after the loss of PIE \*h̥.

(c) By successive applications of the comparative method, the svarabhakti vowels can be paralleled in the Indo-European branches and reconstructed regularly on the basis of two witnesses (Fick’s Rule).

### 3.3.6 Neogr. \*r̥<sup>r</sup> (antevocalic syllabic trill)

§0. Following the introduction of Neogr. \*r̥ in anteconsonantal position, Osthoff (1879a:421, 1879b:14-16) had to admit that the syllabic resonants occurred in antevocalic position as well. For these, Saussure (1879:257-9) introduced the notation \*r̥<sup>r</sup>. After initially being doubted by Brugmann, it was then accepted in his Grundriss.<sup>544</sup>

§1. Brugmann (Grundr<sup>2</sup> 1:452) summarized the “Regelmässige Vertretung des uridg. r̥<sup>r</sup>” as follows:

Uridg.	Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.
r̥ <sup>r</sup> +V	ir, ur	ar	ar ra	αϞ Ϟα	ir	ar	ar	ur	ir	ĩr

<sup>544</sup> As Brugmann’s theory became more abstract, his and Osthoff’s paths separated, with the latter turning back to genuine vowels. As an indication of this, Güntert (1916:vii) refers to Osthoff as the father of the theory of ‘nebentonigen Tiefstufe’ in Lat. magnus (MU VI:209ff.). For further details, see Güntert (1916:20): “Schon Osthoff MU. VI, 212 ff. behauptete, nach Liquiden und Nasalen sei der reduzierte Vokal vielmehr α gewesen [...]”. See also Sturtevant (1943:293) and Güntert (1916:19 [wL]).

Historically speaking, Neogr. \* $\text{r}^{\text{r}}$  was never a phoneme proper, since already Brugmann (Grundr<sup>2</sup> 1:456) identified an environment schwa for the item (in Lat. graui-, illustrated in the following quote):

“Hinter Consonanten entspricht der Wechsel  $\text{r}^{\text{r}} : \text{r}, \text{l}^{\text{l}} : \text{l}$  dem vom  $\text{ii} : \text{i}, \text{uu} : \text{u}, \text{n}^{\text{n}} : \text{n}$ , s. § 282 S. 264f. Z. B. ai. gurú-s . ai. gru-muṣṭi-ṣ ‘schwere Handvoll’, lat. graui-s (§ 193 S.171).”

Structurally speaking, Neogr. \* $\text{r}^{\text{r}}(\text{V})$  stood for the pre-*proto*-form Neogr. \*\* $\text{r}^{\text{r}}\text{əV}$ , where \* $\text{r}^{\text{r}}$  assumedly arose according to the pattern of glides and schwa (compare Neogr. \* $\text{i} + \text{əV} \rightarrow \text{IE } \text{iiV}$  and Neogr. \* $\text{u} + \text{ə} \rightarrow \text{IE } \text{uuV}$ ). In Saussure’s notation, Neogr. \* $\text{r}^{\text{r}}\text{V}$  was written \*\* $\text{r}^{\text{r}}\text{AV}$ . The laryngeal theory agrees with Brugmann and Osthoff in terms of the outcomes of the rule Neogr. \* $\text{r}^{\text{r}}\text{V} \equiv \text{LT } *(C)\text{r}^{\text{r}}\text{HV}$ ; therefore, it needs no separate discussion.

§2. The key problems of the rule \*(C) $\text{r}^{\text{r}}(\text{V})$  can be summarized as follows:

(a) Sievers-Edgerton’s Law for liquids contains examples of the actual behaviour of the sequence PIE \*(C) $\text{r}^{\text{r}}\text{hV} \equiv \text{Neogr. } * $\text{r}^{\text{r}}\text{V} \equiv \text{LT } *(C)\text{r}^{\text{r}}\text{HV}$ , which – against common consensus – do not produce svarabhakti vowels (OInd. ir ur) in Sanskrit. Instead PIE * $\text{r}^{\text{r}}$  turns into simple PIE *r after the loss of PIE * $\text{h}$ :$

PIIr. \*índr $\text{h}^{\text{r}}$ a-  $\rightarrow$  RV. índr $\text{r}^{\text{r}}$ ’a-                      PIIr. \*rudr $\text{h}^{\text{r}}$ á-  $\rightarrow$  RV. rudr $\text{r}^{\text{r}}$ ’á-.

The situation is not limited to these, but they apply to the data in general. To quote another piece of data, however, the extension PIE \*prēah- in

RV. kṛṣṭi prá-                      (a.) ‘die Völker durchdringend’ (WbRV. 349)

(for the laryngeal, cf. CLu. par $\text{h}$ - ‘jagen’) has a weak stem PIE \*pra $\text{h}$ - (cf. Hī. par $\text{h}$ - ‘jagen’). Instead of the ghost form Neogr.  $\text{r}^{\text{r}}$ kṛṣṭipuras [sgG], the attested genitive is RV. kṛṣṭipr $\text{r}^{\text{r}}$ ’ás without the svarabhakti vowel /u/ (i.e. the sequence C $\text{r}^{\text{r}}\text{hV}$  (= PIE \*Cra $\text{hV}$ , \*C $\text{r}^{\text{r}}$ haV) does not develop svarabhakti vowels).

(b) The svarabhakti vowels assumed to be characteristic of the non-Aryan group are also externally paralleled and therefore genuine (Fick’s Rule), with the result that Neogr. \* $\text{r}^{\text{r}}$  did not produce epenthetic vowels in any group. Comparatively, this does not constitute a major problem, because the svarabhakti vowels are externally paralleled and therefore derivable from the proto-language.

(c) Already Saussure (Mém. 271) noticed that \* $\text{r}^{\text{r}}$ , the zero grade of the antevocalic syllabic liquids (a.k.a. ‘laryngeal bases’) C $\text{r}^{\text{r}}\text{AV}$  should give Gr. Ca $\text{qV}$ . This is often not the case, however (see Anttila 1969:5). Consequently, theories that include the rule Neogr. \* $\text{r}^{\text{r}}\text{V} \equiv \text{LT } * $\text{r}^{\text{r}}\text{HV}$  overgenerate unattested reconstructions while simultaneously failing to cover the attested forms.$

§3. Brugmann (Grundr<sup>2</sup> 1:456) reconstructed Neogr. \* $\text{g}^{\text{h}}\text{r}^{\text{r}}\text{ú-s}$  ‘schwer’ (= LT \* $\text{g}^{\text{h}}\text{r}^{\text{h}}\text{u}_2$ , cf. EWA 1:490-1) for “ai. gurú-ṣ, gr. βαρῦ-ς, got. kauru-s”. (See P. 476-477, \* $\text{g}^{\text{h}}\text{er-}$ .) Instead of a uniform prototype, four bases are attested:

PIE *g <sup>u</sup> aḥr-	:	OInd. gru·muṣṭí-, Lat. graui-s, Go. kauru-s <sup>545</sup>
PIE *g <sup>u</sup> áḥr-	:	RV. gurú- (a.) ‘schwer’, AVP. gurvī- (a.f.) ‘id.’
PIE *g <sup>u</sup> eaḥr-	:	Gr. βαρύ-, LAV. go <sup>u</sup> ru- ‘schwer’ (Grundr <sup>2</sup> 1:460)
PIE *g <sup>u</sup> oaḥr-	:	Gr. βόρη- ‘to weight, depress’ (Aiol. κῆρ βόρηται)

§4. Brugmann (Grundr<sup>2</sup> 1:460) reconstructed Neogr. \*t<sub>ṛ</sub><sup>r</sup>V- (= LT. \*t<sub>ṛ</sub>h<sub>2</sub>V) for “Ai. tirás Av. tarō apers. tara<sup>h</sup>- ‘durch hin, hinüber’, ai. tirá-ti turá-ti ‘er dringt hindurch’, Caus. ai. turáya-ti apers. atarayāma<sup>h</sup> : arm. tar ‘fremdes Land’ tara- ‘trans’, aksl. tǐrǒ ‘tero’.” Within this group, several externally confirmed roots appear:

(a) PIE \*til- ‘über’ (with a common Indo-European PIE \*i):

CLu. pua·til-	(n.) ‘(le) passé : ver-gangen, früher’ (DLL. 83)
Thrac. τιλε-	(ao.) ‘aufheben, wegheben, entfernen’ (WH 2:688, τιλε)
RV. úd (...) tira-	(pr6A.) ‘erhöhen, steigern’ (WbRV. 525, úd tirāmasi)
RV. tirás	(prep.) ‘durch, darüber, hinweg, über’ (WbRV. 536)

(b) PIE \*ter \*tor \*tr- (ablaut \*e : o : Ø) in:

OPers. vi·taraya-	(cs.) ‘put across’ (OldP. 186, viyatarayam [1sg])
Go. þairh	(prep.) ‘through’ (GoEtD. 354)
OEng. þerh	(prep.) ‘through, during, by means of’ (GoEtD. 354)
OHG. derh-	(a.) ‘pertusus : durchgebohrt’ (GoEtWb. 354)

(c) PIE \*teahr- ‘cross, above’ with the voiceless laryngeal PIE \*h (see Chapter 4) is attested in:

OIr. tar	(prepA.) ‘über – hinaus : over’ (LEIA T:25-6, GOI:531)
LAv. tarō	(prepA.) ‘durch–hin, über–hin, hinaus’ (AIWb. 641)
OPers. tara <sup>h</sup>	(prepA.) ‘through’ (OldP. 186, tara)

(d) PIE \*deaḥr- ‘beyond, fern, fremd, ausser’ is the voiced variant of the above root with the voiced laryngeal PIE \*ḥ (see Chapter 4) in:

OIr. dar	(prep.) ‘beyond’ (GOI 531)
Arm. tar-	(sb.) ‘fremdes Land’ (ArmGr. 496)
Arm. tara·kaç-	(a.) ‘von fern’ (ArmGr. 496)
Arm. tara·žam-	(adv.) ‘ausser der Zeit’ (ArmGr. 496)
Arm. tara·gir	(a.) ‘ausgeschlossen’ (ArmGr. 496)

§5. Brugmann (Grundr<sup>2</sup> 1:462) reconstructed “Arm. sar, Gen. saroy, ‘Höhe, Gipfel, Abhang’ : ai. síras- av. sarah- ‘Haupt’, gr. κάρωνο-v ‘Haupt’.” Two distinct prototypes are implied by the comparative method:

(a) PIE \*keah<sub>ṛ</sub>- ‘Höhe, Gipfel, Kopf’ (P. 574f.). A common Indo-European /a/ = PIE \*eaḥ is confirmed by three groups:

Hom. κάρ-	(n.) ‘Kopf’ (LSJ. 877, GEW 1:784, κάρ καρός)
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<sup>545</sup> Go. kauru- without an initial labiovelar proves that the initial syllable was accented as /kúru-/, due to which the following unaccented PIE \*a was lost. See Peeters (1974:32): “[P]IE. \*g<sup>u</sup>ṛ- is expected to yield \*qaur-, i.e. \*qaurus in Gothic and not \*kaurus.”

Arm. sar-	(sb.) ‘Höhe, Gipfel, Abhang’ (EtDiArm. 570)
LAv. urvī·sara-	(a.) ‘mit spitz zulaufendem Kopf’ (AIWb. 1546)
LAv. sarah-	(n.) ‘Kopf’ (AIWb. 1565)
Gr. κάραh-	(n.) ‘Kopf’ (GEW 1:784, in Att. κάρα = Ion. κάρη)
Gr. κάρωνο-	(n.) ‘Haupt’ (Grundr <sup>2</sup> 1:462, κάρωνον [sgNA])

(b) PIE \*k̑ir- (or PIE \*kaḥir- ?) ‘Höhe, Gipfel, Kopf, usw.’, a root with an original PIE \*i, is implied by:

RV. śiras-	(n.) ‘Haupt, Kopf’ (WbRV. 1395)
TochB. śísri-	(sb.) ‘acumen, cuspis’ (DTochB. 324, śísri [sgN])
Lyd. sirma-	(c.) ‘Tempel’ (LydWb. 196, syrmaś [sgN], sirmaḷ [DL])
RV. śírśá-	(n.) ‘Haupt, Kopf’ (WbRV. 1398, śírśé [du])
Latv. sirsi-	(m.) ‘grosse Wespe’ (LiEtWb. 988, sirsis [sgN])
RV. śírśán-	(n.) ‘Haupt, Kopf’ (WbRV. 1398)
Li. širšeñ-	(.) ‘Wespenart, Hornisse, vespa’ (LiEtWb. 988)
RV. śírśán·śírśan	(adv.) ‘jedes Haupt, jedes Wesen’ (WbRV. 1398)

The vowel RV. i ≡ Li. i ≡ Lyd. i (← PIE \*i) recurs in Tocharian (with palatalization), leaving no doubt of the etymological origin of the phoneme.<sup>546</sup> Simultaneously the preservation of RV. rś ← PIE \*rs implies that this cluster was not preceded by PIE \*aḥ (the converse of Fortunatov’s Law II).

§6. Brugmann (Grundr<sup>2</sup> 1:467) reconstructed Neogr. \*kȓr- for ‘‘Lat. carō, umbr. karu ‘pars’ kartu ‘distribuito’ aus karetōd : gr. κάρῃναι Aor. zu κείρω ‘ich schere, schneide ab.’’’ The comparative method implies, however, two distinct roots:

(a) PIE \*kr- \*ker- \*kor- (Gr. κείρω) is widely attested in Indo-European, forming various alternative extensions. Of particular interest is the dental one in:

PIE \*kort- \*krt- \*kert-

Ĥi. karta-	(vb1.) ‘abschneiden, beseitigen’ (HEG 1:523)
RV. isu·kṛt-	(a.) ‘wie ein Pfeil verwundet’ (WbRV. 227)
RV. ví (...). cakárt-	(pf.) ‘zerspalten, -schneiden’ (WbRV. 346, cakartā)

Taken together, Old Anatolian and Indo-Iranian prove that this root had no laryngeal; therefore, the paradigmatic relation between Gr. κείρω (without PIE \*aḥ) and Gr. κάρῃναι (with PIE \*aḥ) is suppletive.

(b) PIE \*kaḥr-. The Italo-Greek ‘a-vocalism’ (Neogr. \*a ā ≡ PIE \*eaḥ \*ēaḥ) is proven to contain a palatal (Neogr. \*k̑) by the dental extension with palatovelar and a laryngeal by means of Fortunatov’s Law II in:

PIE \*kaḥr- \*kēaḥr

Hes. κάρ-	(f.) ‘Tod’ (GEW –, Hes. κάρ·θάνατος, Alkm. κάρου)
Gr. κέκαρ-	(pf.) ‘abschneiden, abmähen, aufzehren’ (GEW 1:810)

<sup>546</sup> TochB. śísri ← Neogr. \*k̑ikiri- (with a loss of PIE \*i in the midmost syllable) is required to explain the palatalization of TochB. śi(ś)ri-.

PIE \*keahrn-

Lat. carō(n)-	(f.) ‘Fleisch’ (WH 1:170)
Umbr. karōn-	(f.) ‘Teil eines Opfertieres’ (WbOU. 372-373, caru)
Gr. κάρνο-	(m.) ‘= φρεῖς’ (GEW 1:790)

PIE \*keahrnd-

OInd. śaṅḍa-	(prM.) ‘to hurt’ (MonWil. 1048, śaṅḍate [3sg])
YV. śaṅḍa-	(m.) ‘Name eines Dämons’ (EWA 2:605)
OInd. śaṅḍā·mārkau	(m.du.) ‘two demons ś. and m.’ (MonWil. 1048)

§7. Brugmann (Grundr<sup>2</sup> 1:467) reconstructed Neogr. \*p<sub>r</sub> (≡ LT. \*p<sub>r</sub>h<sub>2</sub>V) for “Lat. parēns, zu lit. periū ‘ich brüte’, vgl. pariō § 514, 3.” In order to account for the data, the derivation requires two starting points, namely:

(a) PIE \*peahr- ‘gebären, usw.’ is implied by the common Indo-European /a/ in

Langob. fara-	(sb.) ‘Geschlecht’ (WP 2:7)
Lat. parent-	(m.) ‘Vater’ (f.) ‘Mutter’ (WH 2:252f.)
Gr. παρ·θένο-	(f.) ‘Jungfrau, Mädchen, junge Frau’ (GEW 2:474)

(b) PIE \*paḥer- ‘gebären, usw.’, the schwebeablaut variant of the previous example, is required by the simultaneous lack of ‘a-vocalism’ in Baltic and the tenuis aspirata in Indo-Iranian<sup>547</sup>:

Li. pēra-	(m.) ‘Fruchtkeim, Keim’ (pl.) ‘Brut’ (LiEtWb. 573)
Li. peria-	(vb.) ‘brüten, auf den Eiern sitzen’ (LiEtWb. 573)
RV. pra·pharvī-	(f.) ‘wollüstiges Mädchen’ (WbRV. 876)

§8. Brugmann (Grundr<sup>2</sup> 1:465) compared “Alb. bir ‘Sohn’: Got. baur aisl. bur-r ‘Sohn’ got bauran-s ‘geboren’ [...]” and (Grundr<sup>2</sup> 1:471) “Got. bauran-s ahd. gi-boran aisl. borenn Part. zu got. bairan ‘tragen’ [...]”. Several externally paralleled root variants can be confirmed for Proto-Indo-European (Fick’s rule):

(a) PIE \*bhir- ‘nehmen, tragen, bringen’ (P. 128) is confirmed by two branches:

Alb. bir-	(m.) ‘Sohn’ (AlbEtD. 26, WH 2:504)
OCS. bīra-	(vb.) ‘sammeln, lesen, wählen, nehmen’ (Sadnik √33)

Hence the common Indo-European /i/ reflects a genuine vowel PIE \*i.

(b) Neogr. \*bhur- contains a genuine PIE \*u with varying ablaut vowels \*e/o in:

LAv. fra·bavar-	(pf.) ‘zu-, übertragen, bringen’ (AIWb. 490, frabavara)
Pahl. bur-	(vb.) ‘carry, bring, bear, procure, remove’ (MPahl. 2:50)
Lat. fūr-	(m.) ‘Dieb’ (WH 1:569)
OIcl. bur-	(m.) ‘Sohn’ (ANEtWb. 65, burr [sgN])
Go. un·bauran-	(pt.) ‘not bearing’ (GoEtDi. 57)
Lat. fūr̄ti-	(adv.) ‘diebischerweise, heimlich’ (WH 1:569, fūr̄tim)

<sup>547</sup> Note how examples of this type imply that ‘laryngeal bases’ (LT \*p<sub>r</sub>h<sub>2</sub>V, etc.) are not the proper strategy to explain the svarabhakti vowels of the root syllable.



(c) PIE \*bher- ‘tragen, bären, usw.’

Gr. φέρω	(pr.) ‘(er-, weg)tragen, usw.’ (GEW 2:1003)
Go. baira-	(vb.) ‘carry, endure, give birth’ (GoEtD. 57)
Arm. bere-	(pr.) ‘bären, tragen’ (ArmGr. 429, berem [1sg])
gAv. bara-	(pr.) ‘(in sich) tragen, besitzen, enthalten’ (AIWb. 933)

§9. Brugmann postulated (Grundr<sup>2</sup> 1:471) Neogr. \*p̥r̥- (LT \*p̥rh<sub>2</sub>V) for “ai. purá purás av. para parō ‘vor’, gr. πάρος ‘vorn, vorher’, got. faur faura ‘vor’.” Two distinct isoglosses are, however, implied by the comparative method:

(a) PIE \*pur- ‘vor, für, etc.’ is confirmed by multiple branches agreeing in PIE \*u:

Go. faur	(adv.prep.) ‘παρά πρό υπέρ : vor, für’ (GoEtD. 110)
RV. purá	(adv.) ‘früher, von Alters her, von je her’ (WbRV. 826)
RV. purás	(adv.) ‘vor, vorne, an der vorderen Seite’ (WbRV. 825)
Go. faurpi-	(adv.) ‘πρῶτον, πρότερον’ (GoEtD. 112, faurpis)
TochA. purccamo-	(a.) ‘primus, optimus’ (Poucha 201)
TochA. purcomo-	(a.) ‘primus, optimus’ (Poucha 201)

(b) PIE \*peaḥr- ‘vor(her), usw.’ is confirmed by several branches:

Gr. πάρος	(adv.) ‘vorher, früher, vorn (prepG) ‘vor’ (GEW 2:476)
LAv. parō	(adv.) ‘ante, vorn, hervor, vor, von Seiten’ (AIWb. 857)
gAv. parō	(prep.) ‘ausser, abgesehen von [A]’ (AIWb. 857)
OGaul. are-morica-	(GN.) ‘in-front-of-sea-nymphs’ (GoEtD. 111)
OIr. a <sup>1</sup> r	(prep.) ‘for, in front of’ (LEIA A:37-8)

Thus two prototypes, PIE \*peaḥr- and PIE \*pur-, are attested in the data.

§10. Brugmann (Grundr<sup>2</sup> 1:473) reconstructed Neogr. \*st̥r̥V (= LT. str̥HV) for “aksl. stīrḡ ‘ich strecke’ : ai. Perf. tistiré ‘er ist hingestretet worden’.”

(a) PIE \*stir- ‘ausbreiten’ is directly confirmed by Sanskrit and Slavonic:

RV. tiṣṭir-	(pf.) ‘hinstreuen, ausbreiten’ (WbRV. 1588, tiṣṭiré)
OCS. po-stīro-	(vb.) ‘ausstrecken, -breiten, -dehnen’ (Sadnik √889)
RV. stīrṇá-	(pret.pt.) ‘gebreytet’ (WbRV. 1589)

Since the participle has no cerebral (the converse of Fortunatov’s Law II), an original PIE \*i without laryngeal remains the sole reconstructive possibility. In this regard, it should also be noted that PIE \*i recurs in an alternative extension:

(b) PIE \*stil- ‘ausbreiten, usw.’<sup>548</sup>

OCS. stīla-	(vb.) ‘ausbreiten, unterbreiten’ (Sadnik √876, stīlati)
OCS. po-stīla-	(vb.) ‘aufbreiten, ausbreiten’ (Sadnik √876, postīlati)
OCS. po-stīla-	(vb.) ‘aus-, unterbreiten’ (Sadnik √876, postīlati) <sup>549</sup>

<sup>548</sup> The alternation √stil- : √stir- is paralleled by variants √ster- : √stel- with similar meaning present in Slavonic (cf. Meillet-Vaillant 1934<sup>2</sup>:37).

<sup>549</sup> Note the original \*e-grade PIE \*steil- in OCS. √stil-.

Owing to the mixture of PIE \*l \*r in Sanskrit, it is possible that some Sanskrit forms actually reflect this root.

§11. As for Neogr. \*r̥ = (C)r̥HV in System PIE, note the following:

(a) After the loss of the laryngeal, the actual outcome of the sequence PIE \*(C)r̥hV is (C)rV in the Indo-European languages. No svarabhakti vowels developed from the syllabic sonants. Accordingly, the early rule Neogr. \*(C)r̥ = LT (C)r̥HV should be replaced with the comparative one.

(b) The resulting lacuna in the explanation of the svarabhakti vowels can be compensated for by means of the comparative method, which finds parallels of the vowels in question and implies the respective PIE prototypes.

### 3.3.7 Neogr. \*r̥ (anteconsonantal long syllabic trill)

§0. Neogr. \*r̥, assumedly a long syllabic trill, was generalized into proto-language based on OInd. r̥ in order to explain the svarabhakti vowels detailed below.

§1. According to Brugmann (Grundr2 1:473ff.), the developments of the Neogr. \*r̥ stand as follows:

Uridg.	Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.
r̥+C	ur	ir	ar ra	āṛ ṛā	ar	ar	ar	ur	ir, ur	ir

Neogr. \*r̥ ≡ (C)r̥C, with its alternative before a vowel being Neogr. \*r̥r̥ ≡ (C)r̥r̥V, was structurally defined by Brugmann (Grundr<sup>2</sup> 1:473), writing “\*st̥r̥no- ‘stratus’ = ai. st̥r̥nā-s stellt sich zu ai. st̥r̥ta-s zu st̥r̥-tave”. With ablaut \*e/o : Ø and the alternation of extension Neogr. ·Ø-/\*·ə-, this Sanskrito-centric reconstruction can be summarized with the table:

*e/o-grade:	Ø-grade:
Neogr. *ster (OInd. st̥r̥tave)	Neogr. *st̥r̥- (OInd. st̥r̥tā-)
Neogr. *ster+ə (OInd. st̥r̥tavāi)	Neogr. *str+ə (OInd. st̥r̥nā-) <sup>550</sup>

The analysis of an underlying Neogr. \*r̥r̥ ≡ \*\*r̥r̥+ə was subsequently accepted by Saussure and the laryngeal theory, with LT \*Cr̥HC- now being written.

§2. The main reconstructive problems of Neogr. \*r̥ are as follows:

(a) For Indo-Iranian, the key problem is that the svarabhakti vowels associated with the Neogr. \*r̥ did not emerge. This can be seen, for instance, from the examples of SUBSET III \*Cr̥aḥT- and \*Cr̥ḥaT- of Fortunatov’s Law II. Following the loss of \*h there are no svarabhakti vowels, and Indo-Iranian has zero grade instead. The situation is identical with the non-dental extensions \*Cr̥aḥC- and \*Cr̥ḥaC-, and as it is

<sup>550</sup> In this regard, it is worth noting that Brugmann’s analysis \*sterə·C- : \*strə·C is structural/internal, and therefore is not necessarily true. This is caused by the ambiguity of OInd. st̥r̥itu- (MonWil. 1260) with OInd. i ≡ Neogr. \*i or Neogr. \*ə, which was left untreated by Brugmann. In such cases it is usually possible to confirm PIE \*i- instead of Neogr. \*ə (e.g. Lat. storea- (f.) ‘Decke aus Stroh’ (WH 1:600) and LAv. fra·sta<sup>1</sup>rya- (a.) ‘zu spreiten’ (AIWb. 1002, barəsmān)).

simultaneously possible to confirm the svarabhakti vowels by external parallels (Fick's Rule) the traditional view is hardly defensible in the post-Anatolian world.

(b) The assumed outcomes of Neogr. \*ř̄ in the non-Aryan group are ambiguous (passim). The svarabhakti vowels like those in Greek

Neogr. \*ř̄ (= Neogr. \*\*rə = LT \*\*ř̄h₂) → Do. qā (Att. ρη), etc.

can be confirmed by external comparison to reflect original quantities.

This basic situation can be seen to hold true in Brugmann's examples:

§3. Brugmann (Grundr<sup>2</sup> 1:474-475) reconstructed Neogr. \*ř̄mo- for "ai. ĩrmá-s av. arəmō 'Arm', arm. armukn 'Ellenbogen, Bug', lat. armu-s, got. arm-s 'Arm', preuss. irmo 'Arm', aksl. ramo und ramę 'Schulter' [...]". Regarding Neogr. \*ř̄mo-, two distinct roots are proven by means of external comparison:

(a) PIE \*ř̄air- 'mouere'. A long /ī/ appears in two subgroups, regardless whether it is followed by a vowel or consonant, with the result that Neogr. \*ř̄ is not feasible in:

RV. ř̄r-	(prM.) 'in Bewegung setzen' (WbRV. 234, ř̄rate [3pl])
gAv. ř̄ra-	(pr.) 'hingelangen lassen, bringen über' (AIWb. 183)
gAv. ř̄ra-	(n.) 'Anlauf, Angriff, Energie, Tatkraft' (AIWb. 372)
RV. ř̄rmá	(adv.) 'bereit, zur Hand' (WbRV. 235)
OPr. irmo-	(f.) 'Arm' (APrS. 347 + Osthoff's Law)

Based on a common Indo-European /ī/, PIE \*ř̄áir- is to be reconstructed instead of a long syllabic sonant.

(b) PIE \*ř̄aermo- 'Arm' (P. 58). A common Indo-European /a/ ≡ PIE \*ř̄ae appears in:

Lat. armo-	(m.) 'Schulterblatt, Vorderbug' (WH 1:69, armus)
Žem. armaĩ	(m.pl.) 'Vorderarm am Wagen' (LiEtWb. 16, armaĩ)
LAv. aēvō.arma-	(a.) 'einarmig' (AIWb. 24)
OCS. ramo-	(n.) 'Schulter' (Sadnik √737)
Arm. arm-ukn-	(sb.) 'Ellenbogen : elbow' (EtDiArm. 141)

§4. Brugmann (Grundr<sup>2</sup> 1:474) reconstructed Neogr. stř̄ n/t- for "Ai. stīrná-s 'hingestret' av. starəta- 'belegt, bedeckt', gr. στρωτό-ς 'stratus' στόρνυμι 'sterno', lat. strātu-s, nkymr. sarn 'stratum, pavementum', aksl. strana 'Seite, Gegend' [...]". The comparative method implies four roots confirmed by Fick's Rule:

(a) PIE \*stir- has already been shown to contain an original PIE \*i in:

OCS. pro-stīrǫ	(vb.) 'ausstrecken, -breiten, -dehnen' (Sadnik √889)
RV. tiř̄tir-	(pf.) 'hinstreuen, ausbreiten' (WbRV. 1588, tiř̄tiré)
RV. saṃ-stír-	(a.) 'zusammenstrebend' (WbRV. 1439)
RV. stīrná-	(pp.) 'gebreitet' (WbRV. 1589)

(b) PIE \*steař̄r- is proven by the common European /a/ ≡ PIE \*eař̄ in:

Cret. σταρτο-	(m.) 'eine Unterabteilung der Phyle' (GEW 2:806)
OIr. cos-sair-	(sb.) 'la couche : Bett' (LEIA C-217, P. 1029)
ModCymr. sarn-	(sb.) 'stratum, pavementum' (Grundr <sup>2</sup> 1:474)

(c) PIE \*stor- is attested in:

OCS. strana	(f.) ‘Seite, Land, fremde Gegend’ (Sadnik √889)
Rus. storoná	(f.) ‘Seite, Land, fremde Gegend’ (REW 3:20)
Gr. στóρνυ-	(pr.) ‘sternere’ (GEW 2:802, στóρνυμι [1sg])
LAv. ništarətō.spaya-	(a.) ‘mit hingebreiteten Kissen’ (AIWb. 1087)

Being unaffected by Fortunatov’s Law II, Avestan does not include the otherwise possible PIE \*stoahr-, thus confirming PIE \*o without a laryngeal.

(d) PIE √strah-, the zero grade root PIE \*str- with a laryngeal extension, survives in:

Gr. στρωτό-	(pt.) ‘ausgebreitet’ (GEW 2:802) ← PIE *strōahto-
Lat. strāto-	(n.) ‘Decke’ (WH 2:590) ← PIE *strēahto-

§5. Brugmann (Grundr<sup>2</sup> 1:474) reconstructed Neogr. \*p̄C for the items: “Ai. pūrva-s av. pa<sup>u</sup>rvō ‘der vordere, frühere’, ai. pūrviyá-s ‘primus’ gthav. pa<sup>o</sup>rvīm ‘primum’, gr. πρῶτο-ς dor. πρῶτο-ς ‘primus’ aus \*πρωτ-ατο-ς, dor. πρῶν ‘vordem’ aus \*πρωτ-α-ν, att. πρῶτην ‘kürzlich’ aus \*πρωτ-ια-ν, alb. parë ‘primus’ aus \*parmo-s, dagegen mit Suffix -mo- lit. pirma-s ‘primus’.”

Several roots are comparatively secured by Fick’s Rule:

(a) PIE \*pur-u and PIE \*pour-u- ‘früher, etc.’

RV. pūrva-	(a.) ‘früher, östlig, vorzüglich, alt’ (WbRV. 845)
gAv. paourvīm	(adv.) ‘zuerst, zu Anfang, bei Beginn’ (AIWb. 873-4)

belong to the root PIE \*pur- ‘vor’, which is proven to be original by:

Go. faur	(adv.prep.) παρὰ πρό υπέρ ‘vor, für’ (GoEtD. 110)
RV. purá	(adv.) ‘früher, von Alters her, von je her’ (WbRV. 826)
Go. faurþi-	(adv.) ‘πρῶτον, πρότερον’ (GoEtD. 112, faurþis)
TochA. purccamo-	(a.) ‘primus, optimus’ (Poucha 201)

(b) PIE \*praḥ- ‘pro-’ (P. 810f.). The bases PIE \*prōaḥ- and PIE \*prēaḥ- are required in order to account for the ablaut ā : ω in:

Hom. πρῶτο-	(a.) ‘der vorderste, der erste’ (GEW 2:609)
Boiot. πρῶτο-	(a.) ‘der vorderste, der erste’ (GEW 2:609)

(c) PIE \*peaḥr- (cf. Gr. πάρ; πάρος above) is the starting point of the extension PIE \*peaḥr-uo- ‘erst(er)’, which is widely attested in Indo-European languages:

LAv. po <sup>u</sup> ru-	(adv.bs.) ‘erst’ (AIWb. 870-2, pourum [sgA = adv.])
Alb. parë	(a.) ‘erster’ (AlbEtDi. 311, parë [sgN])
LAv. pa <sup>u</sup> rva-	(a.) ‘der vordere, der erstere, südlich’ (AIWb. 870)
TochB. parwe-	(a.) ‘(the) first (year)’ (MA 399, DTochB. 360)
OPers. parva-	(adv.) ‘being before’ (OldP. 196, paruvam [sgNA])

(d) √pir- ‘vor(der), erst(er), u.s.w.’ and the respective \*e/o-grade (cf. PIE \*poir- \*peir- in Latvian) appears with alternative extensions in:

Latv. pīere	(f.) ‘Vorderseite, Stirn’ (LiEtWb. 573, pīere [sgN])
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Li. pīrma-	(a.) ‘erster’ (LiEtWb. 597-8, pīrmas [sgN])
OPr. pirma-	(a.) ‘erster’ (APrS. 399)
ORus. pīrvū	(a.) ‘erster’ (REV 2:336-7)
OCS. pīrvū	(a.) ‘erster’ (REV 2:336-7)
Rus. pėrvyj	(a.) ‘erster’ (REV 2:336-7)

The vocalisms of PBalt. \*pir-ma- and PSlav. \*pir-ua- are uncontested due to the corresponding diphthong in Latv. pīere.<sup>551</sup>

§6. Brugmann (Grundr<sup>2</sup> 1:474) reconstructed Neogr. \*k̥rd for “Ai. kūrda-ti ‘er springt, hüpf’t, gr. κόρδαξ ein Tanz, vgl. κρᾶδάω ‘ich schwinde, schwenke’ [...]”. When tested against the extended data, three different roots are implied by the comparative method:

(a) Neogr. \*kūrda- ‘quadrus’ with PIE \*u (not traced back to Neogr. \*r̥), appearing in:

OInd. kūrda-	(vb.) ‘hüpfen, springen’ (KEWA 1:254-5)
TochA. kurtsru	(plObl.) ‘mille passus’ (Poucha 79, kurtsru = yojana)

(b) Neogr. \*Kerd- \*Kard- \*Kord- ‘werfen, tanzen’ (P. 934) in:

OIr. fo-cerd-	(vb.) ‘werfen, usw.’ (LEIA C-72-3, focheird)
OIr. fo-card-	(pret.) ‘werfen’ (LEIA C-72-3, fochaird)
Gr. κόρδακ-	(m.) ‘N. eines Tanzes’ (GEW 1:917-8)

(c) Neogr. \*Krad- (P. 934), which is attested in Greek and in Germanic:

OIcl. hrata-	(vb.) ‘schwanken, eilen, fallen, stürzen’ (ANetWb. 252)
Gr. κρᾶδάο-	(prM.) ‘schwanken, zittern’ (GEW 2:1-2, κρᾶδάομαι)

§7. Brugmann (Grundr<sup>2</sup> 1:475) reconstructed “[Ai.] tūrtá-s ‘eilig’ aus tūrta-s (§ 327, 2 S. 301f.), av. θwāša ‘eilig’ aus θwarta- (§ 469, 3 S. 431), zu ai. tvāra-te ‘er eilt’ [...]”, positing a root Neogr. \*t̥er-. The bases implied by the comparative method are:

(a) PIE √tur- (vb.) ‘eilen, laufen, usw.’ (a.) ‘rasch, eilig’ (num.) ‘fourth’

RV. turá-	(a.) ‘rasch’ (EWA1:656, WbRV. 541)
RV. turíya-	(ord.) ‘der vierte’ (KEWA 1:515, WbRV. 542)
OIcl. þyrja-	(vb.) ‘schnell fahren, laufen’ (ANetWb. 630)
LAv. tūrīya-	(ord.) ‘der vierte’ (AIWb. 656)
OInd. tūrtá-	(a.) ‘eilig’ (EWA 1:629f., Grundr <sup>2</sup> 1:475)
RV. a-túrta-	(n.) ‘der unüberschrittene Raum’ (WbRV. 29)
Gr. τυρτάιο-	(fm.) ‘Vierter (?)’ (GEW 2:918)

In the absence of a retroflex before the dental extension, this root had no laryngeal (the converse of Fortunatov’s Law II). The widely attested numeral Neogr. \*k<sup>u</sup>etur- ‘vier’ (P. 642-644) is a compound based on the root PIE \*tur- with additional connected forms:

<sup>551</sup> 𐬨i. pi-e-ra-an ‘in front’ (CHD P:291f.) may also belong here, as one can defend PIE \*i based on a parallel extension 𐬨i. pi-an = 𐬨i. pi-e-ra-an. Owing to the confusion between OAnat. e : i : ei, etc., this remains uncertain, however.

Umbr. pe ·tur ·purso-	(sb.) ‘quadrupes, Vierfüßler’ (WbOU. 551)
RV. ca ·túr-	(a.) ‘vier’ (WbRV. 433, catúrah [plA])
LAv. ča ·tur-	(num.) ‘vier’ (AIWb. 577, čaturā [plA], čatura [plNA])
Li. ke ·turì-	(num.coll.) ‘vier’ (LiEtWb. 247f.)

(b) PIE \*tuaḥr- ‘eilen’ (P. 1100). The Sanskrit verbal and nominal forms are well known:

Br. tvára-	(vb.) ‘eilen’ (KEWA 1:539, tvárate [3sg])
AV. tvará-	(f.) ‘Eile’ (EWA 1:684-5)
AV. tvaráya-	(cs.) ‘beleben, eilen lassen’ (EWA 1:684-5 tvaráyati)

For this root PIE \*ḥ is implied by Av. ḥ in:

LAv. θwāša-	(a.) ‘eilig, rasch’ (AIWb. 787)
LAv. θwāša.gāman-	(a.) ‘eilig schreitend, raschen Schritts’ (AIWb. 788)

The confirmation for the laryngeal is provided by the prefixed variant of the root Neogr. \*k<sup>h</sup>e ·tuar- (PIE \*k<sup>h</sup>e ·tueaḥr-) with Gr. α = PCelt. \*a:

LAv. ča ·θwar-	(num.) ‘vier’ (AIWb. 557, čaθwarasča [plN])
MidCymr. pe ·tgwar-	(num.) ‘vier’ (ACSS. 2:982, petgwared)
Boiot. πέ ·τταρ-	(num.) ‘vier’ (GEW 2:883, πέτταρες)
Hom. τέ ·σσαρ-	(num.) ‘vier’ (GEW 2:883, τέσσαρες [plN])
TochA. ś ·twar	(num.) ‘vier’ (Poucha 330, śtwar)
OGaul. pe ·tuar-	(ON.num.f.) ‘vierte’ (ACSS. 982)

§8. Brugmann (Grundr<sup>2</sup> 1:475) reconstructed “Ai. tīrṇá-s ‘überschritten, durchgemacht’, tīrthá-m ‘Furt, Tränke’, apers. fra-tarta-h ‘vorwärts gegangen’, zu ai. tára-ti tirá-ti, W. ter-”, assumedly from Neogr. \*tīC. As already pointed out above, there are two externally confirmed roots:

(a) PIE \*ter-, tor-, tr- ‘über, durch’ (P. 1074-5)

RV. tára-	(m.) ‘das Übersetzen, Überfahrt’ (WbRV. 529)
HLu. tari-	(vb.) ‘rise’ (CHLu. 10.12.8, ta <sub>x</sub> -ri + i-ta <sub>x</sub> )
LAv. titāraya-	(cs.) ‘überwinden, bewältigen’ (AIWb. 639)
OPers. vi ·taraya-	(cs.) ‘put across’ (OldP. 186, viyatarayam [1sg])
Go. þairh	(prep.) ‘through, etc.’ (GoEtD. 354)

(b) PIE \*til- ‘erheben’ (P. 1074-5)

Thrac. τιλε/ο-	(ao.) ‘auf-, wegheben, entfernen’ (WH 2:688, τιλε)
RV. úd (...) tira-	(pr6A.) ‘erhöhen, steigern’ (WbRV. 525, úd tirāmasi)

§9. Brugmann (Grundr<sup>2</sup> 1:475) compared “Ai. īrṇá-s ‘in Bewegung gesetzt, erhoben’ [...] gr. νέοστος ‘neu entstanden’, κοιι-οστός ‘Erregung von Staub’ ὀρνυμι ‘ich errege, störe auf’.” Yet again, the enriched data reveals two distinct roots:

(a) PIE \*ḥair- (or \*ir-<sup>?</sup>). The Sanskrit /i/ coincides with Gr. ι in:

Br. īrṇá-	(pt.) ‘in Bewegung gesetzt, erhoben’ (EWA 1:106)
Hes. ἐπ ·ιρνύτιο-	(a.) ‘ἐπιρνύτιος · ζεῦς ἐν κρητή’ (GEW 2:423)

An original PIE \*i is in agreement with the lack of cerebralization in Sanskrit not allowing a laryngeal following a liquid in Indo-Iranian (the converse of Fortunatov's Law II).

(b) PIE \*or- \*r- \*er- 'sich regen, erheben, usw.' is attested in:

Gr. ὄρ-	(ao.) 'sich regen/erheben, eilen' (GEW 2:426-, ὄρτο)
Gr. ἐρό-	(ao.) 'sich regen/erregen' (GEW 2:422, ἔρετο · ὠρομήθη)
Hi. ara-	(vb2.) 'to (a)rise, lift, raise' (HEG 1:52, a-ra-i [3sg])
Gr. ὄρνυ-	(.) 'sich regen/erregen, eilen' (GEW 2:423, ὄρνυμι)
gr. νέ(Ϝ)·ορτο-	(a.) 'neuerstanden' (GEW 2:423, νέορτος [sgN])
Gr. κωνι·ορτό-	(m.) 'Erregung von Staub' (GEW 2:423, κωνι·ορτός)

§10. Brugmann (Grundr<sup>2</sup> 1:479) reconstructed Neogr. \*r̥ for the items: "Av. arəzata-m 'Silber', gr. ἄργυρο-ς ἀργήης (neben ai. rajatá-m, vgl. Wackernagel Ai. Gr. I 12) weisen auf uridg. \*r̥ǵ-, welches auch in arm. arcat' enthalten sein kann. Das Ital. und das Kelt. haben arg- : lat. argentu-m osk. aragetud 'argento', air. argat nkymr. ariant bret. arc'hant. Man setzt für diese Wörter uridg. \*r̥ǵ- voraus [...]."

The traditional reconstruction has been outdated by the emergence of the Old Anatolian laryngeal, which allows for the regular treatment of Italo-Celtic /a/ with PIE \*ha (\*ah) instead of Neogr. \*r̥:

√harǵ- 'weiss, glänzend; Silber' (P. 64)

Hi. hargi-	(a.) 'weiß, hell' (HEG 1:177, har-ki-iš [sgN])
Gr. ἀργι·κέραυνο-	(a.) 'mit glänzendem Donnerkeil' (GEW 1:134)
LAv. arəzata-	(n.) 'Silber' (AIWb. 352, arəzata[m] [sgNA])

§11. Brugmann (Grundr<sup>2</sup> 1:479) reconstructed "Lat. arduo-s : air. ard 'hoch, gross', gall. arduenna, aisl. orðug-r 'steil' urgerm. arðua-, Gf. \*r̥dhūo- r̥dhūo-, vgl. av. arədva 'aufrecht, erhaben'." Here, as in the previous example, all theories containing the laryngeal now reconstruct the laryngeal:

√hardu- 'hoch, steil, gross, usw.'

Lat. arduo-	(a.) 'hoch, steil, schwierig' (WH1:64-5)
OIr. ard	(a.) 'haut, grand : hoch, gross' (LEIA A-87)
OGaul. ardu·enna-	(ONf.) 'Ardennes' (LEIA A-87)
LAv. arədva-	(a.) 'auf, nach oben, in die Höhe gerichtet' (AIWb. 350)

§12. The key issues concerning Neogr. \*r̥ ≡ (C)r̥HC can be summarized as follows:

(a) The actual outcome of the sequence PIE \*(C)r̥hC in Aryan languages after the loss of the laryngeal is (C)r̥C (RV. dr̥ś-, etc.). This is to say, svarabhakti vowels have not developed from syllabic sonants.

(b) Both in Aryan and non-Aryan languages the svarabhakti vowels traditionally derived from Neogr. \*r̥ are externally paralleled, and therefore reflect their original PIE counterparts.

### 3.3.8 Neogr. \*l (consonantal lateral)

§0. Neogr. \*l ≡ PIE \*l, a lateral liquid, was felt to be problematic by the Sanskrito-centric Paleogrammarians because only /r/ was securely attested in Indo-Iranian. The systematic appearance of PIE \*l in the rest of group allowed the Neogrammarians to directly establish PIE \*l beyond doubt with the sound law PIE \*l → PIIr. \*r.

§1. Brugmann provided a number of examples of Neogr. \*l:

(a) Brugmann (Grundr<sup>2</sup> 1:424) reconstructed √leik<sup>u</sup>- ‘lassen’ for “arm. lk‘ane-m gr. λείπω lat. linqūō ‘ich lasse’, got. leiþva ‘ich leihe’ Lit. liekù ‘ich lasse’ aksl. otŭ-lĕkŭ ‘Überbleibsel’, ai. riñák-ti ‘er lässt, lässt los, räumt ein’.”

(b) Brugmann (Grundr<sup>2</sup> 1:424) reconstructed √mel- for “Gr. μέλας (F. μέλαινα) ‘schwarz’, nbret. melen ‘crocus’, lett. meln-s ‘schwarz’ lit. mėlyna-s ‘blau’, ai. maliná-s ‘schmutzig, dunkelfarbig, schwarz’.”

(c) Brugmann (Grundr<sup>2</sup> 1:424) quotes “Gr. ἀλφεῖν ‘verdienen, erwerben’, lit. algà ‘Lohn’, ai. arghá-s ‘Wert, Preis’.”

§2. As for Anatolian, PIE \*l has been thoroughly preserved and only minor issues are worth noting in this connection:

(a) Hawkins (= CHLu.) would prefer to replace the earlier reading of the syllable HLu. la with HLu. “la/i/u”, a sign with three possible interpretations, HLu. la, li or lu. The idea is based on examples like HLu. (‘FLAMMAE(?)’) la/i/u-sà-la/i/u-sà-ta (CHLu. 9.1.11), which Hawkins reads as /lusalusa-/, based on the comparison with PIE √luk- ‘glänzen’ = 𐎧i. luk- ‘id.’ with palatalization in Hieroglyphic Luwian. However, the traditional reading HLu. la is quite satisfactory, owing to the comparative existence of the root:

PIE √les-, √los- ‘glänzen’ (P. –)

HLu. laša-laša-	(vb.) ‘glänzen’ (?) (‘FLAMMAE(?)’) la/i/u-sà-la/i/u-sà-ta)
OInd. lasa-	(a.) ‘shining’ (MonWil. 899, lasas [sgN])
𐎧i. lešala-	( <sup>MUL</sup> c.) ‘Komet’ (HEG 2:54, le-eš-šal-la-aš [sgN])

Similarly, the other alternative readings for “la/i/u” lack comparative content. For this reason, I feel that Hawkins’s suggestion may be an unnecessary complication of the notation.

(b) In Lydian there are two laterals, Lyd. l and Lyd. λ. It has been suggested (Gusmani, LydWb. 33) that Lyd. λ represents a palatal due to the presence of the glide in the comparative evidence (see, for instance, Lyd. aλa- = Lat. alio- ‘alius’). Additional examples of PIE \*l<sub>i</sub>, li → Lyd. λ can now be identified in the data, for instance, in:

CLu. lali-	(c.) ‘Wort, Rede’ (HEG 2:20, DLL. 62, la-li-iš)
Lyd. laλē-	(vb.) ‘aussprechen’ (LydWb. 158, laλēnś [pt.sgN])

Here Gusmani’s Law is confirmed.

§3. A palatalized lateral /l/ is also attested in Tocharian /ly/, constituting a phoneme in both dialects (Adams 1988:10). A similar etymological origin to that of Lydian can



established for both dialects A and B, except that the Tocharian also includes non-organic examples of *ly* having gained the palatal from the following PIE \**ē* (cf. TochB. *klyomo* (a.) ‘noble’ DTochB. 231 : Go. *hliuma* (m.) ‘Gehör’ (pl.) ‘Ohren’ GoEtD. 188).

### 3.3.9 Neogr. \**l̥* (anteconsonantal syllabic lateral)

§0. PIE \**l̥*, the vocalic counterpart of PIE \**l*, was postulated by Osthoff as the lateral counterpart of PIE \**ɾ*. Like PIE \**ɾ*, the syllabic PIE \**l̥* is only attested in Indo-Iranian, but in the rest of the group the svarabhakti vowels are externally paralleled with the result that the Neogrammarian theory needs to be scaled back in this respect.

§1. According to Brugmann’s synthesis (Grundr<sup>2</sup> 1:452), the outcomes of Neogr. \**l̥* in the cognates are expressed in the table:

Uridg.	Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.
<i>l̥</i> +C	<i>ɾ</i>	<i>ər</i>	<i>al, la</i>	<i>αλλα</i>	<i>li</i>	<i>ol</i>	<i>li</i>	<i>ul, lu</i>	<i>il</i>	<i>lī, lū</i>

§2. The problems of Neogr. \**l̥* are identical with those of Neogr. \**ɾ*. Brugmann’s alleged examples can be proven to contain vowels proper instead of svarabhaktis emerging from syllabic \**l̥*, as detailed below.

§3. Brugmann (Grundr<sup>2</sup> 1:456) reconstructed Neogr. \**p̥l̥* for “Ai. *pip̥ɾ-más* gr. *πιπλα-μεν* ‘wir füllen’ (II S. 935)”. The material contains, however, two separate stems:

(a) PIE \**pel-* \**pol-*, the unextended root, is confirmed by the absence of cerebralization (the converse of Fortunatov’s Law II) in Sanskrit:

PIE \**pel-* ‘füllen, usw.’

TochB. <i>päl-</i>	(vb.) ‘drip’ (DTochB. 379, <i>pältsi</i> [inf.])
RV. <i>pípar-</i>	(pr.) ‘füllen, anfüllen’ (WbRV. 775, <i>píparti</i> [3sg])

(b) PIE \**pleah-*, the laryngeal extension of the root, is confirmed by Rig-Vedic hiatus and Greek *α* coinciding in:

RV. <i>prá’-</i>	(ao.) ‘füllen, anfüllen’ (WbRV. 886, <i>práas</i> [2sgConj])
RV. <i>kakṣia-prá’-</i>	(a.) ‘den Leibgurt füllend’ (WbRV. 309, <i>práam</i> [A])
Gr. <i>πιμ πλα-</i>	(pr.) ‘füllen’ (GEW 1:537-8, <i>πιμπλαμεν</i> [1pl])

Thus, a root PIE \**pl-* and its extension PIE \**pleah-* are attested instead of a single root with Neogr. \**l̥*.

§4. Brugmann (Grundr<sup>2</sup> 1:457) compared the items “Ai. *pṛthú-ṣ* av. *pərəθu-š* ‘breit’, ai. *pṛthiví* ‘Erde’ : Arm. *lain* ‘breit’, air. *lethan* ‘breit’ [...]” and (Grundr<sup>2</sup> 1:468) “akymr. *litan* ‘breit’ gall. *Smertu-litanus* Litu-gena [...]”, which are all derived from Neogr. \**p̥l̥t(h)-*. The now enriched material implies, however, a root PIE  $\sqrt{\text{pl-}}$  ‘breit, weit’ with alternative extensions:

(a) PIE \**pl-ah̥i-* (a.) ‘breit, weit’ (CHD P:66)

Ḫi. palḫi-	(a.) ‘breit, weit’ (HHand. 117, pal-ḫi [NA])
Arm. lain-	(a.) ‘breit’ (Grundr <sup>2</sup> 1:457, PIE *pleaḫino-)
OGaul. litano ·briga-	(ON.) ‘Breitburg’ (ACSS. 2:243, PIE *plaḫito-)
OCymr. litan-	(a.) ‘breit’ (ACSS. 2:242, Grundr <sup>2</sup> 1:468)

(b) PIE \*p<sub>l</sub>·thu-, a root without a laryngeal suffix, is secured by the absence of gAv. § (the converse of Fortunatov’s Law II) in:

gAv. pərəθu-	(a.) ‘weit, breit’ (AIWb. 892-3)
RV. pṛthú-	(a.) ‘breit, weit sich austreckend’ (WbRV. 857) <sup>552</sup>

§5. Brugmann (Grundr<sup>2</sup> 1:464) reconstructed Neogr \*l<sup>g</sup>h- for “Gr. ἀλφῆ ‘Arbeitslohn’ (ai. Pf. ān-ṛhúr : árha-ti ‘er ist werth, verdient’), falls lit. algà ‘Lohn’ mit elgiúos ‘ich führe einen Lebenswandel, betrage mich’ zusammenstellen ist.” For this root, the following bases are implied by the comparative method:

(a) Neogr. \*alg<sup>u</sup>h- (PIE \*ḥaelg<sup>u</sup>h-) ‘erwerben’ (P. 32-3, HEG 1:134)

Ḫi. ḫalguešar-	(n.) ‘Ernte, Erstlingsgabe’ (HHand. 36, ḫal-ku-eš-šar)
RV. sahasra ·arḡhá-	(a.) ‘tausendfachen Wert habend’ (WbRV. 1504)
Gr. ἀλφῆ-	(f.) ‘Erwerb’ (GEW 1:81, ἀλφῆ [sgN])
Li. algà-	(f.) ‘Lohn, Sold’ (LiEtWb. 7)
OPr. ālga-	(f.) ‘Lohn’ (APrS. 298, ālga [sgG])

The root with a common Indo-European /a/ is confirmed by the Old Anatolian laryngeal, Rig-Vedic hiatus and Greek ᾶ-. Owing to the presence of Ḫi. ḫ, vocalizations such as Gr. ἀλφ- should no longer be explained with Neogr. \*l̥ but with the vowel PIE \*a (formerly \*h<sub>2</sub>) accompanying PIE \*ḫ.

(b) Neogr \*l<sup>g</sup>h (= PIE \*ḥalg<sup>u</sup>h-), the zero-grade root, appears only in Indo-Iranian and is of secondary origin. Neogr. \*l̥ took syllabicity after the loss of PIE \*a in:

OInd. ān ·ṛh-	(pf.) ‘wert sein’ (Whitney 1955 <sup>8</sup> :282, ānṛhús).
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(c) PIE \*eḥalg<sup>u</sup>h-, the zero-grade root with a prothetic vowel, appears in Baltic:

Li. eĩg-	(vb.) ‘sich benehmen, sich betragen’ (LiEtWb. 7)
Latv. elg-	(vb.) ‘sich aufdrängen, aushalten, usw. (LiEtWb. 7)

§6. Brugmann (Grundr<sup>2</sup> 1:468) reconstructs Neogr. \*m̥l̥to- for “Mir. blith Inf. zu [air.] melim ‘molo’.” The comparative method implies, however, two derivationally distinct roots:

(a) PIE \*mel- \*mol- (root PIE √ml-) are attested in:

Ḫi. mala-	(vb.) ‘mahlen, zerkleinern’ (CHD LN:125-6, ma-al-la-i)
OIr. meli-	(vb.) ‘.i. molō moudre, écraser’ (LEIA M-32, melim)

(b) PIE √mli- ‘mahlen’ (P. 716), the \*·i-extension, is attested in PIE √mlit- ‘mahlen, usw.’

<sup>552</sup> It is possible to compare gAv. pərəθu- with OAnat. <sup>m</sup>paltu·patita- (NOMS. 917, pa-al-du-ú-ba?-a?-ti-it-ta-aš). As we are dealing with a personal name and the meaning of ·patita- is unknown, the comparison remains uncertain.

OIr. mlith-	(vn.f.) ‘moudre, écraser, ruiner, froter’ (LEIA M-32)
Gr. βλίτο-	(n.) ‘Melde : despatch’ (GEW 1:245)
Gr. βλιτά-	(f.) ‘altes Weib’ (GEW 1:245)
OInd. mrit ya-	(pr.) ‘zerfallen, sich auflösen’ (KEWA 2:695)
OInd. a sam mletya-	(a.) ‘ohne zu zerkauen’ (KEWA 2:695)

Three witnesses confirm PCelt. \*li ← PIE \*li, not Neogr. \*l̥, which is placed beyond doubt by the ablauting extension PIE \*mloit-, mleit- in OInd. √mlet-.

§7. Brugmann (Grundr<sup>2</sup> 1:470) compares “Go. lustu-s, ahd. lust ‘Lust’, wahrscheinlich zu ai. lālaša-s ‘begierig’ gr. λαίωμαι ‘ich begehre’ aus \*λι-λασι̯ο- (294 S. 273)”. For this, the comparative method implies two externally paralleled roots, one with Neogr. \*a and another with Neogr. \*u:

(a) PIE \*lus- ‘Lust’ (with Neogr. \*u) is confirmed by two witnesses:

OInd. luṣa bha-	(m.) ‘brünstiger Elephant’ (KEWA 3:109, luṣabhaḥ)
Go. lus tu-	(.) ‘Lust’ (GoEtD. 238)

(b) PIE \*leahs- ‘begehren, verlangen’ (with Neogr. \*a) is evident in:

OInd. lālasa-	(a.int.) ‘heftig verlangend nach’ (KEWA 2:99-100)
Gr. λαίω-	(prM.) ‘heftig begehren, verlangen’ (GEW 2:123)

To the latter belongs the cerebralized stem (originally a reduplication) PIE \*lelahso-

OInd. lāṣa-	(pr.) ‘begehren, Verlangen haben nach’ (KEWA 3:95),
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where the laryngeal implied by Gr α is confirmed by Fortunatov’s Law II.

§8. As for the PIE \*l̥ in System PIE, note the following general remarks:

(a) The syllabic lateral PIE \*l̥ is directly continued only in Indo-Iranian (possibly having turned into ṛ̥). Its Proto-Indo-European origin is confirmed by the impossibility of the loss of any vocalic element in examples like gAv. pərəḍu- = RV. pṛthú-, which are not affected by Fortunatov’s Law II. Owing to this, it is possible to postulate PIE \*l̥ based on the principle of family consistency (Trask DHCL 120). Accordingly, the core of the Neogrammarian theory is sound in terms of its key assertion, the existence of syllabic PIE \*l̥ in the proto-language.

(b) Through the availability of PIE \*h̥ in reconstruction, it can be shown that the outcome of the syllabic lateral was a simple lateral in all dialects. This is because \*l̥ (in PIE \*h̥l̥ and \*l̥h̥) did not produce svarabhakti vowels, but turned into simple PIE \*l following the loss of PIE \*h̥:

PIE *l̥ →	RV. ṛ̥/r̥, Av. ər̥/r̥, Lat. *l̥ (in Lat. l), Li. *l̥ (in Li. l), etc.
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(c) Since the svarabhakti vowels can be externally confirmed by parallels to represent original PIE items by at least two witnesses (Fick’s Rule), scaling back the traditional outcomes of Neogr. \*l̥ presents no theoretical or practical difficulties.

### 3.3.10 Neogr. \*ɭ<sup>l</sup> (antevocalic syllabic lateral)

§0. As the Neogrammarians noticed that the svarabhakti vowels associated with syllabic sonants appeared in antevocalic position as well, Neogr. \*ɭ<sup>l</sup> was introduced as the counterpart of Neogr. \*ɭ<sup>r</sup> to account for the situation.

§1. According to Brugmann (Grundr<sup>2</sup> 1:452), Neogr. \*ɭ<sup>l</sup> resulted in svarabhakti vowels identical to those associated with Neogr. \*ɭ<sup>r</sup>:

Uridg.	Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.
ɭ+V	ir, ur	ar	al	al	il	al	al	ul	il	il

§2. The problems of Neogr. \*ɭ<sup>l</sup> match those of Neogr. \*ɭ<sup>r</sup>. For this proto-phoneme, Brugmann's examples of svarabhakti vowels can be comparatively proven as original in the following manner:

§3. Brugmann (Grundr<sup>2</sup> 1:456) reconstructed Neogr. \*ɭ<sup>l</sup>- 'heben, tragen' for "ai. tula 'Gewicht, Wage', gr. τάλαις 'duldend', lat. 2. Sg. at-tulās, got. þulaip 'er duldet'." Neogr. \*ɭ<sup>l</sup> lacks support, owing to several externally confirmed correspondences:

(a) PIE \*tul- 'tragen' is attested in three subgroups, including Indo-Iranian, and therefore carries an original PIE \*u in:

Lat. tul-	(pf.) 'tragen, bringen' (WH 2:68, tulit [3sg])
OLat. tulō	(pr3.) 'tragen, bringen' (WH 2:688)
OIcl. þola-	(vb.) 'ertragen, dulden' (ANetWb. 615)
Go. þula-	(vb.) 'endure, be patient with' (GoEtD. 367, þulan)
OInd. tulā-	(f.) 'Waage, Waagebalken' (EWA 1:658)

PIE \*u is internally confirmed for Indo-Iranian through the variants PIE \*teul- \*toul-:

OInd. tolaya-	(vb10.) 'aufheben, aufhalten, wägen' (EWA 1:658)
OInd. tolana-	(n.) 'das Aufheben' (EWA 1:658)

(b) PIE √tahl- 'tragen'. Greek and Tocharian (lacking palatalization) preserve the root forms PIE \*teahl- and PIE \*tēahl- in:

Gr. τέταλ-	(pfM.) 'ausproben lassen, hervorbringen' (GEW 2:870)
TochB. tāle-	(sb.) 'load, burden' (DTochB. 296)
Gr. ταλα(Ϝ)ό-	(a.) 'ausdauernd, ertragend, unglücklich' (GEW 2:848)
TochA. tālo-	(a.) 'miser : elend' (Poucha 119)
TochB. tallārñe-	(sb.) 'misery' (DTochB. 282)

§4. Brugmann (Grundr<sup>2</sup> 1:470) reconstructed Neogr. \*k̂ɭ<sup>l</sup>- for "Ai. kulāyam 'Gehäuse, Nest, Lagerstatt', gr. καλιά 'Hütte, Nest', got. hulundi F. 'Höhle' : air. cuil 'Versteck, Winkel', mir. cuile 'Keller, Magazin' wegen u zu § 499?" and (Grundr<sup>2</sup> 1:456, 465) "Go. hulja ahd. hull(i)u 'ich hülle', ahd. hull(i)a 'Hülle', zu ahd. helan 'hehlen'." Several roots are, however, implied by the comparative method:

(a) PIE \*k̂ahl- 'cover, deck, etc.'. An Indo-European /a/ ≡ PIE \*eaḥ is confirmed by Italo-Greek and the laryngeal by cerebralization in Sanskrit in the dental extension PIE \*k̂eaḥl-to-:

Gr. καλίá-	(f.) ‘Hütte, Nest’ (GEW 1:764)
Lat. calim	(adv.) ‘antiqui dicebant pro clam’ (WH 1:138)
Lat. calautica-	(f.) ‘Kopfbedeckung vornehmer Frauen’ (WH 1:136)
OInd. śāṭa-	(m.) ‘a strip of cloth, a kind of skirt’ (MonWil. 1063)

(b) In zero grade, the base PIE \*kahl- with unaccented PIE \*a has resulted in Gr. χ (= Neogr. \*kh) following the loss of PIE \*a, as proven by:

Lat. clam	(adv.) ‘heimlich, verhohlen, insgeheim’ (WH 1:226-7)
Aiol. χλάμυ-	(f.) ‘Oberkleid, Mantel’ (GEW 2:1102, χλάμυν [sgA])

(c) The presence of the \*ě-grade is explained by schwebeablaut in PIE \*kaḥel- \*kaḥēl- ‘verbergen’ (= Neogr. \*khel- \*khēl-):

OIr. celi-	(pr.) ‘verbergen’ (LEIA C-53-4, ceilid)
Lat. cēlā-	(pr1.) ‘verhehlen, verbergen’ (WH 1:196)

(d) PIE √Kul- ‘hohl’; ‘Keller’ (with ambiguous K) is required by Centum forms like:

OIcl. hol-	(a.) ‘hohl’ (ANetWb. 248, holr sgN)
Gr. κόλα	(n.) ‘Höhlungen unter den Augen’ (GEW 2:46)
Ĥi. kuli-	(sb.) ‘Loch, Hohlweg’ (?) (HHand. 83, HEG 1:–)
OEng. a ·holia-	(vb.) ‘to dig’ (ASaxD. 31, aholian [inf.])
MidIr. cuile	(m.) ‘Keller, Magazin’ (LEIA C-269, Grundr <sup>2</sup> 1:456)

Owing to the uniform \*u-vocalism and the absence of PIE \*h (cf. Ĥi. kuli- and Gr. κόλα), the root is not identical with PIE √kaḥl-.

§5. Brugmann (Grundr<sup>2</sup> 1:460) reconstructed Neogr. \*p<sup>l</sup>V for “Ai. purú- av. pouru- (Nom. Pl. parav-ō) apers. paru- ‘viel’ : Lit. pilù ‘ich schützte, giesse’, vgl. got. filu ‘fiel’.” Yet the material confirms several PIE bases implied by isoglosses with a common Indo-European vocalism:

(a) PIE √pul- ‘viel’, the zero-grade root, appears with unified PIE \*u in:

RV. pur-	(ao.) ‘anfüllen, reichlich zufüllen’ (WbRV. 776, pūrdhí)
RV. pūryá-	(prP.) ‘anfüllen’ (WbRV. 776, pūryámāṇam ‘angefüllt’)
OIr. hu <sup>l</sup> le-	(a.) ‘tout, entire, chacun’ (LEIA U:17-18)
Go. full-	(a.) ‘πλήρης = voll’ (GoEtD. 131, fulls [sgN])
OCS. plūnŭ-	(a.) ‘voll’ (Sadnik √672)

Additionally, the ablaut bases PIE \*pe/oúl- \*pē/ōúl- have been preserved in:

RV. paurá-	(m.) ‘Füller, Zufüller, Spender, Mehrer’ (WbRV. 863)
LAv. paoirī-	(a.) ‘viel, zahlreich, reichlich’ (AIWb. 855-6, paoiriš)
Hom. πολύ-ποδ-	(m.) ‘polypus’ (LSJ. 1441, πολύποδος [sgG])

(b) PIE \*polu- ‘viel, zahlreich’ appears in a perfect match between Greek, Iranian and Armenian:

Gr. πολύ-	(a.) ‘viel, zahlreich, häufig’ (GEW 1:577, πολύς [sgN])
gAv. po <sup>u</sup> ru-	(a.) ‘viel, zahlreich, reichlich’ (AIWb. 855-6, pouruš)

OPers. paru-	(a.) ‘much, many’ (OldP. 196, paruv [sgNA])
Arm. y·olov-	(a.) ‘viel’ (Grundr <sup>2</sup> 1:510)

(c) PIE \*pil·(aḥ)- ‘voll, füllen’ with PIE \*i is confirmed by multiple witnesses in:

Li. pīl-	(vb.) ‘gießen, ausschütten, -füllen’ (LiEtWb. 592, pīlti)
Li. aīnt·pīla-	(m.) ‘Auffüllmaterial, Schotter’ (LiEtWb. 592, aīntpīlas)
RV. rās·pīrá-	(a.) ‘geräuschvoll’ (WbRV. 1163)
OIr. il-	(a.) ‘many, numerous’ (DIL. 380, il [sgNA])
Go. filu-	(a.) ‘πολύς : much, λίαν : very’ (GoEtD. 116)

§6. Brugmann (Grundr<sup>2</sup> 1:462, 467) compared “Arm. malem ‘ich zerstosse’ : umbr. kumaltu ‘commolito’, nkymr. malaf ‘ich mahle, zermalme’ [...]”. Instead of Neogr. \*m<sup>h</sup>lV, the comparative method implies a root with an internal laryngeal:

(a) PIE √maḥl- (ablaut PIE \*meaḥl- \*mēaḥl-) with Arm. a = Gr. á = OIr. a is attested in:

Arm. male-	(vb.) ‘zerstossen’ (EtDiArm. 443, malem [1sg])
Gr. μάλευρο-	(n.) ‘Mehl’ (PNm.) ‘Müller’ (GEW 2:166)
OIr. malart	(f.) ‘destruction’ (LEIA M:14)
Li. molé	(f.) ‘Mahlen, Mahlgut’ (LiEtWb. 463)

Here in particular the vowel Li. o must reflect PIE \*ēaḥ. Furthermore,

(b) PIE \*meaḥls-, the \*s-extension of the root, is attested in:

AV. maṣmaṣákaro-	(pr.) ‘zu Staub zermalmen’ (KEWA 2:604)
OInd. maṣmaṣ kārāya-	(pr.) ‘zu Staub zermalmen’ (KEWA 2:604)

The cebralization in Sanskrit (Fortunatov’s Law II) confirms the laryngeal.

§7. Brugmann (Grundr<sup>2</sup> 1:462) compared “Arm. kaḥin, Gen. kaḥnoy, ‘Eichel’ : gr. βάλανο-ς ‘Eichel’, vgl. auch lit. gīlė preuss. gile ‘Eichel’ [...]”, proposing Neogr. \*g<sup>h</sup>lV- as the starting point for the forms. However, the comparative distribution of the items is different.

(a) PIE \*g<sup>h</sup>eaḥl- ‘Eichel’, reflected in common Indo-European /a/, is proven by:

Arm. kaḥin-	(sb.) ‘Eichel’ (EtDiArm. 348, kaḥin, kaḥnoy [G])
gr. βάλανο-	(f.) ‘Eichel’ (GEW 1:213)

The corresponding zero grade (PIE \*g<sup>h</sup>aḥl-) is preserved in

OInd. gula-	(m.) ‘the glans penis, clitoris’ (MonWil. 360).
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(b) PIE \*g<sup>h</sup>aḥl-il- ‘Eichel’ (P. 472) an alternative extension of the root PIE \*g<sup>h</sup>aḥ-, is proven by the alternation of quantity in Baltic, requiring \*g<sup>h</sup>aḥil- and \*g<sup>h</sup>aḥlil-.<sup>553</sup>

Li. gīlė	(f.) ‘Eichel : acorn’ (LiEtWb. 151)
OPr. gīle	(f.) ‘echele : Eichel’ (APrS. 338)
Li. gylė	(f.) ‘Eichel’ (LiEtWb. 151)

<sup>553</sup> For the etymological \*i in Armenian dialects, see Martirosyan (EtDiArm. 411f.).

Latv. dzīla (f.) ‘Eichel’ (LiEtWb. 151)

§8. Brugmann (Grundr<sup>2</sup> 1:473) posits Neogr. \*tʰV- for “Lett. tilát tilinát ‘flach ausbreiten’, aksl. tīlo ‘Boden’ : nbret tal ‘Stirn’ gall. cassi-talos, zu lit. tīlės etc., s. § 521.” Several original vocalizations are, however, confirmed for PIE by the comparative method:

(a) PIE √tahil- ‘ausbreiten, überziehen, bedecken; Boden’, a root with PIE \*i, is now confirmed by Old Anatolian, matching Balto-Slavonic in:

Ĥi. teiala-	(a.) ‘(qualifiziert Leinen)’ (HHand. 176, HEG 3:364)
Latv. tilâ-	(vb.) ‘ausgebreitet liegen’ (LiEtWb. 1093, tilât [inf.])
Ĥi. teialai-	(vb.) ‘bedecken, überziehen’ (HHand. 176, HEG 3:364)
Li. tīlė-	(f.) ‘Bodenbretter, Bodenbelag’ (LiEtWb. 1093)
OCS. tīlo	(n.) ‘Boden : ground’ (Sadnik √970)

(b) PIE √tahl- ‘Fläche, Ebene, Gegend’ is attested in \*e-grade PIE \*teahl-:

OInd. tala-	(n.) ‘Fläche, Ebene, Handfläche’ (KEWA 1:487)
Arm. t’al	(sb.) ‘Gegend, Distrikt’ (P. 1061)
OEng. þel-	(n.) ‘thin piece, plank, plate’ (ASaxD. 1046)

(c) As for Brugmann’s semantically unconvincing comparison of Celtic, I would like to suggest a connection between Greek and Indo-Iranian instead:

PIE √thal- ‘Kuppel, Stirn, Gaumen’

√tehal-, √tohal-

MidIr. tel	(n.) ‘Stirn’ (LEIA T-180f., telaib [plD])
YV. tálu-	(n.) ‘Gaumen : palatum’ (EWA 1:644)
AVP. tālavya-	(a.) ‘zu Gaumen gehörig’ (EWA 1:644)

√thael-, √thaol-

Gr. θόλο-	(f.) ‘Kuppel, rundes Gebäude’ (GEW 1:677)
Gr. θάλαμο-	(m.) ‘innerer Raum des Hauses’ (GEW 1:648)
MidIr. ta <sup>u</sup> l-	(n.) ‘Stirn : forehead’ (LEIA T-180f.)
ModBret. tal	(.) ‘Stirn’ (P. 1061)
OGaul. cassi-talo-	(PN.m) ‘Au front élégant’ (ACSS. 1:828)

§9. The main issues concerning Neogr. \*l̥ = (C)l̥HV can be summarized as follows:

(a) The actual outcome of the sequence PIE \*(C)l̥hV after the loss of laryngeal is (C)IV. That is to say, svarabhakti vowels did not develop from syllabic sonants, as suggested by the Neogrammarians.

(b) The resulting theoretical vacuum is readily filled as the svarabhakti vowels are externally confirmed by means of the comparative method and therefore shown to be original.

### 3.3.11 Neogr. \*ǰ̄ (anteconsonantal long syllabic lateral)

§0. Neogr. \*ǰ̄, the lateral counterpart of Neogr. \*ǰ̄, was generalized for the proto-language by Brugmann and Osthoff, with the intent of explaining the svarabhakti vowels discussed below.

§1. According to Brugmann (Grundr<sup>2</sup> 1:473ff.), the development of Neogr. \*ǰ̄ (identical to Neogr. \*ǰ̄) can be summarized as follows:

Uridg.	Ai.	Av.	Arm.	Gr.	Alb.	Ital.	Kelt.	Germ.	Balt.	Abulg.
ǰ̄+C	ur	ir	al la	ᾱλ λᾱ	al	al	al	ul	il, ul	lī

Neogr. \*ǰ̄ was structurally defined as \*\*ǰ̄+ə (in Cǰ̄əC). This view has been inherited by the laryngeal theory as such (LT \*Cǰ̄HC), and therefore it requires no separate discussion.

§2. The problems of Neogr. \*ǰ̄ are identical with those of Neogr. \*ǰ̄. Instead of repeating these, it is possible to proceed directly to an examination of Brugmann's examples.

§3. Brugmann (Grundr<sup>2</sup> 1:475) compared the items "Ai. mūrhdán- 'Höhe, höchster Teil, Kopf', gr. βλωθρό-ς 'hochgewachsen', vgl. gr. βλαστειν 'in die Höhe kommen, hervorspriessen, keimen', ags. molda 'Kopf.'" Despite this, the data requires a twofold organization:

(a) PIE √mul- (or √maḥul-) 'top, head, usw.' and the extension \*mul·dhon- appear in:

OIr. mul-	(m.) 'tête' (LEIA M-74, mul [sgN])
OEng. molda(n)-	(m/f.) 'the top of the head' (ASaxD. 695)
RV. mūrhdán-	(m.) 'Schädel, Oberhaupt, Kopf' (WbRV. 1053)

Three languages confirm PIE \*u, which is not traceable back to Neogr. \*ǰ̄.

(b) The Hellenic forms, belonging to a different semantic field ('keimen, wachsen'), cannot reflect PIE \*mul- (→ Gr. μωλ-) and must have a different origin:

Gr. βλωθρό-	(a.) 'hochgewachsen' (GEW 1:246, βλωθρός)
Gr. βλαστό-	(pt.m.) 'Keim, Spross, Stengel' (GEW 1:241)
Gr. βλαστό-	(ao.) 'keimen, sprossen' (GEW 1:241, βλαστειν)
Gr. βλάστη-	(f.) 'Ursprung, Geburt' (GEW 1:241)
Gr. βλαστάω	(pr.) 'hervorbringen' (GEW 1:241)

In theory, the Greek items could be compared with

TochA. malto-	(num.ord.) 'primus' (adv.) 'primum' (Poucha 214),
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but this remains uncertain owing to the slight difference in semantics, schwebeablaut and the ambiguity of Gr. β (= PIE \*m, \*b or \*g<sup>u</sup>).

§4. Brugmann (Grundr<sup>2</sup> 1:475) reconstructed Neogr. \*pǰ̄no- for "Ai. pūrḡá-s 'gefüllt', air. lān akymr. laun 'voll', lit. pílna-s aksl. plūnū 'voll', ai. pūrvi F. 'multa', gr. πολλή 'multa' aus. πολῖα, älter \*πολῖα- (§ 293, 2 S. 272)." Instead of a uniform prototype, the comparative method implies several externally confirmed PIE roots:



(a) PIE  $\sqrt{\text{pul-}}$  ‘full’. The Verner-root with PIE \*u appears in:

PIE *pul-	
RV. pur-	(ao.) ‘füllen, reichlich zufüllen, schenken’ (WbRV. 776)
PIE *pulno-	
RV. pūrṛá-	(pt.) ‘voll, gefüllt’ (WbRV. 777, 844)
OCS. plünŭ-	(a.) ‘voll’ (Grundr <sup>2</sup> 1:475)
Rus. polnotá-	(f.) ‘Fülle, Vollständigkeit’ (REW 2:394)
PIE *poulu-	
Hom. πουλύ-	(a.) ‘voll’ (LSJ. 1456, πουλύς)
LAv. pao <sup>u</sup> -	(adv.) ‘reichlich, in reichem Mass’ (AIWb. 855)

(b) PIE  $\sqrt{\text{pil-}}$  ‘voll’, already proven to contain \*i under the respective antevocalic variant, is widely attested:

PIE *pil·(aḥ)-	
Li. pìl-	(vb.) ‘gießen, ausschütten, -füllen’ (LiEtWb. 592, pìlti)
Li. aīnt·pila-	(m.) ‘Auffüllmaterial, Schotter’ (LiEtWb. 592, aīntpilas)
RV. rās·pirá-	(a.) ‘geräuschvoll’ (WbRV. 1163)
OIr. il-	(a.) ‘many, numerous’ (DIL. 380, il [sgNA])
PIE *pilaḥno-	
Li. pìlna-	(a.) ‘voll’ (LiEtWb. 591-2, pìlnas [sgN])
OPr. pilna-	(a.) ‘ganz’ (APrS. 398)
PIE *pilu-	
Go. filu-	(a.) ‘πολύς = much’, λίαν = very’ (GoEtD. 116)

(c) The prototype PIE \*polno- is shown by two witnesses:

Gr. πολλό-	(a.) ‘viel, zahlreich, häufig’ (GEW 1:577, πολλός)
LAv. parənah·vant-	(a.) ‘in Fülle vorhanden, reichlich’ (AIWb. 870)

The absence of the laryngeal is proven by the converse of Fortunatov’s Law II.<sup>554</sup>

(d) The base Neogr. \*plē- (≡ PIE \*plē- v \*plaḥē- v \*plēḥa-) appears in:

Gr. πίμ·πλη-	(pr.) ‘füllen, vollmachen’ (GEW 1:537, πίμπλησι)
Lat. plēno-	(a.) ‘voll(ständig), schwanger, stark, satt’ (WH 1:322)
Umbr. plēno-	(a.) ‘voll’ (WH 1:322, plener [plDAb])

(e) Neogr. \*plōno- (or PIE \*plēahno- v \*plōahno-) has been preserved in the Celtic

OIr. lān-	(a.) ‘full (of), filled (with)’ (DIL. 421). <sup>555</sup>
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<sup>554</sup> Brugmann’s internal reconstruction of Gr. πολλή ← PGr. \*πολῃα is unsatisfactory due to the external confirmation of PIE \*polno-.

§5. Brugmann (Grundr<sup>2</sup> 1:475) reconstructed Neogr. \*u̯l̥n- for “Ai. úrṇā aus \*u̯ūrṇā, lat. lāna aus u̯lānā, lit. vılna ‘Wolle’, gr. οὔλο-ς ‘Kraus’ aus \*ɸολνο-ς (§ 408, 3 S. 359); vgl. § 451 Anm. über mir. oland nkymr. gwlan ‘Wolle’.” The extended material implies several distinctions within the data:

(a) PIE √hauł- is established by various extensions, briefly summarized as follows:

1. PIE \*hauło-, the thematic extension, proves PIE \*á indirectly in OInd. ū:

OInd. sām ·ūla-	(n.) ‘wollenes Hemd’ (KEWA 1:116, 3:652)
Gr. οὔλο-	(m.) ‘Wolle’ (GEW 2:118 & 3:146, οὔλος [sgN]) <sup>556</sup>

2. PIE \*haułio- (with \* ·io-suffix) is attested in:

Ĥi. ĥulia-	(c.) ‘Wolle’ (HEG 1:280, ĥu-li-ia-aš [sgN])
RV. sām ·ulía-	(m./n.) ‘wollendes Hemde’ (WbRV. 1391)

Here Ĥi. ĥ directly reflects the original laryngeal.

3. PIE \*hauł ·(o)n-, the nasal extension, is shared by several branches:

Ĥi. ĥulana-	(c.) ‘Wolle’ (HEG 2:278f., ĥu-u-la-[n(i)])
RV. úrṇa ·mradas-	(a.) ‘Wollen-weich’ (WbRV. 274)
OCS. vlūna	(f.) ‘Wolle’ (ANEtWb. 633)

4. As for the general context (to my knowledge unrecognized), it is worth mentioning that the root √hauł- ‘wool’ is a \* ·l-derivate of the root

√hau- ‘sheep’

HLu. haua-	(c.) ‘sheep’ (CHLu. 1.1.48, OVIS(ANIMAL)há-ua/i-sá)
Li. áva-	(m.) ‘Widder’ (APrS. 309, ávas [Jušk. I,179])
Lat. au ·bubulco-	(m.) ‘pastor ovium’ (WH 1:79)
OIr. u ·gaire	(m.) ‘shepherd’ (DIL 485 [sub oegaire], ugaire)
Lat. ū ·piliō(n)-	(m.) ‘Schafhirt’ (WH 2:211)

(b) PIE \*haułah ·no- ‘Wolle, usw.’, a root with PIE \*i is attested in:

Li. vılna-	(f.) ‘Wolle’ (LiEtWb. 1253)
Lat. uillo-	(m.) ‘das zottige, wollige Haar der Tiere’ (WH 2:791)
OPr. wilna-	(f.) ‘Rock’ (LiEtWb. 1253)

Baltic i, confirmed by Latin, here reflects an original PIE \*i, not Neogr. \*Ī. The segmentation of the extension PIE \* ·l- attaches the items to the main root

PIE √hauı- ‘sheep’:

CLu. ĥauı-	(c.) ‘Schaf’ (KLuN 70, DLL 45)
Gr. ὄϝı-	(c.) ‘Schaf’ (GEW 2:367, Arg. ὄϝıνς [plA])
Lat. oui-	(c.) ‘Schaf’ (WH 2:229-30)

<sup>555</sup> Whether OInd. prāṇa- (a.) ‘voll’ (Wack. AiGr. II/2:731, KEWA 1:283) and LAv. frāna yantōma- (a.) ‘-(?)’ (AIWb. 1016) belong to Lat. plēnus or OIr. lān cannot be determined, owing to the collision of vocalisms in Indo-Iranian.

<sup>556</sup> Whether PIE \*hauło- or PIE \*oĥauło- is to be reconstructed for Gr. οὔλο-remains uncertain.

Li. avi- (4) ‘Schaf’ (LiEtWb. 28, avis [sgN])

(c) PIE \*ulahn- ‘Wolle’ (P. 1139) is implied by the Greek lacking ‘prothetic á-’ in:

Gr. λῆνο-	(m.) ‘Wolle, Wollfaser, -flocke’ (GEW 2:117-8)
MidIr. olann	(f.) ‘Wolle’ (DIL. 489, olann, oland)
MidCymr. gwlan	(f.) ‘wool’ (Schrijver 1995:177)
Lat. lānā-	(f.) ‘Wolle’ (WH 1:756-7, lāna [sgN])

The absence of the initial laryngeal is confirmed by Old Anatolian, where the root PIE √ul- appears with an alternative extension:

Hi. uliḫi- (<sup>(SIG)</sup>c.) ‘e. Kultgegenstand aus Wolle’ (HHand. 185).

§6. Brugmann (Grundr<sup>2</sup> 1:475) reconstructed Neogr. mīC- for “Ai. mūrṇá-s ‘zermalmt’, alat. maltās ‘molles’ umbr. kumates comatir ‘commolitis’ [...] lit. miltai Pl. ‘Mehl’.” As usual, several distinct roots are confirmed by external comparison:

(a) PIE \*mul- is implied by the common Indo-European /u/ in:

Gr. μύλο-	(m.) ‘Handmühle’ (GEW 2:268-70)
RV. pari·mūrṇá-	(pret.pt.) ‘verwelkt, alt geworden’ (WbRV. 389)
Gr. μύλλω	(vb.) ‘mahlen, zerreiben, zermalmen’ (GEW 2:269)
OHG. mulla-	(vb.) ‘crush to pieces’ (GoEtD. 260, mullan [inf.])

As the liquid has been preserved in Rig-Vedic, there was no laryngeal within the root (the converse of Fortunatov’s Law II).

(b) PIE \*maḥl- is confirmed by multiple witnesses in:

Gr. μόλευρο-	(n.) ‘Mehl’ (PNm.) ‘Müller’ (GEW 2:166)
OIr. malart	(f.) ‘destruction’ (LEIA M:14)
Li. molé	(f.) ‘Mahlen, Mahlgut’ (LiEtWb. 463)
AV. maṣmaṣákaro-	(pr.) ‘zu Staub zermalmen’ (KEWA 2:604)
OLat. malto-	(pt.) ‘maltās : molles’ (Grundr <sup>2</sup> 1:475)

(c) PIE \*maḥil- (or \*milaḥ-?) is attested in Italic and Baltic:

Lat. milio-	(n.) ‘Hirse, Rispenhirse’ (WH 2:87, milium [sgNA])
Li. milinỹ-	(f.) ‘Handgriff and der Handmühle’ (LiEtWb. 453)
Li. miltā-	(1m.pl.) ‘Mehl’ (LiEtWb. 453, miltai [plN])
Latv. miltī-	(vb.) ‘zermahlen, prügeln’ (LiEtWb. 403, miltīt [inf.])

§7. The key issues concerning Neogr. \*ī̄ ≡ (C)l̄HC are:

(a) After the loss of the laryngeal, the actual outcome of the sequence PIE \*(C)l̄hC in Aryan languages is (C)l̄r̄C, rebutting the idea that svarabhakti vowels developed from syllabic sonants.

(b) In both Aryan and non-Aryan languages, the svarabhakti vowels traditionally derived from Neogr. \*ī̄ are paralleled by at least two witnesses, and therefore are shown to be original.

### 3.3.12 Liquids PIE \*l/ɭ and PIE \*r/ṛ in System PIE

§0. Only two liquids with consonantal PIE \*l \*r and vocalic PIE \*ɭ \*ṛ allophones are to be reconstructed for the proto-language, with syllabicity being conditioned by the environment C/V.

§1. The core Neogrammarian theory of the syllabic liquids PIE \*ɭ \*ɭ holds true, but the vocalic allophones are only continued in Indo-Iranian. In theory, some improvements could yet emerge, owing to the scattered traces of syllabic liquids in Later Anatolian and Tocharian:

(a) Occasional traces of the syllabic resonant /ṛ/ (written r) appear at the surface level of Later Anatolian. Thus, for example, the phoneme /ṛ/ is found in the environment C<sub>r</sub>C in Lycian:

Lyc. pr̥nawa-	(pr.) ‘build’ (Pedersen 1945:30, pr̥nawati [3sg])
HLu. parnaua-	(vb.) ‘serve’ (CHLu. 1.1.58, (CRUX)pa+r <sup>a</sup> / <sub>i</sub> -na-w <sup>a</sup> / <sub>i</sub> -tu <sub>4</sub> )

Since the Lycian corpus – and, consequently, our knowledge of the language – is relatively restricted, we cannot reconstruct PIE \*p<sub>r̥</sub>nouo- with certainty. In theory, syncope (the loss of the counterpart of the vowel /a/ in HLu. √parn-) could have occurred, thus resulting in a secondary syllabic ṛ in Lycian. As long as Later Anatolian has not been fully compared with Old Anatolian and the rest of the group, it remains possible that verification of PIE \*ɭ and \*ɭ may emerge from Later Anatolian.

(b) Furthermore, sporadic remnants of syllabic liquids also appear in Tocharian in a few (but clearly attested) instances. Thus, for instance, a surface level /ɭ/ appears in Tocharian B (written CɭC), corresponding to OInd. ɭ in:

RV. cākɭp-	(pfM.) ‘sich wonach richten’ (WbRV. 318, cākɭpré)
TochB. klpor-	(sb.abstr.) ‘obtaining’ (DTochB. 171, klpor <sup>a</sup> ) <sup>557</sup>
AV. kɭptá-	(pret.pt.) ‘geordnet (EWA 1:323-4, kɭptá-)

The Tocharian material is admittedly thin, but at least in theory external confirmation for the Indo-Iranian syllabic resonants could emerge from this direction in the future.

§2. No examples for PIE \*ɭ and \*ɭ are available in the ‘non-Aryan’ languages, because the svarabhakti vowels traditionally attached to syllabic sonants are externally paralleled and thus proven to be genuine by the comparative method.

## 3.4 Nasals Neogr. \*n \*m

### 3.4.1 Nasals in the Neogrammarian system

§0. Schleicher (1861-62) already correctly reconstructed the two nasals Paleogr. \*n (= PIE \*n) and Paleogr. \*m (= PIE \*m) in the proto-language.

<sup>557</sup> Adams (loc. cit.) explains the form as a loan, but the suffix is unmistakably Tocharian, and there is no syllabic liquid TochB. ɭ as would be the case if the form were a loan.

§1. In *Grundriss* Brugmann presented his theory of syllabic nasals, consisting of two series – Neogr. \*n̥ n̥<sup>n</sup> n̥ and Neogr. \*m̥ m̥<sup>m</sup> n̥ – that closely resemble liquids. The segmental analysis of the items was assumed to be identical with that of liquids:

Neogr. \*n̥<sup>n</sup> ≡ \*\*n̥<sup>n</sup>əV; \*n̥ ≡ \*\*n̥<sup>n</sup>əC; \*m̥<sup>m</sup> ≡ \*\*m̥<sup>m</sup>əV; \*n̥ ≡ \*\*m̥<sup>m</sup>əC.

§2. According to Brugmann, the nasals of the proto-language (written here for the dental nasal \*n only) were reflected in Indo-European as follows:

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
*n	n	n	v	n	n	n	n	n	n
*n̥+C	a	an	α	e (i)	en	in	un	in	ę
*n̥ <sup>n</sup> +V	an	an	αv	?	en	an	un	in	in̄
*n̥+C	ā	an	vā	?	en	an	un	in	in̄

The alleged outcomes of Neogr. \*n̥<sup>n</sup> \*n̥ \*m̥<sup>m</sup> \*n̥ are identical with liquids, except for the tiny differences of svarabhakti vowels and the treatment of Neogr. \*n̥ \*n̥, which assumedly lost the nasal and turned into the simple vowels /a/ and /ā/ in Indo-Iranian and, to some extent, Greek.<sup>558</sup> The following preliminary remarks concerning the four types of nasals as items of the inventory should be noted.

§3. The non-syllabic consonantal nasals Neogr. \*n (dental) and Neogr. \*m (bilabial) are attested in the antevocalic environment \*nV, mV. The reconstruction of PIE \*n and PIE \*m has not substantially changed, and the most relevant subsequent development concerns Brugmann's (*Grundr*<sup>2</sup> 1:342) distinction between four places of articulation for environments:

“Die idg. Grundsprache hatte vier der Articulationsstelle nach verschiedene Nasale, den labialen, *m*, den dentalen, *n*, den palatalen *n̄*, und den velaren, *ŋ*. Die zwei letzten kamen nur vor palatalen und vor velaren Consonanten vor [...].”

The existence of conditions for Neogr. \*n̄ (before palatals) and Neogr. \*ŋ (before velars) has more commonly been interpreted as indicating the allophonic status of the palatal (Neogr. \*n̄) and velar (Neogr. \*ŋ) articulations. This view is no doubt correct, but nevertheless the underlying problem is not wholly resolved with allophones (for reasons that will be discussed below). The surface-level labial and dental nasals of the Indo-European languages can also be allophones in environments NK (velar), NP (labial) and NT (dental), where an original PIE \*n or PIE \*m cannot be verified owing to the assimilations:

PIE \*n/mK → \*nK    PIE \*n/mP → mP    PIE \*n/mT → nT.<sup>559</sup>

If Brugmann's allophonic reconstruction (\*ŋK) is mechanically replaced with a structural one (\*nK, etc.), the outcomes are not necessary correct. because PIE \*mK,

<sup>558</sup> Because the problems of the syllabic liquids apply to the nasals and vice versa, all of the arguments have not been repeated here.

<sup>559</sup> PIE \*mT was only preserved in Lithuanian (Li. šim̄tas, etc.), with the result that in practice the entire case \*nT is ambiguous.

etc. can also be correct from a comparative point of view. Though this possibility is usually not mentioned in etymological contexts, actually a cover symbol \*N should be used throughout until and unless PIE \*m or PIE \*n has been proven.<sup>560</sup>

§4. In the year marking the appearance of Osthoff's syllabic liquids Neogr. \*l̥ \*r̥, Brugmann (1876a:285-338 & 1876b:363-406) assumed the existence of the syllabic nasals Neogr. \*ṅ̥ \*ṁ̥ for the proto-language (Szemerényi 1996:46-48). These items are now referred to as the short syllabic nasals in anteconsonantal position (i.e. in environments Neogr. \*ṅ̥C and \*ṁ̥C).<sup>561</sup> According to Brugmann, the syllabic nasals were not preserved in any Indo-European language as such, and this statement is generally true in the sense that no language possessed /ṅ̥/ or /ṁ̥/ in its phoneme inventory.<sup>562</sup> In order to find evidence for the PIE items, Brugmann assumed a twofold development:

(a) In the majority of the Indo-European languages, the syllabic nasals developed an epenthetic (svarabhakti) vowel, which assumed syllabicity from its original carrier, the vocalic nasal:

“Die Änderung bestand gewöhnlich darin, dass eine Verspätung des Eintritts der spezifischen Mundstellung des Nasals deutlicheres Hervortreten des schwachen unsilbischen Stimmgleitlautes bewirkte, der zu dieser Stellung führte. Der Gleitlaut zog dann die Funktion des Sonanten an sich und entwickelte sich zu einem Stellungslaut. Z. B. got. munda- aus uridg. m̥ṁtó-.” (Brugmann, Grundr<sup>2</sup> 1:393)

For the Indo-European languages, the assumed svarabhakti vowels were mostly identical with those of the respective liquids.

(b) On the other hand, Brugmann (Grundr<sup>2</sup> 1:393) suggested that the anteconsonantal syllabic nasals were lost in Indo-Arian and Greek, where the outcome was a svarabhakti vowel /a/ only:<sup>563</sup>

“Im Arischen und im Griechischen ging mit dem Erstarren des Gleitlautes der Nasal vor allen Consonanten [...] verloren, z.B. ai. matá- gr. [αὔτό-] μάτο- = got. munda-.”

Historically speaking, the starting point of Brugmann's reconstruction was Pāṇini's internal reconstruction of the verbal paradigms of Sanskrit, displaying well-known alternations of bases with and without a nasal (like RV. √ga- : √gam- ‘gehen’ and RV. √ha- : √han- ‘schlagen’). With the newly postulated proto-language and the sound laws at his disposal, Brugmann (1876a:294) correctly asserted that (Pāṇini's) early rule of nasal loss was impossible:

<sup>560</sup> In practice, the reconstruction of the ambiguous nasal in √C<sub>0-n</sub>NK-, √C<sub>0-n</sub>NP- and √C<sub>0-n</sub>NT- depends on whether we are able to identify the respective roots √C<sub>0-n</sub>N- without extensions ·K-, ·P- and ·T-, revealing either a dental (√C<sub>0-n</sub>n-) or a labial √C<sub>0-n</sub>m- nasal.

<sup>561</sup> Though Brugmann is now generally credited for the introduction of the syllabic nasals, the idea had occurred to several authors before him (see Szemerényi 1996:48, fn1 with literature).

<sup>562</sup> See Brugmann (Grundr<sup>2</sup> 1:393): “[Die kurzen sonantischen Nasale] sind [...] in keiner idg. Sprache unverändert erhalten geblieben.”

<sup>563</sup> In its full form, Brugmann's sound law involves a multi-phased development: Neogr. \*ṅ̥ ṁ̥ → <sup>a</sup>n <sup>a</sup>m → <sup>a</sup>n <sup>a</sup>m → q → Ilr. a, Gr. α.

“Est ist durchstehende Regel, dass nach thematischem a vor folgenden Consonant ein Nasal niemals spurlos wegfällt, dass dagegen ein Nasal nach bindevokalischem a dann schlechtweg verschwindet, wenn seine Silbe tieftönig ist.”

In effect, Brugmann’s key idea was that the nasal was not lost, but had turned into a vowel, as indicated by the internal reconstruction  $*C\bar{m}$ - :  $*Cam$ - and  $*C\bar{n}$ - :  $*Can$ - of the syllabic nasals for the paradigms in question.

(c) Brugmann’s nasals (Neogr.  $*\bar{n}$   $*\bar{m}$ ) have been criticized by Burrow (1949:22) for being “[...] reconstructed purely on the basis of theoretical reconsiderations”. This criticism is accurate, because having taken Panini’s internal reconstruction as his starting point, Brugmann implicitly assumed that the Sanskrit paradigms directly continued those of the proto-language. Consequently, the syllabic nasals were postulated based on structural and distributive evidence, which did not necessarily preserve the truth.

(d) Most importantly, the successful reconstruction of the laryngeal PIE  $*h$  ( $\approx h_2$ ) is a catalytic event that will revolutionize the reconstruction of the syllabic nasals in the future. The laryngeal, by definition, is an obstruent (C). Consequently, hundreds of examples of  $*h\bar{N}C$  and  $*C\bar{N}h$  of shape  $C\bar{N}C$  exist in reconstruction. This allows definition of the real outcomes of the syllabic nasals  $\bar{N}$  based on their measurable reflexes in the cognates. Though the situation is not yet generally understood, the phenomenon has already been recognized for word-initial position by Beekes (1988:22), who in his article *PIE. RHC in Greek and other languages* suggests:

“[...] a change in detail of one of the well established laws. It concerns the development of the ‘long resonants’, i.e. the sequences of vocalic resonant plus laryngeals when before consonant (RHC). On its development there is a general agreement. When not preceded by a vowel the resonant in this sequence is now automatically indicated as syllabic ( $CR\bar{H}C$ ). Within the framework of the laryngeal theory it has not been observed, as far as I know [sic] that this sequence gives a different development in word initial position, at least in some languages. It seems that here the laryngeal [ $R\bar{H}C$ ] was vocalized rather than the resonant.”

Beekes concludes his article by claiming that a ‘vocalization’, basically a non-phonemic vowel  $e$ , accompanied the laryngeal in  $*H_e eH$ , thus creating environments for the different vocalizations discussed (in a nutshell,  $R\bar{H}C = R\bar{H}_eC$  and  $RHC = R_e\bar{H}C$ ). Regarding Beekes’s important article, the following issues can be highlighted:

1. Beekes’s ‘vocalization  $e$ ’ (or ‘prop vowel’) is nothing but the schwa secundum – the anaptyctic/epenthetic vowel of Oštir (1913), Kuryłowicz (1935:29 & fn2, 55f.) and Sturtevant (1941:184) – which functionally corresponds to PIE  $*a$  ( $\equiv$  Neogr.  $*\bar{a}$ ) in System PIE.<sup>564</sup>

2. Beekes’s key observation, that the data proves that the ‘sequence [RHC] gives a different development’ than  $R\bar{H}C$  (traditionally assumed for long syllabic

<sup>564</sup> For Beekes’s highly tentative distribution between  $eH$  and  $H_e$ , see 1988:44: “In the case of  $CmHC$  it is best to write  $Cm_eHC$  as the first phonetic development. For  $mHC$ -, where  $m_eHC$  is clearly not what happened, one might assume  $mH_eC$ -. Of course we would like to find a set of rules which determine where this prop vowel developed. It is clear that the rules are language-specific.”

resonants), is correct in the sense that the syllabic resonants indeed result in consonants without svarabhakti vowels. However, the development is not restricted to word-initial position, but applies to the sequence CRHC as well. This is hardly surprising, since the Neogrammarian theory was formulated without the laryngeal and therefore no measurable sequences CR̥C (≡ CR̥H, HR̥C) were available.

3. In order to demonstrate that Beekes is correct in his positing of the existence of a “different development” for syllabic resonants, I quote a root with PIE \*aḥ (equaling Beekes’s \*<sub>e</sub>h<sub>2</sub>) with the laryngeal confirmed by Vedic hiatus and PIE \*a by the ‘a-vocalism’, in examples such as:

PIE √naḥu- ‘Schiff, Boot’ (P. 755-756)

PIE \*nēaḥu-

RV. nāv-	(f.) ‘Schiff, Boot’ (WbRV. 756, nāvam [sgA])
Hom. νηῦ-	(.) ‘Schiff’ (GEW 2:292-3, Hom. νηῦς, Do. ναός)
Lat. nāui-	(f.) ‘Schiff’ (WH 2:148f.)

PIE \*neaḥu-

RV. ná’u-	(f.) ‘Schiff, Boot’ (KEWA 2:181, nāvus [sgN]) <sup>565</sup>
Gr. ναῦ-	(.) ‘Schiff’ (Gr. ναῦς [sgN])
LAv. nav āza-	(m.) ‘Schiffer’ (AIWb. 1047)

PIE \*naḥu-

OInd. nu-	(n.) ‘a ship’ (MonWil. 567) <sup>566</sup>
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The striking feature is the zero-grade PIE \*naḥu-, which first lost the unaccented PIE \*a, resulting in a syllabic nasal, but then developed into a consonant (OInd. √nu-) rather than a vowel:

PIE \*naḥu- → \*ṇḥu- → OInd. nu-

In other words, the outcome of the syllabic nasal was \*ṇḥ → OInd. n<sup>(h)</sup>, not OInd. ṛā (as assumed by Brugmann). This outcome, as pointed out already by Beekes (1988:33), is general.<sup>567</sup> This is to say, it holds true for all resonants (PIE \*ṁ ṇ ṛ ṛ) in all languages. For nasal PIE \*ṇ we have a simple development:

PIE \*ṇ → OInd. n, Av. n, Gr. ν, Lat. n, etc.

A similar situation appears with the labial nasal PIE \*ṁ, for instance, in:

PIE *máḥus- (→ múḥus-)	→	RV. mús- (m.) ‘Maus’ (WbRV. 1054)
PIE *maḥus- (→ ṁḥus-)	→	RV. muśé (inf.) ‘rauben’ (WbRV. 1051)

<sup>565</sup> For the two-syllabic scansion CVVC (RV. 5.59.2.), see Szemerényi (1956:185ff.).

<sup>566</sup> For the form, see Wackernagel (AiGr. 3:218).

<sup>567</sup> See Beekes (1988:33): “I came upon the matter on the basis of Greek, but it seems that other languages have the same difference.”



4. Beekes's strategy of explaining the difference between the real and conventional outcomes of long syllabic resonants with  $RH_e$  and  $R_eH$  falls apart, because it can be demonstrated that the outcomes of both are consonantal, not vocalic. This is caused by the fact that Beekes's  $RH_e = PIE R_ha$  also yielded a consonant without a svarabhakti vowel:

PIE \* $meha-$  'Mond'

PIE \* $mehan-$

- |                |                                                 |
|----------------|-------------------------------------------------|
| OEng. $mōn-$   | (.) 'moon' (ASaxD. 696)                         |
| Li. $mēna-$    | (m.) 'Monat, Mond' (LiEtWb. 435, $mēnas$ [sgN]) |
| Go. $mena(n)-$ | (m.) 'σελήνη : moon' (GoEtD. 251)               |

PIE \* $mehas-$

- |                  |                                        |
|------------------|----------------------------------------|
| RV. $mās-$       | (m.) 'Mond, Monat' (WbRV. 1036)        |
| LAv. $bi-māhya-$ | (a.) 'zwei Monate dauernd' (AIWb. 965) |
| Arm. $mahik$     | (sb.) 'Mondsichel' (ArmGr. 1:191)      |

PIE \* $mehau-$

- |                      |                                                    |
|----------------------|----------------------------------------------------|
| El. $μεύ-$           | (.) 'Mond' (LSJ. 1093-94)                          |
| OIcl. $mūlin-$       | (m.) 'Mond' (ANetWb. 395)                          |
| OIcl. $mỹlin-$       | (m.) 'Name des Mondes' (ANetWb. 397)               |
| OIcl. $mundil-fari-$ | (PNm.) 'N. für den Vater des Mondes' (ANetWb. 395) |

OIcl.  $mūlin = PIE *m_hául-$  contains an example of PIE \* $m_C$  (in \* $m_h-$ ), yielding OIcl.  $m$  (not  $^{\dagger}um$ , the assumed Neogrammmarian outcome). Thus, the distinction between  $Rh_e$  and  $R_eH$  made by Beekes is not sufficient: OInd.  $\sqrt{muṣ-}$  'rauben' lacks a svarabhakti vowel like OIcl.  $mūlin-$  and all examples belonging to this type.

5. No mention is made in Beekes's article of the true scope of the situation. A consonant R results from a syllabic resonant in  $C_1RC_2$  when  $C_2$  is not PIE \* $h$ , as seen in examples such as:

PIE \* $haenĕ-$  \* $haonĕ-$  'erreichen, (zu) Teil werden, usw.'

- |                   |                                                         |
|-------------------|---------------------------------------------------------|
| RV. $ān-áńś-$     | (pf.) 'in Besitz bekommen' (WbRV. 135, $ānáníśa$ [3sg]) |
| gAv. $fraṣ-$      | (ao.) 'zu teil werden' (AIWb. 360, $fraṣtā$ [3sg])      |
| OIr. $ro-ān-acc-$ | (pf.) 'erreichen' (P. 317, $roānaic$ [3sg])             |
| RV. $áńśa-$       | (m.) 'Anteil, Erbteil, Partei' (WbRV. 1)                |

The respective zero grade contains the consonantal outcome of a syllabic nasal in PIE \* $hankó-$  'Teil':

- |                 |                                        |
|-----------------|----------------------------------------|
| RV. $pari-ńśá-$ | (m.) 'Anteil, Zugeteiltes' (WbRV. 78). |
|-----------------|----------------------------------------|

The full derivation of the form is:

PIE \* $hankó-$  → \* $hṅkó-$  → \* $h_ṅcó-$  → RV.  $ńśá-$ .

In an identical manner, the syllabic nasals develop into respective consonants without svarabhakti vowels according to the schemata:

PIE \*C<sub>1</sub>NC<sub>2</sub> → IE C<sub>1</sub>NC<sub>2</sub> (with C<sub>1</sub> or C<sub>2</sub> = PIE \*h).

Due to the regularity of sound change, two outcomes are not allowed for an identical prototype. Using the upgraded rule restores the consistency in reconstruction, and it is therefore opted for in System PIE and the PIE Lexicon. This results in a considerable simplification of the reconstruction, because the svarabhakti vowels OInd. a ≡ Gr. α etc. represent original vowels Neogr. \*a ≡ PIE \*eah/hae, thus removing any ambiguity.

§5. Soon after the postulation of Neogr. \*(C)ṅC and \*(C)ṁC, it turned out that the svarabhakti vowels also appear in antevocalic position. Brugmann and Osthoff postulated Neogr. \*ṅ<sup>n</sup> and \*ṁ<sup>m</sup> (now LT \*(C)ṅHV and \*(C)ṁHV), but not without some hesitation:

“Wie bei den Kürzen, erscheint einzelsprachlich die consonantische Nasalis und Liquida bald vor bald hinter dem Vokal [...] Worauf beruht dies?” (Brugmann, Grundr<sup>2</sup> 1:417)

Brugmann’s doubts are understandable, because the conditioning of syllabicity by a consonantal environment, the very core of the theory, was lost with the postulation of Neogr. \*(C)ṅV and \*(C)ṁV.

(a) A theoretical improvement was made by Saussure, who replaced the schwa with coefficient \*A, subsequently interpreted as a laryngeal \*H, such that a syllabic environment (CRHV) was restored (at least on paper).

(b) Despite the improvement in the theoretical outlook of the problem, the consonantal outcomes of RH(V)- are not restricted in word-initial position (see Beekes 1988:22) but generally hold true for CRH(V)-. Following the reconstruction of the laryngeal, the sequence CNHV is now present, for instance, in examples of Sievers-Edgerton’s Law for nasals where the actual developments of the cognates allow us to infer the outcome of syllabic nasals directly based on the data. As an example of this, we can observe the root PIE \*ḡneah<sub>2</sub>- (Neogr. \*ḡnō-) ‘wissen’ (P. 376-378).

For this root, the laryngeal is implied by Vedic hiatus:

RV. ṛta jñá’- (a.) ‘das Gesetz kennend’ (WbRV. 285, ṛtajñáas [pIN]).

The stem with confirmed Neogr. \*a appears in the extension PIE \*ḡneah<sub>2</sub>-dh- with Celtic ‘a-vocalism’ in:

OIr. in ·gnad- (a.) ‘strange, wonderful, unusual, etc.’ (DIL. 406)

TochA. ā ·knats- (a.) ‘unwissend’ (Poucha 16)

PIE \*ḡneah<sub>2</sub>-, the root with Neogr. \*ā (Li. o = Lat. ā), is preserved in:

Li. ne ·žnó- (vb.) ‘nicht wissen’ (LiEtWb. 1310, nežnóti [inf.])

Lat. gnāro- (a.) ‘having knowledge; known’ (OxLatD. 768)

TochB. a ·knātsaññe- (sb.) ‘ignorance’ (DTochB. 3)

In the zero grade, the laryngeal stands before the vowel (PIE \*ǵnaɦ+V),<sup>568</sup> with the effect that the regular development of the sequence CNɦV has been preserved in:

RV. jajñ- (pf.) ‘erkennen, wahrnehmen’ (WbRV. 501, jajñús).

In other words, the following phases took place:

PIE \*ǵnaɦV- → PIIr. \*ǵnɦV → RV. jñV, etc.  
 PIE \*CNaɦV- → PIIr. \*CNɦV → IE. CNV, etc.

The syllabic nasal Ț was desyllabified, yielding a consonantal N without svarabhakti vowel, exactly as with the corresponding liquids.<sup>569</sup> As it has been understood from the beginning that the traditional theory produces ghost forms instead of attested ones, it should be corrected in terms of this detail.<sup>570</sup>

§6. The long syllabic nasals Neogr. \*Ț̄ and \*Ț̄̄ before the consonant were postulated by Brugmann, who was feeling less confident about their reconstruction, however.<sup>571</sup>

(a) In the laryngeal theory, the long syllabic nasals were analyzed as standing for Neogr. \*Ț̄ ≡<sub>df</sub> Țə ≡<sub>df</sub> ȚA ≡<sub>df</sub> LT ȚH (see Saussure, *Mém.* 269-75), but due to the abstract nature of the theory the evidence has always been in doubt. A proof for Neogr. \*Ț̄ ≡<sub>df</sub> Țə in the correspondences in question was never presented.

(b) As for the real development of CNȚC, the expected outcome is identical with that of CNȚV for natural reasons: both CNȚC and CNȚV are of simpler shape CNȚ ≡ C<sub>1</sub>ȚC<sub>2</sub> independently of the phoneme following C<sub>2</sub>; accordingly, an identical outcome is expected. Since no sequences C<sub>1</sub>ȚC<sub>2</sub> were preserved in the early material, the traditional (vocalic) interpretation is understandable. However, as with PIE liquids, there are scattered remains in Tocharian and in Later Anatolian with a consonantal outcome of the syllabic nasal, which can be exemplified with the root

PIE \*ǵnaɦ- ‘(er)kennen, wissen’ (P. 376-8)

PIE \*ǵnēaɦ-

Li. ne ·žnó- (vb.) ‘nicht wissen’ (LiEtWb. 1310, nežnóti)  
 Lat. gnāro- (a.) ‘having knowledge; known’ (OxLatD. 786)  
 TochB. aknātsaññe- (sb.) ‘ignorance’ (DTochB. 3)

PIE \*ǵneaɦ-

RV. ṛta ·jñá’- (a.) ‘das heilige Gesetz kennend’ (WbRV. 285)  
 TochA. ā ·knats- (a.) ‘unwissend’ (Poucha 16)

<sup>568</sup> For the value \*ɦ ≡ PIE \*f̄, based on the voiced plosive PIE \*ǵ, see Chapter 4.

<sup>569</sup> As with the liquids, the outcomes of syllabic nasal CNȚ<sup>N</sup>V were erroneously postulated by the Neogrammarians and the laryngealists (LT CNɦV) following them.

<sup>570</sup> See already Saussure (*Mém.* 217 = *Rec.* 253), who pointed out that prototypes such as \*ǵȚAV should produce Gr. ἴγανη-, etc. Instead of metathesis or syncope (see Anttila 1972:5-6), the explanation of vocalism should be sought from their PIE origin.

<sup>571</sup> In Brugmann’s words (*Grundr*<sup>2</sup> 1:417): “Dass die idg. Ursprache anteconsonantisch und im Auslaut lange silbische Nasale besessen habe, halte ich nicht für so sicher, wie dass sie kurze hatte, aber immerhin für wahrscheinlich.”

PIE \*ǵnaḥ-

RV. jajñ- (pf.) ‘erkennen, wahrnehmen’ (WbRV. 501, jajñús)  
TochA. ā·kn·ts·une (sb.) ignorantia, inscientia’ (DTochB. 16)

In zero grade, one can readily verify that following the loss of unaccented PIE \*a the prototype PIE \*ǵnaḥ- resulted in a nasal, both before a vowel V (RV. jajñús) and before an obstruent C (TochA. ā·kn·tsune). Thus the development of the reconstruction can only be:

PIE \*Cnaḥ, \*Cnḥa → \*Cṇḥ → TochA. Cn, RV. Cn.

The general absence of the attested shapes CnC may have been caused by a phonological restriction, according to which such shapes were dropped in usage (or were never formed in the first place?).

(c) As the syllabic nasals result in respective consonants without yielding svarabhakti vowels, the latter can no longer be explained by traditional means. This does not, however, constitute a major reconstructive problem, since the vowels are externally confirmed at least two witnesses, and therefore represent original PIE items.

### 3.4.2 PIE \*n (consonantal dental)

§0. The dental nasal Neogr. \*n (PIE \*n) has been preserved in the cognates as such, and only a few minor issues deserve attention.

§1. Brugmann’s (Grundr<sup>2</sup> 1:344-8) examples of Neogr. \*n include:

(a) Neogr. \*neuo-s, \*neujo-s ‘neu’ (Grundr<sup>2</sup> 1:344): “ai. náva-s, arm. nor (mit einem r-Suffix erweitert), gr. véo-ς, lat. nouo-s, air. nūe, got. niuju-s, lit. nauja-s, aksl. novŭ.”

(b) Neogr. \*seno-s ‘alt’ (Grundr<sup>2</sup> 1:344): “ai. sána-s, arm. hin, gr. ἔνη (‘Tag vor dem Neumond’), lat. senex, air. sen, got. Superl. sinistra, lit. sēna-s.”

(c) Neogr. \*sneigh<sup>h</sup>- ‘schneien’ (Grundr<sup>2</sup> 1:345): “av. snaēžā-ṭ ‘es soll schneien’, gr. νεῖφει ‘es schneit’, hom. ἄγá-ννιφος ‘sehr beschneit’, lat. ninguit nix, mir. snechta ‘Schnee’, got. snaiw-s ‘Schnee’, lit. sniēga-s aksl. sněgŭ ‘Schnee’.”

§2. PIE \*n has been preserved in Tocharian with velar and palatal allophones. This is proven by correspondences like:

Gr. vé(ϕ)o-	(a.) ‘neu, jung, usw.’ (GEW 2:306, LinB. ne-wo)
TochA. ñu	(a.) ‘novus’ (Poucha 111, ñu [sgN])
TochB. nawāke	(m.sg.) ‘novice’ (DTochB. 331, nawākem)
Poln. nowak-	(m.) ‘Neuling’ (LiEtWb. 488)

No nasal loss has taken place in Tocharian. Conversely, when there is no nasal in dialects A and B, the nasal was absent already in the proto-language.

§3. PIE \*n was also preserved in Old Anatolian, as revealed by:

Ḫi. neua- (a.) ‘frisch, neu’ (HEG 2:320, ne-e-ua-an).

On the contrary, when Old Anatolian has no nasal, it is also absent in the proto-language (i.e. no nasal loss has taken place). Note, however, the following minor exceptions:

(a) PIE \*n is not written in consonant clusters, which were impossible to represent in the Old Anatolian syllabic script. Thus, for example, the plural of the stem

Ḫi. ning- (vb1A.) ‘sich satt trinken, sich betrinken’ (HEG 2:331f.)

is written Ḫi. ni-in-kán-zi [3pl] with nasal visible after a vowel, but its singular Ḫi. ni-ik-zi [3sg] lacks the nasal after a consonant. In such cases, the nasal was not historically lost (or assimilated), but left unmarked due to the restrictions of the cuneiform orthography.<sup>572</sup> In such instances, the internal reconstruction of \*n/m is allowed, until/unless proven otherwise by comparison.

(b) In Hieroglyphic Luwian script, the inherited nasals were omitted (or, less likely the case, lost) before consonants, as in Old Persian (Kent 1953:17-18). Consequently, the reconstruction of the now absent nasals in Hieroglyphic Luwian depends on comparison.

§4. A ‘nasal infix’ PIE \*n<sup>573</sup> has been identified in multiple roots. To quote just one example, the infixless root form PIE \*lik<sup>u</sup>- ‘lassen, usw.’ (RV. ric-) is accompanied by an infixed one in athematic PIE \*linek<sup>u</sup>- (RV. riṇak-) and in thematic PIE \*link<sup>u</sup>o- (Lat. linquo-) variants. Etymologically the nasal infix morpheme is connected with the conjunction PIE \*nu- ‘now’ (RV. nú, etc.), which is preserved in the sentence particle Ḫi. n(a)- ‘now’ (PIE \*n(o)- ‘now’). Regarding the analysis of the formation, two dominant theories exist:

(a) According to the infix theory, a nasal morpheme was inserted within the root. This view assumes a process of infixation and derives the nasal forms from the basic roots with this auxiliary (e.g. \*lik<sup>u</sup>- → \*li(ne)k<sup>u</sup>-, \*li(n)k<sup>u</sup>-).<sup>574</sup>

(b) According to Persson, the scholar who has gone into Indo-European root formation in the most depth, the nasal infix forms consist of sequences of suffixed morphemes.<sup>575</sup> Thus, Persson’s segmentation results in multiple morphemes like \*li·k<sup>u</sup>- \*li·ne·k<sup>u</sup>- and \*li·n·k<sup>u</sup>-, where the root √li- is optionally attached with a nasal suffix followed by the determinative ·k<sup>u</sup>-. Already Persson was able to prove several segmentations by demonstrating the alternation of determinatives of the roots,<sup>576</sup> and the material now at our disposal confirms Persson’s observations. Indeed, several

<sup>572</sup> On the Hittite nasal reduction, see already Kronasser (1956:71f.).

<sup>573</sup> For his view on nasal infix, see Brugmann (Grundr<sup>2</sup> 1:452-3). For literature, see Anttila (1969:38-39). For a wide array of examples, see the monographs of Kuiper 1937, Puhvel 1960 and Strunk (1967 & 1973/4).

<sup>574</sup> On the nasal infix in the context of typology, see Bybee (1985:97): “Infixation was not found to be an inflectional process in any of the languages examined, while it was mentioned occasionally as a derivational process.”

<sup>575</sup> Note Anttila’s (1969:38) summary: “Persson (WW 99<sup>1</sup>) expresses himself against the general agreement that the nasal forms are secondary and cuts out a sequence of suffixes: *spr-e-n-gh-*, *wr-e-n-gh-* (cf. Persson 589, 959).”

<sup>576</sup> See Persson’s (1912:503fn1) own discussion on \*lei·k<sup>u</sup> and \*lei·p (√lei-).

roots predicted by Persson’s methodology are now actually attested. For example, the unextended root implied by the extensions PIE \*li·k<sup>u</sup>-, \*li·n·k<sup>u</sup>-, \*li·p- is now attested in:

PIE √li- ‘lassen, lösen, frei(mach)en, usw.’ (\*li- \*lei- \*loi-, HEG 2:1ff.)

Hi. lai- (vb1.) ‘lösen, freimachen’ (HHand. 89, la-a-iz-zi [3sg])

Comparatively speaking, Persson’s segmentation is methodically superior because it predicts the segmentation, hence the shortest forms of historical roots, and thus reveals the maximal portion of the PIE root structure, implying that historically the ‘nasal infix’ formations are not roots proper, but compounds.<sup>577</sup>

### 3.4.3 Neogr. \*ŋ (anteconsonantal syllabic dental)

§0. Neogr. \*ŋ, originally postulated by Brugmann in 1876, is the syllabic counterpart of Neogr. \*n in the consonantal environment \*(C)ŋC. Though syllabic nasal PIE \*ŋ doubtlessly existed in the proto-language, the traditional view of its reflexes in the cognates is no longer supported by the comparative method.

§1. According to Brugmann (Grundr<sup>2</sup> 1:395), the developments of Neogr. \*ŋ in the daughter languages were as follows:

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
*ŋ+C	a	an	α	e (i)	en	in	un	in	ę

§2. Because the general problems of the Neogrammarian reconstruction have already been discussed, I only refer here to the most critical points:

(a) The reconstruction of the laryngeal PIE \*ŋ results in numerous examples of PIE \*ŋ in environments PIE \*hŋC \*(C)ŋhC \*(C)ŋhV that do not produce svarabhakti vowels in the non-Aryan group or Indo-Iranian a (= Gr. α). Instead PIE \*ŋ turns into simple PIE \*n after the loss of PIE \*h.

(b) While PIE \*ŋ fails to produce the svarabhakti vowels, the latter can be comparatively verified as original by two witnesses. Hence, despite the fact that syllabic nasals exist, they have not caused the svarabhakti vowels.

Both phenomena are visible in Brugmann’s examples of Neogr. \*ŋ:

§3. Brugmann (Grundr<sup>2</sup> 1:394, 401) compared “Gr. νέομαι : OInd. ásta-m Av. astə-m ‘Heimat’ aus \*ŋs-to-m W. nes- (II S. 216)”.

(a) PIE \*nes- \*nos-, the \*e/o-grade root, is confirmed beyond doubt:

Gr. νέ(η)ο-	(pr.) ‘glücklich gelangen, zurückkehren’ (GEW 2:304-6)
Go. ga·nasja-	(vb.) ‘heal, save’ (GoEtD. 263, gasasjan [inf.])
Gr. νόστο-	(m.) ‘Rück-, Heimkehr, Fahrt, Ertrag’ (GEW 2:305)
Gr. νέστωϙ-	(!m.) ‘der (glücklich wohin) gelangt’ (GEW 2:305)

<sup>577</sup> Naturally, the number of the roots allowing Persson’s segmentation is well documented in the traditional material (cf. OInd. √yu, √yuj, √yuj, √yuj, etc.).

(b) The structurally assumed zero-grade Neogr. \* $\eta$ sto- in RV.  $\acute{a}$ sta- (n.) ‘Heimat, Heimatstätte’ (adv.) ‘heim(wärts)’ (WbRV. 157-8) is, however, unparalleled. In addition, an alternative etymology is possible, because the meaning ‘Heimat’ appears in a derivate of the root  $\sqrt{\text{sta}}$ - ‘stehen’ (P. 1004-1010):

RV. giri ·stháa- (a.) ‘auf Bergen seine Heimat habend’ (WbRV. 401).

Thus we can reconstruct PIE \*esto- (or PIE \*osto- ?) for Indo-Iranian.

§4. Brugmann (Grundr<sup>2</sup> 1:394, 405) compared “OInd. asmá- : Lesb. ἄμμες Gr. ἡμᾶς Go. uns neben OInd. nás (II S. 803f.)”, deriving these from Neogr. \* $\eta$ s- \*nes- \*nos-. Against this analysis, three identities are confirmed by external comparison:

(a) The root \*n(e/o)- ‘we’ is attested in plurals like:

RV. ·nas	(plNAD.) ‘uns, wir’ (WbRV. 165)
Lat. nōs	(plNA.) ‘wir ; uns’ (WH 2:175-6)
Ḫi. ·naš	(encl.pron.1pl.) ‘(to) us, our’ (CHD LN:396f, ·na-aš)

The plurals are related to the respective duals (Gr. νό, RV. nāu) and singulars in:

TochB. nī	(pron.1sg.sgG.) ‘my’ (DTochB. 265)
TochA. nāš	(pron.1sg.m.) ‘ego’ (Poucha 148-9) <sup>578</sup>

(b) The root PIE \*u- ‘1<sup>st</sup> person’ formed singulars such as CLu. ·ui [1sg.] and TochB. ·u [1sg] with a corresponding dual in TochB. wene ‘we both’ (DTochB. 265). A ‘s-plural’ is attested in TochA. was ‘nōs’ (Poucha 289-90) and a ‘n-plural’ in Ḫi. ·ueni [1pl], Ḫi. ·uani [1pl] and CLu. ·uni [1pl]. The pronouns Go. uns (1pl.pr.pronAD.) ‘uns, unser’ (GoEtD. 378), OIcl. oss ‘id’, etc. with PIE \*uns- belong to this formation.

(c) OIr. ar n- ‘our’ (P. 758) ← PIE \* $\eta$ aes r-ōm [plG] contains a root PIE \* $\eta$ aes- ‘we’, which matches OInd. asmá- : Lesb. ἄμμες : Gr. ἡμᾶς from PIE \* $\eta$ aes m-. The root PIE \* $\eta$ aes- ‘we’, in turn, is an original nominative plural in \*·es of the root meaning ‘I’ (cf. HLu. ·ḥa [1sg], Ḫi. ·ḥi [1sg], etc.).

§5. Brugmann (Grundr<sup>2</sup> 1:398) reconstructed Neogr. “\* $\eta$ ntó-s Part., \* $\eta$ nti-s F. von W. men- ‘denken, sinnen’ : ai. matá-s matí-š, gr. ἀντόματος ‘freiwillig’ (‘selbgedacht’), lat. com-mentu-s mēns mentiō, air. der-met N. ‘das Vergessen’ er-mitiu ‘honor’, got. munda- ga-mundi-, lit. miñta-s at-mintì-s aksl. pa-meṭī.” To these Brugmann (Grundr<sup>2</sup> 1:398) added “\* $\eta$ ñié-tai 3. Sg. Med. von W. men- : gr. μάννεται aus \* $\mu$ αννιε-ται ‘er ist verzückt, rast’, air. do muiniur ‘ich meine, glaube’, aksl. mīnjō ‘ich denke’; nicht ganz sicher ist, ob auch ai. mánya-tē ‘er meint’ hierher gehört (II S. 1061)”.

The comparative method implies several externally confirmed root forms:

(a) PIE  $\sqrt{\text{m}}$ - ‘beachten’, the monoliteral root, is now attested in the reduplication

PIE \*mi mo- ‘beachten, usw.’:

<sup>578</sup> According to Adams (DTochB. 265), “The formation of the first person singular pronoun in Tocharian is as thorny a thicket of morphology and phonology as one can find there.” The problem is caused by a false comparison of the Tocharian pronoun n-, the n̄- pronoun with the pronoun PIE \*m- (OInd. máma), instead of the proper cognates beginning with PIE \*n- (Lat. nōs, etc.).

CLu. mima-	(vb.) ‘beachten (?)’ (HHand. 106)
Ĥi. tarĥu + mima-	( <sup>m</sup> c.) (grand écuyer) (NOMS. 1260, tar-ĥu-mi-ma)
Ĥi. mima mi-	(a.) ‘held in regard’ (HED M-160, HEG 2:212)

(b) PIE  $\sqrt{ma}h-$  ‘id’, the laryngeal extension of PIE  $\sqrt{m-}$ , appears in the feminine PIE  $*m\bar{e}a\check{h}-$  and derivatives in PIE  $*mea\check{h}:(\Sigma)-$ :

PIE $*m\bar{e}a\check{h}-$	
OInd. mā-	(f.) ‘knowledge’ (MonWil. 771, Lex. mā [sgN])
LAv. vī mā-	(a.) ‘besorgend’ (AIWb. 1450)
PIE $*mea\check{h}-$	
RV. ma-	( $\sqrt{ao}$ .) ‘gedenken’ (WbRV. 992, ámata [3sg])
Gr. μέμα-	(pf.) ‘im Sinne haben, gedenken’ (GEW 2:206)
PIE $*mea\check{h}n-$	
RV. maná-	(f.) ‘Eifersucht, Zorn’ (WbRV. 996)
Gr. μάτvo-	(prM.) ‘rasen, toben, von Sinnen sein’ (GEW 2:160)
PIE $*mea\check{h}t-$	
Gr. αὐτόματο-	(a.) ‘freiwillig : selbsgedacht’ (Grundr <sup>2</sup> 1:398) <sup>579</sup>

(c) PIE  $*men-$   $*mon-$ , the nasal extension of PIE  $*me-$   $mo-$ , includes items such as:

Ĥi. men-	(c.) ‘Gesicht, Wange’ (HEG 2:196, me-nu-uš-ša [plA])
Go. man-	(pf.pr.) ‘meinen, glauben’ (GoEtD. 260, man [1sg])
Li. mēna-	(m.) ‘Gedächtnis, Verständnis’ (LiEtWb. 435)
CLu. manaa-	(vb.) ‘schauen’ (?) (DLL. 67-8, ma-na-a-ti [3sg])
gAv. mainya-	(prM.) ‘wissen wollen, bedenken’ (AIWb. 1122)

(d) PIE  $*min-$  ‘denken, usw.’ (P. 714,  $*mein-$   $*moin-$ ) is confirmed by several branches, including:

AVP. men-	(pf.) ‘denken’ (EWA 2:305, mené)
Li. miñ-	(vb.) ‘sich erinnern, gedenken, usw.’ (LiEtWb. 455)
OIr. mīan	(n.) ‘désir, objet de désir’ (LEIA M-47)
OCS. mēni-	(vb.) ‘meinen, glauben, gedenken’ (Sadnik $\sqrt{506}$ mēniti)
OSax. mēnia-	(vb.) ‘meinen, denken, sagen, erklären’ (ASaxD. 659)
Li. minti-	(4.) ‘Gedanke, Einfall, Idee’ (LiEtWb. 455)

(e) PIE  $*mun-$  ‘denken, usw.’ is implied by the comparative method and based on several witnesses:

OEng. muna-	(vb.) ‘remember, be mindful of, think’ (ASaxD. 700)
OIcl. muna-	(vb.) ‘gedenken, sich erinnern’ (ANetWb. 395)
RV. múni-	(m.) ‘ein Begeisterter, Verzückter’ (WbRV. 1050)

<sup>579</sup> Based on the correct meaning of Gr. αὐτόματο- (a.) ‘aus eigenem Antrieb, aus sich selbst handelnd’ (GEW 1:191), the item does not belong to the root.



OEng. mynia-	(vb.) ‘have as the object of desire, intend’ (ASaxD. 704)
OIr. do (...) muini-	(vb.) ‘ich meine, glaube’ (LEIA M-35, muinithir)
RV. máuneya-	(n.) ‘der Zustand eines M, Verzückung’ (WbRV. 1065)
OstLi. muntu-	(a.) ‘verständlich, geschickt, tauglich’ (LiEtWb. 409)

(f) PIE \*met- \*mot-, the dental extension of the stem PIE \*me/o-, is implied by the identities:

PIE *met <sup>c</sup> /o-	(pt.) ‘gedacht, usw.’
Li. mete ·linga-	(f.) ‘Kenn-, Erkundungszeichen’ (LiEtWb. 446) <sup>580</sup>
LAv. mata-	(pt.) ‘gedacht’ (AIWb. 1122)
RV. matá ·vānt-	(a.) ‘das Gedachte verfolgend, achtsam’ (WbRV. 974)
PIE *moti-	(f.) ‘Andacht, usw.’
RV. matí-	(f.) Andacht, Absicht, Sinn, Geist’ (WbRV. 974)
gAv. tarē ·ma’ti-	(f.) ‘widerstrebendes Denken, Trotz’ (AIWb. 641)
Alb. mēsoj-	(pr.) ‘to teach, to train’ (AlbEtD. 262, PAlb. *matjāja-)
PIE *metu-	(f.) ‘Gedank, usw.’
Lat. metū-	(f.) ‘Besorgnis, Furcht’ (WH 2:83)
OGaul. moni ·metu-	(n.) ‘monument’ (ACSS. 2:624, monimetu [sgNA])
RV. matú ·tha-	(m.) ‘der Weise (der Priester)’ (WbRV. 975)

The three formations PIE \*meto- \*moti- \*metu- are externally confirmed not to contain a syllabic nasal.

§6. Brugmann (Grundr<sup>2</sup> 1:398) reconstructed Neogr. “\*ṇ-pod- ‘fusslos’ : ai. á-pad- a-pád- gr. ἄ-πους” for the attested vowel RV. a = Gr. α Neogr. \*a. The extended material satisfies multiple criteria for the absence of the syllabic nasal, thereby challenging the traditional reconstruction:

(a) In Tocharian A, the prefix also appears without nasal TochA. a· ≡ TochB. a·, making a nasal in the proto-language impossible. Some examples of this are:

RV. á ·deva-	(a.) ‘nicht göttlich, gottlos’ (WbRV. 37-8)
TochB. a ·tākatte-	(a.) ‘unfounded, untrue’ (DTochB. 9)
TochA. a ·sinät	(adv.) ‘insatiabiler’ (Poucha 13, asinät)
RV. a ·sinvá-	(a.) ‘unersättlich’ (WbRV. 154, asinvám vavrám)

(b) The negative prefix RV. a· ‘nicht, ohne, -los’ (cf. RV. á ·deva-) stands in quantitative ablaut with RV. ā· ‘nicht, ohne, -los’ (RV. á ·deva-). It appears, for instance, in:

RV. á ·deva-	(a.) ‘gottlos’ (WbRV. 177)
RV. á ·sat-	(a.) ‘nicht seined, unwahr, unheilsam’ (WbRV. 153) <sup>581</sup>

<sup>580</sup> For the segment Li. ·linga- ‘·Zeichen’, see the hitherto problematic OInd. liṅga- (n.) ‘Merkmal, Kennzeichen’ (KEWA 3:101) and LAv. haptō ·hriṅga- (a.) ‘mit sieben Merkmalen (Gestirnbezeichnung)’ (AIWb. 1767), thus reflecting PIE \*l (vs. PIE \*r).

RV. á·art·ana-	(a.) ‘Misernten bringend’ (WbRV. 185)
TochA. ā·knāts-	(a.) ‘foolish, stupid’ (sb.) ‘fool’ (DTochB. 3)
TochB. ā·	(vb.pref.) ‘away, down’ (DTochB. 35)
OHG. uo·haldi	(.) ‘precipice : down-slope’ (DTochB. 35)
OHG. uo·zurne-	(vb.) ‘disdain’ (DTochB. 35, uozurnen [inf.])

(c) The \*o-grade variant of the prefix is apparently attested in Latin:

Lat. o·pico-	(a.) ‘un-gebildet’ (cf. Lat. pic·turā, WH 2:211)
Lat. o·piter-	(a.) ‘cuius pater avō vivō mortuus est’ (WH 2:213)

From an external point of view, the negation prefix PIE \**h<sub>2</sub>ae/o-* \**h<sub>2</sub>ae/ō-* ‘un-, not-, etc.’ lacks a nasal throughout, and it is to be differentiated from the prefix PIE \**ne-* \**no-* \**n-* ‘no, etc.’ despite the identical meaning.

§7. Brugmann (Grundr<sup>2</sup> 1:398, 401) reconstructed: “\**g<sup>h</sup>h<sub>2</sub>-jé-ti* 3. Sg. Act von W. \**g<sup>h</sup>hen-* : ai. *hanya-tē* ‘er wird geschlagen’, aksl. *žinjō* ‘ich schneide ab, ernte’ (a. O.).” [...] “Av. *janya<sup>h</sup>te* ‘sie sollen getroffen werden’ [...]”, (Grundr<sup>2</sup> 1:498): “\**g<sup>h</sup>h<sub>2</sub>tó-s* ‘geschlagen’ (ai. *hatá-s*) zu *hán-ti*.”, (Grundr<sup>2</sup> 1:405): “Gr. *φατό-ς* ‘getötet’ : ai. *hatá-s*, W. *g<sup>h</sup>hen-* ‘schlagen’.” and (Grundr<sup>2</sup> 1:416): “Lit. *giñti* ‘(Vieh) treiben’ ap-*ginti-s* ‘Vertheidigung’ *giñčà giñča-s* ‘Streit’ *giñkla-s* ‘Waffe’, aksl. *žeti* ‘hauen, mähen’ : ai. *hati-š* ‘Schlag’ *hatyā* ‘Tötung’, gr. *φατό-ς* ‘getötet’, as. *gūðea* ‘Kampf’ (urgerm. \**gunþiō*). W. *g<sup>h</sup>hen-* [...] aksl. *žinjō* ‘ich schneide ab, ernte’ : ai. *hanya-tē* ‘er wird geschlagen’ [...]”

Against Brugmann’s Neogr. \**g<sup>h</sup>hen-* \**g<sup>h</sup>h<sub>2</sub>-*, several roots are confirmed:

(a) Neogr. \**g<sup>h</sup>he-* ‘schlagen’, the root without the nasal, is implied by the comparative method owing to the perfect match between Hittite and Indo-Iranian:

H <sub>1</sub> . gue-	(vb.) ‘(er)schlagen, töten’ (HEG 1:604-5, ku-e-mi/-ši)
RV. ha-	(pr.) ‘(er)schlagen, töten’ (WbRV. 1642, hathás, hatás)
gAv. ja-	(vb.) ‘schlagen, töten’ (AIWb. 603, jaidyāi [inf.])
OPers. ja-	(pr.) ‘strike, smite, defeat’ (OldP. 185, jadyi [2sg])

The Hittite e = PIE \*e is confirmed by the second palatalization in Indo-Iranian, proving the absence of the nasal.

(b) Neogr. \**g<sup>h</sup>ho-* ‘schlagen’ with PIE \*o is attested in:

HLu. gua-	(vb.) ‘≈ schlagen’ (CHLu. 6.5.3, CORNU(-)ku-w <sup>3</sup> /i-ha)
Oic. hōg·gva-	(vb.) ‘to hew, beat’ (ANEtWb. 226)
OInd. pāñi·gha-	(m.) ‘striking with the hand’ (MonWil. 615)
OInd. rāja·gha-	(m.) ‘slayer of kings’ (MonWil. 873)

Thus a deep-level nasal did not originally belong to all bases of the root.

(c) PIE √*g<sup>h</sup>·ah<sub>2</sub>-*, the above root with a laryngeal extension, is attested in:

<sup>581</sup> The alternation is independent of ‘laryngeals’ and unconditioned (cf. RV. á·deva- (a.) ‘nicht göttlich, göttlos, den Göttern feindlich’, WbRV. 37-8 and RV. á·sat- (a.) ‘nicht seined, unwahr, unheilsam’, WbRV. 153 without a root-initial laryngeal).

PIE \*g<sup>h</sup>h<sup>ǵ</sup>ah-

OInd. ghā-	(f.) ‘a stroke’ (MonWil. 375)
Gr. ἀπο·φα-	(ao.M.) ‘die’ (GEW 1:657, Hes. ἀπέφατο·ἀπέθανεν)
Gr. πέφα-	(pf.P.) ‘die’ (GEW 1:657, πέφασται [3sg])

PIE \*g<sup>h</sup>h<sup>ǵ</sup>ahl-

AV. ā·ghā́tá-	(m.) ‘Zimbel’ (EWA 1:159, FORTUNATOV II)
TochA. kálta·ñk-	(sb.) ‘n. cuiusdam instrumenti musici’ (Poucha 61)
RV. ā·ghā́tī-	(c.) ‘Cymbeln’ oder ‘Klappern’ (WbRV. 172)

PIE \*g<sup>h</sup>h<sup>ǵ</sup>ah<sup>t</sup>- (= PGr. \*φατ- : φᾶτ)

Gr. ἀρηί·φατο-	(pt.) ‘im Kampf getötet’ (GEW 1:657, ἀρηίφατος)
OInd. jīghata-	(cs.ao.) ‘cause to be slain, put to death’ (MonWil. 1287)
OInd. ghāta-	(a.) ‘tötend’ (m.) ‘Schlag, Vernichtung’ (MonWil. 377)
YV. go·ghātá-	(m.) ‘Kuh-töter’ (EWA 2:800)
Gr. πέφησο-	(pf.fut.) ‘töten’ (GEW 1:657, πεφήσεται) <sup>582</sup>

(d) PIE \*g<sup>h</sup>hin- ‘schlagen’ with common Indo-European \*i is confirmed by several witnesses in:

OCS. žin-	(vb.) ‘schneiden, ernten’ (Sadnik 214, žeti [inf.])
Br. hina-	(prA.) ‘verletzen, schädigen’ (KEWA 3:595, ahinat)
Li. gina-	(pr.) ‘wehren, verteidigen’ (LiEtWb. 152, ginù [1sg])
Arm. jne-	(vb.) ‘schlagen’ (GEW 1:657, PArm. *jine/o-)
Li. giñkla-	(m.) ‘Waffe’ (LiEtWb. 152, giñklas [sgN])
RV. híms-	(pr.) ‘verletzen, beleidigen’ (WbRV. 1665, hímsanti)

(e) PIE \*g<sup>h</sup>hen- ‘schlagen, töten’ (HEG 1:604-606), the nasal extension of the root PIE \*g<sup>h</sup>he- (Ĥi. gue-, RV. há-), appears in:

PIE \*g<sup>h</sup>hen-

Ĥi. guen-	(vb.) ‘(er)schlagen, töten’ (HHand. 81, ku-en-zi [3sg])
RV. hán-	(pr.) ‘(er)schlagen, töten’ (WbRV. 1642, hantanā [2pl])

PIE \*g<sup>h</sup>heni-

Ĥi. gueni-	(vb.) ‘erschlagen’ (HEG 1:604f., ku-e-ni [ipv2sg])
Gr. θείνω	(pr.) ‘(tot)schlagen’ (GEW 1:657, θείνω)
RV. hanyá-	(prP.) ‘erschlagen’ (WbRV. 1645, hanyáte [3sg])

PIE \*g<sup>h</sup>hn-

Ĥi. gun-	(vb.) ‘(er)schlagen, töten’ (HEG 1:604-5, ku-na-an-zi)
RV. ghn-	(pr.) ‘(er)schlagen, töten’ (WbRV. 1643, ghnánti [3pl])
TochA. kuñás-	(sb.) ‘rixa : Streit, Kampf’ (Poucha 76, kuñás [sgN])
OHG. gund·fano	(.) ‘Kriegsfahne’ (Grundr <sup>2</sup> 1:611, gundfano)

<sup>582</sup> In this form, Gr. φ (vs. <sup>†</sup>θ) requires PGr. \*πέφατ·οιο-, implying PGr. \*ᾶ ≡ YV. ā.

OEng. gūð (f.) ‘bellum’ (ASaxD. 493, gūð [sgN])

(f) Neogr. \*g<sup>h</sup>(e)t-, the dental extension, is attested in zero- and \*e-grades:

PIE \*g<sup>h</sup>ht(o)-

OIcl. guð- (f.) ‘Kampf’ (ANetWb. 195)

OIcl. hōguð- (m.) ‘Schwert’ (ANetWb. 280)

PIE \*g<sup>h</sup>het(o)-

RV. sam·hát- (f.) ‘die Schicht’ (WbRV. 1440)

RV. hatá- (pf.) ‘geschlagen, getötet, erschlagen’ (WbRV. 1646)

LAv. jata- (pf.pt.) ‘geschlagen, getötet’ (AIWb. 602)

§8. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed “ai. tanví ‘tenuis’, ahd. dunni aisl. þunnr ‘dünn’ (-nn- aus -nų-, §376 S. 335), aksl. tīnĭkŭ ‘dunn’ vermutlich aus \*tīnųĭkŭ (§ 449), uridg. tŋu-, neben tŋnu-, s. § 432.” (Grundr<sup>2</sup> 1:407): Lat. tentu-s tentiō : ai. tatá-s gr. τᾰτό-ς ‘gestreckt’, gr. τᾰσι-ς ‘Spannung’, W. ten-.” Brugmann (Grundr<sup>2</sup> 1:411) also adds: “OIr. tēt ‘Saite’ : nkymr. tant gGf. \*tŋtu-, vgl. ai. tatá- ‘gestreckt’, W. ten- (Grundr<sup>2</sup> 1: 416) OCS. tīnŭkŭ ‘dünn’ [...] OCS. tŭnŭkŭ ‘dünn’ (russ. tónkij)” and (Grundr<sup>2</sup> 1:416): “Lit. tįsti ‘sich recken’ Li. tįsi-s ‘Fischzug’ : ai. vi-tasti-ς ‘Spanne’, ahd. gi-dunsan ‘gedunsen’, zu W. ten-, s. II S. 1020.” Contrary to Brugmann’s uniform root with deep-level nasal, a monoliteral root with multiple extensions is attested:

(a) PIE √t- ‘strecken, usw.’, the monoliteral root, is preserved in reduplication PIE \*tet- ‘dehnen, hinstrecken’

RV. tat- (pfM.) ‘sich hinstrecken, dauern’ (WbRV. 516, tate)

(b) PIE √taḥ- ‘dehnen, erstrecken, spannen, usw.’, the laryngeal root with extensions, has been preserved in:

PIE \*tēaḥ-

RV. á·tā- (f.) ‘die Umfassung, die Rahmen’ (WbRV. 175)

LAv. hu·pairi·tā- (a.f.) ‘(sich) wohl herumdehnend’ (AIWb. 1826)

Lat. an·tā- (f.pl.) ‘viereckiger Wandpfeiler, Pilaster’ (WH 1:52)

Gr. τέτα- (pfM.) ‘sich dehnen, sich erstrecken’ (GEW 2:864)

Br. ta- (ao.) ‘spannen, dehnen, sich ausdehnen’ (EWA 1:618)

PIE \*teaḥn-

ModCymr. tant (f.) ‘Saite’ (Grundr<sup>2</sup> 1:411, VGK 1:138)

OIr. tēt- (f.) ‘câble, corde’ (LEIA T:55)

OGaul. tantou- (pl.) ‘fides’ (LEIA T-55)

Gr. τανύ- (prM.) ‘spannen, strecken, ausdehnen’ (GEW 2:853)

RV. tanú- (a.) ‘lang, ausgedehnt’ (WbRV. 519)

PIE \*teaḥs-

Czech. tasi- (vb.) ‘ziehen’ (REW 3:81, tasiti [inf.])

Gr. ᾰ τᾰήσ- (a.) Hes. ‘ἀγύμναστος’ (LSJ. 267)

Rus. táska	(f.) ‘das Ziehen’ (REW 3:81)
LAv. vi·tasti-	(f.) ‘Spanne (als Längenmass)’ (AIWb. 1440)

PIE \*teaht-

RV. tatá-	(pf.pt.) ‘aufgespannt, aufgezogen’ (WbRV. 517)
Gr. τató-	(vb.a.) ‘dehnbar’ (GEW 2:864)
OInd. tati-	(f.) ‘Opferhandlung, Zeremonie’ (EWA 1:618)
Gr. τάσι-	(f.) ‘Spannung, Dehnung, usw.’ (GEW 2:864)

(c) PIE \*tin- ‘zart, fein’ is confirmed by Balto-Slavonic and Celtic in:

Ir. tin-	(a.) ‘zart : doux’ (LEIA T-67, tin [sgN])
Latv. tina-	(f.) ‘ein Setznetz’ (WP 724, Latv. tina)
OCS. tinī-	(f.) ‘Seil, Strick’ (Sadnik 966, OCS. tinī)
Li. tiñkla-	(m.) ‘Netz, Falle, Schlinge’ (LiEtWb. 1098)
OCS. tīnūkū	(a.) ‘fein, zart’ (Sadnik 972, tīnūkū)
OGaul. tinneti(n)-	(ON.) ‘Tinzen’ (ACSS. 2:1854, tinneti(n))
OBret. tinsi-	(vb.) ‘sparsit’ (VGK 2:374, tinsit [3sg], Loth: tinsot!)

(d) PIE \*ten-, ten(aḥ)-, the nasal extension of the root, has been preserved in:

Lat. tenū-	(pf.) ‘gespannt/besetzt/zurück/an-halten’ (WH 2:664-5)
Li. tėva-	(a.) ‘schlank, dünn, fein, zart, hoch’ (LiEtWb. 1086)
Lat. tenui-	(a.) ‘dünn, fein, zart, eng, schmal’ (WH 2:666)
OIcl. þinul-	(m.) ‘Tau das das Netz einfasst’ (ANetWb. 611)

(e) PIE √tun- (OHG. gi-dunsan, etc.) is proven to be original through four subgroups:

PIE \*tunu-

Li. tunu-	(a.) ‘dünn’ (LiEtWb. 1140)
OIcl. þunn-	(a.) ‘dünn, schwach, klar’ (ANetWb. 627)
Gr. τυννό-	(a.) ‘klein, gering’ (PGEW 2:945, Gr. *τυνφο-)
OHG. dunni	(a.) ‘dünn’ (ANetWb. 627)
ORus. tūnūkū	(a.) ‘dünn, hager, fein, scharf’ (REW 3:119)
Rus. tónkij	(a.) ‘dünn, fein, schlank’ (REW 3:119)

§9. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. “\*dñkó- Präsensstamm von W. denk̂- ‘beissen’ (ai. dáśa-s ahd. zangar): ai. dáśa-ti (§ 1047,4) gr. ἔ-δακον (II S. 921. 994)”. Brugmann’s reconstruction has already been shown to be erroneous by Burrow (1979:59), who correctly pointed out that “[...] Skt. daṃś- is not from IE \*denk̂-, but from \*dan̂k̂-”. This state of affairs is undeniable as the material (P. 201) agrees with Gr. √δαγκ- in:

(a) PIE \*deahn̂k̂- ‘beißen’ (P. 201)

Gr. δανκάνω	(pr.) = ‘δάκνω’ (LSJ. 364, δαγκάνω)
OHG. zangar	(a.) ‘beissend, scharf’ (GEW 1:344)
Gr. δάνκωλο-	(n.) = ‘δρέπανον’ (LSJ. 364, δάγκωλον)
RV. dañṣtra-	(m.) ‘Zahn, Fangzahn’ (WbRV. 569, dañṣtraḥ [sgN])

LAv. *tiži·dastra-* (a.) ‘mit scharfem Gebiß, Gezäh’n’ (AIWb. 653)

(b) PIE \**deah₂k-* ‘beißen’ (P. 201). The absence of a syllabic nasal is confirmed by the European *a* accompanied by quantitative ablaut:

Gr. <i>δακó-</i>	(ao.) ‘beißen, stechen, verletzen’ (GEW 1:343, <i>ἔδακόν</i> )
RV. <i>dása-</i>	(pr1A.) ‘beißen’ (WbRV. 569, <i>dása</i> [2sg])
TochB. <i>tsāka-</i>	(vb.) ‘bite’ (DTochB. 731, <i>tsākaṃ</i> [3sg]) <sup>583</sup>
Gr. <i>δέδηχ-</i>	(pf.) ‘beißen, stechen, verletzen’ (GEW 1:343, <i>δέδηχα</i> )
Lat. <i>daculo-</i>	(n.) ‘Sichel’ (WH 1:449, <i>daculum</i> [sgNA])

The root variants point to a ‘nasal infix root’ with ‘Persson cut’ PIE \**deah₂n·k-*, not a syllabic nasal Neogr. †*dn̥kó-* (see Burrow).

§10. Brugmann (Grundr<sup>2</sup> 1:401) reconstructed Neogr. \**bhṇdh-* for “Ai. *badhná-ti* ‘er bindet’ *badhyá-tē* ‘er wird gebunden’, Part. *baddhá-* av. *basta-* apers. *basta-* : vgl. got. *bundan-s* ‘gebunden’, W. *bhendh-*” and (Grundr<sup>2</sup> 1:413): “Got. *bundum* ahd. *buntum* aisl. *bundom* ‘wir banden’, zu got. *bindan* ‘binden’ (II S. 1258)”. Yet all attested vocalisms are paralleled by the comparative method.

(a) PIE \**bhend(h)-* \**bhond(h)-* ‘binden’, the nasal root (P. 127), has never been contested:

Go. and <i>band-</i>	(pret.) ‘unbind, loose’ (GoEtD. 71, <i>andband</i> [3sg])
LAv. <i>band-</i>	(vb.) ‘binden, fesseln’ (AIWb. 926, <i>bandyāt</i> [opt])
RV. <i>bandhá-</i>	(m.) ‘Band, Fessel’ (WbRV. 898)
Go. and <i>binda-</i>	(vb.) ‘unbind, loose’ (GoEtD. 71, <i>andbindan</i> [inf.])
Lat. of <i>fendīc-</i>	(f.) ‘das Kinnband an der Priestermütze’ (WH 2:204)

(b) PIE \**bhodh-* ‘binden’. Brugmann’s structural derivation RV. *badh-* ← Neogr. \**bhṇdh-* is proven to be erroneous by Old Anatolian, which also lacks the nasal in:

H̥i. <i>badan-</i>	(GIŠ <sub>n</sub> .) ‘Tablett aus Rohr, Korb, Sieb’ (HHand. 127)
AV. <i>badhná-</i>	(pr.) ‘binden an/mit [L]’ (WbRV. 897, <i>badhnāmi</i> )
H̥i. <i>badar-</i>	(GIŠ <sub>n</sub> .) ‘Tablett aus Rohr, Korb, Sieb’ (CHD P:241f.)

(c) PIE \**bhund(h)-* ‘binden’ is confirmed by the following examples:

Lat. <i>fundā-</i>	(f.) ‘Schleuder, Wurfnetz, Leibbinde’ (WH 1:562)
Lat. <i>funditōr-</i>	(m.) ‘Schleuderer’ (WH 1:562)
Lat. <i>fundulo-</i>	(m.) ‘Blinddarm’ (WH 1:562, <i>fundulus</i> [sgN])
Go. <i>bundan-</i>	(pt.) ‘bound’ (GoEtD. 71, <i>bundans</i> [plN])

§11. Brugmann (Grundr<sup>2</sup> 1:401) reconstructed: “Ai. *śasyá-tē* ‘er wird gelobt’ apers. *ṭahyāmahy* ‘wir werden genannt’, Part. ai. *śasti-ṣ* ‘Lob’ av. *sasti-š* ‘Lob, Gebot’ : osk. *an-censto* ‘incensa’, W. *ġens-* (ai. *śāsa-ti*)” and (Grundr<sup>2</sup> 1: 407): “Lat. *cēnsu-s* für \**cēnstu-s* [...] osk. *an-censto* ‘incensa’ : ai. *śastá-s* ‘gesprochen, gepriesen’, W. *ġens-*”.

<sup>583</sup> The Tocharian palatalization requires PIE \**dañēk-* → \**dñēk-* → TochB. *tsāk-* (schwebeablaut).

The internal reconstruction of Sanskrit has been exaggerated at the cost of external comparison without a nasal in:

(a)  $\sqrt{k}es-$  ‘sprechen’ (P. 566)

TochA. $k\bar{a}s-$	(sb.) ‘reprimand, chastise’ (DTochB. 149, Poucha 62)
Go. $hazja-$	(wk.vb1.) ‘ $\alpha i\nu\epsilon i\nu$ : praise’ (GoEtDi. 181, hazjan)
RV. $\acute{s}asy\acute{a}-$	(prP.) ‘loben, preisen, geloben’ (WbRV. 1366)
TochA. $ka\acute{s}\bar{a}nta\acute{s}\bar{s}e-$	(a.) ‘prtng to reprimand’ (?) (DTochB. 148)
RV. $\acute{s}ast\acute{i}-$	(f.) ‘Lob, Loblied’ (WbRV. 1389)

The absence of a syllabic nasal in these forms is a common Indo-European feature.

(b)  $\sqrt{k}ens-$  ‘sprechen’ (P. 566)

RV. $\acute{s}\bar{a}m\bar{s}-$	(aoM.) ‘feierlich aussprechen, aussagen’ (WbRV. 1366)
Lat. $c\bar{e}n\bar{s}e\bar{o}$	(pr.) ‘begutachten, schätzen, meinen’ (WH 1:198-99)
Osc. $an\cdot censto-$	(a.) ‘incensa, nicht geschätzt’ (WbOU. 102)

Again, a ‘nasal infix root’ (Persson’s cut PIE  $*\acute{k}e\cdot n\cdot s-$ ), not a syllabic nasal, accounts for the alternation RV.  $\acute{s}as-$  :  $\acute{s}\bar{a}m\bar{s}-$ .

§12. Brugmann (Grundr<sup>2</sup> 1:401) reconstructed: “Ai.  $sat-$  av.  $hat-$  Schwundstf. zu  $s-\acute{a}nt-$ ,  $h-\acute{a}nt-$  ‘seiend’, z. B. Gen.  $sat-\acute{a}s$   $hat-\acute{o}$  Nom. Sg. Fem  $sat\acute{i}$   $haiti$  : gr. dor. Fem.  $\acute{\epsilon}\alpha\sigma\sigma\alpha$  aus  $*\acute{\epsilon}\sigma\alpha\tau-\acute{j}\alpha$ , got.  $sunji-s$  ‘wahr’ aus  $*sund-\acute{j}\alpha = ai. sat-\acute{y}\acute{a}-$  ‘wahr’”. Instead of Neogr.  $*sont-$   $*s\bar{n}t-$  there are several extensions with and without a nasal implied by the comparative method:

(a) PIE  $*sont-$  ‘seiend’ is attested in:

RV. $s\acute{a}nt-$	(pt.m.) ‘(wahr) seiend, usw.’ (WbRV. 151)
Gr. $(h)\acute{o}\nu\tau-$	(pt.m.) ‘seiend’ (GEW 1:463, $\acute{o}\nu\tau\epsilon\varsigma$ [plN])

(b) PIE  $*set(o)-$  ‘seiend’ appears in:<sup>584</sup>

RV. $s\acute{a}t-$	(pt.n.) ‘wahr, seiend, wirklich, usw.’ (WbRV. 151)
gAv. $hat-$	(pt.) ‘seiend, usw.’ (AIWb. 266f., $ha\bar{t}$ [sgNA])
Gr. $(h)\acute{\epsilon}t\acute{o}-$	(n.pl.) ‘wahr’ (GEW 1:435, $\acute{\epsilon}t\acute{\alpha}$ [plNA])

(c) PIE  $*sotio-$  ‘wahr, usw.’ is documented in:<sup>585</sup>

Gr. $\acute{o}\sigma\iota\omicron-$	(a.) ‘gerecht, gottgefällig’ (GEW 2:435, $\acute{o}\sigma\iota\omicron\varsigma$ )
RV. $sat\acute{y}\acute{a}-$	(a.) ‘wahr, wirklich’ (KEWA 3:422)
gAv. $hai\bar{\theta}ya-$	(a.) ‘wahr, echt’ (AIWb. 1760)

(d) PIE  $*seah\bar{-}$ ,  $*s\bar{e}ah\bar{-}$  ‘sein’, the laryngeal extension with an optional ‘prothetic vowel’  $*e-$ , is attested in:

Lat. $er\bar{a}-$	(pret.) ‘sein, war’ (WH 2:628, $er\bar{a}s$ [2sg])
gAv. $h\bar{a}t-$	(pt.) ‘seiend’ (AIWb. 267, $h\bar{a}t\bar{a}m$ [plG])

<sup>584</sup> This was already correctly reconstructed by Frisk: ‘ $*s-e-to$  in  $\acute{\epsilon}t\acute{\alpha}$ ’ (GEW 2:435).

<sup>585</sup> See already Frisk (GEW 2:435): “[...] gewöhnlich als  $to-$ -Ableitung eines Ptzs.  $*s-o-to-$  (von  $es-$  ‘sein’) erklärt”. Note that  $*soto-$  exists in OIcl.  $sa\bar{\delta}-$  (a.) ‘wahr, schuldig’ (ANetWb. 462,  $sa\bar{\delta}r$  [sgN]).

gAv. hāitī-	(pt.f) ‘seiend’ (Grundr <sup>2</sup> 1:797, hāitīm) <sup>586</sup>
Do. ἔασσα	(pt.f.) ‘seiend’ (LSJ. 466)
OIr. sa <sup>1</sup> thech	(.) ‘rights, a law, legal measure’ (DIL. 519)

(e) PIE √su- ‘good’ (P. 342) appears with and without a prothetic vowel in:

PIE *osu-	
Hi. ašu-	(a.) ‘SIG <sub>5</sub> = gut, nützlich, angenehm, gütig’ (HEG 1:87)
Northumbr. aro-	(pret.) ‘sein’ (P. 340, aron [3pl], PGerm. *azu-)
PIE *esu-	
Gr. ἐῢ-	(a.) ‘gut’ (adv.) ‘wohl’ (GEW 1:594, ἐῢς, ἐῢ)
Gr. ἦῢ-	(a.) ‘gut’ (adv.) ‘wohl’ (GEW 1:594, ἦῢς, ἦῢ)
PIE *su-	
RV. sú	(a.) ‘schön, wohl, gut, recht, usw.’ (WbRV. 1526)
Gr. ὕ·γιήσ-	(a.) ‘gesund, heilsam’ (GEW 2:954, ὕ·γιής [sgN]) <sup>587</sup>
Hi. šuḥmili-	(a.) ‘well-bound, fixed’ (Lindeman 1997:106)
RV. sūmáya-	(a.) ‘schön verfertigt’ (WbRV. 1566)
Go. sunja	(a.f.) ‘ἀληθής, ἀληθινός = truth(ful)’ (GoEtD. 329)

§13. Brugmann (Grundr<sup>2</sup> 1:402) reconstructed a root Neogr. \*ḡk̑- \*enk̑- \*onk̑- for “ai. aś-nó-ti av. ašnaoiti ‘er erreicht’, vgl. ai. ānáśa, áśa-s ‘Anteil’ [...]”. The postulation of Neogr. \*ḡk̑- to account for all forms is no longer possible due to external confirmation of the root lacking a nasal:

(a) PIE \*ḡak̑- is required by forms displaying Wackernagel’s ablaut OInd. Ø : a : ā in Indo-Iranian and Tocharian with Neogr. \*a and without a nasal:

RV. áś-	(pf.) ‘erreichen, gelangen’ (WbRV. 135, áśa [3sg])
RV. aś-	(aoA.) ‘erreichen, gelangen’ (WbRV. 134-5, aśiám)
gAv. frō·sya-	(vb.) ‘erreichen, treffen’ (AIWb. 360, frōsyāt [3sg]) <sup>588</sup>
TochB. ekita yam-	(vb.fr.) ‘help’ (DTochB. 76, ekita yamašare)
TochB. ekaññe-	(f.pl.) ‘possession, equipment’ (DTochB. 75)
TochA. akäntsune-	(m.) ‘Geld, Besitz : res, pecunia’ (Poucha 1)

(b) PIE \*ḡaenk̑- ‘erreichen, usw.’, the root with a nasal, has an initial laryngeal proven by Celtic:

RV. ān·áñś-	(pf.) “in Besitz bekommen” (WbRV. 135, ānánśa [3sg])
OIr. ro·ān·acc-	(pf.) ‘erreichen’ (P. 317, roānaic [3sg])
Cymr. di·anc-	(vb.) ‘ent·fliehen’ (P. 317)
gAv. fraš-	(ao.) ‘zu teil werden’ (AIWb. 360, fraštā [3sg])

<sup>586</sup> Brugmann’s (Grundr<sup>2</sup> 1:797) analogical explanation of gAv. hāitīm is thus unnecessary.

<sup>587</sup> Bammesberger (1984:38-9) writes: “Das Fehlen von ε- im Anlaut bei gr. ὕ·γιής ist bei der Annahme, dass ə<sub>1</sub>- > ε- geführt habe, kaum verständlich. [...] Es bleibt somit wohl nur die Annahme, daß die Wurzel für ‘sein’ im Anlaut keinen Laryngal aufwies.” For a similar analysis, see also Seebold (1988:505).

<sup>588</sup> For the prefix, see also gAv. frō·gā- (a.) ‘voranschreitend’ (AIWb. 1024), etc.



RV. áńśa- (m.) ‘Anteil, Erbteil, Partei’ (WbRV. 1)

§14. Brugmann reconstructed (Grundr<sup>2</sup> 1:402): “ai. bahú-š ‘dicht, viel, gross’, vgl. Superl. báhīṣṭha-s und av. bāzah- ‘Grösse’ [...]”, allegedly reflecting Neogr. \*bhŋgh- : \*bhengh-. The structurally postulated Neogr. \*ŋ for Gr. α (παχύ-) = RV. a (bahú-) is erroneous, because Hittite parallels the roots with and without a nasal:

(a) PIE \*bhae/oŋh- (CHD P:88f.)

RV. baháv- (a.) ‘dicht(gefüllt), viel, zahlreich’ (WbRV. 902)  
 𐎡𐎢. bagau- (c.) ‘multitude, the people’ (CHD P:88, pa-ga-ua-aš)

(b) PIE \*bhae/ongh- (CHD P:88f.)

RV. báníḥiṣṭa- (sup.) ‘der festeste, dichteste, sehr dicht’ (WbRV. 897)  
 LAV. bāzah- (n.) ‘Höhe, Tiefe’ (AIWb. 962-3)  
 𐎡𐎢. bangu- (a.) ‘gesamt, vereint’ (HHand. 118, pa-an-ku-uš)

§15. Brugmann (Grundr<sup>2</sup> 1:407) reconstructed Neogr. \*ŋsi- ‘Schwert’ (P. 771, WP 1:324) for “Lat. ēnsi-s : ai. así-š ‘Schwert’”. The extended material confirms two roots:

(a) PIE \*ḥas- ‘schneiden, abschaben, werfen (eine Waffe)’ (HEG 1:199)<sup>589</sup>

RV. parā (...) áś- (pfA.) ‘verstoßen’ (WbRV. 152, parā (...) áśa [3sg])  
 𐎡𐎢. ḥašḥaša- (pr1) ‘abschaben’ (HHand. 46, ḥa-aš-ḥa-aš-ša-an [pt.])  
 LAV. aṇha- (vb.) ‘werfen (eine Waffe)’ (AIWb. 279, aṇhaṭ [3sg])  
 RV. así- (m.) ‘das Schwert’ (WbRV. 154, EWA 2:145, asís [sgN])  
 Pal. ḥašira- (c.) ‘Dolch’ (DPal. 55, ḥa-ši-i-ra-am(-pi) [sgA])  
 RV. ásira- (m.) ‘(Strahlen)Geschoss’ (WbRV. 154, ásirena [sgI])  
 LAV. aṇhuya- (f.) ‘Schwert’ (AIWb. 110, parō aṇhuyāt [sgAbI])

Old Anatolian has PIE \*ḥ and agrees with Indo-Iranian in the absence of a nasal. In turn, it is confirmed by the quantitative ablaut RV. a : ā.

(b) PIE \*ēns- ōns- ‘abwischen; Schwert’ is also preserved by Old Anatolian:

𐎡𐎢. anaš- (vb.) ‘abwischen’ (HEG 1:33, a-an-aš-ta-at [3sg])  
 𐎡𐎢. anša šiui- (c.) ‘Leichnam’ (HEG 2:33)  
 Lat. ēnsi- (m.) ‘Schwert’ (WH 1:406)  
 𐎡𐎢. anšia- (vb.) ‘abwischen’ (EHS 507)  
 Lat. ēnsi-culo- (m.dim.) ‘Schwertlein’ (WH 2:406, ēnsiculus [sgN])  
 gAv. aṣta- (m.) ‘Hass, Feindschaft, Feindseligkeit’ (AIWb. 361)

The nasal is consistently preserved and no laryngeal is attested.

§16. Brugmann (Grundr<sup>2</sup> 1:413) reconstructed Neogr. \*ŋdhero- for “Go. undar ahd. untar ‘unter’ : av. aḍa’ri ‘unter’ ai. adhás ‘unten’ ádhara-s ‘der untere’”. The traditional reconstruction was erroneous from the beginning, because Lat. f (not Lat. †inbimo- †inbero) confirms a prefix. As for the root without affixes, the following formations should be noted:

<sup>589</sup> For the etymology, see already Eichner (1980:127fn30).

(a) PIE \*dho- ‘unter’, the main root without a prefix, is attested in:

gAv. də ·bāz-	(prA.) ‘unter ·stützen’ (AIWb. 760, dəbāzaitī [conj.3sg])
gAv. də ·bāzah-	(n.) ‘Unter ·stützung, Hilfeleistung’ (AIWb. 761)
gAv. dā jīṭ.aṛəta-	(PN.) ‘das Gesetz, Recht mindernd’ (AIWb. 609) <sup>590</sup>

The unextended root is documented through numerous extensions, including:

(b) PIE \*dhem- \*dhom- ‘unterste’

RV. a ·dhamá-	(sup.) ‘unterste, niedrigste, geringste’ (WbRV. 43-4)
Lat. īn ·fimo-	(a.) ‘der unterste’ (WH 1:698, īfimus [sgN])
TochB. e ·ttem	(adv.) ‘down’ (DTochB. 81 < *dhomo-)
Lat. īn ·fimā-	(pr.) ‘erniedrigen’ (WH 1:698, īfimāre [inf.])

(c) PIE \*dher- \*dhor- ‘untere’

RV. á ·dhara-	(comp.) ‘untere, niedriger, tiefer stehen’ (WbRV. 44)
Go. un ·dar	(prep.) ‘= ὑπό : under’ (GoEtD. 376)
Lat. īn ·fero-	(a.) ‘der untere’ (WH 1:698, īferus [sgN])
LAv. a ·dāri	(prepA.) ‘unter, unterhalb’ (AIWb. 58)
TochB. an ·tariye-	(a.) ‘under/lower (of garments)’ (DTochB. 15)

(d) PIE \*dhes- \*dhos- ‘unten’

RV. a ·dhás	(adv.) ‘unten, nach unten, unter mit [A,G]’ (WbRV. 44)
LAv. a ·dā	(adv.) ‘unten’ (AIWb. 60)
TochB. e ·tte	(adv.) ‘down’ (DTochB. 81, MA 611)
TochB. e ·tte-	(a.indecl.) ‘lower’ (DTochB. 81)
TochB. e ·ttesa	(prep.) ‘under’ (DTochB. 81)

As it is impossible to derive prefixes from a single prototype, the formation offers no examples of Neogr. \*ṇ.

§17. Brugmann (Grundr<sup>2</sup> 1:414) compared “Go. kunjis (Nom. Acc. kuni) ahd. kunn[i]es (Nom. Acc. kunni) ‘Geschlechtes’ [...] Go. gōda-kund-s ‘von guter Abkunft’, W. ġen- ‘gignere’ [...] Über das Verhältnis von got. sama-kunjis zu gr. ὀμόγιος s. § 282 S. 265”.

Two different roots, a palatal one and a labiovelar one, are implied by the comparative method:

(a) PIE \*ġeḥan- ‘gignere’ (P. 373-5 [ġen-])

Gr. γέν-	(√aoM.) ‘(geboren) werden, entstehen’ (GEW 1:306-8)
RV. jān-	(√aoMP.) ‘erzeugen, gebären’ (WbRV. 469, jāni [3sg])
Gr. γέγον-	(pf.) ‘geboren werden’ (GEW 1:306-8, γέγονε [3sg])
TochB. kan-	(vb.) ‘come to pass, be realized’ (DTochB. 160, kantār)
Gr. πᾶλι γᾶν-	(m.pl.) ‘οἱ ἔνδοξοι, βουλευταί’ (GEW 2:498)
RV. jajān-	(pf.) ‘gebären, erzeugen’ (WbRV. 467-8, jajāna [3sg])

<sup>590</sup> For the respective prefixless forms, cf. RV. bāhiṣṭa- (sup.) ‘der festeste, dichteste, sehr dicht’ (WbRV. 897) and LAv. jīṭ.aṣa- (PN.) ‘das Gesetz, Recht mindernd’ (AIWb. 609).

Pahl. zan- (f.) ‘woman, wife’ (MPalh. 2:228, zan)

(b) PIE \*g<sup>h</sup>eh<sup>n</sup>- ‘gignere’ (P. 473)

Gr. γυνή-	(f.) ‘Weib, Frau’ (GEW 1:333-4, γυνή)
OIcl. kuna-	(f.) ‘Frau’ (ANetWb. 334)
OIcl. kyn-	(n.) ‘Geschlecht, Familie’ (ANetWb. 340)
Go. kuni-	(n.) ‘Geschlecht’ (GoEtWb. 222)
Go. qina·kund-	(a.) ‘θηλυς : female’ (GoEtD. 277)
Lyc. qñza-	(c.) ‘Nachkommenschaft’ (HEG 1:196, qñza)
OIcl. ās·kynd-	(a.) ‘gehörend zum geschlecht von A.’ (ANetWb. 340)

The lack of palatalization in Lycian, a Satem language (see Chapter 4), indicates that the formation does not reflect the zero grade of a palatal root Neogr. \*ǵ<sup>n</sup>C-.

### 3.4.4 Neogr. \*ǵ<sup>n</sup> (antevocalic syllabic dental)

§0. Following Osthoff’s realization that the svarabhakti vowels also appear in antevocalic position, Neogr. ǵ<sup>n</sup> was postulated by the Neogrammarians for the environment \*(C)ǵ<sup>n</sup>V = LT \*(C)ǵ<sup>n</sup>HV.

§1. According to Brugmann (Grundr<sup>2</sup> 1:395), the development of the syllabic nasals in antevocalic position was identical with Neogr. \*ǵ + i, u, as shown in:

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
*ǵ <sup>n</sup> +V	an	an	αν	?	en	an	un	in	in
*ǵ+i, u	an	an	αν	?	en	an	un	in	in

§2. The key problems of Neogr. \*(C)ǵ<sup>n</sup>V can be summarized as follows:

(a) Examples of Sievers-Edgerton’s Law for nasals contain real examples of the sequence PIE \*(C)ǵ<sup>n</sup>HV. Within these PIE \*ǵ turned into simple PIE \*n after the loss of PIE \*ǵ without producing the svarabhakti vowels.

(b) The svarabhakti vowels can, however, be externally paralleled and postulated to the proto-language by at least two witnesses (Fick’s Rule). This state of affairs can be confirmed by Brugmann’s following examples of Neogr. \*ǵ<sup>n</sup>:

§3. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. \*g<sup>h</sup>ǵ<sup>n</sup>ā- ‘Weib’ for “ved. gnā-arm. Pl. kanaik‘ böot. βανά air. ban- (in Compp.) aisl. kona (daneben \*g<sup>h</sup>nā- in ved. gnā- gr. γυναίκα etc.)”. Several distinctions predicated on the ablaut \*o : Ø : e can be drawn from this data:

(a) PIE \*g<sup>h</sup>aǵ<sup>n</sup>-, the zero-grade root, is attested in:

OIcl. kuna-	(f.) ‘Frau’ (ANetWb. 334)
Gr. γυνή-	(f.) ‘Frau, Weib’ (GEW 2:333-4, γυνή)
RV. g <sup>h</sup> nā-	(f.) ‘Götterweib, Göttin’ (zweisilbig, WbRV. 415)

(b) PIE \*g<sup>h</sup>aeh<sup>n</sup>-, the \*e-grade root, is shared by the forms:

OInd. pañāñ·ganā-	(f.) ‘meretrīx’ (KEWA 2:194, EWA 2:69)
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Boiot. βανά-	(f.) ‘Frau, Weib’ (GEW 2:333)
OIr. ban-	(f.) ‘Frau’ (GOI §291, ban [pIG])
Arm. kana-	(sb.obl.) ‘Frau’ (ArmGr. 1:460, kanaç [pIG])

(c) PIE \*g<sup>u</sup>oah<sub>2</sub>n-, the \*o-grade root, is confirmed in

OPhyrg. βονοκ-	(f.) ‘Weib’ (Pedersen, Groupement 48, P. 473).
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(d) PIE \*g<sup>u</sup>aḥ<sub>2</sub>n- ‘Weib, Frau, Herrin, Göttin’ is attested in:

RV. gnā-	(f.) ‘Götterweib, Göttin’ (WbRV. 415, onesyllabic)
Arm. kna-	(sb.obl.) ‘Ehefrau, Weib, Frau’ (ArmGr. 1:460, knav [I])
OIr. mnā-	(f.) ‘Frau’ (GOI §291, mnā [G], mnai [D], mnāib [pID])
Gr. μνάο-	(vbM.) ‘um eine Frau werben, freien’ (GEW 2:240)

The reconstruction is thus postulated without an antevocalic syllabic nasal.

§4. Brugmann (Grundr<sup>2</sup> 1:399) posited Neogr. \*ἡνῦ- ‘gestrect, dünn’ for “ai. tanú-ḡ gr. τανύ-γλωσσοσ lat. tenuis air. tana” and (Grundr<sup>2</sup> 1:412) “OIr. tana ‘dünn’ : corn tanow nbret. tanav ‘dünn’, Ai. tanú-ḡ etc. s. §432”. The comparative derivation of the root, already discussed above, can be presented as follows:

(a) PIE √t-, the monoliteral root, is attested in the perfect PIE \*tet- preserved in

RV. tat-	(pfM.) ‘sich hinstrecken, dauern’ (WbRV. 516, tate).
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(b) PIE \*taḥ<sub>2</sub>-, the laryngeal extension of PIE √t-, is attested in the normal (PIE \*teaḥ<sub>2</sub>-) and long grades (PIE \*tēaḥ<sub>2</sub>-):

Br. ta-	(ao.) ‘spannen, dehnen’ (AIGr. 1:8, atata [3sg])
Gr. τέτα-	(pfM.) ‘sich dehnen, sich erstrecken’ (GEW 2:864)
RV. á ·tā-	(f.) ‘die Umfassung, die Rahmen’ (WbRV. 175)
LAv. hu ·pairi ·tā-	(a.) ‘(sich) wohl herumdehnend’ (AIWb. 1826)

(c) PIE \*teaḥ<sub>2</sub>nu- (\*e-grade), the \*n-extension of the previous example, is preserved in:

RV. tanú-	(a.) ‘lang, ausgedehnt’ (WbRV. 519)
Gr. τανύ-	(prM.) ‘spannen, strecken, ausdehnen’ (GEW 2:853)
OIr. tanae	(a.) ‘mince, fin, étroit’ (LEIA T-26)

(d) PIE \*toah<sub>2</sub>n-, the \*o-grade of the previous example, is possible (see Brugmann’s Law II) in:

RV. tatán-	(pfA.) ‘sich ausbreiten’ (WbRV. 516, tatána [3sg])
Gr. τόνο-	(m.) ‘Spannung, Seil, Saite, Sehne’ (GEW 2:863)
RV. ut ·tāná-	(pt.) ‘ausgestreckt’ (WbRV. 250)
gAv. us ·tāna-	(a.) ‘ausgestreckt’ (AIWb. 633)

(e) PIE \*taḥ<sub>2</sub>enu- (= Neogr. \*thenu-), the schwebeablaut variant of PIE \*teaḥ<sub>2</sub>nu- (Gr. τανύ-), proves the laryngeal of the latter by the tenuis aspirata in Iranian:

LAv. ḡanv-	(m.) (N. einer Pflanze) (AIWb. 785, ḡanvasča [pIA])
LAv. ḡanvar-	(n.) ‘Bogen’ (AIWb. 785, ḡanvarəča [sgNA])

LAv. <i>ḡanvana-</i>	(n.) ‘Bogen’ (AIWb. 785, hača <i>ḡanvanāt</i> )
OPers. <i>ḡanvanya-</i>	(m.) ‘bowman’ (OldP. 187, <i>ḡanuvaniya</i> [sgN])

(f) PIE *\*tenaḡu-* with a common Indo-European *\*e* is preserved in:<sup>591</sup>

Li. <i>tēva-</i>	(a.) ‘schlank, dünn, hager, fein’ (LiEtWb. 1086)
Lat. <i>tenui-</i>	(a.) ‘dünn, fein, zart, eng, schmal’ (WH 2:666)
OIcl. <i>ḡinur-</i>	(m.) ‘Tau, Bogenmitte, Hartes Holz’ (ANetWb. 611)

§5. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. *\*mḡ<sup>n</sup>ē-* “Tempusst. von W. men- ‘sinnen’: 3sg. gr. ἐμάνη got. *munaiþ* aus *\*munē[i]iði*, lit. *mìnē* aksl. *mīnē* neben 1. Sg. *mīnēchū* (II S. 960)” and (Grundr<sup>2</sup> 1:415) “Go. *munan* ags. *munan* aisl. *muna* ‘gedenken’ zu Ind. *man* von W. *men-*: lett. *uš-minu* ‘ich errate’; vgl. got. *munaiþ* § 432, *munjau* § 446”. Against Neogr. *\*ḡ<sup>n</sup>*, the comparative method implies several confirmed root variants:

(a) PIE *√maḡn-* ‘rasen, toben, wüten; Zorn’ is attested with a quantitative ablaut, confirming the laryngeal within the root:

PIE *\*meaḡn-*

Gr. μάνη-	(ps.ao.) ‘rasen, toben, wüten’ (GEW 2:160)
RV. <i>maná-</i>	(f.) ‘Eifersucht, Zorn’ (WbRV. 996)

PIE *\*mēahn-*

Gr. μέμην-	(pf.) ‘rasen, toben, wüten’ (GEW 2:160, μέμηνα)
Do. μᾶνι-	(f.) ‘gerechter, heiliger Zorn’ (GEW 2:229, μᾶνις)
Li. <i>at mōny-</i>	(vb.) ‘rächen, ahnden’ (LiEtWb. 455, <i>atmōnyti</i> [inf.])

In order to account for the bases, PIE *\*mēahn-* instead of Neogr. *\*mḡ<sup>n</sup>V-* is required.

(b) PIE *\*min-* ‘denken, meinen, usw.’ (ablaut PIE *\*mein* *\*moin-*, P. 714)

AVP. <i>men-</i>	(pf.) ‘denken’ (EWA 2:305, <i>mené</i> )
Li. <i>miñ-</i>	(vb.) ‘sich erinnern, gedenken’ (LiEtWb. 455, <i>miñti</i> )
TochA. <i>on min-</i>	(sb.) ‘remorse, repentance’ (DTochB. 115, <i>onmimḡ</i> )
TochB. <i>on min-</i>	(sb.) ‘remorse, repentance’ (DTochB. 115, <i>onmimḡ</i> )
OIr. <i>mīan-</i>	(n.) ‘désir, objet de désir’ (LEIA M-47)
OCS. <i>měni-</i>	(vb.) ‘meinen, glauben, gedenken’ (Sadnik $\sqrt{506}$ )
Li. <i>mintì-</i>	(4.) ‘Gedanke, Einfall, Idee’ (LiEtWb. 455)

(c) PIE *\*mun-* ‘denken, usw.’, an extension with PIE *\*u*, is confirmed by three branches:

Go. <i>muna-</i>	(vb.) ‘meinen, glauben, wollen’ (GoEtD. 260-1)
RV. <i>múni-</i>	(m.) ‘ein Begeisterter, Verzückter’ (WbRV. 1050)
RV. <i>máuneya-</i>	(n.) ‘Verzückung’ (WbRV. 1065)
OstLi. <i>muntu-</i>	(a.) ‘verständlich, geschickt, tauglich’ (LiEtWb. 409)

<sup>591</sup> See Güntert (1916:68): “In lit. dial. *tenvas* ‘schlank’, lett. *tēws* dass. haben wir doch auch Normalstufe; aber wenn diese Wörter selbst nicht vorhanden wären, so läßt sich gar nichts bestreiten, daß *tenuis* Vollstufe erhalten kann.” In this connection, also note that PIE *\*teḡanu-* is equally possible.

OstLi. munu- (a.) ‘verständlich, geschickt, tauglich’ (LiEtWb. 409)

§6. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. \*ṽ<sup>n</sup>- ‘un-’ for “ai. an-udrá-s gr. ἄν-υδρο-ς ‘wasserlos’”. In addition, Brugmann (Grundr<sup>2</sup> 1:415) compared the items to the well-known Germanic negation prefix PGerm. \*un- (before a vowel) in “Go. un-aiwisks ‘schandlos’ ahd. un-armaherz ‘unbarmherzig’ : ai. an- etc., s. § 432”. The comparative method implies, however, two identities:

(a) PIE \*ḥaen- ‘un-, ohne, -los’, an extension of the well-known negative prefix, is confirmed by the common Indo-European /a/ in:

Gr. ἄν υδρο-	(a.) ‘wasserlos’ (GEW 1:1)
OInd. an ·udrá-	(a.) ‘wasserlos’ (GEW 1:1)
Arm. an ·kin-	(a.) ‘ohne Weib’ (sb.) ‘Witwer’ (Grundr <sup>2</sup> 1:403)
Osc. an ·takri-	(a.) ‘integris’ (WH 1:686, Osc. an ·takres)
OIr. an ·fis-	(pref.) ‘ignorance’ (LEIA A-69)

The prefix PIE \*ḥaen- is an extension of PIE \*ḥae- ‘not’, which was already reconstructed above.

(b) PIE \*un- ‘nicht, un-, ohne, -los’, best known as the Germanic negation prefix, is now implied by Tocharian to contain a genuine PIE \*u:<sup>592</sup>

Go. un ·airkn-	(a.) ‘unheilig, gottlos : ἀνόσιος’ (GoEtD. 18)
Go. un ·aiwisk-	(a.) ‘ohne Schande : ἀνεπαύχυντος’ (GoEtD. 21)
TochB. on ·mim-	(sb.) ‘remorse, repentance’ (DTochB. 115)
TochA. on ·mim-	(m.) ‘paenitentia’ (Poucha 46)
TochB. on ·mišše-	(a.) ‘prtng to remorse’ (DTochB. 115)
TochB. on ·missu-	(a.) ‘remorseful’ (DTochB. 115)

Though the negation prefix TochB. on(t) ‘un-’ (PIE \*o ·un-) appears mostly with labials,<sup>593</sup> the distribution may be accidental, because the \*o-grade of the root is also preserved in:

(c) PIE \*uon- ‘ohne, usw.’

Ḥi. uan ·umia-	(a.) ‘kinder-, elternlos, alleinstehend’ (HHand. 194) <sup>594</sup>
Pal. uan ·danguar-	(n.) ‘ohne Dunkel’ (HHand. 194) <sup>595</sup>
OIcl. van ·	(pref.) ‘voran etwas zu fehlt, zu wenig’ (ANEtWb. 643)
Go. wan-	(n.) ‘Mangel’ (GoEtD. 394, Go. wan [sgN])

<sup>592</sup> The Tocharian forms require PIE \*o ·un- ‘no, -less, etc.’ with a vocalic prefix.

<sup>593</sup> Cf. TochB. ont-soyte (a.) ‘insatiable, unsatisfied’ (DTochB. 116), TochB. on ·krocce- (a.) ‘immortal’ (DTochB. 113-4), TochB. on ·wañne (a.) ‘immortal’ (DTochB. 114-5) and TochB. on ·kipše- (a.) ‘shameless’ (DTochB. 112).

<sup>594</sup> The compound Ḥi. uan ·umia- is connected to Ḥi. umiant- (pt.) (Attr. von ‘Vogel’, etwas ‘klein’ ?; see HHand. 185), semantically paralleled in Lat. pullus (WH 2:385-6) ‘jung; Tierjunges; Küchlein; junger Trieb; Hahn’ and Lat. pusillus (WH 2:386) ‘etwas klein’.

<sup>595</sup> The second half of the Palaic word is an extension of the well-known adjective Ḥi. tankua- (a.) ‘schwarz, dunkel’ (HEG 3:107-111, ta-an-ku-uq-aš [sgN]).

§7. Brugmann (Grundr<sup>2</sup> 1:405) reconstructed “Gr. *ἀνύω* hom. *ἄνυμι* ‘ich komme zum Ziel’ : ai. *sanó-ti* ‘er gewinnt’, uridg. \**sṇ*-neu-, \**sṇ*-nu-, W. *sen-* (II S. 1007)”. Instead of a single root with the syllabic nasal Neogr. \**ṇ*<sup>n</sup>, several roots are implied by the comparative method:

(a) PIE \**seah₂-*, an \*e-grade root without nasal, is verified by the exact match of the Old Anatolian laryngeal and the Rig-Vedic hiatus in:

H <sub>i</sub> . <i>šah₂-</i>	(vb1.) ‘erstreben, verlangen’ (HEG 2:818, <i>ša-aḥ₂-ḥu-un</i> )
RV. <i>kṣetra śá-</i>	(a.) ‘Land gewinnend, Acker verleihend’ (WbRV. 370)
RV. <i>sasa-</i>	(pf.) ‘erlangen, erbeuten, gewinnen’ (WbRV. 1467) <sup>596</sup>

(b) PIE \**saḥn-* (ablaut PIE \**soaḥn-* \**seaḥn-*), the nasal extension of the previous root, is attested in:

RV. <i>śasán-</i>	(pf.) ‘erlangen’ (WbRV. 1466, <i>śasána</i> [3sg])
Att. <i>ἀνύ-</i>	(pr.) ‘zustande bringen, vollenden’ (GEW 1:11)
RV. <i>sanó-</i>	(vb.) ‘erlangen, erbeuten, gewinnen’ (WbRV. 1465)

Instead of Neogr. \**sṇ*<sup>n</sup>-, the root PIE \**saḥ*·n- is attested.

### 3.4.5 Neogr. \**ṇ* (long syllabic dental)

§0. The long syllabic nasal Neogr. \**ṇ* was characterized by Brugmann (Grundr<sup>2</sup> 1:417) as a cluster of two phonemes:

“In den meisten Beispielen, wo man lange Nasalis sonans ansetzt, erscheint diese als Ablaut (Schwundstufe) zu einer Gruppe kurzer Vocal + conson. Nasal + ə, z. B. \**gṇtós* ‘genitus’ = ai. *jātá-s* neben ai. *jani-tar* [...]”

Brugmann’s analysis of Neogr. \**ṇ* ≡ \*\*n+ə was shared by Saussure, who posited Neogr. \**ṇ* ≡ \**ṇ*+A (Mém. 250), now LT \**ṇ*+H in the laryngeal theory.

§1. The basic assumptions of the Neogrammarian reconstruction are as follows:

(a) The *seṭ*-forms (RV. *sani-*) are to be interpreted as representing Neogr. \**Cenə-* (= LT \**CenH*).

(b) The zero-grade Neogr. \**Cṇə* of the full-grade Neogr. \**Cenə-* is derived as described by Burrow (1949:36):

“The long sonant nasals are replaced by *ṇH* and *ṃH* [...] Since *ṇ* becomes a in Sanskrit, a \**sṇHtós*- develops first into \**saHtá-*, and then H disappears with the usual lengthening of the preceding vowel.”

According to Brugmann (Grundr<sup>2</sup> 1:417ff.),<sup>597</sup> the subsequent developments of Neogr. \**ṇ*(C) can be summarized as follows:

<sup>596</sup> Brugmann’s view (Grundr<sup>2</sup> 1:401-2), according to which “[n]icht lautgesetzlich sind ai. *sasa-vás* Part. von *san-* ‘gewinnen’ [...]”, is outdated due to Old Anatolian and the Vedic hiatus confirming PIE \**seah₂-* without a nasal.

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
*ñ vor C	ā	an	αν να ?		an, na	an	un	in	in

In particular, Neogr. \*ñ is assumed to yield IIr. ā (i.e. the theory accounts for the Indo-Iranian vṛddhi by means of the long syllabic nasal).<sup>598</sup>

§2. The main reconstructive problems of this theory, already discussed above, are the following:

(a) The svarabhakti vowels attached to Neogr. \*ñ do not emerge from the postulate. This is now seen from the examples of \*CnḥC- where PIE \*ḥ is to be reconstructed, but yet the nasal results in a consonant throughout.

(b) The svarabhakti vowels associated with Neogr. \*ñ by Brugmann (RV. ā, Do. vā, etc.) are confirmed by external parallels, and therefore they are genuine.

The validity of these statements can be shown by the examination of Brugmann's examples of Neogr. \*ñ.

§3. Brugmann (Grundr<sup>2</sup> 1:504) reconstructed “[ai.] go-ṣá-s ‘Rinder gewinnend’ (aus \*sñ-s, vgl. Gen. gō-ṣaṇas), u.a.” In the extended material, both bases are externally paralleled and confirm that the root had no long syllabic nasal:

(a) PIE √saḥ- ‘erlangen, erbeuten, usw.’, the unextended root with the ‘Wackernagel ablaut’ PIE \*saḥ- \*seah- \*sēah-, is attested in varying extensions:

PIE √saḥ-

Ḫi. šaḥ-	(vb.) ‘verlangen, etc.’ (HEG 2:820, ša-aḥ-ḥu-un [1sg])
RV. paśu ṣ-	(a.) ‘Vieh schenkend’ (WbRV. 796, paśuṣás [sgG]) <sup>599</sup>
RV. kṣetra ṣá-	(a.) ‘Land gewinnend’ (WbRV. 370, kṣetrasáam [sgA])
RV. go ṣá-	(a.) ‘Rinder gewinnend/verleihend’ (WbRV. 414) <sup>600</sup>

PIE √saḥi-

Ved. sáy-	(ao.) ‘erlangen’ (Burrow 1979:24, set [3sg])
OInd. sāya-	(prM.) ‘erlangen, erbeuten’ (Lex. sāyate [3sg])
RV. śata ṣéya-	(n.) ‘das Erlangen hundertfachen Gutes’ (WbRV. 1375)
Ḫi. šaḥiški-	(vb.iter.) ‘suchen, verlangen’ (HHand. 142)
Arm. haiḥe-	(vb.) ‘suchen, verlangen, bitten’ (ArmGr. 418) <sup>601</sup>

PIE √saḥn-

<sup>597</sup> Note that I have compiled this table because Brugmann was never able to present a coherent summary of his views concerning the development(s) of Neogr. \*ñ.

<sup>598</sup> See Burrow (1979:25): “[...] the [long] sonant nasals, producing forms of the type khātá-, jātá-, dāntá-, etc. [...]”

<sup>599</sup> The short root is paralleled by gAv. fšu ṣ- (a.) ‘der Vieh in seinen Besitz bringt’ (AIWb. 1030, fšuṣ [sgG]).

<sup>600</sup> The full quantitative ablaut of PIE √saḥ- (Ḫi. šaḥ-) is reflected in RV. √s- (PIE \*saḥ-) : RV. √sa'- (PIE \*seah-) : RV. √sā- (PIE \*sēah-). Naturally some forms may contain PIE \*o \*ō, but the details remain ambiguous owing to the Indo-Iranian merger.

<sup>601</sup> Note that Hittite and Armenian define PIE \*aḥ, not PIE \*ḥa.



RV. sasán-	(pf.) ‘erlangen’ (WbRV. 1466, sasána [3sg])
RV. sanó-	(vb.) ‘erlangen, erbeuten, gewinnen’ (WbRV. 1465)
Att. ávú-	(pr.) ‘zustande bringen, vollenden’ (GEW 1:115)
Att. ávúω	(pr.) ‘zustande bringen, vollenden’ (GEW 1:115)

PIE √saht- (if with PIE \*saḥēt-, not PIE \*sēt-)

RV. sātá-	(pt.) ‘gewonnen’ (KEWA 3:428)
RV. gó·ṣāti-	(f.) ‘Erlangung von Rindern’ (WbRV. 414)
OCS. po·sěti-	(vb.) ‘heim-, besuchen, sehen nach’ (Sadnik √800)
OCS. pri·sěti-	(vb.) ‘besuchen’ (Sadnik √800, prisětiti [inf.])
RV. sātu-	(m.) ‘der empfangende Mutterleib’ (WbRV. 1508)
OCS. po·sětova-	(vb.) ‘besuchen, freien’ (Sadnik √800) <sup>602</sup>

(b) PIE √sen- √son-, a nasal alternative to the laryngeal extension PIE √saḥ-, is confirmed by Old Anatolian, where both unextended and extended forms appear:

PIE √sono-

HLu. sana-	(vb.) ‘to seek’ (CHLu. p. 629, (“*69”)sa-na-tu)
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PIE √sonaḥ-

Ḫi. šanaḥ-	(pr.) ‘(ver)suchen’ (HEG 2:818f., ša-an-aḥ-mi)
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PIE √sonaḥi-

OIr. con·snī-	(vb.) ‘streben’ (VGK 2:633ff.)
CLu. šanḥiški-	(iter.) ‘suchen’ (DLL. 85, ša-an-ḥe-eš-ki-mi [1sg]) <sup>603</sup>

The new evidence implies a monoliteral root PIE \*s- ‘suchen, (ver)langen’ in extensions PIE \*seah- and PIE \*sen-, not long syllabic nasal.

§4. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed \*ḡñ- ‘gignere’ for “ai. jātá- ‘geboren’, lat. gnātu-s nātu-s, gall. Cintu-gnātu-s ‘Erstgeborener’, vgl. ai. jani-tár- ‘genitor’”.

Two roots with alternative extensions are implied by the comparative method:

(a) PIE √ḡeḥa-, √ḡoḥa- ‘gebären, usw.’

PIE \*ḡeḥa-, \*ḡoḥa- (cf. Ḫi. √šaḥ- = RV. sá’-)

LAv. fra·za-	(c.) ‘Nachkommenschaft, Kinder’ (AIWb. 1004)
RV. pūrva·já-	(a.) ‘in der Vorzeit geboren, uralt’ (WbRV. 846)
Hes. βα·γó-	(m.) ‘βασιλεύς, στρατηγός’ (LSJ. 300, βαγός [sgN]) <sup>604</sup>

PIE \*ḡeḥai-, \*ḡoḥai- (cf. Ḫi. √šaḥi- = Arm. hay-)

<sup>602</sup> The identity OCS. ě ≡ RV. ā implies that the often quoted prototype with nasal (Neogr. †sṇti- : LT †sṇHti-) existed only on paper.

<sup>603</sup> For yet another extension, compare the PIE \*senuo- in OHG. sinna- (vb.) ‘streben nach’ (for the verb and the etymology, see Eichman 1973).

<sup>604</sup> For the unextended root PIE √ḡeḥa- coinciding with RV. já-, LAv. za-, see also OSerb. dvi·z (a.) ‘zweijährig’ (P. 230).

TochB. apāk-śai-	(adv.) ‘with genitals exposed’ (DTochB. 16)
LAv. zaya-	(prM.) ‘geboren werden’ (AIWb 1658-9)
OInd. jaya-	(pr.) ‘to be born’ (MonWil. 410, jayate [3sg])
RV. jāyá-	(f.) ‘Eheweib, Gattin’ (WbRV. 485) <sup>605</sup>

PIE \*ǵeh₂aēk- ‘gebären’

Pind. γε γάκ-	(pf.) ‘geboren werden’ (LSJ 349, γεγάκειν [inf.]) <sup>606</sup>
Serb. dvī-zāk	(m.) ‘zweijähriger Widder’ (P. 230)

PIE \*ǵeh₂an-, \*ǵoh₂an- ‘gebären’ (cf. RV. √san- : Gr. √áv-)

Gr. γέν-	(ao.) ‘werden’ (GEW 1:306-8, ἔγεντο [3sg])
Gr. γέγον-	(pf.) ‘werden’ (GEW 1:306-8, γέγονε [3sg])
Gr. πελι γάβ-	(m.) πελιγᾶνες · οἱ ἔνδοξοι, βουλευταί (GEW 2:498) <sup>607</sup>

PIE \*ǵeh₂at-, \*ǵoh₂at- (cf. OCS. √sēt- RV. √sāt-)

Lat. indi-ge-	(a.) ‘einheimisch, eingeboren’ (WH 1:693, indiges)
Gr. τηλύ-γετο-	(a.) ‘spät-geboren’ (GEW 2:893)
LAv. zāta-	(a.) ‘geboren’ (AIWb. 1689; PIE *ē/ō is also possible!)

(b) PIE √ǵnaḥ- ‘gebären’ (cf. Hi. śanaḥ-, śanḥ-) is confirmed by the following vocalizations:

PIE \*ǵnaḥV-

Gr. γίγνο-	(pr.) ‘(geboren) werden, entstehen’ (GEW 1:306)
Gr. νε(Ϝ)ο γνό-	(a.) ‘neugeboren’ (GEW 1:307)
Lat. gigno-	(pr3.) ‘erzeugen, hervorbringen’ (WH 1:597-600)

PIE \*ǵnaḥi-

TochB. kne-	(vb.) ‘fullfill (a wish)’ (DTochB. 160, knetär [3sg])
RV. jajñi-	(pfM.) ‘geboren werden’ (WbRV. 468, jajñiṣe [2sg])
Gr. hoμó γνιο-	(a.) ‘von gleicher Abstammung’ (GEW 1:307)

PIE \*ǵneah₂C-, \*ǵnēah₂C-

Lat. prae-ǵnāt-	(a.) ‘schwanger, trüchtig’ (WH 2:354)
OLat. ǵnāto-	(pret.pt.a.) ‘geboren, alt’ (m.) ‘Sohn’ (WH 1:598)
OGaul. ǵnato-	(m.) ‘gnatus filius lingua Gallica’ (ACSS. 1:2029)

PIE \*ǵnaḥēC-

<sup>605</sup> Owing to the external confirmation of the \*i-extension, Brugmann’s (Grundr<sup>2</sup> 1:420) analogy (“im Ind. wurde nach jāta- das Präs. jāya-ti für \*jānya-te gebildet, wohl auch pūrva-jāvan- ‘in der Vorzeit geboren’ statt \*-jānvan-”) is unmotivated.

<sup>606</sup> Brugmann’s (1900<sup>3</sup>:327-8) analogy (“[n]ach ἔστακα : ἔσταμεν schuf man γεγάκειν (Pind.) neben γέγαμεν, wie umgekehrt nach demselben Vorbild ἠρόσταμεν (Komiker) neben ἠρόστηκα (ἀριστιάω) getreten ist”) is not necessary.

<sup>607</sup> By reconstructing PIE \*ǵeh₂an- (Gr. γέν-), PIE \*ǵoh₂an- (Gr. γον-) and PIE \*ǵēh₂aēn- (Gr. γάβ-), the surface vocalisms are regularly obtained.

Gr. $\kappa\alpha\sigma\acute{\iota}\gamma\nu\eta\tau\omicron-$	(m.) ‘Bruder’ (Schwyzer GrGr. 1:360, GEW 1:307)
Gr. $\delta\iota(\varepsilon)\acute{\omicron}\gamma\nu\eta\tau\omicron-$	(PNm.) ‘Diogenes’ (LSJ. 432)

The root Neogr. \* $\acute{g}en-$  \* $\acute{g}n\acute{o}-$  represents two distinct items PIE \* $\acute{g}eha(n)-$  and PIE \* $\acute{g}nah-$  ‘gebären’, structurally resembling PIE \* $seh-$ , \* $senah-$  ‘suchen’.

§5. Brugmann (Grundr<sup>2</sup> 1:405) reconstructed Neogr. \* $\acute{g}\eta\eta\text{-m-}$  ( $\sqrt{\acute{g}en-}$ ) for “Gr.  $\gamma\alpha\mu\beta\omicron\acute{\omicron}$  ‘Tochtermann, Schwestermann, Bräutigam’ : vgl. ai.  $jámātar-$  av.  $zāmātar-$  ‘Tochtermann’ [...]”. Only one base without Neogr. \* $\eta$  is attested, however:

PIE \* $\acute{g}\acute{e}\eta\acute{a}\acute{e}\text{-}$  ‘Tochtermann’ (P. 369-370)

Gr. $\gamma\alpha\mu\beta\omicron\acute{\omicron}$	(m.) ‘Schwiegersohn, Eidam, usw.’ (GEW 1:287) <sup>608</sup>
LAv. $zāma\ \acute{o}ya-$	(a.) ‘Bruder des Schwiegersohns’ (AIWb. 1689)
RV. $jāmí-$	(c.) ‘Schwester, Bruder’ (WbRV. 484, $jāmí\ [sgN]$ )
LAv. $hu\ zāmi-$	(m.) ‘gute, leichte Geburt’ (AIWb 1839)
LAv. $zāmātar-$	(m.) ‘Eidam, Schwiegersohn’ (AIWb. 1689)

The extension PIE \* $\acute{g}\acute{e}\eta\acute{a}\acute{e}\text{-m-}$  belongs to the previous root and has been built in a similar fashion as PIE \* $\acute{g}\acute{e}\eta\acute{a}\acute{e}\text{-k-}$  (Gr.  $\sqrt{\acute{g}\alpha\kappa-}$ ) and PIE \* $\acute{g}\acute{e}\eta\acute{a}\acute{e}\text{-n-}$  (Gr.  $\sqrt{\acute{g}\alpha\nu-}$ ), discussed above.

§6. Brugmann (Grundr<sup>2</sup> 1:419-20) reconstructed Neogr. \* $\acute{g}\eta\eta\text{-}$  ‘kennen’ for “ai.  $jāná\text{-ti}$  ‘er kennt, weiss’ (av.  $zānata$  [2pl]), lat.  $gnāru\text{-s}$ , lit.  $pa\text{-}žinti$  ‘kennen’; vielleicht auch arm.  $caneay$  ‘ich kannte’ an-can ‘unbekannt’ auf Grund von \* $\acute{g}\eta\eta\text{-n-}$ ”. Based on the extended material, the comparative method implies the variants:

(a) PIE \* $\acute{g}ehaen-$  \* $\acute{g}ehaon-$  ‘erkennen, wahrnehmen, usw.’

RV. $jān-$	(aoM.) ‘[A] erkennen, wahrnehmen’ (WbRV. 501)
Gr. $\gamma\acute{\epsilon}\gamma\omega\nu-$	(pf.) ‘verkünden’ (GEW 1:293, $\gamma\acute{\epsilon}\gamma\omega\nu\alpha$ [1sg])
Arm. $can\text{-}u\acute{c}\text{-}eal-$	(a.) ‘erkannt habend’ (ArmGr1:455)

(b) PIE \* $\acute{g}\eta\eta\text{-}$  \* $\acute{g}\eta\eta\text{-n-}$ , the schwebeablaut variant of the above root with media aspirata, is attested in:

OLat. $hon\acute{o}\text{-s-}$	(m.) ‘Anerkennung, Auszeichnung’ (WH 1:655-6)
Hĩ. $ganeš-$	(vb1.) ‘anerkennen’ (HEG 1:478-80, $ga\text{-}ne\text{-}eš\text{-}zi$ [3sg])
Lat. $hones\ \acute{t}o-$	(pf.pt.) ‘anerkennenswert’ (Machek III (1959):78)
Pael. $hanus\ \acute{t}o-$	(pt.) ‘honesta’ (WH 1:665-6, $hanustu$ )
Hĩ. $ganuš\ \acute{t}a-$	( <sup>m</sup> c.) ‘Honestus (?)’ (NOMS. 508, $ga\text{-}nu\text{-}uš\text{-}ta$ [abs.])

(c) PIE \* $\acute{g}ehai-$  \* $\acute{g}\eta\eta\text{-}$  ‘kennen’ is attested in:

LAv. $zaya-$	(vb.) ‘kennen’ (AIWb. 1659, $zayāt$ [sb3sg])
Latv. $zin-$	(vb.) ‘kennen, wissen’ (LiEtWb. 1310, $zinu$ [1sg])
Li. $pa\ \acute{z}in-$	(vb.) ‘(er)kennen, bekannt sein’ (LiEtWb. 1319, $pažinti$ )

<sup>608</sup> For the difference of quantity between Gr.  $\gamma\alpha\mu-$  and Av.  $zām-$ , see Osthoff’s Law.

§7. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed Neogr. \*ḡtā for “Ai. átā- ‘Umfassung, Rahmen einer Thür’, arm. dr-and ‘Thürpfosten, Thürschwelle’, lat. anta ‘viereckiger Thürpfeiler, Pilaster’”. As for the reconstruction, note the following:

(a) Already Grassmann analyzed RV. átā- correctly as a compound:

RV. á-tā- (f.) ‘die Umfassung, die Rahmen’ (WbRV. 175).

The item consists of the prefix RV. á- ‘um-’ followed by the root PIE \*t- ‘stretch’ and the feminine suffix Neogr. \*ā (= PIE \*ēah). Directly from this has been built

(b) PIE \*hean-, the extended form of the prefix RV. á- ‘um’:

Lat. am plo-	(a.) ‘umfangreich, ausgedehnt, weit’ (WH 1:42)
Lat. an tā-	(f.) ‘viereckiger Thürpfeiler, Pilaster’ (WH 1:52)
Gr. ἀμ φορεύ-	(m.) ‘zweihenkeliger konischer Krug’ (GEW 1:99) <sup>609</sup>
Arm. dr an d	(sb.) ‘Thürpfosten, Thürschwelle’ (ArmGr. 419)

No long syllabic nasal is needed for the alternation of prefixes.

§8. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed Neogr. \*ḡti- for “ai. ātī-š ‘ein Wasservogel’, gr. νῆσσα (urgr. ā) ‘Ente’, vgl. lat. anas Acc. anitem und anatem (§ 244, 1 S. 221), ahd. anut ‘Ente’ und lit. anti-s aksl. oty ‘Ente’ (§ 210 Anm. S. 178)”. The overall matching meaning does not confirm the morphological identity of the forms, because three roots, correctly separated by Walde and Pokorny, are externally confirmed:

(a) PIE \*ḡat- ‘liquid, water, water-animal’ (P. 70) is attested, for instance, in:

Lat. at tilo-	(m.) ‘ein störrischer großer Fisch im Po’ (WH1:78)
Li. ōta-	(m.) ‘gemeine Scholle, Steinbutte’ (LiEtWb. 518, ōtas)
Li. atī-	(.) ‘Steinbutte’ (LiEtWb. 21, atīs [sgN])
Oss. acc	(sb.) ‘Wildante’ (EWA 1:163)
RV. ātī-	(f.) ‘ein Wasservogel’ (WbRV. 175, ātāyas [pl])
OIcl. æð-	(f.) ‘Eidergans’ (ANetWb. 681, æðr [sgN])

(b) PIE √naḡ- ‘water’ appears in various extensions:

PIE \*nēahk<sup>h</sup>·ieah- (or PIE \*nahk<sup>h</sup>·ieah- ?)

Boiot. νάσσα	(f.) ‘Ente’ (GEW 1:317)
Att. νῆττα	(f.) ‘Ente’ (GEW 1:317)

PIE \*ne/oaht- ‘Wasser; Nässe, naß’

Gr. νοτό-	(m.) ‘Südwestwind, der Nässe bringt’ (GEW 2:324)
Arm. nay	(a.) ‘naß, flüssig’ (GEW 2:324, PArm. *nati-)

PIE \*naḡu- ‘ship, boat, water’ (P. 755-756)

OIcl. nō-	(m.) ‘Schiff’ (ANetWb. 411)
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<sup>609</sup> Gr. ἀμ φορεύ- cannot be a haplology due to the simultaneous preservation of Gr. ἀμφι φορεύ- (m.) ‘zweihenkeliger konischer Krug’ (GEW 1:99). Accordingly, the difference must reflect two different prefixes, Gr. ἀμ- and Gr. ἀμφι-.

OIcl. *nō-trog-* (.) ‘Wasserkübel’ (ANEtWb. 411).

(c) PIE *\*h<sub>2</sub>an-* ‘wasser, liquid’. The initial laryngeal is attested in Old Anatolian, coinciding with the Indo-European /a/ in:

Hi. <i>han-</i>	(vb.) ‘schöpfen’ (HEG 1:144-5, <i>ha-an-tén</i> [2pl])
Lat. <i>anat-</i>	(f.) ‘Ente : duck’ (WH 1:44, <i>anas, anatis</i> [G])
Gr. <i>δι·αντό-</i>	(a.) ‘capable of being wetted’ (LSJ. 405)
Li. <i>ánti-</i>	(.) ‘Ente : duck’ (LiEtWb. 11-12, <i>ántis</i> [sgN])
Gr. <i>ἄντλο-</i>	(m.) ‘Schiffsbodenwasser, Kielwasser’ (GEW 1:114)

Thus, Brugmann’s underlying Neogr. *\*ñ* stands for PIE *\*h<sub>2</sub>an-*, PIE *\*h<sub>2</sub>at-* and PIE *\*nañ-*.

§9. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed Neogr. “*\*ñ-* ‘un-’ neben *\*ñ-* (431, 2 S. 398): gr. hom. *ἀμ-φαστή* ‘Sprachlosigkeit’, dor. *νά-ποινος* ‘straflos’ hom. *νη-κερδής* ‘gewinnlos’, osk. *an-censto* ‘incensa’”. Here two morphologically distinct roots are confirmed:

(a) PIE *\*h<sub>2</sub>aen-* ‘un-, ohne, -los’, as already reconstructed above, has been preserved by several languages including:

Arm. <i>an·anum-</i>	(a.) ‘namenlos’ (Grundr <sup>2</sup> 1:404)
RV. <i>an·iná-</i>	(a.) ‘un-kräftig’ (WbRV. 56)
gAv. <i>an·aočah-</i>	(a.) ‘unfreundlich’ (AIWb. 114)
Gr. <i>ἄν·αλτο-</i>	(a.) ‘unersättlich’ (GEW 1:102, <i>ἄναλτος</i> )
TochB. <i>an·aikätte-</i>	(a.) ‘unknown’ (DTochB. 13)

(b) PIE *\*n<sub>2</sub>eah<sub>2</sub>-*, the laryngeal extension of PIE *\*ne-* ‘not’, is attested in:

OIr. <i>na</i>	(neg.adv.) ‘no, not’ (DIL. 473)
OIr. <i>nā</i>	(neg.adv.) ‘no, not’ (DIL. 473)
Do. <i>νά·ποινο-</i>	(a.) ‘straflos, ungerächt’ (GEW 2:573, <i>νάποινος</i> [sgN])
Hom. <i>νή·ποινο-</i>	(a.) ‘straflos, ungerächt’ (GEW 2:573)

The extensions PIE *\*h<sub>2</sub>aen-* ‘un’ and PIE *\*n<sub>2</sub>eah<sub>2</sub>-* have been derived from the respective monoliteral roots PIE *\*h<sub>2</sub>a* ‘un’ and PIE *\*n-* ‘un’ (see above).

### 3.4.6 PIE *\*m* (consonantal bilabial)

§0. The consonantal bilabial nasal Neogr. *\*m* (= PIE *\*m*), already included in Schleicher’s reconstruction, has been preserved practically unchanged throughout.

§1. Brugmann’s (Grundr<sup>2</sup> 1:342-4 & 348-) examples of Neogr. *\*m* include, for instance, the items:

(a) Neogr. *\*māter-* ‘Mutter’ (Grundr<sup>2</sup> 1:342): “ai. *mātár-*, Arm. *mair*, gr. *μήτηρ*, alb. *motrë* (‘Schwester’), air. *māthir*, ahd. *muoter*, lit. *motė* ‘Weib, Ehefrau’, aksl. *mati*”.

(b) Neogr. *\*u<sub>2</sub>em-* ‘vomit’ (Grundr<sup>2</sup> 1:342): “ai. *vāmi-ti, vama-ti* ‘vomit’, gr. *έμέω* ‘vomo’, lat. *uomō*, lit. *vemalāi* Pl. ‘Ausgespienes’”.

(c) Neogr. \*g<sup>h</sup>hermo-, g<sup>h</sup>hormo- (Grundr<sup>2</sup> 1:343): “ai. ghar-má-s ‘Glut’, arm. ĵerm gr. θερμός-ζ lat. formu-s ‘warm’”.

§2. PIE \*m was preserved both in Tocharian and in Anatolian, and no special comments are required.

§3. Brugmann suggested<sup>610</sup> an epenthesis of glide and a change in the place of the articulation of the nasal \*m for Greek:

PIE \*m<sub>i</sub> → PGr. \*v<sub>i</sub> → Gr. iv.

Externally, an original PIE \*n now appears in Brugmann’s key examples (like PIE \*kōn- ‘gemeinsam, usw.’):

Gr. κοινό-	(a.) ‘gemeinsam, usw.’ (GEW 1:892-3)
Gr. κοινό-	(n.) ‘Gemeinde, Bund, usw.’ (GEW 1:892-3)
TochB. an ·kān ·mi-	(sb.) ± ‘commonality’ (DTochB. 5-6)

The labial extension PIE \*kōm- is also confirmed in:

Lat. cum	(prepAbl.) ‘mit, zusammen/zugleich mit’ (WH 1:251)
OFrank. ham ēdii	(sb.m.pl.) ‘con-iūrātōrēs’ (P. 613)
TochB. an ·kām ·nicce	(a.) ± ‘shared, common’ (DTochB. 5-6)

In these cases, the difference of nasals is explained by means of the extensions Neogr. \*ko ·m- ≠ \*ko ·n-, both from Neogr. \*ko- (Lat. co-, OIr. co-, etc.). The postulation of a separate sound law for Greek is unnecessary (Occam’s razor).

### 3.4.7 Neogr. \*ṃ (anteconsonantal syllabic bilabial)

§0. Neogr. \*ṃ was assumed to develop svarabhakti vowels in the cognates in the same manner as Neogr. \*ṇ, with the result that the core issues are identical.

§1. According to Brugmann, the svarabhakti vowels associated with Neogr. \*ṃ were

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
ṃ+C	a	am	α	e (i)	em	im	um	im	ę

§2. Because the problems of Neogr. \*ṃ match those of Neogr. \*ṇ, they are not repeated here. The svarabhakti vowels of Brugmann can be proven to be genuine by external comparison, as follows:

§3. Brugmann (Grundr<sup>2</sup> 1:394, 404) reconstructed Neogr. \*ṃḡ- : \*meḡ- for “Gr. ἄγαυ ‘sehr’ : μέγα-ζ ‘gross’”. Frisk’s dissatisfaction<sup>611</sup> is now supported by the comparative confirmation of two distinct roots:

<sup>610</sup> See Brugmann (Grundr<sup>2</sup> 1:358): “-v<sub>i</sub>- aus -m<sub>i</sub>- mag vorliegen in βαίνω ‘ich gehe’ aus \*βαμ-ίω, wo -am- aus -ṃ- entstanden war (§431).” Note that also in this example the assumed change \*μ- → v is redundant, because βαίνω is derived from √βav-, which is also attested in Sanskrit RV. gán- (vbA.) ‘kommen, hingehen’ (WbRV. 381, ganma [1pl]) and secured by TochB. kánmas- (vbM.) ‘to come’ (DTochB. 160, kánmastrā [3sg]).

(a) PIE \*h<sub>2</sub>ǵ- ‘wunder(bar), würdig, kostbar, usw.’ is attested in several extensions:

1. PIE \*h<sub>2</sub>ǵeah-

Gr. ἄγα-	(vb.) ‘sich wundern’ (GEW 1:5, ἄγαμαι [1sg])
Gr. ἄγα κλε(φ)ήσ-	(a.) ‘mit großem Ruhm’ (GEW 1:5)
Gr. ἄγη-	(f.) ‘Verwunderung’ (GEW 1:5)

2. PIE \*h<sub>2</sub>ǵs-

LAv. aš.ama-	(a.) ‘sehr, besonders stark, kräftig’ (AIWb. 241)
Gr. ἄξιτο-	(a.) ‘würdig, wert’ (GEW 1:116, ἄξιτος [sgN])
Lat. axitiōso-	(a.) ‘kostspielig, pühtsüchtig, usw.’ (WH 1:90)

3. PIE \*h<sub>2</sub>ǵeah<sub>2</sub>su-

TochA. kāsu-	(a.) ‘bonus’ (sb.) ‘bonum’ (adv.) ‘bene’ (Poucha 62-3)
Gr. ἀγαυό-	(a.) ‘verehrungswert, edel’ (GEW1:7, ἀγαυός)
TochA. kāswa ṣi-	(a.poss.) ‘bonus’ (Poucha 64)

4. PIE \*h<sub>2</sub>ǵeah<sub>2</sub>dh-

Gr. ἀγαθό-	(a.) ‘gut, tüchtig, trefflich’ (GEW 1:5)
TochA. aśśi	(ptcl.interrog.) ‘sane’? (Poucha 11, aśśi)
TochB. āktike-	(a.indecl.) ‘wonderful’ (DTochB. 37, āktike)

(b) PIE \*meah<sub>2</sub>- \*mahe<sub>2</sub>- ‘groß, usw.’ (or PIE \*me<sub>2</sub>ǵ-?)

OIr. do-for mag-	(vb.) ‘augere : vermehren’ (WH 2:10)
Lat. mage	(adv.) ‘mehr, eher, vielmehr’ (WH 2:10)
Alb. madi-	(a.) ‘groß’ (WH 2:10)
RV. majmán-	(m.) ‘Grösse, Macht, Herrlichkeit’ (WbRV. 973)
Gr. μέγα-	(a.) ‘groß’ (GEW 2:189-90)
Arm. mec-	(a.) ‘groß’ (GEW 2:190)
Go. mikil-	(a.) ‘groß : μέγας, πολύς’ (GoEtD. 254)

§4. Brugmann (Grundr<sup>2</sup> 1:400) reconstructed Neogr. \*g<sup>h</sup>m̥- for “ai. gahí gthav. gaidī 2. Sg. Imper. von W. g<sup>h</sup>em- ‘kommen’, vgl. §431”. Furthermore, he assumed Neogr. \*g<sup>h</sup>m̥-jo- (Grundr<sup>2</sup> 1:407) for “Lat. ueniō [...] osk. kúm-benneís Gen. ‘conventus’ [...] : gr. βαίνω ‘ich gehe’ ai. gamya-m ‘Ort, wohin man gehen soll’”, Neogr. \*g<sup>h</sup>m̥-ske-ti for “βάσχε Imper. ‘geh’ : ai. gáccha-ti ‘er geht’ [...]” (Grundr<sup>2</sup> 1:404) and Neogr. \*g<sup>h</sup>m̥ti- for “OInd. gáti-ṣ Gr. βási-ς Got. ga-qumþs Lat. in-uentiō” (Grundr<sup>2</sup> 1:394, 397-8). Instead of a single root Neogr. \*g<sup>h</sup>m̥-, several morphologically distinct extensions are implied by the comparative method:

(a) PIE \*g<sup>h</sup>eah<sub>2</sub>- is confirmed by the Rig-Vedic hiatus accompanied by Greek ‘a-vocalism’ in:

RV. ga’a-	(pr.) ‘einen Weg [A,I] gehen’ (WbRV. 392, ga’at [3sg])
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<sup>611</sup> See Frisk (GEW 1:5): “Gewöhnlich wird ἄγα mit μέγα verbunden; die dabei vorauszusetzende Grundform idg \*m̥ǵ(a)- ist wenig erfreulich.”

Gr. βά-	(vb.) ‘walk, step, etc.’ (LSJ. 302, βάρην [3du], Gr. ā)
gAv. ga-	(vb.) ‘kommen’ (AIWb. 494, ga’dī [2sg])
RV. á (...) ga-	(vb.) ‘kommen zu [A]’ (WbRV. 380, gathá) <sup>612</sup>

(b) PIE \*g<sup>u</sup>eahm-, the \* m-extension of the previous root, is attested in:

RV. gam-	(√pr.) ‘kommen, hingehen’ (WbRV. 380, gamiās)
gAv. aibī.gəṃ-	(pr.) ‘hin/herzukommen’ (AIWb. 496, aibī.gəṃan [3pl])
TochB. kamä-	(pretA.) ‘to come’ (DTochB. 161, kamem [3pl])
RV. gāma-	(a.ao.) ‘kommen, hingehen’ (WbRV. 385, gāmadhyai)

(c) PIE \*g<sup>u</sup>aḥm-, the zero grade of the previous example with PIE \*g<sub>u</sub>+á → g<sub>u</sub>+ú in Go. √qum-, is attested in:

TochA. kumnä-	(prA.) ‘venire’ (Poucha 67, kumnäš [3sg])
TochA. kumsa-	(prA.) ‘venire’ (Poucha 67, kumsam [3sg])
Go. ga ·qumþ-	(m.) ‘Zusammenkunft’ (GoEtD. 147, gaqumþs)

(d) PIE \*g<sup>u</sup>eahn-, \*g<sup>u</sup>oahn-, the parallel \*n-extension, is also confirmed by several subgroups:

RV. gán-	(vbA.) ‘kommen, hingehen’ (WbRV. 381, ganma [1pl])
RV. gáni ·gmat-	(int.pt.) ‘kommend’ (WbRV. 385, gánigmatam)
Gr. βαίνω	(pr.) ‘gehen’ (GEW 1:208, βαίνω)
TochB. kánmas-	(vbM.) ‘to come’ (DTochB. 160, kánmastrā [3sg]) <sup>613</sup>
RV. jaganváns-	(pf.pt.) ‘gehend’ (WbRV. 384)

(e) PIE \*g<sup>u</sup>aḥen-, \*g<sup>u</sup>aḥēn-, the schwebeablaut variant with PIE \*e/ē, is documented in:

Lat. uēn-	(pf.) ‘kommen’ (WH 2:747f., uēnī [1sg])
LAv. fra ·ptərə jān-	(a.) ‘im Flug sich bewegend, Vogel’ (AIWb. 984)
Lat. uenī-	(pr4.) ‘kommen’ (WH 2:747f., uenīre [inf.])
TochB. śanmä-	(prA.) ‘come’ (DTochB. 161, śanmäṃ [3sg])
Umbr. benus-	(2.fut.) ‘kommen’ (WbOU. 143-4, benus)

(f) PIE \*g<sup>u</sup>eahski- ‘gehen’ without a nasal has a common Indo-European /a/ in three subgroups:

Gr. βάσχω	(pr.) ‘gehen’ (GEW 1:208, βάσχω [1sg])
RV. gácha-	(prA.) ‘kommen, gehen’ (WbRV. 382, gáchatī [3sg])
Alb. n ·gah-	(pr.) ‘run’ (AlbEtD. 292) <sup>614</sup>

(g) PIE \*g<sup>u</sup>eaḥti- ‘Gang’, an extension without a nasal, is confirmed by four witnesses:

<sup>612</sup> Note the zero grade in RV. g- (ao.) ‘gehen, kommen, wandern’ (WbRV. 392, gus [3pl]) and the lengthened grade in Li. gó- (vb.) ‘gehen’ (LiEtWb. 161, góti [inf.]).

<sup>613</sup> Now that Tocharian as well agrees with Vedic and Greek, Brugmann’s (Grundr<sup>2</sup> 1:358n1) view can be seen as outdated: “Ein uridg. g<sup>u</sup>en- neben g<sup>u</sup>em- anzusetzen, sehe ich keinen ausreichenden Grund.”

<sup>614</sup> Note that the suggested developments have changed. According to Orel (2000:42), PIE \*ṃ ṇ → Alb. a instead of the former Neogr. → Alb. im, in.



RV. gáti-	(f.) ‘der Gang’ (WbRV. 376)
Gr. βάσι-	(f.) ‘Schritt, Gang’ (GEW 1:209, βάσις)
Alb. n :gas-	(ao.) ‘urge, incite, annoy’ (AlbEtD. 293)
Latv. gate	(f.) ‘Weg zwischen zwei Zäunen’ (LiEtWb. 139) <sup>615</sup>

§5. Brugmann (Grundr<sup>2</sup> 1:397, 400) reconstructed a uniform prototype Neogr. \**ḱm̥tóm* ‘hundert’ for a broad spectrum of vowels: “ai. *śatá-m*, gr. *ἑκατόν*, lat. *centum*, air. *cēt*, got. *hund*, lit. *šim̃ta-s*”. The complete data now at our disposal implies several isoglosses with unified vocalisms instead of a single underlying syllabic nasal:

PIE \**ḱaḥ-* ‘10, 100’ (P. 191-192)<sup>616</sup>

PIE \**ḱeaḥ-*<sup>617</sup>

Gr. δέ·κα-	(n.) ‘zehn’ (GEW 1:359, δέκα)
RV. dá·śa-	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, dáśa [NA])

PIE \**ḱoaḥ-*

Arc. δέ·κο-	(n.) ‘zehn’ (Grundr <sup>2</sup> 1:406)
RV. dá·śā-	(n.) ‘zehn’ (WbRV. 582, daśānām, BRUGMANN II)

PIE \**ḱaḥimt-*<sup>618</sup>

Li. <i>šim̃ta-</i>	(m.) ‘centum’ (LiEtWb. 984, <i>šim̃tas</i> [sgN])
OCS. <i>de·seṭi</i>	(num.) ‘zehn, Dekade’ (Sadnik √139)
TochA. <i>taryā·kiñci-</i>	(num.ord.) ‘tricesimus’ (Poucha 116)

PIE \**ḱeaḥNt-*

TochA. <i>kānt-</i>	(num.card.) ‘centum’ (Poucha 66-7)
Bret. <i>kant-</i>	(num.) ‘hundert’ (WH 1:201, <i>kant</i> )
Cymr. <i>cant-</i>	(num.) ‘centum’ (WH 1:201, <i>cant</i> )
Gr. ἴ·κωντι-	(num.) ‘20’ (Schwyzer, GrGr. 1:591)

PIE \**ḱaḥeNto-* (= Neogr. \**ḱhento-*)

Lat. <i>cento-</i>	(n.sg.) ‘hundert’ (WH 1:200-1, <i>centum</i> )
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<sup>615</sup> The Latvian form is not necessarily a loan, because Neogr. \*a/o is possible.

<sup>616</sup> The numeral for ‘10’ (Lat *decem*) consists of the prefix PIE \**deḡa-* ‘unus’ (ablaut \**deḡae-*, \**dēḡa-*) and the root PIE \**ḱeaḥ-* (n.pl.) ‘\*hands’ (num.) ‘ten’ (for the prefix, see Pysalo 2011). The root without the prefix is accepted as belonging with the numeral for ‘100’ (RV. *śatá*), an assumption that is supported by the segmentation, leaving a common root for items such as Gr. δέ·κατο- (ord.) ‘der zehnte’ (GrGr. 1:595, GEW 1:359), Gr. ἑ·κατό- (num.n.) ‘hundert’ (GEW 1:475, *ἑκατόν*) and so forth. The meaning ‘hundred’ is thus derived through the substantivization of the adjective ‘tenth’, with the numeral ‘100’ being approximately ‘(the) tenth (ten)’ (i.e. the ‘power of ten’).

<sup>617</sup> On the root shape in general, note Anttila (1969:159): “It is also impossible to take \**deḱm̥* (§9.11) as one unextended root because of its shape CeCR [...]”

<sup>618</sup> The meaning ‘hand’ embedded in the numeral for ‘10’ is accompanied by the adjective Gr. δού·χιμο- (a.) ‘troublesome, dangerous, fearful’ (LSJ. 461) with Gr. χ ← Neogr. \**kh* ← PIE \**ḱaḥ* proving a tenuis aspirata for the ambiguous OInd. ś in the related nouns OInd. śīma- (m.) ‘Zubereiter’ (EWA 2:637-8) and RV. śīmī- (f.) ‘Arbeit, Eifer, Werkdienst, Opferdienst’ (WbRV. 1394), etc.

LAv. θ̄ri·sant-	(f.) ‘dreissig’ (AIWb. 810, θ̄risas̄ča [sgN]) <sup>619</sup>
PIE *k̑eaḥto-, *k̑oaḥto- <sup>620</sup>	
RV. śatá-	(num.n.) ‘hundert’ (WbRV. 1372, śatá [NA])
TochA. kät-	(num.card.) ‘centum’ (Poucha 66-7, kät [316 b 7])
Gr. ἑκατό-	(num.n.) ‘hundert’ (GEW 1:475)
Arc. ἑκατό-	(num.n.) ‘hundert’ (Schwyzer, GrGr. 1:592, ἑκατόν)
Aiol. δέκατο-	(ord.) ‘der zehnte’ (GEW 1:359)
Att. εἴκοσι-	(num.) ‘20’ (GEW 1:453)
Aiol. εἴκοσι-	(num.) ‘20’ (GEW 1:453)
RV. śāta·vaneya-	(a.) ‘zum Geschlecht des ś. gehörig’ (WbRV. 1391)
PIE *k̑aḥun- (= Neogr. *k̑hun-)	

Go. tai·hun-	(num.card.) = δέκα ‘ten’ (GoEtD. 339)
Arm. ere·sun-	(num.) ‘dreissig’ (ArmGr. 1:491)
Arm. k’arā·sun-	(num.) ‘40’ (ArmGr. 1:491)
Go. hunda-	(n.pl.) ‘hundert’ (GoEtD. 194-5)

§6. Brugmann (Grundr<sup>2</sup> 1:397, 400) reconstructed Neogr. \*ṃbhr̥- for “OInd. abhrá- ‘Gewölk, trübes Wetter’, gr. ἀφρός- ‘Schaum’, lat. imber (Gen. imbris); Av. awra-npers. awr ‘Wolke’”, also adding (Grundr<sup>2</sup> 1:429) OPers. αβροζόμης (Herod.). Contrary to this, two roots are implied by means of the comparative method:

(a) PIE \*ḥaebhr- (Neogr. \*abhr-) can be reconstructed for:

Gr. ἀφρός-	(m.) ‘Schaum, Geifer’ (GEW1:197, ἀφρός [sgN])
Gr. ἀφρό·νιτρο-	(n.) ‘Mauersalz’ (KVG:242, ἀφρό·νιτρον)
RV. abhrá-	(m.) ‘Wolke, Gewitterwolke’ (WbRV. 88)
LAv. awra-	(n.) ‘Regenwolke, Wolke, Regen(schauer)’ (AIWb. 99)

(b) PIE \*ḥaebh-, the unextended base of the previous example, connects Greek and the well-known Celtic items (P. 1-2) through a common Indo-European /a/ in:

Gr. ἀφó·νιτρο-	(n.) ‘Mauersalz’ (KVG:242, ἀφó·νιτρον)
OGaul. ἄβo-	(m.) ‘Fluß’ (ACSS 1:5-6, ἄβoς [sgN])

Here (as in the derivate PIE \*ḥaebhr-) Neogr. \*a is attested, not a syllabic nasal.

(c) PIE \*ḥaembh- ‘Wolke, Regen, Wasser’, a root with a nasal, is confirmed by three subgroups agreeing on a common Indo-European /a/:

Arm. amb-	(sb.) ‘Wolke’ (o-stem) (ArmGr. 1:417)
Osc. an <sup>a</sup> frī-	(m.) ‘Regengottheit’ (WbOU. 95-6, anafriś [plD])
RV. ambhṛṇá-	(a.) ‘nebelhaft, feucht’ (WbRV. 96)
RV. ámbhas-	(n.) ‘Wasser, Regenwasser’ (WbRV. 96)

<sup>619</sup> Alternatively, Avestan belongs to Tocharian and Celtic with a non-palatalizing vowel.

<sup>620</sup> Note that TochA. kät lacks the nasal, and Greek has ablaut α : o, implying that there was no syllabic nasal in the proto-form.

§7. Brugmann (Grundr<sup>2</sup> 1:397, 404) reconstructed Neogr. \*sm̥ ‘unus’ “als Präfix ‘mit, zusammen’ : ai. sa-kīrt ‘einmal’, gr. ἁ-πλόος ‘einfach’, lat. sim-plex, ai. sadhriy-āñc- ‘nach einem (demselben) Punkt hin gerichtet, vereint, einsam’, gr. ἁ-θροοί ‘im Verein, gesamt’”. The comparative method implies the following correspondence sets:

(a) PIE \*seah<sub>2</sub>- ‘with, together, etc.’ The common Indo-European /a/, which does not reflect a syllabic nasal, is proven by the following items:

Li. sà ·	(prep.pref.) ‘zusammen’ (LiEtWb. 753)
Latv. sa ·	(prep.) ‘zusammen, usw.’ (LiEtWb. 753)
TochB. ·sa	(end.sgPerl.) ‘with, by, etc.’ (DTochB. passim)
RV. sa ·rátha-	(a.) ‘auf gleichem Wagend fahrend’ (WbRV. 1487)
RV. sá ·varṇa-	(a.) ‘gleiches Aussehen habend’ (WbRV. 1492)
Gr. ἁ πλόο-	(a.) ‘einfach’ (GEW 1:1, ἁπλόος [sgN])
OInd. sódaka-	(a.) ‘containing water’ (MonWil. 1248)

(b) PIE \*sōah<sub>2</sub>- ‘with, together, etc.’, the \*ō-grade of the previous example, is proven to be original by two branches:

Li. súo ·kalbi-	(.) ‘agreement’ (LiEtWb. 942)
Li. suo ·žinė-	(f.) ‘conscience’ (LiEtWb. 936)
Latv. suō ·vardi-	(c.) ‘Namensvetter’ (LiEtWb. 753)
RV. sá ·varṇi-	(m.) ‘EN eines Mannes’ (WbRV. 1513)
RV. sã ·kám	(adv.) ‘auf einmal’ (EWA 2:721-)
RV. sá ·rathi-	(m.) ‘Wagengenosse, Gefährte’ (WbRV. 1513)

PIE \*sōah<sub>2</sub>- is to be reconstructed with the position of the laryngeal confirmed by a Baltic accent.<sup>621</sup> The ablaut \*e : ō is, therefore, accountable for the alternation of quantity RV. a : ā in pairs:

RV. sa ·rátha-	(a.) ‘auf gleichem Wagend fahrend’ (WbRV. 1487)
RV. sá ·rathi-	(m.) ‘Wagengenosse, Gefährte’ (WbRV. 1513)
RV. sá ·varṇa-	(a.) ‘gleiches Aussehen habend’ (WbRV. 1492)
RV. sá ·varṇi-	(m.) ‘EN eines Mannes’ (WbRV. 1513)

(c) PIE \*sem- ‘ein, zugleich’ is implied for:

LinB. ηεμ-	(pron.m.) ‘one’ (GEW 3:83, DMycGr. 392, <sup>h</sup> e-me <sup>i</sup> [D])
Lat. semel	(adv.) ‘einmal, das erstemal’ (WH 2:511)
OLat. semol	(adv.) ‘zugleich’ (WH 2:538)

Instead of a single root with Neogr. \*sm̥- : \*sem-, there is a monoliteral root PIE √s- ‘ein, eins, zusammen, usw.’ with alternative extensions PIE \*seah<sub>2</sub>- and PIE \*sem-.

§8. Brugmann (Grundr<sup>2</sup> 1:398) reconstructed Neogr. \*dekm̥ ‘zehn’ for “ai. dása, arm. tasn, gr. δέκα, lat. decem, air. deich n-”, to which he adds (Grundr<sup>2</sup> 1:413) “Got. taihunda aisl. tionde ‘zehnte’ : gr. δέκατο-ς” and (Grundr<sup>2</sup> 1:415) “Lit. dešimta-s

<sup>621</sup> For additional examples in Baltic, see already Bezzenberger (1888:146-8).

preuss. *desēmts* aksl. *desętŭ* ‘zehnter’ : gr. *δέκατο-ς*”. As already discussed above, several extensions are implied by the comparative method:

(a) PIE \**keah₂-* \**koah₂-* ‘zehn’

Gr. <i>δέκα-</i>	(n.) ‘zehn’ (GEW 1:359, <i>δέκα</i> )
RV. <i>dáśa-</i>	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, <i>dásā</i> [NA])
Arc. <i>δέκα-</i>	(n.) ‘zehn’ (Grundr <sup>2</sup> 1:406)
RV. <i>dásā-</i>	(n.) ‘zehn’ (WbRV. 582, <i>daśānām</i> [plG])

The absence of a syllabic nasal is proven by the qualitative alternation Gr. *α* : *ο*, reflected as RV. *a* : *ā* in Indo-Iranian (with Brugmann’s Law II in RV. *daśānām*).

(b) PIE \**keah₂n-* ‘zehn’

Arm. <i>ta·san-</i>	(num.) ‘zehn’ (ArmGr. 496, <i>tasn</i> [N], <i>tasanc</i> [G])
OSax. <i>te·han</i>	(num.) ‘zehn’ (GoEtD. 339)
TochB. (w)j· <i>kām</i>	(num.) ‘zwanzig’ (DTochB. 61, <i>ikām</i> )
Gr. <i>δεκανό-</i>	(m.) ‘decurio, Aufseher’ (GEW 1:359)

The forms have in common Indo-European /a/ = Neogr. \*a followed by a nasal extension PIE \**n-*.

(c) PIE \**kahto-* ‘zehn, hundert’ is attested in the ablaut grades PIE \**e* and PIE \**o*:

PIE \**keah₂to-*

Gr. <i>δέκατο-</i>	(ord.) ‘der zehnte’ (Schwyzer GrGr. 1:595, GEW 1:359)
Gr. <i>ἑκατό-</i>	(num.n.) ‘hundert’ (GEW 1:475, <i>ἑκατόν</i> )
RV. <i>śatá-</i>	(num.n.) ‘hundert’ (WbRV. 1372, <i>śatām</i> , <i>śatēna</i> )
RV. <i>śatá·asva-</i>	(a.) ‘aus hundert Rossen bestehend’ (WbRV. 1376)

PIE \**koah₂to-*

TochA. <i>kāt-</i>	(num.card.) ‘centum’ (Poucha 66-7, <i>kāt</i> [316 b 7])
Lesb. <i>δέκατο-</i>	(ord.) ‘der zehnte’ (GEW 1:359, LSJ. 377)
Arc. <i>ἑκατό-</i>	(num.n.) ‘hundert’ (Schwyzer, GrGr. 1:592, <i>ἑκατόν</i> )
RV. <i>śāta·vaneya-</i>	(a.) ‘zum Geschlecht des ś. gehörig’ (WbRV. 1391)

Brugmann’s early reconstruction is outdated<sup>622</sup> because Gr. *α* : *ο* (Att. *δέκατος* : Att. *ἑκατοῖ*) belongs to the standard ablaut PIE \**eah₂* : \**oah₂* (see Chapter 2), as illustrated by:

PIE * <i>keah₂to-</i>	≡	Att. <i>δέκατο-</i>	:	RV. <i>śatá-</i>
PIE * <i>koah₂to-</i>	≡	Arc. <i>δέκατο-</i>	:	RV. <i>śāta-</i> <sup>623</sup>

(d) PIE \**kahtim-* ‘zehn, hundert’

<sup>622</sup> See Brugmann (Grundr<sup>2</sup>. 1:406): “Nur scheinbar treten im Griech. auch andre Vocale als *α* als lautliche Fortentwicklung von sonantischen Nasal auf. Über att. *ἑκατοῖ* gegenüber dor. *ἑκατι*, arkad. *δέκα* *δέκατος* gegenüber Att. *δέκα* *δέκατος* u. dgl. s. II S. 490f. 494, Verf. Gr.Gr.<sup>2</sup> s. 137, Kretschmer KZ. 31, 361ff.”

<sup>623</sup> The stem is based on a possible PIE \**o*-grade (Brugmann’s Law II) in RV. *śāta·vaneya-* (a.) ‘zum geschlecht des śatavani gehörig’ (WbRV. 1391) and RV. *śāta·pantā* [du] = *śatavat-* (?) (WbRV. 1391).

Li. šimta-	(m.) ‘centum’ (LiEtWb. 984)
OPr. de ·simto-	(num.) ‘zehn’ (APrS. 320, dessimton)
OLI. de ·šimti-	(num.) ‘Dekade, zehn’ (LiEtWb. 91, dēšimtis [sgN])
TochA. taryā ·kiñci-	(num.ord.) ‘tricesimus’ (Poucha 116)

Baltic and Tocharian (two witnesses) imply a genuine PIE \*i.

(e) PIE \**kaḥem-* ‘zehn’ (Neogr. \**khem-*)

Lat. de ·cem	(num.) ‘zehn’ (WH 1:327, decem)
OIr. de ·ich <sup>N</sup>	(num.) ‘ten’ (DIL 200, deich n-)
Umb. de ·sen ·duf	(num.) ‘duo-decim, zwölf’ (WbOU. 169)
OPr. de ·semp <sup>t</sup> -	(num.) ‘zehn’ (APrS. 320, dessemp <sup>t</sup> s [sgN])

(f) PIE \**kaḥun-* ‘zehn, hundert’ (Neogr. \**khun-*)

Go. tai ·hun-	(num.card.) ‘zehn : δέκα’ (GoEtD. 339)
Arm. ere ·sun-	(num.) ‘dreissig’ (ArmGr. 1:491)
Go. hunda-	(n.pl.) ‘hundert’ (GoEtD. 194-5)
OIcl. tiond-	(f.) ‘zehner Teil’ (ANetWb. 590)

Armenian u, coinciding with Germanic u, implies an original PIE \*u.

§9. Brugmann (Grundr<sup>2</sup> 1:400) reconstructed \**iṃsḱe/o-* for “ai. yácha-ti ‘er hält’, av. a-yasaēša ‘du mögest an dich nehmen’, apers. a-yasatā ‘er zog an sich’, zu ai. yama-ti (II S. 1031)”. Though the data is mostly Indo-Iranian, the impossibility of syllabic nasals can be proven when the complete data is accounted for:

(a) PIE \**iaḥ-* ‘halten, fassen’, a base neglected by Brugmann, is attested in

gAv. yā-	(f.) ‘Halten, Fassen’ (AIWb. 1264, yaṃ [sgA]). <sup>624</sup>
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(b) PIE \**ieaḥm-* ‘halten, paaren, bezwingen’ (P. 505), with a possible laryngeal revealed by Brugmann’s Law II in the strong perfect, has been preserved in:

RV. yem-	(pfM.) ‘sich [D] darbieten/hingeben’ (WbRV. 1093)
RV. úd (...) yayām-	(pf.) ‘erheben, emporsteigen lassen’ (WbRV. 1095) <sup>625</sup>
TochA. yam-	(sb.) ‘pair’ (Poucha 238) <sup>626</sup>
TochB. yamaṣṣuki-	(sb.) ‘participant’ (DTochB. 483, yamaṣṣuki)

(c) PIE \**ieaḥṣk-* (or PIE \**iesk-* <sup>?</sup>) does not contain a nasal, owing to the quantitative ablaut PIIr. \*a : \*ā preserved in:

gAv. yas-	(a.) ‘in den Besitz gelangend, teilhaftig’ (AIWb. 1269)
RV. yácha-	(pr.) ‘darreichen, aus-, vorstrecken’ (WbRV. 1090)
gAv. ā yesa-	(vb.) ‘herholen, holen’ (AIWb. 1288-9, āyese [3sg])

<sup>624</sup> The feminine PIE \**i-ēaḥ-* implies a monoliteral root PIE *√i-* ‘halten, fassen’ from which the attested derivatives have been built.

<sup>625</sup> Note, however, that RV. yayām- could derive its vrddhi from an original \**ō*. Accordingly, a root without laryngeal (PIE \**iem-* *√iom-*) is also possible.

<sup>626</sup> Owing to the possible genetic relationship, a loan from RV. yamá- (a.) ‘verbunden, verschwistert, gepaart’ (WbRV. 1096) is unmotivated.

LAv. ā (...) OPers. ā LAv. ā	(...) yāsa- yasa- apa (...)	(vb.) ‘herholen, holen’ (AIWb. 1288-9) (pr.) ‘reach out for, take as one’s own’ (OldP. 205) (vb.) ‘wegnehmen’ (AIWb. 1288, apa vā yāsāiti)
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(d) PIE \*ieaht- (or PIE \*iet-<sup>?</sup>) also does not contain a nasal, owing to the quantitative ablaut PIIr. \*a : ā in:

RV. yātá- LAv. yāta- LAv. yāta- RV. yātāya-	(pf.pt.) ‘gezügelt, gelenkt’ (WbRV. 1095) (n.) ‘Anteil, Besitz’ (AIWb. 1283) (a.) ‘reich an Besitz, vermögend’ (AIWb. 1283) (csA.) ‘verbinden, vereinigen’ (WbRV. 1080, yātayati)
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§10. Brugmann (Grundr<sup>2</sup> 1:400) reconstructed Neogr. \*ṅbhri- for “ái. ábhri-ṣ ‘Hacke, Spaten’ zu nabh- ‘bersten’”. The problems of the reconstruction are insurmountable:

(a) There are no parallels for OInd. ábhri- (KEWA 1:43) as the zero grade of RV. nábh- (f.) ‘Zerspalter, Zerbrecher’ (WbRV. 708) in the rest of the group.

(b) The related long grade reveals the quantitative ablaut OInd. a : ā:

OInd. ābhriká-	(a.) ‘mit der Hacke arbeitend’ (KEWA 1:43).
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Hence Neogr. †ṅbh- is impossible.

(c) It is possible to segment OInd. ā·bhri- instead of Neogr. \*ṅbhRi-, attaching the forms to the well-known root

√bhri- ‘schneiden, scheren, zerbröckeln’ (P. 182):

OInd. á·bhri- Lat. friā- Pahl. brī- RusCS. bri- OInd. ā·bhriká- RV. bhrīṅá- LAv. pairi.brīna-	(.) ‘Hacke, Spaten’ (KEWA 1:43) (vb.) ‘zerreiben, zerbröckeln’ (WH 1:549, friāre) (vb.) ‘schneiden’ (AIWb. 972, brītan [inf.]) (sb.) ‘scheren’ (WH 1:549, briti [inf.]) (a.) ‘mit der Hacke arbeitend’ (KEWA 1:43) (vb.) ‘zürnen’ (tr.) ‘strafen’ (WbRV. 967, bhrīnāti) (vb.) ‘ringsum schneiden’ (AIWb. 972, ·brīnānti [3pl])
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§11. Brugmann (Grundr<sup>2</sup> 1:404) reconstructed Neogr. \*tṃp- for “τάπης ‘Decke, Teppich’ : Li. tiṃpti ‘sich recken’ neben teṃpti Iter. tampýti ‘spannen’, W. temp-”. The complete material contains several roots with confirmed Indo-European vocalisms:

(a) PIE \*taḥp- with ablaut PIE \*teahp- : \*tēahp- is implied by the following comparison:

Gr. τάπητ- ModPers. tāp-	(m.) ‘Teppich, Decke’ (GEW 2:854) (vb.) ‘spinnen, drehen, wenden’ (GEW 2:854, tāftan)
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The root is an extension of the root PIE \*teah- \*tēah- ‘id.’, already discussed above.

(b) PIE \*tin-, hosting the extension \*tin p- (→ Li. tiṃp-), is proven to be original by two witnesses:

Latv. tin- Ir. tin-	(vb.) ‘flechten, winden, wickeln’ (Latv. tinu, tit) (a.) ‘zart : doux’ (LEIA T-67)
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OCS. tinī-	(f.) ‘Seil, Strick’ (Sadnik √966)
Li. tiñkla-	(m.) ‘Netz, Fischernetz, Falle, usw.’ (LiEtWb. 1098)
OGaul. tinnetiō(n)-	(ON.) ‘Tinzen’ (ACSS. 2:1854, tinnetiōne)
Li. tim̃p-	(vb.) ‘sich recken’ (Grundr <sup>2</sup> 1:404, tim̃pti [inf.])
OBret. tinsi-	(vb.) ‘sparsit’ (VGK 2:374, tinsit [3sg])
OCS. tīnūkū	(a.) ‘fein, zart’ (Sadnik √972, tīnūkū [sgN])

(c) Neogr. \*temp- ‘spannen’. In addition to the well-known Lithuanian and Latin forms, a Lycian stem may also belong to this root:

Li. teñp-	(vb.) ‘spannen, ausdehnen, recken’ (LiEtWb. 1079)
Li. tampý-	(vb.) ‘spannen, dehnen, sich recken’ (LiEtWb. 1054)
Li. iš·temp̃ima-	(m.) ‘Anspannen’ (LiEtWb. 1079)
Lyc. tm̃peimeh	(lc.) ‘-(?)’ (Blyk. 4:58, tm̃peimeh)
Lat. templo-	(n.) ‘gespannt Querholz’ (WH. 2:659, templa [plNA])
Li. templē-	(f.) ‘Bogensehne, Sehne, Saite’ (LiEtWb. 1079)

The formation \*ten p- is an extension of the root Neogr. \*ten- in:

RV. tan-	(ao.) ‘weit hinstrecken’ (WbRV. 514, átan)
Umbr. an·ten-	(vb.) ‘intenditō’ (WH 2:662, antentu [3sg])
Umbr. en·ten-	(vb.) ‘intenditō’ (WH 2:662, ententu [3sg])
Lat. tēnsa-	(f.) ‘Prozessions-, Götterwagen’ (WH 2:666)
OPr. tensei-	(vb.) ‘reizen’ (APrS. 448, ni tenseiti [3sg])
OPr. en·tensit-	(pf.pt.ps.) ‘gefasst’ (APrS. 448, entensits [sgN])
Lat. tento-	(n.) ‘Spinnewebe’ (a.) ‘gespannt’ (WH 2:662)

In this way, no svarabhakti vowels resulting from Neogr. \*m̃ are attested.

### 3.4.8 Neogr. \*m̃<sup>m</sup> (antevocalic syllabic bilabial)

§0. Neogr. \*m̃<sup>m</sup>, the labial counterpart of Neogr. \*ñ<sup>n</sup>, was postulated and assumed by Brugmann to develop similarly as the corresponding dental.

§1. According to Brugmann, the developments of Neogr. m̃ were as follows:

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
m̃ <sup>m</sup> vor a etc.	am	am	αμ	?	em	am	um	im	īm

§2. The problems of Neogr. \*m̃<sup>m</sup> are essentially identical with those of Neogr. \*ñ (to which I refer in this connection). Brugmann’s svarabhakti vowels, assumedly from Neogr. \*m̃<sup>m</sup>, can be proven to be genuine by the comparative method (i.e. implied by at least two witnesses).

§3. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. “\*sm̃<sup>m</sup>o- ‘irgend einer’: ai. sama- gr. ἄμο- got. suma- (Verf. Ausdr. f. d. Totalität S. 5)” and (Grundr<sup>2</sup> 1:412) “OIr. samail ‘Gleichnis, Bild’: nkymr. hafal ‘similis, par’, lat. simili-s, gr. ἄμο

‘zugleich’”, adding (Grundr<sup>2</sup> 1:415) “Go. sum-s aisl. sum-r ‘irgend ein’ : ai. sama- etc.”. Instead of a uniform root, there are several paralleled extensions:

(a) PIE \*seah<sup>h</sup>m-. The common Indo-European /a/ (PIE \*ea<sup>h</sup>) is confirmed by several branches:

RV. sám	(prepI.) ‘mit’ (adv.) ‘zugleich’ (WbRV. 1478)
Gr. ἄμ-α	(adv.) ‘zu·sammen, zu·gleich’ (GEW 1:83)
OIr. samail-	(f.) ‘ressemblance’ (LEIA S-21-2)

The formation is an extension PIE \*seah<sup>h</sup>-m- of the root PIE \*seah<sup>h</sup>- (see above).

(b) PIE \*sem- ‘one, oneself’, an extension of the root PIE \*s-, is attested in:

OMyc. ηεμ-	(pron.m.) ‘ein’ (DMycGr. 392, <sup>h</sup> e-me <sup>i</sup> [sgD])
OLat. sem·ol	(adv.) ‘zugleich’ (WH 2:538 = Lat. simul)
Lat. sem·per	(adv.) ‘immer; jedesmal’ (WH 2:511)
Lat. simili-	(a.) ‘ähnlich’ (WH 2:538)

(c) PIE \*sum- ‘some; together’<sup>627</sup> contains a genuine PIE \*u confirmed by three branches:

Go. sum-	(indef.prn) ‘anyone, someone, some’ (GoEtD. 328)
RV. sum·ád	(adv.) ‘zusammen, zugleich’ (WbRV. 1545) <sup>628</sup>
Aiol. ὅμοι	(adv.) = ‘ὅμοῦ’ (LSJ. 1849)
Aiol. ὅμοιο-	(a.) = ‘ὅμοιος’ (LSJ. 1849)
Go. suman	(adv.) ‘ποτέ’ ‘once, formerly’ (GoEtD. 328)

§4. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed Neogr. \*g<sup>h</sup>m<sup>h</sup>mó- as “Präsensst. von \*g<sup>h</sup>em- ‘kommen’ : ai. gamé-t, ahd. coman aisl. koma (II S. 920)”. Instead of a single prototype, the complete data now reveals two different vocalizations implied by the comparative method:

(a) PIE \*g<sup>h</sup>eah<sup>h</sup>m- ‘kommen’ is paralleled by Indo-Iranian and Tocharian in:

RV. gáma-	(a.a.o.) ‘kommen’ (WbRV. 385, gámadhyai [inf.])
TochB. kame-	(pretA.) ‘to come’ (DTochB. 161, kameṃ [3pl]) <sup>629</sup>

Taken together, the forms imply PIE \*g<sup>h</sup>eah<sup>h</sup>mo- without an antevocalic syllabic nasal.

(b) PIE \*g<sup>h</sup>á<sup>h</sup>m- (→ \*g<sup>h</sup>ú<sup>h</sup>m-) ‘venire’ is paralleled by Tocharian and Germanic and, therefore, it is shown to be original:

Go. qum-	(m.) ‘Ankunft’ (GoEtD. 279) <sup>630</sup>
TochA. kumnäs-	(prA.) ‘venire’ (Poucha 67, kumnässi [inf.])
TochA. kumpā-	(impfA.) ‘venire’ (Poucha 67, kumpār [3pl])

<sup>627</sup> PIE \*su-, the unextended starting point of the extension PIE \*sum-, appears in TochB. su- (dem.pr.) ‘the; he, she, it’ (DTochB. 693, su) and in Li. su- (pref.) ‘mit, in Begleitung von [I.]’ (LiEtWb. 933).

<sup>628</sup> Note RV. ·ád (postp.) ‘zu’ paralleled in Umbr. ·ař (postp.A) ‘zu, bei, an’ and belonging to Lat. ad (prep.pref.) ‘ad’ (WH 1:11).

<sup>629</sup> In addition, a PIE \*o-grade (cf. Go. qam- (pret.) ‘kam’) is possible in Tocharian.

<sup>630</sup> The surface-level PGerm. \*um did not result from the syllabic nasal Neogr. \*m̥, but from PIE \*á<sup>h</sup>m with PIE \*a assimilated to the labial component of \*g<sup>h</sup>.



OHG. chumft-	(f.) ‘das Kommen, Ankunft’ (Grundr <sup>2</sup> 1:413)
TochA. kumsa-	(prA.) ‘venire’ (Poucha 67, kumsam)
Go. ga·qumþ-	(m.) ‘Zusammenkunft’ (GoEtD. 147, gaqumþs)

§5. Brugmann (Grundr<sup>2</sup> 1:399) reconstructed \*medhm<sup>m</sup>o- ‘mittelster’ for “av. madəma-, got. miduma F. ‘Mitte’, ahd. \*metamo ‘mediocris’ in metamun-schaftī ‘mediocritas’ (II S. 157)”. Attempts to explain the alternation with a syllabic nasal do not succeed, because the variation of suffixes is externally secured:

(a) PIE \*medh- ‘middle’ (P. 706-7), the unextended root, appears in:

Go. mid·gardiwaddju-	(m.) ‘= συνείδησις : consciousness’ (GoEtD. 258)
LAv. maið·yāiryā-	(m.) ‘d. Gottheit der fünften Jahreszeit’ (AIWb. 1117)
OIcl. mið-	(n.) ‘Mitte’; ‘Fischplatz im Meer’ (ANetWb. 386)

(b) PIE \*medhomo- is shared by Avestan and Germanic in:

LAv. maðəma-	(a.) ‘in der Mitte befindliche, mittlere’ (AIWb. 1114)
OEng. meteme-	(a.) ‘mediocer’ (ASaxD. 677, cf. OHG. metam-)

(c) PIE \*medh(e/o)u- appears in Germanic and Celtic:

Go. miduma-	(f.) ‘Mitte : μέσον’ (GoEtD. 253)
OIcl. mjǫdm-	(f.) ‘Hüfte, Leibesmitte’ (ANetWb. 390)
OIr. medón-	(m.) ‘milieu, centre, partie centrale’ (LEIA M-28)
Go. midjun·gard-	(m.) ‘inhabited world’ (Gr. οἰκομένη, GoEtWb. 253)

§6. Brugmann (Grundr<sup>2</sup> 1:415) reconstructed Neogr. \*g<sup>u</sup>ḡm<sup>i</sup>- for “Lit. pógimis ‘Natur’ Gen. -gimio, zu gimti ‘geboren werden’, neben Präs. gemù.”.

The root PIE \*g<sup>u</sup>eah<sup>-</sup> (Neogr. \*g<sup>u</sup>a-), only sketched by Walde and Pokorny in P. 465, can now be reconstructed with far more details:

(a) PIE \*g<sup>u</sup>eah<sup>-</sup> ‘gebären’, the unextended root, appears in

Gr. βᾶ-	(ao.) ‘geboren werden’ (GEW 1:210, ἐβᾶθη [ps.]).
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(b) PIE \*g<sup>u</sup>eah<sup>i</sup>- ‘id.’ is documented with a schwebeablaut in Avestan, matching Li. gemù in PIE \*e:

Gr. βαῖα-	(f.) ‘Amme’ (GEW 1:208, βαῖα [sgN])
LAv. jāē-	(f.) ‘Weib’ (AIWb. 606, jāē [sgN], jāēš [plA])
LAv. jāē·karšta-	(a.) ‘von den Menschen bewirkt’ (AIWb. 601)

This formation is the starting point of the Satem root √gim- preserved in Baltic and Albanian:

(c) PIE \*g<sup>u</sup>aḡim- ‘geboren werden’

Li. gim̃-	(vb.) ‘geboren werden’ (LiEtWb. 151, gimti [inf.])
Alb. pre·gim-	(sb.) ‘Gastmahl eines Erstgeborenen’ (LiEtWb. 151)
OPr. pēr·gima-	(m.) ‘Kreature(n)’ (APrS. 395, pērgimmans [plA])

(d) PIE \*g<sup>u</sup>aḡēm- ‘geboren werden’ (P. 465), the labial extension of the root, is attested in several branches:

OPr. gem-	(vb.) ‘gebären’ (APrS. 336-7, gemton [inf.])
Li. gema-	(pr.) ‘geboren werden, entstehen’ (LiEtWb. 151, gemù)
OPr. gemia-	(f.) ‘Hausfrau’ (APrS. 337, gemia [sgN])
LAV. ni-ĵāmaya-	(cs.) ‘zu Gebären bringen’ (AIWb. 1081, niĵāmayeiti)
TochB. śām-nya-	(pret.) ‘create’ (DTochB. 621, śāmnnyare [3pl])

§7. Brugmann (Grundr<sup>2</sup> 1:417) reconstructed Neogr. \*tṃ<sup>m</sup>- for “Aksl. tīma ‘Finsternis’, W. tem- ‘dunkel sein’ (lit. uš-temis ‘Verfinsterung’ ai. támas N. ‘Dunkel’), vgl. lit. tímsra-s ‘schweissfüchsig’”. In the material, two roots are now confirmed by Fick’s rule:

(a) PIE \*tim- ‘dunkel, finster’ appears in Baltic, Slavonic and Indo-Iranian:

OCS. tīma	(f.) ‘Finsternis’ (‘darkness’, Sadnik 971)
OInd. timirá-	(a.) ‘dunkel, finster’ (KEWA 1:502)
ModPers. timir-	(sb.) ‘Dunkelheit’ (KEWA 1:502)
Li. tímsra-	(a.) ‘bleifarbig, schweißfüchsig’ (LiEtWb. 1097)

(b) PIE \*temaḥ- (or \*teḥam-<sup>?</sup>) ‘Dunkel, Finsterniss’ with PIE \*h implied by the Lithuanian acute is attested in four groups:

Li. tém-	(vb.) ‘finster/dunkel/Abend werden (LiEtWb. 1080)
RV. támas-	(n.) ‘Dunkel, Finsterniss’ (WbRV. 524)
gAv. tāmah-	(n.) ‘Finsternis, Dunkel’ (AIWb. 648)
OHG. demar	(.) ‘Dämmerung’ (LiEtWb. 1081)
Lat. temere	(adv.) ‘blindlings, zufällig, ohne Grund’ (WH 2:656)

### 3.4.9 Neogr. \*ṃ (long syllabic bilabial)

§0. Neogr. \*ṃ, the labial counterpart of long syllabic Neogr. \*ṅ, behaves in all respects in the same way as the corresponding dental nasal.

§1. According to Brugmann (Grundr<sup>2</sup> 1:417f.), the developments of Neogr. \*ṃ in the daughter languages were as follows:

Uridg.	Ar.	Arm.	Gr.	Alb.	Ital.	Urir.	Germ.	Balt.	Slav.
*ṃ vor C	ā	an	αν να ?		an, na	an	un	in	īn

§2. The theoretical and reconstructive problems of Neogr. \*ṃ coincide with those of Neogr. \*ṅ. In essence, Brugmann’s svarabhakti vowels, assumedly from Neogr. \*ṃ, are comparatively confirmed by at least two witnesses (Fick’s rule), as shown below.

§3. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed Neogr. \*dṃ ‘zähmen’ for “ai. dámya-ti ‘er zähmt’, gr. ion. δέδημαι, διητό-ς, διησι-ς (urgr. ā) und δάμασι-ς ἄ-δάματος vgl. ai. dami-tár- ‘domitor’”. Yet again two etymologically distinct roots are attested:

(a) PIE \*dahm- ‘zähmen’ with the ablaut \*e/o in PIE \*deahm- \*doahm- is implied by the following forms:

Hom. ἰπτό·δαμο-	(m.) ‘Rossebändigend’ (GEW 1:346, ἰπτόδαμος)
OIr. da’mi-	(pr.) ‘zähmen’ (DIL 175, da’mid [3sg])

Lat. domā-	(pr1.) ‘zähmen, bändigen’ (WH 1:367, domäre [inf.])
RV. dāmā-	(f.) ‘Seil’ (WbRV. 595 + Brugmann’s Law II)
Aiol. δάμνα-	(vb.) ‘bezähmen, bändigen, bewältigen’ (GEW 1:346)
OIr. domna-	(vb.) ‘festbinden, bändigen’ (DIL 180, domnaid)

(b) PIE \*dmah₂- ‘bändigen, usw.’

Gr. δέδμη-	(pf.) ‘bändigen, bezähmen, -wältigen’ (GEW 1:346)
Hom. δμῶσ-	(m.) ‘Sklave’ (Schwyzer, GrGr. 1:480, GEW 1:403)
Hom. ἄ·δηήτ-	(pt.) ‘ungebändigt, unverheiratet’ (GEW 1:346)
Gr. ἄ·δηητο-	(pf.pt.) ‘gebändigt, unverheiratet’ (GEW 1:346)

The formation has no external parallels that I would be aware of. Despite this a direct derivation of (b) from (a) is impossible, because in zero grade the root PIE \*dah₂m- resulted in media aspirata:

(c) PIE \*dah₂om- ‘binden, anheften, usw.’ (Neogr. \*dhōm-)

Gr. θῶμυγ-	(f.) ‘Strick, Schnur, Band’ (GEW 1:700)
Ἡi. daming-	(vb1A.) ‘anheften, -kleben (?)’ (HEG 3:77-8)

§4. Brugmann (Grundr<sup>2</sup> 1:419) reconstructed Neogr. \*k̑h₂- ‘ermüden’ for “ai. śámya-ti ‘er hört auf, lässt nach’, gr. ion. κέκημηκα κμητό-ς (urgr. ā) und κάματο-ς, vielleicht auch κάμνω aus k̑h₂nō, vgl. ai. Imper. śami-ṣva”.<sup>631</sup> Nevertheless, two distinct correspondences are implied by the comparative method:

(a) PIE \*kaḥmah₂- ‘mühen; liegen, Lager’ (ablaut PIE \*keah₂m- \*kōah₂m-, P. 557)<sup>632</sup>

Lat. camā	(f.) ‘kurzes, niedriges Bett, Pritsche’ (WH 1:145)
RV. śamāyá-	(dn.) ‘tätig sein, sich Mühe geben’ (WbRV. 1380)
Gr. ἄ·κάμαντ-	(pt.) ‘unermüdlich, frisch’ (GEW 1:773)
Gr. κῶματ-	(n.) ‘tiefe, ruhiger Schlaf’ (GEW 2:61)

(b) PIE \*kmah₂- ‘liegen’ (P. 557, KEWA 3:381-2)

AV. śma śāna-	(n.) ‘Fried-hof, Leichen-stätte’ (EWA2:659)
Do. κέκημακ-	(pf.) ‘sich mühen, ermatten, sterben’ (GEW 1:773)
Gr. ἄ·κμηήτ-	(a.) ‘unermüdlich’ (GEW 1:773, ἀκμηής [sgN])

(c) PIE \*kō- ‘liegen’ (Ablaut \*k̑- k̑o- k̑e-). The base of the above extensions and the shortest form of the root is revealed by an attribute of the gods Rudra and Śiva (AiGr. II/2:81):

OInd. giri śa-	(m.) ‘inhabiting mountains’ (KEWA 3:304).
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The best-known extension PIE \*kei- ‘liegen’ (P. 539-540) has been built on this formant.

<sup>631</sup> For Güntert’s discussion on the alternation κάματος · κμητός, see (1916:115).

<sup>632</sup> According to conventional understanding, the root has two meanings, ‘liegen’ and ‘mühen’. These are, however, ultimately incompatible, and two etymologically distinct roots – one meaning ‘Hand : mühen’ and the other meaning ‘Acker : liegen’ – actually exist. Since this distinction is morphologically irrelevant, I have not separated the roots here.

### 3.4.10 Nasals PIE \*m/ṃ and \*n/ṅ in System PIE

§0. The extended data does not support the postulation of syllabic nasals with the methodology suggested by Brugmann. The comparative method implies that the svarabhakti vowels are paralleled and thus of PIE origin, not epenthetic outcomes of syllabic sonants.<sup>633</sup> Consequently, the Neogrammarian rules for CṅC CNHV CNHC can be simplified into a single item CṅC → CNC, based on the actual development of the syllabic nasals (the principle of regularity of sound change).

§1. As for PIE \*C<sub>1</sub>NṅC<sub>2</sub>, only a handful of forms with C<sub>1</sub> and C<sub>2</sub> not representing the laryngeal have been preserved in the data, all in languages not available for Brugmann and his colleagues.<sup>634</sup> However, in a special case C<sub>1</sub> ≡ PIE \*ḥ, a syllabic nasal \*ṃ \*ṅ emerged without developing svarabhakti vowels, thus allowing determination of the outcome of PIE \*C<sub>1</sub>NṅC<sub>2</sub> to be the respective consonant N.

§2. PIE \*C<sub>1</sub>NḥV (≡ Neogr. \*ṅ<sup>m</sup> \*ṅ<sup>n</sup>) is a special case of the previous example with C<sub>2</sub> ≡ PIE \*ḥ. Owing to the identity of the environment C<sub>1</sub>Nḥ = C<sub>1</sub>NṅC<sub>2</sub>, one would expect the syllabic nasal to yield a consonant without a svarabhakti vowel. This is now implied by the comparative method in examples like PIE √ḡnah- ‘wissen’ with a common Indo-European development

PIE \*ḡnahV- → \*ḡnhV- → \*ḡṅ<sup>h</sup>V- → \*ḡnV-

as, for instance, in

RV. jajñ- (pf.) ‘erkennen, wahrnehmen’ (WbRV. 501, jajñús).

No svarabhakti vowels emerged in the process, and the resulting nasal is consonantal.

§3. PIE \*C<sub>1</sub>NḥC (≡ Neogr. \*ṃ<sup>m</sup> \*ṃ<sup>n</sup>) is another special case of the previous example with C<sub>2</sub> ≡ PIE \*ḥ. Accordingly, the outcomes are consonantal, as seen in the sole certain example:

TochA. ā ·kntsune (sb.) ‘ignorantia, inscientia’ (DTochB. 16).

## 3.5 Resonants in System PIE

### 3.5.1 The resonants \*i u l r m n in System PIE

§0. The main issues concerning the resonants as phonetic items and as part of a phonological system can be summarized as follows:

<sup>633</sup> The existence of parallels of svarabhakti vowels is not restricted to Brugmann’s examples, but holds true generally for the entire data. The rest of the examples will be treated in the PIE Lexicon.

<sup>634</sup> In Later Anatolian examples like Lyc. sñta- ‘100?’ or ‘a percent?’ and Lyc. tm̄peimeh (Lc.) ‘-(?)’ (Blyk. 4:58), the syllabic nasal (PIE \*CṅC) remains unproven owing to the possibility of syncope.

(a) The existence of the consonantal resonants PIE \*ǵ l m n r ǵ in Proto-Indo-European is beyond doubt and no substantial changes are required in the traditional theory.

(b) The existence of the vocalic resonants PIE \*i ǵ m ǵ r u is equally provable, with the result that the core of the Neogrammarian theory is sound.<sup>635</sup> However, the svarabhakti vowels allegedly arising from the syllabic sonants Neogr. \*ǵ r m ǵ are comparatively paralleled, and therefore they are established to be genuine. In order to avoid generating ghost forms from Neogr. \*ǵ r m ǵ, the traditional rules must be replaced with a simpler one stating that the syllabic resonants resulted in the respective consonants after the loss of surrounding PIE \*ǵ (the principle of the regularity of sound change).

§1. The key developments of the Proto-Indo-European glides PIE \*i \*u can be summarized as follows:

(a) PIE \*i/ǵ and PIE \*u/ǵ continue in cognates with exceptions regulated by the sound laws of the languages in question.

(b) PIE \*á (Neogr. \*ǵ) assimilated with PIE \*i \*u regardless of whether PIE \*ǵ preceded or followed PIE \*á, according to the following rules:

PIE *á+i *i+á	→	RV. ī, Li. y, Gr. ī, OCS. i, etc.
PIE *á+u *u+á	→	RV. ū, Li. ū, Gr. ū, OCS. y, etc.

(c) Sturtevant's idea of a laryngeal and/or schwa being the cause of the two-syllabic scansions of Sievers's Law can be formulated with precision for the environments

PIE *ǵiV	*ǵV	*ǵuV	*ǵV.
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These rules should be adopted because counterexamples prevent Sievers's original (prosodic) explanation.

(d) In PIE \*Ki/ǵ \*Ku/ǵ, the semivowels/glides resulted in palato- and labiovelars with well-known outcomes in the cognates (see Chapter 4).

§2. The key developments of the Proto-Indo-European liquids PIE \*l/ǵ and PIE \*r/ǵ can be summarized as follows:

(a) The syllabic liquids have been preserved in Indo-Iranian, but they are generally absent in all other Indo-European languages (except for possible scanty remnants in Later Anatolian and Tocharian).

(b) The presence of PIE \*ǵ constitutes the long-sought condition of Fortunatov's Law: in the environments (V)LǵT and (V)ǵLT, the laryngeal and liquid were lost and a palatalization ensued, resulting in cerebrals in Sanskrit and Avestan §.

(c) Actual examples of the development of (C)LǵV have been preserved (e.g. in Edgerton's samples of Sievers's Law for liquids). RV. índra- indicates that no

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<sup>635</sup> Conversely, Schmitt-Brandt's (1967:48) assertion ("In der Tat besaß das Indogermanische keine silbischen Liquiden und Nasale.") is too strong. Syllabic sonants existed, but yielded only respective consonants.

svarabhakti vowel emerged, leaving the latter to be explained by means of external comparison.

(d) The neutrality of the long syllabic resonants in the environment (C)L<sub>h</sub>C is indicated by RV. √dṛś- (WbRV. 255) : Gr. √δρακ- (GEW 1:368) : OIr. √drach- (DIL. 24, LEIA A-76), in which no svarabhakti vowels emerged. Taken together, the traditional rules for the Indo-European liquids (C)LC (C)L<sub>h</sub>V (C)L<sub>h</sub>V can be replaced with a single rule.

§3. The key developments of the Proto-Indo-European nasals PIE \*m \*n can be summarized as follows:

(a) The consonantal nasals PIE \*m and PIE \*n have been preserved for the most part as such in the cognates.

(b) PIE \*ṃ and PIE \*ṅ turned into respective consonants without developing svarabhakti vowels. The situation was already understood by Brugmann in terms of the initial sequences \*mn-, \*mr-, \*ml- (with PIE \*ṃ), but the true scope of the phenomenon has become apparent only after the reconstruction of PIE \*ḥ. In the environments PIE ḥNC and PIE Cṅḥ containing PIE \*ṃ \*ṅ, the loss of the laryngeal has left PIE \*m and PIE \*n in the cognates without epenthetic vowels.

§4. For Proto-Indo-European is postulated the simplest system initially sought by the Neogrammarians:

PIE \*i/ī \*j/l \*ṃ/m \*ṅ/n \*r/r \*u/ū (System PIE).

Simultaneously, the attached sound laws are greatly simplified in the manner detailed above.

### 3.5.2 The evaluation of the Sonantentheorie

§0. Owing to the existence of the syllabic resonants PIE \*l ṛ ṃ ṅ (conditioned by position) and the goal of connecting the related Indo-European forms, the core of the Neogrammarian theory is sound. However, the decisively extended Indo-European data and the emergence of PIE \*ḥ has led to a situation where Brugmann and Osthoff's reconstructions no longer reflect the material in a consistent manner, and a transition from the Sanskrito-centric method of reconstruction of the Neogrammarians to a comparative (external) one is required. The reasons for this and related issues are briefly analyzed here.

§1. Despite their anti-Paleogrammarian tendencies in the treatment of the PIE vowel system (Neogr. \*ə ä ě ǫ ǎ vs. Paleogr. \*ā), Brugmann and Osthoff fell back into Sanskrito-centrism in their reconstruction of the syllabic sonants. This is apparent throughout the reconstruction:

(a) On the level of phonetics, Brugmann adopted the concept of svarabhakti vowel and syllabic liquids (OInd. ṛ ṝ) from the Sanskrit grammarians, importing and generalizing these for the proto-language. These preferences can be exemplified by well-known comparisons like RV. dṛś- (WbRV. 255) : Gr. δρακ- (GEW 1:368) and

their alleged prototype Neogr. \*dṛk̄-. In this postulation, a non-trivial assumption was made that Greek had developed a svarabhakti vowel Gr. α, and that the Indo-Iranian zero grade (RV. Ø) represented the original state of affairs. In so doing, Osthoff and Brugmann operated not only *ex nihilo nihil*, but in violation of the principle of postulation (Fick's Rule). The identity of the vocalisms OIr. √drach- (DIL. 24, LEIA A-76) : Gr. √δραχ- (two witnesses) properly implies Indo-Iranian as having developed a secondary syllabic resonant RV. √dṛś- after the loss of PIE \*a (= Neogr. \*ə).

(b) In terms of morphology, Sanskrito-centrism manifested in a twofold manner. First, the counterparts of the theoretical Sanskrit-roots √p̄ṛ- √t̄ṛ- were projected onto the proto-language in a vastly generalized form, not only involving liquids (Neogr. \*p̄ṛ- and \*t̄ṛ-) but nasals. Secondly, only the Sanskrit roots of the Hindu grammarians (e.g. √san-, √sā- 'win, gain, obtain') were reconstructed, meaning that the theory was incomplete from the beginning.<sup>636</sup> In order to illustrate the latter point, Brugmann's postulation of the root OInd. √san- : √sā- can be compared with Burrow's critique (1979)<sup>637</sup> and the reality of the data. In the traditional reconstruction, the morphological variation was accounted for with the following schema:

*e-grade:	zero-grade:	
Neogr. *sen- (√san-)	*sṇC (√sa ·C-)	*snV (-)
Neogr. *senə- (√sani-)	*sṇəC (√sā-)	*snəV (-)

The critical feature of the reconstruction is the assumed presence of an underlying nasal Neogr. \*n/ṇ in all forms of the root. This was never consistent with the facts, because roots without the nasal OInd. √s-, √sa- existed *de facto* outside the description of the Sanskrit grammarians.<sup>638</sup> When Brugmann excluded the forms without a nasal (or explained these by means of analogy), the theory was left without the primary roots. However, for reasons mentioned by Burrow, analogy is not an acceptable explanation.<sup>639</sup> The absence of an underlying nasal is also implied by the comparative method:

<sup>636</sup> See Brugmann (1879b:273): "Delbrück stellt diese ā-formen vb. 93 mit jātá- von jan, khātá- von khan und mātavaí von man zusammen, recurriert zur erklärang derselben auf parallelwurzeln sâ, vâ, jâ, khâ, mâ [...]."

<sup>637</sup> See Burrow (1979:24) "Another Hittite root terminating in -ḫ which has been mentioned in this connection is šanḫ- 'to strive, seek'. This Hittite verb has been connected with the Sanskrit root san- 'to win, gain, obtain' [...]."

<sup>638</sup> Burrow (1979:24) writes: "One could then assume that, on the basis of this root stem analogically produced, the form sâtaséya- is derived on the analogy of ratnadhéya. Such a history is not altogether convincing even for these forms, preserved in the Veda, set (3 sg. active aor. inj.) and sîmahî, which according to K. Hoffmann (MSS 22, pp. 26 ff.) is an optative 1 pl. mid. derived from this root."

<sup>639</sup> Burrow (1979:24) adds: "It is not possible to account for the root sâ-/s- in these forms as having arisen analogically in the manner described above. We are forced to the conclusion that the root form present in these cases is ancient and original, and if so, the same obviously applies in vâja-sâ-, etc. which are also difficult to account for otherwise. If this root was originally sâ-, then the present sanóti can be analyzed as sa-nó-ti, a fifth class formation with the reduced grade of this root."

PIE √saḥ-

Īi. śaḥ-	(vb.) ‘verlangen, etc.’ (HEG 2:820, śa-aḥ-ḥu-un [1sg])
RV. go-śá-	(a.) ‘Rinder gewinnend/verleihend’ (WbRV. 414) <sup>640</sup>
RV. kṣetra-śá-	(a.) ‘Land gewinnend’ (WbRV. 370, kṣetrasáam [sgA])
RV. paśu-ś-	(a.) ‘Vieh schenkend’ (WbRV. 796, paśuśás [sgG])
gAv. fšu-š-	(a.) ‘der Vieh in seinen Besitz bringt’ (AIWb. 1030)

PIE √saḥi-

Ved. śáy-	(ao.) ‘erlangen’ (Burrow 1979:24, set [3sg])
OInd. sāya-	(prM.) ‘erlangen, erbeuten’ (Gramm. sāyate [3sg])
RV. śata-śéya-	(n.) ‘das Erlangen hundertfachen Gutes’ (WbRV. 1375)
Īi. śaḥiški-	(vb.iter.) ‘suchen, verlangen’ (HHand. 142)
Arm. haiçe-	(vb.) ‘suchen, verlangen, bitten’ (ArmGr. 418)

PIE √saḥn-

RV. sasán-	(pf.) ‘erlangen’ (WbRV. 1466, sasána [3sg])
RV. sanó-	(vb.) ‘erlangen, erbeuten, gewinnen’ (WbRV. 1465)
Att. ἄνύ-	(pr.) ‘zustande bringen, vollenden’ (GEW 1:115)
Att. ἄνύω	(pr.) ‘zustande bringen, vollenden’ (GEW 1:115)

PIE √saḥt-

RV. sātá-	(pt.) ‘gewonnen’ (KEWA 3:428)
RV. gó-śāti-	(f.) ‘Erlangung von Rindern’ (WbRV. 414)
OCS. po-sěti-	(vb.) ‘heim-, besuchen, sehen nach’ (Sadnik √800)
OCS. pri-sěti-	(vb.) ‘besuchen’ (Sadnik √800, prisětiti [inf.]) <sup>641</sup>
RV. sātu-	(m.) ‘der empfangende Mutterleib’ (WbRV. 1508)
OCS. po-sětova-	(vb.) ‘besuchen, freien’ (Sadnik √800)

(c) At the grammatical level, Brugmann assumed that the Sanskrit paradigms directly reflected those of the proto-language. Therefore, according to him, the alternation of paradigms like RV. han-ti : RV. ha-tha had to contain a common deep-level root. Brugmann’s (1879c:287) structural mode of reasoning is illustrated by the following quote:

“Ich gehe von einem meines erachtens ganz sicheren fall aus. Dass das praesens badhnáti ‘bindet’ sich zum perfect babándha ebenso verhält wie mṛdhnáti zu mamárda, tṛpnóti zu tatárpa, dhṛṣṇóti zu dadhárṣa und demgemäss auf ein \*bṛdhnáti zurückzuführen ist, wird wol niemand bestreiten, der die entstehung von tatá- aus \*tṛtá- u. s. w. zugibt.”

<sup>640</sup> Burrow’s (1979:24) skepticism (“It is more difficult to see how the root stem -sā- (in vāja-sá- and śata-sá-, nom. sg. vājasáḥ, śatasáḥ, acc. sg. vājasám) could be derived from such a base [= \*sṇH-].”) is completely justified: Īi. śaḥ- = RV. sa’-, śá-.

<sup>641</sup> The theoretical derivation referred to by Burrow is falsified by OCS. √sět- from PIE \*saḥēt- without a nasal. See Burrow (1979:24): “From such a base the participle sātá- and the action noun sāti- could be easily derived as representing \*sṇHto- and \*sṇHti-.”



Despite this, owing to the enriched data, Brugmann’s internal reconstructions have now been cast into doubt. As a rule, when external parallels are available, the nasal is also absent. Thus, there is no nasal in:

Ḥi. badan-	(GIŠn.) ‘Tablett aus Rohr, Korb, Sieb’ (CHD P:241f.)
AV. badhná-	(pr.) ‘binden an/mit [L]’ (WbRV. 897, badhnāmi [1sg])

Identically, the short root form RV. √ha- did not contain the nasal that is present in RV. √han- (= Ḥi. guen-), because the vowel reflects PIE \*e:

Ḥi. gue-	(vb.) ‘(er)schlagen, töten’ (HEG 1:604-5, ku-e-mi/-ši)
RV. ha-	(pr.) ‘(er)schlagen, töten’ (WbRV. 1642, hathás, hatás)
gAv. ja-	(vb.) ‘schlagen, töten’ (AIWb. 603, jaidyāi [inf.]).

In this regard, one should mention the questionable part played by analogy in Brugmann’s (1879c:290) thought:

“In wurzeln wie bhandh ‘binden’, skand ‘steigen’ u.a. ist der nasal, nach allem, was wir wissen, ein ebenso *wesentlicher* bestandtheil wie das r in wurzeln wie dark ‘sehen’, vart ‘wenden’ u. s. w. Wenn er fehlt, so ist er entweder auf *lautgesetzlichem* weg geschwunden, wie in badhnāti und baddhá-, oder es hat eine *neubildung nach der analogie von unnasalirten wurzeln* stattgefunden, wie bei bedhús nach šekús und áhnl.”

However, yet a third explanation is possible, which is not based on sound laws or analogy (the two privileged agendas of the Neogrammarians). This is the Proto-Indo-European derivation, now externally confirmed as the true cause of the difference RV. ha- : han- = Ḥi. gue- : guen- and other similar alternations.

§2. As a second factor contributing to the problems of the Sonantentheorie, it is necessary to mention the incompleteness of the Neogrammarian data, sound law system and phoneme inventory. In terms of these vulnerabilities, the following may be observed:

(a) Regarding the data used by the Neogrammarians:

1. Brugmann did not use all of the available data in his theory formation, which left the theory incomplete. Using the concurrent Sanskrit-centric (internal) approach had consequences, because multiple alleged svarabhakti vowels of the individual subgroups (Baltic, Celtic, etc.) could have been externally confirmed from the beginning. As an example, one may cite Brugmann (1879b:276):

“Dagegen haben wir an den verwandten sprachen für ā-wurzeln keinen irgend genügenden anhalt bei sā, ferner bei jā in jātá-, jāyáte, jā- (kind, geschöpf), bei tā in tāyáte und bei dem oben noch nicht genannten ghā- in ghātá- adj. ‘schlagend’, subst. m. ‘schlag, tödtung’ neben hānti hatá- hatyā-. Hier ist vorsicht geboten und zuzusehen, ob die differenz nicht erst auf dem einzelsprachlichen gebiet entstanden ist.”

Against this analysis, the roots in question were actually attested already in the traditional material, as revealed by the following examples:

OInd. ghāta-	(m.) ‘Schlag, Tötung, Vernichtung’ (MonWil. 377)
YV. go ghātá-	(m.) ‘Kuh-töter’ (EWA 2:800)

OInd. ghātaya-	(cs.) ‘töten lassen, töten’ (KEWA 3:576)
Gr. πέφθο-	(pf.fut.P.) ‘töten’ (GEW 1:657, πεφθησεται)

and

OIcl. guḑ-	(f.) ‘Kampf’ (ANEtWb. 195)
RV. sam·hát-	(f.) ‘die Schicht’ (WbRV. 1440)
RV. hatá-	(pf.) ‘geschlagen, getötet, erschlagen’ (WbRV. 1646)
LAv. jāta-	(pf.pt.) ‘geschlagen, getötet’ (AIWb. 602)

Thus there were already defects in the Neogrammarian theory before the Old Anatolian and/or Tocharian data appeared. Accounting only for an incomplete set of items with abstract prototypes rather than actual parallels (Do. √φατ-, OIcl. √gut-), the theory was a gamble.

2. Though it would be inappropriate to criticize the Neogrammarians for not using data that was unavailable to them, it should be noted that the contrast between the abstractness of the Neogrammarian reconstruction and the concreteness of the data has considerably increased since the emergence of Old Anatolian and Tocharian. Neither group has a tendency to characteristic svarabhakti vowels, and in particular Tocharian preserves synchronically numerous alternative vowels:

PIE \*k̑eaḡ-/\*k̑oaḡ- ‘decem, centum’ (P. 191-192)

PIE \*k̑eaḡ-/\*k̑oaḡ-

Gr. δέ·χα-	(n.) ‘zehn’ (GEW 1:359, δέκα)
RV. dá·śa-	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, dáśa [NA])
TochB. śa·k	(num.) ‘ten : zehn’ (DTochB. 619, śak [N])
Arc. δέ·χο-	(n.) ‘zehn’ (Grundr <sup>2</sup> 1:406)
RV. dá·śā-	(n.) ‘zehn’ (WbRV. 582, daśānām, BRUGMANN II)

PIE \*k̑aḡimt-

Li. šimta-	(m.) ‘centum’ (LiEtWb. 984, šimtas [sgN])
OCS. de·seṭī	(num.) ‘zehn, Dekade’ (Sadnik √139)
TochA. taryā·kiñci-	(num.ord.) ‘tricesimus’ (Poucha 116)

PIE \*k̑eaḡnt-/\*k̑oaḡnt-

TochB. kante-	(num.) ‘centum’ (MA. 405, DTochB. 139)
Gr. τριά·κοντα	(num.) ‘dreissig’ (LSJ. 1815, Schwyzer, GrGr. 1:592)
Gr. ἴ·κωντι-	(num.) ‘20’ (Schwyzer, GrGr. 1:591, ἴκωντι)

PIE \*k̑eaḡto-, \*k̑oaḡto-

RV. śatá-	(num.n.) ‘hundert’ (WbRV. 1372, śatá [NA])
Gr. ἑ·κατό-	(num.n.) ‘hundert’ (GEW 1:475)
Arc. ἑ·κοτό-	(num.n.) ‘hundert’ (Schwyzer, GrGr. 1:592, ἑκοτόν)
Aiol. δέ·κοτο-	(ord.) ‘der zehnte’ (GEW 1:359)
TochA. kät-	(num.card.) ‘centum’ (Poucha 66-7, kät [316 b 7])

The identities of the svarabhakti vowels Toch.  $\sqrt{kint-} = \sqrt{Li. \text{šim̃t-}}$ , Toch.  $\sqrt{kant-} = \text{Gr. } \sqrt{\lambda\alpha\nu\tau-}$ , Toch.  $\sqrt{kät-} = \text{RV. } \sqrt{\acute{s}at-}$  are decisive, leaving one to wonder whether the theory would never have been suggested had Brugmann had the Tocharian data at his disposal.

(b) By and large the incompleteness of the Neogrammarian sound law system was caused by the absence of PIE  $*h_1$ , and there is little point in criticizing the pioneers for that. However, the Neogrammarians overproduced sound laws by setting forth abstract underlying forms for derivations in examples like

Neogr.  $*p_r^tV-$  ( $\equiv$  LT  $*p_rHV$ ) → OInd. pur- ‘forth’

without first checking the possibility of an external (comparative) match (i.e. common Indo-European vowels traced back to Proto-Indo-European). Had this been done, the more economical solution<sup>642</sup> might have emerged a century earlier through such correspondences as the following:

PIE  $\sqrt{pur-}$  ‘vor, für, usw.’

Go. faur	(adv.prep.) ‘vor, für’ (GoEtD. 110)
Umbr. pur ·doui-	(vb.) ‘porricitō’ (WbOU. 612, purdouitu [3sg])
ModPers. pul-	(sb.) ‘Brücke’ (Güntert 1916:95)
RV. purá	(adv.) ‘früher, zuvor, usw.’ (WbRV. 826)
LAv. pao <sup>1</sup> rya	(adv.) ‘zu Anfang (der ersten Welt)’ (AIWb. 874)
Go. faurþis	(adv.) ‘πρῶτον, πρότερον before, earlier’ (GoEtD. 112)
TochA. purcomo-	(a.) ‘primus, optimus’ (Poucha 201)

(c) The incompleteness of the traditional phoneme inventory was perhaps not sufficiently understood by Brugmann and Osthoff, the key theoreticians. Saussure’s segmental analysis Neogr.  $*ā \equiv eA$  and Møller’s guttural interpretation of  $*A$ , though admittedly not adequately formulated, were revolutionary indeed. Unfortunately, Saussure and Møller were not rewarded with a proper response (i.e. positive attempts to develop the ablaut theory of Neogr.  $*ə$  a  $\bar{a}$  and to check the possibility of the existence of a segmental laryngeal Neogr.  $*h$ ). Had the Neogrammarians studied the ideas more fully, they might have been able to eliminate some of Saussure’s and Møller’s early mistakes before the appearance of the first interpretations of Old Anatolian.

§3. As a final problem, I would like to discuss the so-called (absolute) uniform hypothesis shared by several proponents of the Neogrammarian theory.

(a) As mentioned by Dyen (1969:502), Brugmann supported the (absolute) uniform hypothesis:

“Brugmann did regard the Ursprache as having a relatively high degree of uniformity, if one is to judge by the following (1897:22): ‘In der früheren, engeren Urheimat mögen die

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<sup>642</sup> Campbell (2004:133) writes: “What is meant by the criterion of economy is that when multiple alternatives are available, the one which requires the fewest independent changes is most likely to be right.”

Indogermanen eine Sprache geredet haben, die noch etwa in dem Sinne einheitlich war, in dem wir heute eine deutsche Mundart wie die bairische als eine Einheit bezeichnen’.<sup>643</sup>

The typology of the modern Indo-European languages (and their dialectal variation) as the model of the reconstruction of the proto-language is recognizably present in the Neogrammarian theory of syllabic sonants. In practice, a single (uniform) prototype was assumed for a meaning (e.g. ‘100’) and the sound laws were postulated from this (absolute) uniform starting point, according to the pattern:

Neogr. \* $\hat{k}m\tau o$ - → RV. śatá-, Li. šimta-, Lat. cento-, Gr. ἑκατό-, Go. hunda, ...

Simultaneously, the incompatible surplus was explained as dialectal variation, in this case represented by the Slavonic stem

OCS. sŭto- (num.) ‘hundert’ (Sadnik 917, sŭto [sgNA]).<sup>644</sup>

(b) This absolute uniformity negatively affected the acceptability of the Neogrammarian theory<sup>645</sup> for reasons neatly detailed by Twaddell (1948:139):

“The [...] purpose of reconstruction is to establish a single formula which can be regarded as a starting point for subsequent evolutions. This purpose involves necessarily an emphasis on maximum simplicity and an intentional neglect of non-uniformities.”

Concerning this situation, Burrow (1949:32) has the following to say:

“[...] a few examples are sufficient to illustrate, on the one hand, the very great variability of the Indo-European languages in the matter of word-formation, and on the other hand the fact that this feature is frequently not given adequate attention by comparativists.”

Thus, according to Burrow’s (1949:32) interpretation:

“There has been an error of method in conceiving of the Indo-European parent language as a single and united form of speech after the manner of Latin. Attempts to reconstruct this single original have frequently resulted in violence being done to the facts of the individual languages.”

Burrow (1949:32) concludes:

“The truth is that at no period which can be reached by comparison is such a simplified state of affairs to be found. The evidence points rather to a continuum of varying dialects of the same language, manifesting differences in the matter of morphology which are often very considerable.”

The more material that emerges, the easier it is to agree with Nyman (1978:39):

“To quote Hall (1960:203): ‘Ever since the beginning of the comparative method, it has been evident that [...] every proto-language has to be reconstructed as non-uniform, i.e. showing dialectal variations’.”

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<sup>643</sup> See also Brugmann (1904:503).

<sup>644</sup> See Brugmann (Grundr<sup>2</sup> 1:415): “Die Ansicht von Meillet Mém. 8,236, dass im Slav. auch ŭ Vertreter von uridg. Nasalis sonans sei, z. B. in sŭto ‘hundert’ halte ich für verfehlt.”

<sup>645</sup> See especially Katičić (1970:116): “It was the absolute unity of the proto-language that was for many linguists and historians difficult to accept.”

(c) In a further criticism of the absolute uniform hypothesis, note the remarks of Dyen (1969:506):

“Not only does the [absolute] uniformity assumption specify a characteristic not found in normal observed languages, but interestingly enough it also contradicts the results obtained by the comparative method, for the application of the comparative method does not necessarily produce a uniform protolanguage.”

The existence of variation was naturally understood also by Brugmann (1879b:274), according to whom it could be tolerated, if strictly based on comparison:

“Bei dem gegenwärtigen stand der vergleichenden sprachwissenschaft kommen wir vielfach über den ansatz von parallelwurzeln nicht hinaus. Wir finden oft formationen nebeneinander, deren wurzeltheile offenkundig etymologisch nahe verwandt sind und doch lautlich nicht zu einer einheitlichen form combinirt werden können. Indess nur dann sollte man von parallel wurzeln reden, wenn die verschiedenheit der nicht zu trennenden kernhaften worttheile sich schon als eine urindogermanische herausstellt.”

In other words, the uniform hypothesis is sustainable in its non-absolute form allowing variation when implied by two witnesses (Fick’s rule).<sup>646</sup> The over-strong hypothesis of absolute uniformity of the proto-language can be avoided and variation meaningfully dealt with; the absolute uniformity of correspondences is upheld, but as many correspondences are postulated as the comparative method demands.

(d) With the enriched data at our disposal, Indo-European linguistics now has the opportunity to shift from absolute uniformity to the real parent language with derivational diversity. The difference between the two approaches can be illustrated with the modern counterpart of the Neogrammarian reconstruction, in which the following derivational variants (confirmed by two witnesses) are implied by the comparative method:

PIE \**kaḥ*- ‘10, 100’

PIE \**keah*-, \**koah*-

Gr. δέκα-	(n.) ‘zehn’ (GEW 1:359, δέκα)
RV. dáśa-	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, dáśa [NA])
Arc. δέκα-	(n.) ‘zehn’ (Grundr <sup>2</sup> 1:406)
RV. dáśā-	(n.) ‘zehn’ (WbRV. 582, dáśānām, BRUGMANN II)

PIE \**keahiNt*-

OPr. dešimto-	(num.) ‘zehn’ (APrS. 320, dessimton)
OLi. dešimtī-	(num.) ‘Dekade, zehn’ (LiEtWb. 91, dēšimtīs [sgN])
OCS. dešetī	(num.) ‘zehn, Dekade’ (Sadnik v139)
TochA. taryākiñci-	(num.ord.) ‘tricesimus’ (Poucha 116)

<sup>646</sup> Compare Katičić (1970:117): “What we want to stress here is that by reconstructing a proto-language nothing is said about [...] how much variety is encompassed by its unity.”

PIE \**keah̥nt-* \**koah̥nt-*

Bret. kant-	(num.) ‘hundert’ (WH 1:201, kant)
Cymr. cant-	(num.) ‘centum’ (WH 1:201, cant)
TochA. kánt-	(num.card.) ‘centum’ (Poucha 66-7)
Gr. ἴκαντι-	(num.) ‘20’ (Schwyzer, GrGr. 1:591)
Gr. τριάκοντα	(num.) ‘dreissig’ (LSJ. 1815, Schwyzer, GrGr. 1:592)

PIE \**keah̥t-* \**koah̥t-*

RV. śatá-	(num.n.) ‘hundert’ (WbRV. 1372, śatá [NA])
TochA. kät-	(num.card.) ‘centum’ (Poucha 66-7, kät [316 b 7])
Gr. ἑκατό-	(num.n.) ‘hundert’ (GEW 1:475)
Arc. ἑκοτό-	(num.n.) ‘hundert’ (Schwyzer, GrGr. 1:592, ἑκοτόν)
Aiol. δέκοτο-	(ord.) ‘der zehnte’ (GEW 1:359)
Att. εἴκοσι-	(num.) ‘20’ (GEW 1:453)
Aiol. εἴκοσι-	(num.) ‘20’ (GEW 1:453)
RV. śāta ·vaneya-	(a.) ‘zum Geschlecht des ś. gehörig’ (WbRV. 1391)

PIE \**kaḥun-*

Go. tai ·hun-	(num.card.) ‘= δέκα : ten’ (GoEtD. 339)
Arm. ere ·sun-	(num.) ‘dreissig’ (ArmGr. 1:491)
Arm. k’afa ·sun-	(num.) ‘40’ (ArmGr. 1:491)
Go. hunda	(n.pl.) ‘hundert’ (GoEtD. 194-5)
Go. taihunda	(num.ord.) ‘tenth’ (GoEtD. 339)

PIE \**kaḥut-*

OCS. sŭto	(num.) ‘hundert’ (Sadnik 917, sŭto [sgNA])
OCS. sŭtīnŭ	(a.num.m.) ‘der hundertste’ (Sadnik 917)
RV. śutu ·drī-	( <sup>1D</sup> f.) ‘Fluss im Fünfstromland’ (WbRV. 1403) <sup>647</sup>

In terms of the reconstruction, it is important to note that:

1. All nodes of the matrix are supported by at least by two witnesses, due to which their reconstruction for the proto-language is legitimate and based on the comparative method, also according to Brugmann’s more moderate view.

2. The nodes of the matrix (or isoglosses) do not appear in the axis of ‘regular vs. dialectal’ but in that of derivational variation. In the traditional theory, OCS. sŭto- was considered dialectal because the form could not be derived from syllabic sonants. Due to the parallel (RV. śutu ·drī-), this situation has now changed. Since there is no ‘Indo-Slavic’ dialect but an Indo-Slavic isogloss, this type of variation is best referred to as *derivational*.<sup>648</sup>

<sup>647</sup> As pointed out by Mayrhofer (EWA 2:646), the forms RV. śutu ·drī- and OInd. śata ·drū- refer to the same river, implying RV. śutu- = RV. śata- ‘hundred’.

<sup>648</sup> In my opinion, we are able to infer more than Dyen’s (1969:506) observation: “In cases like these [...] the comparative method [...] shows us irreconcilably different forms, whose relation as alternants or as dialectal variants, it does not reveal.”

3. All nodes of the matrix (isoglosses) are perfectly regular and uniform. The comparative method implies reconstructions for the root PIE  $\sqrt{\text{ka}}\text{h}$ - and its derivatives PIE  $\sqrt{\text{ka}}\text{h}\cdot\text{imt}$ -,  $\sqrt{\text{ka}}\text{h}\cdot\text{nt}$ -  $\sqrt{\text{ka}}\text{h}\cdot\text{t}$ -,  $\sqrt{\text{ka}}\text{h}\cdot\text{un}$ - and  $\sqrt{\text{ka}}\text{h}\cdot\text{ut}$ -. Consequently, the comparative method accounts for the derivational diversity in a manner that has already been noted by the leading root theoreticians like Persson and Walde. In this way, it should further be noted, the comparative method also postulates the explicit structure of the proto-language, allowing its study in the future.<sup>649</sup>

§4. The following general remarks and recommendations are critical for the theory of syllabic sonants:

(a) Due to the existence of the syllabic sonants PIE  $*\text{m}\ \text{n}\ \text{l}\ \text{r}$  and the overall goal of explaining the links between the etymologically connected Indo-European data, the substance of the Neogrammarian theory and etymology remains largely unchanged. The traditional sound laws concerning the outcomes of Neogr.  $*\text{m}\ \text{n}\ \text{l}\ \text{r}$  are no longer in harmony with the environment PIE  $*\text{h}$ , implying consonantal outcomes /m/ /n/ /l/ /r/ in the Indo-European languages. In particular, the svarabhakti vowels are externally paralleled and ultimately caused by morphological variation (derivation) of the proto-language.

(b) The absolute uniform view of the structure of the proto-language should be replaced with a more realist view that allows for a derivational variation of Proto-Indo-European as implied by the comparative method. The comparative method accounts for variation and indicates the relative positions of the roots and their extensions, thus providing a stable platform for the classification and presentation of the data. In this regard, owing to the requirements of the data, a shift from the mostly biliteral Neogrammarian roots to the monoliteral ones will be necessary.

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<sup>649</sup> Thus it is possible to avoid the criticism mentioned by Katičić (1970:146): “Traditional comparative linguistics has often been criticized as foreign to the fundamental idea of structure its main interest being concentrated on the comparison of the isolated words and forms.”





## 4 PIE \*h and the PIE obstruent system

### 4.1 Introduction

§0. The Proto-Indo-European obstruent system consists of plosives and fricatives, which are discussed and analyzed in this chapter. Except for the absence of PIE \*h and a generally exaggerated fricative system, the Neogrammarian proto-phoneme system is correctly postulated and suitable as the starting point of the comparative reconstruction as such.

#### 4.1.1 The Neogrammarian obstruent inventory

§0. The Neogrammarian obstruent system can be approached through the natural classification of the phonemes postulated.

§1. In its full form, the Neogrammarian plosive system consisted of twenty phonemes:

	1.	2.	3.	4.	5.
	–	–	–	–	–
I	*p	*t	*k	*k <sup>u</sup>	*k̂
II	*ph	*th	*kh	*k <sup>u</sup> h	*k̂h
III	*b	*d	*g	*g <sup>u</sup>	*ĝ
IV	*bh	*dh	*gh	*g <sup>u</sup> h	*ĝh

The problems of the plosive system are divided into two subsets:

(a) Columns 1–3 represent the so-called ‘Decem-Taihun isogloss’, reflecting the problem of the four manners of articulation (the series T : Th : D : Dh) in the proto-language.

(b) Columns 3–5 represent the so-called ‘Centum-Satem isogloss’, representing the problem of the three velar places of articulation (the series K : K<sup>i</sup> : K<sup>u</sup>) in the proto-language.

§2. The Neogrammarian system of fricatives consisted of two main categories, sibilants (Neogr. \*s sh z zh) and thorn (Neogr. \*p̃ ph̃ ð̃ ð̃h̃), but lacked the definitively established laryngeal implied by H̃i. h̃ and indirect features in the rest of the cognates.

#### 4.1.2 Neogr. \*T Th D Dh (Decem-Taihun isogloss)

§0. The term Decem-Taihun isogloss<sup>650</sup> refers to a division of Indo-European languages: the Taihun group, which went through a sound shift of the system Neogr.

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<sup>650</sup> For the coining of the term, see Hopper 1981.

\*T : Th : D : Dh (Germanic and Armenian), and the Decem group, which did not undergo that shift.

§1. The Germanic sound shift (‘Lautverschiebung’, otherwise known as Grimm’s Law) was in essence grasped already by Rask (1818), except for PIE \*b (for which he lacked examples)<sup>651</sup> and for the series Th,<sup>652</sup> which would be discovered later on (Szemerényi 1996:55). In its full form, the Germanic sound shift stands as follows:

Labials		Dentals		Velars	
	–		–		
*p	→ f	*t	→ þ	*k	→ h
*ph	→ f	*th	→ þ	*kh	→ h
*b	→ p	*d	→ t	*g	→ k
*bh	→ b	*dh	→ d	*gh	→ g

§2. Exceptionally, the sound law itself is generally unproblematic, while the term used for it is not:

(a) The term ‘sound shift’ was coined before Grassmann’s classical demonstration of the existence of the fourth series Th (tenuis aspiratae). Owing to the collision of the series T and Th, both yielding Proto-Germanic \*f þ χ, the sound change was no longer a proper shift (unlike, for instance, the Old High German sound shift) (Szemerényi 1996:55).

(b) On the other hand, the alternative term ‘Grimm’s Law’ was already criticized by Pedersen, who considered it Rask’s Law, a view that has recently gained greater traction.<sup>653</sup> Thus, according to Fox (1995:21): “The term [Grimm’s Law] itself is a misnomer, as Grimm was certainly not the discoverer of this law; predecessors, especially Rasmus Rask, deserve much of the credit for its discovery.” Similarly Collinge (1995:28) writes: “The dependence of Grimm on Rask in phonology (the 1822 version of the first volume of Grimm’s grammar was revised by 596 Rask-inspired pages) led Pedersen to suggest that the law be suitably renamed (Pedersen 1916:59). Support came from Jespersen.”

§3. In Armenian, a very similar but more complete shift took place:

Labials		Dentals		Velars	
	–		–		
*p	→ Ø/v	*t	→ Ø/tʰ	*k	→ kʰ
*ph	→ pʰ	*th	→ tʰ	*kh	→ x
*b	→ p	*d	→ t	*g	→ k
*bh	→ b	*dh	→ d	*gh	→ g

<sup>651</sup> The gap left by Rask regarding \*b was immediately filled by Jakob Bredsdorff (1821:21-22). See Collinge (1985:63) for details.

<sup>652</sup> The series Th was proven by Grassmann in 1863.

<sup>653</sup> As reported by Collinge (1985:64), “Pedersen (PedS 261) saw no progress [in Grimm 1822] over Rask’s results, and less insight.”

§4. Other cognates, not having gone through a similar shift, are called Decem languages (except for Tocharian and Anatolian, which in my opinion are better left outside the isogloss).

§5. In Tocharian the oppositions of voice and aspiration, manifested in the series T : Th : D : Dh, were lost altogether. The unique development of Tocharian makes it a merger group of its own rather than a Decem or a Taihun language. In particular, ‘Taihun language’ would be a misnomer, because despite the common developments Dh → D and \*D → T, the series T did not ‘shift’ (unlike in Germanic and Armenian).

§6. Concerning the Anatolian group, one should note the following:

(a) The oppositions T : Th : D : Dh were not marked in Old Anatolian cuneiform and hieroglyphic script, as a result of which our knowledge of the developments of the four original series depend on external comparisons.<sup>654</sup>

(b) In Later Anatolian, especially in Lycian and in Lydian, there are obstruents based on an identical place of articulation but alternating in terms of voice (e.g. Lyd. f : Lyd. b). It is likely, therefore, that at least some of the oppositions T : Th : D : Dh were also preserved in Old Anatolian, which in the absence of any real distinctions should not be identified with Tocharian.<sup>655</sup>

(c) In Hittite, two reflexes of palatalized dentals appear, namely Ḫi. š (e.g. in Ḫi. šiu- ‘god’) and Ḫi. z (e.g. in Ḫi. zaḫ-). The two outcomes can only be understood if there was a difference between voiceless and voiced stops in Old Anatolian (i.e. Ḫi. š ← \*t(h)ḫ and Ḫi. z ← \*d(h)ḫ).<sup>656</sup>

### 4.1.3 Neogr. \*K : K<sup>l</sup> : K<sup>u</sup> (Centum-Satem isogloss)

§0. The definition of the Centum-Satem isogloss is twofold:

(a) The series Neogr. \*k̂ ḡ ḡh resulted in palatals in the Satem group (the first palatalization), but collided with the plain velars Neogr. \*k g gh in the Centum group.

(b) The series Neogr. \*k<sup>u</sup> g<sup>u</sup> g<sup>u</sup>h was continued in the Centum group with well-known subsequent developments, but the labial component was neutralized in the Satem group, resulting in a collision with the series Neogr. \*k g gh (plain velars).

§1. Though the traditional theory has prevailed for over a century, there is now relevant new data and interpretations. Accordingly, the problem is dealt with in a separate chapter below.

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<sup>654</sup> Against Sturtevant’s geminate rule, see Kronasser (EHS 1:13-18) with counterexamples such as Ḫi. me-ek-ki : RV. mahi-, etc.

<sup>655</sup> Similarly, most of the oppositions were not marked in Linear B and in Cyprian syllabary (Buck 1955:210), but this does not justify inferring that they had been lost in the respective languages.

<sup>656</sup> The endings Hi. -zi [3sg] and Hi. -nzi [3pl] would, therefore, imply Neogr. \*-dhi and \*-ndhi. This can be backed by the material, since in the singular both voiceless and voiced endings appear in OIr. -t and OIr. d. Similarly, voiceless endings appear for the plural in Greek, as pointed out by Grassmann (1863:103): “die boot. endung -ωνθι neben -ουσι, dor. -ωντι, z. b. ἐξωνθι [...]”, with the voice confirmed by Go. -nd [3pl].

## 4.2 Theories of the four plosive series T Th D Dh

§0. In order to explain the four plosive series of Proto-Indo-European (or the Decem-Taihun isogloss), four theories have emerged:

- (a) The Neogrammarian (or ‘traditional’) theory with T : Th : D : Dh.
- (b) The root constraint theory of Meillet and Magnusson.
- (c) The laryngeal theory with three series T : D : Dh.
- (d) The glottalic theory, a revised laryngeal theory with three series T<sup>(h)</sup> : T<sup>ˀ</sup> : D<sup>(h)</sup>.

In this chapter, the theories are evaluated against the data.

### 4.2.1 Neogrammarian system T Th D Dh

§0. The comparative work of the Neogrammarian school resulted in the classical reconstruction of the plosive system (Szemerényi 1996:54-56):

*p	*t	*k	(tenues)
*ph	*th	*kh	(tenues aspiratae)
*b	*d	*g	(mediae)
*bh	*dh	*gh	(mediae aspiratae)

§1. The Neogrammarian plosive system distinguishes between three places of articulation (labial, dental and velar) and four manners of articulation: tenues (T), tenues aspiratae (Th), mediae (D) and mediae aspiratae (Dh).

§2. The Neogrammarian reconstruction is comparative (obtained through external comparison) and complete (no further items exist). Therefore, it is acceptable as the basis for further analysis and reconstruction.

### 4.2.2 Meillet’s and Magnusson’s root constraint theory

§0. Based on observations of the existing Proto-Indo-European root shapes, Meillet (1937:173-4)<sup>657</sup> presented a theory of root constraints that applies to roots with two successive plosives T—T.

§1. According to Meillet, the following root shapes were allowed in the proto-language:

T—T	T—D	D—T
Dh—Dh	D—Dh	Dh—D

§2. In contrast, according to Meillet, the following root shapes were non-existent:

T—Dh	D—D	Dh—T
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<sup>657</sup> For Meillet’s root constraints with a discussion, see Szemerényi (1996:99-100) and Mayrhofer (1986:95n19).

Regarding the root constraints, one should note the following additional conditions:

§3. Vaan (1999:1) writes: “The [...] combination [T—Dh] is admitted if preceded by #s- (s mobile included), for instance \*steigh-.”<sup>658</sup>

§4. Miller (1977a:367) adds: “[...] the constraint applies only to morphemes and not to whole words (cf. \*gher+to- ‘milk butter’ (Pokorny 446), \*bhr̥+tí- ‘(act of) carrying’ (Pokorny 128), etc.).”<sup>659</sup>

§5. In his article *Complementary Distributions among the Root Patterns of Proto-Indo-European*, Magnusson (1967:19) further develops Meillet’s root constraints, first excluding ‘pure patterns’ (roots with two successive plosives belonging to the same series):

T—T            :            (D—D)            :            Dh—Dh.

§6. After this, Magnusson (1967: 24-5) states that roots with D (= Neogr. \*b d g ĝ g<sup>u</sup>) are in complementary distribution, because the two unattested root shapes T—Dh and Dh—T can be used to derive existing patterns, according to the schemata:

T—D            ←            (T—Dh)            →            D—Dh  
D—T            ←            (Dh—T)            →            Dh—D

As pointed out by Magnusson (1967:19), in this framework “one may explain all 2-occludent patterns in terms of only two original occludent series [i.e. T and Dh]”.<sup>660</sup>

§7. Despite the partial success of Meillet and Magnusson, the theory is incomplete (it applies to roots with two successive plosives only) and outdated in terms of the segmental laryngeal now reconstructed for Proto-Indo-European.

### 4.2.3 The typology T D Dh of the laryngeal theory

§0. Saussure’s early segmental analysis Neogr. \*th = t+A (1891) was generalized by Kuryłowicz (1935:46) for the series tenues aspiratae as a whole (= T+h<sub>2</sub>), a move which ultimately led to the elimination of the series in the laryngeal theory by Lehmann (1952).

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<sup>658</sup> If this rule is accepted, its converse must apply as well (i.e. the shape sT—D does not imply sT—Dh).

<sup>659</sup> Conversely, if the root is of the shape T—Dh, it must contain an affix. Accordingly, gAv. frad- and Gr. πληθ- are affixed derivatives of the root √pl- ‘fill’. For counterexamples, see Miller (1976: 59).

<sup>660</sup> Immediately after this correct generalization, Magnusson presents a chain of fallacious inferences summarized by Miller (1976) as follows: “Magnusson arbitrarily arranges IE stops in the following hierarchy (weakest to strongest): labiovelars – dentals – palatals – labials.” (1976:55); “[...] the strength assignments are arbitrary, and all of these rules are impossible.” (1976:57); “Magnusson’s theory fails to distinguish accidental gaps from genuine constraints, and quasi-complementary distributions in roots that appear for reasons that obviously have nothing to do with ‘hierarchies’.” (1976:58); “If anything, [Magnusson] has muddled the issue with a more arbitrary and typologically dubious solution [...]” (1976:60). See also Mayrhofer (1986:105fn42). It is abundantly clear that there is no need to discuss Magnusson’s errors any further, and I will restrict the treatment here to his correct initial observation and its consequences.

§1. In the mainstream laryngeal theory, the elimination of the *tenuis aspiratae* has led to the replacement of the four series of the Neogrammarians with three series, as indicated in:

*p	*t	*k	( <i>tenuis</i> )
*b	*d	*g	( <i>mediae</i> )
*bh	*dh	*gh	( <i>mediae aspiratae</i> )

§2. Soon after Lehmann's proposal, Jakobson (1958:23) declared the laryngealist remodeling to be typologically deviant:

“To my knowledge no language adds to the pair /t/ – /d/ a voiced aspirate /d<sup>h</sup>/ without having its voiceless counterpart /t<sup>h</sup>/, while /t/, /d/, and /t<sup>h</sup>/ frequently occur without the comparatively rare /d<sup>h</sup>/, and such stratification is easily explainable (cf. Jakobson-Halle); therefore theories operating with the three phonemes /t/ – /d/ – /d<sup>h</sup>/ in Proto-IE must reconsider the question of their phonemic essence.”<sup>661</sup>

In connection with his demand for typological realism, Jakobson interpreted<sup>662</sup> the laryngealist plosive system as questionable.<sup>663</sup>

#### 4.2.4 The glottalic theory (Gamkrelidze and Ivanov)

§0. Hopper (1973) and Gamkrelidze & Ivanov (1973) reacted to Jakobson's challenge with a new typological proposal, namely the existence of ejective stops in (Pre-)Proto-Indo-European. The slightly different ejective models, which nonetheless share common hypotheses,<sup>664</sup> are now called the glottalic theory.<sup>665</sup>

§1. To avoid the problem of a deviant system with three series, the ejective model of Gamkrelidze and Ivanov (1973 = GI)<sup>666</sup> attempts the following successive steps:<sup>667</sup>

(a) The voiced (unaspirated) stops D<sup>668</sup> were replaced with a series of glottalized (ejective) stops T'.

<sup>661</sup> For a discussion of 'Jakobson's Universal', see Barrack (2003:1-2).

<sup>662</sup> See Jakobson (1958:23): “A conflict between the reconstructed state of a language and the general laws which typology discovers makes the reconstruction questionable.”

<sup>663</sup> Against Jakobson's typology, it should be now noted that there are some languages that actually contain the three series T : D : Dh (see Mayrhofer 1986:93fn14).

<sup>664</sup> For a summary of various ejective models, see Collinge (1985:260).

<sup>665</sup> For the glottalic theory, see Hopper 1973, Gamkrelidze & Ivanov 1973 and 1995, Szemerényi (1996:151-3) and Mayrhofer (1986:92-98).

<sup>666</sup> The details of the glottalic theories vary somewhat. Gamkrelidze & Ivanov (1973:152) posit Th : T' : Dh and Hopper (1973:152) posits T : T' : Ḍ (where Ḍ is a 'laryngealized' sound). Hopper (1981:133) writes simply T : T' : Dh. A recent summary of the varieties of the glottalic theory is provided by Kümmel (2012:293)

<sup>667</sup> The glottalist approach is based on the three series of laryngeal theory. See Gamkrelidze & Ivanov (1973:151): “Das System der indogermanischen Verschlusslaute wird traditionell in Form von drei Serien rekonstruiert.” Similarly, according to Hopper (1981:135-6): “Comparative evidence [...] leads us to posit a three-fold obstruent system for the whole of Indo-European.”

<sup>668</sup> Pedersen (1951:10f.) had already asserted that PIE \*b d g had arisen from earlier \*\*p t k. See also Szemerényi (1996:145) and Mayrhofer (1986:94).

(b) The voiceless (unaspirated) stops T were replaced with series T<sup>h</sup> appearing in free variation T ~ T<sup>h</sup>.

(c) The voiced (aspirated) stops D<sup>h</sup> were replaced with series D in free variation D ~ D<sup>h</sup>.

§2. From a phonological point of view, Gamkrelidze and Ivanov's glottalic theory (GI) can be understood as the laryngealist version of Meillet and Magnusson's theory, in the sense that it attempts to explain the same distributions of the PIE roots by slightly different means:

(a) GI explains the absence of the traditional roots D—D (rewritten T'—T') by an extension of Grassmann's Law, which allegedly applies to roots that originally had two successive glottal stops (Gamkrelidze & Ivanov 1973:152):

“Das [...] Nichtvorhandensein der Wurzeln vom Typus \*ged- (Media + Media) im Indogermanischen wird leicht durch Unvereinbarkeit von zwei heterorganen glottalisierten Lauten in einer Wurzel erklärt (also \*k'et'-).”

Derivationally this is synonymous with the idea that the traditional roots with T—D and D—T are derived from D—D.

(b) GI explains the absence of the traditional roots T—D<sup>h</sup>, D<sup>h</sup>—T by rewriting these in aspirated form T<sup>h</sup>—D<sup>h</sup>, D<sup>h</sup>—T<sup>h</sup> and then applying Grassmann's Law. Thus, according to Gamkrelidze and Ivanov (1973:153):

“[...] das Nichtvorhandensein der Wurzeln vom Typus \*ghet- oder \*tegh- [...] wird durch die Unvereinbarkeit von zwei durch Stimmbeteiligung unterschiedenen aspirierten Phonemen in einer Wurzel erklärt (also \*gheth- oder \*theqh-).”

§3. Serious objections have been presented against the glottalic theory, which may be discussed in connection with the related data.<sup>669</sup> For the sake of background context, however, I must express a single preliminary reservation concerning the foundations of the theory. In his immediate comment to Jacobson's typology, Ivanov (*apud* Jacobson 1958:26) made the following remark:

“In mathematics two systems are called isomorphic if we can establish a one-to-one correspondence between them while preserving the relations between the elements. [...] This concept can be applied to two cognate languages as studied by the method of internal reconstruction.”

A comparison of the laryngeal theory and the move of Gamkrelidze and Ivanov in 1973 leaves no doubt that just such an isomorphism was presented. Though not usually mentioned, this is problematic, since by an inconsistent platform being chosen as the starting point, the odds are good that another inconsistent theory was created.

#### 4.2.5 Overview of the theories of the PIE plosive system

§0. The following table presents an overview of the rival theories:

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<sup>669</sup> For his three points against the glottalic theory, see Szemerényi (1996:152).

Neogr.	T	Th	D	Dh
MM	T	(Th) <sup>670</sup>	[D]	Dh
LT	T	–	D	Dh
GI	T <sup>(h)</sup>	–	T'	D <sup>(h)</sup>

None of the systems are completely acceptable, due to the reasons detailed below.

§1. Though comparatively flawless, the Neogrammarian system has become outdated after the appearance of the Old Anatolian laryngeal. As Jakobson (1958:23) already pointed out, “languages possessing the pairs voiced-voiceless, aspirate–non–aspirate have also phoneme /h/”, and in general the relationship between the PIE laryngeal and the Neogrammarian plosive system requires systematic clarification.

§2. Despite its empirical content, Meillet and Magnusson’s root constraint theory remains incomplete. The root constraint against the series D (voiced mediae) applies only to the roots with two plosive stops, and the issue of segmental laryngeal is left untreated. In order to win acceptance, the theory needs to be modernized and generalized.

§3. The mainstream laryngeal theory with elimination of series Th is typologically questionable (Jakobson). Though a few languages with T D Dh do exist, linking them with the Indo-European group is not tempting because typologically the Indo-European languages require four series (like Sanskrit), with the result that a simpler system with three series is not a proper parallel.<sup>671</sup>

§4. Gamkrelidze and Ivanov’s glottalic theory is a typological isolate itself, as recently pointed out by Barrack (2003:7-9): “[...] no triserial language contains both voiceless ejectives (/T’/) and voiced aspirated stops (/D<sup>H</sup>/).” Therefore, as concluded by Barrack (2003:14): “[...] the Glottalic Theory compels us to reexamine not only the adequacy of the Standard Model [= Mayrhofer 1986:98] but to take a closer look at the typologically superior quadraserial configuration that preceded it: Neogrammarian \*T – \*D – \*TH – \*DH.”

§5. None of the existing theories are capable of explaining the problematic typology, and consequently there is a vacuum in this area of the Proto-Indo-European reconstruction theory, which needs to be examined in connection with the four series T – D – Th – \*Dh.

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<sup>670</sup> Meillet and Magnusson do not account for the series *tenues aspiratae*.

<sup>671</sup> See Barrack (2003:11): “What is not recognized [by Mayrhofer], however, is a more subtle bias in favor of the triserial over the Neogrammarian quadraserial configuration: the unexamined bias on the part of linguistics toward formally ‘simpler’ systems.”



### 4.3 *Tenues Neogr. \*k, p, t*

#### 4.3.1 Material of Neogr. \*k, p, t

§0. The unaspirated tenues PIE \*k \*p \*t are the least problematic items of the Proto-Indo-European obstruent system. As already included in Schleicher's reconstruction, and essentially unchanged ever since, only a brief excursion shall suffice here.

§1. Neogr. \*k. Some examples of the phoneme (Grundr<sup>2</sup> 1:571-2) are:

(a) Neogr. \*kru- 'Fleisch' (P. 621-622)

Gr. κρέας	(n.) 'Fleisch, Fleischstück' (GEW 2:11)
Lat. cruento-	(a.) 'blutig, blutbespritzt, grausam' (WH 1:294)
RV. kravy-ád-	(a.) 'Leichname verzehrend' (WbRV. 359)
gAv. xrūra-	(a.) 'blutig, grausig' (AIWb. 539)

(b) Neogr. \*kark- (P. 531-532)

Gr. κέκαρον-	(pf.) 'to cut' (LSJ. 935, κέκαρον [1sg])
OInd. karka-	(m.) 'Krabbe' (KEWA 1:171, Lex. karkas [sgN])
Gr. καρον-ίνο-	(m.) 'Krabstier, Krabbe' (GEW 1:789)
TochB. karkar-	(sb.) 'cancer' (DTochB. 144)
OInd. karkaṭa-	(m.) 'Krebs, Krabbe' (KEWA 1:169)

(c) Neogr. \*kel- \*kol- 'Spitze, usw.' (P. 544)

Li. kél-	(vb.) 'aufsteigen, sich erheben' (LiEtWb. 237-8)
Gr. κολο-φωv-	(m.) 'Gipfel, Spitze, Höhepunkt' (GEW 2:904)
OCS. čelo	(n.) 'Stirn, Front' (Sadnik √102, čelo [sgNA])
Li. kálna-	(m2.) 'Berg' (LiEtWb. 209, kálnas [sgN])
RV. caṣála-	(m.) 'der Knauf der Opfersäule' (WbRV. 443) <sup>672</sup>

(d) Neogr. \*kāu- \*kəu- 'schlagen, usw.' (P. 535)

Li. káu-	(vb.) 'schlagen, hauen, vernichten' (LiEtWb. 232)
TochA. kāw-	(vb.) 'occidere, necare' (Poucha 85, kāwe [3pl])
TochB. kau-	(vb.) = Skt. vadhāya- (DTochB. 208, kausi-ś [inf.])
Li. kúji-	(f.) 'schwerer Schmiedehammer' (LiEtWb. 232, kújis)

(e) Neogr. \*kes- \*kos- 'kämmen, scharren, graben, usw.' (P. 585)

Li. kàs-	(vb.) 'graben, scharren' (LiEtWb. 226, kàsti)
Ĥi. keš-	(vb.) 'kämmen' (HEG 1:587f., ki-iš-zi)
OCS. česa-	(vb.) 'kämmen, abstreifen (von Früchten)' (Sadnik 105)
Li. kasà-	(f.) 'Haarflechte, Zopf' (LiEtWb. 226, kasà [sgN])
Gr. κερκέο-	(n.) 'Werg' (GEW 1:834, κερκέον)
OInd. kacchú-	(f.) 'Krätze' (KEWA 1:139)

<sup>672</sup> RV. caṣálavant- (a.) 'mit einem Knaufe versehen' (WbRV. 443) with PIE \*e corresponds to PIE \*o in Go. hals- (m.) 'Hals' (GoEtWb. 175). The Rig-Vedic retroflex suggests a laryngeal (Fortunatov's Law II), which is in turn confirmed by the Lithuanian accent (Li. é, á).

Hĩ. keřri- (SÍGc.) ‘etwas aus Wolle, Handschuh?’ (HHand. 80)

§2. Neogr. \*p. Some examples of the labial plosive (Grundr<sup>2</sup> 1:507) are:

(a) Neogr. \*pet-, \*pot- ‘Schutzer, Herr’ (Grundr<sup>2</sup> 1:513)

RV. páti- (m.) ‘Schutzer, Herr, Gebieter, Behüter’ (WbRV. 765)  
Lat. potī- (vb.) ‘teilhaftig machen, bemächtigen’ (WH 2:350)  
Lat. poti- (a.) ‘vermögend, mächtig’ (WH 2:350)  
OLi. patī- (m.) ‘Ehemann, Gatte, Gemahl’ (LiEtWb. 551)  
Go. hunda ·faþ- (m.) ‘Befehlshaber über 100 mann’ (GoEtD. 194-5)

(b) Neogr. \*spek̄- ‘sehen, spähen’ (P. 984)

RV. spás- (m.) ‘Späher, Beschauer’ (WbRV. 1608, spát [sgN])  
LAv. spas- (m.) ‘Späher, Wächter’ (AIWb. 1614-5, spaš [N])  
Lat. speciō (pr.) ‘sehen’ (WH 2:570-1)  
TochA. spaktān- (sb.n.) ‘servitium, ministerium’ (Poucha 384)

(c) Neogr. \*sup- ‘schlafen’ (P. 1048-9, HEG 2:1175)

Hĩ. šup- (vbM.) ‘schlafen’ (HHand. 155, šuptari [3sg])  
RV. ní (...) sušup- (pf.) ‘entschlafen, sterben’ (WbRV. 1625)  
OCS. sūpa- (vb.) ‘schlafen’ (Sadnik 915, sūpati [inf.])  
Gr. ύπνο- (m.) ‘Schlaf’ (GEW 1:970, ύπνος)  
Gr. άγρ υπνο- (a.) ‘wakeful, keeping awake’ (LSJ. 16, άγρυπνος)  
gAv. x<sup>v</sup>afna- (n.) ‘Schlaf, Schläfrigkeit’ (AIWb. 1863)

§3. Neogr. \*t. Some examples of the phoneme (Grundr<sup>2</sup> 1:521-2) are:

(a) Neogr. \*ten- ‘dehnen’ (P. 1065-6)

RV. tan- (ao.) ‘weit hinstrecken’ (WbRV. 514)  
Gr. τείνω (vb.) ‘spannen, in die Länge ziehen’ (GEW 2:863f.)  
Li. tėva- (a.) ‘schlank, dünn, fein, zart, hoch’ (LiEtWb. 1086)  
Lat. tenui- (a.) ‘dünn, fein, zart, eng, schmal, niedrig’ (WH 2:666)

(b) Neogr. \*trei- ‘drei’ (P. 1090-2)

RV. trí- (num.) ‘drei’ (WbRV. 555, trín [plA])  
TochA. tri- (f.) ‘tres’ (Poucha 135, tri)  
TochB. trai- (num.m.) ‘three’ (Poucha 319, trai [NA])  
Gr. τρεí(i)- (num.pl.) ‘drei’ (GEW 2:621, Gortyn. τρεές [plN])

(c) Neogr. \*pet- ‘fliegen’ (P. 825-6)

Hĩ. pet- (vb1.) ‘laufen, fliegen’ (CHD P:352f, píd-da-an-zi)  
Lat. prae ·pet- (a.) ‘im Fluge vorseilend, günstig’ (WH 2:354)  
AV. ví ánu (...) papāt- (pf.) ‘durchfliegen’ (WbRV. 761, ví ánu papāta [3sg])  
RV. páta- (pr1.) ‘fliegen’ (WbRV. 761, pátaši [2sg])  
Gr. πέτο- (vb.) ‘fliegen’ (GEW 2:521-2, πέτομαι [1sg])

### 4.3.2 Theoretical approaches to series T (tenues)

§0. Until recently, the series T (unaspirated tenues) has not been contested. However, the few attempts to challenge the general consensus can briefly be discussed here.

§1. In order to explain Meillet's root constraints against T—D<sup>h</sup> and D<sup>h</sup>—T, Gamkrelidze and Ivanov (1973) claimed that the PIE voiceless unaspirated plosives were originally aspirated (i.e. Neogr. T ≡ GI T<sup>h</sup>). This would mean that the non-aspirated series did not exist in Proto-Indo-European, but the series T<sup>h</sup> became deaspirated in all dialects (Gamkrelidze and Ivanov 1973:154).

§2. In his books *Proto-Indo-European Labiovelars* (1978) and *Proto-Indo-European Laryngeals and Ablaut* (1984), Speirs uses the term 'labiovelar' to designate an underlying superphoneme of the pre-*proto-language*, which he (1978:47) describes as concealing a:

“[...] hitherto overlooked correlation between velar, labial and dental occlusives, such that they appear to be interchangeable in root-initial and root-final position, or as extensions to roots.”

According to Speirs (1978:47), the changes appear to be identical with those of Greek:

“[...] it must be concluded that at some earlier period, which we call the PIE period, labiovelars underwent the same shifts as they underwent again in Greek.”

### 4.3.3 Solutions to the series T (PIE \*k \*p \*t)

§0. Despite its simplicity, the series PIE \*k \*p \*t forms the minimal core of the Proto-Indo-European plosive system, from which all other items can be derived. In this sense the series is fundamental. In particular, the following points should be noted regarding the series:

§1. The glottalic replacement of the series T with T<sup>h</sup> reveals an inconsistency in the foundations of Gamkrelidze and Ivanov's ejective model: If the definition Neogr. \*T ≡ \*\*T<sup>h</sup> is accepted, then the glottalic equation Neogr. \*D = \*\*T' is no longer possible, because typologically \*\*T' presupposes \*T. This contradicts Gamkrelidze and Ivanov's claim that the series T did not exist,<sup>673</sup> suggesting that the glottalic theory is indeed inconsistent.

§2. Speirs's ideas concerning 'labiovelars' have been shunned by Indo-Europeanists<sup>674</sup> for reasons that can be readily understood: the underlying superphonemes – allegedly

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<sup>673</sup> Another set of solid counter-arguments against the equation T = Th in Gamkrelidze & Ivanov's glottalic theory is presented by Miller (1977a:382-4).

<sup>674</sup> See, for example, Mayrhofer (1986:109): “Das [...] Buch von A. G. E. Speirs, *The Proto-Indo-European Labiovelars* (Amsterdam 1978) kann auf den derzeitigen Stand noch nicht beurteilt werden.”

yielding velars, labials and dentals – would violate the principle of the regularity of sound change. On the contrary, it must be concluded that the places of articulation PIE \*k ≠ p ≠ t are irreducible and the oppositions are distinctive. Any attempt to derive these items from other places of articulation is doomed to failure.

§3. In what follows, it will be shown that the three fundamental obstruents PIE \*k \*p \*t are sufficient for the entire plosive system to be derived.

#### 4.4 *Tenuis aspiratae Neogr. \*kh, ph, th*

##### 4.4.1 General remarks on tenuis aspiratae

§0. After an initial postulation of the tenuis aspiratae in the 19<sup>th</sup> century, the discussion of the 20<sup>th</sup> and 21<sup>st</sup> centuries has been dominated by a segmental analysis of the series. As the laryngealist elimination of the series was not performed in a flawless manner, a detailed analysis and improvements to the series will defend its place.

§1. After the failures of Schleicher and others, finally Grassmann (1863:96-98)<sup>675</sup> successfully postulated the series tenuis aspiratae Neogr. \*kh \*ph \*th for the proto-language.<sup>676</sup> This opened the path for Grassmann's Law, which offers a general solution for the problem of the differences of the aspirated stops, especially in Indo-Iranian and Greek. After the Indo-European character of Armenian was recognized, that language has also been added to the evidence of the series Th.<sup>677</sup>

§2. The reflects of the series Th in languages preserving this phoneme can be summarized as follows:

Neogr.	OInd.	Av.	Gr.	Arm.
–	–	–	–	–
*kh	kh	x	χ	x
*ph	ph	f	φ	p <sup>ʰ</sup>
*th	th	þ	θ	t <sup>ʰ</sup> <sup>678</sup>

§3. In addition, a trace of the tenuis aspiratae has been preserved in Slavonic (Meillet & Vendryes, 1934<sup>2</sup>:22-26), where the aspirated voiceless velar is continued:

Neogr \*kh → OCS. ch, Rus. ch, etc.<sup>679</sup>

<sup>675</sup> For Grassmann's initiative in the postulation of tenuis aspiratae, see Pedersen (1983:65). On tenuis aspiratae, see Hiersche 1964, Szemerényi (1996:68-9 & fn1) and Szemerényi (1996:56 fn1).

<sup>676</sup> On tenuis aspiratae (with discussion and literature), see Szemerényi (1996:68fn1), Sturtevant (1941b:3fn12), Frisk 1936:3-50, Mayrhofer (1986:91-92), and Meillet (1935:109-120).

<sup>677</sup> On Armenian as an Indo-European language, see Schmitt (1975:3-30).

<sup>678</sup> Arm. t<sup>ʰ</sup> from Neogr. \*th is preserved in all positions (also VthV) in Armenian.

<sup>679</sup> OCS. ch has multiple origins, including PIE \*s → ch in the ruki-rule. Therefore, it requires an external confirmation.

#### 4.4.2 Material of Neogr. \*kh, ph, th

§0. The series Neogr. \*kh \*ph \*th was postulated by Grassmann in his famous article of 1863 on the treatment of roots with two successive aspirates in Greek and Sanskrit.

§1. The evidence for Neogr. \*kh (Grundr<sup>2</sup> 1:571) is plentiful, and it suffices to choose a few correspondences to illustrate the proto-phoneme:

(a) Neogr. *ḱonkh-* ‘Muschel’ (P. 614)

Gr. <i>κόγχο-</i>	(m.) ‘Muschel(schale), Hohlmaß’ (GEW 1:889-90)
AV. <i>śāṅkhá-</i>	(m.) ‘Muschel, Schläfe’ (EWA 3:290)
Latv. <i>sence</i>	(f.) ‘Muschel’ (P. 614)

(b) Neogr. \*khakh- (P. 634)

OInd. <i>kákha-</i>	(vb.) ‘lachen’ (KEWA 1:136, Lex. <i>kákhati</i> )
Arm. <i>xaxan-</i>	(sb.) ‘lautes Gelächter’ (ArmGr. 1:455, <i>xaxank’</i> [pl])
Gr. <i>χαχάζω</i>	(vb.) ‘laut lauchen’ (GEW 1:804)
OCS. <i>chochota-</i>	(vb.) ‘laut lauchen’ (GEW 1:804, <i>chochotati</i> [inf.])
Li. <i>kakno-</i>	(vb.) ‘laut auflauchen’ (LiEtWb. 206)

(c) Neogr. \*khor- ‘Esel’ (P. –)

LAv. <i>xara-</i>	(m.) ‘Esel’ (AIWb. 532)
OInd. <i>khára-</i>	(m.) ‘Esel : donkey’ (KEWA 1:302)
LAv. <i>xarā</i>	(f.) ‘Eselstute’ (AIWb. 532)
Alb. <i>kërr</i>	(.) ‘donkey, ass, foal, gray’ (CHGAlb. 67)

(d) Neogr. \*khaid- ‘schlagen’ (P. 917)

Lat. <i>caedō</i>	(vb.) ‘hauen, (er)schlagen’ (WH 1:129)
RV. <i>ni (...)</i> <i>khida-</i>	(pr.) ‘niederdrücken’ (WbRV. 374, <i>ni (...)</i> <i>khida</i> [2sg])
RV. <i>sám (...)</i> <i>khida-</i>	(pr.) ‘zusammenschlagen’ (WbRV. 374)
Go. <i>dulga ·haitja(n)-</i>	(m.) ‘creditor’ (GoEtD. 97)

(e) Neogr. \*khad- ‘zerbeissen, verzehren’ (P. 634)

RV. <i>ā (...)</i> <i>cakhád-</i>	(pf.) ‘zerbeissen, essen, verzehren’ (WbRV. 373)
LAv. <i>vī ·xaða-</i>	(vb.) ‘auseinander quetschen’ (AIWb. 531)
RV. <i>khadirá-</i>	(m.) ‘Acaxia catechu’ (WbRV. 372)
Arm. <i>xacane-</i>	(pr.) ‘bite, sting’ (EtDiArm. 323, <i>xacanem</i> [1sg])

(f) Neogr. \*mahulKh- ‘dumm; schweigend’ (P. 719)

Li. <i>mùlk-</i>	(vb.) ‘dumm werden’ (LiEtWb. 471, <i>mùlkti</i> [inf.])
OInd. <i>mūrkhá-</i>	(a.) ‘blöde, Tor’ (KEWA 2:664)
Li. <i>mùlki-</i>	(m.) ‘Dummkopf, Tropf, Tor, Trottel’ (LiEtWb. 471)
ORus. <i>mūlča-</i>	(vb.) ‘schweigen’ (REW 2:153)
OCS. <i>mlūča-</i>	(vb.) ‘σιωπᾶν : schweigen’ (Sadnik √529)

(g) Neogr. \*kākḱh- ‘Ast, Zweig, Stock, Stab’ (P. 523, Szemerényi 1996:68)

RV. dáśa-śákha-	(a.) ‘zehn Finger habend’ (Hand) (WbRV. 582)
RV. śákhā-	(f.) ‘Ast, Zweig’ (WbRV. 1391, KEWA 3:321)
OCS. po-socha-	(f.) ‘Stock, Stab’ (Sadnik √857)
Go. hoha(n)-	(m.) ‘Pflug : plow’ (GoEtWb. 189, hohan [sgA])
TochB. śákātai-	(sb.obl.) ‘stick, club’ (DTochB. 619, śákātaisa [Perl]) <sup>680</sup>

§2. The examples of Neogr. \*ph (Grundr<sup>2</sup> 1:507) include:

(a) Neogr. \*phoi- ‘Feim, Schaum’ (P. 1001)

OHG. feim-	(m.) ‘Feim, Schaum’ (Grundr <sup>2</sup> 1:696)
OEng. fām	(m.) ‘Schaum, Feim’ (GoEtD. 123)
RV. phéna-	(m.) ‘Schaum, Feim’ (WbRV. 897, phénam [sgA])
OCS. pěna	(f.) ‘Schaum, Speichel’ (Sadnik √643, Grundr <sup>2</sup> 1:716)
OCS. pěni-	(vb.) ‘schäumen, aufbrausen’ (Sadnik √643, peniti)

(b) Neogr. \*koph- ‘Huf’ (P. 530)

RV. śaphá-	(m.) ‘Huf, Klaue, Achtel’ (WbRV. 1378)
LAv. safā-	(m.) ‘Huf, Hufstück’ (AIWb. 1557-7, safəm [sgA])
OHG. huof-	(.) ‘Huf’ (Grundr <sup>2</sup> 1:696)
OEng. hōf-	(.) ‘ungula : hoof’ (ASaxD. 548)

(c) Neogr. \*phelg- (P. –)

RV. phalgúa-	(a.) ‘gering, schwächlich’ (WbRV. 896)
Gr. φελγύνω	(pr.) ‘ἀσυνετεί, ληγεῖ’ (GEW 2:1000)
Gr. ἄ φελγύνουσα-	(pt.) Hes. = ‘κακοῦσα’ (LSJ. 287)

(d) Neogr. spho- ‘gedeihen’ (P. 983-4)

Hi. išpa-	(vb1.) ‘sich satt essen’ (HEG 1:408, iš-pa-a-i [3sg])
LAv. hu-pairi-spā-	(a.) ‘ringsum wohl gedeihend’ (?) (AIWb. 1826)
OInd. pasphāy-	(pf.) ‘feist wurden sein’ (MonWil. 1270, pasphāye)
Hi. ęšpi-ningatar-	(n.) ‘Sättigung an Speis und Trank’ (HHand. 66)
RV. sphirá-	(a.) ‘feist’ (WbRV. 1612)

(e) Neogr. \*sphur- ‘Fuß : schnellen, usw.’ (P. 992-3, Grundr<sup>2</sup> 1:689)

RV. apa-sphúr-	(a.) ‘wegstoßend, fortschnellend’ (WbRV. 74)
RV. sphurá-	(pr6.) ‘mit dem Fuße wegstoßen’ (WbRV. 1612)
Gr. σφυρό-	(n.) ‘Fußknöchel, Fußgelenk’ (GEW 2:835, σφυρόν)
OEng. spor-	(n.) ‘trace, track, spoor’ (ASaxD. 903)

(f) Neogr. \*koph- or \*koph- ‘cyprinus : Karpfenart’ (P. 614)

Rus. sápa	(f.) ‘Barbe, Cyprinus ballerus’ (REW 2:578)
OInd. śaphara-	(m.) ‘Cyprinus saphore’ (KEWA 3:296)
Li. šāpala-	(m.) ‘Leuciscos dobula, Döbel’ (LiEtWb. 963)
Latv. sapal-	(m.) ‘Dünakarpfen’ (LiEtWb. 963, sapals [sgN])

<sup>680</sup> Note the Tocharian palatalization, which implies PIE \*e for the root.

§3. The examples of Neogr. \*th (Grundr<sup>2</sup> 1:522) include:

(a) Neogr. \*menth- ‘rühren, wirren’ (P. 732)

Li. mēt-	(vb.) ‘umrühren (Mehl)’ (LiEtWb. 442, mēsti)
OCS. męt-	(vb.) ‘ταράττειν, turbare’ (REW 2:189, męsti)
RV. manthá-	(m.) ‘Gebräu, Rührtrank’ (WbRV. 1000)
RV. nis (...) mántha-	(pr1.) ‘zuschütteln’ (WbRV. 976)
Li. mentūrē-	(f.) ‘Quirl, Kelle’ (LiEtWb. 437)

(b) PIE \*h<sub>3</sub>ath- ‘wisdom’ (P. –)

Hi. hata-	(vb.) ‘denken, überlegen, klug sein’ (HEG 1:214, 219)
Hi. hatah-	(cs.) ‘verständlich, klug machen’ (HEG 1:217)
Do. ἀθάνα	(f.) ‘Athene’ (GEW 1:28, Do. ἀθάνα, Att. ἀθήνη)
Lyc. tēne ·guri-	(c.) ‘Αθηναγόρας’ (LuPG 5)

(c) Neogr. \*skēth, skōth ‘schaden’ (Szemerényi 1996:69, P. 950)

LAv. skatī-	(f.) ‘Heuschrecke’ (AIWb. 1586, skaitim [sgA])
Gr. ἀ·σκηθήσ-	(a.) ‘unversehrt, wohlbehalten’ (GEW 1:164)
OIr. scatha-	(pr.) ‘verstümmeln, lähmen’ (LEIA S-53, scathaid [3sg])
Go. ga ·skapja-	(vb.) ‘harm, damage’ (GoEtD. 309, gaskapjan [inf.])

(d) Neogr. \*roth- ‘Rad, Kreis, Wagen’ (P. 866)

RV. rátha-	(m.) ‘rasch fahrende Streitwagen’ (WbRV. 1137)
Lat. bi ·roto-	(a.) ‘zweirädig’ (WH 2:444, bi ·rotus [sgN])
OGaul. roto ·magos-	(ON.) ‘Rouen’ (ACSS. 2:1079f., rotomagos [sgN])
Li. rāta-	(m1.) ‘Rad, Kreis(ring)’ (LiEtWb. 705)
Lat. rotā-	(f.) ‘Rad, Rolle, Wagen, Kreisel’ (WH. 2:443-4)
Lat. rotā-	(vb.) ‘im Kreis herumdrehen’ (WH 2:443, rotāre)

(e) Neogr. \*k<sup>h</sup>enth- ‘Leid : leiden’ (P. 641)

Gr. πένθοσ-	(n.) ‘Leid, Trauer’ (GEW 2:478)
Li. kēnt-	(vb.) ‘leiden, ertragen, erdulden’ (LiEtWb. 246, kęsti)
Gr. πέπονθ-	(pf.) ‘leiden, erdulden’ (GEW 2:478, πέπονθα [1sg])
Li. kantrā-	(f.) ‘Geduld, Langmut’ (LiEtWb. 246)
OIr. cēsa-	(vb.) ‘souffrir, endurer’ (LEIA C-79f., cēsaid [3sg])

(f) Neogr. \*ōusth-, əusth- ‘Mund, Lippe’ (P. 784-5)

RV. óṣṭha-	(m.) ‘die Oberlippe, die Lippe’ (WbRV. 306)
LAv. aošta-	(m.) ‘Oberlippe’ (du.) ‘die beiden Lippen’ (AIWb. 44)
OCS. usta-	(n.pl.) ‘Mund, Maul, Rachen’ (Sadnik √1033, usta)
OPr. austa-	(n.pl.) ‘Mund’ (APrS. 308, austa)
Hi. huštai-	(vb1.) ‘(Stimme) dampfen’ (HEG 1:317)
Hi. hušteišk-	(vb.iter.) ‘(Stimme) dampfen’ (HHand. 57)

(g) Neogr. \*st(h)ā- ‘stehen’ (P. 1004ff.)

LAv. hišta-	(pr.) ‘stehen, dastehen’ (AIWb. 1600, hištaiti [3sg])
Lat. sistō	(pr3.) ‘stehen, usw.’ (WH 2:596f.)
RV. sthā-	(a.) ‘stehend’ (WbRV. 1603)
LAv. upa stā-	(f.) ‘Beistand, Hilfe’ (AIWb. 396)

§4. Despite its secure comparative basis, the series Th is statistically rare compared to the series Dh.

#### 4.4.3 Theoretical approaches to the series Th

§0. The Neogrammarians accepted the series \*Th without further interpretation. That would change in the subsequent discussion of the 20<sup>th</sup> century, which was dominated by segmental analysis made possible by Saussure’s \*A and the statistical rarity of the series.

§1. The original formulation of Siebs’s Law (1904) allows a voiced aspirate following \*s to become voiceless or non-aspirated. Within the traditional theory, this opened a derivational mechanism for the elimination of the series Th. The attempt culminated in Hiersche’s (1964) comprehensive work, which suggested that the tenues aspiratae were secondary and developed in combination with s-mobile after the sibilant was lost.<sup>681</sup>

§2. However, the main effort of questioning the phonemic status of tenues aspiratae dates back to Saussure (1891 = Rec. 603), according to whom Neogr. \*th consisted of \*t+A (written \*t+’)<sup>682</sup> in examples<sup>683</sup> such as:

RV. pṛthú-	:	Neogr. *pṛthú-	:	DS. pṛt’u-
RV. tiṣṭhā-	:	Neogr. *tiṣṭhe/o-	:	DS. tiṣṭ’e/o-

§3. Without Anatolian evidence, Saussure was unable to defend his idea against the Neogrammarian critics,<sup>684</sup> and the issue was stalemated until Kuryłowicz (1927) extended Saussure’s analysis to voiceless aspirates in general (see also Kuryłowicz 1935:46-54 and 1956:375-82).

§4. The glottalic theory is an extreme form of the laryngeal theory in which segmental analysis of the series \*Th is understood to imply non-existence (and elimination). Referring to Jakobson (1958), Gamkrelidze & Ivanov (1995:12) underlined the contradiction of the absence of the Th series in the laryngeal theory, but little

<sup>681</sup> Note, however, that Miller (1977a:366) is correct in saying that “Hiersche’s theory [...] must be rejected on the grounds of phonetic implausibility”.

<sup>682</sup> See Saussure (Mém. 603): “M. de Saussure apporte comme contribution à l’histoire des aspirées sourdes (kh, čh, ṭh, th, ph) du sanscrit une série d’exemples destinées à établir l’origine de certains th dans les racines et les suffixes. Ces th proviendraient de t indo-européen suivi du phonème ə régulièrement éliidé devant voyelle.”

<sup>683</sup> For other examples of segmental T+h, see Burrow (1949:58-59, 1979:26-30).

<sup>684</sup> Note, for instance, Brugmann’s now outdated denial of Saussure’s analysis. See Brugmann (Grundr<sup>2</sup> 1:632-3).



understood that adopting the very same triserial system meant adopting the contradiction as well (see below).

#### 4.4.4 Comparative solution of the series Th

§0. The segmental analysis of the series \*T+A as put forth by Saussure (and, following him, the laryngeal theory) is vulnerable to criticism from two main directions:

(a) The analysis Neogr. \*Th ≡ T+A (= T+h<sub>2</sub>) leaves much to be hoped for in terms of the details of the reconstruction (see examples below).

(b) The elimination of the series Neogr. \*Th leads to the questionable typology of the three series T : D : Dh (see Jakobson's remark above).

In order to make the laryngealist ideas acceptable, it is necessary to develop the theory in a manner that overcomes these difficulties.

§1. The laryngealist analysis Neogr. \*Th ≡ \*T+h<sub>2</sub> continues to have persistent problems, such as 'a-colouring' (or its absence), and the simultaneous alternations of environments like ablaut Neogr. \*i : ī, \*u : ū and \*T : Th that are unaccounted for. These problems can be best illustrated with examples:

(a) The lack of 'a-colouring' in Lat. sistō (pr3.) 'stehen, usw.', an \*e/o-stem, stands in contrast with the 'a-colouring' in Lat. √stā-. The problem can be solved by positing PIE \*aḥ instead of \*A [= h<sub>2</sub>] in PIE \*staḥ- 'stehen' (P. 1004f.). Consequently, the alternation of 'a-colouring' can be regularly treated with prototypes such as:

I-A	*steaḥ-	→	Gr. στατός = Lat. status 'id.' (Neogr. *sta-/stə-)
I-B	*staḥ <sup>e</sup> / <sub>o</sub> -	→	Lat. sist <sup>e</sup> / <sub>o</sub> - = Av. hišta- 'id.' (Neogr. *sth <sup>e</sup> / <sub>o</sub> -)

In other words, the overstated colouring rule of the laryngeal theory, demanding 'h<sub>2</sub>' to colour all surrounding vowels, can be fixed with the postulation of PIE \*ḥa aḥ instead.

(b) Another laryngealist problem is manifest in the group P. 951-53, including the items:

OIcl. hūs-	(n.) 'Haus' (ANEtWb. 268)
CrimGo. hūs-	(n.) 'domus' (GoEtD. 161, hus [sgN])
Go. gud·hūs-	(n.) 'Tempel' (GoEtD. 161, gudhusa [sgD])
Pahl. kūšk	(sb.) 'part of a building' (DTochB. 206, kwšk)
Arm. xuç	(sb.) 'Stube' (Persson 1912:420; Arm. ç ← s·k̂)

The long quantity here is usually explained in the laryngeal theory as laryngeal metathesis (Mayrhofer 1986:174-5), but strictly speaking this is impossible, owing to its absence in Arm. xuç (with Neogr. \*kh-). Instead of LT \*k+h<sub>2</sub>, the reconstruction requires PIE \*k+aḥ, as indicated in the equations:

I-A	*káḥus·Σ-	→	*kúḥus·Σ-	→	OIcl. hūs, Pahl. kūšk, etc.
I-B	*kaḥús·Σ-	→	*khús·Σ-	→	Arm. xuç 'Stube'

(c) Sturtevant<sup>685</sup> sought to explain some examples of the alternation Neogr. T : Th, such as LAv. kanənti ‘they dig’ : OInd. khānati ‘digs’, as analogical generalizations. The difficulties he encountered (Sturtevant 1941:10-11) are caused by an overstated compensatory lengthening rule. By simply abandoning this assumption, the alternation can be reconstructed regularly:

I-A \*keahno- → LAv. kana- ‘dig’ (AIWb. 437-8)  
 I-B \*kaḥono- → RV. khāna- ‘dig’ (WbRV. 372)

(d) √skhal- (P. 928). A schwebeablaut with diphonemic \*ḥa appears in

I-A \*skeḥal- → Gr. σκέλος ‘Schenkel, Bein’ (GEW 2:723)  
 I-B \*skḥael- → OInd. skhala-, Arm. sxalem (Grundr<sup>2</sup> 1:587)

§2. The examination of the data of tenues aspiratae reveals that the series is to be reconstructed with a voiceless value of the cover symbol \*ḥ ≡ PIE \*h:

RV. kh, gAv. x, Gr. χ, Arm. x, etc. ≡ PIE \*kah v \*kha (≡ Neogr. \*kh)  
 RV. ph, gAv. f, Gr. φ, Arm. p’, etc. ≡ PIE \*pah v \*pha (≡ Neogr. \*ph)  
 RV. th, gAv. ḍ, Gr. θ, Arm. t’, etc. ≡ PIE \*tah v \*tha (≡ Neogr. \*th)

These modifications allow us to account for all irregularities of the laryngealist segmental analysis.

§3. Several roots with Neogr. \*Th are currently explained as being sporadic (see, for instance, the initial \*(s)p(h)- of Pokorny’s dictionary, P. 980 ff.). With segmental PIE \*ḥa \*aḥ at our disposal, the examples can be reconstructed regularly without any reference to sporadic alternation.

§4. According to the current practice, roots are reconstructed by default with unaspirated tenues Neogr. \*T when aspirated tenues Neogr. \*Th are also possible. These not uncommon circumstances appear when no Indo-Iranian, Greek, Armenian or Slavonic parallels are available. Thus, for instance, the well-known root P. 796, \*peisk- \*pisk- (Lat. piscis ‘fish’, Go. fisks, OEng. fisk- ‘fish’ (ASaxD. 289, fisca [plG]), etc.) is reconstructed with an unaspirated labial, although both Neogr. \*pisk̄- and \*phisk̄- are actually possible.<sup>686</sup>

§5. The schwebeablaut often conceals voiceless aspirates reflected in alternation T : Th.<sup>687</sup> Some examples of tenues aspiratae belonging to this category have been preserved in the following equations:

(a) √paḥr- ‘gebären, usw.’ (P. 818)

<sup>685</sup> See Sturtevant (1941:3): “There are, however, cases in which Sanskrit has generalized the non-aspirate at the expense of the aspirate”.

<sup>686</sup> Owing to the existence of the root Neogr. \*phi- (P. 1001, cf. OEng. fām-, RV. phéna-, etc.), the group Go. fisk- could be connected here if the group Lat. pisci- : Go. fisk-, etc. contains an initial tenuis aspirata (note that this remains unproven, however).

<sup>687</sup> For the alternation T : Th, see Brugmann (Grundr<sup>2</sup> 1:632-3).

I-A: \*peaḥr-

Fal. pepar-	(pf.) ‘hervorbringen, darbringen’ (WH 2:255)
Lat. pepar-	(pf.) ‘hervorbringen, erzeugen’ (WH 2:255)
Langob. fara	(.) ‘Geschlecht’ (WP 2:7)
Lat. parent-	(m.) ‘Vater’ (f.) ‘Mutter’ (WH 2:252f.)
Gr. παρ-θένο-	(f.) ‘Jungfrau, Mädchen, junge Frau’ (GEW 2:474)

I-B: \*paḥer-

Li. pēra-	(m.) ‘Fruchtkeim, Keim’ (pl.) ‘Brut’ (LiEtWb. 573)
Li. perě-	(vb.) ‘(aus)brüten, auf den Eiern sitzen’ (LiEtWb. 573)
RV. phárvara-	(m.) ‘Säer, Säemann’ (WbRV. 896)
RV. pra-pharvǐ-	(f.) ‘wollüstiges Mädchen’ (WbRV. 876)

(b) √taḥur- ‘Stier’ (P. 1083)

I-A *teaḥuro-	→	Lat. tauro- ‘Stier’ (WH 2:650)
I-B *taḥeuro-	→	OIcl. þjór- (m.) ‘Stier’ (ANEtWb. 614)

When Saussure’s \*A is replaced with PIE \*ḥa or PIE \*aḥ, the alternation of the aspirates and the non-aspirates can be reconstructed exactly in the manner mentioned by Sturtevant (1941:7):

“If de Saussure’s theory is correct, we should expect to find independent evidence of the presence of laryngeals in some at least of the morphemes concerned, and we should be able to reconstruct plausible forms justifying the aspirates and also the alternating non-aspirates.”

Owing to the simultaneous alternations of aspiration and the ‘a-colouring’, only diphonemic PIE \*ha and \*ah can account for the attested variants, thus confirming the analysis Neogr. \*Th ≡ PIE \*Tah √ \*Tha.

§6. In languages which went through a second palatalization, the following development of velars took place before front vowels and glide:

PSatem \*k, \*kh → RV. c, gAv. č, OCS. č, Latv. c, etc.

In such cases, the second palatalization masks a voiceless aspirate. For instance, one finds:

RV. coda-	(pr.) ‘antreiben’ (WbRV. 456, codata [2pl])
RV. codáya-	(cs.) ‘schärfen, wetzen’ (WbRV. 457)

Etymologically the form is connected with

RV. khudá- (vb.) ‘hineinstossen’ (WbRV. 374, khudáta),

implying PIE \*kaheudo- for RV. coda- (compare PIE \*keahud- with the schwebeablaut in Lat. caudex).

§7. Grassmann’s Law does not apply only to two successive voiced aspirates Dh—Dh, but to roots with voiceless aspirates as well.

(a) The roots Th—Th with two voiceless aspirated stops lose one of the aspirates, as indicated by the root Neogr. \*khakh- ‘lachen, Gelächter’ (P. 634):

OInd. kákha-	(vb.) ‘lachen’ (KEWA 1:136, Gramm. kákhati)
Arm. xaxan-	(sb.) ‘lautes Gelächter’ (ArmGr. 455, xaxank’ [pl])
OCS. chochota-	(vb.) ‘laut lauchen’ (GEW 1:804, chochotati [inf.])
Gr. χαχάζω	(vb.) ‘laut lauchen’ (GEW 1:804)

(b) The mixed roots with voiceless (Th) and voiced aspirates (Dh) were affected by Grassmann’s Law, as proven by the correspondence:

LAv. xumba-	(f.) ‘Topf, topfähnliche Vorrichtung’ (AIWb. 532)
RV. kumbhá-	(m.) ‘Topf, Krug’ (WbRV. 329)
LAv. xumbya-	(PNm.) ‘EN. eines Gläubigen’ (AIWb. 533)
RV. kumbhín-	(a.) ‘mit einem Krüge versehen’ (WbRV. 329)

Since only Armenian, Slavonic and Avestan can preserve the original Th-series in examples belonging to this type, it is virtually certain that the material contains unidentified specimens of *tenuis aspiratae*.<sup>688</sup>

§8. Bartholomae’s Law, usually associated to the voiced aspirates, also applied to the voiceless aspirates. By a stroke of luck, we can now compare Indo-Iranian and Old Anatolian in:

LAv. haxa-	(n.) ‘Fussole’ (AIWb. 1744, haxəm [sgA])
Ḫi. śakuta-	(n.) ‘Hüften, Oberschenkel’ (HHand. 139, HEG 2:743)
gAv. haxti-	(n.) ‘der innere Teil des Oberschenkels’ (AIWb. 1745)
RV. sákthi-	(n.) ‘der Schenkel, das Dickbein’ (AIWb. 1440, sákhti)

From this comparison, we may derive the following conclusions:

(a) LAv. haxa- proves that the root-final plosive Av. x, not the suffix (PIE \*·to-, ·ti-), was originally aspirated. The aspiration of PIIr. \*sákh·ti- has moved into the suffix in Sanskrit (> RV. sákthi-), according to Bartholomae’s Law, and therefore applies to the voiceless aspirates as well.

(b) Bartholomae’s Law consists of two separate developments: the assimilation of voice (unless already identical) and the transfer (metathesis) of aspirate (except in the case of voiceless stops in Avestan, where the transfer was prevented by fricativization).

§9. During the last century, several authors have rejected the series \*Th and, with that, many solid Indo-European etymologies (see, for instance, P. 633). In addition, extreme versions of the laryngeal theory have preferred to eliminate the series or explain it – as done by Kuryłowicz – as secondary.<sup>689</sup> Such claims are

<sup>688</sup> This was already understood by Brugmann, who correctly refers to a possible Neogr. \*kh- in Gr. χόγχο- : AV. śáñkhá-.

<sup>689</sup> A different, but equally immature view is expressed by Kuryłowicz (1956:375-82), according to whom the *tenuis aspiratae* are explicable as local innovations developed independently in Indo-Iranian (see also already Kuryłowicz 1935:46-72). This makes no sense, because the series Th is

counterproductive, because comparative reconstruction actually requires voiceless aspirates in connection with several etymologically difficult items like:

(a) PIE \**thae̯kah-* ‘schnell; Schnellen, Füßknöchel, Würfel’ (P. 250 [diff.])

Gr. <i>τάχα</i>	(adv.) ‘schnell, leicht, vielleicht’ (GEW 2:861)
Gr. <i>θάσσοv</i>	(comp.adv.) ‘schneller’ (GEW 2:861)
Lat. <i>taxillo-</i>	(dim.) ‘kleiner Würfel/Klotz’ (WH 2:645)
Lat. <i>tālo-</i>	(m.) ‘Fußknöchel, Spielwürfel’ (WH 2:645)
Lat. <i>tālitro-</i>	(n.) ‘Schnellen mit den Fingern’ (WH 2:644)
Gr. <i>ταχύ-</i>	(a.) ‘schnell, geschwind’ (GEW 2:861, <i>ταχύς</i> )

(b) PIE \**thaelm-* ‘Auge; heat’ (P. –)<sup>690</sup>

Gr. <i>ὄφ·θαλμό-</i>	(m.) ‘Auge’ (GEW 2:452, <i>ὄφθαλμός</i> [sgN])
Gr. <i>ὄφ·θαλμέω</i>	(pr.) ‘beäugeln, anschauen’ (GEW 2:452, <i>ὄφθαλμέω</i> )
OEng. <i>þelma</i>	(m.) ‘heat’ (ASaxD. 1046)

(c) PIE \**tahi-* (or \**thai-* ?) ‘Herde’ (P. –)

Pāṇ. <i>aja·thya-</i>	(sb.) ‘Herde von Ziegen’ (Frisk 1936:3)
Pāṇ. <i>avi·thya-</i>	(sb.) ‘herd of sheep’ (Frisk 1936:3)
LAv. <i>gava·iθya-</i>	(n.) ‘Rinderherde’ (Frisk 1936:3)
Go. <i>awe·þi-</i>	(m.) ‘ποτόμηv : herd of sheep’ (GoEtD. 52)

(d) PIE \**thau-* ‘sitzen’ (sub P. 235-239, *dhē-*)

OPers. <i>gā·θu-</i>	(m.) ‘Thron’ (OldP. 183, Frisk 1936:34)
Sogd. <i>g·dwk-</i>	(sb.) ‘Thron’ (Frisk 1936:34)
Gr. <i>θάρακο-</i>	(m.) ‘Sitzung, Sitz, Stuhl’ (GEW 1:647, in <i>θάρακος</i> )
Gr. <i>θαρακέω</i>	(vb.) ‘sitzen’ (GEW 1:647, in <i>θαρακέω</i> )
Gr. <i>θό(φ)ωκο-</i>	(m.) ‘Sitzung, Sitz, Stuhl’ (GEW 1:647, <i>θόωκος</i> )
Gr. <i>θο(φ)άζω</i>	(vb.) ‘sitzen’ (GEW 1:676, <i>θοάζω</i> [1sg])

§10. In terms of the generality of the analysis PIE \**Tah* v \**Tha* ≡ Neogr. \**Th*, one can note Jakobson’s (1958:23) typology:

“The surmised coexistence of a phoneme ‘aspirated stop’ and a group of two phonemes – ‘stop’ + /h/ or another ‘laryngeal consonant’ is very doubtful in the light of phonological typology.”

Under such circumstances, the assumption of a non-segmental series \**Th* would create more problems than it would solve, and the segmental approach PIE \**Tah* v \**Tha* is to be generalized.

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revealed as a common Indo-European entity by correspondences already quoted by Grassmann in his pivotal article (1863).

<sup>690</sup> For the semantics, compare pairs like OIr. *sūil-* ‘Auge’ (P. 881-2, 1045) : OEng. *swōlig-* (n.) ‘burning, heat’ (a.) ‘sultry’ (ASaxD. 961), etc.

§11. On the other hand, it should be noted that the absolute elimination of the series Th would summon Jakobson's argument against the typology T D Dh. In order to avoid this, I recommend the following:

(a) According to Szemerényi (1967:95): "[...] it seems pointless to try to eliminate the Tenues Aspiratae where they are found." From the comparative point of view, this is certainly true. If the elimination of the series Th means abandoning the quest for finding correspondences with tenues aspiratae, the only consequence is a loss of results. As no outcome could be more undesirable, the Neogrammarian series tenues aspiratae, despite its analytical nature, is upheld as a practical approximation.

(b) In addition, Szemerényi (1996:144) asserted that "the existence of unvoiced aspirates in Indo-European cannot be denied". This is also true in the sense that the clusters PIE \*tha \*kha \*pha contained diphonemic PIE \*th \*kh \*ph from the beginning and PIE \*tah \*kah \*pah yielded \*th \*kh \*ph after the loss of unaccented PIE \*a. In this sense, the "elimination of tenues aspiratae" does not obviate the clusters PIE \*th kh ph any more than other sequences (say \*tr or \*ip).

(c) The elimination of the Th- series has led the glottalic theory to an impasse where the existing correspondence sets with voiceless aspirates

PIE \*tah, tha → RV. th, gAv. θ, Gr. θ, Arm. t', Lat. t, etc.

are rejected and the non-aspirated series T is claimed to be aspirated, despite the fact that no aspirate is present in the examples. Suffice it to say, Grassmann (1863)<sup>691</sup> already proved the distinction between voiceless unaspirated and voiceless aspirated plosives, certainly not in free variation.

## 4.5 Mediae Neogr. \*g \*b \*d

### 4.5.1 Material of Neogr. \*g, b, d

§0. Already Schleicher, followed by the Neogrammarians, reconstructed the voiced unaspirated plosives PIE \*b d g (mediae) for the proto-language.

§1. Brugmann's examples of Neogr. \*g (Grundr<sup>2</sup> 1:572) include:

(a) Neogr. \*steg- 'Dach; verhüllen, verbergen' (Grundr<sup>2</sup> 1:573, P. 1013-14)

Gr. στέγος-	(n.) 'Dach, Haus' (GEW 2:780)
Li. stóga-	(m.) 'Dach, Heim, Wohnstätte' (LiEtWb. 911)
OInd. sthága-	(prA.) 'cover, hide' (MonWil. 1261, sthagati [3sg])
OInd. sthagáya-	(cs.) 'verhüllen, verbergen' (KEWA 3:523)
OPr. stogi-	(m.) 'Dach' (APrS. 438)

(b) Neogr. \*ag- 'Schuld, Sünde' (P. 8)

<sup>691</sup> See Grassmann (1863:107): "Der endung -tha der 2.sing. perf. entspricht got., altn. -t, wo auch das griech. -θα die ursprünglichkeit des skt. th bestätigt."

RV. án ·āga-	(a.) ‘schuldlos, sündlos’ (WbRV. 54)
Gr. ἄγος-	(n.) ‘(Blut)schuld, Fluch, Sühne’ (GEW 1:14)
RV. āgas-	(n.) ‘Sünde, Unrecht’ (WbRV. 172)
RV. án ·āgas-	(a.) ‘schuldlos, sündlos’ (WbRV. 54)
Gr. ἐν·αγήσ-	(a.) ‘fluch-, schuldbeladen’ (GEW 1:14)

(c) Neogr. \*gel- ‘Eis, Frost, Kälte’ (P. 365-6)

OEng. cōl-	(pret.) ‘be(come) cold, cool’ (ASaxD. 143, cōl)
Lat. gelo-	(n.) ‘Eiskälte, Frost, Eis’ (WH 1:585-6, gelum)
Li. gélmeni-	(f.) ‘strenge, prickelnde Kälte’ (WH 1:586, gélmenis)
Go. kald-	(a.) ‘cold’ (GoEtD. 214, kalds [sgN])
RV. jáḍhav-	(a.) ‘stumpfsinnig’ (WbRV. 465, RV. jáḍhavas 8.61.11)

(d) Neogr. \*aug- ‘wachsen’ (P. 84-5)

Li. áug-	(vb.) ‘wachsen, größer werden’ (LiEtWb. 24, áugti)
Go. ana ·ai auk-	(pret.) ‘sich mehren’ (GoEtD. 50, anaiauk [3sg])
RV. ugrá-	(a.) ‘kräftig, mächtig, gewaltig’ (WbRV. 245-6)
Gr. αὔξω	(pr.) ‘mehren, fördern, wachsen’ (GEW 1:187)
Hi. huęatar/n-	(n.) ‘Haufen, Getreidesilo <sup>692</sup> ’ (HHand. 52, HEG 1:264)

§2. Neogr. \*b (Grundr<sup>2</sup> 1:507) is attested in examples like:<sup>692</sup>

(a) Neogr. \*bel- ‘Kraft’ (P. 96)

RV. bála-	(n.) ‘Kraft, Leibeskraft, Stärke’ (WbRV. 901)
Lat. de ·bili-	(a.) ‘kraftlos, schwach’ (WH 1:362, debilis [sgN])
OCS. bolje	(adv.) ‘besser, grösser’ (Sadnik v58)
Gr. βέλτιων-	(comp.) ‘better’ (GEW 1:232, βέλτιων)
Gr. βέλτερο-	(comp.) ‘better’ (GEW 1:232, βέλτερος)

(b) Neogr. \*trab- ‘Baum, Balken, Haus’ (P. 1090)

Lat. trab-	(f.) ‘Balken, Schiff, Baum, Dach, Haus’ (WH 2:696)
Li. trobà-	(3f.) ‘Haus, Gebäude’ (LiEtWb. 1127)
MidIr. treb-	(f.) ‘habitation, exploitation agricole’ (LEIA T-126f.)
Osc. trīb-	(f.) ‘Haus’ (WbOU. 765f., trībúm [A], trībud [Abl])
Umbr. trebno-	(m/n.?) ‘tabernāculum’ (WbOU. 761, tremnu [sgAbl])
LAv. avara.ṡrabah-	(m.) ‘EN eines Gläubigen’ (AIWb. 176-7)

(c) Neogr. \*bal-, \*bol- ‘eilen’ (P. 93)

Umbr. am ·bol-	(pr4.) ‘herumlaufen’ (WbOU. 84, amboltu [Ipv.])
Lat. am ·būlā-	(pr1.) ‘(umher)gehen, reisen, spazieren’ (WH 1:38)
OInd. bal ·balī-	(prA.) ‘wirbeln’ (KEWA 2:421, balbalīti [3sg])
Lat. ballā-	(vb.) ‘tanzen’ (WH 1:95, ballāre)
Gr. βαλλίζω	(pr.) ‘tanzen’ (GEW 1:215)

<sup>692</sup> For a list of PIE \*b based on several sources, see Mayrhofer (1983:146fn98).

(d) Neogr. \*amb- (P. 316, Grundr<sup>2</sup> 1:511)

Arm. amp-	(sb.) ‘Wolke’ (ArmGr. 1:417, *o-stem)
OGaul. ambe-	(sb.) ‘rivo’ (LÉIA A:4-5)
RV. ambar ḥṣa-	(m.) ‘Nachkomme des vṛṣagir-’ (WbRV. 96)
Gr. ὄμβρο-	(m.) ‘Regen : thunderstorm’ (GrGr. 1:333, ὄμβρος)
OSpan. ombri-	(a.) ‘umbrisch’ (WbOU. 796)
RV. kiyámbu-	(n.) ‘Bez. einer Wasserpflanze’ (WbRV. 326)
gAv. vy āmbura-	(a.) ‘dem Wasser feindlich’ (AIWb. 1478)

(e) Neogr. \*slab- ‘schlafen, schlaff’ (P. 655)

Li. slōb-	(vb.) ‘schwach werden’ (LiEtWb. 833, slōbti [inf.])
Go. saislep-	(vb.) ‘schlafen : sleep’ (GoEtD. 315, saislep [3sg])
OIcl. slāp-	(m.) ‘Faulpelz’ (ANEtWb. 513, slāpr [sgN])
OCS. slabū	(a.) ‘schwach, schlaff’ (Sadnik √832, slabū [sgN])

(f) Neogr. \*bel- ‘höhlen, graben, schneiden : Kluft’ (P. 96 = PIE \*behal-)

Arm. pele-	(vb.) ‘höhlen, graben’ (P. 96, pelem [1sg]) <sup>693</sup>
MidIr. belach-	(n.) ‘Kluft, Pass, Weg’ (LEIA B-29)
AV. baṇḍá-	(a.) ‘verstümmelt, verkrüppelt’ (EWA 2:206)

§3. Neogr. \*d (Grundr<sup>2</sup> 1:522) appears, for instance, in:

(a) Neogr. \*dekm̄- ‘zehn’ (P. 192, Grundr<sup>2</sup>. 1:522 = PIE \*deḡa ·keah̄-)

Gr. δέκα	(n.) ‘zehn’ (GEW 1:359, δέκα)
RV. dáśa	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, dáśa [NA])
TochA. śā-k-	(num.card.) ‘decem’ (Poucha 320)
OSax. te ·han	(num.) ‘zehn’ (GoEtD. 339, tehan)
Arm. ta ·san-	(num.) ‘zehn’ (ArmGr. 496, taśn [N], taśanç [G])

(b) Neogr. \*ueid- ‘wissen’ (P. 1025f.)

Li. vȳd-	(vb.) ‘erblicken, wahrnehmen’ (LiEtWb. 1265)
gAv. vīd-	(pf.) ‘wissen’ (AIWb. 1316, vīdyāt [opt3sg])
Gr. (F)οἶδ-	(pf.) ‘wissen’ (GEW 1:451, οἶδα [1sg])
Go. wait-	(pret.pr.) ‘wissen’ (GoEtD. 406, wait [1sg])
Li. véida-	(3m.) ‘Anlitz, Aussehen, usw.’ (LiEtWb. 1212-3, véidas)
OCS. vidě-	(vb.) ‘sehen, wahrnehmen’ (Sadnik √1079, viděti [inf.])

(c) Neogr. \*ud- ‘Wasser’ (P. 78f. = PIE \*fauḍ-)

RV. úd-	(f.) ‘Woge, Wasser’ (WbRV. 252, udá [sgI])
RV. óda-	(pr1.) ‘quellen, wallen’ (WbRV. 251, in ódati [pt.f.])
Hom. ὕδατ-	(n.) ‘Wasser’ (GEW 2:957, ὕδατος with ὕ in Il. 21.300)
Li. údra-	(m.) ‘Fischotter’ (LiEtWb. 1157, údras [sgN])
OCS. vydra-	(f.) ‘Fischotter’ (GEW 2:957)

<sup>693</sup> Arm. pelem, quoted by Walde in (WP 2:110), does not appear in ArmGr. or EtDiArm.



(d) Neogr. \*sed- (P. 884f. = PIE \*seh₂ad-, \*sfiad-)

Li. sēd-	(vb.) ‘sich setzen’ (LiEtWb. 777, sēstis [inf.])
Latv. sēd-	(vb.) ‘sich setzen’ (LiEtWb. 777, sēstiēs [inf.])
Li. sodà-	(f.) ‘Dorf, Ansiedlung’ (LiEtWb. 854-5)
OIr. saidi-	(pr.) ‘s’asseoir, être assis’ (LEIA S-7f., GOI 354, sa’did)
OGaul. sado(n)-	(ON.) ‘Saze, dép Gard, arr. Uzès’ (ACSS. 2:1283, sado)

(e) Neogr. \*do- ‘geben, schenken, gewähren’ (P. 223-226 = PIE \*dāh₁-, deah₁-)

Lat. da-	(√pr.) ‘geben, gewähren’ (WH 1:360f., damus [1pl])
Arm. ta-	(vb.) ‘geben’ (ArmGr. 496, tam [1sg], tamk’ [1pl])
gAv. da-	(vb.) ‘geben’ (AIWb. 678, daidyāi [inf.])
Lat. dā-	(vb.) ‘geben’ (WH 1:360, dā [2sg], dās [2sg])
Gr. δό-	(aoM.) ‘geben’ (GEW 1:388-9, ἐδόμην [1sg])
Li. donì-	(f.) ‘Zins, Steuer, Tribut’ (LiEtWb. 99)
Latv. dāva-	(vb.) ‘anbieten, schenken’ (LiEtWb. 112, dāvat [inf.])
Li. dovanà-	(f.) ‘Gabe’ (LiEtWb. 112, dovanà [sgN])

#### 4.5.2 Theoretical approaches to the series mediae

§0. The central problem of the Taihun-Decem isogloss during the 20<sup>th</sup> century has been the voiced unaspirated series D (mediae), treated both by Meillet and Magnusson and by the glottalic theory.<sup>694</sup>

§1. In the Neogrammarian system, the unaspirated voiced plosives \*g b d (mediae) were reconstructed on comparative grounds without further analysis.

§2. Within the laryngeal theory, Kuryłowicz (1935:54-55) reconstructed for the variants of the traditional root P. pō- ‘trinken’ (= LT \*pe₃-) the following alternation:

LT *pe₃C-	→	OInd. pā- (Gr. πῶ- ‘id.’)
LT *pip₃V-	→	OInd. pibati ‘drinks’ (OIr. ibid ‘id.’)

According to Kuryłowicz, the ‘o-colouring’ laryngeal e₃ was voiced and accounts for the voice of OInd. b ← \*\*pe₃ (assimilation).<sup>695</sup>

§3. The glottalicist idea of deriving the series mediae from the earlier cluster of tenuis+ejective D ≡ T’ can be understood as a generalization of Kuryłowicz’s analysis “p+e₃” with the value e₃ ≡ ’ attached for the entire series:

$$b^* \equiv **p' \quad d \equiv **t' \quad g \equiv **k' \quad (GI).^{696}$$

<sup>694</sup> Statistically the distribution of PIE \*b \*d \*g is uneven. Whereas PIE \*d and \*g are commonplace, PIE \*b is rare.

<sup>695</sup> Compare Sturtevant’s attempt to distinguish the single (Ḥi. ḥ) and double writings (Ḥi. ḥḥ) by associating these with voiced and voiceless laryngeals. See also Hendriksen (1941:38).

§4. Based on the remarks of Aulus Gellius (Noctes Atticae 9.6. & 12.3), Lachmann (1850) suggested the following rule for Latin: if the root ends in a voiced stop, then the root-syllable vowel is lengthened in the participle.<sup>697</sup> This conjecture, now known as Lachmann's Law (see Collinge 1985:105), comes with only a few counterexamples:

(a) Within the PIE \*·to-participles, only Lat. *strīcto*- 'straff' (WH 2:604, to Lat. *stringō* 'schnüren') with an apparent root-final \*·g- inferred from Lat. *strigula* has a short root vowel Lat. *ī*, this form being the sole counterexample of this category.

(b) On the other hand, Lachmann's Law does not apply to the \*·so-participle (cf. Lat. *ēso*-, *uīso*-, *cāso*-, *fisso*-, *fosso*-, *sessō*-, *presso*-, etc.). In this formation, a long root vowel is followed by a single sibilant Lat. *s*, a short vowel by a geminate Lat. *ss* (see already Sommer 1914:122).

The renewed interest in Lachmann's Law can be credited to Gamkrelidze and Ivanov (1995:61), according to whom the lengthening of Lachmann's Law was caused by an earlier ejective resulting in compensatory lengthening: GI \**ak̰*' *t<sup>h</sup>os* → PItal. \**āk* *tos*.

§5. In 1978, according to Szemerényi (1996:153), Werner Winter

“[...] voiced the conjecture that the long vowel which appears in a number of cases in Balto-Slavic in contrast to the short vowel in other languages is conditioned by a following unaspirated voiced stop: cf. Lith. *ėdu* 'I eat' *sėdėti* 'sit', *bėgti* 'run' : Lat. *edō*, *sedeō*, Gr. *φῆβουαι*.”<sup>698</sup>

Winter's conjecture, assumedly accounting for the long quantity of Li. *pėdas* 'footstep', *vėdaras* 'belly', *úosti* 'to smell', *núogas* 'naked', *úoga* 'berry', etc. has been accepted by Kortlandt (1988), interpreting the Balto-Slavonic long grade as the glottalic counterpart of Lachmann's Law.

§6. Magnusson's (1967) elimination of the series D applies only to those roots with two plosives, but no satisfactory treatment has been offered for the roots with only one media D. In Miller's (1976:57) words, “Magnusson's analysis is thus highly artificial since he would have underlying simple stops only in roots like \**ed*- 'eat' or *leid*- 'play' (Pokorny 666) with voiced aspirates elsewhere [...]”

### 4.5.3 Solutions to the problems of the series mediae

§0. The problems and the comparative solutions of the series mediae are discussed in this chapter.

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<sup>696</sup> Collinge's analysis (1985:265) of another glottalist, Hopper, is revealing: “Hopper (1977a:50, 1978:70, 1982:133) works with the sequences /pe?/, /p?/, being happy with a segmental glottal stop in PIE; and he sees /p?/ reanalyzed as /p'/ and then laryngealized so as to reflect as voiced /b/.”

<sup>697</sup> Lachmann's original version is “ubi in praesenti media est, participia producuntur”.

<sup>698</sup> Winter (1978:439) writes: “In Baltic and Slavic languages, the Proto-Indo-European sequence of short vowel plus voiced stop was reflected by lengthened vowel plus voiced stop, while short vowel plus aspirate developed into short vowel plus voiced stop.”

§1. Regarding Lachmann's Law, the following should be observed:

(a) The theme Lat. *stringō*, *strīxī*, *strictus* can be reconstructed with PIE \*gh, if it is compared to OEng. *string* 'line, cord' (OxEngEt. 876) instead of Lat. *strigula*. This would eliminate the sole counterexample and leave the sound law flawless.

(b) Lachmann's original formulation did not account for the fact that in Latin there are two past participles, one in PIE \*so- and another in PIE \*to-. When Lachmann's Law is restricted to the \*to-participle only, the law has no exceptions at all.

(c) In the 'Osthoff-Kent-Kuryłowicz-Watkins formulation' (so dubbed by Collinge 1985:110), no condition is admitted for Lachmann's Law, and the quantities of Latin are understood as original. Despite the high accuracy of Lachmann's Law, I am sympathetic towards this view because of its higher comparative content (*'lectio difficilior'*) and economy. Furthermore, in spite of Lachmann's Law, it makes sense to accept the Latin quantities without any assumption of lengthening, because the quantities are usually paralleled. Thus, we may posit a stem

Lat. *āg-* (pret.) 'agere' (in Lat. *āctus* [pt.sgN])

because the quantity coincides with:

PIE \*h<sub>2</sub>āēg- 'agere'

Lat. *amb-āg-* (f.) 'Umgang, Umlauf, Winkelzüge' (WH 1:37)

LA. *nav-āza-* (m.) 'Schiffer' (AIWb. 1047)

RV. *āja-mīḍha-* (m.) 'Abkömmling des *ajamīḍha-*' (WbRV. 173)

TochA. *āke-* (prA.) 'vehere' (Poucha 14, *ākeñcām* [3pl+encl.])

TochB. *āke-mane-* (ptM.) 'leading' (DTochB. 36, *ākemane*)

§2. Several counterarguments have been presented against Winter's rule, and I will mention here only the most critical ones, which should suffice to demonstrate that the proposal cannot be accepted as an Indo-European sound law.

(a) As pointed out by Szemerényi (1996:153): "[...] a number of exceptions cannot easily be reconciled with his interpretation [...] Lith. *padas* 'sole of foot or shoe', Russ. *pod* 'ground' [...] Slav. *voda* 'water' [...]."

(b) Balto-Slavic displays quantitative ablaut before the series mediae in examples like:

Li. *ága-* (vb.) 'wachsen' (Grundr<sup>2</sup> 1:211, *águ* [1sg])

Li. *úoga-* (f.) 'Beere, Kirsche' (LiEtWb. 1165)

OCS. *agoda-* (f.) 'Frucht, Beere' (Sadnik √4A)<sup>699</sup>

Had Winter's lengthening taken place, the short root forms (and quantitative ablaut in general) would not exist.

(c) Finally, a point understood by Winter (but missed by his critics) should be mentioned here. Winter begins his article by noting:

"Calvert Watkins (1969:31-32) agrees with Jerzy Kuryłowicz (1956:305-306) in assuming that the lengthening in, e.g., Lith. *bėgu*, R. *begu* : Gk. *φέβομαι* was a special Balto-Slavic

<sup>699</sup> For the *vṛddhi*, it should be noted that OIr. *ās-* (n.m.) 'croissance' (LEIA A-92-93) can be attached here instead of the usual etymology (P. 787) with inferior semantics.

development (to be kept apart from the apparent parallel in Lat. *ēst* ‘he is eating’: *edere* ‘eat’).”

Such an assumption runs counter to the facts, because as a rule the Balto-Slavic quantity matches the common Indo-European one in the following examples of the rule:

Neogr. *ēd-	Li. <i>éd-</i> , Lat. <i>ēdī</i> , OIcl. <i>āt-</i> , Gr. <i>εδηδώς</i> (P. 287-8)
Neogr. *sēd-	Li. <i>séd-</i> , Lat. <i>sēd-</i> , Go. <i>anda ·set-</i> (P. 884f.)
Neogr. *pēd-	Li. <i>péd-</i> , Gr. <i>πηδάω</i> , Lat. <i>pēs</i> (P. 790f.)
Neogr. *ōd-	Li. <i>úod-</i> , Gr. <i>ὄδωδα</i> , Arm. <i>hr ·ut</i> ‘ <i>πυρ ·ώδεϛ</i> ’ (P. 772-3)
Neogr. *bhēg-	Li. <i>bég-</i> , Hind. <i>bhāg-</i> < * <i>bhāgg-</i> (P. 116)

The traditional explanation, the Proto-Indo-European *v̥ddhi*, suffices to explain the phenomenon without producing any inconsistencies resulting from an assumption of lengthening in Balto-Slavonic.

§3. Magnusson concludes his article by admitting the problem of roots with one voiced plosive. In his opinion, three possibilities might account for the roots Neogr. \*D, but none of these are possible as such (see Magnusson 1967:24-25). Despite this, I agree with Magnusson’s (1967:25) general conclusion, according to which:

“It would seem more in accordance with a scientific attitude, however, for one to be interested in an eventual endeavour to explain the origin of the three orders in one-occludent patterns.”

§4. Magnusson (1967) does not fully clarify the fact that his and Meillet’s observations concerning the PIE root constraints were never unambiguous, owing to the incompleteness of the phoneme inventory at their disposal.<sup>700</sup> In particular, the segmental laryngeal PIE \**h* has not been studied in connection with the root constraint and, in particular, Magnusson’s (1967:24) observation on the voiced stops in one-plosive roots:

“[...] one-occludent patterns in some cases represent reductions of 2-occludent patterns by loss of one occludent [...]”

Because the array PIE \**k p t* represents the minimal set of places of articulation, the loss of a phoneme within the array T : Th : D : Dh is impossible in the framework of Proto-Indo-European. However, a phoneme belonging to a different category (namely the laryngeal fricative PIE \**h*) was indeed lost. Its potential effects on the plosive system have not been studied so far.

§5. In terms of the effects of the cover symbol PIE \**h*, the key conjecture can be stated as follows: *The Neogrammarian roots with one unaspirated voiced plosive D also contain PIE \*h̥ (i.e. the voiced value of the cover symbol PIE \*h̥).*

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<sup>700</sup> Magnusson’s main sources (1967:20fn8), the etymological dictionaries of Pokorny (P.) and Walde (WP.), do not account for PIE \**h* and its properties.

The conjecture is provable due to the following criterion being satisfied for the Indo-European material in question: *The Neogrammarian roots D with one unaspirated voiced plosive also contain at least one feature implying PIE \*h*  $\equiv$  PIE \*h.<sup>701</sup>

This statement readily holds true for the examples of the series mediae quoted above, all of which imply PIE \*h ( $\equiv$  \*h). Thus:

(a) Neogr. \*bel-  $\equiv$  PIE \*behal- ‘wachsen; Kraft’ (P. 96)

RV. bála-	(n.) ‘Kraft, Leibeskraft, Stärke’ (WbRV. 901)
Lat. de·bili-	(a.) ‘kraftlos, schwach’ (WH 1:362)
Gr. βέλτιον-	(comp.) ‘better’ (GEW 1:232, βέλτιον)

PIE \*h is proven for the root by Fortunatov’s Law II, as seen in the dental extension

RV. baṣkáyā-	(a.) ‘ausgewachsen (vom Kalb)’ (EWA 2:219).
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(b) Neogr. \*gel-  $\equiv$  PIE \*gehal- ‘Kälte, Frost, Eis’ (P. 365-6)

OEng. cōl-	(pret.) ‘be(come) cold, cool’ (ASaxD. 143, cōl)
Lat. gelo-	(n.) ‘Eiskälte, Frost, Eis’ (WH 1:585-6, gelum)

PIE \*fa is proven by the Lithuanian acute and Fortunatov’s Law II in:

Li. gélmeni-	(f.) ‘strenge, prickelnde Kälte’ (WH 1:586, gélmenis)
RV. jáḍhav-	(a.) ‘stumpfsinnig’ (WbRV. 465, RV. jáḍhavas 8.61.11)

(c) Neogr. \*deḱm-  $\equiv$  PIE \*defa·keah- ‘ten’ (P. 191-2)

Gr. δέ·κα	(n.) ‘zehn’ (GEW 1:359)
RV. dá·śa	(n.) ‘zehn’ (n.) ‘zehn Finger’ (WbRV. 581, dáśa [NA])
TochA. śā·k-	(num.card.) ‘decem’ (Poucha 320)

PIE \*h is revealed by the ‘a-colouring’ of the prefix (PIE \*defae·keahn-) in Armenian:

Arm. ta·san-	(num.) ‘zehn’ (ArmGr. 496, tašn [N], tasanç [G]).
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(d) Neogr. \*ueid-  $\equiv$  PIE \*ufaid- ‘sehen, wissen’ (P. 1025f.)

Gr. (Ϝ)οῖδ-	(pf.) ‘wissen’ (GEW 1:451, οῖδα [1sg])
Go. wait-	(pret.pr.) ‘wissen’ (GoEtD. 406, wait [1sg])
OIr. fiad	(prepD.) ‘coram’ (DIL 303, fiad)

PIE \*h is revealed by Lithuanian acute and long glide Neogr. \*i in:

Li. véida-	(3m.) ‘Anlitz, Aussehen, usw.’ (LiEtWb. 1212-3, véidas)
Li. víd-	(vb.) ‘erblicken, wahrnehmen’ (LiEtWb. 1265)
gAv. vīd-	(pf.) ‘wissen’ (AIWb. 1316, vīdyāt [opt3sg])

(e) Neogr. \*sed-  $\equiv$  PIE \*sehad- ‘sich setzen’ (P. 884f.)

Li. séd-	(vb.) ‘sich setzen’ (LiEtWb. 777, séstis [inf.])
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<sup>701</sup> By such features, I mean properties indicating the presence of PIE \*h, including the Old Anatolian laryngeal (Ḫi. ḫ), ‘a-colouring’, Lithuanian acute, Indo-Iranian retroflex, lengthening of semivowels, Rig-Vedic hiatus, and so forth (as discussed throughout this study).

Latv. sêd- (vb.) ‘sich setzen’ (LiEtWb. 777, sêstiês [inf.])

PIE \*f<sub>h</sub> is implied by accent Li. ě = Latv. ê and Neogr. \*a/ā (schwebeablaut) in:

OIr. sad- (pr.) ‘to sit’ (GOI 354, sa<sup>i</sup>did [3sg])  
OGaul. sado(n)- (ON.) ‘Saze, dép Gard, arr. Uzès’ (ACSS. 2:1283, sado)  
Li. sodà- (f.) ‘Dorf, Ansiedlung’ (LiEtWb. 854-5)

Similarly the one-plosive roots D can be proven to contain PIE \*f<sub>h</sub> through the presence of additional criteria that imply the laryngeal.

The Neogrammarian roots D can be split into *Class I*, consisting of the roots f<sub>h</sub>—D, and *Class II*, consisting of the roots D—f<sub>h</sub>. Both classes are briefly outlined below.

§6. **Class I** (roots f<sub>h</sub>—D). Some examples of this class are:

(a) √f<sub>h</sub>aisd- ‘Bein’ (P. –)

OĤi. ĥišda;a- (É.) ‘Beinhaus’ (HEG 1:237-8, ĥi-iš-ta-a-aš)  
OInd. eḍ·ūka- (Ém.) ‘charnel-house, reliquary’ (KEWA1:127)

The directly preserved Ĥi. ĥ was voiced (PIE \*f<sub>h</sub>), based on OInd. ḍ.

(b) √f<sub>h</sub>aid- (\*f<sub>h</sub>aeid- \*f<sub>h</sub>aoid-) ‘Wange, Geschwulst, Eiter’ (P. 744)

Arm. ait- (sb.) ‘Wange’ (ArmGr. 1:418, ait)  
Gr. οἰδῖ·πο- (Im.) ‘Oidipus’ (GEW 2:358, οἰδῖπος [sgN])  
Gr. οἰδέω (pr.) ‘schwellen’ (GEW 2:357)  
Gr. οἰδοο- (n.) ‘Geschwulst’ (GEW2:357, οἰδος [NA])  
OIcl. eit- (n.) ‘Eiter, Raserei’ (ANEtWb. 98, eit)

Arm. a- confirms a laryngeal in the root-initial position with value PIE \*f<sub>h</sub>, based on Gr. δ.

(c) √f<sub>h</sub>alig- ‘klein, gering, armselig, schlecht’ (P. 667)

Gr. ὀλίγο- (a.) ‘klein, gering, wenig’ (GEW 1:376)  
Arm. ałk·ałk (a.) ‘gering, armselig, dürftig, schlecht’ (P. 310 [diff.])

Arm. a- implies PIE \*f<sub>h</sub> (for voice, cf. Gr. γ = Arm. k).

(d) √f<sub>h</sub>ang<sup>a</sup>- ‘Salbe, Butter; salben’ (P. 779)

Lat. unguō (pr3.) ‘salben’ (WH 2:819, unguere [inf.])  
Gr. θοί·αμβος (.) ‘Salben des Feigenbaums’ (Stüber 1997:84)<sup>702</sup>  
RV. áñjas- (n.) ‘Salbe, Mischung’ (WbRV. 25-6)  
OPr. ancta- (n.) ‘Butter’ (APrS. 300, anctan)  
Bret. amann- (.) ‘Salbe’ (Stüber 1997:84, PCelt. \*amban-)  
Corn. amen·en- (.) ‘Salbe’ (Stüber 1997:84)

Celtic /a/ implies PIE \*f<sub>h</sub> (for voice, cf. Lat. gu = Gr. β, etc.).

(e) √f<sub>h</sub>arġ- ‘weiß, glänzend’ (P. 64)

Gr. ἀργό- (a.) ‘weißglänzend’ (GEW 1:132-3, ἀργός [sgN])

<sup>702</sup> For the interpretation of Greek, see Stüber (1997:84), with a reference to Janda.

Ḫi. ḫargi-	(a.) ‘weiß, hell’ (HEG 1:177, ḫar-ki-iš [sgN])
TochB. arkwa-	(a.f.) ‘white’ (DTochB. 23, arkwañña)
RV. árjuṇa-	(a.) ‘weiss, silberfarben’ (WbRV. 112-3, EWA 1:116)
RV. řj̥-iti-	(a.) ‘glühend, strahlend’ (WbRV. 279)

The Old Anatolian laryngeal is accompanied by Gr. α, implying the root fi—D.

(f) √fiarḡ- ‘eilen’ (P. 64)

Gr. ἀργό-	(a.) ‘schnell beweglich’ (GEW 1:132)
RV. řj̥iant-	(pt.) ‘vordringend, vorwärtsschießend’ (WbRV. 280)
Gr. ἀργί·πουδ-	(a.) ‘schnellfüßig’ (Perrson, Beitr. 828)
Ḫi. ḫarganau-	(c./n.) ‘Sohle?, Ferse?’ (HHand. 42, HEG 1:176)
RV. řj̥rāśva-	(PNm.) ‘dessen Rosse geradeaus eilen’ (WbRV. 280)
LAv. ərəzrāspa-	(PNm.) ‘EN. eines Gläubigen’ (AIWb. 355)

The Old Anatolian laryngeal is accompanied by Gr. α, implying the root fi—D.

(g) √fiarḡ- ‘Adler’ (P. 854-5)

OInd. řj̥i·pyá-	(a.) ‘epith. of OInd. śyená- = Adler’ (Beitr. 827)
LAv. ərəzi·fya-	(m.) ‘Adler’ (AIWb. 354)
Arm. arci·w-	(sb.) ‘Adler : eagle’ (EtDiArm. 139)
Maced. ἀργιό·που-	(m.) Hes. ‘ἀετός’ (LSJ. 235, ἀργιόπους [sgN])

PIE \*fi is implied by Arm. a- ≡ Maced. ἄ- with voice in Maced. γ ≡ Av. z. By cutting the extension \*·ḡ-, the main root is obtained:

PIE \*fiar- (P. 325-6):

Ḫi. fiara-	(c.) ‘Adler’ (HHand. 41, fi-a-ra-aš [sgN])
Pal. fiara-	(c.) ‘Adler?’ (DPal. 54, fi-a-ra-aš [sgN])

Yet another extension PIE \*fiar·(o)n- is attested in:

Ḫi. fiaran-	(c.obl.) ‘Adler’ (HEG 1:170f. fi-a-ra-na-aš [G])
Go. aran-	(m.) ‘Aar, Adler’ (GoEtD. 40, arans [plN])
CLu. fiarani-	(c.) ‘a bird’ (HEG 1:170f., fi-a-ra-ni-en-za)
Gr. ὄρνεο-	(n.) ‘Vogel’ (GEW 2:421-2, ὄρνεον)

(h) √fiard- ‘Schmutz; feucht, naß’ (P. 334)

Gr. ἄρδα-	(f.) ‘Schmutz’ (GEW 1:134, ἄρδα [sgN])
Gr. ἄρδαλόω	(vb.) ‘beschmutzen’ (GEW 1:134, ἄρδαλόω)
RV. ārdrá-	(a.) ‘feucht, naß, wogend’ (EWA 1:117-8)
OIcl. ertla-	(f.) ‘Bachstelze, Motacilla Fusca’ (ANetWb. 105)

Gr. α also directly matches Ḫi. fi in the unextended root:

PIE \*fiar- ‘idem’

Ḫi. fiar-	(vb.) ‘verunreinigen’ (HEG. 1:169, HHand. 41)
Gr. ἄρο-	(m.) ‘τὰ λιβάδια’ (LSJ. 245, ἄρους·τὰ λιβάδια)

(i) √fiasd- ‘branch, twig, usw.’ (P. 782)

Hi. ḥašduir-	((Giš)n.) ‘Zweige, Reisig, Bast, Häcksel’ (HEG 1:206)
Gr. ὄζο-	(m.) ‘Ast, Zweig, Schößling’ (GEW 2:353, ὄζος)
OEng. ὄst-	(m?.) ‘knot, knob’ (ASaxD. 768)
Arm. ost-	(sb.) ‘branch, twig’ (ArmGr1:482)

Dominating the extension, the vocalism Gr. ὄ- ≡ Arm. o- reflects PIE \*ḥao- (not LT †h<sub>3</sub>e-), because Hi. ḥ matches with Lat. a in the root without extension:<sup>703</sup>

Hi. ḥaš-	(n.) ‘Span o.ä.’ (HEG 1:194-5)
Li. asý-	(f.) ‘Schlachtelhalm’ (LiEtWb. 124, asýs [sgN])
Gr. ἤῥα-	(n.pl.) ‘Spreu, Getreidehalme’ (GEW 1:625, ἤῥα, ῥῥα)
Lat. aristā-	(f.) ‘Granne, Ähre, Borsten’ (WH 1:67, arista)

(j) √ḥad- ‘essen’ (P. 289)

RV. madhu-’ád-	(a.) ‘Süßes, süsse Frucht essend’ (WbRV. 990)
Hi. ḥadar-	(n.) ‘einer Art Getreide’ (HEG 1:220, ḥa-at-tar [NA])
Lat. adōr-	(n.) ‘einer Art Getreide, Spelt’ (WH 1:14, ador [NA])
Gr. ἀδάξο-	(pr.) ‘ὀδάξω : τοῖς ὀδοῦσι δάκνει’ (GEW 2:348)
Arm. atamn-	(sb.) ‘Zahn’ (ArmGr. 422, atamn [N])

PIE \*ḥ is confirmed by Rig-Vedic hiatus, agreeing with Hi. ḥ and Lat. a ≡ Arm. a.

(k) PIE \*ieḥag<sup>h</sup>- ‘können, vermögen’ (P. 503)

Latv. jēg-	(vb.) ‘begreifen, verstehen’ (LiEtWb. 192, jēgt [inf.])
Li. pa-jēg-	(vb.) ‘imstande sein, können, vermögen’ (LiEtWb. 192)
Li. jėgà-	(4f.) ‘Kraft, Stärke, Macht’ (LiEtWb. 192, jėgà)
Do. ἦβᾱ-	(f.) ‘Jugendkraft, jugendliches Alter’ (GEW 1:62)
Aiol. ἄβᾱ-	(f.) ‘Jugendkraft, jugendliches Alter’ (GEW 1:620)

PIE \*ḥ is confirmed by Aiol. ᾱ and Li. g ≡ Gr. β.

(l) √lafib- ‘lip, lick’ (P. 651)

Lat. labio-	(m.) ‘Lippe, Rand’ (WH 1:738, labium)
OEng. lapia-	(vb.) ‘lap, lick’ (ASaxD. 621, lapian [inf.])
OIcl. lepia-	(vb.) ‘schlüpfend lecken’ (ASaxD. 621, ANEtWb. –)
Lat. labello-	(n.dim.) ‘Lippchen’ (WH 1:738, labellum [sgNA])
Lat. labro-	(n.) ‘Lippe, Rand’ (WH 1:738, labrum [sgNA])
OCS. lobŭza-	(vb.) ‘küssen’ (Sadnik √471, lobŭzati [inf.])

PIE \*ḥ is implied by Lat. a with voice in Lat. b ≡ OEng. p.

(m) √maḥg̃- ‘drücken, kneten, abstreichen, reinigen, salben’ (P. 696)

Gr. μαγό-	(ao.) ‘drücken, kneten, abstreichen’ (GEW 2:180)
OCS. maza-	(vb.) ‘salben, schmieren’ (Sadnik √493, mazati [inf.])
Rus. máza-	(pr.) ‘bestreichen, beschmieren, salben’ (REW 2:87)
Gr. μαγμό-	(m/n.?) Hes. = τὸ καθάρσιον’ (GEW 2:181)

<sup>703</sup> The root etymology \*h<sub>2</sub>o-sd- (to P. \*sed- ‘sit’) is thus erroneous.



RV. khara ·majrá- (a.) ‘scharf (= khara-) reinigend (Sāy.)’ (WbRV. 372)

The unambiguous Gr. α implies PIE \*f<sub>h</sub> with voice in Gr. γ ≡ RV. j.

(n) √mafnd- ‘verweilen, bleiben, wohnen, Wohnsitz, Stall’ (P. 699)

OCS. mōdi-	(vb.) ‘zögern, verharren, verweilen’ (Sadnik √542A)
OInd. mandirá-	(n.) ‘Wohnsitz, Haus, Palast, Tempel’ (KEWA 2:582)
OIr. mainder-	(f.) ‘enclos (pour le bétail), lieu fermé’ (LEIA M-10)
Gr. μάνδρα-	(f.) ‘Pferch, Hürde, Stall, Kloster’ (GEW 2:169)
Lex. mandu ·pāla-	(m.) ‘groom’ (KEWA 2:582)
OInd. mandurá-	(f.) ‘Pferdestall’ (KEWA 2:582)

Gr. α and Gr. δ ≡ OInd. d imply PIE \*f<sub>h</sub>.

(o) √mafnd- ‘trinken’ (P. 694-5)

gAv. mada-	(m.) ‘Rauschtrank’ (AIWb. 1114, madahyā [sgG])
Lat. madeō	(pr.) ‘naß sein, triefen, reif/voll/trunken sein’ (WH 2:6)
Gr. μαδάω	(pr.) ‘von Nässe triefen, zerfließen’ (GEW 2:157)

Greek and Latin agree in /a/, with the voiced stop Lat. d ≡ Gr. δ implying PIE \*f<sub>h</sub>.

(p) √sufiad- ‘sweet’ (P. 1039-40)

RV. su’áda-	(pr.) ‘angenehm, genussreich machen’ (WbRV. 1622)
RV. havya ·súd-	(a.) ‘die Opfertränke süßig machend’ (WbRV. 1657)
OGaul. suādu ·rīg-	(PNm.) ‘Suß ·könig’ (ACSS. 2:1644, suadurix [sgN])
El. (h)Ἔαδύ-	(a.) ‘süß’ (GEW 1:623, El. Ἔαδύς, Do. ἀδύς, Att. ἡδύς)

PIE \*f<sub>h</sub> is confirmed by hiatus in Rig-Veda, the long glide RV. ū ← \*uḥá and Do. ā.

§7. **Class II** (roots D—f<sub>h</sub>). Roots beginning with media followed by the voiced laryngeal include the following well-known examples:

(a) √deafins- ‘zeigen, unterrichten, usw.’ (P. 201-2)

RV. dañsáya-	(cs.) ‘züchtigen’ (WbRV. 569)
gAv. dāhišta-	(sup.) ‘bestunterrichtete’ (AIWb. 746)
RV. dáñsas-	(n.) ‘wunderliche, herrliche Tat’ (WbRV. 570)
Hes. ἄ ·δανέσ-	(a.) ‘ἀπρονόητον’ (GEW 1:382)
Gr. δήνεσ-	(n.) ‘Ratschläge, Anschläge’ (GEW 1:382, δήνεα [pl])

Gr. δ, α imply PIE \*f<sub>h</sub>.

(b) √deafis- ‘lehren’ (P. 201-2)

Gr. δαῖh-	(vb.) ‘lehren’ (GEW 1:382, δαε [ipv2sg])
Hom. δέδαῖh-	(ao.) ‘lehren’ (GEW 1:384, δέδαε [3sg])
gAv. dīdaiḥha-	(futMP.) ‘unterwiesen werden’ (AIWb. 746, dīdaiḥhe)
Gr. διδάσσω	(vb.) ‘unterrichten, lehren’ (GEW 1:338)
RV. dasrá-	(a.) ‘wunderthätig’ (WbRV. 585, EWA 1:712)
gAv. daṅgra-	(a.) ‘weise, kundig, geschickt’ (AIWb. 681)

Gr. δ, α imply PIE \*f<sub>h</sub>.

(c) √diafi- ‘Himmel, Zeus’ (P. 183-7)

Do. ζά-	(m.) ‘Zeus’ (GrGr. 1:576f., GEW 1:610, ζάς, ζάv)
RV. diá-	(m.) ‘Himmel’ (WbRV. 601-4, RV. diám = Lat. diem)

PIE \*h with voice in RV. d is confirmed by Do. á and Rig-Vedic hiatus.

(d) √gʷahs- ‘kosten, wählen, erproben, usw.’ (P. 399, \*gʷeus-)

Gr. γεύho-	(pr.) ‘kosten’ (GEW 1:302, γεύομαι)
Go. kiusa-	(vb.) ‘kiesen, prüfen, wählen, erproben’ (GoEtD. 219)
RV. sa jús-	(prepI.) ‘vereint, zusammen, zugleich’ (WbRV. 1449)
Khot. ysūš-	(vb.) ‘schätzen’ (P. 399, ysūš-dē)
OIr. asa gū-	(.) ‘er wünsche’ (VGK 2: 549, asagū [3sg])

PIE \*h with voice in Gr. γ is proven by Indo-European ū ← PIE \*uáfi in two branches (RV. ú = OIr. ū).

(e) PIE \*gʷah- ‘gehen’ (P. 463-5)

RV. g-	(ao.) ‘gehen, kommen, wandern’ (WbRV. 392, gus)
gAv. ga-	(vb.) ‘kommen’ (AIWb. 494, ga¹dī [2sg])
Gr. βά-	(vb.) ‘walk, step, etc.’ (LSJ. 302, βάτην [3du], Gr. /ā/)
RV. ga’a-	(pr.) ‘einen Weg [A,I] gehen’ (WbRV. 392, gaat [3sg])
RV. gá-	(pr.) ‘gehen, kommen, wandern’ (WbRV. 391, gás)
Li. gó-	(vb.) ‘gehen’ (LiEtWb. 161, góti [inf.])
Do. βᾶ-	(ao.) ‘sich aufmachen, gehen’ (GEW 1:208, βᾶθι)

PIE \*h with voice in Gr. β is proven by Gr. á = RV. a, Do. ᾱ = Li. ó and Rig-Vedic hiatus.

(f) PIE \*gʷahs- ‘fressen’ (P. 404, MA. 175)

Gr. γράσ-	(ao.) ‘gnaw, eat’ (LSJ. 360, in Cypr. γράσθι)
RV. jagras-	(pf.) ‘fressen, hinwegnehmen’ (WbRV. 418)
RV. grása-	(prM.) ‘fressen, ohne Obj.’ (WbRV. 418, grásete [3du])
Gr. γράω	(pr.) ‘nagen, fressen’ (GEW. 1:326)
OIcl. krās-	(f.) ‘Leckerbissen, Futter’ (ANEtWb. 329)
Lat. grāmen-	(n.) ‘Grass als Futterkraut’ (WH 1:616-7)

PIE \*h with voice in Gr. γ is implied by Gr. á and Lat. ā (← PIt. \*as).

(g) √gʷahl- ‘triefeln, gießen’ (P. 471-2, gʷel-)

OInd. gala-	(vb1.) ‘drip, drop, etc.’ (MonWil. 350, galati)
OInd. galana-	(a.) ‘träufelnd’ (EWA 1:476)
Gr. βαλανεύ-	(m.) ‘Bader’ (GEW 1:212, βαλανεύς)
Gr. βαλανε(φ)ιο-	(n.) ‘warmes Bad’ (GEW 1:212, βαλανειον)
OInd. gālana-	(n.) ‘das Abtropfenlassen, Seihen’ (GEW 1:476)
Gr. ἄμ βολάδην	(adv.) ‘aufsprudelnd, vom Wasser’ (LSJ. 79)
OHG. quall-	(pret.) ‘hervorquellen, schwellen’ (P. 472)

Gr. α, implying PIE \*h, is directly attested.

(h) √gʷeahl- ‘sterben, verschwinden’ (P. 470f., 1. gʷel-)

OInd. gála-	(vb1.) ‘verschwinden’ (MonWil 350, gálati [3sg])
OIr. at·ball-	(pr.) ‘sterben’ (LEIA A-98, at·ba‘ill [3sg])

OIr. a implies PIE \*f̥.

(i) √glaf̥in- ‘shine, pure, clean’ (P. 366-7)

Gr. γλαϊνός-	(m.pl.) ‘star-shaped ornament’ (LSJ. 350)
OHG. kleini-	(a.) ‘subtilis’ (ASaxD. 157)
OEng. clǣne	(a.) ‘pure, clean’ (ASaxD. 157)
OEng. clǣnsia-	(vb.) ‘purify, cleanse’ (ASaxD. 157)

Gr. α implies PIE \*h̥.

(j) √g̥afr- ‘singen, klagen, rufen’ (P. 352; WH 1:583)

Oss. zar-	(sb.) ‘Gesang’ (WP 1:537, GoEtD. 215)
OIr. fo·gar-	(m.) ‘Ton, Laut : sound’ (DIL. 319)
Gr. γαργαρός	(m.) ‘Hes. = θόρυβος’ (LSJ. 339)
OIr. fo·gor-	(m.) ‘Ton, Laut : sound’ (DIL. 319)
OHG. kara-	(f.) ‘mourning’ (GoEtD. 215)
Go. kara-	(f.) ‘Sorge’ (GoEtD. 215)

Gr. α = OIr. a implies PIE \*f̥h̥ (for voice, see Gr. γ).

§8. According to *ex nihilo nihil*, we expect a measurable cause to exist for the distribution of the roots h̥—D and D—h̥. The sole possible factor is the cover symbol \*h̥, standing for a voiced laryngeal fricative PIE \*f̥h̥ in environment D. The existence of PIE \*f̥h̥ is proven by the contamination of voice from the laryngeal to the surrounding plosives. This is to say, for the roots Neogr. D containing one plosive we obtain the rules

$$h̥—T \rightarrow h̥—D \quad \& \quad T—h̥ \rightarrow D—h̥.$$

§9. That voice was not an original property of the plosives, but a feature of PIE \*f̥h̥ is proven by roots containing a laryngeal but alternating in terms of the voice of the plosives C<sub>1</sub> and C<sub>2</sub>.<sup>704</sup> An example of the alternation C<sub>1</sub>—h̥—G<sub>2</sub> : G<sub>1</sub>—h̥—C<sub>2</sub> is found, for instance, in:

(a) √praf̥ug- ‘Heuschrecke, Frosch; laufen’ (P. 845-6)<sup>705</sup>

Rus. pryg-	(m.) ‘Heuschrecke, locusta’ (REW 2:450, pryg)
Rus. prýga-	(f.) ‘Sprungfeder’ (REW 2:450)
OIcl. frauiki-	(m.) ‘Frosch’ (ANetWb. 141)
Rus. prýgnu-	(vb.) ‘einen Sprung, einen Satz machen’ (P. 845-6)

(b) √braf̥uk- ‘Hinterfuß, Heuschrecke, laufen’ (P. 103)<sup>706</sup>

<sup>704</sup> Phonetically the connection is natural, since the places of articulation of the glottal fricative and the feature ‘voice’ coincide in the larynx.

<sup>705</sup> Laryngeal PIE \*prah̥ug- (or \*pr̥h̥aug ?) is confirmed by the quantity of Rus. pryg.

<sup>706</sup> The root-middle laryngeal \*brah̥uk- (or \*br̥h̥auk?) is proven by Gr. βραῦκo- (with ‘a-vocalism’) and Rus. bryká- (with lengthening).

Gr. βραῦκο-	(m.) ‘Art Heuschrecke’ (GEW 2:271; *breaʰuk-)
Gr. βροῦκο-	(m.) ‘Art Heuschrecke’ (GEW 2:271; *broaʰuk-)
Gr. βρούκο-	(m.) ‘Art Heuschrecke’ (GEW 2:271; *braʰuk-)
Rus. bryká-	(vb.) ‘mit den Hinterfüßen ausschlagen’ (REW 1:127)

The feature voice was not a necessary property of the root-final \*praʰug- (≡ T—ʰ—D) or root-initial \*braʰuk- (≡ D—ʰ—T) plosive. The ability for voice to be absent from both of the plosives indicates that it had to be a feature of the remaining candidate, the laryngeal PIE \*ʰ.

§10. As a generalization of the above lemmas, we may postulate the following inductive hypothesis: *From the roots Neogr. \*D it is allowed to infer to a root PIE \*ʰ—D or a root PIE \*D—ʰ.*

This rule is of considerable comparative importance because thereby it becomes possible to recover a significant number of lost laryngeals implied by mediae. An example of the application of the rule is the traditionally reconstructed root

Neogr. \*g<sup>u</sup>eru- ‘Pfahl, Stachel’ (P. 479):

Go. qairu-	(n.) ‘Pfahl, Stachel’ (GoEtD. 275)
Lat. uerū-	(n.) ‘Spieß’ (WH 2:766, uerū [sgNA])
OIr. bi <sup>u</sup> r-	(n.) ‘Speer, Spieß : broche : épieu’ (LEIA B-51-2)
Umbr. berva-	(f.) ‘= Lat. uerua’ (WbOU. 145)

The root contains a voiced plosive Neogr. \*g<sup>u</sup>, with the result that it also contains PIE \*ʰ. The open question concerning the position of the laryngeal – either \*(ʰ)g<sup>u</sup>er, g<sup>u</sup>e(ʰ)r or g<sup>u</sup>er(ʰ) – is settled by the data pointing to the laryngeal within the root:

Gr. βαρού-	(c.) ‘δένδρα’ (LSJ. 307, Hes. βαρούες · δένδρα)
TochA. kār̥w-	(sb.) ‘arundo, calamus’ (Poucha 92, kār̥wām [sgL])
TochB. karwa-	(sb.pl.) ‘reeds’ (MA. 480, DTochB. 145, karwaṃts)

§11. The series mediae PIE \*g b d, obtaining its voice from PIE \*ʰ, is derived from the unaspirated tenues PIE \*k p t (the primary series). Consequently the series mediae is, strictly speaking, secondary also for roots containing only one plosive. Confirmation of this is readily available in examples of alternation T : D, seen below:<sup>707</sup>

(a) PIE √klahu- : √ġlafu- ‘hören : gehört (Ruhm, Ehre, usw.)’

√klhau-

Gr. κλυ-	(vb.) ‘hören’ (GEW 1:877, κλυθι [2sg])
OIr. clū	(n.) ‘renommée, célébrité, rumeur’ (LEIA C-125f., clú)
RV. śrū-	(ao.) ‘hören’ (WbRV. 1428, śrūyās [prec3sg])
Li. šlovė	(3f.) ‘Ehre, Ruhm, Herrlichkeit’ (LiEtWb. 1009)
Phok. κλέφοσ-	(n.) ‘Gerücht, Ruf, Ruhm’ (GEW 1:869, κλέφος [NA])

√ġlfhau-

<sup>707</sup> For the alternation, see Brugmann (Grundr<sup>2</sup> 1:629-632), Szemerényi (1964:106-7fn3) and Stang 1967.

Lat. glōriā- (f.) ‘Ruhm, Ehre’ (WH 1:609-10)  
 Cret. ἀγα γλῶτω (PN.) ‘= ἀγακλύτω (KVG:239)

(b) PIE √hāk- : √hag̃- ‘Wort, sagen, befehlen’ (P. 290-1)

√hāk-  
 Arm. as- (sb.) ‘Wort(e)’ (ArmGr. 421, as-k’, asiç [plG])  
 Arm. asaç- (ao.) ‘sagen’ (ArmGr. 421, asaçi)

√hag̃-  
 Gr. ἄν ωγ- (pf.pr.) ‘befehlen’ (GEW 1:115, ἄνωγα)  
 Lat. ad ·agio- (n.) ‘Sprichwort’ (WH 1:12, ad ·agium)  
 Gr. ἀν ωγή- (f.) ‘Befehl’ (GEW 1:115)

(c) PIE √hak<sup>h</sup>- : √hag<sup>h</sup>- ‘Auge’ (P. 775-777, ok<sup>h</sup>-)

√hak<sup>h</sup>-  
 Gr. ὄπ- (f.) ‘the eye, face’ (LSJ 1282, ὄπα)  
 Gr. ἀψίον (n.) ‘= τὸ πρόσωπον : face’ (LSJ. 299)

√hag<sup>h</sup>-  
 AV. al ·ají- (f.) ‘Einzündung [al-] des Auges’ (EWA 1:125)<sup>708</sup>  
 Arm. ač’- (sb.) ‘Auge’ (ArmGr. 413, ač’k’ [plN])  
 OPr. agin- (m.) ‘Auge’ (APrS. 296, agins [sgN])  
 Arm. akan- (sb.) ‘Auge’ (ArmGr. 413, akan [sgG])

(d) PIE √sehat- : √sehad- ‘sitzen’ (P. 884f. \*sed-)

√sehat-  
 OSax. sethal- (sb.) ‘Sitz, Wohnsitz’ (Grundr<sup>2</sup> 1:635)  
 OHG. sedal- (sb.) ‘Sitz, Wohnsitz’ (Grundr<sup>2</sup> 1:635)  
 √sfaed-  
 OIr. saidi- (pr.) ‘to sit’ (GOI, 354, sa’did [3sg])  
 OGaul. sado- (ON.) ‘j. Saze, dép Gard, arr. Uzès’ (ACSS. 2:1283)  
 Li. sodà- (f.) ‘Dorf, Ansiedlung’ (LiEtWb. 854-5)

(e) PIE √lahk- : √lahg̃- ‘lecken, saufen’ (P. 653)

√lahk-  
 Li. lāk- (vb.) ‘auflecken, leckend fressen’ (LiEtWb. 337, lakti)  
 Rus. laka- (vb.) ‘lecken, saufen’ (REW 2:55, lakat’ [inf.]

√lahg̃-  
 Arm. lake- (vb.) ‘lecken’ (P. 653, lakem [1sg])<sup>709</sup>

<sup>708</sup> For the initial segment, see OSwed. ala- (vb.) ‘lodern, flammen’ sub P. 28 [4. al-].

<sup>709</sup> Meillet’s (1910/11:242) *ad hoc* sound law “Arm. lakem (k, sans doute de \*kk)” is no longer required to explain the voice.

Arm. lakan- (sb.) ‘Schüssel’ (ArmGr. 1:351)

(f) PIE √uhaip- : √ufoib- ‘drehen, schwingend bewegen’ (P. 1131-2)

√ufoib-

RV. vépa- (prM.) ‘in zitternder Bewegung sein’ (WbRV. 1283)

LAv. parā vaepaya- (pr.) ‘abwenden’ (AIWb. 1323, parāča vaepaya)

OIcl. veifa- (vb.) ‘schwingen, werfen’ (ANEtWb. 651)

√ufoib-

Latv. viēb- (vb.refl.) ‘sich drehen, usw.’ (LiEtWb. 1236, viēbtiēs)

Li. vỹbur- (vb.) ‘schwingen, herumdrehen, usw.’ (LiEtWb. 1236)

Lat. uibrā- (pr1.) ‘sich zitternd bewegen, usw.’ (WH 2:780)

(g) PIE √pahit- : √bafhit- ‘Kleidung, Gewand, Rock, Mantel’ (P. 92-3)

√pahit-

Alb. petk- (m.) ‘Kleidung, Gewand’ (EtDiAlb. 317)

√bafhit-

Gr. βoίτη- (f.) ‘Zelt oder Rock aus (Ziegen)Fell’ (GEW 1:210)

OEng. pād- (f.) ‘coat, cloak, outer garment’ (ASaxD. 771, pād)

Go. paida- (f.) ‘Leibrock, Unterkleid’ (GoEtD. 271, paida)

(h) PIE √spehāk- : √spehag- ‘betrachten’ (P. 984 + 981)

√spehāk- ‘spähen, usw.’

RV. spás- (ao.) ‘betrachten, erwägen, achten auf’ (WbRV. 1608)

Lat. haru·spec- (m.) ‘Wahrsager’ (WH 1: 634-6, haruspex [sgN])

Arm. spas- (sb.) ‘Aufwartung, Dienst’ (ArmGr. 1:492)<sup>710</sup>

RV. spásáya- (cs.) ‘erspähen’ (WbRV. 1608, spásáyasva [2sg])

√spehag- ‘weise, usw.’

OIcl. spak- (a.) ‘klug, erfahren’ (ANEtWb. 531, spakr [sgN])

OIcl. spekja (vb.) ‘weise machen, besänftigen’ (ANEtWb. 533)<sup>711</sup>

(i) PIE √kahl- : √gafil- ‘kahl, bloss, nackt, haarlos’

√kahl- ‘kahl’ (P. 554)

Lat. caluo- (a.) ‘kahl(geschoren)’ (WH 1:144)

LAv. ka<sup>u</sup>rva- (a.) ‘kahl, unbehaart’ (AIWb. 456)

OInd. kálvālikṛta- (a.) ‘kahl gemacht’ (KEWA 1:204)

√gafil- ‘kahl, nackt, bloss’ (P. 349)

<sup>710</sup> See Güntert (1916:91).

<sup>711</sup> The root Neogr. \*spek- had a laryngeal based on three properties: the Armenian ‘a-colouring’, Brugmann’s Law II and the alternation Neogr. \*k̄ : ġ.

OCS. golŭ-	(a.) ‘nackt, bloss’ (Sadnik √238)
OEng. calu-	(a.) ‘callow, bold, without hair’ (ASaxD. 144)
OHG. chalo	(a.) ‘kahl’ (ASaxD. 144)

(j) PIE √klaš- : √glaš- ‘schlagen, brechen’ (P. 545-7, klā-)

√klašd-

Gr. κλάδαρο-	(a.) ‘gebrechlich’ (GEW 1:864)
Lat. clādēi-	(f.) ‘Verletzung, Beschädigung, Schaden’ (WH1:225)
OIr. clādēb-	(m.) ‘machera, gladius : épée’ (LEIA C-110-1)

√glašd-

Lat. gladio-	(m.) ‘messerförmiges Schwert’ (WH 1:603)
Lat. gladiātōr-	(m.) ‘gladiator’ (WH 1:603)

(k) PIE √klahi- : √glāfi- ‘See, Meer’

√klahi- (P. 607 k̄lei-)

OIcl. hlē-	(m.) ‘Meer’ (ANetWb. 237, hlēr [sgN])
Li. šlik-	(vb.) ‘tropfen, fließen, usw.’ (LiEtWb. 1005)

√glāfi- (P. 401 ḡlei-)

RV. upá (...) jraya-	(vb1.) ‘hinzueilen’ (WbRV. 506)
RV. pṛthu jráya-	(a.) ‘weit laufend’ (KEWA 1:449)
LAv. zrayah-	(n.) ‘See, Meer’ (AIWb. 1701)

(l) PIE √sēhak- : √sēfhag- ‘still, leise, langsam, usw.’ (P. 896, Grundr<sup>2</sup> 1:680)

√sēhak-

Gr. ἤλα(τ)	(adv.) ‘still, leise, langsam, ein wenig’ (GEW 1:627)
TochA. sākāt	(adv.) ‘tacite, quiete’ (Poucha 362)

√sēfhag-

Lat. sēgni-	(a.) ‘langsam, schläfrig, träge’ (WH 2:510)
Lat. sēgnios-	(a.comp.) ‘oft in non/nihilo segnius’ (WH 2:510)

(m) PIE √shaup- : √shaub- ‘OBER’ (P. 1107)

√shaup-

Osc. supro-	(a.) ‘oberer’ (WbOU. 722, supru)
Lat. suprā	(adv.) ‘oben darauf, usw.’ (WH 2:613)

√shaub-

OGaul. subro-	(n.) ‘oberer (?)’ (ACSS. 2:1652, subron [sgA])
Umbr. subra	(adv.) ‘oberhalb’ (prepA.) ‘oben’ (WbOU. 706-7)

(n) PIE √hatr- : √hadr- ‘Feuer; schwarz’

√hatr-

gAv. ātar-	(m.) ‘Feuer’ (AIWb. 312f.)
Lat. āter-	(a.) ‘schwarz, dunkel, finster, unheilvoll’ (WH 1:75)
OPers. āçina-	(Im.) ‘Elamite rebel’ (OldP. 167)
√fadr-	
Umbr. adro	(a.) ‘schwarz, dunkel, finster, unheilvoll’ (WH 1:75)
Maced. ἄδραία-	(f.) Hes. αἰθρία < cf. προεξαίθριάζω > (LSJ. 24)
OItal. adria-	(ON.) ‘Adria’ (WH 1:75)

(o) PIE √tah- : √dafi- ‘geben, schenken’ (P. 223-226)

√tah-	
Gr. τό-	(pr.) ‘geben’ (Grundr <sup>2</sup> 1:654, τῶτω ‘dato’)
Att. ἄφρο τί δη-	(f.) = Gr. ἀφροδίτα (KVG:249; PIE *táh-i-dēafi-)
Phryg. τοφε-	(vb.) ‘geben’ (Phryg. 138, ετοφεε)
√dafi-	
Gr. δό-	(pr.) ‘geben’ (GEW 1:388-9, ἐδόμην [1sg])
Gr. ἀφρο δί τα-	(f.) ‘Aphrodite’ (KVG:249, PIE *dáh-i-tēah-)
Cypr. δοφέ-	(vb.) ‘geben’ (GEW 1:389, δοφέναι [inf.])

(p) PIE √uhat- : √uñad- (P. 1104-1105, Grundr<sup>2</sup> 1:636)

√uhat-	
Lat. utero-	(m.) ‘Unter/Mutterleib, Bauch’ (WP 1:191)
√uñad-	
RV. udára-	(n.) ‘Bauch’ (WbRV. 253), ‘Mutterleib’ (EWA 1:216)
OInd. an-ūdara-	(a.) ‘bauchlos’ (EWA 1:216)
Li. vēdera-	(m.) ‘Eingeweide, Magen, Unterleib’ (LiEtWb. 1210)
Li. vēdara-	(m.) ‘Eingeweide, Magen, Unterleib’ (LiEtWb. 1210)
Hes. (F)ῶδεγο-	(c.) ‘Bauch, Mutterleib’ (GEW 2:956)

(q) PIE √plahu- : √blafu- ‘Floh’ (P. 102)

√plahu-	
OHG. flōh-	(m.) ‘a flea’ (ASaxD. 291)
OEng. flēa-	(m.) ‘a flea, pulex’ (ASaxD. 291)
Arm. lu-	(sb.) ‘Floh’ (EtDiArm. 315)
RV. plūṣi-	(f.) ‘ein schädliches Insekt’ (WbRV. 895)
√blafu-	
Li. blusà-	(f.) ‘Floh’ (LiEtWb. 51)
OPr. blus kaym-	(ON.) ‘Floh-Dorf’ (APrON. 21)
ORus. blūcha-	(f.) ‘Floh’ (REW 1:94)
Rus. blochá-	(f.) ‘Floh, pulex’ (REW 1:94)

(r) PIE √hāk- : √hag- ‘treiben’ (P. 4ff.)



	√hāk-	
Osc. ac-		(vb.) ‘treiben’ (WbOU. 78-9, acum [inf.])
	√haġ-	
Lat. ago-		(prA.) ‘treiben, führen, hetzen, verhandeln’ (WH 1:23)
LAv. aza-		(prM.) ‘(weg)treiben, wegschleppen’ (AIWb. 223)
RV. ája-		(prA.) ‘(an)treiben, vorwärts bewegen’ (WbRV. 18)

(s) PIE √tun- : √dunafi- ‘might, power, ability, strength’ (P. 218 [diff.])

	√tun-	
OPers. tun -vant-		(a.) ‘powerful’ (OldP. 186, tunuva <sup>n</sup> tam [sgA])
	√dunafi-	
Gr. δύνα-		(pr.) ‘to be able/strong’ (LSJ. 452, δύναμαι)
Gr. δύναμι-		(m.) ‘Kraft, Macht’ (GEW 1:423-4)

§12. As for the alternation T : D, note in particular that:

(a) The alternation T : D is attested in all Indo-European languages except Tocharian, where the feature voice was lost, and in Old Anatolian, where the feature voice was (mostly) unmarked. The alternation is abundant, both internally and externally,<sup>712</sup> and as its dimensions are not fully understood there is a largely unexplored domain of comparison that may enable us to connect seemingly isolated roots with a well-defined methodology.<sup>713</sup> In order to illustrate this, I quote the traditional root Neogr. \*od- ‘riechen’ (P. 773-4, Lat. odor), now written <sup>h</sup>h<sub>3</sub>ed- in the laryngeal theory. The comparative reconstruction of the root can be established thus. Starting from the rule

Neogr. √D → PIE √fi—D √ PIE √D—fi,

we may conclude that PIE √D—fi is excluded, because the root Neogr. \*od- was not followed by the laryngeal. Hence the root shape was PIE √fi—D, and we may postulate:

PIE √fiad- ‘Wind, Atem, Geruch’ (P. 773-4, ablaut PIE \*fiad, \*fiad̥-)

Li. úod-		(vb.) ‘riechen, spüren, wahrnehmen’ (LiEtWb. 1167-8)
Il. ὀδωδῆ-		(f.) ‘Geruch’ (GEW 2:354)
OLat. odōs-		(n.) ‘Geruch’ (WH 2:203f., odōs [NA])

<sup>712</sup> In addition to such well-known internal alternations as RV. śákman- (n.) ‘Kraft, Geschick, Werk, Arbeit’ (WbRV. 1371) vs. RV. śágmá- (a.) ‘vermögend, stark, kräftig’ (WbRV. 1371), there is an unknown number of unidentified alternations. *Exemplii gratia*, I quote Gr. ἀπαλό- (a.) ‘zart, weich’ (GEW 1:117-8) and Gr. ἄβρο- (a.) ‘zart, weichlich, fein, üppig’ (GEW 1:4), both of which lack an acceptable external etymology but clearly belong together.

<sup>713</sup> Though it would be premature to present exact figures, according to my preliminary estimate there are more unidentified doublets than identified ones, suggesting a considerable figure altogether.

The laryngeal is implied by the Lithuanian acute, and its voiced value PIE \*h̥ is provided by the voiced obstruent Gr. δ = Lat. d = Li. d. The voiceless counterpart of the root is obtained from the rule  $\sqrt{h}\text{---}D \rightarrow \sqrt{h}\text{---}T$ , resulting in a match with the data

PIE  $\sqrt{\text{hat-}}$  ‘Hauch, Wind, Rauch, usw. ; atmen’ (P. 345, \*ēt-):

LAv. āt-	(vb.) ‘atmen’ (AIWb. 317, LAv. ātāē [inf.])
Ir. athach-	(f.) ‘Hauch, Wind’ (LEIA A-99-100)
Gr. ἀτμός-	(m.) ‘Dampf, Dunst, Rauch’ (GEW 1:179 ἀτμός [sgN])
RV. ātmán-	(n.) ‘Hauch, Atem, Odem, Lebenshauch’ (WbRV. 175)

In this manner, Proto-Indo-European had a single root PIE  $\sqrt{\text{HAT-}}$  with voiceless (PIE  $\sqrt{\text{hat-}}$ , P. 345) and voiced (PIE \*h̥ad-, P. 773-4) variants. Since the voiceless root can be understood as primary, in theory every voiced root can have a voiceless counterpart. Conversely, every voiceless root with laryngeal can have formed a voiced variant, though all variants may not have been preserved (or formed in the first place).<sup>714</sup>

(b) The loss of voice in Tocharian A and B is compensated to some extent, owing to the secondary character of the voice. At this point we are unable to decide whether the forms

TochB. wīpāṣṣ-	(vb.) ‘shake’ (TochB. 603, wīpā[ṣṣām])
TochB. wipāske-	(prMP.) ‘shake’ (DTochB. 603, wipāskemane [pt.])

reflect the voiceless PIE \*uhaip- (RV. vip-) or the voiced root PIE \*uhaib- (Lat. uib-), but as both have a common etymological origin the distinction was of lesser relevance already in the proto-language.<sup>715</sup>

(c) The phonetic explanation for the alternation of voice, being regular and general, can be used to replace early attempts that utilized inferior methodologies like analogy and *ad hoc* sound laws.<sup>716</sup>

§13. The voiced laryngeal PIE \*h̥ necessitates an important restriction of Meillet and Magnusson’s theory in terms of the application of the rules<sup>717</sup>

$$T\text{---}D \rightarrow T\text{---}Dh \quad (\text{and}) \quad D\text{---}T \rightarrow Dh\text{---}T.$$

In particular, the existence of PIE \*h̥ reveals the ambiguity of the shapes T—D and D—T, because a segmental PIE \*h̥ may also account for the voice of plosives in other

<sup>714</sup> Owing to the unutilized prospects, I foresee significant possibilities for future research focusing on the identification of voiceless and voiced root variants.

<sup>715</sup> The loss of voice in Tocharian is easier to understand in the light of the fact that the alternation PIE \*h̥ : h was not distinctive (in the strictest sense of the term).

<sup>716</sup> See, for instance, Brugmann’s (Grundr<sup>2</sup> 1:652) explanation: “Zuweilen Media für Tenuis durch Analogiewirkung, z. B. mess. κελεβός zu κλεπ- ‘stehlen’ [...]” However, PIE \*h̥ is confirmed by ‘avocalism’ in Gr. κλάπη- (ps.ao.) ‘stehlen’ (i.e. Mess.  $\sqrt{\text{κλεβ-}}$  contained PIE \*h̥).

<sup>717</sup> See Magnusson (1967:19): “At least one may assume that occurrences are due to special conditions and that originally b was identical with one or the other of the consonants represented mostly by p or bh.”

positions than immediately after D. In order to cover all the possibilities, Meillet and Magnusson's rules should be replaced with the disjunctions:

$$\begin{array}{lcl} T-D & \rightarrow & h-T-D \quad \vee \quad T-h-D \quad \vee \quad T-D-h \\ D-T & \rightarrow & h-D-T \quad \vee \quad D-h-T \quad \vee \quad D-T-h \end{array}$$

In each case, the position of the laryngeal PIE \*h must be confirmed by the measurable properties of the material rather than through a mechanical application of only Magnusson's rules.<sup>718</sup>

§14. The cover symbol for the laryngeal has two values, voiceless and voiced:

$$\text{PIE } *h \quad \equiv \quad \text{PIE } *h \quad \vee \quad \text{PIE } *h.$$

The value of the cover symbol can be determined if the root has an obstruent: PIE \*h appears in the environment PIE \*k p t and PIE \*h in the environment PIE \*g b d.

§15. The existence of the voiceless laryngeal PIE \*h is proven by the roots \*h—T and \*T—h with a single unaspirated voiceless plosive. Since the voice of the laryngeal has not assimilated to the plosive, the laryngeal is voiceless. Some examples of the voiceless laryngeal are:

(a) PIE √hap- 'Hand, Macht, (vor)handen sein' (P. 780, HEG 1:157f.)

Ḫi. ḫap-	(vb1.) 'reichlich vorhanden sein' (HHand. 40)
Lat. op-	(f.) 'Macht, Vermögen, Reichtum' (WH 2:215, ops)
LAv. x'āpara-	(a.) 'segensreich, -bringend' (AIWb 187, x'āparaṃ)

(b) PIE \*hap- 'schlagen, brechen' (HEG 1:163-4)

Gr. ἥπεδ·ανό-	(a.) 'schwach, gebrechlich' (GEW 1:639-40)
Ḫi. ḫapad·eia-	(vb.) 'schlagen, verletzen, töten' (HHand. 40)
Lat. pe <sup>d</sup> ·ierā-	(pr1.) 'falsch schwören' (WH 2:274, peierāre)

(c) PIE \*pah- 'schützen' (P. 839)

Ḫi. paḫš-	(vbM.) 'schützen, verteidigen, verwahren' (CHD P:2f.)
RV. pári (...) pās-	(s.ao.) 'rings schützen' (WbRV. 800, pári pāsati [conj.])
TochA. pās-	(vbM.) 'custodire, tueri' (Poucha 168, pāsantār [3pl])

(d) PIE \*pahi- 'schlagen' (P. 827)

Ḫi. paḫi-	(c.) 'something harmful' (CHD P:1, pa-aḫ-ḫi-in)
Gr. παύ(h)ω	(pr.) 'schlagen, hauen, stoßen' (GEW 2:464)
Ḫi. paḫiškiuar-	(n.) 'eine Feindselige Handlung' (HHand. 115)

§16. The examples of PIE \*h and PIE \*h discussed above include proof that both IE \*h and \*h were preserved in Old Anatolian and are uniformly reflected as Ḫi. ḫ = Pal. ḫ = CLu. ḫ = HLu. ḫ. Conversely, when the laryngeal is not attested in Old Anatolian,

<sup>718</sup> Thus, for example, we are to posit \*keah<sup>d</sup>- 'fall' (P. 516), not \*kadh, according to Magnusson's distribution. This is because Lat. cadō (pr3.) 'fallen' (WH 1:128) and OInd. śasā<sup>d</sup>- (pf.) 'ausfallen, abfallen' imply PIE \*af<sup>i</sup> within the root, based on the 'a-vocalism'.

no laryngeal is to be reconstructed for the proto-language. ‘Szemerényi’s Rule’ (1990<sup>4</sup>:147 = 1970<sup>1</sup>:131), according to which “Ein heth es- ‘sein’ [...] beweist also ein idg. \*es- [...] ohne Laryngal [...]”, allows (or enforces) drawing reconstructive distinctions when the laryngeals required by Old Anatolian and the rest of the group do not match. One may refer to the following pair of examples:<sup>719</sup>

(a) PIE √had ‘eat’ (P. 287-289), a root with a laryngeal, is contained in:

Li. <i>éd-</i>	(vb.) ‘fressen’ (LiEtWb. 124, <i>ěsti</i> )
H <sub>i</sub> . <i>ḫadar</i>	(n.) ‘einer Art Getreide’ (HEG 1:220, <i>ḫa-at-tar</i> [NA])
Lat. <i>adōr-</i>	(n.) ‘einer Art Getreide, Spelt’ (WH 1:14, <i>ador</i> [NA])
Gr. <i>ἀδάξο-</i>	(.) = <i>ἀδάξω</i> (= ‘τοῖς ὀδοῦσι δάκνει’, GEW 2:348)
Arm. <i>atamn-</i>	(sb.) ‘Zahn’ (ArmGr. 422, <i>atamn</i> [N])
Gr. <i>ὀδάξ</i>	(adv.) ‘mit den Zähnen’ (GEW 2:348, <i>ὀδάξ</i> )
Lat. <i>dent-</i>	(m.) ‘Zahn’ (WH 1:340-1)

(b) PIE √dah- ‘eat’<sup>720</sup>, another root without a laryngeal, is attested in:

H <sub>i</sub> . <i>ed-</i>	(vb.) ‘essen’ (HEG 1:117-9, <i>e-te-ir</i> [3pl], PIE *edah)
H <sub>i</sub> . <i>ad-</i>	(vb.) ‘essen’ (HEG 1:91f., <i>a-da-an-zi</i> , PIE *odah)
TochB. <i>tsāk-</i>	(vb.) ‘bite’ (DTochB. 731, PIE *dahēk-, cf. P. 201) <sup>721</sup>

These items are to be separated from the group (a), because no initial PIE \*h is attested in Old Anatolian (i.e. we are dealing with two roots).

§17. Among others, Gamkrelidze and Ivanov (1973:151) have insisted that the absence of \*b (“das Fehlen von b”) resulted in a gap (“Lücke”) in the series *mediae*.<sup>722</sup> However, occurrences of the correspondence set PIE \*b are common enough to demonstrate that there is no gap (see Szemerényi 1996:57), while the statistical rarity of PIE \*b – as has been pointed out by Barrack (2002, 2003) – does not mean its non-existence.<sup>723</sup>

§18. Barrack challenges the glottalists by showing that there is no /p’/ gap in systems with glottal stops, concluding (2002:81) that “[...] the Gl[ottalic] Theory does not provide a credible explanation [f]or the labial gap”. It is however possible that the relative rarity of PIE \*b could be understood as a phonetically motivated feature caused by the maximal distance between the lips and the glottis, the place of articulation of voice. The distance from the glottis could have made the voice

<sup>719</sup> For observations concerning the material Li. *éd-* and so forth, see Miller (1976:57).

<sup>720</sup> The voiceless counterpart of the root has been preserved in OInd. *tha-* (m.) ‘eating’ (MonWil. 464, Lex. *thas* [sgN]).

<sup>721</sup> Note the PIE \*deah-Σ- with the voiced laryngeal in Gr. *δάκνω* (pr.) ‘beißen, stechen, verletzen’ (GEW 1:343).

<sup>722</sup> For similar references of absence or ‘rarity’ of \*b, see Hopper (1981:134). Such arguments are not entirely new. For instance, already Pedersen 1951 spoke of its absence in the proto-language.

<sup>723</sup> The methods used by Gamkrelidze and Ivanov in their quasi-elimination of PIE \*b are unsound. Thus, for instance, denying correspondence sets for being “areally restricted” (1995:5-6) means nothing, because practically all comparisons belong to this category.

contamination of PIE \*h̥ more problematic with the labial PIE \*p than with PIE \*t and \*k. Some hints of this may be contained in the data, illustrated here by an unextended root and its non-labial vs. labial extensions:

√ueh<sub>l</sub>- ‘wollen, wählen’ (P. 1137-8, 2. uel-)

Li. vél- (vb.) ‘wollen, erlauben’ (LiEtWb. 1220, vélti)  
 LAv. fra-vaš̥i- (f.) ‘Wahlentscheidung’ (AIWb. 992-5)

Here the laryngeal is implied by the Lithuanian acute and Av. š̥ (Fortunatov’s Law II). The dental extension (PIE \*ueh<sub>l</sub>-d-) has a voiced determinative in

Gr. (F)ἐλδο- (prM.) ‘sich sehnen, verlangen nach’ (ἐλδομαι [1sg]).

Despite the value \*h̥ ≡ PIE \*h, implied by Gr. δ, the labial extension (PIE \*ueh<sub>l</sub>-p) was not voiced:

Gr. (F)ἐ(φ)ολπ- (pfA.) ‘erwarten, hoffen’ (GEW 1:502, ἐολπα [1sg])  
 Gr. (F)ἐλπο- (prM.) ‘erwarten, hoffen’ (GEW 1:502-3)  
 Gr. (F)ἀλπαιλέο- (a.) ‘erwünscht, reizend’ (GEW 1:78)  
 Gr. ἔπ(φ)άλπνο- (a.) ‘erwünscht, reizend’ (GEW 1:78)

§19. Possibly owing to the long-lasting uncertainty concerning PIE \*b, the phoneme has been somewhat neglected in comparative study. Consequently, it is still possible to identify new correspondences involving PIE \*b. In order to illustrate this potential, I mention the following comparisons currently without an etymology:

(a) PIE \*b<sub>l</sub>has- ‘harm, injure’<sup>724</sup>

Gr. βλασ·φημο- (a.) ‘lästernd, verumleumdend’ (GEW 1:241-2)  
 Gr. βλασ·φημέω (pr.) ‘schmähen, lästern, verumleumden’ (GEW 1:241)  
 RV. bḥsayā- (m.) etwa ‘Zauberer’ (WbRV. 910, KEWA 2:445)  
 RV. bḥsayā- (m.) ‘Bezeichnung eines Dämons’ (WbRV. 910)

(b) PIE \*b<sub>u</sub>has- ‘dicht, enge’

RV. busá- (n.) viell. ‘das Dichte, das Dunkel’ (WbRV. 910)  
 Gr. βύζην (adv.) ‘dicht gedrängt, eng aneinander’ (GEW 1:277)  
 Gr. βυζάντιο- (ONn.) ‘βυζάντιον, a colony of Megara’ (GEW 1:277)

(c) PIE \*b<sub>i</sub>fiar- (or b<sub>i</sub>fir ?) ‘Höhle, Loch’ (P. –)

RV. bíla- (n.) ‘Höhle’ (WbRV. 906, bílam [sgNA])  
 Alb. birë- (.) ‘Loch : hole’ (AlbEtD. 26, birë, bira [pl])  
 OInd. bíla- (n.) ‘Loch, Öffnung’ (WbRV. 906)  
 Dhātup. bila- (pr1A.) ‘split, cleave, break’ (MonWil. 732)

§20. Gamkrelidze and Ivanov (1973:152) strongly suggest the non-existence of the roots (“Nichtvorhandensein der Wurzeln”) Media + Media (shape D—D).<sup>725</sup>

<sup>724</sup> For the root with an alternative extension, see Gr. βλά·πτω (GEW 2:239).

<sup>725</sup> See also Hopper (1981:134-5). Already Grassmann had mentioned the absence of the roots D—D in Greek (Grassmann 1863:115): “[...] im griechischen keine wurzel mit zwei medien und einem

According to Gamkrelidze and Ivanov (1995:17), the gap is explained by Grassmann's Law, which allegedly applies to two successive ejective stops (T'—T'). In this regard, Barrack (2002:82) is the first to correctly underline that "[t]here is no convincing statistical evidence for such a constraint in PIE". Barrack's remark can be supported by multiple examples of comparatively secured roots D—D:

(a) √bafid- 'gelb, rot, braun' (P. 92)

Lat. badio-	(a.) 'kastanienbraun' (WH 1:92)
OIr. buide	(a.) 'jaune : gelb' (LEIA B-113)
OGaul. bodio·casses (VN.)	'aux boucles blondes' (LEIA B-113, bodiocasses)

(b) √diafh̄- 'zeichnen, lehren' (P. 290, Grundr<sup>2</sup> 1:630)

Gr. δέδειγ-	(pf.) 'zeigen' (GEW 1:355-6, δέδειγμα)
Lat. prō·digio-	(n.) 'Wunderzeichen' (WH 2:368)
OEng. tāca-	(vb.) 'show, offer a view, present' (ASaxD. 967, tācan)
Lat. digno-	(a.) 'würdig, wert, passend, geziemend' (WH 1:351)
Go. taikn-	(n.) 'token, miracle' (GoEtD. 340)

(c) √glafh̄- 'zwitschern, usw.' (P. 350-1 [glag-])

OIcl. klaka-	(vb.) 'zwitchern, gackern' (ANEtWb. 313)
Gr. γλάζω	(vb.) 'erklingen lassen' (GEW 1:309, γλάζω)
Lat. glōciō	(pr4.) 'glucken, von der Henne' (WH 1:606)

(d) √gafh̄- 'Furcht erregend, grausig, wild' (P. 353)

Arm. karce-	(vb.) 'ich fürchte, glaube' (P. 353, karcem [1sg])
Gr. γοργό-	(a.) 'furchtbar, schrecklich' (GEW 1:321)
Gr. γοργώ-	(f.) 'Schreckgespenst, Gorgo' (GEW 1:321)
OIr. garg-	(a.) 'rough, blunt, fierce' (DIL 356)
Arm. karcr-	(a.) 'hart' (ArmGr. 459)

(e) √bafib- 'stammeln, lallen' (P. 90)

Lat. balbo-	(a.) 'stammelnd, lallend' (WH 1:94, balbus)
OInd. balbalā-	(f.) 'chatter, babble' (KEWA 2:421)
OInd. balbalā·karo-	(pr.) 'stammeln' (KEWA 2:421, balbalākaroti)
Lat. balbūtī-	(pr4.) 'stammeln' (WH 1:94)

(f) √gafib- 'sehen, usw.' (P. 349)

OIcl. kōpa-	(vb.) 'angaffen, starren, gaffen' (ANEtWb. 326)
OEng. cēpa-	(pr.) 'observe, keep, regard, etc.' (ASaxD. 152)
Rus. zabóta-	(f.) 'Sorge' (REW 1:436, zabóta = ORus. zabota)
ORus. zobota-	(f.) 'Sorge' (REW 1:436)

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dazwischenstehenden einfachen oder durch einen nasal vermehrten vokal giebt". Also note Szemerényi (1996:100). This idea was generalized for Indo-European as a whole by Meillet (1934:173ff.).

(g) √gefiag-, √gofiag- ‘Kuchen, Kopf’ (P. 349)

ModIcl. kaka-	(f.) ‘Kuchen’ (ANEtWb. 297)
OEng. cicel-	(m.) ‘cake, morsel, little mouthful’ (ASaxD. 153)
Li. gúogè	(f.) ‘Kohlkopf, Kopf, Dickschädel’ (LiEtWb. 175)
Li. gógè	(f.) ‘Kopf’ (LiEtWb. 175)
OHG. kuocho-	(.) ‘Rundes Brot, Kuchen’ (ANEtWb. 297)
OIcl. kòkukorn-	(dim.) ‘kleiner Kuchen’ (ANEtWb. 297)

(h) √gefiang- √gofiang- ‘Hohn’ (P. 352)

OInd. gañja-	(.) ‘Verachtung, Hohn’ (KEWA 1:315)
OEng. ge·canc-	(n.) ‘Spott, Hohn : mock, gibe’ (ASaxD. 379)
OEng. cancetta-	(vb.) ‘laugh aloud’ (ASaxD. 144)
OEng. cinc·ung-	(f.) ‘loud or cackling laughter’ (ASaxD. 155)

(i) √defiag- ‘nehmen’ (P. 189 [diff.])

Gr. δέγ-	(ao.) ‘annehmen’ (GEW 1:373, ἐδέγμην [1sg])
Go. tai·tok-	(pret.) ‘berühren : touch’ (GoEtD. 342, taitok [3sg])
OIcl. tak-	(n.) ‘Nehmen, Greifen’ (ANEtWb. 580)
Go. teka-	(pr.) ‘berühren : touch’ (GoEtD. 342, tekiþ [3sg])
OIcl. taka-	(vb.) ‘nehmen, wählen, kosten’ (ANEtWb. 580)

The number of roots D—D is satisfactory, due to which Meillet’s early constraint against the root should be reconsidered. Consequently, no application of Grassmann’s Law à la glottalic theory is required to eliminate the attested roots.<sup>726</sup>

§21. Explaining the relative scarcity of roots D—D, Barrack (2002:84) suggests, “Under the assumption of a constraint in PIE. against \*DVD roots, linguists have been reluctant to suggest any candidates.” Indeed, there may be a seed of truth in this, because it is not difficult to identify more candidates belonging to the type:

(a) PIE \*g<sup>h</sup>afid- ‘sprechen’ (P. 480-1)

OInd. gada-	(pr.) ‘sagen’ (KEWA 1:319, gadati [3sg])
OInd. gadana-	(n.) ‘das Hersagen’ (EWA 1:460)
Gr. ἐν·γυάζω	(pt.m.) Hes. = ‘ἀντιφωνῶν’ (LSJ. 468)

(b) PIE \*brafb- ‘errichten, usw.’ (P. –)

RV. bṛbád·uktha-	(a.) ‘hoch zu preisen’ (WbRV. 910)
RV. bṛbú-	(m.) ‘EN eines Mannes’ (WbRV. 910)
Gr. βῤαβέύ-	(m.) ‘Kampfrichter, Richter, Anführer’ (GEW 1:261-2)
Gr. βῤαβέύω	(vb.) ‘richten, entscheiden’ (GEW 1:261-2)

<sup>726</sup> For a more positive estimation of glottalic ideas, see Miller (1977a:377): “The Hopper/Gamkrelidze-Ivanov system explains very neatly the constraint against \*deg (two voiced stops), since in reality it would be the typologically widespread constraint against two checked (glottalized) stops in the same root. It also justifies the (near) absence of the plain voiced series from inflectional suffixes and the scarcity of IE \*b.”

- RV. b̥būka- (a.) ‘BW des Nebels’ (WbRV. 910)
- (c) PIE \*g<sup>h</sup>af̥ld- ‘Kugel, Ballen, usw.’ (Persson, Beitr. 68fn3, P. 357-8)
- OInd. gaḍu- (m.) ‘Auswuchs, Buckel’ (KEWA 1:316)
- OInd. guḍá- (m.) ‘Kugel’ (KEWA 1:337)
- Norw. kult- (sb.) ‘runde Figur, Bergkuppe’ (NDEtWb. 593)
- Swed. kult- (sb.) ‘kleiner Hügel’ (Persson, Beitr. 68)
- Swed. ror ·kult- (sb.) ‘Ruderstock’ (Persson, Beitr. 68)

§22. Finally, the glottalic analysis Neogr. D ≡ T’ has been criticized by Barrack (2002:86) on the basis of a critical phonetic problem:

“[...] putative \*T’ did not simply deglottalize [...], but also voiced (\*T’ → \*D). Many [...] consider this to be the main weakness of the theory.”<sup>727</sup>

This lack of realism can now be supplemented with the following critical remark: though the glottal theory correctly attempts to explain the Proto-Indo-European voice, it does so with the wrong pre-proto-segment. Instead of <sup>h</sup>p’elo- for RV. bála-, the voice of the plosive is caused by the voiced laryngeal in PIE \*befal- (with PIE \*f̥ proven by RV. baṣkáyā- ‘ausgewachsen’ (EWA 2:219) via Fortunatov’s Law II).

§23. In terms of the cover symbol PIE \*ḥ (= H̥i. ḥ), which appears in the allophones PIE \*h and \*f̥, note the following:

(a) In order to establish the allophones PIE \*h : \*f̥ in a strict sense, the complete conditions of voicing will be required in the future. Though they are not yet available, once the root variants containing the alternation have been lexically reconstructed, it will be possible to turn the focus to the causes of the phenomenon and formulate conditions, if any.

(b) The transfer of voice from PIE \*f̥ to PIE \*k p t → PIE \*b d g means that the series mediae can be eliminated from the proto-language. The postulation of a simple set (PIE \*k p t) suffices, since the series D can be derived from f̥—T, T—f̥, but as the explicit conditions for the voicing remain unidentified both here and in the PIE Lexicon, the attested voice (PIE \*g b d) is given.

§24. Despite the possibility of elimination, the series mediae remains an essential tool for comparison. Whereas it is possible to reconstruct PIE \*fiat- and to derive PIE \*fiad- by the ‘voicing rule’, the actual rule extends well beyond simple assimilation, and its description is likely to require considerable effort. Some indications of the complexity of the situation are contained in the following examples:

(a) In the root-initial position, an alternation between f̥—T—D and f̥—D—T appears in:

PIE √fiatuḡ- (P. –, shape f̥—T—D)

<sup>727</sup> The weakness, noted by Collinge (1985:263), is obvious: “Greenberg has pointed out (e.g. 1970:125) that a glottalized stop is rarely voiced; certainly the heavily glottalic plosives of London English never are.”



Hī. ḥatugi-	(a.) ‘fruchtbar, schrecklich’ (HEG 1:227-229)
Gr. ἀτύζο-	(prM.) ‘erschrecken’ (GEW 1:183, ἀτύζομαι)
OInd. tujya-	(vb.) ‘erschreckt fliehen’ (KEWA 1:509, tujyáte)
PIE √haduk-	(P. 773, shape fh—D—T)
Gr. ὀδώδυσ-	(pf.) ‘zürnen, grollen’ (ὀδώδυσται)
Gr. ὀδύσο-	(prM.) ‘zürnen, grollen’ (Gr. ὀδύσομαι)
CrimGo. atochta-	(a.) ‘malum : bad’ (GoEtD. 46)

(b) Alternation between T—h—T, T—fi—D and D—fi—T is attested in:

PIE √krahk-	(shape T—h—T)
Lat. cracentēs	(a.) ‘= grācilēs : mager, schlank, dürr’ (WH 1:284)
Li. krōš-	(vb.) ‘vertrocknen’ (LiEtWb. 223-4)
Li. krēš-	(vb.) ‘vertrocknen’ (LiEtWb. 223-4)
PIE √krahg-	(shape T—fi—D)
Shetl. rak-	(sb.) ‘mageres, armes Tier’ (ANetWb. 251)
Fär. rak-	(sb.) ‘magerheit’ (ANetWb. 251)
OIcl. hrak-	(n.) ‘wertloses Ding; Schimpwort’ (ANetWb. 251)
ModIcl. hrak-	(n.) ‘wertloses Ding, Schimpwort’ (ANetWb. 251)
PIE √grahk-	(shape T—fi—D)
Lat. gracili-	(a.) ‘mager, schlank, dürr’ (WH 1:284)

(c) Alternation between T—h—T, T—fi—D and D—fi—D<sup>728</sup> is attested in:

PIE √kahpr-	(shape T—h—T)
Gr. κάρχο-	(m.) ‘Eber : wild boar, sea-fish’ (LSJ. 876)
Lat. caper-	(m.) ‘Ziegenbock, Bock’ (WH 1:157f.)
PIE √kafibr-	(shape T—fi—D)
Umbr. kabro-	(m.) ‘goat’ (WbOU. 368 kabru [sgA])
Umbr. cabrino-	(a.) ‘von der Ziege, caprinī’ (WbOU. 359)
PIE √gafibr-	(shape D—fi—D)
OGaul. gabro magos-	(ON.n.) ‘Geißfeld’ (ACSS. 1:1511)
Illyr. γαβρο ἦτα-	(f.) ‘Geißwald’ (ACSS. 1:1510, γαβροῖτα ὕλη)
OIr. gabor	(m.) ‘Bock’ (f.) ‘Ziege’ (DIL 351, gabor)

<sup>728</sup> The root shape D—fi—D reveals that a single PIE \*fh could contaminate two surrounding voiceless plosives (note the voiceless starting point in T—h—T). This example (and similar one) prove that Meillet’s constraint against the root D—D is erroneous. In a wider context, the contamination of two plosives is quite acceptable (as the phenomenon also occurs, for example, in Bartholomae’s Law (shape DDh)).

Similar alternations with yet other distributions of plosives are documented, suggesting that the discovery of the entire set of rules might turn out to be a relatively complicated matter.<sup>729</sup>

§25. In terms of the instances of Neogr. \*a formerly accounted for with syllabic sonants, note that the simultaneous presence of a voiced plosive confirms PIE \*h<sub>1</sub>a ah instead of Neogr. \*m̥ n̥ l̥ r̥. Thus, for instance, the alternation PIE \*ah : \*ah<sub>1</sub> is contained in:

PIE \*h<sub>1</sub>keah<sub>1</sub>t-, \*h<sub>1</sub>keah<sub>1</sub>id-

Do. h<sub>1</sub>·κατ-                   (.) ‘20’ (Schwyzer, GrGr. 1:591, Ther. Thess. h<sub>1</sub>καός)

Gr. δε·κάδ-                   (.) ‘Dekade, Zehnergruppe’ (GrGr. 1:498, 596-7)

The early reconstruction Neogr. \*h<sub>1</sub>km̥t- \*h<sub>1</sub>km̥d-, which cannot explain the alternation of voice (*ex nihilo nihil*), can thus be replaced with PIE \*ah/ah<sub>1</sub>.

§26. In a few examples of the root Neogr. \*D, a confirmation for PIE \*h<sub>1</sub> (except the voiced plosive itself) is apparently missing. However, as we have not yet reached the limits of comparison, it is not impossible that forms without etymology may contain the desired confirmation. As an example of the expected PIE \*h<sub>1</sub>, I refer to the usually quoted data for a voiced root without any criterion for the laryngeal (in addition to voice itself):

Neogr. \*egr- ‘wake’ (P. 390 ger-, grei-),

Gr. ἐγγο-                   (aoM.) ‘wecken, anregen’ (GEW 1:437, ἐγγοετο)

LAv. fra·grāraya-           (cs.) ‘aufzuwecken’ (AIWb. 977, fragrārayō [inf.])

Instead of blind postulation of a root-initial laryngeal (LT <sup>†</sup>h<sub>1</sub>ger-), we should add the following items, proving an initial PIE \*h<sub>1</sub> for the root, to the comparison:

PIE \*h<sub>1</sub>agr- ‘(a)wake’

Gr. ἄγρ ὑπνο-           (a.) ‘wakeful, keeping awake’ (LSJ. 16, ἄγρὑπνος)<sup>730</sup>

Gr. ἄγρ ὑπνέω           (pr.) ‘lie awake’ (LSJ. 16, ἄγρὑπνέω)

Consequently, the traditional root Neogr. \*egr- is PIE \*eh<sub>1</sub>agr-, not LT <sup>†</sup>h<sub>1</sub>egr-.

Unhandled material often allows similar suppletion of the laryngeal through some measurable feature, with the result that the number of examples of roots D without PIE \*h<sub>1</sub> virtually drops to nothing, thus effectively proving the induction hypothesis.

<sup>729</sup> Because I am unwilling to propose any premature rules governing the alternation in this study, I hope to revisit the problem in the PIE Lexicon once there is sufficient material.

<sup>730</sup> For Greek, compare the very similar compound RV. jāgrat·svapná- (a.) ‘im Wachen Zustande und im Schläfe vorkommend’ (WbRV. 482) to PIE \*h<sub>1</sub>ag<sub>1</sub>h<sub>1</sub>agr-.

## 4.6 Mediae Aspiratae Neogr. \*dh \*bh \*gh

### 4.6.1 Material of Neogr. \*dh, bh, gh

§0. The series mediae aspiratae was already included in Schleicher's reconstruction and accepted by the Neogrammarians postulating Neogr. \*gh bh dh. Over the next century, the following developments in particular are worth noting:

1. During the 20<sup>th</sup> century, a segmental analysis of the series Dh = D+h was presented by Cuny, who was followed in this by the monolaryngealist Szemerényi.

2. Jakobson argued on typological grounds that no known natural language has voiced aspirates without voiceless ones (1958), thus raising the typological problem of the series Dh.

These and other key issues related to the series Dh will be discussed in this chapter.

§1. Brugmann's examples of Neogr. \*gh (Grundr<sup>2</sup> 1:571) include:

(a) Neogr. \*ghos- 'Verbeugung, Besuch, Gast' (P. 452, HEG 1:34)

CLu. gaš-	(vn.bs.) 'besuchen : visit' (?) (DLL 54, ka-ši-i [inf.])
CLu. gaši-	(c.) 'Verbeugung, Besuch' (?) (HHand. 75, DLL. 54)
OLat. hosti-	(m.) 'Fremdling, Feind' (WH 1:662-3)
ORun. sali·gasti-	(m.) 'Fremder in der Halle' (ANEtWb. 461, saligastiR)
Go. gast-	(m.) 'stranger' (GoEtD. 149, gasts [sgN])
OCS. gostī	(m.) 'Gast, Genosse, Freund' (Sadnik √244)

(b) Neogr. \*steigh- 'steigen' (P. 1017-8)

Gr. στίχ-	(f.) 'Glie(d)er, Reihe(n)' (GEW 2:783, στιχός, στιχέξ)
OInd. ati·ṣṭīgh-	(vb.) 'übersteigen' (EWA 2:761, atiṣṭīgham [inf.])
Gr. στείχω	(vb.) 'marschieren, steigen, ziehen' (GEW 2:783)
Go. steiga-	(vb.) 'climb' (GoEtD. 324, steigip [3sg])
Alb. shteg-	(m.) 'path, road' (AlbEtDi. 437, shteg)
Li. staigý-	(pr.int.) 'eilen' (LiEtWb. 892, staigýtis [inf.])

(c) Neogr. \*meigh- (P. 713)

LAv. maeγa-	(n.) 'Wolke' (AIWb. 1104-5)
RV. meghá-	(m.) 'Wolke' (WbRV. 1062)
Arm. mēg-	(sb.) 'Nebel' (ArmGr. 1:474, EtDiArm. 466)
RV. ni·méghamāna-	(ptM.) 'sich voll gießend' (WbRV. 1043)
Li. miglà-	(f.) 'Nebel' (LiEtWb. 451)
Gr. ὀμίχλη-	(f.) 'Nebel' (GEW 2:387, GrGr. 411-2, 433)

§2. Brugmann's examples of Neogr. \*bh (Grundr<sup>2</sup> 1:507-8) include:

(a) Neogr. \*bher- 'tragen' (P. 128f.)

Gr. φέϑ-	(ao.) '(er-, weg)tragen' (GEW 2:1003)
Lat. fer-	(pr5.) 'tragen, hervorbringen' (WH 1:483, ferre)
RV. bhár-	(pr2.) 'tragen' (WbRV. 960, bhárti [3sg])

Go. bar-	(pret.) ‘carry, endure, give birth’ (GoEtD. 57)
Arm. bere-	(pr.) ‘bring, bear, give fruit’ (EtDiArm. 176)

(b) Neogr. \*nebh- ‘Wasser, Wolke, Nebel’ (P. 315-6)

RV. nábh-	(f.) ‘Wolke’ (WbRV. 722)
RV. nábhas-	(n.) ‘Nass, Wasser, Wolke, Nebel’ (WbRV. 709)
Gr. νέφος-	(n.) ‘Wolke, Nebel’ (GEW 2:313, νέφος)
OCS. nebo <sup>s</sup> -	(n.) ‘Himmel’ (Sadnik √570, nebo [sgNA])
Lat. nebula-	(f.) ‘Dunst, Nebel, Dampf, Wolke’ (WH 2:151)

(c) Neogr. \*bhars- (Grundr<sup>2</sup> 1:514, MA. 51, CHD P:183)

Lat. farr-	(n.) ‘Dinkel, Spelt, Schrot, Mehl’ (WH 1:455-6)
Gr. φάρσο-	(n.) ‘Stück, Teil’ (GEW 2:994-5, φάρσος)
Ĥi. barša-	(c.) ‘Stück, Brochstück, Broken’ (HHand. 124)
OCS. brašino	(n.) ‘Speise, Nahrung’ (Sadnik √64)
Rus. bórošno	(n.) ‘Roggenmehl’ (REW 1:110)

§3. Brugmann’s examples of Neogr. \*dh (Grundr<sup>2</sup> 1:522-3) include:

(a) Neogr. \*dhē- ‘setzen, stellen, legen’ (P. 235f.)

OCS. dě-	(vb.) ‘legen, setzen, stellen’ (Sadnik √146, děti [inf.])
Li. dė-	(vb.) ‘setzen, stellen, legen, pflanzen’ (LiEtWb. 91, dėti)
Gr. ἀνάθημα-	(n.) ‘Aufstellung, Weihgeschenk’ (GEW 2:897-8)
Go. missa ·deþ-	(f.) ‘misdeed’ (GoEtD. 136)

(b) Neogr. \*rudh- ‘rot, rötlich, röten’ (P. 872-3)

Gr. ἐρεῦθω	(vb.) ‘röten, rot färben’ (GEW 1:555)
OGaul. roudio-	(PN.a.) ‘rot’ (ACSS. 2:1235, roudius [sgN])
RV. rudhi·krá-	(m.) ‘Bez. eines Dämons’ (WbRV. 1176)
AV. rudhirá-	(a.) ‘blutig, blutrot’ (WbRV. 1176)
LAv. raoiðita-	(pt.a.) ‘rot, rötlich’ (AIWb. 1495)
Gr. ἐρυθρός-	(a.) ‘rot’ (GEW 1:567, ἐρυθρός [sgN])
Umbr. rufro-	(a.) ‘rot’ (WbOU. 637)

(c) Neogr. \*bhendh- \*bhondh- ‘binden’ (P. 127)

Go. and ·band-	(pret.) ‘unbind, loose’ (GoEtD. 71, andband [3sg])
RV. bandhá-	(m.) ‘Band, Fessel’ (WbRV. 898)
LAv. banda-	(m.) ‘Bande, Fessel’ (AIWb. 926, bandəm [sgA])
Gr. πενθερός-	(m.) ‘Schwiegervater’ (Grundr <sup>2</sup> 1:345, πενθερός)
Li. beñdra-	(m.) ‘Teilhaber, Genosse’ (Grundr <sup>2</sup> 1:345)

(d) Neogr. \*medhu-, modhu- (Grundr<sup>2</sup> 1:523) [P. 707]

Gr. μέθυ-	(n.) ‘Rauschtrank, Wein’ (LSJ. 1091, GEW 2:191)
OEng. medu-	(m.) ‘mead’ (ASaxD. 676)
Li. medù-	(m.) ‘Honig’ (LiEtWb. 425, medùs [sgN])
CLu. madu-	(n.) ‘Traubenschaft, Honigwein’ (HEG 2:165)

#### 4.6.2 Historical approaches to the mediae aspiratae

§0. Voiced aspirates have been preserved as such only in the Indo-Aryan branch.<sup>731</sup> Exceptionally the study of the origin of the series in the proto-language must be started with their traditional transcription, OInd. bh dh ḍh gh jh, which was generalized for Proto-Indo-European as well.

§1. Brugmann (Grundr.<sup>2</sup> 1:76) described the aspirates of Sanskrit as follows:

“Das altindische Alphabet (in Transcription) ist folgendes: [...] ḥ [...] k kh g gh [...] t th d dh [...] p ph b bh [...] h. [...] ḥ (visarjanīya, visarga) und h spricht man beide wie unser deutsches h aus. Diese Aussprache ist für ḥ richtig, h dagegen war nach dem ausdrücklichen Zeugnis der Prātiśākhya ein stimmhafter Hauch (vgl. Sievers Phon.<sup>4</sup> 28).”

Regarding mediae aspiratae, Brugmann (Grundr.<sup>2</sup> 1:76) added:

“Dagegen [ai.] gh jh ḍh dh bh als stimmhafte Mediae +h; doch ist nicht sicher, wie sie von den alten Indern ausgesprochen wurden, s. Meringer und Hoffory a. O., Sievers Phon.<sup>4</sup> 157f., Wackernagel Ai. Gr. 114f.”

On the basis of the traditional correspondence sets and sound laws, the series mediae aspiratae Neogr. \*gh \*bh \*dh were reconstructed in a comparatively acceptable manner by the Neogrammarians, though no further analysis of the series was ever suggested or sought.<sup>732</sup>

§2. A new phase in the analysis of the mediae aspiratae began with Cuny (1912), who suggested that at least some voiced aspirates might be understood as consisting of unaspirated mediae D followed by the laryngeal \*A (= H<sub>2</sub>). Some alleged examples<sup>733</sup> of this would be:

Gr. ἐγώ	← *eḡoH <sub>2</sub>	:	RV. ahám	← *eḡH <sub>2</sub> -
Gr. μέγα	← *meḡH <sub>2</sub> -	:	RV. mahánt-	← *meḡH <sub>2</sub> -

The key problem of Cuny’s analysis is explained by Szemerényi (1967:94-5):

“[...] it has often been held that Mediae Aspiratae can represent combinations of Media + Laryngeal but only when some discrepancy between various IE languages is to be explained (e.g. Skt. aham: Lat ego). There seems however no ground for a distinction of two kinds of Mediae Aspiratae on the diachronic plane.”

<sup>731</sup> On the allegedly preserved voiced aspirates in Old Armenian, see Szemerényi (1996:142fn1). Whether Old Anatolian preserved voiceless aspirates has not been proven, due to the limitations of the presentation of the data.

<sup>732</sup> However, as pointed out by Collinge (1985:259), already “Hirt (1931:80) was doubtful as to what sort of phonetic creature to recognize in [Neogr. \*bh, dh, gh]”.

<sup>733</sup> For other suggestions of segmental D+h, see Burrow (1949:58-59, 1979:26-30).

Szemerényi's argument is in harmony with Jakobson's typological remark mentioned above, due to which Cuny's treatment should not be accepted without necessary improvements.<sup>734</sup>

§3. For his part, Szemerényi (1996:144) suggested the generalization of Cuny's idea according to the following lines:

“Since according to our conclusions the ‘laryngeal’ was a glottal spirant h, it is also clear that the unvoiced and voiced aspirates originally represented the combinations *unvoiced stop+h* and *voiced stop+h*, which in Indo-European counted as monophonematic.”

Thus, according to Szemerényi, the entire series Dh would be polyphonematic (= D+h) in exactly the same manner as Th (= T+h). Szemerényi's view is delightfully economical, but problems remain in its details:

(a) As shown in connection with the series mediae, the cover symbol \*h̥ had two values, PIE \*h (voiceless) and PIE \*ɦ (voiced). In these cases, it is obligatory to derive Neogr. \*Dh from \*D+ɦ instead of D+h (Szemerényi), a state of affairs that can be readily proven as the traditional notation ‘Dh’ is a misnomer for Dɦ.

(b) If the segmental analysis \*Dh ≡ D+ɦ is accepted, what can be said of the origin of the feature ‘voice’ of the plosive D?

§4. In the glottalic theory, two different approaches towards the series Dh have emerged. Hopper (1973) satisfies himself by claiming that “breathy voice” would account for the mediae aspiratae. More radically, Gamkrelidze and Ivanov (1973, 1995) advocated a view according to which the series Dh was actually made up of variant-pairs D : Dḥ. This assumption is related to the PIE root constraints through an alleged extension of Grassmann's Law. According to Gamkrelidze and Ivanov, the roots Dḥ—Dḥ may be realized as D—Dḥ (Sanskrit and Greek) or Dḥ—D (Italic).

### 4.6.3 Critical corrections and solutions

§0. The problems of the series mediae aspiratae began in the 19<sup>th</sup> century when the voiced aspirates of the Devanāgarī alphabet were transcribed as OInd. h gh bh dh jh ḍh. This notation not only prevailed in traditional presentations of Sanskrit, but slipped into Proto-Indo-European reconstruction through Neogr. \*bh dh gh ḡh g<sup>u</sup>h.

§1. The traditional Romanization of Sanskrit is mistaken because the mediae aspiratae are clearly described by *Ṛk-Prātisākhya* (xiii.4-6) as (single) phonemes accompanied by ‘breath’ and ‘voice’:

“Breath is emitted for the voiceless sound and voice for others, except for voiced fricative (h) and the voiced aspirates, where both breath and voice are emitted.”<sup>735</sup>

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<sup>734</sup> Jakobson's claim (1958:23) about the coexistence of aspirated stop and a laryngeal consonant can be repeated for the respective voiced items.

In particular, the feature ‘voice’ must also have been a property of the aspirate (i.e. the correct transcription of Sanskrit is OInd. *ḥ bh dh gh jh ḍh*).<sup>736</sup> Historically this tiny error originated in the transcription of the voiceless glottal /h/ with OInd. *ḥ* (‘visarga’). Consequently, the phoneme /h/ was represented in two ways, Lat. *h* and OInd. *ḥ*. Simultaneously, both the voiceless /h/ and voiced /h/ glottals were referred to by a single phoneme, Lat. *h* and OInd. *h*.<sup>737</sup>

§2. The initial transcription failure of PIE *\*bh dh gh* misled Jakobson, among others. As a result, due to the lack of distinction between voiced and voiceless aspirates, his famous PIE typologies are more general than their formulation.<sup>738</sup> Differentiating *h* ≠ *ḥ* is a step in the direction of solving the problems, as will be shown below.

§3. Szemerényi’s typologies based on Jakobson can be supplemented in terms of the voiced laryngeal PIE *\*ḥ* [with my additions marked with corner brackets] in such a manner that these serve as true typologies for voiced aspirates:

- (a) “But while they [= *Th, Dḥ*] exist, their existence is, so to speak, tied up with the existence of an independent phoneme /h/ [and /ḥ/].” (Szemerényi 1967:89.)  
 (b) “*We do need a laryngeal [ḥ] – not [...] to account for the [PIE long vowels [...]] but [...] for the aspirated stops b[ḥ], d[ḥ], etc.*” (Szemerényi 1967:92.)  
 (c) “If the so-called Mediae Aspiratae presuppose the existence of a phoneme [ḥ], we can conversely say that they are combinations of unaspirated voiced stops with this phoneme.” (Szemerényi 1967:94.)

§4. In short, the existence of the segmental voiced laryngeal PIE *\*ḥ* allows us to deal with the series Neogr. *\*dh \*gh \*bh* in an identical manner as the series *tenuis aspiratae*,<sup>739</sup> as defined in:

RV. <i>bh</i> , Gr. <i>φ</i> , Go. <i>b</i> , ...	≡	PIE <i>*bḥa v *baḥ</i>	(≡ Neogr. <i>*bh</i> )
RV. <i>dh</i> , Gr. <i>θ</i> , Go. <i>d</i> , ...	≡	PIE <i>*dḥa v *daḥ</i>	(= Neogr. <i>*dh</i> )
RV. <i>gh</i> , Gr. <i>χ</i> , Go. <i>g</i> , ...	≡	PIE <i>*gḥa v *gaḥ</i>	(= Neogr. <i>*gh</i> )

§5. Concerning these, note the following issues:

- (a) Jakobson’s challenge against the set *T D Dḥ* has been answered. The series Neogr. *\*Dḥ* can be analyzed in exactly the same manner as the series Neogr. *\*Th*. Together this leaves only two series *T* and *D*, of which even the latter is has gained its voice from PIE *\*ḥ*.

<sup>735</sup> Allen’s translation (1953:34) corresponds with *Rk-prāṭisākhya*’s wording, *soṣṣoṣmaṇām ghoṣinām śvāsanādau* (“both breath and voice are properties of voiced aspirates”).

<sup>736</sup> Thus, the answer is affirmative to Collinge’s (1985:259) pondering, “Indeed was the aspiration also voiced (/bh/)? Freestanding /h/ in Sanskrit is so.”

<sup>737</sup> I am pleased to see that the notation *Dḥ* is currently gaining ground (for example, see Kümmel 2012).

<sup>738</sup> Thus, for instance, the unfounded notation /b<sup>h</sup>/ /d<sup>h</sup>/ /g<sup>h</sup>/, originally taken over from Sanskrit transliteration, still appears in the phonetic alphabet of IPA.

<sup>739</sup> See Szemerényi (1967:95): “At an earlier stage (...) the Mediae Aspiratae were probably diphonemic.” Instead of diphonemic PIE, however, *\*Daḥ* and *\*Dḥa* were triphonemic.

(b) As with the series Neogr. \*Th, the reconstructive choice between PIE \*Daf and \*Dfa has to be decided individually for each correspondence, based on the measurable properties of the material.

(c) The main criterion for choosing between PIE \*Daf and PIE \*Dfa is the ‘a-vocalism’ of the root or its absence, in practice equaling ‘e-vocalism’. Other means – such as Balto-Slavonic accent – are also occasionally available and if so, these are taken into account in order to secure the correct reconstruction.

§6. The existence of PIE \*gfa bfa dfa is readily proven, because the examples coincide with the class of problematic roots with ‘a-vocalism’, possibly in ablaut with Neogr. \*o ð. Some examples illustrating the reconstruction can be quoted here.

(a) PIE \*gfa- appears, for example, in:

PIE \*gfaġaf- (P. 424) ‘krümmen, biegen’ (ablaut: PIE \*gfaogaf- \*gfaēġaf-)

OIcl. ġaf-hals-	(a.) ‘mit zurückgebogenem Hals’ (ANEtWb. 152)
Norw. ġaf-	(a.) ‘rückwärtsgebogen’ (ANEtWb. 152 ġagr [sgN])
Arm. ġog-	(sb.) ‘Höhlung, Schoss, Bauch’ (ANEtWb. 152)
Li. ġōġa-	(m.) ‘Widerrist des Pferdes’ (LiEtWb. 160)

(b) PIE \*bfa- appears, for instance, in:

PIE \*bfialk̑- \*bfiaelk̑- ‘strong’ (P. 120)<sup>740</sup>

OIr. balc	(a.) ‘fort, puissant’ (LEIA B-12, Burrow: 103)
Cymr. balch	(a.) ‘hardi, fort’ (LEIA B-12)
OInd. bhṛśa-	(a.) ‘strong, vehement, mighty’ (MonWil. 765-6)
OInd. bhṛśāya-	(vbM.) ‘to become powerful, strong’ (MonWil. 766)
OInd. bhraśiman-	(m.) ‘potence, vehemence, strength’ (MonWil. 766)

(c) PIE \*dfa- appears, for instance, in:

PIE \*dfaen- ‘death; die’

Maced. δάνο-	(m.) ‘death’ (GEW 3:103, δάνοϲ [sgN])
Gr. θάνο-	(ao.) ‘die’ (GEW 1:653, ἔθανον [1sg])
Gr. θάνατο-	(m.) ‘Tod’ (GEW 1:652-3, θάνατοϲ [sgN])

In PIE \*dfan-, the respective zero grade, the unaccented root vowel PIE \*a was lost:

Gr. τέθνα-	(pf.) ‘sterben’ (GEW 1:653, τέθναμεν [1pl])
Aiol. θναίτω	(pr.) ‘to die’ (GEW 1:653)
OPhyrg. ε[π]ι·θνιου-	(vb.) ‘to die’ (Phryg. 104, ε[.π]ι·θνιουμενοϲ)

§7. In this connection, note that:

(a) Mechanical inference from the ‘a-colouring’ to PIE \*gfa bfa dfa is susceptible to error, because there are also roots with laryngeal extension PIE \*Df̑·eah̑. Within

<sup>740</sup> For the unextended root, see OIr. ad·bal- (a.) ‘fort, grande, vaste’ (LEIA A-16). The root PIE \*bfiael- is a schwebeablaut alternative of RV. bāla- (n.) ‘Kraft, Leibeskraft, Stärke’ (WbRV. 901), etc. with PIE \*bfial-.



these, the vowel attached to the second laryngeal (rather than the first) is responsible for the vocalism of the root.<sup>741</sup>

(b) Proof of the triphonic character of PIE \*gaf̥ baf̥ daf̥ is contained in schwebeablaut alternatives with PIE \*geaf̥ beaf̥ deaf̥ and the voiceless variants PIE \*keaf̥ peaf̥ teaf̥, discussed separately below.

§8. The root constraints of Meillet and Magnusson with the phonetically proper Df̥h replacing Neogr. Dh can be expressed as follows:

T—Df̥h	→	T—D	v	D—Df̥h
Df̥h—T	→	D—T	v	Df̥h—D

(a) The existence of the roots D—D leaves T—Df̥h and Df̥h—T as the only two non-attested shapes. As already understood by Magnusson, the shapes T—D, D—Df̥h, D—T, Df̥h—D can be derived from these by two simple rules, the loss of laryngeal (→ T—D and D—T) and the contamination of voice (→ D—Df̥h and Df̥h—D), which form the root constraint proper.

(b) Miller (1977a:367) is unhappy about the lack of explanation for the PIE root constraint, which he would like to see as a special case of Bartholomae’s Law.<sup>742</sup> Though the root constraints differ from Bartholomae’s Law in some respects, the core of Miller’s idea will be shown below to be correct.

(c) In the root constraints proper, either the voice of PIE \*f̥h was contaminated for the entire root (→ D—Df̥h, Df̥h—D) or PIE \*f̥h was lost (→ T—D, D—T). Both of these features reflect a general *constraint against the simultaneous presence of PIE \*f̥h and a voiceless obstruent \*T* within a root. In essence, this is the very phenomenon that has turned the roots f̥h—T and T—f̥h into f̥h—D and D—f̥h, resulting in the emergence of the series mediae and the series mediae aspiratae: Taf̥h Tfa → Daf̥h Dfa → Df̥h.

§9. An actual proof for the root constraints against T—Df̥h and Df̥h—T is contained following data:

(a) √pet-, √pot- ‘posse’ (P. 842+453) ‘Hausherr, Herr; Gatte’

Ĥi. pat	(ptcl.) ‘eben(so), auch, vielmehr’ (ĤudA 77f.)
Li. pàt	(indecl.ptcl.) ‘selbst, sogar, gerade’ (LiEtWb. 551)
Latv. pat	(indecl.ptcl.) ‘selbst, sogar, gerade’ (LiEtWb. 551)
Lat. hos ·pet-	(m.) ‘Gastfreund’ (WH 1:660-1)
OLi. pati-	(m.) ‘Ehemann, Gatte, Mahlin’ (LiEtWb. 551)
RV. páti-	(m.) ‘Schutzer, Herr, Gebieter, Behüter’ (WbRV. 765)

<sup>741</sup> Such an extension is attested in PIE \*baf̥eaf̥h- (cf. RV. bhá’as- (n.) ‘Licht, Schein’, WbRV. 934), alternating with PIE \*baf̥el- (cf. OCS. bělŭ- (a.) ‘weiss’, Sadnik √38 and OIcl. bāl- (n.) ‘Feuer, Scheiterhaufen’, ANetWb. 23) without the laryngeal extension.

<sup>742</sup> Miller (1977a:367) writes: “What neither Hopper’s nor anyone else’s analysis [...] explains to my satisfaction is the constraint against \*tegh and \*ghet [...] the operation of BL was responsible for this particular constraint [...]”

Old Anatolian does not have a laryngeal, and Sanskrit has two successive unaspirated tenuis (RV. p—t), due to which the root is provably of the form T—T. The laryngeal extension PIE \*pet·ēah- and PIE \*pot·ēah- appears in:

Lat. hos·pitā-	(f.) ‘Gastfreundin, Fremde, Wirtin’ (WH 1:660)
Gr. δεσ·πότηα-	(m.) ‘Herr des Hauses’ (GEW 1:370)

The suffixes have the diagnostic Indo-European /ā/, but the voice has not been contaminated, implying a value PIE \*h and shape T—T—h. Following the loss of PIE \*a in zero-grade PIE \*petah- \*potah-, the laryngeal is confirmed through a voiceless aspirate in Indo-Iranian (root root T—Th):

LAv. paṭi-	(pr.) ‘potiri, in Besitz sein’ (AIWb. 844)
LAv. paṭaya-	(pr.) ‘potiri, in Besitz sein’ (AIWb. 844)

On the other hand, the root-final dental is voiced in the extension PIE \*pod·ēaf:

OCS. gos·poda	(f.) ‘Herberge’ (Sadnik √243),
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with the result that the root shape is T—D—h. In zero grade of the suffix (PIE \*podah), a simple unaspirated media proven by Greek ζ appears in

PIE \*podafi- ‘herr, herrschen’:

OCS. gos·podī-	(m.) ‘Herr’ (Sadnik √243)
LAv. paṭi-	(pr.) ‘potiri, in Besitz sein von’ (AIWb. 844)
Gr. δεσ·πότηζω	(pr.) ‘herrschen’ (GEW 1:371, δεσπότηζω [1sg])
OCS. gos·požda	(f.) ‘Herrin’ (Sadnik √243)

Therefore, an unbroken chain of proof has been established for the root constraint T—Dh → T—D.

(b) PIE \*pah- ‘trinken’ (P. 839-40).<sup>743</sup> The laryngeal extension PIE \*peah-, formed as PIE \*potēah above, is attested in:

Fal. pa-	(vb.) ‘bibere’ (WH 1:103, pafo [1sg])
Fal. pipa-	(vb.) ‘bibere’ (WH 1:103, pipafo [fut1sg])

In the corresponding zero grade PIE \*pibafi- appears with unaspirated rather than aspirated media as in PIE \*podafi-:

RV. píba-	(vb.) ‘trinken, bibere’ (WbRV. 801, píbati [3sg])
OIr. ibi-	(vb.) ‘trinken’ (DIL 378, ibid [3sg])
OCymr. ibe-	(vb.) ‘trinken’ (WH 1:103, iben [1pl] : bibimus)

When this development is compared to the alternative PIE \*bibañ- in

Lat. bib-	(pf.) ‘trinken’ (WH 1:103, bibī [1sg])
Lat. bibo-	(pr3.) ‘trinken’ (WH 1:103, bibere [inf.])

it is readily seen that the alternations fit the root constraint exactly:

<sup>743</sup> The unextended root without laryngeal PIE \*pip- appears in RV pip- (pr.) ‘pibere’, attested in RV. vi-pipāná- ‘von Saft durchtränkt’ (WbRV. 803).

T—Df̂	→	T—D	∨	D—Df̂
PIE *pibaf̂	→	IE pib- (RV. píba-)	∨	IE bibf̂- (Lat. bibo-)

Though we are not (yet) in possession of rules enabling us to predict when T—D or D—Df̂ (or both) result, the root constraint is the sole possibility dealing with the problem regularly, and therefore sound in terms of its content.

§10. The key issues concerning the root constraint can be summarized as follows:

(a) Without the segmental laryngeal PIE \*h/f̂ at his disposal, Magnusson (1967) was not aware of the ambiguity of the root forms T—D and D—T, for which he could only offer the starting points T—Dh and Dh—T. Consequently, Magnusson’s rules require questionable derivations, as pointed out by Miller.<sup>744</sup> Some examples of this are:

1. †kerdh from Neogr. \*kard-, kord- (Lat. cord- ‘heart’, P. 579-580). Magnusson’s rule fails, because there is an unaccounted laryngeal in the root (Gr. καρδια ← PIE \*keaf̂rd-). As PIE \*f̂, the voiceless laryngeal implied by the ‘a-vocalism’ and root final media (Gr. δ), is confirmed by PIE \*gaf̂rd- → RV. h̄rd- (Av. zərəd-), the laryngeal within the root is proven instead of Magnusson’s †kerdh.

2. †teg<sup>h</sup> from Neogr. \*teg (Gr. τέγος, P. 1013-4). Leaving aside the labiovelar – based on Magnusson’s hierarchies – the root was PIE \*tef̂ag-, not †tegaḥ. This is implied by the voiced variant of the root PIE \*def̂ak- preserved in

Ion-Att. δεκτή- (f.) ‘χλαῖνα, χλανίς’ (GEW 1:360, P. 189).<sup>745</sup>

(b) It is allowed to apply Magnusson’s root constraints only if a laryngeal in any other position is excluded. Thus, for example, we may reconstruct PIE \*pedaf̂- \*podaḥ- ‘foot’ for Neogr. \*ped- pod-) owing to the lack of laryngeal in Ḥi. pada- (c.) ‘foot’ (Lat. ped- ‘id’), allowing application of the rule T—Df̂ → T—D.<sup>746</sup>

(c) Some examples of the root shapes T—Df̂ and Df̂—T are attested in spite of the root constraint. For example, the shape is found in:

Neogr. \*bhoḥk- ‘flammen, brennen’ (P. 162)

Lat. foco-	(m.) ‘Feuerstätte, Herd’ (WH 1:521, focus [sgN])
Arm. bosor-	(a.) ‘bloodred, crimson’ (EtDiArm. 187, bosor [sgN])

<sup>744</sup> In Miller’s (1976:56) words: “Because of alleged complementary distribution and the absence of roots of the structure T—Dh, Magnusson would have to derive \*kerd- ‘heart’ from \*/kerdh-/ , \*d̂ḡhwā ‘tongue’ from \*/t̂ḡhwā/, \*teg- ‘cover’ from \*/tegh-/ , \*terg- (so Pokorny 1073) ‘scowl’ from \*/tergh-/ , etc.”

<sup>745</sup> Note that this comparison (see Frisk 1:360) was already presented by Blumenthal: “Nach Blumenthal Hesychst. 25 A. I durch dissimilation aus \*τεκτή, zu lat. tego, toga.” Though called “ganz unwahrscheinlich” by Frisk, he was not aware of Meillet and Magnusson’s constraint allowing the regular treatment of the alternation of voice.

<sup>746</sup> The diagnostic ‘a-vocalism’ (PIE \*bdeaf̂) is revealed by Gr. ἔπιδά (f.) ‘Tag nach dem Fest’ (GEW 1:536), RV. upabdá- (m.) ‘Geräusch, Gepolter’ (WbRV. 255) and other formations belonging here, all with the root shape DD—f̂.

Under no circumstances should such roots be considered as ‘non-PIE’ due to the ostensible violation of the root constraint<sup>747</sup> nor interpreted as invalidating the root constraint. In such data segmentation, leaving a compound (compare to Gr.  $\pi\lambda\eta\theta$ -, gAv. fra ·d-) actually conveys valuable information about the formations in question. Regardless of how Neogr. \*bhok- is to be analyzed, it is not a primary root, but a compound.

(d) Kuryłowicz’s postulation of a voiced, ‘o-colouring’ laryngeal  $\dagger\text{ə}_3$  (=  $\dagger\text{h}_3$ ) is fallacious. In the sole example, the assumed o-colouring is caused by the vowel PIE \*o in Gr.  $\pi\acute{o}\tau\omicron$ - (m.) ‘Trinken, Trank’ (← PIE \*poahto-) and the voiced media of RV.  $\text{p}\acute{\text{i}}\text{b}\text{a}$ - (OIr. *ibi*-) by the root constraint (← PIE \*pibaŋ), also accounting for the loss of aspiration. In such circumstances, PIE \*b is not to be equated with LT \*\*p+ə<sub>3</sub>. As Kuryłowicz’s analysis is the basis of the conjecture D = T, the same argument applies to the glottalic theory.

§11. The alternation T : Dfī, already identified by Brugmann (Grundr<sup>2</sup> 1:634-5),<sup>748</sup> consists of two main groups:

1. Roots ending with ·T- alternating with extended roots in ·Dfia- or ·Dafī-.
2. Roots beginning with T- in alternation with Dafi- or Dfia-, consequently revealing a laryngeal within the root.

Both types are accounted for by PIE \*·afī and \*·fa as detailed next.

§12. Examples of the roots ending with ·T- are:

(a) An unextended root PIE \*defiaK- appears in Do.  $\delta\acute{\epsilon}\chi\omicron\mu\alpha\iota$  ‘annehmen’, extended as PIE \*defiaGafī- in Gr.  $\delta\acute{\epsilon}\chi\omicron\mu\alpha\iota$  ‘annehmen’.<sup>749</sup> Similar alternations are commonplace in Greek and need no further comment.

(b) PIE \*rut- ‘rot, rötlich, usw.’, the unextended root, is attested in:

Lat. rutilo-	(a.) ‘rötlich’ (WH 2:456)
Lat. rutilio-	(m.) ‘N. einer Römischen gens’ (WH 2:456, rutilius)
Illyr. rutilio-	(VN.) ‘rötlich’ (WH 2:456, rutilius)
Illyr. rutulo-	(VN.) ‘rötlich’ (WH 2:456, rutulus)

PIE \*rudafī-, the \*·afī-extension of the previous, is far better known:

Go. raud-	(a.) ‘rot’ (GoEtD. 282, raudai [sgD])
OCS. ruda	(f.) ‘Erz, Bergwerk’ (Sadnik √772)

<sup>747</sup> To mention further ‘irregularities’, Miller’s (incomplete) list of counterexamples includes the roots P. 516 (kadh), P. 518 (kagh, Lat. cohō), P. 518 (kaghlo), P. 542 (keigh, keibh), P. 560 (kenəbh) Gr.  $\kappa\nu\acute{\epsilon}\phi\alpha\lambda\lambda\omicron$ -  $\gamma\nu\acute{\nu}\phi\alpha\lambda\lambda\omicron$ -  $\kappa\nu\acute{\alpha}\phi\alpha\lambda\omicron$ -, P. 563 (knudh), P. 579 (kerdh), P. 590 (keubh), P. 592 (kumbh), P. 594 (keubh), P. 594 (\*keudh), P. 608 (kneigh<sup>h</sup>), P. 617 (krebh), P. 623 (kreudh), P. 625 (kseubh), P. 627 (kudh), P. 631 (kuendhro), P. 806 (plēdh), P. 1062 (telegh), P. 1067 (tengh), P. 1073 (tergh), P. 1073 (treugh), P. 1080 (tubh), P. 1089 (tragh), and P. 1099 (tūengh).

<sup>748</sup> Already Grassmann (1863:96), enabled by his identification of the series Th and the postulation of his law, understood that an alternation T : Dfī : (Th) was required to explain the entire phenomenon: “Im griechischen nun finden wir einen häufigen wechsel zwischen tenuis und aspirate.”

<sup>749</sup> As for the alternations of this category, see Brugmann’s (Grundr<sup>2</sup> 1:652) now outdated analogical explanation: “Oft ist durch Analogiewirkung Ten. asp. für. Ten eingetreten [...] in  $\delta\acute{\epsilon}\chi\omicron\mu\alpha\iota$  ‘ich nehme an’, neben ion. dor. lesb.  $\delta\acute{\epsilon}\chi\omicron\mu\alpha\iota$ , in den Perfekta wie  $\delta\acute{\epsilon}\delta\epsilon\iota\chi\alpha$ , zu  $\delta\epsilon\acute{\iota}\chi\nu\mu\iota$  ‘ich zeige’. S. II S. 1230.”

AV. rudhirá-	(a.) ‘blutig, blutrot’ (WbRV. 1176)
LAv. raoḍita-	(pt.a.) ‘rot, rötlich’ (AIWb. 1495)

(c) PIE \*lup- ‘lieben, begehren, usw.’, the unextended root, appears in:

Go. liuf-	(a.) ‘ἀγαπητός : beloved’ (GoEtD. 235)
OInd. lo-lupa-	(a.) ‘begehrlich, verlangend’ (KEWA 3:117)

PIE \*lubafi-, the \*·afi extension of the previous example, dominates the material with mediae aspiratae in most of the Indo-European data:

Go. gudi-lub-	(PNm.) ‘god-loved’ or ‘god-loving’ (GoEtD. 162)
OInd. lo-lubha-	(a.) ‘begehrlich, verlangend’ (KEWA 3:117)

Similar alternations (OIcl. þrœl- ‘Diener’ : OHG. drigil- ‘id.’, etc.; see Grundr<sup>2</sup> 1:690, etc.) are attested practically in every language, and can be regularly accounted for with PIE \*h̥.

§13. The more interesting type reveals a voiceless laryngeal TehC in schwebeablaut with voiced root Dh̥eC in examples such as:

PIE √pahu (P. 842-3) + √bafu (P. 146-150)

PIE *p(e)ahu- →	Att. παῦς ‘Kind, Sohn’, φιλόπαϝ- (GEW 2:462-3)
PIE *baf(e)u- →	RV. bháv- (ao.) ‘sein, usw.’ (WbRV. 948)

This type of alternation is also well documented, and further examples will be provided below.

§14. The alternation \*Th : Dh̥ was also correctly identified by the Neogrammarians (Brugmann, Grundr<sup>2</sup> 1:632). The alternation of voice reflects that of the laryngeal PIE \*h : h̥ under unknown conditions. Some examples of the alternation are:

(a) √hantah- : √handafi- ‘brennen, gebrannt, usw.’ (P. 41)

PIE \*hantah-

Arm. ant‘el-	(sb.) ‘hot coal, ember’ (EtDiArm. 85)
Gr. ἄνθρακ-	(m.) ‘Glutkohle’ (GEW 1:109f., ἄνθρακες [plN])
Arm. ant‘roc‘-	(sb.) ‘hot coal, ember’ (EtDiArm. 85)

PIE \*handafi-

OIr. and-	(vb.) ‘allumer, enflammer’ (LEIA A-75, andud [inf.])
RV. andhá-	(a.) ‘blind, dunkel’ (EWA 1:78, WP 2:182)
OGaul. anda-bata-	(m.) ‘Blindkämpfer’ (ACSS 1:148, WH 1:46)
Ḫi. ḫand-aiš-	(n.) ‘Hitze, Wärme’ (HEG 1:154, ḫa-an-da-iš [sgNA])
Ḫi. ḫanz-ana-	(a.) ‘schwarz’ (HEG 1:157, ḫa-an-za-na-aš [sgG])

(b) √noPaḥ- ‘Nabe, Nabel, Nachkomme, usw.’ (P. 314 \*enebh-)

PIE \*nopah-

LAv. nāfa-	(m.) ‘Nabel’ (AIWb. 1062)
LAv. nāfa-	(m.) ‘Verwandtschaft, Familie’ (AIWb. 1062)



RV. dhanvā-śáh-	(m.) ‘Bogenträger’ (WbRV. 657)
RV. dhánvan-	(n.) ‘Bogen : bow’ (WbRV. 657, KEWA 2:90)

§15. The alternation Df̥i : D, also identified by the Neogrammarians (Brugmann, Grundr<sup>2</sup> 1:633-4), is similar to the alternation T : Df̥i, and accordingly there are two types:

1. Roots beginning with D- in alternation with Df̥i- (schwebeablaut), thus revealing PIE \*f̥i within the root.

2. Roots ending with -D in alternation with extensions -Daf̥i and -Dfi, thus revealing a suffix PIE \*f̥i.

§16. Some examples of the first category are:

(a) √daf̥i- ‘geben’ (P. 223f., dō, dā). The ablaut bases of the root are fully preserved in:

PIE *dēaf̥i-	→	Lat. dā-, Li. dovana, etc.
PIE *deaf̥i-	→	Lat. da-, gAv. da-, Arm. da-
PIE *doaf̥i-	→	Gr. δοϕεναι, Umbr. pur·doui-
PIE *dōaf̥i-	→	Gr. δίδωμι, Li. dúoti, etc.

In the zero grade (PIE \*daf̥i-), the loss of PIE \*a resulted in a voiced aspirate attested in forms such as:

RV. dádhī-	(a.) ‘gebend, verleihend’ (WbRV. 574)
RV. dhiṣ-	(ds.a.f.) ‘Lust zu geben, usw.’ (WbRV. 683, dhiṣá [sgI])

(b) PIE \*baf̥irdaf̥i- ‘beard’. The root with initial media, vocalized as

PIE *beaf̥ir(z)af̥i-	→	Lat. barba (f.) ‘Bart, Kinn’ (WH 1:96),
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stands in opposition to the root with initial media aspirata (schwebeablaut):<sup>751</sup>

PIE *baf̥irdaf̥i-	→	OEng. beard- (m.) ‘beard’ (ASaxD. 72).
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(c) PIE \*gaf̥il- ‘turtle’ (P. 435) appears in two vocalizations:

PIE *geaf̥il-	→	Lat. galapago- ‘Schildkröte’ (WH 1:614)
PIE *gaf̥el-	→	Gr. χέλυ- ‘Schildkröte’ (GEW 2:1086)

(d) √ġaf̥nu- ‘Knie, Ecke, Winkel’ (P. 380-1). In this root, PIE \*f̥i is suggested by the voiced media (palatovelar) and Brugmann’s Law II, implying PIE \*ġoaf̥nu- for:

Gr. γόνυ-	(n.) ‘knee’ (GEW 1:321, γόνυ [sgNA])
RV. jánu-	(n.) ‘knee’ (WbRV. 483)
TochA. kanu-	(m.) ‘Knie’ (Poucha 51, kanweṃ [duN])

In the respective zero grade and schwebeablaut forms of Old Anatolian, a voiced aspirate is revealed:

<sup>751</sup> Based on OHG. tanne ‘fir’, several scholars (e.g. Adams, MA. 202) have suggested the identification of Hittite items with this ‘tree’. This is quite possible, of course.

<sup>752</sup> Thus irregular explanations, such as Szemerényi’s (1996:58) “Lat. barba (from \*farbā by assimilation)”, are no longer required.

PIE \*ǵahnu- \*ǵahenu- \*ǵafionu- ‘Knie’

Gr. πρό γυυ-	(adv.) ‘knielings, auf den Knien’ (GEW 2:605, πρόγγυυ)
Ἡi. ganu-	(n.) ‘Knie’ (HEG 1:552, ga-nu-ut [sgI])
Ἡi. genu-	(n.) ‘Knie’ (HEG 1:552, gi-e-nu)
Pal. genu ·kat-	(n.) ‘ein Fleisch- oder Körperteil’ (DPal. 59)

§17. In terms of these alternations, the following should be observed:

(a) The early claims of analogy (in the broad sense) are outdated due to the existence of regular treatment for the alternation by means of PIE \*D+ah, \*D+fa.<sup>753</sup>

(b) In general, the alternations must not be reconstructed mechanically, but the comparative facts should always be taken into account. An example of a violation of the data is included in Cuny’s (1912:119-120) early reconstruction:

*meǵA-	Gr. μέγα-	(a.) ‘gross’ (GEW 2:189-90, μέγα)
*meǵA-	RV. máh-	(a.) ‘gross’ (WbRV. 1013)

A close inspection reveals several defects in the analysis, however:

1. The Greek derivatives (including Gr. μέγεθος, Ion. μέζων, and Gr. μέγιστος) imply Neogr. \*meǵ- (not †megA-), a root of general shape D. The roots D, in turn, are of the form h—D or D—h, the former being implied by Italo-Celtic (cf. Lat. magis WH 2:10, OGaul. magio-rīg- ‘groß-König’, etc.) with Neogr. \*a.

2. Containing PIE \*h, the root √mahǵ- (Gr. √μέγ- ← \*maheǵ and Lat. √mag ← \*meahǵ-) is to be separated from RV. máh-, because the latter is now paralleled by Old Anatolian (where no laryngeal appears):

√meǵh- ‘groß, zahlreich, viel’

OἩi. meg-	(a.) ‘viel, zahlreich’ (HEG 2:181, me-e-ik [sgNA])
RV. máh-	(inf.bs.) ‘herrlich, glücklich, froh sein’ (WbRV. 1011)
gAv. maz-	(a.) ‘gross’ (AIWb. 1156, mazō [sgG])

Hittite also coincides with Indo-Iranian in the paralleled extensions \*·i- and \*·n-:

Ἡi. megi-	(a.) ‘groß’ (HEG 2:181f., me-ik-ki)
RV. máhi-	(a.) ‘gross, sehr, hoch, heftig, kräftig’ (WbWV. 1019)
gAv. mazi-	(adv.) ‘magnopere, mit Nachdruck’ (AIWb. 1156)
RV. mahn-	(n.) ‘Grösse, Macht, Reichlichkeit’ (WbRV. 1017)
Ἡi. magnu-	(vb1.) ‘vermehrten, anhäufen’ (HEG 2:99)

The set Ἡi. g = RV. h = gAv. z defines PIE \*meǵh-, \*moǵh-. This is a root to be separated from √mahǵ- (Lat. mag-), based on the difference of the phonetic shapes. Thus, RV. √mah- cannot be directly derived from Gr. μέγ- with the extension PIE \*·h, as suggested by Cuny. This is shown by the existence of the monoliteral root

<sup>753</sup> See, for example, Brugmann (Grundr<sup>2</sup> 1:655): “Durch Analogiebildung kam die Ten. asp. an die Stelle der Media in Formen wie Perf. ἤχαι zu ἄγω, τέτριφα, zu τριβω.”



√m- ‘viel ; wachsen’ (ablaut: PIE \*mo- \*me-):

HLu. ma-	(a.) ‘viel’ (HEG 2:181, ma-pa-wa/i ‘und viel’)
Ḫi. ma-	(vb2A.) ‘wachsen, gedeihen, reifen’ (HEG 2:91, 166)

In other words, PIE √meafġ and √meġafġ were built on the root matrix PIE √m- instead of reflecting a single prototype.

§18. In terms of the treatment of the series Neogr. \*Dfġ in the glottalic theory of Gamkrelidze and Ivanov (GI), note the following:

(a) According to the glottalic theory, the series Dfġ has aspirated and unaspirated allophones D and D<sup>h</sup> in free alternation. This basic idea of the glottalic theory is falsified by alternations like Neogr. \*bel- (P. 96) and Neogr. \*bhal- (P. 120), connected by a schwebeablaut as indicated in:

PIE *behal ·Σ-	Gr. βελτίων-, RV. baṣkáyā-, RV. bála-, etc.
PIE *bhal ·Σ-	OInd. bhṛśā-, etc.
PIE *bhael ·Σ-	OIr. ad ·bal-, OIr. balc-, etc.

Numerous similar alternations imply that the alternation, conditioned by the (schwebe)ablaut, is not free.

(b) The glottalic theory claims that in the Italic group the non-aspirated allophone D prevails non-initially (e.g. Lat. medius). Again, there are multiple issues falsifying such a conjecture:

1. Miller (1977a:384) correctly observes that in such cases “[...] the dialect forms are difficult to motivate in any non-ad-hoc way (Osc. loc. sg. f. mefiái)”.

2. Szemerényi (1996:44) points out that Lat. medius is trisyllabic, a property which can be accounted for by positing PIE \*medáfġjo- → PItal. \*medġjo- → Lat. medius. A regular explanation for the alternation Osc. f : Lat. d and the trisyllabic scansion of Lat. medius thus exists, as a result of which there is no reason to accept the speculations of the glottalicists.

3. As Lat. medius and similar examples can be accounted for with PIE \*d(+afġ), the traditional sound law requiring non-initial \*dfġ → Lat. b (Umbr. uerfale : Lat. uerbale; see Brugmann Grundr<sup>2</sup> 1:535-7) needs not be contested.

#### 4.6.4 Grassmann’s Law and its exceptions

§0. In 1863, Grassmann presented the famous sound law now bearing his name. It is outlined and briefly discussed below.<sup>754</sup>

§1. Grassmann’s Law, the deaspiration of one of two adjacent aspirates in Sanskrit and Greek, consists of implications:

$$\text{Th—Th} \quad \rightarrow \quad \text{OInd. T— Th v Th—T} \quad \text{Gr. T—Th v Th—T}^{755}$$

<sup>754</sup> According to Collinge (1985:47), the research history of Grassmann’s Law starts from “Raumer (1837:74) [who] may actually have been the first to speculate, as least as to Sanskrit”. See also Mayrhofer (1986:112fn58).

Df̄i—Df̄i → OInd. D—Df̄i v Df̄i—D Gr. T—Th v Th—T<sup>756</sup>

As pointed out, for instance, by Brugmann, the sound law applies not only to the mediae aspiratae, but to the tenues aspiratae<sup>757</sup> (as well as mixed roots with Th—Df̄i (OInd. kumbhás : Av. xumba-)<sup>758</sup> and Df̄i—Th).

§2. The considerable number of instances in which Grassmann's Law has operated perfectly secures the sound law beyond doubt. On the other hand, there exists a handful of exceptions requiring corrections in order to establish the complete regularity of the law. The methodology used in the identification of the exceptions is the converse of Grassmann's Law, stating that that if there is a root form not of the shape T—Th or Th—T, then the original was not Th—Th either.<sup>759</sup>

§3. Counterexamples failing to be of form T—Th or Th—T are particularly commonplace in Greek. Since a properly formulated sound law does not allow exceptions, the irregularities must be replaced with etymologies containing only one aspirate (shapes T—Th, Th—T, D—Df̄i, Df̄i—D).

§4. The key examples violating Grassmann's Law and alternative etymologies are detailed below.

(a) Gr. πυνθάνω 'erfragen, usw.' (GEW 2:625) has been compared to RV. √budh-, √bhud- 'worauf merken, achten' (P. 150f.) ever since Grassmann (1863:120). Despite this Gr. πύστις does not have an initial aspirate whence the PIE root underlying Greek did not contain two aspirates. Consequently an alternative etymology is to be sought, in this case from the root

PIE √pu- 'rechnen, denken, fragen' (P. 827 \*peu-)

PIE √pu-

Ἡi. ga·pua-	(vb.) 'abzählen, denken, usw.' (HEG 1:493-5)
Ἡi. ga·puai-	(vb.) 'rechnen, denken, usw.' (HEG 1:493-5)
Gr. νή·π(ϕ)ιο-	(a.) 'unverständlich, kindisch' (GrGr. 1:696, νήπιος)

PIE √pun-

Gr. πυνθάνω	(pr.) 'erfragen, erforschen, vernehmen' (GEW 2:625)
Ἡi. punuš-	(vb1.) '(er)fragen, erforschen' (CHD P. 377f.)

<sup>755</sup> For the sake of simplicity, only the series Th—Th and Df̄i—Df̄i are provided here.

<sup>756</sup> For the original formulation of the law, see Grassmann (1863:110-111).

<sup>757</sup> Brugmann (Grundr<sup>2</sup> 1:641) writes: "Tenues und Mediae aspiratae verloren ihre Aspiration, wenn auf sie im Auslaut derselben Silbe oder im Anfang der nächsten Silbe eine Aspirata folgte." For some examples, see Brugmann (Grundr<sup>2</sup> 1:641-2).

<sup>758</sup> Sturtevant (1941b:10) writes: "Skt. kumbhás 'pot' is shown by Av. xumba- 'pot' to come from Indo-Iran. khumbhás by dissimilation of aspirates; it cannot be cognate with Gk. κύβος 'cup'."

<sup>759</sup> For exceptions of Grassmann's Law in Greek, requiring thorough re-examination, see Brugmann (Grundr<sup>2</sup> 1:652).

PIE √putah-

Lat. putā-	(vb.) ‘berechnen, vermuten, denken, usw.’ (WH 2:393)
Gr. πυθ-	(vb.) ‘erfragen, erforschen, vernehmen’ (GEW 2:625)

PIE √puti-

LinB. να πυτιο-	(a.) ‘unverständlich, kindisch’ (GEW 3:157, na-pu-ti-jo)
Gr. νη πύτιο-	(a.) ‘unverständlich, kindisch’ (GEW 1:2:315, νηπύτιος)

(b) Gr. πείσμα (n.) ‘Tau, Seil’ (GEW 2:492) has been compared to RV. bandh : OInd. bhand- (Gr. πενθερό-) ever since Grassmann (1863:120). Here again the lack of initial aspirate in Greek would result in a violation of Grassmann’s Law, and one does better by comparing the Greek to a formation without an initial aspirate:

PIE \*póhant- ‘binden’ (P. 988 \*(s)pen(d)-)

Li. pánti-	(f.) ‘Koppelstrick, Spannstrick, Fessel’ (LiEtWb. 537) <sup>760</sup>
OPr. panto	(f.) ‘Fessel’ (APrS. 389)
OCS. poto	(n.) ‘πέδη : Fessel, Strick’ (Sadnik √641)

(c) Gr. πειθο- (prM.) ‘(ver)trauen, sich verlassen, gehorschen’ (GEW 2:487) has also been compared with Lat. fidō ‘(ver)trauen’ (P. 117) ever since Grassmann (1863:120). However, there is no trace of an initial aspirate in Gr. πιστός (see also Gr. πέπεισθι) and the etymology does not satisfy the requirement of regularity. Unsurprisingly an alternative etymology can be presented for Greek:

√pi- ‘trust, believe’

PIE √pih-

Lat. pīo-	(a.) ‘pflichtgemäß handelnd, fromm, usw.’ (WH 2:311)
Lat. pīā-	(vb.) ‘reinigen, sühnen, besänftigen, ehren’ (WH 2:311)

PIE √pir-

TochA. perāk-	(a.) ‘pius, credulus’ (Poucha 188)
TochB. perāk-	(a.) ‘faithful, trusting’ (DTochB. 395)
Sogd. pyr’k-	(a.) ‘believing’ (DTochB. 395)
OIr. hires-	(.) ‘Glaube’ (GOI 19, 69)

PIE √pitah-

Gr. πιθό-	(ao.) ‘(ver)trauen, sich verlassen (...)’ (GEW 2:487)
Gr. πειθο-	(ao.) ‘(ver)trauen, sich verlassen (...)’ (GEW 2:487)
Gr. πέποιθ-	(pf.) ‘(ver)trauen, sich verlassen (...)’ (GEW 2:487)
Gr. πιστό-	(a.) ‘treu, verlässlich, glaubwürdig’ (GEW 2:487) <sup>761</sup>

(d) Finally, a separate treatment must be presented for the stem

<sup>760</sup> The acute of Li. pánti- implies PIE \*pohanti-, suggesting PIE \*pehant- for the Greek.

<sup>761</sup> Yet another extension of the root (‘perfect in π’) appears in Gr. πέπεικ- (pf.tr.) ‘überreden, überzeugen’ (GEW 2:487, πέπεικα [1sg]).

Gr. παχύ- (a.) ‘dick, feist, wohlgenährt, dicht’ (GEW 2:484).

Since Grassmann (1863:121), the item has been directly compared to

RV. bahú- (a.) ‘dicht(gefüllt), viel, zahlreich’ (WbRV. 902).

Here Gr. α and RV. a assumedly reflect Neogr. \*ṇ, a syllabic nasal (cf. P. 127 \*bhengh-), structurally inferred from the root variant with nasal:

RV. bāñhiṣṭa- (sup.) ‘der festeste, dichteste, sehr dicht’ (WbRV. 897)

Ḥi. bangu- (a.) ‘gesamt, vereint, allgemein’ (HHand. 118)

The problem of the traditional reconstruction is twofold. First, the items

Ḥi. bagau- (c.) ‘multitude, the people, assembly, etc.’ (CHD P:88f.)

RV. baháv- (a.) ‘viel, reichlich, zahlreich’ (WbRV. 902, baháve [D])

imply PIE \*o for the root without nasal. Secondly, the comparative of Gr. παχύ-

Gr. πάσσων (comp.a.) ‘dicker’ (GEW 2:484, πάσσονα [sgA])

lacks initial aspiration, proving that Gr. π- is not identical with RV. bh- (the converse of Grassmann’s Law). This which leaves PIE \*peahǵh as the sole reconstructive possibility for Greek, therefore standing in schwebeablaut relation to

Neogr. \*bhoǵhou- ≡ Ḥi. bagau- = RV. baháv-.

§5. Sanskrit and Greek preserve a handful of forms with two successive aspirates, and thus are true exceptions to Grassmann’s Law.<sup>762</sup> These remnants can be understood as a direct confirmation of the original existence of two-aspirated roots, illustrated here by:

Neogr. \*steigh- (P. 1017-1018)

Gr. σίχ- (f.) ‘Glie(d)er, Reihe(n)’ (GEW 2:783, σιχός, σιχές)

OInd. ati-ṣṭigh- (vb.) ‘überschreiten’ (EWA 2:761, atiṣṭigham [inf.])

Gr. στείχω (vb.) ‘marschieren, steigen, ziehen’ (GEW 2:783)

With this data, Greek and Sanskrit are the only languages preserving the distinction between Neogr. \*t and \*th after \*s. Furthermore, both can be seen to have been affected by Grassmann’s Law (i.e. the traditional reconstruction is ambiguous). In addition to Neogr. \*steigh-, also Neogr. \*stheigh- is possible. The latter is actually confirmed by the initial aspirate of the stem:

OInd. ati-ṣṭhīg- (vb.) ‘überschreiten’ (Hiersche 1964:46).

This form (and those similar to it) with two successive aspirates apparently dates back to a form of language preceding Grassmann’s Law (or to a dialect that avoided it) without challenging the law as a whole.

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<sup>762</sup> Thus, for instance, Gr. θυφλός ‘blind’ contains PGr. \*Th—Th. For this and some other examples in Greek, see Mayrhofer (1986:115), including literature.

§6. For the incompatibility of the glottalic hypothesis and Grassmann's Law, see the discussion and literature presented by Collinge (1985:263-4).

#### 4.6.5 Bartholomae's Law and its generalization

§0. The internal analysis of the participle type OInd. labdha- was understood already by the Sanskrit grammarians, but Bartholomae's demonstration of a similar development in Gāthā-Avestan gave the sound change the status of an Indo-Iranian sound law.<sup>763</sup> Though the sound law itself is flawless, Miller's remarks claiming a connection between Bartholomae's Law and Meillet's root constraint deserve closer attention. With a careful analysis of both, it is possible to formulate a generalized version of Bartholomae's Law (II) that applies to all cognates simultaneously.

§1. According to Bartholomae's Law of aspirates in Sanskrit and in Gāthā-Avestan,<sup>764</sup>

“[...] wenn in der wortbildung oder – flexion ein tönender aspirirter mit einem tonlosen geräuschlaut zusammentrifft, so wird letzterer tönend und unternimmt des ersten aspiration.”

In terms of attempts to generalize the development of Bartholomae's Law (formally DfT → DfD → DDf)<sup>765</sup> for the rest of the Indo-European languages, it suffices to quote Szemerényi (1996:102), who still correctly writes, “There are no convincing examples outside Aryan.”<sup>766</sup>

§2. The most noteworthy issues related to Bartholomae's Law are listed below.<sup>767</sup>

(a) As correctly mentioned by Bartholomae, the sound change underlying the law (DfT) consists of two parts:

1. The contamination (or progressive assimilation) of voice from DfT to DfD.
2. The progressive transfer of aspiration from DfD to DDf.<sup>768</sup>

(b) The transfer of laryngeal also took place in voiceless aspirates (from ThT to TTh in Sanskrit), but not in Iranian due to fricativization.

(c) By accounting for the lost unaccented PIE \*a, the full development of Bartholomae's Law can be written as follows:

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<sup>763</sup> For example, Grassmann (1863:119) contrasted Sanskrit with Greek: “skt. lab-dhás aus labh+ta-s, griech. γραπτό-ς aus γραφ+το-ς [...]”

<sup>764</sup> For the law, see Bartholomae (1882, 1883:48, §124, 1885:206) and Collinge 1985:7.

<sup>765</sup> See Miller (1977a:365): “When Bartholomae published his famous article in 1885, Indo-European scholars immediately set out to find more examples from other IE languages, among them Germanic (cf. Brugmann 1897:1.625).”

<sup>766</sup> For various attempts to generalize Bartholomae's Law (e.g. Bennett 1966), see Collinge (1985:7-11).

<sup>767</sup> Thus, against Ejerhed's (1981:146) suggestion, Bartholomae's Law involves more than just a movement of /h/. See Collinge (1985:9).

<sup>768</sup> See Collinge's (1985:264) interesting analysis: “[...] we could put together the Indian phoneticians' analysis of /dh/ etc. as having ‘voice plus breath’ and their concept of abhinidhāna (non-release of prior segments in clusters); for then [ddh] is just the outcome we expect (cf. Allen 1953:34-35, 71-72).”

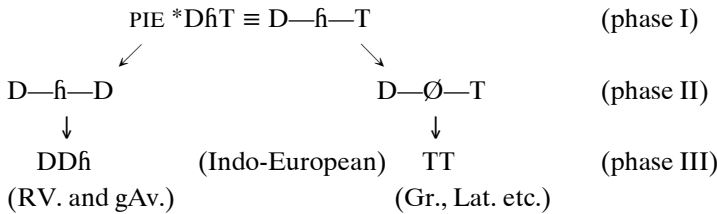
ThaT TahT → ThT → ThT → TTh  
 DfaT DafiT → DfiT → DfiD → DDfi

§3. Miller (1977a) interprets Bartholomae's Law as a special case of Meillet's root constraint. The correctness of this view can be seen in the context of a general formulation of Bartholomae's Law for all cognates. Thus, if the starting point of Bartholomae's Law (DfiT) is written in a root constraint form (D—fi—T), there are two outcomes in the Indo-European languages:

(a) D—fi—T → D—fi—D. With the transfer of the aspirate (→ D—D—fi), this reflects the classical formulation of Bartholomae's Law for Sanskrit and Gāthā-Avestan (e.g. in OInd. lubdha- (pt.) 'gierig, habsüchtig' (KEWA 3:107)).

(b) D—fi—T → D—∅—T. With the loss of the voiced aspirate, this reflects the typical outcome of the starting point of Bartholomae's Law in the rest of the group (→ T—∅—T) (e.g. Gr. λυπά- (pf.pt.) 'ἐταίρα, πόρνη' (GEW 2:146)).

Being thus, the developments (a) and (b) can be combined into a single formulation, Bartholomae's Law II, that unites all branches in a single development, as indicated in the table below:



Bartholomae's Law can be understood as the counterpart of the root constraint for Dfi—T, owing to the identity of the patterns before the transfer of the aspiration:

PIE *Dfi—T	→	Dfi—D	v	D—T	(root constraint)
PIE *Dfi—T	→	Dfi—D (DDfi)	v	D—T	(Bartholomae's Law)

§4. In contrast to Miller's valuable ideas, the glottalic theory is incompatible with Bartholomae's Law (Collinge 1985:263-264). The assumed free variation of Neogr. \*Dh ≡ \*D<sup>(h)</sup> : D results in reconstructive chaos as the comparatively inferred aspiration is left without any proper prototype (see Gamkrelidze and Ivanov 1995 passim).

## 4.7 Summary of the Decem-Taihun isogloss

### 4.7.1 Summary of the series T : Th : D : Dfi in System PIE

§0. The absence of the segmental laryngeal PIE \*h in the Neogrammarian system and the failure of its phonetic interpretation (≡ PIE \*h/fi) in the laryngeal theory did not support a solution in any of the historical theories of the problem of the four plosive series T : Th : D : Dfi. With the interpretation of the cover symbol PIE \*h ≡ PIE \*h/fi,

the origin of the series T : Th : D : D $\acute{h}$  can be inferred based on the comparative method.

§1. The Proto-Indo-European plosives \*k ≠ \*p ≠ \*t occupied the velar, labial and dental places of articulation. PIE \*h, the voiceless allophone of the cover symbol PIE \* $\acute{h}$ , had no effect on the voice of the plosives PIE \*k \*p \*t.

§2. From the series \*k p t, the series tenues aspiratae Th ≡ Neogr. \*kh ph th emerged when followed by diphonemic PIE \*ah and PIE \*ha:

PIE \*kah \*kha      PIE \*pah \*pha      PIE \*tah \*tha.

Though the series Neogr. Th is segmentally analyzable, it also has comparative content since correspondences with Th are actually attested in the Indo-European languages.

§3. PIE \* $\acute{h}$ , the voiced allophone of the cover symbol PIE \* $\acute{h}$ , yielded the series (unaspirated) mediae D ≡ PIE \*g b d from PIE \*k p t in the environments indicated in:

PIE \* $\acute{h}$ —g \*g— $\acute{h}$       PIE \* $\acute{h}$ —b \*b— $\acute{h}$       PIE \* $\acute{h}$ —d \*d— $\acute{h}$ .

Though the series D, appearing only in  $\acute{h}$ —D and D— $\acute{h}$ , is strictly speaking also secondary, the conditions for the alternation PIE \*h :  $\acute{h}$  remain to be identified. Accordingly, the traditional notation PIE \*g b d remains meaningful, not least because it is the one attested in Indo-European.

§4. The series mediae aspiratae D $\acute{h}$  ≡ Neogr. \*gh bh dh emerged from the series PIE \*k p t (and PIE \*g b d) when followed by diphonemic PIE \*a $\acute{h}$  ha:

PIE \*ga $\acute{h}$  \*g $\acute{h}$ a      PIE \*ba $\acute{h}$  \*b $\acute{h}$ a      PIE \*da $\acute{h}$  \*d $\acute{h}$ a.

§5. Taken together, the sole items required for the reconstruction of the Neogrammarian four-term plosive system T : Th : D : D $\acute{h}$  are the unaspirated series PIE \*k p t and diphonemic PIE \* $\acute{h}$ a a $\acute{h}$  with voiceless (PIE \*h) and voiced (PIE \* $\acute{h}$ ) values of the laryngeal, as summarized below:

Neogr. *k p t	PIE	*k	*p	*t
Neogr. *kh ph th	PIE	*kah *kha	*pah *pha	*tah *tha
Neogr. *g b d	PIE	* $\acute{h}$ —k * $\acute{k}$ — $\acute{h}$	* $\acute{h}$ —p * $\acute{p}$ — $\acute{h}$	* $\acute{h}$ —t * $\acute{t}$ — $\acute{h}$
Neogr. *gh bh dh	PIE	*ka $\acute{h}$ *k $\acute{h}$ a	*pa $\acute{h}$ *p $\acute{h}$ a	*ta $\acute{h}$ *t $\acute{h}$ a

In general, therefore, the problem of the four series T : Th : D : D $\acute{h}$  can be simplified to the emergence of the voiced PIE \* $\acute{h}$  from its voiceless counterpart PIE \*h.

Though the conditions of the alternation PIE \*h :  $\acute{h}$  remain unknown, the alternation is well documented. It is reflected in full variation T : Th : D : D $\acute{h}$ , for instance, in:

(a) The root h—T (in PIE \*meahsto-)

Gr. μαστός-	(m.) ‘Brustwarze’ (GEW 2:183, μαστός)
ModPers. māst-	(sb.) ‘saure Milch’ (P. 694)

(b) The root  $\text{h}—\text{D}$  (in PIE  $*\text{meah}_2\text{zd}o-$ )

Gr.  $\mu\alpha\sigma\delta\acute{o}$ - (m.) ‘Brustwarze’ (GEW 2:183,  $\mu\alpha\sigma\delta\acute{o}\varsigma$ )  
RV.  $\acute{m}\acute{e}d\acute{y}a-$  (pr4.) ‘fett werden’ (WbRV. 1042,  $\acute{m}\acute{e}d\acute{y}antu$  [3pl])

(c) The root  $\text{h}—\text{Th}$  (in PIE  $*\text{meah}_2\text{stah}-$ ) and/or  $\text{h}—\text{Dh}$  (in PIE  $*\text{meah}_2\text{zdah}_2-$ )

Gr.  $\mu\alpha\sigma\theta\acute{o}$ - (m.) ‘Brustwarze’ (GEW 2:183,  $\mu\alpha\sigma\theta\acute{o}\varsigma$ )<sup>769</sup>

Such variants are directly measurable, and it is possible that we will be capable of identifying the conditions for voicing of the laryngeal in the future.

§6. Finally, I would like to note that the segmental analysis of the four series should not be understood as suggesting that the early concepts ‘*tenues*’, ‘*tenues aspiratae*’, ‘*mediae*’ and ‘*mediae aspiratae*’ are erroneous or non-existent. The Indo-European material requires four series as outcomes of the earlier proto-forms. Owing to this comparative content, the four series will continue to have a key role in the postulation of correspondences.

#### 4.7.2 Evaluation of the Decem-Taihun theories

§0. Regarding the evaluation of the theoretical approaches to the Decem-Taihun isogloss, I would like to make the following concluding remarks.

§1. Owing to the absence of the Old Anatolian laryngeal ( $\text{H}i. \text{h}$ ), as well as its comparative interpretation as PIE  $*\text{h}/\text{h}$ , the Neogrammarians lacked the proper tools for solving the problem of the four series  $\text{T} : \text{Th} : \text{D} : \text{Dh}$ .

§2. The promising segmental start of Saussure (OInd.  $\text{th} = *t+$ ) was sidetracked by the multiplication of laryngeals  $\text{†E} \text{†A} \text{†O}$ , which misdirected the study from the properties of  $\text{H}i. \text{h}$  and its reconstruction PIE  $*\text{h} : *h$  to secondary deductions. After  $\text{H}i. \text{h}$  was interpreted as a single phoneme ( $\text{A} = \text{h}_2$ ), usually understood as a voiceless velar fricative, and the feature voice was associated by Kuryłowicz with  $\text{†O}$  ( $= \text{†h}_3$ ), it was no longer possible to conceive that the alternations of voice could be traced back to a single item PIE  $*\text{h}/\text{h}$  appearing in etymologically connected words.

§3. In terms of the glottalic theory, the problem does not lie in the sound laws, but Murphy’s Law, according to which “Everything that can go wrong, will go wrong”. By projecting an isomorphic alternative of an inconsistent theory, another inconsistent theory was produced. From a broader perspective, the critics such as Back (1979), who pointed out the loss of contact between the typological speculations and the data, and Dunkel (1981), who demanded that typology should follow reconstruction, are correct. In addition, the glottalic theory is disappointing for its lack of insight into the real phenomena underlying Meillet’s root constraints, the Proto-Indo-European

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<sup>769</sup> Another example of the alternation, but exclusively with a voiced laryngeal (PIE  $*\text{h}$ ) is preserved in  $*\text{tehang}_2\text{fu}-$  (OIr. *tenge*),  $*\text{dehang}_2\text{fu}-$  (Lat. *dingua*) and  $*\text{dhaeng}_2\text{fu}-$  (Osc. *fangua*), all with the identical meaning of ‘tongue’.



voice and aspiration. The outcome is reconstructive chaos, resulting from the loss of the relation between the reconstruction and the data.

§4. In contrast, the root constraint theory of Meillet and Magnusson, further developed by Miller, leads to a complete solution of the Decem-Taihun isogloss when strengthened with the segmental laryngeal PIE \*h : \*f. The earlier conjectures concerning the root constraint and Bartholomae's Law can be confirmed and complete regularity in the data ensues. Accordingly, this option will become the basis of coherent Indo-European reconstruction theories in the future.

## 4.8 *Centum-Satem isogloss or the three velar series*

### 4.8.1 General remarks on the Centum-Satem isogloss

§0. Three places of articulation for Proto-Indo-European velars were proven by the Neogrammarians: the plain velars \*k, etc. (Grundr<sup>2</sup> 1:569-586); the labiovelars \*k<sup>u</sup>, etc. (Grundr<sup>2</sup> 1:586-622); and the palatovelars \*k̂, etc. (Grundr<sup>2</sup> 1:542-569).<sup>770</sup> In the 20<sup>th</sup> century, progress was made in the study of the velar system by various researchers whose achievements are combined into a unified theory in this chapter.

§1. The reconstruction of the PIE velars begins with Schleicher, who postulated a single series (for example, see Mayrhofer 2004:43) for all three variants. However, as mentioned by Allen (1978:87), “Schleicher (1866:162ff.) [...] attempted, and inevitably failed, to formulate [Satem vs. Centum] ‘rules’ [...]”, and thus was forced to leave the development of the reconstruction to the Neogrammarians.

§2. There is a general agreement that the comprehensive solution to the Centum-Satem problem was finally presented by Bezenberger in his article, *Die indogermanischen Gutturalreihen* (1890:234-260).<sup>771</sup> Tischler credits Bezenberger not only for the formulation of the theory but for an adequate preliminary presentation of the material,<sup>772</sup> establishing the three series (the plain velars, the labiovelars and the palatovelars)<sup>773</sup> and distinguishing between the Centum and Satem languages.<sup>774</sup>

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<sup>770</sup> The PIE velars are also referred to as ‘gutturals’, ‘dorsals’ and ‘tectals’ (for terminology, see Szemerényi 1996:58). Though I favor the unambiguous term ‘tectal’, for reasons of research history it felt more natural here to use the conventional ‘labiovelars’ (instead of ‘labiotectals’ and so forth).

<sup>771</sup> See Allen (1978:89) and Tischler (1990:65-66), and note the contemporaneous contributions of Wharton, Bugge, Osthoff and von Bradke.

<sup>772</sup> Tischler (1990:65) writes: “Das Hauptverdienst kommt dabei zweifellos A. Bezenberger zu, der nicht nur die Theorie formuliert, sondern auch das einschlägige Material ausführlich diskutiert.”

<sup>773</sup> Bezenberger (1890:244) writes: “[...] es bestanden in der gemeinsamen grundlage aller ‘sprachen mit labialisierung’ neben der alten ç-reihe eine q- und eine k-reihe [...]”. For his own summary of the developments, see Bezenberger (1890:259).

<sup>774</sup> Bezenberger (1890:260) continues: “In den arischen sprachen, dem Litu-Slavischen, Phrygischen, Armenischen und Albanischen sind also die k- und die q-reihe, in den übrigen indogermanischen sprachen die ç- und die k-reihe zusammengefallen.”

§3. Bezzenberger's reconstruction was accepted by Brugmann, who postulated the classical system of twelve velars in the second edition of *Grundriss* (1897):

	T:	TA:	M:	MA:
pure velars	*k	*kh	*g	*gh
labiovelars	*k <sup>u</sup>	*k <sup>u</sup> h	*g <sup>u</sup>	*g <sup>u</sup> h
palatovelars	*k̂	*k̂h	*ĝ	*ĝh

§4. The subsequent developments of the velars in the Indo-European languages are well known, and it suffices to exemplify these with the voiceless unaspirated series:

	CLu.	OInd.	Av.	Li.	Arm.	Hi.	Gr.	Go.	OIr.	Lat.
	–	–	–	–	–	–	–	–	–	–
*k	k	k/c	k/č	k	k'/č	k	κ	h	c	c
*k <sup>u</sup>	ku	k/c	k/č	k	k'/č	ku	π/τ	h <sup>w</sup>	c	qu
*k̂	z <sup>775</sup>	ś	s	š	s	k	κ	h	c	c

The entire body of Indo-European material results from this array of proto-phonemes with two sets of sound laws (called the first and second palatalization).<sup>776</sup>

§5. The law of palatals (das Palatalgesetz)<sup>777</sup> or the second palatalization was “floating in the air”, thanks to conditions created by the reinvigorated study of the Proto-Indo-European vowel system initiated by the Neogrammarians.<sup>778</sup> According to this law, the plain velars and labiovelars Neogr. \*k, \*k<sup>u</sup>, etc. became affricates (RV. c, gAv. č, etc.) before front vowels Neogr. \*e, ē, etc. in languages belonging to its domain. The discovery would constitute a key part of the wider shift from the Paleogrammarian Sanskrito-centric paradigm to the Neogrammarian one. Historically, a number of authors (including Thomsen, Verner, Schmidt, Tegner, Saussure, and Collitz) claimed the authorship of the law.<sup>779</sup> For my sake, I agree with the contemporary testimony of Verner (apud Collinge 1985:135), according to whom the law was an overripe fruit. Accordingly, the question of *Prioritätsrecht* needs not concern us here.<sup>780</sup>

§6. The few irregularities of the second palatalization can be split into two categories: those lacking the expected palatalization and those with an unexpected one. Both are briefly sketched below.

<sup>775</sup> The affricate CLu. z corresponds to HLu. s in Luwian.

<sup>776</sup> In Tocharian, already recognized as a Centum language by Pedersen (1931:318), the four series and three rows collided together. The sole outcome, PToch. \*k, was subsequently preserved unless followed by a palatal.

<sup>777</sup> On the law of palatals, see Szemerényi (1967:68fn1).

<sup>778</sup> Already Benfey (1837:911) had preferred the Greek vowel system as more original. Certainly, Amelung's (1871) claim that /e/ and /a/ had merged in Skt. a could not have been without impact for the genesis of the law.

<sup>779</sup> On the disputed authorship and the ‘second palatalization’, see Szemerényi (1967:68, 1996:38n2) and Collinge with detailed discussion (1985:133-142).

<sup>780</sup> For an influential contemporary account of Palatalgesetz, see Osthoff 1886.

(a) Contrary to expectations, PIIr. \*ki, \*gi, \*ghi have been preserved in some examples.

1. Some apparent exceptions can be regularly treated with PIE \*á (= Neogr. \*ə) colliding with PIE \*i in Indo-Iranian, except for being neutral in the second palatalization. See, for example, OInd. kiṇa- = Lat. callo- from PIE \*káhlnō-.

2. In another class of counterexamples, PIE \*aḥ, ḥa + PIE \*i has neutralized the palatal in Sanskrit, but not in Avestan:

PIE \*Kaḥi, Khaī → OInd. ki, Av. či.

In both cases, the exceptions are regular and simultaneously provide an additional criterion for the reconstruction of PIE \*ḥa and PIE \*aḥ.

(b) An unexpected palatalization (OInd. c, etc.) occasionally appears in a non-palatalizing environment in Sanskrit. Some examples of this are OInd. cūrṇá- ‘feiner Staub, Mehl’ and OInd. yācñā- (f.) ‘Bitte’ with the apparent outcome of second palatalization before a non-front phoneme. To my knowledge, no explanation exists in the framework of established sound laws.

§7. The first palatalization of the palatovelars Neogr. \*k̂ kĥ ḡ ḡĥ was clarified by Bezenberger and von Bradke (1890:63f., 107f.),<sup>781</sup> with the latter coining the terms Centum and Satem (for a summary of developments, see Grundr<sup>2</sup> 1:542). According to Brugmann (Grundr<sup>2</sup> 1:543), the isogloss consists of the fact that:

“[...] schon in uridg. Zeit zwei Aussprachweisen der k̂-Laute nebeneinander standen, dass diese in einem Teile des uridg. Sprachgebietes als reine Verschlusslaute, in einem andern als Spiranten oder als Affricatae gesprochen wurden.”

§8. Direct support for the existence of three velar series in Proto-Indo-European has been pointed out on the basis of Albanian, Armenian and Anatolian.

(a) According to Pedersen, the three velar series have survived before front vowels in Albanian.<sup>782</sup> Pedersen’s proof, to quote Allen (1978:91), consists of a rule according to which:

“[...] in Albanian generally (as in the satem languages) \*k and k<sup>w</sup> merge as k, and \*k̂ > th [p]: but before a front vowel \*k<sup>w</sup> is apparently palatalized to give a fricative s, whereas \*k̂ here retains a plosive or affricate value as q [c(ç)].”

Pedersen’s suggestion (see Tischler 1990:73) was accepted by Brugmann (1904:157f.) and continues to be supported by Orel (2000:66), thus suggesting that the labiovelars did not completely merge with plain velars in Albanian, and thereby also pointing to three original series within the Satem group.

(b) Pisani (1950:165-193) suggests that three series have been preserved in Armenian in Arm. sirt (Li. širdì-): Arm. k’erem (Gr. κέρω), and Arm. č’ork’ ‘vier’.<sup>783</sup> The

<sup>781</sup> On von Bradke’s Centum-Satem isogloss, see Szemerényi (1996:59).

<sup>782</sup> Pedersen (1900:306) writes: “Besonders hervorzuheben ist aber, dass das Albanesische die einzige indogermanische sprache ist, welche alle drei gutturalreihen auseinanderhält.”

<sup>783</sup> For a wider set of Armenian examples, see Tischler (1990:77-78).

correctness of Pisani's conjecture can be proven, because especially in the series mediae aspiratae there is no other choice but to reconstruct Arm. g j j ← Neogr. \*gh gh g<sup>h</sup>.

(c) Most importantly, however, the three series are now synchronically preserved in Anatolian, especially in Luwian (both Cuneiform and Hieroglyphic) with oppositions k : ku : z, but also in Lycian (both A and B), and possibly in Lydian as well.

§9. Several researchers have claimed the existence of Satem languages in Anatolian: Thus, already according to Meriggi (1936:257f.) and Bonfante & Gelb (1944:169ff.) Lycian and Hieroglyphic Luvian are Satem languages.<sup>784</sup> These views, recently rigorously defended by Melchert (1989) and Tischler (1990), are based on reliable comparative evidence, including several well-known Indo-European roots:

(a) HLu. suani- 'dog' (see Melchert 1989:201- and Tischler 1990:83) is compared with root P. 632-3, including an identical \*i-extension in OPr. suni- (m.) 'Hund' (APrS. 441).

(b) HLu. surni- 'horn' (see Melchert 1989:201-2 and Tischler 1990:83-4) is identical with ORun. horna- (n.) 'horn', Go. haurnja- (vb.) 'blow a horn' (GoEtD. 180) and related forms, all with the palatovelar (P. 574-577).

(c) CLu. azua- 'Pferde', HLu. asua- 'horse' and Lyc. esbe 'id.' (see Melchert 1989:201-202 and Tischler 1990:83-4) belong to Lat. equo- 'horse', RV. ásva- 'id.', etc., one of the best-known palatovelar roots in existence (P. 301-2).

(d) CLu. zarpi- 'ein Übel das den Menschen befällt', H̱i. karpi- 'Groll, Wut, Zorn' (Tischler 1990:88). Though no cognates outside Old Anatolian have been identified, Tischler's comparison (HEG 1:515f.) is acceptable both formally and semantically.

(e) CLu. zarza 'liver' or 'heart' (?). Depending on the translation, we may compare either H̱i. karat- 'innards' (Melchert 1989:196-7), HLu. zarza 'heart', or both (Tischler HEG 1:499f., HHand. 73). Thus, at least the Hieroglyphic Luwian form matches with Indo-Iranian \* i-stem in:

RV. hárdi-	(n.) 'Herz, Eingeweide, Bauch' (WbRV. 1661, hárdi)
RV. hr̥di-śp̥ś-	(a.) 'das Herz berührend, erfreuend' (WbRV. 1679)
HLu. zarza-	(n.) 'heart' (CHLu. 10.20.11, za+ra/i-za)

(f) CLu. zia- 'lie, be placed' (Melchert 1989:195-6) and Lyc. siyeñi (Tischler 1990:85, 87) correspond with the well-known root P. 539f., including:

Pal. kei-	(vb.) 'liegen' (DPal. 59, ki-i-ta-ar [3sg])
H̱i. kei-	(vb.) 'liegen, gelegt sein' (HEG 1:568-9, ki-it-ta-ri [3sg])
LAv. say-	(aoM.) '(da)liegen' (AIWb. 1571, saēte [3sg])

(g) The figura etymologica HLu. uazana uazihana [1pl] 'request a request' (see Melchert 1989:198 and Tischler 1990:87) belongs to the root P. 1135 \*uek̥-

H̱i. uek-	(vb1.) 'wünschen, erbitten, verlangen' (HHand. 200)
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<sup>784</sup> On the research history of Satem elements in Anatolian, see Gusmani (1969:281ff.) and Melchert 1989.

RV. vás- (pr2.) ‘wünschen, verlangen, wollen’ (WbRV. 1226-7)  
 Gr. φερόντ- (ao.pt.) ‘freiwillig’ (GEW 1:479, Locr. φερόν [sgN])

(h) HLu. uaza- (vb.) ‘carry, drive, transport (by chariot)’ (CHLu. 2.11.7, PES<sub>2</sub>(-)w<sup>a</sup>/i-za-ha [1sg]) can be compared to the root \*ueǵh- (P. 1118-20), including the items:

Pamph. φέχο- (vb1.) ‘hintragen, darbringen’ (GEW 2:604)  
 RV. váha- (prA.) ‘fahren, herbeifahren, bringen’ (WbRV. 1240)

(i) Hī. karauar ‘Horn’ = CLu. zarwani ‘id.’ is compared by Tischler (1990:84,88) to the items belonging to the root PIE \*krou- ‘Horn’

LAv. srav- (sb.) ‘Horn’ (AIWb. 1647, sravō [plA])  
 Gr. δί·ρο(φ)ο- (a.) ‘forked, cloven’ (LSJ. 430)  
 TochA. kroñše (sb.) ‘apis’ (Poucha 92)  
 TochA. krorr- (sb.) ‘lunae falx’ (Poucha 93, krorr)  
 OGaul. su·crōraripin- (PN.) ‘good·horn·(?)’ (ACSS. 2:1654)

(j) Lyc. sāta ‘hundert’ (for the meaning, see Tischler 1990:85) is connected to:

LAv. θρι·sant- (f.) ‘dreissig’ (AIWb. 810, θρισάσχα [sgN])  
 Lat. cento- (n.sg.) ‘hundert’ (WH 1:200-1, centum [sgNA])  
 TochB. kante- (num.) ‘centum’ (MA. 405, DTochB. 139)  
 Gr. τριά·κοντα- (num.) ‘dreissig’ (LSJ. 1815, Schwyzer, GrGr. 1:592)  
 Gr. ἴκαντι- (num.) ‘20’ (Schwyzer, GrGr. 1:591, ἴκαντι)

(k) Lyc. sidi ‘Ehemann’: CLu. ziti- ‘Mann’ with Lyc. s = CLu. z can imply PIE \*k̑ in a formation belonging to the root P. \*k̑ei- ‘liegen’ (see Tischler 1990:85fn91), though in the absence of a direct parallel the semantics remains uncertain.

(l) CLu. za- (dem.pr.): HLu. za- : Hī. ka- ‘this’ and CLu. zi- (dem.pr.): HLu. zi- : Hī. ki- ‘this’ (Tischler 1990:87) are related to the Indo-European demonstratives, such as Li. šī- ‘dieser’ (P. 609-10) and/or Lat. ho- ‘dieser’, etc.

§10. Evidence for the Anatolian Satem languages is gaining more substantiation with the progress of comparison, and I would like to contribute to the effort with some additional comparisons:

(a) CLu. zaršia- ‘Geleitbrief’, already compared to Hī. karši- ‘gut, richtig, zutreffend’ by Tischler (1990:88), can be further compared to:

TochA. kärs- (prA.) ‘scire’ (Poucha 70, kärsiñc [optA])  
 TochA. šärs- (pretA.) ‘scire’ (Poucha 70, šärsā)  
 TochB. karsa- (prA.) = Skt. ājñātam (DTochB. 166, karsatsi [inf.])

(b) HLu. ašaza- ‘speak’ (cf. Melchert 1989:198-9, Tischler 1990:87)<sup>785</sup> reveals a voiced and aspirated palatovelar Neogr. \*seǵh-, \*soǵh-, based on Germanic and Iranian cognates (cf. P. 897f.):

<sup>785</sup> CLu. a-a-aš-ša- ‘Mund’ belongs with Hī. aieš- (n.) ‘Mund’ (Obl. iš-). Both roots had an original PIE \*i (cf. Lat. pe·ierā-), which is therefore to be distinguished from HLu. ašaza- (vb.) ‘sprechen’.

Fär. siga-	(vb.) ‘sagen, mitteilen’ (ANetWb. 459)
HLu. a šaza-	(vb.) ‘speak’ (Melchert 1989:198-9, Tischler 1990:87)
OIcl. saga-	(f.) ‘Erzählung, Bericht, Saga’ (ANetWb. 459)
OPers. hazāna-	(sb.) ‘tongue’ (OldP. 214-5, hazānam [sgA])
OIcl. segja-	(vb.) ‘sagen, mitteilen’ (ANetWb. 467, segjan [inf.])

(c) HLu. zašali- (a.) ‘angry’ (see Melchert 1989:199, HLu. IRA(-)za-sa-li-sà) can be compared to a Slavonic formation without etymology:

OCS. u žasū-	(m.) ‘Furcht, Schrecken’ (Sadnik 1155)
OCS. u žasa-	(vb.) ‘erschrecken, verwirren’ (Sadnik 1155)
OCS. prě žasa-	(vb.) ‘bestürzt machen, erschrecken’ (Sadnik 1155)

Both formations have a regular derivation: OCS. žasū- ← PSlav. \*zjaso- ← Neogr. \*ǵhēso-, and HLu. zašali- ← Neogr. \*ǵhōs-ōli.<sup>786</sup>

(d) CLu. zaria- (a.) ‘stürmisch’ (HEG 1:509, za-ar-ri-ia-an-za ID<sup>MES</sup>-an-za [pLA]) has been compared to Hī. garit- ‘flood’ already by Tischler (HEG K:281; see also Melchert 1989:190). A further connection with the Balto-Slavonic formation

Li. ēžera-	(m.) ‘See’ (LiEtWb. 125)
OCS. jezerū-	(m.) ‘See’ (LiEtWb. 125)
Li. āžera-	(m.) ‘See’ (LiEtWb. 125)
Rus. ózero	(n.) ‘See’ (APrS. 304)
OPr. asara-	(n.) ‘See’ (APrS. 304, assaran)

is possible, because a prothetic prefix PIE \*e · \*o · can be postulated for the items.

§11. Melchert (1989:204) summarizes the situation of Old Anatolian reflexes of velars as follows:

“It is obvious that by the strict tenets of the comparative method Luvian requires reconstructing three sets of velars [= k : ku : z] for PIE, supporting evidence from Albanian and Armenian [...].”

Melchert’s view is supported by Mayrhofer and others,<sup>787</sup> and as the results coincide with the classical (Neogrammarian) theory,<sup>788</sup> this is the most suitable starting point in explaining the facts (see Tischler).<sup>789</sup>

§12. Despite the actual existence of three velar series, doubts have been cast on every one of the trio Neogr. \*k k<sup>h</sup> k̂,<sup>790</sup> and the respective eliminations attempted through

<sup>786</sup> For OCS. ž from PSlav. \*zj, cf. OCS. župīlu- (m.) ‘Schwefel’ and OCS. župelū ‘id.’ and their respective \*e/o-grades OCS. zjupīlū ‘id.’ and OCS. župelū ‘id.’ (Sadnik √1179), etc.

<sup>787</sup> See Mayrhofer (1989 [Lg. 65]:138): “I would prefer this hypothesis of three reflexes from three PIE dorsals (see Mayrhofer 1986:105f., and the references there.)” Thus the rejection of Satem forms (1<sup>st</sup> palatalization) in Anatolian (see Szemerényi 1996:148) cannot be sustained.

<sup>788</sup> For the classical model and its wide support, see Tischler (1990:67-69 & fn24-25).

<sup>789</sup> Tischler (1990:93): “Das ‘klassische’ Verschlusslautmodell mit seinem Ansatz von drei grundsprachlichen Gutturalreihen – Velare, Palatale und Labiovelare – ist am besten zur Erklärung der belegten Fakten geeignet.”

<sup>790</sup> Thus, for example, Hirt (1906: 388) denies the three series in Albanian.

all possible distributions (PIE \*k k<sup>h</sup>, PIE \*k k̂, and PIE \*k̂, k<sup>h</sup>).<sup>791</sup> I offer a brief survey of each attempt in connection with the respective velar, though I readily agree with Cavoto (2001:50-51):

“[...] we should be clear that nobody has been able to devise a system, based on two phonemic realization of each series, complete with rules determining the phonetic realization of each series in every context, that would account for all the data.”

§13. Ever since Laroche’s preliminary remarks (1954:123 & 1963:77ff.), a possible loss of velars in Luwian has occasionally been mentioned.<sup>792</sup> Today the improved level of the material allows us to settle the matter once and for all, as the alleged lost velars can be compared to Indo-European forms also lacking velars. A brief survey of the alleged loss of velars includes:

(a) CLu. išari- ‘Hand’ (DLL. 52-3, Lyc. izre ‘Hand’, BLYk 1:71) has been compared to Hĭ. gešar- (<sup>UZU</sup>c.) ‘Hand’ (HEG 1:558f., HHand. 78, 80, ki-eš-šar [N]). The etymology has to be abandoned, because Lyc. z does not permit PIE \*s, which in turn is certain in Hĭ. gešar (cf. Gr. χεῖρ ‘Hand’, etc., P. 447).<sup>793</sup> Furthermore, PIE \*i- is possible for Lycian and Luwian, which we may compare to OIcl. iðja- ‘do’ = HLu. izia- ‘do, make’ within the framework of the established sound laws.

(b) CLu. imaraši- (a.) ‘of field’ (DLL 52-53) has been compared with Hĭ. gimara- ‘open field’ (Li. žėmė, P. 414-6). However, this does not prove a loss of velar because Luwian may be compared with Lat. ĩmo- (sup.) ‘der unterste’ (WH 1:685-6), Lat. ĩmitus (adv.) ‘aus dem Grunde’, which also is without velar.<sup>794</sup>

(c) CLu. paraia- (a.) ‘high’ (DLL. 78, p̄ar-ra-ia-an-za [plA]) has been compared to Hĭ. parga- (a.) ‘high, lofty, tall, elevated’. A loss of velar in Luwian remains unproven, because it is also absent in the Celtic \*i-extension, similar to Luwian:

OGaul. βq̄ia- (f.) ‘Berg’ (ACSS. 1:530)  
 OGaul. sado·bria- (f.) ‘cf. sodo·brigā’ (ACSS. 2:1283, sadobria [sgN])

Thus, a root with alternative extensions is attested instead of a single item.

(d) CLu. deiami- ‘earth’ (DLL 97, ti-ia-am-mi-iš [sgN]) has been compared to Hĭ. degan (HEG 3:292-300). However, we may connect Luwian with Alb. dhe- (m.f.n.) ‘earth, land’ (AlbEtD. 80), where the loss of velar is impossible:

PIE \*dañoio- → Alb. dhe- (m.f.n.) ‘earth, land’  
 PIE \*dafeio·mi- → CLu. deiami- (c.) ‘earth’

<sup>791</sup> The erroneous motivation for the elimination is summarized by Allen (1978:91): “The absence of more than two reflexes in any one languages is expressly cited as one objection to the triadic reconstruction by Burrow (1955:75) and Kuryłowicz (1956:356; 1973:64).”

<sup>792</sup> For a summary discussion and the suggested restriction of the loss allegedly applying to the voiced velars PIE \*g(h) \*ĝ(h), see Melchert (1989:184-187).

<sup>793</sup> Cf. Lyc. z = Hĭ. z in Lyc. hrzzi- ‘upper’ : Hĭ. šarazia- ‘id’ from PIE \*dahj- or \*dhaj-.

<sup>794</sup> Note also that in Li. lyd·ĭma- (m.) ‘Rodeland’ (LiEtWb. 364), Li. √lyd- ‘Rode’ appears with a suffix Li. ĭma- ‘Land’.

(e) CLu. maia- (a.) ‘groß, viel, zahlreich’ (HEG 2:92, ma-ia-aš [sgN]) has been compared with H̥i. megi- ‘gross’ (cf. RV. mahi-). This conclusion is not obligatory, because a parallel extension appears in RV. nabhas māya- (a.) ‘wasserreich’ (WbRV. 709). This is compatible with the fact that the shortest form of the root has no extension at all:

PIE √mo- ‘viel; wachsen’

HLu. ma-	(a.) ‘viel’ (HEG 2:181, ma-pa-wa/i ‘und viel’)
H̥i. ma-	(vb2A.) ‘wachsen, gedeihen, reifen’ (HEG 2:91, 166)

(f) H̥i. egu- agu- ‘trinken’ (Lat. ēbrio- ‘trunken’, Gr. νήφω) has been compared with CLu. u- ‘trinken’.<sup>795</sup> This is uncertain due to the possible connection of Luwian and the formation illustrated here:

H̥i. uet-	(.) ‘Wasser’ (HHand. 203, uiti [L])
H̥i. uatar-	(n.) ‘Wasser’ (HHand. 199)
Pal. uatan-	(n.) ‘Wasser’ (DPal. 79, ua-at-ta-na [sgDL])

(g) Finally, against the assumption of the loss of velars in Luwian, one should note that the velars are preserved in Luwian. Accordingly, the loss would violate the principle of the regularity of sound change.<sup>796</sup>

#### 4.8.2 The plain velars Neogr. \*k kh g gh

§0. The plain velar series (Neogr. \*k kh g gh, Grundr<sup>2</sup> 1:569-586) has already been discussed in connection with other plosives. The series is analyzable like dentals and labials, and a few remarks concerning the series as a system will be made below.

§1. Neogr. \*k is attested in examples such as:

(a) PIE \*kehak-, \*kohak- ‘verhöhnern’ (P. 634 \*kāk-)

OHG. huohō-	(vb.) ‘Spott, Hohn’ (GEW 1:837)
Gr. κηκᾶδ-	(a.) ‘schmächtend, höhrend’ (GEW 1:837)
Gr. κηκᾶζω	(vb.) ‘verhöhnern, schmähen’ (GEW 1:837)

(b) PIE \*keahl-, \*koahl- ‘call’ (P. 548-550)

Lat. calā-	(pr1.) ‘aus-, zusammenrufen’ (WH 1:141)
OInd. kala-	(vb.) ‘to sound, to count’ (MonWil. 260)
Aiol. κᾶλη-	(pr.) ‘(herbei)rufen, nennen’ (P. 548-550)

(c) PIE \*keahn-, \*koahn- ‘schlagen, töten, graben, usw.’ (P. 559 + 634)

OPers. ni ·kan-	(ao.) ‘destroy, obliterate’ (OldP. 178, ni ·ka <sup>n</sup> tu [3sg])
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<sup>795</sup> Note that Tischler provides an ambiguous stem CLu. uti- (sb.) ‘Trank’ or (vb.) ‘trinken’ (HHand. 189, utiš [sgN] or [2pers]).

<sup>796</sup> Cf. HLu. uaza- : Lat. Uehō, etc. See also Melchert (1989:186): “[...] the conditioning for velar loss in Luwian is not yet entirely clear [...]”



LAv. kana-	(pr.) ‘(ein, ver)graben’ (AIWb. 437-8, kanənti [3pl.])
Gr. κανο-	(ao.) ‘töten’ (GEW 1:755, κανεῖν)
Gr. κᾶνω	(pr.) ‘töten’ (GEW 1:755)
Gr. κέκον-	(pf.) ‘töten’ (GEW 1:755, κέκονα)
LAv. vī-kānaya-	(cs.) ‘zerstören, abtragen’ (AIWb. 437-8, vīkānayāt)

§2. Neogr. \*kh (for Brugmann’s examples, see Grundr<sup>2</sup> 1:571) is attested in:

(a) PIE \*khaek(h)-, khoak(h) ‘lachen’ (P. 634)

OInd. cakākh-	(pf.) ‘lachen’ (KEWA 1:136, cakākha)
Lat. cac·hinnā-	(vb1.) ‘hell auflachen’ (WH 1:126, cachinnō)
Gr. κᾶχάζω	(vb.) ‘laut lachen’ (GEW 1:804)
Arm. xaxan-	(sb.) ‘lautes Gelächter’ (ArmGr. 1:455, xaxank’ [pl])

(b) PIE \*kahel-, \*kahol- [not attested/identified, see below]

(c) PIE \*kahlen-, \*kahon- ‘graben’ (P. 634fn & 554 \*ken-)

RV. khāna-	(pr.) ‘graben’ (KEWA 1:301, WbRV. 372, khānāmi)
LAv. xānya-	(a.) ‘fontanus’ (AIWb. 532)
RV. khanitār-	(m.) ‘der Gräber (der Pflanzen ausgräbt)’ (WbRV. 372)

§3. Neogr. \*g (for Brugmann’s examples, see Grundr<sup>2</sup> 1:571) is attested in:

(a) PIE \*geafil-, \*goafil- ‘stimme, usw.’ (P. 350-351 [2. gal-])

OIr. gol-	(m.) ‘weeping, wailing’ (DIL. 367)
OCS. glagola-	(vb.) ‘reden, sprechen’ (Sadnik 217)
RV. gāgara-	(m.) ‘Laute, Harfe’ (WbRV. 387)
Lat. gallo-	(m.) ‘Hahn’ (WH 1:580)
MidIr. gall-	(m.) ‘Hahn, Schwan’ (DIL. 356)
OIcl. kall-	(n.) ‘Ruf, Name’ (ANetWb. 298)

(b) PIE \*gehag-, \*gofiag- ‘lachen’ (P. 634)

OHG. chachazze-	(vb.) ‘laut lachen’ (ASaxD. 147)
Dhātup. gāggha-	(vb.) ‘lachen : laugh’ (KEWA 1:313)
ModHG. kicher-	(vb.) ‘kichern’ (Kluge 1975:368)
OEng. ceahheta-	(vb.) ‘laugh loud’ (ASaxD. 147)

(c) PIE \*geafin-, \*goafin- ‘destroy, etc.’ (P. –)

Gr. ἐν γανᾶ-	(vb.) Hes. ‘ἐγγανᾶται · διέφθαρχται’ (LSJ. 467)
Gr. ἐν γήναλοι	(m.pl.) Hes. = ‘ὑπογράμματοι’ (LSJ. 467)

§4. Neogr. \*gh (for Brugmann’s examples, see Grundr<sup>2</sup> 1:571) is attested in:

(a) PIE \*ghaegggha- ‘lachen’ (P. 637)

OInd. ghāggha-	(vb.) ‘lachen’ (KEWA 1:355, ghagghati [3sg])
Gr. κᾶκχάζω	(pr.) ‘laut lachen’ (GEW 1:804)

(b) PIE \*gafiel- \*gafhol- (P. 428f. ghel-, HEG 1:465f.)

OIcl. gala-	(pret.) ‘schreien, singen’ (ANetWb. 153, gala [inf.])
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Syrac. κῖ χήλα-	(f.) ‘Drossel’ (GEW 1:862)
Gr. χελιδών	(a.) ‘Schwalbe’ (GEW 2:1084)
Ĥi. gališ-	(vb1.) ‘rufen, schreien, anlocken’ (HHand. 70)

(c) \*gafn ·Σ- ‘nagen’ (P. 436. ghen-)

OIcl. gnaga-	(vb.) ‘nagen’ (ANetWb. 177)
OEng. gnaga-	(vb.) ‘gnaw, bite’ (ASaxD. 482, gnagan)
Gr. γνίω	(vb.) ‘abnagen’ (GEW 2:1106)
LAv. aiwi.γnixta-	(pp.) ‘angenagt, angefressen’ (AIWb. 89)

§5. Etymologically, the data of the rows (a), (b) and (c) of §1- §4 belong together, forming the variation T : Th : D : Dñ in a manner expressed in the summary table:

(a)	CeaḥC:	CaḥeC:
PIE *h :	PIE *kehak- (P. 634)	PIE *khaek(ha)- (P. 634)
PIE *ñ :	PIE *gehag- (P. 634)	PIE *gñaeg(gña)- (P. 637)
(b)	CeaḥC:	CaḥeC:
PIE *h :	PIE *keahl- (P. 548)	[not attested (?)]
PIE *ñ :	PIE *geafil- (P. 350)	PIE *gafiel- (P. 428f.)
(c)	CeaḥC:	CaḥeC:
PIE *h :	PIE *keahn- (P. 559)	PIE *kahen- (P. 634)
PIE *ñ :	PIE *geafn- (P. –, Gr. γαν)	PIE *gaf(e)n- (P. 436)

§6. The attempt to eliminate the plain velar series can be traced back to an early distributional idea of Meillet (1894a:278), according to whom:

“l’existence de k<sub>3</sub> [= \*k] n’est supposée que pour expliquer la correspondance αβ [= Satem k : Centum k]. Si l’on réussit à rendre compte de αβ [Satem k : Centum k] par des lois de détail, l’unique raison qui fait poser k<sub>3</sub> [\*k], s’évanouit.”

Meillet (1937:93-94) referred to the (alleged) relative rarity of the series \*k, and claimed a distribution according to which the plain velar series occurs mostly before \*a and \*r and after \*s, and at the end of root (particularly after \*u, but not before \*l).<sup>797</sup> If such distribution existed, Neogr. \*k and \*k̂ could be understood as allophones of a single phoneme, and the PIE velar system would consist only of \*k̂ and k<sup>u</sup>.<sup>798</sup>

§7. Steensland (1973) attempted to demonstrate statistically that pure velars appear in Meillet’s complementary distribution, but the reality is different. Actually Neogr.

<sup>797</sup> On Meillet’s suggestion for k̂ : k<sup>u</sup>, see 1894. See also Meillet (1937:91-5), Tischler (1990:69), Miller (1976:47), Allen (1978:96) and Shields (1981:210).

<sup>798</sup> More recently, Kortlandt (1978:237) has claimed that a typological parallel for the system k̂ k<sup>u</sup> (without k) appears “in the Caucasus (Circassian, Ubykh) and on the Canadian Pacific Coast (Kwakiutl, Heiltsuk).”

\*k̂ appears in a position where we would expect \*k, were Meillet's condition to be true. A few counterexamples involving well-attested correspondences suffice here:

(a) PIE \*k̂rahd- 'glauben' (P. 580)

Lat. crēdo-	(pr.) 'vertrauen, usw.' (WH 1:286, crēdō [1sg])
RV. a-śraddhá-	(a.) 'ungläubig' (WbRV. 139)
OIr. creti-	(vb.) 'glauben' (LEIA C-228, cretim [1sg])

(b) PIE \*k̂ahd- 'fall' (P. 516)

OInd. śaśād-	(pf.) 'ausfallen, abfallen' (EWA 2:607, śaśāda)
Lat. cecad-	(pf.) 'fallen' (WH 1:127)
Lat. cadō	(pr3.) '(ab-, aus-)fallen, sinken' (WH 1:128)
AV. śatsyá-	(fut.) 'abfallen, ausfallen werden' (EWA 2:607)
OIr. casar	(f.) 'Hagel, Blitz' (LEIA C-46)

No real distribution is achieved through Meillet's condition as result of which the assumption – leading to numerous inconsistencies – is not helpful.

§8. The existence of a prefix PIE \*k(o)- (or several such items) is possible. The usual candidates, quoted here from Szemerényi (1996:95-6), are:

(a) The root \*kost- (P. 616), including OCS. kostī (f.) 'Knochen, Bein' (Sadnik 368) and Lat. costa (f.) 'Rippe' (WH 1:281), can be compared with Hī. ḥaštai- 'bone', etc. with a prefix PIE \*ko-hast- (cf. Lat. co-, OIr. co-, etc.).

(b) The root \*koḡo- (P. 517-8), including OCS. koza- (f.) 'Ziege' (Sadnik 377), Alb. kedh- 'kid' (IE&IE 501, keth, kedhi) and Go. hakul- (m.) 'Mantel' (GoEtDi. 173), has been compared to RV. ajá- (m.) 'Ziegenbock' (WbRV. 19), Li. ožỹ- (f.) 'Ziegenbock' (P. 6-7) with the prefix PIE \*ko-.

(c) To these I would like to add a possible comparison of two otherwise isolated forms:

LAv. ka mərəða-	(n.) 'Kopf' (AIWb. 440) <sup>799</sup>
Gr. κ μέλεθοο-	(n.pl.) 'Stubendecke, Balken' (GEW 1:879) <sup>800</sup>

#### 4.8.3 The labiovelars Neogr. \*k<sup>u</sup> \*k<sup>uh</sup> \*g<sup>u</sup> \*g<sup>uh</sup>

§0. The research situation of the labiovelars Neogr. \*k<sup>u</sup> \*k<sup>uh</sup> \*g<sup>u</sup> \*g<sup>uh</sup> (Grundr<sup>2</sup> 1:586-622)<sup>801</sup> is more complicated than that of the plain velars, owing to the segmental nature of the series. Not only are aspiration and voice segmentally analyzable, but the labial constituent is as well. In essence, the segmental solution was proposed by Reichelt; his presentation, however, requires slight critical improvements.

<sup>799</sup> Though Bartholomae's explanation of the meaning of the prefix (AIWb. 440) is unconfirmed, his segmentation, LAv. ka mərəða- is certainly correct.

<sup>800</sup> According to Frisk (GEW 1:879): "Die Ähnlichkeit mit μέλαθρον (s.d.) kann kaum zufällig sein."

<sup>801</sup> See also Szemerényi (1996:145) and Mayrhofer (1986:108-9).

§1. Originally Brugmann had considered the series  $K^u$  to be ‘labialized’, as described by Allen (1978:88):

“In the first edition of Brugmann’s *Grundriss* (1886) we find a basic system of two series, symbolized as  $*k̠$  etc. (Palatal) and  $*q$  etc. (velar) – the symbols  $*k$  etc. being used only where the attribution in a particular case is doubtful (262). The different developments of  $*q$  in the centum and satəm languages (e.g. Latin *qu* versus Sanskrit *k*) led Brugmann to characterize these as languages with and without labialization respectively (307ff.). He did not yet find it possible to determine whether the labialization was an original feature of these sounds lost by the satəm languages, or was an innovation of the centum languages (343).”

After the appearance of Bezzenger’s article (1890) and other contemporary contributions, Brugmann (*Grundr*<sup>2</sup> 1:586-622) revised his views and accepted the labiovelars Neogr.  $*k^u k^u h g^u gh^u$  as phonemes of the proto-language.<sup>802</sup>

§2. Neogr.  $*k^u$  (see Brugmann, *Grundr*<sup>2</sup> 1:587-9) appears in examples like:

(a) Neogr.  $*sek^u$ - ‘folgen’ (*Grundr*<sup>2</sup> 1:587, P. 896-7)

Lat. sequ-	(pf.) ‘(ver)folgen, begleiten, gehorchen’ (WH 2:519)
RV. prá (...) sác-	(vb.) ‘vorangehen’ (WbRV. 1445, prá (...) sákṣvā)
Gr. ἔπο-	(prM.) ‘folgen’ (GEW 1:544, ἔπομαι [1sg])

(b) Neogr.  $*k^u in$ - ‘poena’ (*Grundr*<sup>2</sup> 1: 588, P. 636-7)

MidIr. cin-	(m.) ‘guilt, crime, payment due’ (LEIA C-101, cin)
gAv. kaēnā-	(f.) ‘Strafe, Vergeltung, Rache’ (AIWb. 429)
Gr. ποινή-	(f.) ‘Busse, Wergelt, Rache, Strafe’ (GEW 2:573)

(c) Neogr.  $*ok^u$ - ‘Auge’ (*Grundr*<sup>2</sup> 1:589, P. 775-777)

Gr. ὄπ-	(f.) ‘the eye, face’ (LSJ 1282, ὄπα)
OPr. aki-	(f.) ‘Auge’ (APrS. 297, ackis [plN])
Gr. ὄψι-	(f.) ‘appearance’ (LSJ 1282-3, ὄψις, ὄψεως)
Gr. ἄψιτο-	(n.) ‘face, etc.’ (LSJ 299, ἄψιον · τὸ πρόσωπον)

(d) Neogr.  $*k^u ri$ - ‘kaufen’ (*Grundr*<sup>2</sup> 1:589, P. 648)

Gr. πρῶα-	(√pr.) ‘buy’ (GEW 2:594-5, πρῶατο = LinB. qi-ri-a-to)
OIr. ni ·cria-	(pr.) ‘acheter’ (LEIA C-229-230, nicria [conj.])
ORus. křīnu-	(vb.) ‘kaufen’ (REW 1:660, křīnuti [inf.])
TochA. kuryär-	(sb.) ‘Kauf, Handel : commercium’ (Poucha 79)
Bret. prena-	(pr.) ‘acheter, racheter’ (LEIA C-230, prena)

(e) Neogr.  $*k^u i$ - ‘who, which, what’ (P. 644f., HEG 1:611ff.)

Hi. kui-	(rel.pron.) ‘wer, was, welche(r/s)’ (HHand. 82, ku-iš)
CLu. kui-	(rel.pron.) ‘wer, was; welche(r/s)’ (HHand. 82)

<sup>802</sup> According to Brugmann (*Grundr*<sup>2</sup> 1:93), labiovelars were phonemes, not combinations of velars followed by the labial semivowel: “Anm. 4.  $k^u$ ,  $g^u$  sind nicht  $k$ ,  $g$  mit nachgeschlagenem  $u$ , sondern Verschlusslaute, bei denen gleichzeitig mit der velaren Zungenthätigkeit eine den akustischen Eindruck modifizierende Lippenrundung stattfand.”

Lat. qui-	(rel.pron.) ‘wer, was, ...’ (WH 2:410, quis, quid)
Lyd. qi-	(rel.pron.) ‘wer, was, ...’ (LydWb. 185, qis, qys, qid)
Osc. pi-	(rel.pron.) ‘who, which’ (WbOU. 558-9, pis, píd)
Gr. τί-	(rel.pron.) ‘wer, was welcher’ (GEW 2:903-4)
RV. ci-	(rel.pron.) ‘wer?’ (WbRV. 444, cid)

§3. With a limited amount of comparisons at his disposal, Brugmann (Grundr<sup>2</sup> 1:587) was unable to provide an acceptable example of the voiceless aspirated labiovelar Neogr. \*k<sup>h</sup>.<sup>803</sup> This gap can be filled, however, with comparisons such as:

(a) \*(h)osk<sup>h</sup>hu- (P. 783)

LAv. asčū-	(m.) ‘Unterschenkel, Wade’ (AIWb. 211)
Gr. ὀσφύ-	(f.) ‘Hüfte, Lende’ (GEW 2:439, ὀσφύς [sgN])

(b) \*k<sup>h</sup>h- ‘Auge : sehen’ (\*ok<sup>h</sup>, \*ēk<sup>h</sup>; sub P. 775f. \*ok<sup>h</sup>-)

√k<sup>h</sup>h-

Gr. ὄφ·θαλμός-	(m.) ‘Auge’ (GEW 2:452, ὄφθαλμός [sgN])
Gr. ὄφ·θαλμέω	(pr.) ‘beäugeln, anschauen’ (GEW 2:452)

√k<sup>h</sup>hahi-

RV. ánu (...) cakhi-	(pf.) ‘nachblicken’ (WbRV. 375, cakhyathus)
RV. á (...) khya-	(vb.) ‘anschauen’ (WbRV. 375, á (...) akhyat [3sg])

√k<sup>h</sup>hahiah-

RV. abhi·khyá-	(f.) ‘Lichtschein, gnädiges Anblicken’ (WbRV. 83)
RV. abhi·khyáya	(absol.) ‘erblicken’ (WbRV. 375)
Gr. κατ·η·φιάω	(vb.) ‘sich schämen’ (GEW 1:801)

§4. Neogr. \*g<sup>u</sup> (Grundr<sup>2</sup> 1:587ff.) is the voiced counterpart of Neogr. \*k<sup>h</sup> in the environments PIE \*h—g<sup>u</sup> and PIE \*g<sup>u</sup>—h. Some examples of Neogr. \*g<sup>u</sup> are:

(a) PIE \*g<sup>u</sup>eah<sup>u</sup>ski- (Grundr<sup>2</sup> 1:590, P. 465 \*g<sup>u</sup>ā- g<sup>u</sup>em-)

RV. gácha-	(prA.) ‘kommen, gehen’ (WbRV. 382, gáchatī)
Gr. βάσχο-	(pr.) ‘gehen’ (GEW 1:208, βάσκει [2sg])
Alb. n·gah-	(pr.) ‘run’ (AlbEtD. 292)

(b) PIE \*h<sup>u</sup>aeng<sup>u</sup>- \*h<sup>u</sup>aong<sup>u</sup>- ‘salben, Butter’ (P. 779, ong<sup>u</sup>-)

RV. añj-	(pr.) ‘fett, süß machen’ (WbRV. 24, añjānti [3pl])
OHG. anco-	(sb.) ‘Butter’ (P. 779, anco, ancho)
Bret. amann-	(.) ‘Salbe’ (Stüber 1997:84, PCelt. *amban-)
Corn. amen·en-	(.) ‘Salbe’ (Stüber 1997:84)
Lat. unguen-	(n.) ‘Salbe’ (WH 2:819)
RV. áñjas-	(n.) ‘Salbe, Mischung’ (WbRV. 25-6)
OPr. ancta-	(n.) ‘Butter’ (APrS. 300, anctan)

<sup>803</sup> Brugmann’s only example, the Gr. σφάλλομαι : OInd. skhalate (Arm. sxalem) mentioned with hesitation, does not work, because the Greek form is more likely to belong to Lat. fallō.

Bret. a- = Corn. a implies PIE \*fa.

(c) PIE \*g<sup>h</sup>ehar- \*g<sup>h</sup>ohar- ‘swallow; drink, eat’ (P. 474-5, g<sup>h</sup>er-)

Li. gér-	(vb.) ‘trinken’ (LiEtWb. 148, gér̃ti)
RV. jagár-	(pf.) ‘verschlingen’ (WbRV. 399, jagára [3sg])
Gr. βορό-	(a.) ‘gefräßig’ (GEW 1:251, βορός)
Lat. uorā-	(vb1.) ‘gierig essen, verschlingen’ (WH 2:836, uorāre)

(d) PIE \*g<sup>h</sup>ahn- ‘Frau, Weib; Geburt’ (P. 473, \*g<sup>h</sup>en-)

Gr. γυνή-	(f.) ‘Weib, Frau’ (GEW 1:333-4, γυνή)
OIcl. kuna	(f.) ‘Frau’ (ANEtWb. 334)
OIr. ban-	(f.) ‘Frau’ (GOI §291, ban [plG])
Boiot. βανά-	(f.) ‘Frau’ (GEW 1:333, βανά [sgN])
OInd. pañāñ-ganā-	(f.) ‘πόρνη : meretrīx’ (KEWA 2:194, EWA 2:69)
Arm. kana-	(sb.obl.) ‘Ehefrau, Weib, Frau’ (ArmGr. 1:460, kanac)
NeoPhryg. βανεκος	(f.) ‘Weib’ (P. 473)

(e) PIE \*g<sup>h</sup>afir- ‘schwer, hart’ (P. 476-477)

Go. kaurja-	(vb.) ‘beschweren’ (GoEtD. 217)
OInd. gariman-	(m.) ‘Schwere’ (EWA 1:490)
RV. gurú-	(a.) ‘schwer (drückend), heftig, hart’ (WbRV. 403)
Gr. βαρύ-	(a.) ‘schwer(wiegend)'; vom Ton ‘tief’ (GEW 1:221-2)
LAv. go <sup>h</sup> ru.zaodra-	(a.) ‘des Weihgüsse schwer sind’ (AIWb. 524)

§5. The examples of Neogr. \*g<sup>h</sup> (see Brugmann, Grundr<sup>2</sup> 1:587-8), the voiced aspirate, are relatively few but credible enough:

(a) Neogr. \*g<sup>h</sup>her \*g<sup>h</sup>hor ‘warm’ (P. 493-5)

Gr. θερμό-	(a.) ‘warm’ (GEW 1:664)
Arm. ĵerm	(a.) ‘warm’ (Grundr <sup>2</sup> 1:432)
Phryg. γέρμη-	(ON.) ‘cf. above’ (Grundr <sup>2</sup> 1:586)

(b) Neogr. \*g<sup>h</sup>hen- \*g<sup>h</sup>hon- ‘schlagen, töten’ (P. 490-3)

Gr. φόνο-	(m.) ‘Totschlag, Mord(blut)’ (GEW 2:1035, φόνος)
RV. ghaná-	(m.) ‘Zermalmer, Vernichter’ (WbRV. 421)
ORus. gonǔ-	(m.) ‘Ackerstück’ (REW 1:292)

(c) Neogr. \*(h)alg<sup>h</sup>h- ‘Erwerb, Lohn, Ernte’ (P. 32-3, HEG 1:176)

Gr. ἀλφή-	(f.) ‘Erwerb’ (GEW 1:81, ἀλφή [sgN])
OPr. ālga-	(f.) ‘Lohn’ (APrS. 298, ālgas [sgG])
Ĥi. ĥalguešar-	(n.) ‘Ernte, Erstlingsgabe’ (HHand. 36, ĥal-ku-eš-šar)
RV. sahasra’arghá-	(a.) ‘tausendfachen Wert habend’ (WbRV. 1504)

(d) Neogr. \*g<sup>h</sup>haid- ‘hell : Himmel, usw.’ (P. 488)

Gr. φαιδρό-	(a.) ‘hell, klar, heiter, fröhlich, vergnügt’ (GEW 2:981)
Li. gaidrà-	(f.) ‘Himmel, heiteres Wetter’ (LiEtWb. 128)

§6. The attempts to eliminate the labiovelars can be traced back to Kuryłowicz (1935:1-26; 1956:356-366; 1973:66f.),<sup>804</sup> according to whom the series \*K<sup>u</sup> came to exist as the result of a “partial falling together of velars and velars + w when a palatal vowel immediately followed” in the Centum languages.<sup>805</sup> Kuryłowicz’s solution, the emergence of \*k<sup>u</sup> after the merger of \*k̥ and \*k, has remained “less widely” accepted (see Allen 1978:97) for the reason neatly explained by Szemerényi (1996:67):

“The infinitive of OCS *ženq* ([P]IE \*g<sup>w</sup>hen-) is *gūnati*, in which *ū* can be explained only as a reflex of the labial element of the [P]IE labiovelar. These instances, few as they are, are sufficient to refute the thesis that labiovelars had never existed in the satem languages.”

Furthermore, as pointed out by Szemerényi (1996:61):

“There can be no doubt that here the centum type represents the original articulation, which in the satem languages lost the *w*-element as did Latin *qu* in the Romance languages.”<sup>806</sup>

§7. The segmental analysis of the labiovelars as sequences of velars and labials (Neogr. \*k<sup>u</sup> = \*k + u, etc.) was first championed by Reichelt (1922:81).<sup>807</sup> The idea has found several supporters, including Hirt (1927:228f.), Sturtevant (1951:38,55) and Szemerényi (1964:401f.), according to whom the secondary nature of the labiovelars is proven by the alternation Neogr. \*k<sup>u</sup> : \*ku.<sup>808</sup> The oft-quoted examples include:

(a) PIE \*kur- ‘Handel’ (P. 648, k<sup>u</sup>rei-)

TochA. kuryär-	(sb.) ‘commercium : Handel, Kauf’ (Poucha 79)
Gr. <i>πρία-</i>	(√pr.) ‘buy’ (GEW 2:594-5, <i>πρίατο</i> )
TochB. karyor-	(sb.) ‘buying, business negotiation’ (DTochB. 144)

(b) PIE \*nafgu- ‘naked’ (P. 769)

OSwed. <i>nakuþer-</i>	(a.) ‘naked’ (Reichelt IF 40:41)
OEng. <i>nacod-</i>	(a.) ‘nudus : naked, bare’ (ASaxD. 706)
Go. <i>naqap-</i>	(a.) ‘nackt : γυμνός’ (GoEtD. 263)
Li. <i>núoga-</i>	(3a.) ‘nackt, bloss, kahlt’ (LiEtWb. 511, <i>núogas</i> )
RV. <i>nagná-</i>	(a.) ‘nackt’ (EWA 2:5, WbRV. 705)

<sup>804</sup> See, however, also Szemerényi’s (1996:145n1) view, according to which the elimination of labiovelars began with Johannes Schmidt (1881 [KZ 25]:134).

<sup>805</sup> Kuryłowicz (1935:3) writes: “[I]a genèse des labiovélares dans les langues centum est simplement due à la coïncidence, dans ce groupe de langues, des vélares pures avec les groupes vélares + u, sous certaines conditions. Il est facile de définir ces conditions: caractère palatal de la voyelle suivante.”

<sup>806</sup> For the Satem languages, see also Szemerényi (1996:62): “[...] the labiovelars [...] generally lose the labial element and thus fall together with plain velars.”

<sup>807</sup> In addition to his basic analysis, according to which labiovelars arose by assimilation of pure velars to labials, Reichelt uses mixed methodologies, some of which satisfy scientific standards.

<sup>808</sup> Szemerényi (1996:145-6) writes: “Although the labiovelars are to be posited for the IE period as unitary phonemes (see 4.7.8.), they must have arisen from the groups kw, gw, ghw; this is indicated by the fact that beside a full grade k<sup>w</sup>e a zero grade ku is often found.” A similar argument was already presented by Hirt (1927:231): “[...] die Labiovelare haben in einer Reihe von Fällen deutlich eine Schwundstufe mit u neben sich.”

(c) PIE \**guafn-* ‘birth, woman’ (P. 473)

Gr. γυνή-	(f.) ‘Frau’ (GEW 1:333-4, γυνή)
OIcl. kuna-	(f.) ‘Frau’ (ANEtWb. 334)
OIr. ban-	(f.) ‘Frau’ (GOI §291, ban [plG])
Boiot. βανά-	(f.) ‘Frau’ (GEW 1:333, βανά [sgN])

(d) PIE \**guáfm-* ‘gehen’ (P. 464)

Go. qum-	(m.) ‘Ankunft’ (GoEtD. 279, qums [sgN])
OEng. cuma-	(vb.) ‘come, go, happen’ (ASaxD. 173) <sup>809</sup>
Go. quman-	(pt.) ‘come’ (GoEtD. 276)
TochA. kumnä-	(prA.) ‘venire : kommen’ (Poucha 67, kumnäs)
TochA. kumsa-	(prA.) ‘venire’ (Poucha 67, kumsam)

(e) √*guaft-* ‘Harz, Gummi, Lack, Kitt, usw.’ (P. 480)

OEng. cudu-	(n?.) ‘cud, what is chewed’ (ASaxD. 173)
OEng. cwidu-	(n.) ‘cud, what is chewed, gummi’ (ASaxD. 181)
OInd. játu-	(n.) ‘Lack, Gummi’ (KEWA 1:415)
MidIr. be <sup>1</sup> the-	(m.) ‘bouleau ou buis? : buxus’ (LEIA B-28)

(f) √*guefial-* ‘stechen, usw.’ (P. 470-471 [1. g<sup>u</sup>el-])

OPr. gulseni-	(m.) ‘Schmerz’ (APrS. 344, gulsennien [sgA])
Li. gél-	(vb.) ‘stechen, weiltun’ (LiEtWb. 145, gélti [inf.])
OIr. at-ball-	(vb.) ‘mourir’ (LEIA B-12-13, atbail [3sg])
OEng. cwela-	(vb.) ‘mori : die’ (ASaxD. 177, cwelan [inf.])

(g) √*guafl-* ‘water, drip’ (P. 471-2)

OInd. gala-	(vb1.) ‘drip, drop, etc.’ (MonWil. 350, galati)
Gr. βαλανεύ-	(m.) ‘Bader’ (GEW 1:212, βαλανεύς)
OEng. collen-	(pt.) ‘geschwollen’ (ASaxD. 165)

(h) √*guafsp-* ‘verflechten; Quast’ (P. 480)

RV. gušpita-	(a.) ‘verflochten, verschlungen’ (WbRV. 403)
Lat. uespec-	(f.) ‘dichtes Gesträuch’ (WH 2:771)
MidLG. quispel-	(.) ‘Quast, Wedel’ (P. 480, quispel)

(i) √*guafski-* ‘Büschel, Bund’ (P. 386)

OInd. guccha-	(m.) ‘Büschel, Bund’ (KEWA 1:337)
Arm. kuç-	(sb.) ‘Handvoll’ (Persson, Beitr. 316, 336)

(j) √*guafl-* ‘Hand, nehmen, fassen, ergreifen’ (P. 397)

Lat. uola-	(f.) ‘die hohle Hand’ (WH 2:825)
Gr. ἐν-γυαλίζω	(vb.) ‘einhändigen’ (GEW 1:330)

<sup>809</sup> Note the Germanic loss of labiovelar before a following the Germanic o/u (OIcl. koma, OEng. cuman), except in Gothic (Go. √qum-, etc.).



Arm. kalu- (pr.) ‘nehmen, fassen, ergreifen’ (GEW 1:330)

(k) √guafid- sagen, sprechen’ (P. 480-481)<sup>810</sup>

OInd. ni (...) gada- (pr.) ‘hersagen, aussprechen’ (EWA 1:460, ni gadati)

Gr. ἐν γυόζων (pt.) Hes. = ‘ἀντιφώνων’ (LSJ. 468)

§8. The PIE accent on the labial prevented the emergence of a labiovelar. Such circumstances are confirmed for the Satem languages, for example, in:

Hĩ. gun- (vb.) ‘schlagen, erschlagen, töten’ (HEG 1:604-5)

Li. gũny- (vb.) ‘verscheuchen’ (LiEtWb. gũnyti [inf.])

§9. The preservation of PIE \*u after velar (or the non-emergence of the labiovelar) also happened when PIE \*ḥa, aḥ occurred in the environment K+u+ḥa/aḥ. Here the vowel PIE \*a (rather than the labial) was syncoped, thus preventing the emergence of a labiovelar. The presence of PIE \*ḥ following the labial is proven by several examples with Fortunatov’s Law II in Indo-Iranian:

(a) PIE \*guahld- ‘jung’ (P. 358, gel-t-, gel-d)<sup>811</sup>

OEng. colt- (m.) ‘pullus : Junges von Tieren’ (ASaxD. 165)

OInd. gaḍi- (m.) ‘junger Stier’ (KEWA 1:316, Beitr. 69)

(b) √kuahl- ‘Holz, Wald’ (P. 545-7)

√kuahld-

OEng. holt- (m.n.) ‘holt, wood, grove, copse’ (ASaxD. 551)

OIcl. holt- (n.) ‘kleiner Wald’ (ANEtWb. 249)

OHG. holz- (m.) ‘nemus, silva, saltus, arbor, lignum’ (ASaxD. 551)

√kuahlta-

OInd. kuṭha- (m.) ‘a tree’ (KEWA 1:221, 223, Lex. kuṭhas [sgN])

OInd. kuṭhāru- (m.) ‘a tree’ (MonWil. 289, Lex. kuṭhārus [sgN])

(c) √kuahl- ‘Bach, Fluß, Strom’ (P. 546-7)

RV. kuliá- (f.) ‘Bach, Fluß, Strom’ (WbRV. 330, KEWA 1:224)

OHG. huliwa- (f.) ‘uligo, sordes limi uel aquae’ (P. 547-548)

The unrealized labiovelar, implying PIE \*kuahl-, is supported by the dental extension PIE \*kuahlto- with retroflex in Sanskrit (Fortunatov’s Law II):

OInd. kaṭa- (vb.) ‘to rain’ (MonWil. 243).

(d) √kuahl- ‘Tierjunge, junger Hund’ (P. 550). The unextended root

<sup>810</sup> Pokorny (480) includes the Sanskrit item under the root 2. g<sup>h</sup>et-, noting “Ai. gadati ‘sagt’ (falls durch analog. Einfluß aus \*gatati). Owing to the Greek parallel and the regular treatment now available through PIE \*fi, no analogy is needed.

<sup>811</sup> This root, skillfully postulated by Persson (Beitr. 69), is an alternative extension of Gr. ἀδελαρός (RV. gárbha-, P. 473). The root-initial media points to PIE \*fi, which is confirmed by Gr. δαλαρός = δελαρός (schwebeablaut).

Li. kālē-	(f.) ‘Hündin’ (LiEtWb. 208)
Alb. këlysh-	(m.) ‘Tierjunges, bes. junger Hund’ (AlbEtD. 176)

has a dental extension \* -n- with an unrealized labiovelar and Fortunatov’s Law II in:

PIE \*kuahln- (KEWA 1:224)

Gr. κύλλα-	(f.) = σκύλαξ ‘Hündchen, junger Hund’ (GEW 2:741)
OInd. kuṇaka-	(m.) ‘a young animal just born’ (MonWil. 289)

(e) √kuahln- ‘sonare’ (P. 550). The root in normal grade (PIE \*e/o) is attested in:

TochA. kälñ-	(prM.) ‘(re)sonare’ (Poucha 71)
OIcl. hvell-	(a.) ‘laut tönend’ (ANetWb. 271, hvellr [sgN])
TochB. kalne-	(pr.) ‘resound’ (DTochB. 171, kalneṃ [3pl])

PIE \*h, implied by an unrealized labiovelar in Tocharian and Sanskrit, is accompanied by Fortunatov’s Law II in the respective zero grade:

TochB. kula-	(sb.) ‘bell’ (DTochB. 185, kulantse)
Dhātup. kuṇa-	(vbA.) ‘to sound’ (MonWil. 289, kuṇati [3sg])
Dhātup. kuṇaya-	(csA.) ‘to converse with, address, invite’ (MonWil. 289)
OInd. kuṇinda-	(m.) ‘sound’ (MonWil. 289)

(f) √kuahln- ‘lame, crippled’ contains an unrealized labiovelar accompanied by Fortunatov’s Law II in two dental extensions:

√kuḥaln-

Br. kuṇi-	(a.) ‘lame in the arm’ (Hirt 1927:205, Br. kuṇi-)
Gr. κυλλό-	(a.) ‘crippled, lame in hand or foot’ (GEW 2:47)
RV. kúṇāru-	(a.) ‘= ahastám : armlahm’ (WbRV. 328)

√kuḥalt(h)- (KEWA 1:225)

OInd. koṭaya-	(cs.) ‘to divide, break asunder’ (MonWil. 288)
OInd. kuṭhāra-	(.) ‘axe’ (Hirt 1927:205)
Lat. culter	(m.) ‘knife : Messer’ (WH 1:304, culter, cultris)

(g) √kuahr- ‘biegen’ (P. 935). Unrealized labiovelars appear with Fortunatov’s Law II in dental extensions of Sanskrit:

Gr. κυρτό-	(a.) ‘gewölbt, gerundet, bauchig, buckelig’ (GEW 2:55)
OInd. kuṭa-	(pr1.) ‘become crooked, curved’ (MonWil. 288, kuṭati)
OInd. kuṭīla-	(a.) ‘bent, crooked, curved, round’ (MonWil. 288)
OInd. kaṭī-	(n.) ‘a crooked sword, sabre, scimitar’ (MonWil. 244)
Lat. curuo-	(a.) ‘gekrümmt, gewölbt’ (WH 1:317)

In such pairs, the simultaneous effect of Fortunatov’s Law II and the preservation of the labial \*u before a velar confirm PIE \*ḥa aḥ by means of two features.

§10. A further argument for the combinatory nature of the labiovelars is based on the schwebeablaut alternation Ku<sup>e/o</sup> : K<sup>e/o</sup>u:

(a) PIE \*sekou- : \*sekou- ‘folgen’ (P. 846)<sup>812</sup>. The bases are confirmed by alternation

Lat. secū-	(pf.) ‘folgen’ (WH 2:519, secūtus [sgN] ← *sekou-)
Lat. sequo-	(pr.) ‘folgen’ (WH 2:519, sequor [1sg] ← *sekou-)

No irregular explanation like Pokorny’s “analog. solūtus für älterer \*sectos = Gr. \*heptós, lit. ít. at-sektas.” is therefore required.

(b) PIE \*haku- (\*hakeu- \*hakou-) ‘Auge’. The labiovelar root Neogr. \*(h)ok<sup>h</sup>- ‘Auge’ (P. 775-777) is well known:

Gr. ὄπ-	(f.) ‘the eye, face’ (LSJ 1282, ὄπα ← PIE *haoku-)
Gr. ἄψίτων	(n.) ‘face’ LSJ. 299, τὸ πρόσωπον ← PIE *haekusio-
RV. ánika-	(n.) ‘Angesicht’ (WbRV. 57, ← PIE *haku-)
Lat. ali-ōquī	(adv.) ‘in anderen Hinsicht’ (WH 1:29f., PIE *haōkuo-)

The segmental character of the labiovelar is proven by the schwebeablaut variant

PIE \*hakeu- \*hakou- (cf. P. 587 keu-):

Do. ἐπ·άκο(φ)ο-	(m.) ‘witness (to a transaction)’ (LSJ. 620)
Cypr. ἀκεύω	(vb.) ‘beobachten, usw.’ (LSJ. 49, ἀκεύει· τηρεῖ)
OCS. ču-	(vb.) ‘empfinden, wahrnehmen’ (Sadnik √129, čuti)
gAv. čəviš-	(ao.) ‘sich versehen, erhoffen’ (AIWb. 442)
OCS. čujīs·tvo	(n.) ‘Gefühl : sensation, feeling’ (Sadnik √129)

(c) PIE \*orku- \*erku- \*rku- (P. 340) ‘singen, beten, bitten’ is reflected in Old Anatolian and Indo-Aryan:

RV. řk-	(f.) ‘Lied’ (KEWA 1:50, 118, WbRV. 278)
Ĥi. arku-	(vb.) ‘beten, bitten’ (HEG 1:60-61, ar-ku-ut-ta [3sg])
RV. řkvan-	(m.) ‘Sänger’ (a.) ‘singend, jubelnd’ (WbRV. 277)
Ĥi. arkuar-	(n.) ‘Gebet’ (HEG 1:61, ar-ku-ua-ar [sgNA])

A schwebeablaut variant of the type Lat. secū·to- appears in

Ĥi. arkeui-	(É.) ‘Betraum, Kapelle’ (EHS 415, 472, HEG 1:60),
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suggesting that the meaning of the form has been correctly inferred.

(d) A similar phenomenon recurs in the zero grade of the root P. 640 \*k<sup>h</sup>ek<sup>h</sup>lo-, etc. with accent on PIE \*ú:

Gr. κύκλο-	(m.) ‘Kreis’ (pl.) ‘Räder’ (GEW 2:44)
TochA. kukäl-	(m.) ‘vehiculum’ (Poucha 76, kukäl [sgN])

The forms are accompanied by respective full grades:

PIE \*keukl-, \*koukl- ‘wheel(s), wagon, chariot’

OIcl. hjöl-	(n.) ‘Rad’ (ANetWb. 232)
TochB. kokale-	(m.) ‘cart, wagon, chariot’ (DTochB. 200)

<sup>812</sup> For Brugmann’s comments on Lat. socius : sequor, see Grundr<sup>2</sup> 1:280.

Yet again, segmental origin is implied for the root-initial labiovelar.

§11. A third feature advocating segmental analysis can be found in the historical notation of the aspirated labiovelars Neogr. \*k<sup>h</sup> and \*g<sup>h</sup>, linearly consisting of the sequences \*k+ɰ+h and \*g+ɰ+h. An implicit criticism of this convention has been presented by Szemerényi (1996:145-6) observing that “[...] the labiovelars [...] must have arisen from the groups kw, gw, ghw [...]”. Not only Szemerényi’s segmental approach here, but his linear arrangement g+h+w (instead of the conventional g+w+h) is noteworthy.<sup>813</sup> Szemerényi’s interpretation can be shown to be correct by the following factors:

(a) The aspirated labiovelars do not display aspiration (Ḥi. ḥ) after Old Anatolian ku, gu (which should be the case, had the aspirate followed the labial as implied by the notation \*g<sup>h</sup> = g+ɰ+h). There is no laryngeal after the labial in Old Anatolian examples like

PIE \*haelǵu- ‘Ernte, Erwerb, Wert’ (P. 32-3):

Gr. ἀλφῆ-	(f.) ‘Erwerb’ (GEW 1:81, ἀλφῆ [sgN])
Ḥi. ḥalguešar-	(n.) ‘Ernte, Erstlingsgabe’ (HHand. 36, ḥal-ku-eš-šar)
RV. sahasra’arǵhá-	(a.) ‘tausendfachen Wert habend’ (WbRV. 1504)

proving that the aspirated labiovelars were actually of the form \*ǵḥw instead of †ǵwḥ.

(b) The sequences PIE \*kuh \*guḥ never yield aspirated labiovelars, because the aspiration was prevented by the intermediating labial. The non-existence of root variants with aspirated labiovelars further implies that the loss of PIE \*h/ḥ took place before labiovelars emerged. This is confirmed by the roots beginning with k<sup>h</sup>+h- and g<sup>h</sup>+ḥ, which do not alternate with Neogr. \*k<sup>h</sup> and \*g<sup>h</sup>. Thus, for instance, all variants of the root PIE √g<sup>h</sup>eah- ‘gehen’ (shape g<sup>h</sup>+ḥ) are unaspirated, especially in the zero grade:

PIE *g <sup>h</sup> ah-	→	RV. g-	(ao.) ‘gehen, usw. (WbRV. 392, gus)
PIE *g <sup>h</sup> eah-	→	RV. ga’a-	(pr.) ‘gehen’ (WbRV. 392, gaat [3sg])
PIE *g <sup>h</sup> ēah-	→	RV. gā-	(pr.) ‘gehen’ (WbRV. 391, gās) <sup>814</sup>

The full derivation of the zero-grade PIE \*g<sup>h</sup>ah- → \*g<sup>h</sup>ḥ- → \*g<sup>h</sup>- → RV. g- proves that the aspirated root variants g<sup>h</sup>ḥ- (from PIE \*g<sup>h</sup>+ḥ) resulted in \*g<sup>h</sup>, with the result that Neogr. g<sup>h</sup>- actually contains a sequence \*ǵḥ just (as correctly observed by Szemerényi).

§12. In addition, the aspirated labiovelars Neogr. \*k<sup>h</sup> \*g<sup>h</sup> (i.e. \*kḥ and \*ǵḥ-) are ambiguous in terms of the position of the vowel PIE \*a, as expressed in the following definitions:

<sup>813</sup> An obvious candidate that could lie behind Szemerényi’s observation is OIr. laigiú (comp.) ‘minor’ (Grundr<sup>2</sup> 1:606). In this group the sequence g-h-u is obviously based on Gr. ἐλαχύ- (GEW 1:484): AV. laghú- (a.) ‘gering, unschwer, leicht’ (KEWA 3:31). From these forms, the aspirated labiovelar is produced (cf. Gr. ἐλαφρό- ‘leicht, behind, schnell, gering’, GEW 1:484). As Szemerényi does not cite specific data, the exact origin of his idea remains unproven.

<sup>814</sup> For a laryngeal confirmed by accent, cf. Li. gó- (vb.) ‘gehen’ (LiEtWb. 161, góti).

Neogr. *k <sup>h</sup>	≡	PIE *kahu v khau	(with unaccented PIE *a and *u)
Neogr. *g <sup>h</sup>	≡	PIE *gafu v ghau	(with unaccented PIE *a and *u)

The choice between PIE \*kahu v khau and PIE \*gafu v ghau must be made comparatively for every correspondence with Neogr. \*k<sup>h</sup> and \*g<sup>h</sup>. In this procedure, the schwebeablaut, zero grade and alternation PIE \*h : h̄ play significant roles. Some examples of the choice between the alternatives PIE \*a<sup>h</sup> and PIE \*h̄a are:

(a) Neogr. \*k<sup>h</sup>- ‘Auge : sehen’ (\*ok<sup>h</sup>, \*ēk<sup>h</sup>; sub P. 775f. \*ok<sup>h̄</sup>-)

Gr. ὄφ-θαλμός-	(m.) ‘Auge’ (GEW 2:452, ὄφθαλμός [sgN])
RV. ánu (...) cakhi-	(pf.) ‘nachblicken’ (WbRV. 375, cakhathus)
RV. abhi·khyáya	(absol.) ‘erblicken’ (WbRV. 375, KEWA 1:33)
Gr. κατ-η-φιάω	(vb.) ‘sich schämen’ (GEW 1:801)

Of the two theoretically possible alternatives, PIE \*khau or PIE \*kahu, the latter is proven correct by the \*e/o-grade of the root in:

PIE \*keahu \*koahu (P. 587-8)

Lat. caueō	(pr.) ‘sich in acht nehmen, sich vorsehen’ (WH 1:186f.)
RV. kaví-	(a.) ‘weise, sinnig’ (m.) ‘der Weise’ (WbRV. 318) <sup>815</sup>
Gr. νο(φ)έω	(pr.) ‘bemerken, vernehmen, hören’ (GEW 1:891)

(b) PIE √kahu- ‘schlagen’ (P. 535, kāu-, kəu-) can be reconstructed on the basis of the following formations:

√kahu-	
Li. káu-	(vb.) ‘schlagen, hauen, usw.’ (LiEtWb. 232, káuti [inf.])
TochB. kau-	(vb.) ‘Skt. vadhāya = töten’ (DTochB. 208, kautsi-ś)
OCS. kovo-	(pr.) ‘schmieden, verfertigen’ (Sadnik √374, kovq [1sg])
√kahui-	
Li. kóvia-	(pret.) ‘schlagen, hauen, usw.’ (LiEtWb. 232, kóviau)
Li. kúja-	(f.) ‘Stelze’ (LiEtWb. 232, kúja with Li. ú ← PIE *áhu)
√kahun-	
Li. káuna-	(pr.) ‘schlagen, vernichten, usw.’ (LiEtWb. 232)
Latv. kaúna-	(pr.) ‘schlagen, hauen, usw.’ (LiEtWb. 232)

The voiced counterpart of the root PIE \*kahun- is PIE \*gafun- with PIE \*a<sup>h</sup> (not †h̄a), better known as the root

Neogr. \*g<sup>h</sup>hen- \*g<sup>h</sup>hn- ‘schlagen, töten, treiben’ (P. 491-2)

Ḥi. gun-	(vb.) ‘schlagen, erschlagen, töten’ (HEG 1:604-5)
Ḥi. guen-	(vb.) ‘(er)schlagen, töten’ (HHand. 81, ku-en-zi)
RV. hán-	(pr.) ‘schlagen, töten, usw.’ (WbRV. 1642, hánti [3sg])

<sup>815</sup> Note especially that in the absence of Brugmann’s Law II, RV. kaví- must stand for PIE \*keahui-, thus matching Lat. cau- in terms of the root vocalism.

Gr. θέβο-

(ao.) ‘schlagen, totschiagen, töten’ (GEW 1:657)<sup>816</sup>

§13. Sequences of K+u are occasionally preserved in the Satem languages (e.g. OInd. kvátha- : OCS. kvasŭ, P. 627-8). It has been argued that this phenomenon could prove the difference between labiovelars proper (\*K<sup>u</sup>) and secondary clusters \*K+u. Owing to the reconstruction of the segmental laryngeal, however, one can observe the following distribution: *When the unrealized labiovelars Ku/Ku appear in Satem languages, a following PIE \*h<sub>1</sub>ah<sub>1</sub> is also implied for the proto-root by at least one measurable criterion.*

From the phonetic and phonological point of view, the unrealized labiovelars Ku and Ku are caused either by the blocking action of the laryngeal PIE \*h<sub>1</sub> and/or the vowel PIE \*a (possibly further assimilated into /u/). This distribution is supported by the key examples of Satem K+u, all of which are accompanied by independent criteria for PIE \*h<sub>1</sub>ah<sub>1</sub> following the unrealized labiovelar:

(a) Neogr. \*g<sup>u</sup>haizd(h)- ‘Stern’

OCS. dzvězda	(f.) ‘Stern’ (Sadnik √1152, dzvězda [sgN])
Poln. gwiazda	(f.) ‘Stern’ (REW 1:447)
Rus. zvezdá	(f.) ‘Stern’ (REW 1:447)
OCS. dzvězdo-zírīci-	(m.) ‘Sterndeuter, Astrolog’ (Sadnik √1152)

Whether the starting point of OCS. dzvězda is Neogr. \*g<sup>u</sup>haid- (P. 488)

Gr. φαίδρο-	(a.) ‘hell, klar, heiter, fröhlich, vergnügt’ (GEW 2:981)
Li. gaidrà-	(f.) ‘Himmel, heiteres Wetter’ (LiEtWb. 128)

or Neogr. \*g<sup>u</sup>hais- ‘glänzen’ (P. 488)

Gr. φαῖος	(a.) ‘(dunkel)grau, schwärzlich’ (GEW 2:984)
Li. gāisa-	(m.) ‘Lichtschein, Röte am Himmel’ (LiEtWb. 128)

the forms belong to the root Neogr. \*g<sup>u</sup>hai-, for which PIE \*h<sub>1</sub> is implied by Gr. α.

(b) PIE \*g<sup>u</sup>ahl- ‘Lager, Regio’ (P. 402 [1. gol-])

Li. gvali-	(f.) ‘Lager eines Tieres’ (Beitr. 578)
Arm. kałaf-	(sb.) ‘Lager wilder Tiere’ (Beitr. 578)
Arm. kołm-	(sb.) ‘side, region’ (EtDiArm. 369)
Li. guōli-	(.) ‘Lagerstätte, Schlafstätte’ (LiEtWb. 161)

PIE \*h<sub>1</sub> is implied by Arm. a inside the root and the root-initial voiced velar (Neogr. √D → PIE √D—h<sub>1</sub>).

(c) PIE \*kuahtah- ‘brennen, kochen; sauer’ (P. 627-8)

OInd. kvátha-	(pr1.) ‘sieden, kochen’ (EWA 1:420)
OInd. kvatha-	(m.) ‘decoction, extract’ (MonWil. 324)
OInd. kvātha-	(m.) ‘boiling’ (MonWil. 324)
Go. hvapja-	(vb.) ‘schäumen : foam’ (GoEtD. 199)

<sup>816</sup> This pair of roots and all related items will be fully dealt with in the PIE Lexicon demo (<http://pielexicon.hum.helsinki.fi>).

Go. <i>hvaþo(n)-</i>	(f.) ‘Schaum’ (GoEtD. 199, <i>hvaþon</i> [sgD])
OCS. <i>kvāsũ</i>	(m.) ‘Sauerteig, säuerliches Getränk’ (Sadnik √437)
Latv. <i>kūsā-</i>	(vb.) ‘seethe’ (GoEtD. 199, <i>kūsāt</i> [inf.])
OCS. <i>kysělũ</i>	(a.) ‘sauer’ (Sadnik √437)

PIE \*a is implied by the long glide (OCS. *y*) and PIE \*h by the broken tone in Latv. *û*.  
(d) √*skhuaḥg̃-* ‘Spalt, Kluft; schlachten’ (P. –)

Gr. <i>διὰ σφάγ-</i>	(f.) ‘Riss, Spalt, Felsenkluff’ (GEW 2:826)
OCS. <i>skvozě</i>	(adv.prep.) ‘durch’ (Sadnik √830)
OCS. <i>skvěžě</i>	(adv.prep.) ‘durch’ (Sadnik √830, schwebeablaut)
Gr. <i>σφαγή</i>	(f.) ‘Schlacht-, Opfermesser’ (GEW 2:825)
Gr. <i>σφάζω</i>	(pr.) ‘schlachten, töten, opfern’ (GEW 2:825)
OCS. <i>skvožĩna</i>	(f.) ‘Kluft’ (Sadnik √830)

Gr. *α* implies PIE \*ah.

(e) √*kuahit-* ‘blühen; Blume, Weizen’ (P. 628-29)

OCS. <i>cvětũ</i>	(m.) ‘Blume, Blüte, Lilie’ (Sadnik √97)
OCS. <i>cvit-</i>	(vb.) ‘blühen’ (Sadnik √97, <i>cvisti</i> [inf.])
Czech. <i>kvit-</i>	(vb.) ‘blühen’ (REW 3:284, <i>kvisti</i> [inf.])
Latv. <i>kvitē-</i>	(vb.) ‘flimmern, glänzen’ (REW 3:284, <i>kvitēt</i> [inf.])
Li. <i>kvietỹ-</i>	(.) ‘Weizenkorn’ (pl.) ‘Weizen’ (LiEtWb. 326) <sup>817</sup>
Latv. <i>kviesi-</i>	(.) ‘Weizenpflanze, -staude, Weizen’ (LiEtWb. 326)
Gr. <i>σῖτο-</i>	(m.) ‘Weizen, Getreide, Brot, Speise’ (GEW 2:711)

The laryngeal is implied by the long vowel Gr. *ĩ* = OCS. *i* and the existence of the voiced variant of the root (→ PIE \*h) in:

√*kuahid-* ‘Weizen’ (P. 628-9)

Go. <i>hvaitei-</i>	(m.) ‘σῖτος : Weizen : wheat’ (GoEtD. 197, <i>hvaiteis</i> )
OIcl. <i>hveiti</i>	(n.) ‘Weizen’ (ANEtWb. 270)
OEng. <i>hwæte</i>	(m.) ‘triticum : wheat’ (ASaxD. 571)

Instead of proving the labiovelar series to be original, the sequences *K+u* thus provide a regular criterion for the reconstruction of PIE \*h<sub>1</sub>a ah<sub>1</sub> within the Satem languages.

§14. In his early presentation, Brugmann (Grundr<sup>2</sup> 1:618) accounted for the special development of labiovelars in Avestan, according to which

Av. *š* ← Neogr. \*k<sup>h</sup><sub>1</sub>i                      and                      Av. *ž* ← Neogr. \*g<sup>h</sup><sub>1</sub>h<sub>1</sub>.

Here Av. *š*, *ž* appear instead of the regular reflexes before front vowels (Av. *č*, *ž*). In addition, Brugmann (1900:98) compared these developments to similar ones in Greek:

<sup>817</sup> Owing to the Greek parallel, Li. *kvietỹs* is not necessarily borrowed from Germanic (as suggested by Fraenkel).

Gr. -σσ- = Att. -ττ- (initially σ-, τ-) ← Neogr. \*k<sup>u</sup><sub>ī</sub> \*k<sup>u</sup><sub>hī</sub> \*g<sup>u</sup><sub>hī</sub>.

Some common isoglosses of Avestan and Greek (with Latin indicating the original labiovelar) are:

*k <sup>u</sup> <sub>ī</sub> ēt-	→	Av. šyāta-	:	Lat. quiēt-	(P. 638)
*k <sup>u</sup> <sub>ī</sub> ēut-	→	Av. šyaoθna-	:	Gr. τευτάζω	(P. 539)
*og <sup>u</sup> hi-	→	Av. aži-	:	Gr. ὄφι-	(P. 44)

Walde and Pokorny (both in WP. and in P. passim) are unaware of such distinctions within the velar system. Thus, for example, Walde and Pokorny reconstructed a root-final plain velar for the root \*<sup>h</sup>keuk- P. 597:

RV. sóca-	(pr1.)	‘leuchten, strahlen, glänzen’	(WbRV. 1400)
gAv. suxra-	(a.)	‘rot’ (vom Feuer)	(AIWb. 1582)

based on an alleged Centum parallel with an assumed original meaning ‘\*der Weiße’:<sup>818</sup>

Gr. κύκνο-	(m.)	‘Schwan’	(GEW 2:45).
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No further light was shed on the matter by another possible Centum cognate

TochB. kok-	(f.)	‘countenance, appearance’	(DTochB. 200),
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owing to the general collision of velars in Tocharian. However, Av. š is unambiguous in implying a root-final labiovelar for

LAv. saošyant-	(pt.)	‘der flammenden Feuer’	(AIWb. 1552). <sup>819</sup>
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In this manner, Avestan also supports the original existence of labiovelars in the Satem group, and the development can be used to infer the original labiovelars.

§15. The general issues concerning the labiovelars historically and in System PIE can be summarized as follows:

(a) Segmental analysis of the labiovelars is recommended for a number of reasons, including the schwebeablaut alternation (\*Ke/ou : Kue/o), the preservation of the accented labial (\*Kú) and other factors discussed above. The segmental character of labiovelars is provable through examples in which the velar component has been confirmed by parallels, generally of the form:

√g <sup>u</sup> hen-	‘schlagen, töten, treiben’	(P. 491-3)
Hī. gun-	(vb.)	‘erschlagen, töten’ (HEG 1:604-5. ku-na-an-zi)
Li. gūny-	(vb.)	‘verscheuchen’ (LiEtWb. gūnyti [inf.])
TochA. k <sub>u</sub> ñāś-	(sb.)	‘rixa : Streit, Kampf’ (Poucha 76, k <sub>u</sub> ñāś)
OHG. gund·fano(n)-	(m.)	‘Kriegsfahne’ (P. 492)

<sup>818</sup> This semantic supposition remains unproven, since the meaning ‘swan’ could also point to ‘sing(er)’, as is the case in the root P. 1046-7 (cf. OIcl. svan- (m.) ‘Schwan’, ANEtWb. 564 : RV. svaná- (m.) ‘Rauschen, Brausen, Donner, Toben’, WbRV. 1625).

<sup>819</sup> As is readily understood, the Avestan development confirms that the Satem group had developed labiovelars. This falsifies the contrary idea advanced by Kuryłowicz.



It is possible and correct to analyze the labiovelars (Neogr. \*k<sup>u</sup> etc.) segmentally as PIE \*ku, etc., whereas the delabialization of Neogr. \*k<sup>u</sup> is not phonetically credible: the labiovelarization was caused by the absence of accent in the labial component. The segmental analysis of labiovelars will be necessary in the future, as it contains vital information on the PIE accent.

(b) Szemerényi (1964:401f., 1970:138) opines that while PIE \*k<sup>u</sup> is a unitary phoneme, it is to be derived from an earlier diphonemic \*\*k<sub>u</sub>. Regarding this point, I would like to underline that Szemerényi's segmental analysis, though correct, is formulated in terms of the untenable doctrine of a two-phased proto-language. The only possibility of avoiding this is to posit PIE \*ku/k<sub>u</sub> for the proto-language and then derive the labiovelars (Lat. qu = LinB. q = Ogam. q, etc.) and their subsequent successors (Gr. τ/π, OIr. c, etc.) from the proto-language.

(c) The following definitions hold true for the traditional labiovelars in System PIE:

Ḫi. ku, LinB. q, Gr. τ/π, RV. k/c,...	≡ PIE *ku	(≡ Neogr. *k <sup>u</sup> )
Ḫi. gu, LinB. q, Gr. δ/β, RV. g/j,...	≡ PIE *gu	(≡ Neogr. *g <sup>u</sup> )
Ḫi. ku, LinB. q, Gr. θ/φ, RV. kh/c,...	≡ PIE *kahu v khau	(≡ Neogr. *k <sup>uh</sup> )
Ḫi. gu, LinB. q, Gr. θ/φ, RV. gh/h,...	≡ PIE *gafu v gfau	(≡ Neogr. *g <sup>uh</sup> )

Despite the fact that the parent language did not originally contain labiovelars as segmental phonemes, the labiovelars preserve their position in comparative reconstructions based on distinctions between the labio-, palato- and plain velars attested in Indo-European languages.

#### 4.8.4 The palatovelars Neogr. \*k̂ kĥ ĝ ĝh

§0. The phonetic character of the first palatalization<sup>820</sup> is straightforward, and the sound laws of the cognates are well known. Nevertheless, the theory can be further developed by means of a segmental analysis of the palatovelars in the manner first suggested by Szemerényi (Neogr. \*k̂ ≡ PIE \*ki), allowing for all of the distinctions present in the data.

§1. The palatovelars, absent in Schleicher's reconstruction, were established by the Neogrammarians, postulating the series Neogr. \*k̂ kĥ ĝ ĝh (Grundr<sup>2</sup> 1:542-569).

§2. Neogr. \*k̂ (Grundr<sup>2</sup> 1:547-8), the voiceless unaspirated palatovelar, is widely attested, and some of Brugmann's examples of the phoneme are referred to here:

(a) Neogr. \*k̂m̂t̂ó-m 'hundert' (P. 192)

Lat. cento-	(n.sg.) 'hundert' (WH 1:200-1, centum)
Lyc. ŝnta	(num.) 'centum' (VLFH 230)

<sup>820</sup> The immediate reflect of palatalization (PSatem \*ć, approximately /tsh/) can be inferred from its dental reflexes in Albanian th, dh and in Old Persian θ, d as well as from nominatives such as RV. víṭ [sgN]. See Meillet (1894a:284). On the other hand, the sibilant component is well-attested in RV. ś, Av. s, Arm. s, etc.

TochB. kante	(num.) ‘centum’ (DTochB. 139, kante [NA])
RV. śatá-	(num.n.) ‘hundert’ (WbRV. 1372)
LAv. sata-	(n.) ‘hundert’ (AIWb. 1555, satəm)
Li. šimta-	(m.) ‘centum’ (LiEtWb. 984, šimtas [sgN])

(b) Neogr. \*āk- ‘spitz’ (P. 18f.)

TochB. āk	(sb.) ‘ear of grain’ (DTochB. 35)
Lat. aceō	(pr.) ‘sauer sein’ (WH 1:6, acēre)
Gr. ἀκμό·θετο-	(n.) ‘Untersatz des Ambosses’ (GEW 1:54)
RV. áśma·cakra-	(a.) ‘dessen Rad der Pressstein ist’ (WbRV. 138)
Gr. ἄκμων	(m.) ‘Amboß : anvil’ (GEW 1:54)
Li. āšmen-	(m.pl.) ‘Scharfe, Schneide’ (LiEtWb. 19, āsmens)

(c) Neogr. \*oktō(u) ‘acht’ (P. 775)

LAv. ašta-	(num.indecl.) ‘acht’ (AIWb. 260)
RV. aṣṭá	(num.) ‘acht’ (WbRV. 144-5)
Gr. ὀκτώ	(num.) ‘acht’ (GEW 2:374-5, ὀκτώ)
Lat. octō	(num.) ‘eight’ (WH 2:199-200, octō)

(d) Neogr. \*deks- ‘recht, dexter’ (P. 190)

RV. dákṣa-	(prA.) ‘es jemand [D.] recht machen’ (WbRV. 570)
RV. dákṣiṇa-	(a.) ‘südlich gelegen, usw.’ (WbRV.572)
LAv. dašina-	(a.) ‘recht, dexter’ (AIWb. 703-4)
Li. dėšina-	(a.) ‘rechts’ (LiEtWb. 91)
Gr. δεξιτερό-	(a.) ‘zur Rechten befindlich’ (GEW 1:366)
Alb. djathtë	(a.) ‘right’ (AlbEtD. 67)
Lat. dexter	(a.) ‘rechts, glückbringend, günstig’ (WH 1:346)

§3. Brugmann (Grundr<sup>2</sup> 1:548) did not offer a single example of Neogr. \*kh̄. The voiceless aspirated palatovelar was postulated merely as a place-filler (≈ Systemzwang).<sup>821</sup> Despite this, the correspondence set \*kh̄ can be defined in a meaningful manner. The Hellenic aspirate Gr. χ corresponds to RV. ś : Lat. c, etc. (i.e. Neogr. \*kh̄ has collided with Neogr. \*k̄ in the rest of the group). Some examples are:

(a) Neogr. \*khr- ‘blassgelb, glänzend, schön’ (P. 618, Grundr<sup>2</sup> 1:677)

OLat. pol·cher-	(a.) ‘schön, hübsch, herrlich, usw.’ (WH 2:384) <sup>822</sup>
Gr. πολλα·χρό-	(a.) ‘πολλαχρόν·καλόν’ (WH 2:384)
Gr. ὠ·χρό-	(a.) ‘blassgelb, blass, bleich’ (GEW 2:1153-4)
LAv. sray-	(f.) ‘Schönheit’ (AIWb. 1645, sraya [sgI])

<sup>821</sup> Brugmann’s comparison between RV. śákhā- ‘Ast, Zweig’ (WbRV. 1391): Arm. քաչ- ‘fresh branch with leaves’ (EtDiArm. 619) fails because Arm. ք requires \*s̄k or \*ks (Meillet 1936:36). The latter is proven to be correct by ModPers. šāx (sb.) ‘Zweig’.

<sup>822</sup> The correspondence was properly postulated already by Juret (1937:78). It is possible that Latin ch represents here an archaism rather than an innovation.

Gr. πολύ·χρῶο-	(a.) ‘many-coloured, variegated’ (LSJ. 1446)
Lat. pul·chrīmo-	(sup.) ‘schönst’ (WH 2:384)
gAv. srīra-	(a.) ‘schön anzusehen, schön’ (AIWb. 1645)
Lat. pul·chritūdō(n)-	(f.) ‘Schönheit’ (WH 2:384)

(b) Neogr. \*khlam- ‘bergen, verhüllen’ (P. 553-4)

Lat. clam	(adv.prepA) ‘heimlich, verhohlen’ (WH 1:226-7)
Lat. clam·dēstīno-	(a.) ‘geheim, verborgen’ (WH 1:226-7, clandestīnus)
Gr. χλαμύ-	(f.) ‘Oberkleid, Mantel’ (GEW 2:1102, χλαμυν)

(c) Neogr. \*khlai- ‘heiß, warm’ (P. 551)

Gr. χλαία-	(f.) ‘Wärme’ (GEW 2:1103)
Gr. χλίω	(vb.) ‘warm oder weich werden’ (GEW 2:1103)
MidCymr. clayar	(a.) ‘lau : warm’ (Beitr. 794, VGK 1:66)

In these examples, the aspirated palatovelar is the analytical outcome of the velar and a following PIE \*h. Thus √χλαμ- is derived from a root with ‘European a’, as proven by Lat. calim (adv.) ‘antiqui dicebant pro clam’ (WH 1:138), similar to Gr. χλαία to PIE √keahl- ‘heiß, warm’ in:

Lat. caleō	(vb2.) ‘heiß, warm sein, glühen’ (WH 1:137, caleō)
TochB. kalla-	(a.) ‘warm, heiß’ (DTochB. kallona)

The defective postulation of Neogr. \*kh has resulted in a reconstructive gap, which offers some prospects of comparison. Even if other etymological possibilities are exhausted, it remains possible that Gr. χ matches RV. ś, Lat. c, etc.<sup>823</sup>

§4. Neogr. \*ḡ, the voiced variant of Neogr. \*k̂ in environments \*fi—ḡ and \*ḡ—fi, is present in a rich collection of examples (Grundr<sup>2</sup> 1:548):

(a) PIE √haḡ- ‘treiben’ (P. 4f.). Both ‘a-colouring’ and voice (via \*ḡ) are confirmed in

RV. nir·áj-	(ao.) ‘austreiben; Obj. Kühe’ (WbRV. 19, niráje [inf.])
Arm. ace-	(ao.) ‘bring, lead, move, beat, etc.’ (EtDiArm. 16)
Lat. agō	(pr3.) ‘(be)treiben, führen, hetzen’ (WH 1:23-4)
Gr. ἄγω	(pr.) ‘treiben, leiten, führen, gehen’ (GEW 1:18)

(b) PIE √haḡr- ‘Acker, Feld, Trift, Flur, usw.’

Lat. ager	(m.) ‘Acker, Feld, Flur’ (WH 1:22, ager, agrī)
Gr. ἄγρο-	(m.) ‘Feld, Acker’ (GEW 1:16, ἄγρος [sgN])
Go. akr-	(m.) ‘Acker : field’ (GoEtD. 24, akrs [sgN])
RV. ájra-	(m.) ‘die bewachsene Ebene, die Flur’ (WbRV. 23)

(c) PIE √ḡnafi ‘kennen’ (P. 376-8, ablaut PIE \*ḡnafi- \*ḡneafi- \*ḡnēafi-):

RV. jajñ-	(pf.) ‘erkennen, wahrnehmen’ (WbRV. 501, jajñús)
RV. ṛta·jñá’-	(a.) ‘das Gesetz kennend’ (WbRV. 285, ṛtajñáas)

<sup>823</sup> The collision of Neogr. \*k̂ and \*kh implies that, in principle, every correspondence lacking a Greek parallel is ambiguous.

OIr. in ·gnad	(a.) ‘strange, wonderful, unusual’ (DIL. 406)
Li. ne ·žnó-	(vb.) ‘nicht wissen’ (LiEtWb. 1310, nežnóti [inf.])
Lat. gnāro-	(a.) ‘having knowledge, known’ (OxLatD. 786)

(d) PIE √ǵehfan- ‘gebären’ (P. 373-5 ḡen-)

Gr. πελι ·γόν-	(m.pl.) ‘γέροντες, οἱ ἐν τιμαῖς’ (GEW 2:498)
Gr. γέγον-	(pf.) ‘geboren werden’ (GEW 1:306-8, γέγονε [3sg])
RV. jajān-	(pf.) ‘gebären, erzeugen, schaffen’ (WbRV. 467-8)
Gr. πελι ·γῶν-	(m.pl.) ‘οἱ ἔνδοξοι, βουλευταί’ (GEW 2:498)
Li. žénta-	(m.) ‘Schwiegersohn, Schwager’ (LiEtWb. 1301)

The laryngeal is implied by Gr. ᾱ, the Lithuanian acute, and possibly also the lengthening of RV. jajāna [3sg] (Brugmann’s Law II).

§5. The voiced aspirate Neogr. \*ǵh (Grundr<sup>2</sup> 1:548-9) has been preserved in examples like:

(a) Neogr. \*ǵhei(m)- ‘Winter’ (P. 425-6)

Hĩ. giem-	(c?.) ‘Winter’ (HEG 1:571f, gi-e-mi [sgD])
gAv. zim-	(f.) ‘Winter’ (AIWb. 1700, zimō [sgG])
RV. hím-	(f.) ‘Kälte, Frost’ (WbRV. 1665, hímā [sgI])
Gr. χειματ-	(n.) ‘Winter’ (GEW 2:1079f., χειμα [sgNA])

(b) Neogr. \*ueǵh- ‘vhere’ (P. 1118-20)

RV. vah-	(ao.) ‘fahren, zu den Götter bringen’ (WbRV. 1243)
Lat. uehō	(pr3.) ‘fahren, führen, tragen, bringen’ (WH 2:742)
Pamph. φέχο-	(vb1.) ‘hintragen, darbringen’ (GEW 2:604, φεχέτω)
HLu. uaza-	(vb.) ‘carry’ (CHLu. 2.11.7, PES <sub>2</sub> (-) <sup>w</sup> /i-za-ha [1sg])

(c) Neogr. \*anǵh- ‘beengen’ (P. 42-43)

RV. ánh-	(f.) ‘Enge, Bedrängniss’ (WbRV. 3, áňhas [Abl])
Gr. ἄνωω	(pr.) ‘zu(sammen)schnüren, erdroßeln’ (GEW 1:17)
LAV. ąza-	(vb.) ‘bedrängen, in Not bringen’ (AIWb. 362, ązanhē)
Lat. angō	(pr.3) ‘beengen, zuschnüren’ [WH 1:47]

(d) Neogr. \*leiǵh- ‘(be)lecken, liebkosen’ (P. 668-9)

RV. ríh-	(ao.) ‘belecken, liebkosen’ (WbRV. 1168-9, rihaté [3pl])
Gr. λείγω	(pr.) ‘lecken’ (GEW 2:102)
Go. bi ·laigo-	(vb.) ‘lick’ (GoEtD. 70, bilaigodedun [pret3pl])
Arm. lize-	(vb.) ‘lecken’ (EtDiArm. 398, lizem [1sg]) <sup>824</sup>
OIr. ligi-	(vb.) ‘lecken’ (GEW 2:102, DIL 434, ligim [1sg])
Li. liēž-	(vb.) ‘öfters ein wenig lecken’ (LiEtWb. 369, liēžti)

<sup>824</sup> According to the well-known rule, Arm. z stands between vowels for Arm. j (elsewhere). Without contesting this, I remain uneasy because of counterexamples such as Arm. awji-k’ (sb.) ‘Halsband’ (Gr. ἀύχην- ‘Nacken, Hals’).

§6. The attempt to eliminate the series Neogr. \* $\hat{k}$   $\hat{k}h$   $\hat{g}$   $\hat{g}h$ <sup>825</sup> is based on a hypothesis according to which the plain velars became palatals before front vowels (especially PIE \*e, ē) in the Satem group.<sup>826</sup> In this argument, it is claimed that the palatovelars were analogically generalized to the environment before PIE \*o \*ō (via ablaut \*e/o). The supporters of the idea include Hirt (1898:224) and, more recently, Lehmann (1952:8 & 100-102) and some other scholars. The problems with this view are overwhelming, however:

(a) The assumption of only the two velars PIE \*k and \*k<sup>h</sup> is difficult, since – as mentioned by Miller (1976:47) “[...] Hirt’s discussion fails to explain how the velars came to be palatalized in other environments, as exemplified by \*ekwo- (Lat. equus; Skt. áśva- ‘horse’, Lith. ásvà ‘Mare’).”<sup>827</sup>

(b) The assumed analogical emergence of palatovelars before \*o, ō lacks rigour due to the existence of roots with \*e/o-ablaut without the first palatalization before \*e ē and \*o ō. This is the case, for instance, in:

PIE \*kes-, \*kos- ‘kämmen, scharren’ (P. 585)

Hi. keš-	(vb.) ‘to comb, card’ (HEG 1:587, ki-iš-zi)
Li. kàs-	(vb.) ‘scharren, graben’ (LiEtWb. 226, kàsti [inf.])
CLu. keša-	(vb.) ‘kämmen : peigner, carder’ (DLL. 55)
OCS. česa-	(vb.) ‘kämmen, abstreifen’ (Sadnik √105)

(c) The idea that plain velars became palatals (OInd. ś, etc.) before front vowels PIE \*e, ē in the Satem group violates the principle of regularity of sound change, because the plain velars before front vowels resulted in the second palatalization with well-known outcomes OInd. c, Av. č, OCS. č, Latv. c, etc.

(d) The claim of a complete absence of lacking palatal articulation in the Centum group<sup>828</sup> is inaccurate. The existence of the palatovelars (Neogr. \* $\hat{k}$ , etc.) in the Centum group is confirmed by Greek, where Neogr. \* $\hat{k}$   $\hat{k}h$   $\hat{g}$   $\hat{g}h$  followed by PIE \* $\hat{i}$  yielded Gr. σ σ ζ σ.<sup>829</sup> An identical development is now attested in Tocharian,<sup>830</sup> with the result that palatovelars are proven for the Centum group. As palatovelars are secured both for the Satem group and the Centum group, the attempt to eliminate them leads nowhere.

<sup>825</sup> For an account of this attempted elimination, see Tischler (1990:70).

<sup>826</sup> In Sihler’s (1995: 152) words, “the satem group FRONTED plain velar stops”.

<sup>827</sup> Similarly, Allen (1978:97) writes: “[...] exceptions have been cited by other scholars as a disproof of its validity – e.g. by Pisani (1963:51) the occurrence of Lat. octo: Skt aṣṭau < \*ōktō(u), where there is neither the phonetic environment nor any analogy to account for the palatal: cf. also Kuryłowicz 1956:357f.”

<sup>828</sup> See Sihler (1995:152), referring to “[...] the total lack of evidence pointing to specifically palatal articulation of \* $\hat{k}$ , \* $\hat{g}$ , and \* $\hat{g}h$  in ANY ‘centum language’.”

<sup>829</sup> See Brugmann (1900<sup>3</sup>: §38).

<sup>830</sup> For an isogloss containing both Greek and Tocharian, see PIE √ $\hat{g}i$ ah<sub>1</sub>- in Gr. ἐν-ζά(φ)ω (vb.) ‘live in’ (LSJ 565) : TochA. śāw- (vbA.) ‘vivere’ (Poucha 326, śāwiṣ [opt3sg]) and TochB. śāwe- (vb.) ‘live’ (DTochB. 627, śāweṃ [3pl]).

§7. The main contribution to the segmental analysis of the Proto-Indo-European palatovelars has been presented by Szemerényi (1996:148), “The preconsonantal palatals [...] owe their origin, at least in part, to a lost palatal vowel.” The details of the palatalization, supported by typology,<sup>831</sup> are provided by Szemerényi (1964:400) in his related comment:

“Palatalization is impossible before another stop. We must therefore infer that ‘eight’ at one time had a palatalizing vowel between k and t which was later lost. [...] I would simply state that the most likely form seems \*okitō.”

Szemerényi’s identification of PIE \*i as the phonetic origin of the first palatalization (Neogr. \*k̂ ≡ PIE \*ki) is correct, because the front vowels PIE \*e, ē are the main cause of the second palatalization, and are therefore not capable of accounting for the first one. In other words, the first palatalization is essentially an ‘i-palatalization’ and the second palatalization is an ‘e-palatalization’. Szemerényi’s idea makes perfect sense, because the palatovelars Neogr. \*k̂, ġ, ... contain \*i and are, therefore, capable of appearing in all environments.<sup>832</sup> Accordingly, Szemerényi’s treatment of the first palatalization can be generalized by setting the definitions for the non-aspirated items:

Neogr. \*k̂ ≡<sub>df</sub> PIE \*ki      Neogr. \*ġ ≡<sub>df</sub> PIE \*gi<sup>833</sup>

with an unaccented PIE \*i (→ \*i̯).<sup>834</sup>

§8. Szemerényi’s outstanding work is not restricted to the conjecture, but includes a sketch of a proof. Thus, according to Szemerényi (1996:146):

“Most scholars see themselves rather as forced to the conclusion that the palatals arose secondarily from fronted velars [...]. Since on this supposition the development of palatalization depends on certain conditions [...] the survival of some non-palatalized forms is in principle to be expected.”

Szemerényi’s suggestion, involving a preserved PIE \*í and/or schwebeablaut (i.e. a velar root with palatal diphthong alternating with a palatovelar root), can indeed be supported by the material to a degree. Thus, for instance, we may reconstruct PIE \*koiuo- ‘horse’ for the items:

OPr. kaywe-	(f.) ‘kobele d.h. Stute’ (APrS. 351, kaywe [sgN])
LAv. kaēva-	(m.) ‘EN eines Gläubigen’ (AIWb. 429)

<sup>831</sup> See also Miller (1976:48): “[...] typologically speaking, languages do not generally have palatalized velars except as a result of a palatalization process.”

<sup>832</sup> Thus, the palatovelar appears before Neogr. \*a in RV. śad- (Lat. cad-), before Neogr. \*r in RV. śmaśru-, before Neogr. \*u in RV. śvaśrū-, before Neogr. \*m in RV. aśman-, before Neogr. \*l in RV. śru-, etc.

<sup>833</sup> PIE \*gi in environments \*h—gi and \*gi—h.

<sup>834</sup> Thus, PIE \*haekim- is reconstructed for Neogr. \*(h)akm- (Gr. ἄκμων), PIE \*giehian- for Neogr. \*ġen- (Gr. γειν-), and so forth.

Though its meaning is unknown, the lineage of the Avestan name (LAv. *fṛīnaspāhe kaevahe ašaonō*) can contain a *figura etymologica* (i.e. point to a direct connection) between LAv. *kaēva-* and LAv. *aspa-* through schwebeablaut PIE *\*ekiuo-* : *\*koiuo-*.<sup>835</sup> The proof sought from this direction faces, however, the usual ambiguity problems caused by the three-term nature of the the velar series. Here the loss of the labiovelars in the Satem group means that an initial Neogr. *\*k<sup>h</sup>* is equally possible for OPr. *kaywe-* : LAv. *kaēva-* unless a match with the Centum group proving otherwise is found.<sup>836</sup>

§9. The true factor necessitating the segmental analysis of the palatovelars with Szemerényi's methodology is not the unaspirated palatals, but the aspirated ones, because their traditional writing Neogr. *\*k<sup>h</sup>* *\*g<sup>h</sup>* does not cover the actual distinctions of the data. This is caused by the fact that the cover symbols Neogr. *\*k<sup>h</sup>* *\*g<sup>h</sup>* stand for four distinctive starting points of the proto-language, as expressed by the definitions:

Gr.  $\chi$  : RV.  $\acute{s}$  : Av. *s*     $\equiv_{df}$  PIE *\*kiah* v *\*kiha* v *\*kahi* v *\*khai* (= Neogr. *\*k<sup>h</sup>*)  
 Gr.  $\chi$  : RV. *h* : Av. *z*     $\equiv_{df}$  PIE *\*giafi* v *\*gifa* v *\*gafi* v *\*gfai* (= Neogr. *\*g<sup>h</sup>*)

Because evidence for the voiceless aspirate Neogr. *\*k<sup>h</sup>* is scarce, I will illustrate the segmental analysis with roots now marked with Neogr. *\*g<sup>h</sup>*. Some examples of the different segmental starting points of Neogr. *\*g<sup>h</sup>* are:

(a) Neogr. *\*g<sup>h</sup>*  $\equiv_{df}$  PIE *\*giafi* is contained, for example, in:

PIE *\*giafem-* 'Erde' (P. 414-6)

OCS. *zemja*                    (f.) 'earth' (Sadnik  $\sqrt{1132}$ )  
 Li. *žēmė*                      (f.) 'Erde, Boden, Acker, Land' (LiEtWb. 1299)

The voiceless alternative of the root PIE *\*kieahm-* 'liegen, Lager' (Pyysalo 2011) reveals the expected vocalism Lat. *a* in:

Gr.  $\kappa\acute{\omega}\mu\eta-$                     (f.) 'Dorf, Quartier, Viertel einer Stadt' (GEW 2:61-2)  
 Lat. *camā-*                    (f.) 'kurzes, niedriges Bett, Pritsche' (WH 1:145)  
 Gr.  $\kappa\acute{\omega}\mu\alpha\tau-$                     (n.) 'tiefe, ruhiger Schlaf' (GEW 2:61)

(b) Neogr. *\*g<sup>h</sup>*  $\equiv_{df}$  PIE *\*gifa* is preserved, for example, in:

PIE *\*gifaer-* *\*gifaor-* 'age, old' (P. -)

Gr.  $\chi\acute{\alpha}\rho\omega\nu$                     (m.) 'an old man' (IE&IE 724)  
 OInd. *jharjharita-*            (a.) 'zerschlagen, welk, verdorben' (KEWA 1:422)  
 Av. *a zarəšant-*              (a.) 'nicht alternd' (AIWb. 225)  
 LAv. *zarəta-*                    (pp.) 'altersschwach' (AIWb. 1682)

<sup>835</sup> For a lively discussion on etymologically related names in the Indo-European lineage (in Greek) with a remark on "the habit of giving the son a component of his father's name", see Palmer (1980:34ff.).

<sup>836</sup> Certainly, however, Pedersen's (1900:293) pessimism regarding the possibilities of the analysis is exaggerated: "Zwar ist es sehr gut möglich daß alle drei reihen auf eine reihe zurückgehen, aber irgend eine spur von dieser entstehung in den uns erreichbaren sprachforme finden zu vollen ist eine unternehmen, das meiner ansicht nach nur misslingen kann."

This root – with PIE \*fia proven by Gr. ἄ – is related to the well-known root PIE \*gieh̥ar- ‘old age’ (P. 390-391):

RV. jára-	(pr.) ‘aufreiben, gebrechlich/alt machen’ (WbRV. 479)
Arm. cer	(sb.) ‘Greis : old, elder’ (Grundr <sup>2</sup> 1:116)
RV. jára-	(a.) ‘alternd’ (WbRV. 485, PIE *gioharo- <sup>837</sup> )
Gr. γηράσ-	(n.) ‘Alter’ (GEW 1:304)

(c) PIE \*gafheir- ‘Geier, Begierde’<sup>838</sup>

OHG. gîr-	(m.) ‘Geier’ (AhdEW. G-57)
OHG. gîra-	(f.) ‘Begierde, Habgier’ (AhdEW. G-57)
OHG. gîrheit-	(f.) ‘Gier, Begierde, Habsucht’ (AhdEW. G-59)

The root with a respective palatovelar is attested in:

√gafhier- ‘begehren, gern haben’ (P. 440-1, ḡher)

OHG. ger	(a.) ‘begehend, verlangend’ (AhdEW. G-14)
gAv. zara-	(m.) ‘Ziel, Streben’ (?) (AIWb. 1670)
RV. hárya-	(pr.) ‘gern haben’ (KEWA 3:583)
OHG. giri-	(a.) ‘begierig, habgierig’ (AhdEW. G-59)
Osc. heriio-	(vb.) ‘wollen’ (WbOU. 321-2, heriad [conj3sg])

§10. In the alternations of voice and (schwebe)ablaut, the palatovelars behave similarly as the other plosives (i.e. form variants T : Th : D : Dh). The variation can be exemplified with the root PIE \*kiahu-, \*giahu- ‘Kraft Stärke’:

(a) PIE \*kiáhu ·r, the root with ‘unaspirated tenuis T’, appears in

RV. sú’ura-	(m.) ‘der Starke, der Held’ (WbRV. 1411) <sup>839</sup>
RV. súra-	(a.) ‘stark, heldenhaft’ (WbRV. 1411)
gAv. a ·sūra-	(a.) ‘unstark, unvernünftig’ (AIWb. 211)
Gr. κῆροσ-	(n.) ‘Bekräftigung, Rechtskraft’ (GEW 2:53-4)

(b) PIE \*kiahu ·r, the root with ‘aspirated tenuis Th’, appears in

RV. súr ·údh-	(m.) ‘der Starke, der Held’ (WbRV. 1407)
RV. súr ·údh-	(f.) ‘stärkender Trank’ (WbRV. 1407)

following the loss of PIE \*a.

(c) PIE \*gieafhu ·r/s, the root with ‘unaspirated media D’, appears in

LAv. zāvar-	(n.) ‘(physische) Kraft, Stärke’ (AIWb. 1689, zāvāra)
Gr. γαῦρο-	(a.) ‘stolz, übermutig’ (GEW I:292)
MidIr. gūaire	(a.) ‘edel’ (WH 1:535)
gAv. zavah-	(n.) ‘Kraft, Stärke’ (AIWb. 1669)

<sup>837</sup> Unless we are able to prove PIE \*o structurally, the quantity of RV. jára- remains ambiguous owing to its possible identity with Gr. γηράω (pr.) ‘altern, reifen’.

<sup>838</sup> For AhdEW. G, see [www.indogermanistik.uni-jena.de/dokumente/PDF/G-Woerter.pdf](http://www.indogermanistik.uni-jena.de/dokumente/PDF/G-Woerter.pdf).

<sup>839</sup> The three-syllabic Rig-Vedic scansion proves PIIr. \*cúhura- ← PIE \*káhuro-.



(d) PIE \*ǵafu ·r/s-, the root with ‘aspirated media Df’, appears in

LA.v. vī ·zvārant-	(a.) ‘tüchtig, geschickt’ (AIWb. 1472)
MidIr. guss	(.) ‘Kraft, Heftigkeit, Zorn’ (P. 448 [diff.])
Gr. σὺν χέο-	(vbM.) ‘zürnen, unwillig zein’ (GEW 2:1125)
Gr. χόο-	(vbM.) ‘zürnen, unwillig zein’ (GEW 2:1125, χόομαι)

#### 4.8.5 Proto-Indo-European velars in System PIE

§0. The key facts concerning the Proto-Indo-European velar system can be summarized as follows:

(a) A consistent reconstruction theory requires all three places of articulation of the classical theory Neogr. \*k : k̂ : k<sup>u</sup>, etc. (Bezzenberger, Brugmann, Tischler, etc.) with the four variants T : Th : D : Df. The oppositions are independent of environment, with the result that attempts to eliminate any series are not recommended.

(b) The postulation of a single plain velar PIE \*k suffices for the reconstruction of the entire classical velar system:

1. The voiced velar PIE \*g appears in environment PIE \*fi.

2. Followed by PIE \*u, PIE \*k is the starting point of the labiovelars Neogr. \*k<sup>u</sup> = PIE \*k+u, etc. (Reichel).

3. Followed by PIE \*i, PIE \*k is the starting point of the palatovelars Neogr. \*k̂ = PIE \*k+i, etc. (Szemerényi).<sup>840</sup>

§1. Starting from the minimal set of one velar (tectal) PIE \*k, the following definitions equal the classical array of the Neogrammarians:

Gr. κ : OInd. k/c	≡ PIE *k	(Neogr. *k)
Gr. χ : RV. kh/c	≡ PIE *kah v kha	(Neogr. *kh)
Gr. γ : RV. g/j	≡ PIE *g (in fi—g, g—fi)	(Neogr. *g)
Gr. χ : RV. gh/h	≡ PIE *gafi v gfi	(Neogr. *gh)
Gr. τ/π : RV. k/c	≡ PIE *ku	(Neogr. *k <sup>u</sup> )
Gr. φ/θ : RV. kh/c	≡ PIE *kahu v khau	(Neogr. *k <sup>u</sup> h)
Gr. β/δ : RV. g/j	≡ PIE *gu (in fi—gu, gu—fi)	(Neogr. *g <sup>u</sup> )
Gr. φ/θ : RV. gh/h	≡ PIE *gafu v gfau	(Neogr. *g <sup>u</sup> h)
Gr. κ : RV. ś : Av. s	≡ PIE *ki	(Neogr. *k̂)
Gr. χ : RV. ś : Av. s	≡ PIE *kiah v kiha v kahi v khai	(Neogr. *k̂h)
Gr. γ : RV. j : Av. z	≡ PIE *gi (in fi—gi, gi—fi)	(Neogr. *ḡ)
Gr. χ : RV. h : Av. z	≡ PIE *giafi v gifia v gafi v gfai	(Neogr. *ḡh)

Requiring only a single item PIE \*k, this is the most economical existing solution.

§2. An alternation of the palatovelars Neogr. \*k̂ kh ḡ ḡh and plain velars Neogr. \*k kh g gh has been proposed for some examples of the data.<sup>841</sup> The incomplete

<sup>840</sup> Steensland (1973:93) writes: “Es ist daher völlig klar, daß die verstellung der gutturale in irgendeiner weise mit dem wurzelvokalismus zusammenhängt.”

<sup>841</sup> See Brugmann (Grundr<sup>2</sup> 1:544-547), Tischler (1990:80) and Steensland (1973:101ff.).

satemization (for this terminology, see Szemerényi 1996:146n1) is, however, unacceptable.<sup>842</sup> Sound changes do not allow exceptions, and consequently the comparisons of phonetically incompatible palatalized and unpalatalized roots must be erroneous. The solution lies in the vast Indo-European vocabulary, as a rule containing palatalized and unpalatalized roots confirmed by two witnesses (Fick's Rule). Some examples of distinct roots with and without palatovelars are discussed next.

(a) The alternation \*k : k̂. In this type, most forms are attested with a plain velar, but an occasional palatovelar appears. This is the case, for example, with the root

PIE √luk- 'Morgen : tagen' (P. 687-690):

Ḫi. luk-	(vb1A/M) 'hell werden, tagen' (HEG 2:65-)
Gr. λυκ·αυγήσ-	(a.) 'morgendgrauend' (GEW 2:149)
RV. rúk-	(f.) 'Glanz, Licht, Ansehen' (WbRV. 1172)

In addition, a root form with palatal (see Hirt 1927: 239-40) appears in RV. rúsant- (pt.) 'leuchtend, hell, licht' (WbRV. 1177). This is not an indication of irregularity, because the palatal root is also externally paralleled:

PIE √luki- 'Morgen, Glanz ; hell werden, tagen' (Neogr. \*luk̂-)

Arm. lus-	(sb.obl.) 'Licht' (ArmGr. 453, lusoy [sgG])
RV. a·ruśa·hán-	(a.) 'dunkle (Wolke) schlagend' (WbRV. 10)
RV. rúsant-	(pt.) 'leuchtend, hell, licht' (WbRV. 1177)
Arm. lusa·vor	(sb.) 'lichtbringend, leuchtend' (ArmGr. 429)

In this case, the root Neogr. √luk̂- is a derivative of PIE \*luk-, the primary root with a plain velar.

(b) The root P. 444 gherdh-, ostensibly reconstructed with a plain velar, masks a labiovelar and a palatovelar root, both externally confirmed:<sup>843</sup>

1. Neogr. \*g<sup>h</sup>ordh- (PIE \*gafu(o)rdañ-) 'encirclement, castle' (HEG 1:658f.)

Ḫi. gurda-	( <sup>É</sup> c.) 'Burg, Akropolis, Zitadelle' (HHand. 86)
LAv. gərəða-	(m.) 'Höhle als Behausung' (AIWb. 522-3)
Li. gāřda-	(m.) 'Pferch' (LiEtWb. 135)
Alb. gardh-	(m.) 'fence' (AlbEtD. 110, garth, gardhe [plN])
OCS. gradŭ	(m.) 'Stadt' (Sadnik √253)
Phryg. mane·gordu-	(ON.) 'Mannes-Stad' (P. 444)

<sup>842</sup> Note that while Szemerényi uses the term 'incomplete satemization', his (1990:155 = 7.2.2.2) explanation of the issue is practically identical with one favoured here: "Da bei dieser Annahme die Entwicklung der Palatalisierung an gewisse Bedingungen gebunden ist – vor allem an ein folgendes e, i oder y-, ist auch das Weiterleben von nichtpalatalisierten Formen prinzipiell zu erwarten." For the full discussion, see Szemerényi (1990:154-159).

<sup>843</sup> For the emergence of such doublets in etymology, observe Pokorny's shortcut (1969:5): "Bei der Anordnung der Lemmata habe ich, im Gegensatz zu W.-P., bei den Gutturalen nur Palatale, reine gutturale und Labiovelare unterschieden, und an Stelle des unsicheren Fällen verwendeten q einfach k geschrieben."

OCS. o·gradi- (vb.) ‘fence in, enclose’ (Sadnik √235, ogradi [ipv2sg])

2. PIE \*gʰiardafi- ‘id.’ (Neogr. \*gʰordh-, P. 442, 444)

Go. gard- (m.) ‘house, court’ (GoEtD. 147, gards [sgN])

Li. žaīdi- (m.) ‘umzäunter Weideplatz’ (LiEtWb. 1290)

Phryg. mane·zordu- (ON.) ‘Mannes-Stad’ (P. 444)

The root is a derivative of the following formation.

3. PIE \*gʰiart- ‘Gehege, Hof, usw.’ (P. 442, 444)

Osc. hort- (f<sup>2</sup>.) ‘Hain’ (WbOU. 334, Osc. hūrz, hūrtúm)

Lat. co·hort- (f.) ‘eingezäunter Hofraum, Viehhof’ (WH 1:242)

Gr. γόρτο- (m.) ‘Gehege, Hof’ (GEW 2:1112, γόρτος)

Cymr. garth (.) ‘Pferch, Hürde, Gehege, Hofraum’ (WbOU. 335)

TochB. kercī (m.pl.) ‘palace’ (DTochB. 196)

Similar examples are not uncommon and the variation is explained through an etymological difference rather than incomplete satemization.<sup>844</sup>

(c) From the morphological perspective, the segmental analysis of palatovelars means a shift towards a more flexible idea of Proto-Indo-European root formation. Thus, examples of a detailed derivation of Neogr. \*gʰh, contained in the etymology of the root Neogr. \*dheigh- (P. 244-5), can be shown in:

PIE *dahik-	(Neogr. *dhik- = Df̄—T)
Osc. fificus-	(2fut.) ‘ausgedacht haben werden’ (WbOU. 279, fificus)
OFal. fifike-	(vb.) ‘finxit’ (WbOU. 279, fifiked [3sg]) <sup>845</sup>
PIE *dahig-	(Neogr. *dhig- = Df̄—D) <sup>846</sup>
Gr. θιγό-	(ao.) ‘mit der Hand berühren, antasten’ (GEW 1:674-5)
Lat. figulo-	(m.) ‘Töpfer’ (WH 1:502)
Lat. fig·ūrā-	(f.) ‘Bildung, Gestaltung, Figur’ (WH 1:502)
Go. ga·dikis-	(n.) Gr. πλάσμα ‘molded figure’ (GoEtD. 90)
PIE *dahigafi-	(Neogr. *dhig- = Df̄—Df̄)
OInd. sam·dégh-	(ao.) ‘smear, cover’ (MonWil. 1143, samdegdhi)
OInd. sam·deghá-	(m.) ‘conglomeration’ (MonWil. 1143)
PIE *dahigafi-	(Neogr. *dhig- = Df̄—Df̄)
RV. dih-	(vb.) ‘bestreichen, verkitten’ (WbRV. 608, dihānāḥ [pt])
LAv. uz·diz-	(pt.) ‘aufhäufen, -schichten, -mauern’ (AIWb. 673-4)
RV. pári (...) déh-	(ao.) ‘überziehen, bedecken’ (WbRV. 608, pári déhat)

<sup>844</sup> Cf. also Neogr. \*gʰhel- (Lat. fel-, Li. gełta-, Lat. folus) vs. Neogr. gʰhel- (Lat. helus ‘vegetables, greens’) and so forth.

<sup>845</sup> Note, however, that Walde’s translations are uncertain. So are the attested forms (Osc. fif[ic]us, Fal. f[if]iquod, fificed); see Untermann (WbOU. 279).

<sup>846</sup> Apparently derived from PIE \*dahik- with the root constraint Df̄—T → Df̄—D.

LAv. pairi·daēza- (m.) ‘Umwallung, Ummauerung’ (AIWb. 865)

Consequently, it is possible to account regularly in System PIE for the formerly problematic alternations involving incomplete satemization in Neogr. \*dhik- : \*dhig- : \*dhigh- : \*dhiġh-.<sup>847</sup>

§3. The Old Anatolian Satem languages (to wit, Luwian) have undergone the first palatalization (viz. the affricativization of the palatovelars), and they preserve the labiovelar series as a whole. These features have turned a corner in the study of the Centum-Satem isogloss. Simultaneously, they have caused some confusion, as the early definition was based on the assibilation of Neogr. \*k̂ kĥ ġ ģh and the merger of Neogr. \*k<sup>u</sup> k<sup>h</sup> g<sup>u</sup> g<sup>h</sup> and Neogr. \*k kh g gh in the Satem group.<sup>848</sup> This view is now outdated by the data, because there are two independent variables, the treatment of the palatals and the treatment of labiovelars, with the two axes actually defining four types of languages instead of two (Satem vs. Centum). All four types are actually attested, as can be seen from the modernized classification:

- (a) +Palatalized and +Labiovelar languages. This group consists of the Anatolian Satem languages continuing both series (e.g. cuneiform Luwian and Lycian).
- (b) +Palatalized and –Labiovelar languages. This group consists of the traditional Satem languages indirectly preserving the palatovelars, but having lost the labiovelars (e.g. Lithuanian and Avestan).
- (c) –Palatalized and +Labiovelar languages. This group consists of the traditional Centum languages having lost palatovelars, but preserving labiovelars as distinct from the plain series (e.g. Latin and Greek).
- (d) –Palatalized and –Labiovelar languages. This group consists of the Centum languages that have lost palatovelars and merged the labiovelars with the plain velar series. The group consists of Tocharian and Irish (except for Neogr. \*g<sup>u</sup> → OIr. b).

## 4.9 Proto-Indo-European fricatives

### 4.9.1 General remarks on the historical fricative systems

§0. Two series of fricatives were postulated for the proto-language by the Neogrammarians:

Neogr. \*s sh z zh (sibilants)

Neogr. \*p̪ ph̪ ð̪ ð̪h (interdentals).

In contrast with the two abundant arrays of sibilants and interdentals, no segmental laryngeal was included in the traditional phoneme inventory. These factors make the fricative system the weakest link of the Neogrammarian reconstruction, and it required considerable modifications.

<sup>847</sup> The other alternations of aspirated stops Neogr. \*gh : ġh (cf. OInd. drogh- : droḡhar-) are to be explained similarly (i.e. with a suffix \*·i-).

<sup>848</sup> See Melchert (1989:204): “In conclusion, I wish to stress one point regarding centum/satem in Anatolian. [...] Luwian (CLuvian, HLuvian, Lycian) is neither centum nor satem, since it would show neither a merger k̂, k > k nor k, k<sup>w</sup> > k, but a three-way contrast.”

§1. Proto-Indo-European had only two (dental/alveovelar) sibilants, PIE \*s and PIE \*z. The typologically postulated items Neogr. †sh †zh do not exist, except for the clusters of PIE \*s+h and PIE \*z+h with the segmental laryngeals PIE \*h and PIE \*h̥.

§2. The series Neogr. \*þ þh ð ðh ('thorn') was postulated through the comparison of etymologically differing proto-phonemes IIr. s : Gr. τ/θ in a similar manner as the syllabic sonants of Brugmann and Osthoff. When the complete data is accounted for, sibilants and dentals can be externally paralleled. Therefore, abandoning the series is recommended (see Chapter 1).

§3. As already discovered by the monolaryngealist school (Zgusta, etc.), a single segmental laryngeal PIE \*h̥ is implied for the proto-language by the comparative method of reconstruction, a result independently confirmed in this study. For this phoneme, a glottal fricative articulation (Szemerényi) with voiceless and voiced values PIE \*h/h̥ (Pyysalo) can be secured.

#### 4.9.2 The sibilants PIE \*s and \*z

§0. The parent language had a single coronal sibilant, PIE \*s (≡ Neogr. \*s), with the voiced allophone PIE \*z (≡ Neogr. \*z) conditioned by the environment z+D(h). The place of articulation of the fricative PIE \*s remains uncertain (whether it is dental or alveolar), but as no opposition exists between the alternatives the exact pronunciation remains a matter of lesser importance.

§1. The examples of PIE \*s (Grundr<sup>2</sup> 1:722-89, Szemerényi 1996:51-2) include:

(a) PIE \*sept- 'seven' (P. 909, Grundr<sup>2</sup> 1:722, HEG 2:1061f.)

RV. saptá-	(ord.) 'sieben' (WbRV. 1474)
Gr. ἑπτᾶ-	(num.) 'sieben' (GEW 1:545)
RV. sāptá-	(n.) 'Siebengespann' (WbRV. 1512)
Lat. septem	(num.) 'sieben' (WH 2:517)
Cpd. śaptama-niga-	(f.c.) '7th' (NOMS. 1111, śa-áp-ta-ma-ni-ga)
Īi. śeptamia-	(n.) 'Flüssigkeit' (HHand. 152, ši-ip-ta-mi-ia)

(b) PIE \*srehau- 'stream, flood' (P. 1003, sreu-, Grundr<sup>2</sup> 1:722)

RV. sráva-	(pr.) 'strömen, fließen' (WbRV. 1618, srávanti [3pl])
Gr. ῥέ(Ϝ)o-	(pr.) 'fließen, strömen' (GEW 2:650f., ῥεῖ [3sg])
Li. srovė-	(4f.) 'Ströme' (LiEtWb. 888)
OIr. srūaim-	(n.) 'flot, grande quantite' (LEIA S-188)

(c) PIE \*ues- 'kleiden' (P. 1172-3, Grundr<sup>2</sup> 1:722)

RV. vás-	(aoM.) 'sich anziehen, kleiden in' (WbRV. 1231, váste)
Īi. ueš-	(vb1.) 'gekleidet sein, angezogen sein' (HHand. 201)
CLu. uaš-	(iA) 'bekleiden, anziehen' (DLL 108, ua-aš-ḡa [1sg])
Go. wasja-	(vb.) 'dress, be dressed' (GoEtD. 395, wasjan [inf.])
Lesb. (Ϝ)έμμα-	(n.) 'Kleid' (GEW 1:521, (Ϝ)έμμα [sgNA])

Lat. uesti- (f.) ‘Kleid, Gewand’ (WH 2:773, uestis [sgN])

§2. According to the Indo-Iranian ‘ruki-rule’<sup>849</sup> and its Balto-Slavonic counterpart (also known as Pedersen’s Law), the sibilant of the proto-language was retracted in the sound change

PIE \*s → Av. š (OInd. ś), Li. š (OCS. ch), etc. (RUKI)

after \*r u K i in Indo-Iranian and Slavonic (but in Lithuanian only after \*r). The sound law is beyond doubt, but there is a set of hitherto unexplained exceptions, both in Indo-Iranian and in Slavonic:

(a) Several Vedic counterexamples are the earliest possible:

RV. kīstá- (m.) ‘Sänger, Dichter’ (WbRV. 328, KEWA 1:217)  
AV. bísa- (n.) ‘Wurzelschoss (der Lotuspflanze)’ (WbRV. 907)<sup>850</sup>  
AV. sísa- (n.) ‘Blei’ (Burrow 1976:33, EWA 1:734, EWA 3:478)

These ancient exceptions are accompanied by dozens of similar exceptions in the later language, many of which have been accounted for by Burrow:

OInd. kāśisa- (sb.) ‘green vitriol/sulphate of iron’ (Burrow 1976:33)  
OInd. kisara- (sb.) ‘an aromatic substance’ (Burrow 1976:33)  
OInd. kisalaya- (sb.) ‘leaf-bud, sprout, shoot’ (Burrow 1976:33)  
OInd. píśya- (pr.) ‘stretch, expand’ (Burrow 1976:33)  
OInd. péśuka- (a.) ‘expanding’ (Burrow 1976:33)  
OInd. avi marīsa- (sb.) ‘sheep-milk’ (Burrow 1976:33)

(b) The etymologies, when available, speak for the Proto-Indo-European character of the formations.<sup>851</sup> Thus, a PIE root can be postulated for an exception of the ruki-rule in:

PIE √h<sub>1</sub>al- ‘Höhlung; tief’

PIE √h<sub>1</sub>alb-

RV. ṛb-śisa- (.) ‘a hole in the earth’ (Burrow 1976:33, KEWA 1:124)

PIE √h<sub>1</sub>alu-

Ĥi. ḥalu- (a.) ‘tief’ (sb.) ‘Höhlung’ (HEG 1:135-6)

OInd. arvīśa- (.) ‘a hole from which vapours arise’ (Burrow 1976:33)

Therefore, an explanation that can be traced back to Proto-Indo-European phonology is needed.<sup>852</sup>

<sup>849</sup> See Collinge (1985:143-5) and Szemerényi (1996:51-2).

<sup>850</sup> RV. bisa-ḥá- (m.) ‘der Wurzelschosse ausgräbt, W. ausgrabend’ (WbRV. 907).

<sup>851</sup> Note that Burrow’s catalogue of the counterexamples of the ruki-rule implies that the Indo-Iranian exceptions occur only after PIIr. \*r u i, but never after \*K (note that the same applies to Slavonic as well).

<sup>852</sup> Note the rare, but existing Slavonic counterexamples restricted to Neogr. \*us ūs → OCS. ūs, ys, confirming the PIE origin of the phenomenon.

§3. Some comparatively secure conclusions can be drawn, based on the counterexamples of the ruki-rule:

(a) The stem RV. *kīstá-* requires three-syllabic scansion with hiatus RV. ' ← PIE \**h* and an extra vowel RV. *ī* ← PIE \**a*, thus representing a full form:

RV. *kīīstá-* (m.) 'Sänger, Dichter' (WbRV. 328)<sup>853</sup>

The proto-form PIIr. \**Kīhastó-* contains PIE \**i* followed by PIE \**ha* before PIE \**s*. In other words, the diphonemic PIE \**ha* between the semi-vowel and the sibilant has prevented the ruki-rule from occurring. By generalizing this behaviour to PIE \**u* and PIE \**r*, the exceptions of the ruki-rule can be conditioned by the 'ruihas-rule' in the environment

PIE \**rui+ha+s* → IE *rui+s* (where \**h* ≡ PIE \**h* v \**h*).<sup>854</sup>

(b) According to the induction hypothesis, we can postulate a diphonemic PIE \**ha* for the exceptions of the ruki-rule in examples like:

1. PIE \**bufias-* 'dicht, Dichte' (P. –, KEWA 2:440f.)

RV. *busá-* (n.) viell. 'das Dichte, das Dunkel' (WbRV. 910)

Gr. βύζην (adv.) 'dicht gedrängt, eng aineinander' (GEW 1:277)

The laryngeal PIE \**h* is thus implied by two witnesses, the voiced obstruent Gr. β = RV. b and the ruihas-rule.

2. PIE \**blfias-* 'lästern, schmähen, zaubern' (P. 719)<sup>855</sup>

RV. *bṛśaya-* (m.) etwa 'Zauberer' (WbRV. 910)

RV. *bṛśaya-* (m.) 'Bezeichnung eines Dämons' (WbRV. 910)

Gr. βλασ·φημο- (a.) 'lästernd, verumleumdend' (GEW 1:241-2)

Gr. βλασ·φημέω (pr.) 'schmähen, lästern, verumleumden' (GEW 1:241)

The laryngeal is implied by Gr. α, the voiced value by Gr. β = RV. b, and diphonemic PIE \**ha* (vs. PIE \**ah*) by the ruihas-rule. In this manner, the ruihas-rule is compatible with the other sound laws and provides an additional criterion for reconstruction of the laryngeal and a means of choosing between the alternatives PIE \**ha* and \**ah*. Due to the limited number of comparative etymologies, the sound law needs to be extensively tested.

(c) On the other hand, if a root with PIE \**r/u/i* is followed by PIE \**h* and PIE \**s* and the ruki-rule has taken effect, then PIE \**rui+ah+s* is to be reconstructed (the principle of the regularity of sound change). As an example, I quote the root

PIE \**giuafis-* 'kosten, wünschen, usw.' (Neogr. \**ǵeus- ǵus-*, P. 399):<sup>856</sup>

<sup>853</sup> Here PIE \**ha* (not \**ah*) is required by the hiatus (= RV. *kīīstá-*) and the following vowel, necessitating PIE \**a* in the absence of any other vowel capable of being lost.

<sup>854</sup> As the sequences PIE \**rhas* \**uhas* \**ihas* were immune to the ruki-rule, I will call the principle governing the counterexamples the 'ruihas-rule'.

<sup>855</sup> Pokorny, assuming an original meaning "als Verfehltes, Unpassendes sagend" connects the Greek items with the root 2. *mel-* (cf. Li. *māla-* 'Lüge'). This is problematic, however, owing to the difference in meaning and schwebeablaut.

RV. sa-júš-	(prpI.) ‘vereint, zusammen, zugleich’ (WbRV. 1449)
OIr. asa-gū-	(.) ‘er wünsche’ (VGK 2: 549, asagū [3sg])
LAv. zuš-	(a.) ‘gefällig, anmutig, entzückend’ (AIWb. 1698)
Gr. γεύ(η)ο-	(pr.) ‘kosten, kosten lassen’ (GEW 1:302, γεύομαι)

PIE \*a is implied by the quantity RV. ú ≡ OIr. ū, the voiced laryngeal PIE \*h by the root-initial voiced velar (RV. j ≡ Gr. γ), and PIE \*ah by the ruki-rule (RV. š = Av. š).

§4. PIE \*z, the voiced counterpart of PIE \*s, is generally attested only before the voiced mediae and mediae aspiratae (i.e. in the environment zD(h)). The distribution reflects a regressive assimilation of voice PIE in \*sD(h) → zD(h),<sup>857</sup> due to which PIE \*z is usually not reconstructed in examples such as:

(a) PIE \*hasd- ‘Ast’ (P. 782)

Gr. ὄζο-	(m.) ‘Ast, Zweig, Schößling’ (GEW 2:353, ὄζος)
OEng. ὄst	(m?.) ‘knot, knob’ (ASaxD. 768)
Arm. ost	(sb.) ‘branch, twig’ (ArmGr. 482)
Ғi. һаѕдуир	( <sup>GIŠ</sup> n.pl.) ‘Zweige, Reisig, Bast’ (HEG 1:206)

(b) PIE \*misdañ- ‘Lohn, Sold, Miete, Gewinn’ (P. 746)

Gr. μισθό-	(m.) ‘Lohn, Sold, Miete, Tagelohn’ (GEW 2:244)
LAv. mižda-	(n.) ‘Lohn, Gewinn, Vorteil’ (AIWb. 1188)
RV. miḍhá-	(n.) ‘Kampf, Wettkampf’ (WbRV. 1046)
OCS. mīzda-	(f.) ‘Lohn’ (Sadnik √525)
Go. mizdō-	(f.) ‘Lohn’ (GoEtWb. 259)
OEng. meard-	(f.) ‘reward, pay’ (ASaxD. 679)

§5. In a few examples, however, PIE \*z appears as a segmental phoneme without an immediately following voiced plosive D(h). The rare occurrences of this PIE \*z in alternation with PIE \*s include, for instance, the following:

(a) PIE \*señad \*zeñad- ‘sedere’ (P. 884f.)<sup>858</sup>

Lat. sedent-	(pt.) ‘sitzend’ (WH 2:507, sedentis [sgG])
Umbr. zeřent-	(pt.) ‘sedens’ (WbOU. 659, zeřef [sgN]) <sup>859</sup>
Li. sedlu-	(.) ‘saddle’ (LiEtWb. 769, sedlus [sgN])
Li. zedlu-	(.) ‘= sedlus’ (Fraenkel 1931:413) <sup>860</sup>
Lat. sellula-	(f.dim.) ‘Stuhl, Sessel’ (WH 2:507, OxLatD. 1729)

<sup>856</sup> The laryngeal is implied by the voice of the palatovelar and the quantity of the glide (Fick’s Rule).

<sup>857</sup> See Szemerényi (1996:51): “For Indo-European only one spirant can be established with certainty, voiceless s. Voiced z also occurs, but only as an allophone of s before voiced stops.”

<sup>858</sup> The ‘a-vocalism’ (OIr. saidid [3sg]) added with the Lithuanian acute (Li. sóda-) and the voiced mediae (Lat. d = Li. d etc.) imply PIE \*fia for the root.

<sup>859</sup> Brugmann’s claim of Umbrian development (Grundr<sup>2</sup> 1:372n1) is insufficient, because an identical development is attested in Lithuanian.

<sup>860</sup> According to Fraenkel, Li. zedlu- is “aus poln. zedel, zydel ‘Sitzbock, Pritsche, Sessel’ entlehnt”. However, the suffixes do not match. As it is conceivable in theory that Li. z is caused by PIE \*h, I use the occasion to mention this possibility.



(b) PIE \*sehar \*zefiar- ‘beobachten’ (Brugmann, Grundr<sup>2</sup> 1:372)

PIE \*séhari- \*zefiari-

Umbr. seri- (pr.) ‘beobachten’ (OUD. 669-670, seritu [3sg])  
 Umbr. an zeria- (pr.) ‘Vögel beobachten’ (WbOU. 103-5, anzeriatio)

PIE \*séharg- \*sóharg-

OLi. sérg- (vb.) ‘behüten, bewahren’ (LiEtWb.776, sérgmi [1sg])  
 Li. sárga- (3m.) ‘Wächter, Hüter’ (LiEtWb. 762-3, sárgas [sgN])  
 Lat. sergio- (PN.) ‘Sergio’ (WH 2:527, sergius [sgN])<sup>861</sup>

In the absence of any other factor accounting for the voice of \*zefiad- (Umbr.  $\sqrt{ze}\check{r}$  = Li. zed-) and \*zefiar- (Umbr.  $\sqrt{ze}r$ -), as well as the voice of the extensions \*sehar g and \*šhaer d, it can only be concluded that the fricative PIE \*s was assimilated to the voice of PIE \*h, resulting in PIE \*z (compare PIE \*k → g, PIE \*p → b, PIE \*t → d in environment \*h). Since the voiced laryngeal \*h accounts for the voiced PIE \*z and D in \*h—zD and \*zD—h, this alternation is ultimately also caused by PIE \*h.

§6. Szemerényi (1996:104-105) writes that Siebs, in his article of 1904, “[...] inferred that in Indo-European a voiced stop became unvoiced and a voiced aspirate became an unvoiced aspirate or non-aspirate when an s, presumably a prefix, came before it.” As for Siebs’s Law,<sup>862</sup> formally comprised of three separate rules

s+D- → sT-                      s+Dh- → sTh-                      s+Dh̄- → sT̄-,

one should observe the following:

(a) PIE \*stefiag (with a laryngeal) is secured for the root Neogr. \*steg- (Gr. στέγω, P. 1013-14) by multiple criteria that imply PIE \*h:

Gr. στέγωσ- (n.) ‘Dach, Haus’ (GEW 2:780)  
 Li. stóga- (m.) ‘Dach, Heim, Wohnstätte’ (LiEtWb. 911)  
 OInd. sthága- (prA.) ‘cover, hide’ (MonWil. 1261, sthagati [3sg])  
 OInd. sthagáya- (cs.) ‘verhüllen, verbergen’ (KEWA 3:523)  
 OP. stogi- (m.) ‘Dach’ (APrS. 438)

PIE \*a is implied by the vocalism of Li. stóga- and the laryngeal by the Lithuanian acute and OInd.  $\sqrt{sthag}$ - requiring PIE \*sth̄eag- (schwebeablaut). Finally, the voiced laryngeal PIE \*h is implied by the root-final PIE \*g-, yielding PIE \*stefiag-. In PIE \*sthaeg-, the laryngeal lost its voice, yielding OInd.  $\sqrt{sthag}$ -. Accordingly, an actual example of Siebs’s Law exists.

(b) Siebs’s Law did not affect \*zd zdh̄, when the sibilant \*s was not functioning as ‘s-mobile’ (prefix).<sup>863</sup> Hence the examples like the one below are regular:

<sup>861</sup> The presence of PIE \*h tallies with the Lithuanian acute and the voiced extension. Furthermore, the ‘a-colouring’ is revealed by schwebeablaut in yet another voiced extension: PIE \*shaerd in Lat. sardā- (vb.) ‘intellegere’ (WH 2:479, sardāre [inf.]).

<sup>862</sup> For Siebs’s Law, see Collinge (1985:155-158), Szemerényi (1996:104-5, 143-4) and Seebold (1972).

<sup>863</sup> Szemerényi rejects Siebs’s Law, citing gAv. zdī ‘bel’ (PIIr. \*s dh̄i) as his counterexample (cf. OInd. edhī < PIIr. \*as dh̄i), but strictly speaking ‘s-mobile’ is not involved.

Gr. μισθό-	(m.) ‘Lohn, Sold, Miete, Tagelohn’ (GEW 2:244)
LAv. mižda-	(n.) ‘Lohn, Gewinn, Vorteil’ (AIWb. 1188)
RV. mīdhá-	(n.) ‘Kampf, Wettkampf’ (WbRV. 1046)

In these cases, Siebs’s Law is genuine and its initial description can be upgraded with segmental PIE \*h : h in order to eliminate the sporadic emergence of an aspirate of the original formulation.<sup>864</sup>

§7. PIE \*s-mobile (or movable \*s)<sup>865</sup> refers to the prefix \*s· attested in several roots as appearing side by side with respective prefixless items. As for this, the following should be noted:

(a) The number of examples of \*s-mobile is satisfactory (i.e. the existence of the formant is beyond doubt). An oft-quoted example is the root

PIE \*stehag- ‘cover’ (P. 1013-14)

OPr. stogi-	(m.) ‘Dach’ (APrS. 438, stogis [sgN])
Gr. στέγος-	(n.) ‘Dach, Haus’ (GEW 2:780)
Li. stóga-	(m.) ‘Dach, Heim, Wohnstätte’ (LiEtWb. 911)
OInd. sthága-	(prA.) ‘cover, hide’ (MonWil. 1261, sthagati [3sg])
OInd. sthagáya-	(cs.) ‘verhüllen, verbergen’ (KEWA 3:523)

The items belong to a root without \*s-mobile:

PIE \*tehag \*tohag ‘cover’ (P. 1013-14)

OIcl. þak-	(n.) ‘Dach, Decke, Dachmaterial’ (ANEtWb. 605)
Lat. togā-	(f.) ‘Gewand, Toga’ (WH 2:654)
Hom. τέγος-	(n.) ‘Dach, Haus’ (GEW 2:780-1)

(b) Following the emergence of PIE \*h, the traditional examples of \*s-mobile require confirmation in terms of the possibility of a root-initial laryngeal. The reasons can be illustrated with the root

Neogr. \*ster- ‘star’ (P. 1027-8):

Hi. ḡštert-	(c.) ‘star’ (HEG 1:204-, ḡa-aš-te-er-za [sgN])
Gr. ἀστέρ-	(m.) ‘star’ (GEW 1:170-1, ἀστήρ, ἀστέρως [sgG])
LAv. star-	(m.) ‘Stern’ (AIWb. 1598, starasča)
RV. sṛ-	(f <sup>?</sup> .) ‘Stern’ (EWA 2:755-, sṛbhīś [plI])

The initial laryngeal of PIE \*haster-, absent in the traditional reconstruction, prevents a historical interpretation of the root as the \*s-mobile variant of the root

PIE \*ter- ‘Stern’:

RV. tár-	(m.) ‘Stern’ (EWA 1:755-, tárah [plN])
OInd. ṭr-	(m.) ‘Strahl’ (KEWA 1:524, ṭrbhis [plI])

<sup>864</sup> Regarding the glottalic aspect here, see Collinge (1985:262): “If Siebs is correct on the alternations, the glottalicists are on shaky ground.”

<sup>865</sup> On \*s-mobile, see Hirt (1927:329-333), Szemerényi (1996:93-4) and Southern 1999.

AV. <i>tára-kā-</i>	(f.) ‘Stern’ (KEWA 1:497)
OInd. <i>tará-</i>	(f.) ‘Sternbild, Fixstern’ (KEWA 1:497)
Gr. <i>τείρεα-</i>	(f.) ‘Vor-, Wahrzeichen, Wunder’ (GEW 2:878)

(c) The explanations of \*s-mobile range from prefix to analogy, but as forms both with and without \*s-mobile are synchronically attested, the ‘s-mobile’ is a prefix by definition.<sup>866</sup>

### 4.9.3 PIE \*h/h̥ and the properties of the laryngeal

§0. The properties of the cover symbol PIE \*h̥, the criteria for its reconstruction based on the measurable features of the Indo-European data, and its behaviour in all environments are summarized in this paragraph.

§1. The laryngeal fricative has been preserved as a segmental phoneme in Old Anatolian (H̥i. h̥, Pal. h̥, CLu. h̥, HLu. h̥), allowing the reconstruction of PIE \*h̥ based on the principle of family consistency. Despite the loss of the segmental PIE \*h̥ in other subgroups, they preserve multiple criteria that can be correlated with PIE \*h̥, making reconstruction possible even without Old Anatolian parallels.

§2. The cover symbol PIE \*h̥ stands for a voiceless (PIE \*h) and a voiced (PIE \*h̥) laryngeal, but conditions of alternation will remain unknown until preconditions for a comprehensive induction hypothesis have been created by the advancement of comparison and lexicography.

(a) The existence of a voiceless laryngeal PIE \*h is implied by the traditional series *tenuis aspiratae* Th (= T + \*h) and confirmed by the roots with a laryngeal and *tenuis* PIE \*h—T, and \*T—h), where the lack of the voice of T implies the voiceless PIE \*h.

(b) The existence of the voiced laryngeal PIE \*h̥ is implied by the traditional series *mediae aspiratae* (Dh = T + h̥) and the Neogrammarian roots with one media D, actually of the shape PIE \*h̥—D or \*D—h̥, with PIE \*h̥ accounting for the voice of the *mediae*. A voiced laryngeal may have been preserved in H̥i. *tarhundaši-* (OHP. 1:446f.), a derivate of the Old Anatolian word for ‘weather-god’, since its counterpart in the Ugaritic (Ras Shamra) alphabet has a voiced laryngeal (Ugar. *tr̥nds*).<sup>867</sup>

(c) Both PIE \*h and PIE \*h̥ have been preserved as H̥i. h̥ ≡ Pal. h̥ ≡ CLu. h̥ ≡ HLu. h̥ in Old Anatolian, shown by pairs such as:

PIE *hast- ‘Knochen’	→	H̥i. <i>haštai-</i> Gr. <i>ὄστέο-</i> , etc.
PIE *hasd- ‘Ast’	→	H̥i. <i>hašduir</i> , Gr. <i>ὄζος</i> , etc.

<sup>866</sup> In this connection, note that instead of a single ‘s-mobile’ it is likely that there are several semantically and etymologically separate prefixes PIE \*s<sub>1</sub>-, \*s<sub>2</sub>- ... \*s<sub>n</sub>-, but as a lexical matter no further investigation on the matter can be made in the framework of this study.

<sup>867</sup> As the examples known to me are limited to this form, we only have thin support for the place of articulation at this time. In this connection, note also the velar articulation of the ‘laryngeal’ Ugar. *ḡ* = H̥i. h̥.

(d) The existence of voiced and voiceless root variants in etymologically connected morphemes like

\*h—T (Av. āt- ‘atmen’, P. 345)      \*ḥ—D (Lat. ōd- ‘riechen’, P. 773)

implies that PIE \*h and \*ḥ ultimately belong to the same phoneme, which is referred to in this study with the cover symbol PIE \*ḥ.<sup>868</sup> The alternations of voice remain unexplored in the lexicon, but it is likely (*ex nihilo nihil*) that a comprehensive study will provide the conditions for the alternation PIE \*h : \*ḥ in the future.<sup>869</sup>

(e) The place of articulation of the laryngeal PIE \*h/ḥ, voice (a feature produced by vocal chords), and tone/pitch accent coincide in glottis.<sup>870</sup> It is possible that these phenomena are bound together by a currently unknown rule, which may also govern the alternation PIE \*h : ḥ. In such case, a solution to the PIE accent problem may be required before the conditions for PIE \*h : ḥ can be identified.

§3. With regard to the place of articulation of PIE \*ḥ, note the following:

(a) The voiceless and voiced variants of the cover symbol PIE \*ḥ exclude the glottal stop as a possible phonetic interpretation, because the phoneme has no voiced counterpart.<sup>871</sup> Phonetically and phonologically, the cover symbol PIE \*ḥ can represent three places of articulation in particular:

1. Larynx, producing the laryngeal proper (i.e. the glottal fricative with voiceless /h and voiced /ḥ/ variants).

2. Pharynx, producing the emphatic pharyngeal fricative articulated by the back of the tongue with voiceless /ħ/ and voiced /ʕ/ (‘ayn’) variants.

3. Uvula (or velum), producing the uvular fricative with voiceless /x/ and voiced /ḡ/ variants.

Concerning these alternatives, we can securely infer the following:

(b) Szemerényi (1996:140) has presented the following argument in favour of the glottal fricative articulation:

“We know, moreover, that, as R. Jakobson formulated it, ‘languages which have the pairs voiced–voiceless, aspirated–unaspirated also have the phoneme /h/. It seems to follow from this that the laryngeal which we have just accepted was none other than *h*, the normal glottal spirant. With its *h* the [P]IE system was similar to that of Latin.”

This interpretation is compatible with *Ṛk-prāṭiśākhyā* (i.39-40), according to which (Allen 1953:48) in Sanskrit, “The fricatives *h* [i.e. /ḥ/] and *-ḥ* [i.e. /h/] are glottal (*kaṇṭhya*), or as some say, pulmonic (*urasya*).” Also from the phonological point of

<sup>868</sup> From a phonological point of view, PIE \*ḥ consists of the featureless basic phoneme PIE \*h and the feature ‘voice’.

<sup>869</sup> On the basis of the *ex nihilo nihil* principle, the feature ‘voice’ that causes the alternation PIE \*h : \*ḥ has to have been conditioned by some measurable criterion (or criteria).

<sup>870</sup> Furthermore, according to *Ṛk-prāṭiśākhyā* (i.38), the vowel “*a* is glottal” (Allen 1953:59). Following this (Allen 1953:60), *Ṛk-prāṭiśākhyā* (iii.15) adds, “Some say that the voice of voiced consonants consists of *a*.”

<sup>871</sup> Compare Hock (1991:14): “The glottal stop comes only in one variety – voiceless. The reason seems to be that the vocal cords cannot simultaneously produce a stop and the vibration of voicing.”

view, the idea that the emerging secondary laryngeals (PIE \*s, \*ǵh, etc. → OInd. ḥ h) took the place of articulation of the formerly existing phonemes PIE \*h f is highly satisfactory. Based on this, it is acceptable that the cover symbol PIE \*ḥ had at least glottal articulation with voiceless (PIE \*h) and voiced (PIE \*f) variants.<sup>872</sup>

(c) In addition to the values PIE \*ḥ ≡ \*h : \*f, the pharynx and uvula (or velum) also remain possible places of articulation covered by Old Anatolian ḫ. This cannot be verified or falsified based on Indo-European data, but an answer could be found in Semitic transliterations of Old Anatolian, which potentially contains further clues. To mention just a couple examples, OEg. ḫtšr (Ḫi. ḫatušili-) appears with a voiceless velar fricative /ḫ/ (see Puhvel 1965:83). The example Ugar. trḡnds (= Ḫi. ṽtar-ḫu-un-ti-iš-ša (?), NOMS. 1272) appears with a voiced velar fricative (Ugar. ḡ = /g/). The example Hebr. ḫitti ‘Hittite’ (Gr. χεττοι) appears with a voiceless pharyngeal, whereas Ugar. ḫty ‘Hittite’ (see Puhvel 1965:83) has a velar fricative instead. Studies that seek an interpretation of the cover symbol PIE \*ḥ based on Semitic (or other languages in general) should note the following:

1. PIE \*ḥ – regardless of its phonetic interpretation – could have allophones in Old Anatolian, written as Ḫi. ḫ but understood (and written) as distinct phonemes by the speakers of the Semitic languages. The fact that they had a wide array of laryngeals in their native phoneme inventory means that deriving secure conclusions might prove problematic.

2. A sound change may have affected the phoneme PIE \*h/f, for instance yielding a fricative /ḫ/ in Old Anatolian, which also adds to the problems of using Semitic transliterations.

§4. Functionally speaking, the laryngeal fricative PIE \*h/f appears in connection with PIE \*a in diphonemic PIE \*ḫa \*aḫ. With the voiceless and voiced values of the cover symbol, a solution to the Proto-Indo-European laryngeal problem can be found in the equations

$$\text{PIE } *ḫa \equiv \text{PIE } *ḫa \vee *ḫa \quad \& \quad \text{PIE } *aḫ \equiv \text{PIE } *aḫ \vee *aḫ.$$

(a) The diphonemic PIE \*ḫa and \*aḫ have syllabic status, due to the attached vowel PIE \*a. Accordingly, they form a system that is not completely unlike that envisioned by Saussure with his ‘coefficient’ \*A.

(b) The diphonemic connection between the segmental laryngeal and PIE \*a furnishes us with a key criterion for the reconstruction of PIE \*ḫ based on cognates preserving Neogr. \*ḫ, a, ā. The diphonemic connection functions in both directions, with the result that the following rules of inference are valid:

$$\text{PIE } *ḫ \rightarrow \text{PIE } *a \text{ (in Neogr. } *ḫ, a, \bar{a}) \quad \& \quad \text{PIE } *a \text{ (in Neogr. } *ḫ, a, \bar{a}) \rightarrow \text{PIE } *ḫ.$$

(c) It is desirable that a typological parallel be found for a system of phonemes PIE \*a and PIE \*ḫ choosing each other (strict phonotactical selection) in diphonemic PIE \*aḫ

<sup>872</sup> The general agreement within the laryngeal theory that the ‘second laryngeal’ was a ‘voiceless velar fricative’ /x/, is unwarranted. See Lehmann (1952:85-89, 103-8), Polomé 1965 and Beekes (1972: 44n2.).

: \*h̥a. My knowledge of the languages of the world is not sufficient, however, to provide such a parallel. Assuming that such a system has been preserved in some language, the situation may yet change.

(d) Despite the diphonemic distribution of PIE \*h̥a \*ah̥, the laryngeal PIE \*h̥/h and PIE \*a were distinct phonemes. Therefore, the possibility of their independent existence must be mentioned. The question of the existence of independent items in the proto-language can be reduced to a lexical problem, depending on whether correspondences with PIE \*a and PIE \*h̥ without each other exist or not. If PIE \*a and PIE \*h̥ can be comparatively proven to appear independently, they must be postulated as such.<sup>873</sup> If, however, PIE \*h̥ and \*a are shown to be connected throughout, the diphonemic hypothesis is proven in a strong sense. Either way the diphonemic hypothesis allows us to approach the problem in a systematic manner, all the way to the bottom of the material, thereby inevitably leading to a solution.

§5. The Vedic (and older Avestan) meter occasionally requires a two-syllabic scansion for a single vowel attested in the text. In the absence of any other regular explanation, the hiatus reflects a lost laryngeal, as already discovered by Kuryłowicz (1927, 1935). As a rule, the hiatus can be confirmed by some other criterion implying the laryngeal as well. Thus, for instance, PIE \*h̥ implied by the Vedic scansion

RV. gá'-	(m.f.) 'Stier, Rind, Kuh' (WbRV. 408, gáam [sgA])
Do. βō-	(c.) 'Rind, Kuh, Ochse' (GEW 1:260, βōv [sgA])

is confirmed by the root-initial voiced stop (RV. g = Do. β), proving that the laryngeal in question was voiced PIE \*h̥. The potential of the Rig-Vedic hiatus has not to date been fully exhausted, and the study of Indo-Iranian meter will remain critically important until all the evidence has been gathered and studied.

§6. Brugmann's Law II (i.e. the lengthening of PIE \*oh̥CV → Iir. āVC) implies PIE \*h̥. Unlike most other criteria for PIE \*h̥ (e.g. OAnat. h̥, etc.), which allow the reconstruction of PIE \*h̥ as such, Brugmann's Law II is ambiguous due to PIE \*ē and/or \*ō also yielding Iir. ā. For this reason, the law always requires a confirmation through another criterion implying PIE \*h̥.

§7. The absence of the second palatalization in Indo-Iranian examples like

OInd. kiṇa-	(m.) 'Schwiele' (KEWA 1:208, EWA 3:90, kiṇah̥)
Lat. callo-	(n.) 'Schwiele, dicke Haut' (WH 1:139, callum [sgNA])

points to an original PIE \*a, thus also implying PIE \*h̥.

§8. The Lithuanian acute (Li. é ó á ú, í, etc.), corresponding to the Latvian broken tone (Latv. ê, â, etc.), correlates with the following PIE \*h̥. Since both CVh̥R or CVRh̥ are theoretically possible, the position of PIE \*h̥ is ambiguous, and it must be settled on the basis of the material. Some examples of PIE \*h̥ before and after a resonant are:

<sup>873</sup> Note that a theoretical framework for independent PIE \*h̥ and PIE \*a already exists. This view coincides with classical monolaryngealism, assuming no connection whatsoever between the items in its strongest form.

(a) PIE \*gieh₂an- ‘geboren werden, usw.’ (P. 373-5, \*ĝen-)

Gr. γέν-	(√aoM.) ‘geboren werden’ (GEW 1:306-8, ἔγεντο)
Gr. πελι γᾶν-	(m.pl.) ‘οἱ ἔνδοξοι, βουλευταί’ (GEW 2:498)
Li. ženta-	(m.) ‘Schwiegersohn, Tochtermann’ (LiEtWb. 1301)

(b) PIE \*sehar- ‘behüten, beobachten, bewahren’ (P. 910, Neogr. \*ser-)

OLi. sérg-	(vb.) ‘behüten, bewahren’ (LiEtWb.776, sérgmi [1sg])
Lat. sergio-	(PN.) ‘Sergio’ (WH 2:527, sergius [sgN])
Lat. seruā-	(pr1.) ‘beobachten, erretten’ (WH 2:525-6)
LAv. ni-šharva-	(vb.) ‘sich behüten, bewahren’ (AIWb. 1787)

(c) PIE \*ba₂herah₂n- ‘bear’ (P. 128f.)

Gr. φορά-	(f.) ‘das Tragen, Last, Abtragen, usw.’ (GEW 2:1003)
Ligur. porco·bera	( <sup>1D</sup> f.) ‘Fisch-führend’ (P. 129)
Ligur. gando·bera-	( <sup>1D</sup> f.) ‘Geröll-führend’ (P. 129)
OLi. bérna-	(m.) ‘Bursche, Knabe, Knecht’ (LiEtWb. 40)
Gr. φορᾶδ-	(f.) ‘trächtige Stute’ (GEW 2:1004)

§9. The Greek exceptions to Osthoff’s Law imply PIE \*h₂, and similar discoveries may yet appear in connection with other languages.<sup>874</sup>

§10. Neogr. \*ī and \*ū, the long semi-vowels, are assimilations of accented PIE \*á and PIE \*i \*u (unless representing original PIE \*i+i and PIE \*u+u):

PIE \*áhi \*hái \*iáh \*ihá (Neogr. \*ī)    PIE \*áhu \*háu \*uáh \*uhá (Neogr. \*ū).

The Indo-European long semi-vowels thus provide an additional criterion for the reconstruction of PIE \*h₂, though confirmation for the position of PIE \*h₂ and PIE \*a is required.

§11. The Vedic scansions of Sievers’s Law, involving OInd. i and OInd. u before a vowel, can be demonstrated to occur in positions where PIE \*h₂a and PIE \*ah₂ are also present. This behaviour yields yet another criterion for the reconstruction of PIE \*h₂. Since the diphenemic PIE \*h₂a, \*ah₂ can occur in two ways (both before and after PIE \*i, \*u), its position must also be decided through comparison.

§12. Fortunatov’s Law II, which applies in the environments Vh₂LT and VLh₂T in Indo-Iranian, provides a criterion for the reconstruction of PIE \*h₂. It does require, however, confirmation in terms of the position of the laryngeal.

§13. Grassmann’s series tenues aspiratae Neogr. \*Th (≡ PIE \*Tah v \*Tha) consists of clusters of unaspirated tenues T and PIE \*ah₂ \*ha, providing numerous examples of voiceless laryngeal PIE \*h in Indo-Iranian, Greek and Armenian.

<sup>874</sup> Thus, for instance, the root PIE \*ǵh₂ǵh₂alt- ‘Gold’ has a short diphthong in OstLi. žel̥ta-(a.) ‘golden, goldgelb, blond’ (LiEtWb. 1296-7, želtas), but the Thracian counterpart has a long one in Thrac. ζηλτα (f.) ‘Gold’ (?) (P. 429, ζηλτα), just like in Greek.

§14. The series mediae aspiratae Neogr. \*Dh (≡ PIE \*Daf̥h v \*Df̥h) consists of clusters of unaspirated tenues and mediae followed by PIE \*af̥h and \*f̥h, providing several examples of PIE \*f̥h in Sanskrit (and indirectly elsewhere).

§15. Unless caused by an accent in PIE \*ú, the clusters \*Ku, Kṷ of the Satem and Centum groups imply PIE \*ḥa \*aḥ following the labial, thus providing yet another criterion for the reconstruction of PIE \*ḥ.

§16. It is possible that yet other criteria for the laryngeal not presented in this study will be identified in the future, thus increasing our capabilities of reconstruction.



## 5 The reconstruction theory System PIE

### 5.1 System PIE and PIE Lexicon

§0. System PIE, the Proto-Indo-European reconstruction theory presented in this study, consists in its extended form of five main parts:

- (a) The primary phoneme inventory for Proto-Indo-European (as presented in Chapters 2, 3 and 4 of this study).
- (b) The axiomatization and digitalization of System PIE (Chapters 1 and 5).
- (c) The formulation of the upgraded sound law system for Proto-Indo-European, to be digitalized in the future.
- (d) The decision method for Indo-European etymology, based on Schleicher's sketch and the phoneme inventory of System PIE.
- (e) The PIE Lexicon, the Indo-European morpheme inventory consisting of the internal and external etymology of the Indo-European languages in reconstructed form.

This chapter presents some concluding remarks on each of these five parts.

#### 5.1.1 The phoneme inventory of System PIE

§0. The comparative and segmental analysis of this study results in the primary phoneme inventory for Proto-Indo-European, comprised of a minimal array of proto-phonemes that are no longer analyzable in terms of items of the inventory.

§1. The primary phoneme inventory of System PIE consists of fourteen functionally defined items:

V	*a : ā <sup>?</sup>	*e : ē	*o : ō				(Chapter 2)
R	*i : ĭ	*u : ŭ	*l : ǀ	*r : ǀ	*n : ŋ	*m : m̥	(Chapter 3)
C	*k : g	*p : b	*t : d		*s : z	*h : h̥	(Chapter 4)

As for the phoneme system PIE, note the following general phonological features:

- (a) The typological simplicity of the PIE phoneme inventory gives it a truly archaic look, as only the basic places of articulation are implied for Proto-Indo-European by the comparative method of reconstruction.
- (b) No further segmental analysis of the proven places of articulation is possible. It makes no sense to derive the phonemes of System PIE from anything other than themselves. In addition it is not possible to add phonemes to the inventory, except for the possible pharyngeal and velar places of articulation for the laryngeal. Consequently System PIE is minimal in terms of the current Indo-European data.
- (c) Each phoneme appears with two functional variants: vowels alternate in quantity, resonants in syllabicity, and obstruents in voice. The variants appear in etymologically

connected words and are dealt with simultaneously in the alphabetical order of PIE Lexicon.<sup>875</sup>

Regarding the individual proto-phonemes of System PIE, the following brief characterizations should be noted:

§2. PIE \*a and PIE \*ā<sup>?</sup> are spelled in the range /a ... α/, possibly under allophonic conditions that are no longer identifiable, owing to the respective distinctions in the data.

(a) PIE \*a is the cover symbol for a phoneme /a/, corresponding to Neogr. \*ə of the traditional reconstruction, \*A of Saussure and \*h<sub>2</sub> of the laryngeal theory.

1. The accented PIE \*á was preserved in most languages as such (Lat. a, OIr. a, Gr. α, etc.), but turned into a front vowel in Indo-Iranian (≡ RV. i, gAv. i, etc.) through PIIr. \*/ə/, as revealed by its neutrality in the second palatalization.

2. The unaccented PIE \*a was lost in all languages except for the possible ‘prothetic a’ in Greek, Armenian, Macedonian and Phrygian. This rule resembles the earlier loss of schwa, but has a wider scope than found in traditional reconstruction.

3. Functionally PIE \*a appears in the diphonemic pairs PIE \*h<sub>2</sub>a a and PIE \*h<sub>2</sub>a, thus accounting for the syllabic status of Saussure’s coefficient sonantique \*A.<sup>876</sup> Despite the considerable amount of archaic data handled in the PIE Lexicon, no provable example of PIE \*a without PIE \*h<sub>2</sub> (or vice versa) has emerged as of yet. However, as long as the material has not been completely analyzed, a counterexample remains possible.

(b) PIE \*ā<sup>?</sup>, a long counterpart of PIE \*a, is of uncertain existence like its historical counterpart Neogr. \*ā, postulated as ‘Systemzwang’ by the Neogrammarians. Since structural postulation is not allowed in System PIE, the existence of PIE \*ā depends on a comparative proof. Until now I have been unable to verify (or falsify) phoneme PIE \*ā<sup>?</sup> due to an ambiguity caused by the emergence of the secondary Indo-European ā (Neogr. \*ā) from PIE \*a+ē, \*ē+a → IE \*ā. Identifying a criterion that can reveal a distinction between an original PIE \*ā<sup>?</sup> and the attested IE ā is practically impossible, though analysis at the suprasegmental level could still lead to a solution of the problem in the future.<sup>877</sup>

§3. PIE \*e and PIE \*ē are spelled in the range IPA /e ... ε/ possibly under allophonic conditions that will likely remain unknown in the absence of distinctions in the Indo-European data.

(a) PIE \*e stands for a front vowel revealed by its direct successors in languages that preserve the vowel (Lat. e, Arm. e, Li. e, etc.) and the second palatalization in Indo-Aryan (and Tocharian).

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<sup>875</sup> In other words the alphabets of PIE Lexicon are arranged as pairs PIE \*o/ō \*e/ē \*a/ā<sup>?</sup> \*h/h<sub>2</sub> \*i/ī \*k/g \*l/ł \*m/m̄ \*n/n̄ \*p/b \*r/r̄ \*s/z \*t/d \*u/ū.

<sup>876</sup> As far as I can see, this feature is the main contribution of Saussure to Indo-European linguistics.

<sup>877</sup> Unless our understanding of the structural properties of PIE quantity does not decisively improve, this state of affairs may turn out to be permanent.

(b) PIE \*ē, the long counterpart of PIE \*e, is problematic only in terms of the proper notation, PIE \*ē or PIE \*ee. The difference could turn out to be relevant since PIE \*ee (≡ \*e+e) allows more distinctions of accentuation (e.g. /éé/ vs. /eé/, etc.) than PIE \*ē, with the result that a change of convention may be necessary in the future.

§4. PIE \*o and PIE \*ō are spelled in the range IPA /o ... ɔ/, possibly under allophonic conditions that will likely remain unknown in the absence of respective distinctions in the data.

(a) PIE \*o stands for a non-front vowel revealed by its direct successors in languages that preserve the place of articulation (Lat. o, Arm. o, Gr. o, etc.) and its neutrality in the second palatalization in Indo-Iranian and in Tocharian.

(b) PIE \*ō, the long counterpart of PIE \*o, is problematic only in terms of whether PIE \*ō or PIE \*oo should be reconstructed (see PIE \*ē above).

§5. PIE \*h and PIE \*h̥ represent the phonetic values of the cover symbol PIE \*h̥:

(a) For the cover symbol PIE \*h̥, at least the articulation ‘+glottal’ and ‘+fricative’ with voiceless PIE \*h̥ and voiced PIE \*h̥ variants can be confirmed (i.e. at least the laryngeal proper (IPA /h/, /h̥/) existed in the proto-language). Other places of articulation, especially the pharynx and velum, remain theoretically possible. Currently, however, the issue depends on relatively few and problematic Semitic transliterations.

(b) The conditions of the alternation of voice PIE \*h̥ : \*h̥ remain unknown. The alternation of voice is reflected in the plosives surrounding PIE \*h̥. Since dozens of etymologically connected roots with alternation PIE \*h̥ : PIE \*h̥ exist, it is likely that the conditions can be identified in the future, when the main bulk of data has been gathered and analyzed. Such a task is beyond the scope of this study, owing to its potential connection with the accent of the proto-language, but the conditions for the study will be established in the PIE Lexicon.

(c) PIE \*h̥ (≡ PIE \*h̥/h̥) appears in connection with PIE \*a in diphonemic PIE \*h̥a and PIE \*ah̥. No examples of PIE \*h̥ independent of PIE \*a have emerged so far, but in theory it remains possible that both segments also appeared independently.

§6. PIE \*i and \*i̯, the palatal continuants, stand for IPA /i/ and /j/.

(a) PIE \*i is a front vowel preserved in most languages as such (Lat. i, RV. i, etc.) and PIE \*i̯ as the respective palatal glide, the consonantal counterpart of PIE \*i.

(b) In environments PIE \*á+i and PIE \*i+á, the front vowel resulted through assimilation of PIE \*á and contraction in the respective long vowel.

(c) After velar K the unaccented PIE \*i̯ resulted in the palatovelars Neogr. \*k̥, kh̥, ġ, ġh. These turned into palatals in the Satem group, but collided with plain velars in the Centum group (except for the special treatments of Greek and Tocharian).

§7. PIE \*u and \*u̯, the velar continuants, stand for IPA /u/ and /w/.

(a) PIE \*u stands for a back vowel preserved in most positions as such (Lat. u, RV. u, etc.) and PIE \*u̯ as its consonantal counterpart.

(b) In environments PIE \*á+u and PIE \*u+á, the back vowel resulted through assimilation of PIE \*á and contraction in the respective long vowel.

(c) After velar K the unaccented PIE \*u/ṽ resulted in the intermediate labiovelars Neogr. \*k<sup>u</sup> k<sup>h</sup> g<sup>u</sup> g<sup>h</sup> in the Centum group (directly attested in Latin and Linear B), but lost the labial component in Satem languages (except for the special treatments of Luwian, Lycian, Albanian, Armenian and Avestan).

§8. PIE \*l and PIE \*ḷ, the lateral with consonantal and vocalic (syllabic) variants, existed in the proto-language conditioned by the environments \*lV and \*ḷC.

(a) The consonantal lateral PIE \*l has been preserved as such, except for Indo-Iranian (and Linear B) with the collision of PIE \*l and PIE \*r.

(b) In the environments VhlT and VlḥT, the lateral was lost in Indo-Iranian, leading to the palatalization of Fortunatov's Law II.

(c) Contrary to the traditional view, the syllabic lateral PIE \*ḷ did not yield svarabhakti vowels of the cognates. It was preserved only in a few forms of Sanskrit, though scattered traces of such a phoneme remain possible in Tocharian and in Later Anatolian.

§9. PIE \*r and PIE \*ṛ, the trill with consonantal and vocalic (syllabic) variants, existed in the proto-language conditioned by the environments \*rV and \*ṛC.

(a) The consonantal trill PIE \*r has been preserved as such in most of the languages.

(b) In environments VhrT and VrḥT, the trill was lost in Indo-Iranian, leading to the palatalization of Fortunatov's Law II.

(c) Contrary to the traditional view, the syllabic trill PIE \*ṛ did not yield svarabhakti vowels of the cognates, and was preserved only in Indo-Iranian, though some scattered traces remain possible in Tocharian and in Later Anatolian.

§10. PIE \*m and \*ṃ, the bilabial nasal with consonantal and vocalic (syllabic) variants, existed in the proto-language conditioned by environments \*mV and \*ṃC.

(a) PIE \*m was preserved as such in most of the languages.

(b) The outcome of PIE \*ṃ was consonantal, as now revealed by the clusters PIE \*ḥṃC and Cṃḥ preserving the original PIE \*ṃ. The process did not yield the svarabhakti vowels of the Neogrammarians, but resulted in Indo-European mC, Cm after the loss of the laryngeal.

§11. PIE \*n and PIE \*ṅ, the dental/alveolar nasal with consonantal and vocalic (syllabic) variants, existed in the proto-language conditioned by environments \*nV and \*ṅC.

(a) PIE \*n was preserved as such in most of the languages.

(b) The outcome of PIE \*ṅ was consonantal, as now revealed by the clusters PIE \*ḥṅC and Cṅḥ preserving the original PIE \*ṅ. The process did not yield the svarabhakti vowels of the Neogrammarians, but resulted in Indo-European nC, Cn after the loss of the laryngeal.

§12. PIE \*s and PIE \*z, the oral dental/alveolar fricatives, existed in the proto-language. The voiced variant PIE \*z gained its voice from the environment \*sD(h), where the voice of D reflects the environment of PIE \*ḥ.

§13. PIE \*k, the velar plosive, existed in the proto-language. This phoneme participated in combinatory sound changes with PIE \*h/h̄, a, \*i/ī and \*u/ū that resulted in twelve cover symbols of the Neogrammarians, summarized in the following table:

Gr. κ : OInd. k/c	≡ PIE *k	(Neogr. *k)
Gr. χ : RV. kh/c	≡ PIE *kah v kha	(Neogr. *kh)
Gr. γ : RV. g/j	≡ PIE *g (in h̄—g, g—h̄)	(Neogr. *g)
Gr. χ : RV. gh/h	≡ PIE *gah v gfa	(Neogr. *gh)
Gr. τ/π : RV. k/c	≡ PIE *ku	(Neogr. *k <sup>u</sup> )
Gr. φ/θ : RV. kh/c	≡ PIE *kahu v khau	(Neogr. *k <sup>u</sup> h)
Gr. β/δ : RV. g/j	≡ PIE *gu (in h̄—gu, gu—h̄)	(Neogr. *g <sup>u</sup> )
Gr. φ/θ : RV. gh/h	≡ PIE *gahu v ghau	(Neogr. *g <sup>u</sup> h)
Gr. κ : RV. ś : Av. s	≡ PIE *ki	(Neogr. *k̂)
Gr. χ : RV. ś : Av. s	≡ PIE *kiah v kiha v kahi v khai	(Neogr. *k̂h)
Gr. γ : RV. j : Av. z	≡ PIE *gi (in h̄—gi, gi—h̄)	(Neogr. *ĝ)
Gr. χ : RV. h : Av. z	≡ PIE *giah v gifa v gahi v ghai	(Neogr. *ĝh)

§14. PIE \*p, the bilabial plosive, existed in the proto-language. In connection with PIE \*h/h̄ and PIE \*a, the four proto-phonemes of the Neogrammarians emerged, as summarized in the following table:

Gr. π : RV. p	≡ PIE *p	(Neogr. *p)
Gr. φ : RV. ph	≡ PIE *pah v pha	(Neogr. *ph)
Gr. β : RV. b	≡ PIE *b (in h̄—b, b—h̄)	(Neogr. *b)
Gr. φ : RV. bh	≡ PIE *bah v bfa	(Neogr. *bh)

§15. PIE \*t, the dental or alveovelar plosive, existed in the proto-language. In connection with PIE \*h/h̄ and PIE \*a, the four proto-phonemes of the Neogrammarians emerged, as summarized in the following table:

Gr. τ : RV. t	≡ PIE *t	(Neogr. *t)
Gr. θ : RV. th	≡ PIE *tah v tha	(Neogr. *th)
Gr. δ : RV. d	≡ PIE *d (in h̄—d, d—h̄)	(Neogr. *d)
Gr. θ : RV. dh	≡ PIE *dah v dfa	(Neogr. *dh)

§16. Except for the theoretical possibility of additional places of articulation masked by the Old Anatolian h̄, the primary Proto-Indo-European phoneme inventory of System PIE is minimal (i.e. it contains all items necessary for the reconstruction of the entire Indo-European data, but no analyzable phonemes).

### 5.1.2 The axiomatization of System PIE

§0. Based on the principles of natural science, System PIE can be embedded as such in axiomatic predicate calculus. As allowing a further translation of the system into modern digital programming languages, the underlying calculus will be briefly

sketched here in terms of its basic propositions, axioms, rules of inference and definitions.<sup>878</sup>

§1. For propositions, connectives, variables and quantifiers, the following abbreviations are used:

(a) The propositions (symbol:  $p, q, r, \dots$ ) are expressions with a truth value, usually functions of predicate calculus of the form  $f(x_1, x_2, \dots, x_n) = 'y'$ , at the primary level expressing the definitions of the strings of phonemes and their translations (meanings). From the propositions, further expressions can be built with logical connectives and quantifiers, as detailed below.

(b) Negation (symbol:  $\neg$  'not', 'it is not the case that...') expresses the opposite of proposition  $\neg p$  ('not  $p$ '). With negation, additional auxiliary functions can be defined, especially including the following:

$$\begin{array}{lll} a \neq b & \equiv_{df} & \neg(a = b) \quad ('a \text{ and } b \text{ are not identical}') \\ \neg\neg p & \equiv_{df} & p \quad ('it \text{ is not the case that not } p') \end{array}$$

(c) The other logical connectives are disjunction (symbol:  $\vee$  'or'), conjunction (symbol:  $\&$  'and'), implication (symbol:  $\rightarrow$  'if ... then ...') and equivalence  $\Leftrightarrow$  ('... is equivalent to ...', '... if and only if ...'). With these connectives, any two propositions  $p$  and  $q$  form a new proposition (e.g.  $p \rightarrow q$  'if  $p$  then  $q$ '). With negation and disjunction, the rest of the connectives can be defined as follows:

$$\begin{array}{lll} p \rightarrow q & \equiv_{df} & \neg p \vee q \\ p \& q & \equiv_{df} & \neg(\neg p \vee \neg q) \\ p \leftrightarrow q & \equiv_{df} & (\neg p \vee q) \& (\neg q \vee p) \end{array}$$

(d) The existence quantifier  $\exists x$  ('there is  $x$ ') binds constants and free variables with a bound variable (symbol:  $x, y, z, \dots$ ). The existence formula  $\exists x f(x)$  'there is an  $x$ , such that  $f(x)$ ' is defined as the disjunction

$$\exists x f(x) \quad \equiv_{df} \quad f(a_1) \vee f(a_2) \vee \dots \vee f(a_n).$$

In order to infer the existence of  $x$ , at least one of objects  $a_1, a_2, \dots, a_n$  must satisfy the function  $f$  (where  $a_1, a_2, \dots, a_n$  is the domain of the variable  $x$ ). The universal quantifier  $\forall x$  ('for all  $x$ ') is defined by negation and an existence quantifier as follows:

$$\forall x f(x) \quad \equiv_{df} \quad \neg \exists x \neg f(x).$$

Furthermore, the universal quantifier is equal to a conjunction

$$\forall x f(x) \quad \equiv_{df} \quad f(a_1) \& f(a_2) \& \dots \& f(a_n)$$

(i.e. for a universal statement  $\forall x f(x)$  to be valid, it is necessary that  $f$  is satisfied by all objects  $a_1, a_2, \dots, a_n$  belonging to the domain of the variable  $x$ ).

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<sup>878</sup> Different formulations of predicate calculus have been presented by Whitehead and Russel 1962, Hilbert and Ackermann 1949, Herbrand 1930 and Genzen 1934-35. For a set theory of predicate calculus in linguistics, see Partee et. al 1990.

§2. The logical apparatus of System PIE consists of axioms and rules of inference preserving the truth of axioms in inductive transformations of the data, thus allowing for the reconstruction of implicit information embedded in the data based on identities.

In System PIE, the following axioms and rules of inference are accepted:

(a) The axiom of identity

$$x = x \quad (\text{AX1})$$

holds true for all objects  $x$ . If the opposite is true, the formula  $x \neq x$  is provable and the theory is inconsistent.<sup>879</sup>

(b) The following Peano axioms for proposition calculus<sup>880</sup> hold true for all propositions  $p, q$  and  $r$ :

$$(p \vee p) \rightarrow p \quad (\text{AX2})$$

$$p \rightarrow (p \vee q) \quad (\text{AX3})$$

$$(p \vee q) \rightarrow (q \vee p) \quad (\text{AX4})$$

$$(p \rightarrow q) \rightarrow [(r \vee p) \rightarrow (r \vee q)] \quad (\text{AX5})$$

From these axioms, the other logically true propositions follow.

(c) For predicate calculus, axioms of quantification regulate the elimination (elim.) and introduction (intr.) of quantifiers:

$$\forall x f(x) \quad \rightarrow \quad f(a) \quad (\forall\text{-elim.})^{881}$$

$$f(a) \quad \rightarrow \quad \exists x f(x) \quad (\exists\text{-intr.})^{882}$$

To these are added rules of  $\forall$ -introduction and  $\exists$ -elimination:

$$\text{If } p \rightarrow f(x) \text{ is true then so is } p \rightarrow \forall x f(x) \quad (\forall\text{-intr.})$$

$$\text{If } f(a) \rightarrow p \text{ is true then so is } \exists x f(x) \rightarrow p \quad (\exists\text{-elim.})^{883}$$

(d) The rule of substitution: *If the arguments of an axiom are isomorphically replaced with others, then the proposition obtained is also a true formula.*

Thus, for instance, the proposition PIE  $*p \rightarrow \exists x \text{PIE}(x)$  is directly obtained from a substitution to the axiom of  $\exists$ -introduction and is therefore true.

(e) The rule of inference (modus ponens) follows:

$$\text{If propositions } p \text{ and } (p \rightarrow q) \text{ are true, then so is } q \quad (\text{MP}).$$

§3. Definitions of any level, typical of Indo-European linguistics, can be readily formulated by means of predicate calculus. A full list of definitions will be appended to the PIE Lexicon; hence I only offer here some simple examples:

<sup>879</sup> In an inconsistent theory, anything can be proven, equaling its triviality.

<sup>880</sup> For the Hilbert-Axioms used in this presentation, see Hilbert and Ackermann (1949:59-61).

<sup>881</sup> Read: 'If for all  $x$ ,  $f(x)$ , then for any  $a$ ,  $f(a)$ .'

<sup>882</sup> Read: 'If for some  $a$ ,  $f(a)$ , then there is an  $x$  such that  $f(x)$ .'

<sup>883</sup> Note the restriction that the variable  $x$  must not appear free in  $p$ .

(a) 'x is a Indo-European language' is expressed by an extensive definition consisting of a disjunction of cognates:

$$\text{IE}(x) \quad \equiv \text{Alb}(x) \vee \text{Arm}(x) \vee \text{Av}(x) \vee \text{etc.}$$

(b) 'x is a PIE phoneme' is functionally defined for V R C and Ø (zero) by the disjunction:

$$\text{PHON}(x) \quad \equiv \text{VOW}(x) \vee \text{RES}(x) \vee \text{CONS}(x) \vee \text{Ø}(x).$$

(c) 'x is an ablaut vowel (of System PIE)' consists of

$$\text{ABL}(x) \quad \equiv (x = *\bar{o}) \vee (x = *o) \vee (x = \text{Ø}) \vee (x = *e) \vee (x = *\bar{e}).$$

(d) 'x is a (PIE) morpheme' is expressed by a somewhat complex formula:

$$\text{Morph}(x) \quad \equiv \exists y_1 \dots \exists z (\text{Phon}(y_1 y_2 \dots y_n) \ \& \ \text{Transl}(z) \ \& \ x = (y_1 y_2 \dots y_n = z)).$$

(e) 'x is the phoneme /p/' (and other similar statements) can be defined as a conjunction of distinctive features (à la Trubetskoy, Jakobson and others):

$$\text{Phon}/p/(x) \quad \equiv \text{Labial}(x) \ \& \ \text{Plos}(x) \ \& \ \neg \text{Voice}(x).$$

(f) 'x is a primary phoneme' reflects the situation where there are no phonemes  $y_1 y_2 \dots y_n$ , such that their sequence is x (except x itself):

$$\text{Prim}(x) \quad \equiv \neg \exists y_1 y_2 \dots y_n \text{PIE}(*y_1, y_2, \dots, y_n) \ \& \ *x = \text{PIE}(*y_1, y_2, \dots, y_n).$$

The negation of this formula defines non-primary phonemes as consisting of multiple segments:

$$\neg \text{PRIM}(*x) \quad \equiv \exists y_1 y_2 \dots y_n \text{PIE}(y_1, y_2, \dots, y_n) \ \& \ *x = \text{PIE}(*y_1 + y_2 + \dots + y_n).$$

Thus, for instance, Neogr.  $*\hat{k}$  is not primary, owing to the provability of the formula

$$\neg \text{PRIM}(*\hat{k}) \quad \equiv \exists y_1 y_2 \text{PIE}(y_1 = *k \ \& \ y_2 = *i \ \& \ *\hat{k} = \text{PIE}(*k + i)).$$

In general, a phoneme inventory is minimal if and only if it consists only of primary phonemes:

$$\text{MINIM}(*x) \quad \equiv \forall y_1, y_2, \dots, y_n (\text{PRIM}(y_1, y_2, \dots, y_n) \ \& \ *x = y_1, y_2, \dots, y_n).$$

§4. Similarly, the entire set of Indo-European data, its mutual relations, reconstruction and the theory language can be expressed by means of predicate calculus and its digital extensions. Since in an axiomatic system the true propositions are mechanically obtained from axioms and definitions by an application of the rule of inference, System PIE is the first fully empirically formulated reconstruction theory in Indo-European linguistics.

### 5.1.3 The sound laws of System PIE

§0. The sound (or phonological) laws that describe the sound changes represent the converse direction of the reconstruction  $\text{IE } p \rightarrow \text{PIE } *q$ . Thus the sound laws consist of the forms marked with asterisks as the starting points of the implications:



PIE \*q → IE p

(the delta function δ).

In natural science, such implications are called delta (or ‘change’) functions, and if proven true by measurable features of the data, they are accepted as true propositions and added to the axiom system as (empirical) auxiliary hypotheses. Together with the phoneme inventory, the sound laws provide the individual quality of natural science for Indo-European linguistics.

§1. The Proto-Indo-European sound laws are inductive generalizations that describe the development of the proto-phonemes of the individual Indo-European languages in all environments. As such, the sound laws can also be expressed in predicate calculus and consequently in chosen programming languages. Usually several languages share the same sound laws, due to which these can be defined for other Indo-European languages sharing the sound law. I am currently in the process of formulating the PIE sound law system for the predicate calculus governing the reconstruction of the PIE Lexicon. The digitalized sound laws will be published both as part of the derivation as well as an independent set of rules. Owing to the importance of the sound laws for the study, I present a brief sketch of the formalization of the sound laws in System PIE in order to illustrate the general procedure.

(a) The first kind of sound laws express identities of the 1<sup>st</sup> Class (i.e. preservation of a PIE phoneme in cognates as such). The sound laws belonging to this type, exemplified here by the preservation of PIE \*p in most cognates, are of the general form:

$$\forall x(\neg \text{Celt}(x) \ \& \ \neg \text{Arm}(x) \ \& \ \neg \text{Germ}(x)) \quad \rightarrow \quad \text{PIE } *p \rightarrow \text{IE } p,$$

read ‘for all languages x, if x is not Celtic, Armenian or Germanic, then PIE \*p → IE p.’<sup>884</sup> The direct preservation of PIE phonemes can be set as the basic assumption; accordingly, in practice it suffices to formulate the sound laws for the changed proto-phonemes of the cognates.

(b) The identities of the 2<sup>nd</sup> Class involve sound changes leading from the proto-language to a cognate, exemplified below with some changes concerning PIE \*k p t. The sound laws can be formulated without scope and thus the (unconditional) fricativization of PIE \*k p t is written

$$\text{PIE } *k, p, t \rightarrow *x, f, \beta \quad \text{‘The fricativization of series T’} \quad (1).$$

To such sound laws, individual languages can be attached as their domain:

1. The general fricativization (as a part of the first sound shift) of the series T in the Germanic languages is written

$$\forall x(\text{Germ}(x)) \quad \rightarrow \quad \text{PIE } *k, p, t \rightarrow \text{PGerm. } *x, f, \beta).$$

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<sup>884</sup> To the main rules, minor exceptions can be added according to the requirements of the data (e.g. the loss of root-final \*p- in Greek, etc.).

2. On the other hand, by adding the environment ‘before resonant R’, one obtains

$$\text{PIE } *kpt+R \rightarrow xfp+R \quad \text{‘The fricativization before R’}$$

This proposition is valid not only in the Germanic but in the Iranian branch:

$$\forall x(\text{Germ}(x) \vee \text{Ir}(x)) \rightarrow \text{PIE } *kpt+R \rightarrow xfp+R.$$

3. In the environment ‘between vowels’, the proposition becomes true for the Germanic and the Celtic (cf. Old Irish lenition) branches:

$$\forall x(\text{Germ}(x) \vee \text{Celt}(x)) \rightarrow \text{PIE } *VkptV \rightarrow VxpfV.$$

Similarly, by compiling a catalogue of all changes involving PIE \*k p t in all languages and all environments, including the well-known restrictions, the sound laws for PIE \*k p t will be fully formalized. By repeating this procedure for every item in the phoneme inventory of System PIE, the entire system of PIE sound laws can be explicated.<sup>885</sup>

§2. In the PIE Lexicon, the lexical databank of System PIE, the generation of IE data from PIE reconstruction through sound laws typically involves objects like:

$$\text{PIE } *k\acute{e}ahu- \rightarrow \text{Li. } k\acute{a}u- \quad (\text{vb.}) \text{ ‘schlagen’} \quad (\text{LiEtWb. 232}).$$

In order to obtain the stem (Li. káu-) from its reconstruction (PIE \*kĕahu-), a chain of successive sound laws  $s_1, s_2, \dots, s_n$  yielding the attested data must be explicated. *Exemplii gratia*, the derivation of Li. káu- is expressed by the sound law chain  $s_1$  &  $s_2$  &  $s_3$  &  $s_4$ :

PIE *kĕahu-	Li. káu-	(vb.) ‘schlagen’	(LiEtWb. 232)
$s_1$ . PIE *ĕa	$\rightarrow$ IE *ā	‘The assimilation of *ĕ+a’	( $\rightarrow$ *kāhu-)
$s_2$ . PIE *ĶH	$\rightarrow$ Li. VĶ	‘The Lithuanian acute rule’	( $\rightarrow$ *kāhu-)
$s_3$ . PIE *VH	$\rightarrow$ V∅	‘The loss of *H before V’	( $\rightarrow$ *káu-)
$s_4$ . PIE *V:RC	$\rightarrow$ VRC	‘Osthoff’s Law’	( $\rightarrow$ Li. káu·ti)

Similarly, a finite chain of sound laws will be associated to every reconstruction of the PIE Lexicon, thus yielding a digital proof for reconstruction and the sound laws of System PIE.

§3. In a historical perspective the Neogrammarian concept of ‘mechanical derivation’ can be defined as the existence of a chain of sound laws yielding regularly the attested data when applied to the PIE reconstruction:

$$\begin{aligned} \text{PIE } *(x_1, x_2, \dots, x_n) &\rightarrow \text{IE}(y_1, y_2, \dots, y_n) \\ &\equiv_{\text{df}} \exists s_1 s_2 \dots s_n (\text{PIE } *(s_1, s_2, \dots, s_n) \ \& \ \text{PIE } *(x_1, x_2, \dots, x_n) \rightarrow \text{IE}(y_1, y_2, \dots, y_n)) \end{aligned}$$

§4. The Proto-Indo-European sound laws revised in in this study can be digitalized, for instance, using the finite-state transducers of FOMA (Måns Hulden) to compute

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<sup>885</sup> For the sake of comparison, in arithmetic the axiom of induction has the form ‘If  $f(1)$  AND  $f(n) \rightarrow f(n+1)$ , are true, then so is  $\forall x f(x)$ ’.

the sound law chains.<sup>886</sup> Though FOMA in its current form only allows the treatment of exact matches (excluding variations typical of Proto-Indo-European, such as ablaut and accent), in principle the method is the equivalent of predicate calculus. Therefore, either by developing FOMA or creating an independent programming code for this purpose, the reconstruction of the material can be managed digitally in the System PIE framework in the future.<sup>887</sup>

### 5.1.4 The decision method of Indo-European etymology

§0. The decision method of Indo-European etymology, the crown jewel of the comparative method, was understood and described already by Schleicher (1852b: iv-v), quoted here in Koerner’s (1982:24) translation:

“When comparing the linguistic forms of two related languages, I firstly try to trace the forms to be compared back to their probable base forms, i.e., that structure [gestalt] which they must have [had], excepting phonetic laws [lautgesetze] which became effective at a later time, or at least I try to establish identical phonetic situations in historical terms for both of them.”

§1. The decision method, intuitively known to practicing etymologists through the history of the study, can be formalized by means of predicate calculus, thus providing a precise explication for Schleicher’s sketch.<sup>888</sup>

(a) Schleicher’s first operation, “to trace the forms to be compared to their probable base forms”, is equal to the postulation of a disjunction of the theoretically possible proto-phonemes for each member  $x$  of the function  $\Phi_{IE}(x_1, x_2, \dots, x_n)$ . The postulation of a maximal disjunction, consisting of all theoretically possible prototypes of the form, does not require external or internal comparison, except for the information contained in the postulation of the phoneme inventory and sound laws. The PIE maximal disjunction can be generally formulated as follows: let  $f_{IE}(x_1, x_2, \dots, x_n) = 'y'$  be any morpheme of an Indo-European language  $f$ . Then the maximal disjunction of  $f(x_1, x_2, \dots, x_n)$  consists of disjunctions of  $x_1, x_2, \dots, x_n$ , each specifying the possible proto-phonemes of  $x$  as indicated in:

$$\begin{array}{lcl} x_1 & = & *a_1 \vee a_1 \vee \dots \vee a_n \\ x_2 & = & *b_1 \vee b_2 \vee \dots \vee b_n \\ \dots & & \\ x_n & = & *n_1 \vee n_2 \vee \dots \vee n_n \end{array}$$

<sup>886</sup> For finite-state morphology in general, see Beesley & Karttunen 2003.

<sup>887</sup> After the digitalized sound laws have been formulated, we will be able to apply the decision method to the entire material.

<sup>888</sup> In his “probable base forms” (i.e. reconstructions), Schleicher implicitly assumes a phoneme inventory of the proto-language. For this purpose, System PIE (instead of Schleicher’s Sanskrit) is chosen below.

The PIE expansion of Indo-European morphemes  $f_{IE}(x_1, x_2, \dots, x_n)$  is, therefore, of the following general form:

$$f_{PIE}(*a_1 \vee a_1 \vee \dots \vee a_n) \& (*b_1 \vee b_2 \vee \dots \vee b_n) \& \dots \& (*n_1 \vee n_2 \vee \dots \vee n_n).$$

Thus Schleicher's early intuitive account has been replaced with an exact formula of predicate calculus. In order to illustrate the maximal disjunction in practice, we may examine the stem  $f_{RV}(x_1, x_2) = 'y'$ , defined as

$$RV. \acute{a}s- \quad \quad \quad (prA.) \text{ '(da, vorhanden) sein, usw.' (WbRV. 146, \acute{a}sti).$$

Regardless of the phonemes appearing in the related Indo-European forms, the maximal expansion of the Rig-Vedic stem according to the rules of System PIE is

$$PIE *es- \vee *h\acute{a}es- \vee *e\acute{h}as- \vee *ea\acute{h}s- \vee *a\acute{h}es- \vee *os- \vee *h\acute{o}as- \vee *a\acute{h}os-.$$

As such, the disjunction contains all theoretically possible prototypes of the stem.

(b) Next Schleicher advises "to establish identical phonetic situations in historical terms for both of them" (understood here as an independent step rather than an alternative one). Formally, a Proto-Indo-European etymology exists if and only if there is an intersection of the two maximal disjunctions being compared. For this purpose, a maximal disjunction of another language is needed; for this we can choose Greek:

$$Gr. \acute{\epsilon}h- \quad \quad \quad \equiv \quad \quad \quad PIE *es- \vee *e\acute{h}as- \vee *a\acute{h}es-.$$

When compared to the Sanskrit disjunction

$$PIE *es- \vee *h\acute{a}es- \vee *e\acute{h}as- \vee *ea\acute{h}s- \vee *a\acute{h}es- \vee *os- \vee *h\acute{o}as- \vee *a\acute{h}os-,$$

an intersection consisting of three terms (viz.  $PIE *es- \vee *e\acute{h}as- \vee *a\acute{h}es-$ ) results. Finally, when this disjunction is compared to a third one, that of Hittite

$$\begin{array}{lll} Gr. \acute{\epsilon}h- & \equiv & PIE *es- \vee *e\acute{h}as- \vee *a\acute{h}es- \\ \text{H}i. e\check{s}- & \equiv & PIE *es- \vee *eti- \vee *ethi- \end{array}$$

only one "identical phonetic situation" remains possible, namely the comparative reconstruction:

$$PIE *es- \quad \Leftrightarrow \quad RV. as- \equiv Gr. \acute{\epsilon}h- \equiv \text{H}i. e\check{s}-.$$

In brief, the decision method of Indo-European etymology consists of the generation of the maximal disjunctions for the possible PIE prototypes, including potentially lost phonemes, choosing common terms (intersections) and eliminating the impossible. When elimination is no longer possible, the common starting point (here  $PIE *es-$ ) is postulated on the basis of the axiom of identity ( $RV. as- \equiv Gr. \acute{\epsilon}h- \equiv \text{H}i. e\check{s}-$ ). Thus consisting of a finite number of operations, the decision method of Indo-European

etymology is mechanical and independent, and therefore allows testing of etymology in an objective manner.<sup>889</sup>

§2. The decision method and the formulation of System PIE in predicate calculus imply that the comparative method of reconstruction can be implemented as an algorithm for testing and generating the Indo-European etymologies mechanically; this task will be undertaken in the PIE Lexicon.<sup>890</sup> As the translation of the decision method into programming code is far less problematic than that of the sound laws, we will soon be in possession of an algorithm associating a maximal disjunction to every Indo-European morpheme, comparing these to each other, finding, verifying and falsifying etymologies in an objective, systematic manner, enabling us to overcome the long-standing stagnation of the study.<sup>891</sup>

### 5.1.5 Proto-Indo-European (PIE) Lexicon

§0. Owing to limitations of space, only representative extracts of the data have been dealt with in this study. No such restrictions are imposed, however, for the Proto-Indo-European Lexicon (PIE Lexicon), the data bank of System PIE and next-generation etymological dictionary of Indo-European languages on a digital platform. The PIE Lexicon Project is a research program designed to present the Indo-European data, its reconstruction and the sound laws with full inductive proof of the conjectures of System PIE. It can be found online at:

<http://pielexicon.hum.helsinki.fi> (PIE Lexicon).

A brief introduction to the scope of material, reconstruction, articles, digitalization and other relevant features of the PIE Lexicon will be presented here.

§1. The phoneme inventory and the sound laws of System PIE are used in the PIE Lexicon, further corrected and improved according to advancements in comparative work. The phoneme inventory and the sound laws of System PIE, in turn, will be verified by the complete Indo-European data generated from the reconstruction through the sound laws.

§2. Another immediate goal of the PIE Lexicon is the completion of the PIE morpheme inventory, based on the hundred (or so) most ancient Indo-European languages. In practice, every Indo-European morpheme – ranging from the most archaic to the classical phase of the language – will be ultimately covered in the PIE

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<sup>889</sup> In a sense Szemerényi's (1977:292) call ("What is *needed today* is a *body of principles which will so guide the researcher as to reach a solution in a methodical fashion.*") has already been answered by Schleicher.

<sup>890</sup> Note that the decision method is also restricted by the set of (verified) sound laws (and the phoneme paradigm) in the sense that if the PIE prototype of the phoneme IE  $x_n$  is unknown, the expansion of maximal disjunction fails.

<sup>891</sup> Note, however, that the decision method must be equipped with an advanced theory of semantic fields before the treatment of the semantic data in a fully mechanical manner can become possible.

Lexicon. For Old Anatolian, for instance, this means that several major sources will be compiled and compared, initially including in particular:

- (a) Hittite (and Old Anatolian) etymology by Tischler (HEG) and Puhvel (HED)
- (b) The names of the Old Anatolian gods by van Geissel (OHP)
- (c) The Old Anatolian personal names by Laroche (NOMS)
- (d) The Old Anatolian place names by del Monte and Tischler (OGH)
- (e) The Hieroglyphic Luwian texts by Hawkins (CHLu.)
- (f) The remnants of Cuneiform Luwian by Laroche (DLL)
- (g) The remnants of Palaic by Carruba (DPal.)
- (h) The Hurrian vocabulary by Laroche (GIHur.)

In addition to this core material, standard dictionaries (CHD, HED, etc.), supplements, corrigenda and other literature (especially books, monographs and articles) will be consulted for the sake of making improvements. Defined thus, the most ancient data provides reasonable chronological depth, but in essence it is governed by a single set of sound laws with only minor potential exceptions (like the presence of hiatus in Rig-Vedic meter). In this manner, the foundation of the PIE Lexicon is comprised of the work of the most capable experts in the Indo-European languages, such as Liddell and Scott, Grassmann, Bartholomae, Holder, Walde, Lejeune, Fraenkel, Frisk, Laroche, Tischler and others, maximizing the stability of the etymology from the outset. Gradually adding newly coded material to this core data set will eventually result in a complete reconstruction of the data, ultimately making all Indo-European data available on a single digital platform.

§3. The presentation of the material in the PIE Lexicon follows the standard of this study (i.e. the Indo-European morphemes and stems are chosen as the basic level of observation). The morphemes and stems will be presented in a somewhat extended form, illustrated here with the following (slightly compressed) extract from the PIE Lexicon:

√gafu- ‘schlagen, usw.’

√gafue-

PIE *gafue-	Hj. gue-	(vb.) ‘schlagen’ (HEG 1:604-5, guemi [1sg])
PIE *gafue-	RV. ha-	(vb.) ‘schlagen’ (WbRV. 1642-3, hathás [2du])

The PIE Lexicon root matrices consist of multiple ‘functions’, which express different properties and contents, including especially:

- (a) The root (√gafu- ‘schlagen, usw.’) and its extensions (√gafue-), morphemes arranged under a root matrix expressing the PIE root structure. From these nodes, the rules of the PIE derivation will be extracted in the future.
- (b) The reconstructed proto-stems (PIE \*gafue- etc.) as comparatively obtained from the data and – by turning the process around – yielding it regularly by successive applications of sound laws.<sup>892</sup>

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<sup>892</sup> The reconstruction is displayed as the rightmost column, added to the Indo-European stems and the other data. For a similar solution, see LIV<sup>2</sup> (Rix et alii 2001).

(c) The “IE functions” (Ĥi., RV., etc.), which express the language of a stem. This variable allows not only typological statements, but defines the subgroups and the scope of the sound laws.

(d) The IE data (e.g. gue-, ha-, etc.) presented as stems, cut into morphemes directly obtained from the data by the removal of inflectional endings, enclitics and affixes, all stored in the PIE Lexicon as independent entries.

(e) The grammatical analysis of the attested stems (e.g. ‘pr.’, etc.).

(f) The meaning (or the translation) of the stems: (e.g. ‘schlagen’, etc.).

(g) The reference (e.g. HEG 1:604-5, WbRV. 1642-3), basically a quote pointing to a primary scientific source serving as authentication of the stem and attendant discussion.

(h) The attested IE forms (e.g. Ĥi. guemi, RV. hathás, etc.), bringing in syntax and semantics when the respective Indo-European data becomes published on the Internet or is added to the PIE Lexicon.

(i) The inflectional analysis of the quoted forms (e.g. [1sg], [2du], etc.).

§3. With its roots in philology and the comparative method, the PIE Lexicon is designed to be able to provide a scholarly article for every IE stem stored therein.<sup>893</sup>

Though not immediately available, hyperlinked articles will contain exact details and the analysis of stems with a discussion of related philological and comparative issues:<sup>894</sup>

(a) The locus (and the textual context) of the forms belonging to the stem, including the possible philological problems concerning the interpretation of the attested form(s) and other relevant philological and internal details (in a broad sense).

(b) The external (comparative) discussion concerning the reconstruction and the etymology of the entry. The original presenter of the etymology will be credited, failed suggestions accounted for, and so forth.<sup>895</sup>

(c) The general scientific discussion concerning the entry with bibliographical references will be provided. Initially, the most conservative and reliable dictionaries will be used as the starting point of the PIE Lexicon, but changes, upgrades and corrections will be incorporated into the data in order to eliminate mistakes of earlier input. Thus, for instance, Grassmann’s *Wörterbuch zum Rig-Veda* (1996<sup>6</sup>) will serve as the starting point of the Rig-Vedic data. However, Grassmann’s early interpretation

RV. kóka yātu-            (m.) ‘Kobold in Gestalt eines Kukuks’ (WbRV. 352)

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<sup>893</sup> In order to grasp the general idea of what is meant by PIE Lexicon articles, see the item *Der Artikelaufbau am Beispiel von althochdeutsch haso ‘Hase’* online at [www.indogermanistik.uni-jena.de/dokumente/Artikelaufbau.pdf](http://www.indogermanistik.uni-jena.de/dokumente/Artikelaufbau.pdf).

<sup>894</sup> Owing to the hundreds of thousands of Indo-European stems and vast discussion involved the compilation of the PIE Lexicon, articles will obviously be a long-term enterprise requiring numerous editors and involving an ongoing process of digitalization of scientific data. For this purpose, I am currently forming the PIE Lexicon Project team.

<sup>895</sup> Naturally an evaluation of the presented etymologies will be based on the decision method, consisting of an objective finite procedure.

is replaced with the improved translation of Mayrhofer, supported by an internal comparison, as follows:

OInd. kóka-	(m.) ‘Wolf : wolf’ (KEWA 1:268)
RV. kóka yātu-	(m.) ‘Kobold in Gestalt eines Wolfes’ (WbRV. 352)

Thus, while it is possible to postulate the entire Indo-European data on a single digitalized platform, the data can be extended and improved gradually until the vocabulary has been accounted for in an optimal manner.

§4. The key novelty of the PIE Lexicon in the spirit of Schleicher is the explicit reconstruction of all Indo-European forms and their generation by mechanized sound laws in the extended version of System PIE. In terms of these features, the following remarks are particularly noteworthy:

(a) Being fully inductive, System PIE establishes a logical equivalence between the Indo-European data  $\Delta$  and its comparative reconstruction  $*\mathcal{C}$ . Thus, for instance, the root

$\sqrt{\text{gahue-}}$  ‘schlagen’

PIE $*\text{gahue-}$	H̥i. gue-	(vb.) ‘schlagen’ (HEG 1:604-5: guemi [1sg])
PIE $*\text{gahue-}$	RV. ha-	(vb.) ‘schlagen’ (WbRV. 1642-3, hathás [2du])

is of the form:

$$\text{PIE } *\mathcal{C} \Leftrightarrow \text{IE } \Delta \qquad (\text{PIE } *\text{gahue-} \Leftrightarrow \text{RV. ha-} \equiv \text{H̥i. gue-}).$$

The logical identity of reconstruction and the data is explained by reconstruction being a function  $f$ , primarily choosing the preserved phonemes of the 1<sup>st</sup> Class:

	1.	2.	3.	4.	5.	
H̥i.	g	-	-	u	e	-
RV.	-	-	h̥	-	(a)	-
	↓	↓	↓	↓	↓	
PIE	*g	(a)	*h̥	*u	*e	-

(b) In addition, the PIE sound laws required to generate the IE data will be fully explicated in the PIE Lexicon as the coding of the material progresses. Thus, the derivation of the quoted Indo-Iranian stem consists of five successive sound laws that can be expressed in form of direct substitution functions, as follows:

PIE $*\text{gahue-}$	→	RV. ha-	(pr.) ‘(er)schlagen, etc’ (WbRV. 1642-3)
1. PIE $\text{R} + \text{V}$	→	RV	→ $*\text{gahue-}$
2. PIE $*\text{a}$	→	IE $\emptyset$	→ $*\text{ghue-}$
3. PIE $*\text{ghue}$	→	$\text{j}h̥ue$	→ $*\text{j}h̥ue-$
4. PIE $*\text{j}h̥u$	→	$\text{j}h̥$	→ $*\text{j}h̥e-$
5. PIE $*\text{e}$	→	$*\text{a}$	→ RV. ha-

The chain of derivation leading to the data is complete and regular.



§5. As an open source project, the PIE Lexicon will be connected to other digital projects on the Internet by means of search engines. This will be of consequence both for the PIE Lexicon and other digital databanks. There are several such projects currently ongoing. Here I limit myself to mentioning one of the most important projects for Indo-European linguistics, the TITUS Program, publishing the oldest Indo-European texts on the Internet. The PIE Lexicon uses the Titus Cyberbit Unicode Font of TITUS, and consequently the trusted written sources of the PIE Lexicon can be tested against the new digital data of the TITUS program. Similar connections are bound to emerge with other digital platforms, such as the Indo-European Etymological Dictionaries Online (IED Online) of Leiden and individual dictionaries (e.g. Liddell-Scott-Jones), digital journals, articles and other sources. In this way, the PIE Lexicon can be supplemented with the most recent data. Naturally I am keen to find partners and co-operate with parties contributing to the completion of the basic research and digitalization of the Indo-European data.

§6. The reconstruction of the PIE morpheme inventory in a way that fully matches the data promises to have remarkable consequences for the so-called “(internal) reconstruction of the proto-language” (i.e. Proto-Indo-European as “[...] structure considérée en elle-même [...]” (see Saussure *Mém.* 283 and Koerner 1985:329). The reconstruction of the Proto-Indo-European morpheme inventory determines the structure of Proto-Indo-European in a manner sketched out by Katičić (1970:90):

“In fact, it is a search for the morphological system of the proto-language which is coded into the correspondence relations among the morphological system of genetically related languages.”

In other words, the internal reconstruction of proto-language is an unavoidable consequence of the external postulation of proto-language, reflecting its structure in the form of the PIE root matrices. In this sense, the concepts of reconstruction and synchronic metalanguage coincide in a purely external (empirical) form.<sup>896</sup> As the formulas of this metalanguage equal the data, it is legitimate to take the reconstruction as the object of the study as such.<sup>897</sup> Consequently, the settings of the PIE Lexicon can be optimized to limit the display of the data to the proto-language by replacing the data sequences with their reconstructive counterparts of the form

PIE \*gah<sub>2</sub>ue-                      (pr.) ‘(er)schlagen, etc.’ (= H<sub>i</sub>. gue- + RV. ha-).

The reconstructive metalanguage, when it is available, greatly simplifies the task of internal reconstruction of the proto-language, because it is possible to work with a uniform language without historical changes (except for a handful of yet unsolved

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<sup>896</sup> Korhonen (1974:124) writes: “Nun kann die Frage erhoben werden, ob nicht durch innere Rekonstruktion und Vergleichung gewonnene Grundsprache und ihre Formen eher zum Begriffgreifs der synchronen Metasprache gesehen werden, auf welche die Eigenschaften der verwandten Sprachen projiziert werden.”

<sup>897</sup> For the possibilities here, see Hock (1991:570-1): “[...] through reconstruction we can recover morphophonemic alternations which require synchronic rules within the ancestral language.”

problems).<sup>898</sup> Therefore, it is natural that an explication of the rules generating PIE morphological variation should be included among the future tasks of Indo-European linguistics.<sup>899</sup> When the preconditions have been satisfied, this dimension of morphological analysis can also be added to PIE root theory studied in an experimental environment designed for this purpose (i.e. the PIE Lexicon). As soon as this goal has been achieved, we will witness whether the attitude of philologists towards the reconstruction, referred to by Matthews (1991:3), can be reversed:

“Philologists have long given up the hope (expressed so seductively in Max Müller’s Oxford lectures of 1889) that by studying the ‘evolution’ of words in Indo-European, and their ‘four or five hundred’ basic roots in particular, the ‘world-old riddle of the origin of language’ can be solved.”

§7. As I write these concluding remarks, the PIE Lexicon is operational and the uploading of reconstructed IE data has already begun. Though the exact details may change, I can offer an initial tentative timetable:

(a) The *PIE Lexicon Demo* will be published concurrently with this dissertation. The demo has been built to contain all key conjectures of System PIE, thus offering a proof for the reconstructive system through a limited but complete segment of the data. The PIE Lexicon root chosen for this purpose is PIE √KAHU- ‘schlagen’, appearing with a voiceless PIE \*kahu- (P. 535, kāu-, kəu-) and a voiced PIE \*gafu- (P. 491-3 g<sup>uh</sup>·en-) variant.<sup>900</sup>

(b) PIE Lexicon \*m-, the first initial to be published, contains a comprehensive segment of the morpheme inventory. It will appear as soon as it is ready for publication. At this point, the etymology of the most ancient data of PIE \*m- has been almost completed, and the manuscript requires only corrections, additions and the reconstruction of the vocalisms of the individual forms. Following this, the rest of the initials will be published.

§8. With the culmination of the contributions of hundreds of scholars in the 19<sup>th</sup> century, the emergence of Anatolian data and its monolaryngealist interpretation in the 20<sup>th</sup> century, the new millennium begins with new hope for Indo-European linguistics. Systematic applications of the comparative method presented in this study constitute a major breakthrough in the segmental phonology of Proto-Indo-European, starting with a solution of the laryngeal problem and leading to a complete revision of both the PIE phoneme inventory and the sound law system. When the Neogrammarians took similar steps forward, more than a hundred years ago, it led to a general revitalization of the study. Such progress can be expected for Indo-European linguistics in the future. With greatly improved empirical auxiliary devices,

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<sup>898</sup> As readily seen, the task is relatively modest if compared to that faced by the pioneers (like Rask, Bopp, Schleicher, and Brugmann and his Neogrammarians).

<sup>899</sup> In this connection, it should be noted that it is not only the production of reconstruction, but securing the reconstruction that constitutes the problem.

<sup>900</sup> Regarding the size of the PIE Lexicon Feature Presentation file, the proof sheet comprises some 600 stems requiring c. 110 sound laws for their derivation.

phonology, morphology, typology and digital technology now available, the comparative method is reaching the necessary critical momentum to solve the main bulk of the remaining problems of Proto-Indo-European reconstruction. Through the cooperation of philologists, lexicographers and comparative linguists, it will be possible to deliver the entire body of Indo-European material, etymologized and reconstructed, by means of a digital platform and provide the study with a fresh start.

## 6 References

- Adams, Douglas Q. 1988. *Tocharian Historical Phonology and Morphology*. (American Oriental Series, 71.) New Haven: American Oriental Society.
- 1999. *A Dictionary of Tocharian B*. [= DTochB.] (Leiden Studies in Indo-European, 10.) Amsterdam: Rodopi.
- Allen, William Sidney. 1953. *Phonetics in ancient India*. (London oriental series, 1.) London: Oxford University Press.
- 1978. The PIE Velar Series: Neogrammarian and Other Solutions in the Light of Attested Parallels. *Transactions of Philological Society* 1978: 87-110.
- Amelung, Arthur. 1871. *Die Bildung der Tempusstämme durch Vokalsteigerung im Deutschen*. Berlin: Weidmann.
- Ammer, Karl. 1952. Studien zur indogermanischen Wurzelstruktur. *Die Sprache* 2:193-214.
- Anderson J. M. & Jones C. 1974<sup>ed</sup>. *Historical Linguistics II. Theory and description in phonology*. Amsterdam: North-Holland Publishing Company & American Elsevier Publishing Company Inc.
- Anttila, Raimo. 1969. *Proto-Indo-European Schwabeablaut*. (University of California Publications Linguistic, 58.) Berkeley: University of California Press
- 1972. *An introduction to historical and comparative linguistics*. New York: Macmillan Co.
- 2000. *Greek and Indo-European Etymology in Action: Proto-Indo-European \*aǵ-*. (Amsterdam Studies in the Theory and History of Linguistic Science, Series IV: Current Issues in Linguistic Theory, 200.) Amsterdam: Benjamins.
- Arbeitman, Yoël & Ayala, Gilbert-James. 1981. Rhotacism in Hieroglyphic Luwian. (→ Arbeitman & Bomhard 1981<sup>ed</sup>:25-28) Amsterdam: Benjamins.
- Arbeitman, Yoël & Bomhard, Allan R. 1981<sup>ed</sup>. *Bono Homini Donum – Essays in Historical Linguistics in Memory of J. Alexander Kerns*. Amsterdam: Benjamins.
- Arntz, Helmuth. 1936<sup>ed</sup>. *Germanen und Indogermanen. Volkstum, Sprache, Heimat, Kultur. Festschrift für Hermann Hirt I-II*. Heidelberg: Winter.
- Austin, William M. 1941. The prothetic vowel in Greek. *Language* 17: 83-92.
- Back, Michael. 1979. Die Rekonstruktion des idg. Verschlußlautsystems im Lichte der einzelsprachlichen Veränderungen. *KZ* 93: 179-195.
- Bammesberger, Alfred. 1984. *Studien zur Laryngaltheorie*. (Ergänzungshefte zur Zeitschrift für Vergleichende Sprachforschung, 33.) Göttingen: Vandenhoeck & Ruprecht.
- 1988<sup>ed</sup>. *Die Laryngaltheorie und die Rekonstruktion des indogermanischen Laut- und Formensystems*. Heidelberg: Winter.
- Barentsen, A. A., Groen B. M. & Sprenger E. 1988<sup>ed</sup>. *Dutch contributions to the Tenth International Congress of Slavists, Sofia, September 14.12, 1988*. (Studies in Slavic and General linguistics, 11.) Amsterdam: Rodopi.
- Barrack, Charles M. 2002. The Glottalic Theory revisited: a negative appraisal. *IF* 107: 76-95.
- 2003. The Glottalic Theory revisited: a negative appraisal. Part II: the typological fallacy underlying the Glottalic Theory. *IF* 108: 1-16.
- Bartholomae, Christian. 1882. *Arische Forschungen I*. Halle: Max Niemeyer.
- 1883. *Handbuch der altiranischen Dialekte*. Leipzig: Breitkopf & Härtel.
- 1885.  $\theta\upsilon\gamma\acute{\alpha}\pi\eta\theta$ . *KZ* 27: 206-207.
- 1891. Arm. a > griech. o und die indogermanischen vokalreihen. *BB* 17: 91-132)
- 1894. Zur /-Frage. *IF* 3: 157-197.
- 1904. *Altiranisches Wörterbuch*. [= AIWb.] Straßburg: Trübner.
- Bechtel, Fritz. 1892. *Die Hauptprobleme der indogermanischen Lautlehre seit Schleicher*. Göttingen: Vandenhoeck & Ruprecht.

- Beekes, Robert Stephen Paul. 1969. *The Development of the Proto-Indo-European Laryngeals in Greek*. (Janua Linguarum Series Practica, 38.). The Hague: Mouton
- 1972. H<sub>2</sub>O. *Die Sprache* 18: 117-131.
- 1976. Some Greek aRa-forms. *MSS* 34: 9-20.
- 1988. PIE *RHC*- in Greek and other languages. *IF* 93: 22-45.
- 1995. Comparative Indo-European Linguistics. An Introduction. Amsterdam: Benjamins.
- Beesley, Kenneth R. & Karttunen, Lauri. 2003. *Finite State Morphology* (Studies in computational linguistics, 3.) Stanford: Center for the Study of Language and Information.
- Benfey, Theodor. 1837. Review of Pott 1833a-36. *Ergänzungsblätter zur Allgemeinen Literatur-Zeitung*, December 1837: 905-33.
- Bennett, William H. 1966. The Germanic evidence for Bartholomae's Law. *Language* 42: 733-37.
- Benveniste, Émile. 1935. *Origines de la formation des noms en indo-européen I*. Paris: Adrien-Maisonneuve.
- 1962. *Hittite et indo-européen. Études comparatives*. (Bibliothèque archéologique et historique de l'institut français d'archéologie d'Istanbul, 5.) Paris: Adrien-Maisonneuve
- Benware, W. A. 1974. *The study of Indo-European vocalism in the 19th century. From the beginnings to Whitney and Scherer*. Amsterdam: Benjamins.
- Bergsland, Knut. 1938. Sur les hypothèses les plus importantes relatives au phonème hittite *h*. *RHA* 4/31: 257-287.
- Bezenberger, Adalbert. 1888. Litauisch sa, lettisch so. *BB* 13:146-148.
- 1890. Die indogermanischen gutturalreihen. *BB* 16: 234-260.
- Bloomfield, M. 1895. On Professor Streitberg's Theory as to the Origin of Certain Indo-European Long Vowels. *TAPA* 26: 5-15.
- Bonfante, G. & Gelb, I. J. 1944. The position of 'Hieroglyphic Hittite' among the Indo-European languages. *JAOS* 64: 169ff.
- Bopp, Franz. 1825. Vergleichende Zergliederung des Sanskrits und der mit ihm verwandten Sprachen. (*Abhandlung der königlichen Akademie der Wissenschaften zu Berlin, phil.-hist. Klasse*, 191-200.)
- Boretzky, Norbert. 1975. Laryngealtheorie und innere Rekonstruktion. *IF* 80:47-61.
- Borgstrøm, Carl, Hj. 1954. Internal Reconstruction of Pre-Indo-European Word-forms. *Word* 10: 275-287.
- Bosworth, Joseph & Toller, T. Northcote. 1882-98. An Anglo-Saxon dictionary. [= ASaxD.] Oxford: Clarendon Press.
- Bradke, Peter von. 1890. Über Methode und Ergebnisse der arischen (indogermanischen) Alterthumswissenschaft. Giessen: J. Ricker'sche Buchhandlung.
- Bredsdorff, Jakob H. 1821. Om Aarsagerne til Sproggenes Forandringer. Roskilde: Bemmerich-Vos, Albert.
- Brugmann, Karl. 1876a. Nasalis sonans in der indogermanische Grundsprache. *Curtius' Studien zur griechischen und lateinischen Grammatik* 9: 285-328.
- 1876b. Zur Geschichte der stammabstufenden Declination. *Curtius' Studien zur griechischen und lateinischen Grammatik* 9: 363-406.
- 1879a. Zur geschichte der nominalsuffixe -as-, -jas- und -vas-. *KZ* 24: 1-99.
- 1879b. Die achte conjugationsklasse des altindischen und ihre entsprechung im griechischen. *KZ* 24: 255-286.
- 1879c. Ueber einige altindische verba der V. und IX. conjugationsklasse. *KZ* 24: 286-293.
- 1879d. Besprechung von de Saussure 1878. *Literarisches Zentralblatt für Deutschland* 29: coll 773-4.
- 1885. *Zum heutigen Stand der Sprachwissenschaft*. Straßburg: Trübner [Reprint in Wilbur 1977]
- 1890. Excurs: Zur bildung des nom. acc. plur. neutr. *MU* 5:52-61.
- 1895. Review of Schmidt 1895. *Literarisches Centralblatt für Deutschland* 48: 1723-27.

- 1895-1916<sup>2</sup>. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen I-II*. [= Grundr<sup>2</sup>] Strassburg: Trübner.
- 1900<sup>3</sup>. *Griechische Grammatik. Lautlehre, Stammbildungs- und Flexionslehre und Syntax*. München: Beck.
- 1904. *Kurze vergleichende Grammatik der indogermanischen Sprachen*. [= KVG] Straßburg: Trübner.
- 1913. Zu den Ablautverhältnissen der sogenannten starken Verba des Germanischen. *IF* 32: 179-195.
- Brugmann, Karl & Osthoff, Hermann. 1878 Vorwort. *MU* 1:iii-xx.
- Brugmann, Karl & Streitberg, Wilhelm- 1892. Zu Franz Bopps hundertjährigem Geburtstage. *IF* 1:v-x.
- Buck, Carl Darling. 1955. *The Greek Dialects. Grammar. Selected Inscriptions. Glossary*. Chicago: University of Chicago Press.
- Burrow, Thomas. 1949. "Schwa" in Sanskrit. *Transactions of the Philological Society* 1949 (1950) :21-61)
- 1971. Spontaneous cerebrals in Sanskrit. *BSOAS* 34: 538-559.
- 1972. A reconsideration of Fortunatov's law. *BSOAS* 35: 531-545.
- 1973<sup>3</sup>. *The Sanskrit Language*. (Rev. ed. of 1955<sup>1</sup>). London: Faber and Faber.
- 1976. Sanskrit words having dental -s- after i, u, and r (→ Morpurgo Davies & Meid 1976<sup>ed</sup>:33-41).
- 1979. *The Problem of Shwa in Sanskrit*. Oxford: Clarendon Press.
- Butters, Albion M. & Tikkanen, Bertil. 2010. *Purvaparaprajñābhindandanam: East and West, past and present: Indological and other essays in honour of Klaus Karttunen*. (Studia Orientalia, 110.) Helsinki: Finnish Oriental Society.
- Bybee, Joan L. 1985. *Morphology. A study of the relation between meaning and form*. Amsterdam: Benjamins.
- Campbell, Lyle. 2004<sup>2</sup>. *Historical Linguistics. An Introduction*. Edinburgh: Edinburgh University Press.
- Carruba, Onofrio. 1970. *Das Palaische. Texte, Grammatik, Lexikon*. [= DPal.] (StBoT, 10.) Wiesbaden: Harrassowitz.
- Cate, Philo Hendrik Jan Houwink ten. 1961. *The Luwian Population Groups of Lycia and Cilicia Aspera During the Hellenistic Period*. [= LuPG] (Documenta et monumenta orientis antiqui, 10.) Leiden: Brill.
- Cavoto, Fabrice. 2001. Did PIE have Three Velar Series? I: Laryngeal + Velar Sequences in Root-final Position. *MSS* 61: 29-55.
- Chantraine, Pierre. 1968-80. *Dictionnaire étymologique de la langue grecque. Histoire des Mots*. [= DELG]. Paris: Klincksieck.
- Chrystal, David. 1980. *A First Dictionary of Linguistics and Phonetics*. Cambridge: Andre Deutsch.
- Collinge, N. E. 1985. *The Laws of Indo-European*. Amsterdam: Benjamins.
- 1995. Further Laws of Indo-European. (→ Winter 1995<sup>ed</sup>:27-52)
- 1999. The Laws of Indo-European: The State of Art (1998). *JIES* 27: 355-77.
- Collitz, H. 1878. Ueber die annahme mehrerer grundsprachlicher a-laute. *BB* 2: 291-305.
- 1886a. Die flexion der nomina mit dreifacher stammabstufung in altindisch und in griechisch. *BB* 10: 1-71.
- 1886b. Die neueste Sprachforschung und die Erklärung des idg. Ablautes. *BB* 11: 203-42.
- Comrie, Bernard. 1981. *Language Universals and Linguistic Typology*. Oxford: Blackwell.
- Costello, John R. 1995. Theory and data in phonological reconstruction: Whence and whither? *Word* 46: 9-27.
- Courtenay, Baudouin de. 1894. Einiges über Palatalisierung (Palatalization) und Entpalatalisierung (Dispalatalisation). *IF* 4: 43-57.
- Cowgill, Warren Crawford. 1965. Evidence in Greek. (→ Winter 1965<sup>ed</sup>:142-180).

- Cuny, Albert. 1912. Notes de phonétique historique. Indoeuropéen et sémitique. *Revue de Phonétique* 2:101-132.
- 1927. Réflexions sur le type  $\chi\sigma\eta$  ( $\zeta\eta\nu$ , etc. . . .) et le type  $\eta\chi\omega$ . (*Symbolae Grammaticae in honorem Ioannis Rozwadowski*, 1:85-94.) Kraków: Drukarnia Uniwersytetu Jagiellońskiego.
- Curtius, Georg. 1858-62. *Grundzüge der griechischen Etymologie I-II*. Leipzig: B.G.Teubner.
- 1864. Über die Spaltung des *a*-lautes im Griechischen und Lateinischen mit Vergleichung der übrigen europäischen Glieder des indogermanischen Sprachstammes. *Berichte über die Verhandlungen der Königlich Sächsischen. Gesellschaft der Wissenschaften zu Leipzig. Philologisch-Historische Klasse* 16: 9-42.
- Davies, A. M. 1975. Language classification in the nineteenth century. (→ Sebeok 1975:607-716).
- Davis, H. B. H. 1972. *A history of the research on Indo-European vocalism 1868-1892*. Chapel Hill: University of Carolina.
- Delbrück, B. 1894. Der Typus  $\varphi\acute{\epsilon}\sigma\omega$  —  $\varphi\sigma\acute{\epsilon}\omega$  im Arischen. *IF* 4: 132-33.
- Dunkel, George E. 1981. Typology versus reconstruction (→ Arbeitman & Bomhard 1981<sup>ed</sup>:559-569).
- Dyen, Isidore. 1969. Reconstruction, the comparative method and the protolanguage uniformity assumption. *Language* 45: 499-518.
- Edgerton, Franklin. 1934. Sievers's law and IE. weak-grade vocalism. *Language* 10: 235-65.
- 1943. The Indo-European semi-vowels. *Language* 19: 83-124.
- 1962. The semivowel phonemes of Indo-European: a reconsideration. *Language* 38: 352-9.
- Eichman, Th. L. 1973. Althochdeutsch sinnan 'steben nach', sanskritisch san-, sā- 'gewinnen' und hethitisch sanh- 'erstreben'. *KZ* 87: 269-71.
- Eichner, Heiner. 1973. Die Etymologie von heth. mehur. *MSS* 31: 53-107.
- 1978. Die urindogermanische Wurzel \**H<sub>2</sub>reu-* 'hell machen'. *Die Sprache* 24: 144-162.
- 1980. Phonetik und Lautgesetze des Hethitischen - ein Weg zu ihrer Entschlüsselung. (→ Mayrhofer, Peters & Pfeiffer 1980<sup>ed</sup>:120-165)
- 1988. Anatolisch und Trilaryngalismus. (→ Bammesberger 1988<sup>ed</sup>:123-151)
- Ejerhed, E. I. 1981. The analysis of aspiration in Sanskrit phonology. *Nordic Journal of Linguistics* 4: 139-59.
- Fick, August. 1870-71. *Vergleichendes Wörterbuch der indogermanischen Sprachen*. Göttingen: Vandenhoeck & Ruprecht.
- 1879. Schwa Indogermanicum. *BB* 3: 157-165.
- 1880. Review of Saussure 1879. *Göttingische Gelehrte Anzeiger* 14: 417-39)
- Fisiak, Jacek. 1978<sup>ed</sup>. *Recent Developments in Historical Phonology*. (Trends in Linguistics – Studies and Monographs, 4.) The Hague: Mouton.
- 1985<sup>ed</sup>. *Papers from the 6<sup>th</sup> International Conference on Historical Linguistics, Poznan, 22-26 August 1983*. (Current Issues in Linguistic Theory, 34.) Amsterdam: Benjamins & Adam Mickiewicz University Press.
- Fortunatov, F. F. 1881. *L* + dental im Altindischen. *BB* 6:215-220.
- 1900. Die indogermanischen Liquiden im Altindischen. *KZ* 36: 38-54.
- Fox, Anthony. 1995. *Linguistic Reconstruction. An introduction to theory and method*. Oxford: Oxford University Press.
- Fraenkel, Ernst. 1931. Kreuzung einheimischer und fremder Synonyma ähnlicher Lautung im Baltischen. Ein Beitrag zur Fremdwortforschung dieser Sprachgruppe. *Zeitschrift für slavische Philologie* 8: 412-427.
- 1962-65. Litauisches etymologisches Wörterbuch I-II [= LiEtWb.] Heidelberg & Göttingen: Winter, Vandenhoeck & Ruprecht
- Frisk, Hjalmar. 1936. Suffixales -th- im indogermanischen. *Göteborgs Högskolas Årsskrift* 42.2: 3-50.
- 1960-72<sup>2</sup>. *Griechisches etymologisches Wörterbuch I-III*. [= GEW.] Heidelberg: Winter.
- Gamkrelidze, Thomas & Ivanov, Vyacheslav. 1973. Sprachtypologie und die Rekonstruktion der gemeindogermanischen Verschlüsse. *Phonetica* 27: 150-156.

- 1995. *Indo-European and the Indo-Europeans. A Reconstruction and Historical Analysis of a Proto-Language and a Proto-Culture, 2 vols.* [= IE&IE] (Trends in Linguistics. Studies and Monographs, 80.) Berlin: Mouton de Gruyter.
- Genzen, Gerhard. 1934-35. Untersuchungen über das logische Schließen. *Mathematische Zeitschrift* 39/2: 176-210 & 39/3: 405-431.
- Gessel, B.H.L. van. 1998. *Onomasticon of the Hittite Pantheon I-II* [= OHP.] (Handbuch der Orientalistik, 1: Der Nahe und Mittlere Osten. Dreiunddreissigster Band-). Leiden: Brill.
- Glare, P. G. W. 1982. *Oxford Latin Dictionary* [= OxLatD.]. Oxford: Clarendon Press.
- Godel, Robert. 1975. *An Introduction to the study of classical Armenian*. Wiesbaden: Reichert.
- Grassmann, Hermann. 1863. Über die Aspiraten und ihr gleichzeitiges Vorhandensein im An- und Auslaute der Wurzeln. *KZ* 12: 81-138.
- 1996<sup>6</sup>. *Wörterbuch zum Rig-Veda, 6. überarbeitete und ergänzte Auflage von Maria Kozińska.* [= WbRV.] Wiesbaden: Harrassowitz.
- Grimm, Jacob. 1819-37. *Deutsche Grammatik. 4 vols.* Göttingen: Dietrich.
- 1822. *Deutsche Grammatik. Erster Theil. Zweite Ausgabe.* Göttingen: Dietrich.
- Güntert, Hermann. 1916. *Indogermanische Ablautprobleme. Untersuchungen über Schwa secundum, einen zweiten indogermanischen Murmelvokal.* (Untersuchungen zur indogermanischen Sprach- und Kulturwissenschaft, 6.) Strassburg: Trübner.
- Gusmani, Roberto. 1964. *Lydisches Wörterbuch. Mit grammatischer Skizze und Inschriftersammlung.* [= LydWb.] Heidelberg: Winter.
- 1969. Forme 'satem' in Asia Minore. (→ FSPagliario 2: 281-332)
- 1975. *Neue epichorische Schriftzeugnisse aus Sardis (1958-1971).* (Archaeological Exploration of Sardis, Monograph 3.) Cambridge (Massachusetts): Harvard University Press.
- 1979. Ittito, teoria laringalistica e ricostruzione. (→ Neu & Meid 1979<sup>ed</sup>: 63-71)
- 1980. *Lydisches Wörterbuch, Ergänzungsband, Lfg. 1.* Heidelberg: Winter.
- 1982. *Lydisches Wörterbuch, Ergänzungsband, Lfg. 2.* Heidelberg: Winter.
- 1986. *Lydisches Wörterbuch, Ergänzungsband, Lfg. 3.* Heidelberg: Winter.
- Hall, Robert A., Jr. 1960. On realism in reconstruction. *Language* 36: 203-206.
- Hamp, Eric P. 1983. Further on Latin capillus and pullus and Lautgesetze. *Folia Linguistica Historica* 4/1: 133-135.
- Hawkins, John David. 2000. *Corpus of Hieroglyphic Luwian Inscriptions.* [= CHLu.] Berlin: Walter de Gruyter.
- 2003. The Luwians: Scripts and Texts. (→ Melchert 2003<sup>ed</sup>: 128-169)
- Hempel, Carl G. 1952<sup>10</sup>. *Fundamentals of Concept Formation in Empirical Science.* (Foundations of the Unity of Science, 2:7.) London: The University of Chicago Press.
- Hendriksen, Hans. 1941. *Untersuchungen über die Bedeutung des Hethitischen für die Laryngalthorie.* (Det Kongelige Danske Videnskabernes Selskab, Historisk-filosofiske meddelelser, 28:2.) København: Munksgaard.
- Herbrand, Jacques. 1930. *Reserches sur la théorie de la démonstration.* (Thèses présentées à la faculté des sciences de Paris). Paris.
- Hiersche, Rolf. 1964. *Untersuchungen zur Frage der Tenues aspiratae im Indogermanischen.* Wiesbaden: Harrassowitz.
- Hilbert, David & Ackermann, W. 1949<sup>3</sup>. *Grundzüge der theoretischen Logik.* (Die Grundlehren der mathematischen Wissenschaften, 27.) Berlin: Springer-Verlag.
- Hirt, Hermann. 1898. Zur lösung der gutturalfrage im Indogermanischen. *BB* 24: 218-291.
- 1900. *Der Indogermanische Ablaut, vornehmlich in seinem Verhältnis zur Betonung.* Strassburg: Trübner.
- 1906. Zur idg. Laut- und Formenlehre. *IF* 17: 388-402.
- 1913. Fragen des Vokalismus und der Stammbildung im Indogermanischen. *IF* 32: 236-47.



- 1921. *Indogermanische Grammatik. Teil II. Der indogermanische Vokalismus*. Heidelberg: Winter.
- 1927. *Indogermanische Grammatik. Teil I. Einleitung I. Etymologie II. Konsonantismus*. Heidelberg: Winter.
- 1928. *Indogermanische Grammatik, IV. Doppelung. Zusammensetzung. Verbum*. Heidelberg: Winter.
- Hock, Hans Henrich. 1986. *Principles of Historical Linguistics*. (Trends in Linguistics, Studies and Monographs, 34.) Berlin: Mouton - de Gruyter.
- 1991. *Principles of Historical Linguistics. Second revised and updated edition*. Berlin: Mouton - de Gruyter.
- Hoenigswald, Henry M. 1974. Internal Reconstruction and Context. (→ Anderson & Jones 1974: 189-201).
- Hoffmann, Karl. 1986. Avestisch §. (→ Schmitt, R. & Skjaervø, P.O. 1986<sup>ed</sup>: 163-183)
- Hoffner, Harry A. & Güterbock Hans G. 1989<sup>ed</sup>. *The Hittite Dictionary of the Oriental Institute of the University of Chicago L-N*. [= CHD L-N]. Chicago: The Oriental Institute of the University of Chicago.
- 1997<sup>ed</sup>. *The Hittite Dictionary of the Oriental Institute of the University of Chicago P*. [= CHD P] Chicago: The Oriental Institute of the University of Chicago.
- Holder, Alfred. 1896. *Alt-Celtischer Sprachschatz. Erster Band A – H*. [= ACSS 1] Leipzig: Teubner.
- 1904. *Alt-Celtischer Sprachschatz. Zweiter Band I – T*. [= ACSS 2]. Leipzig: Teubner.
- Hopper, Paul J. 1973. Glottalized and murmured occlusives in Indo-European. *Glossa* 7: 141-166.
- 1977<sup>ed</sup>. *Studies in descriptive and historical linguistics; Festschrift for Winfred P. Lehmann, ed. by P. J. Hopper*. (Amsterdam Studies in the Theory and History of Linguistic Science, 4:4.) Amsterdam: Benjamins.
- 1981. 'Decem' and 'taihun' languages: an Indo-European isogloss. (→ Arbeitman & Bomhard 1981<sup>ed</sup>: 133-142).
- Hrozný, Bedřich. 1915. Die Lösung des hethitischen Problems. *Mitteilungen der Deutschen Orientgesellschaft* 56: 17-50.
- 1917. *Die Sprache der Hethiter, ihr Bau und ihre Zugehörigkeit zum indogermanischen Sprachstamm*. (Boghazköi-Studien, 1-2). Leipzig: Hinrichs.
- Hübschmann, Heinrich. 1879. Iranische Studien. *KZ* 24: 323-415.
- 1885. *Das indogermanische Vokalsystem*. Straßburg: Trübner.
- 1897. *Armenische Grammatik I: Armenische Etymologie*. [= ArmGr.]. Leipzig: Breitkopf & Härtel.
- Itkonen, Esa. 1978. *Grammatical theory and metascience*. (Current Issues in Linguistic Theory, 5.) Amsterdam: Benjamins.
- Jakobson, Roman. 1958. Typological studies and their contribution to historical comparative linguistics. (→ Sievertsen 1958<sup>ed</sup>: 17-35)
- Johansson, K. F. 1888. Miscelle. *BB* 13: 111-128.
- 1890. Morphologische studien II. *BB* 15: 304-316-
- Jones, David. 1950. *The Phoneme: Its Nature and Use*. Cambridge: Heffer.
- Jones, Sir William. 1788. Anniversary Discourse (February 2nd 1786). *Asiatick Researches* 1: 415-431.
- Jonsson, Hans. 1978. *The Laryngeal Theory. A Critical Survey*. (Skrifter utgivna av vetenskapsocieten i Lund, 74.) Lund: CWK Gleerup.
- Joseph, Brian D. 1982. The treatment of \*CR̥H and the origin of CaRa in Celtic. *Ériu* 33: 31-57.
- Juret, A. 1937. Études de morphologie et d'étymologie latines. *Revue des études latines* 15: 72-83.
- Kammenhuber, Annelies. 1985. Zum Modus Injunktiv und zum Drei-Genus-System im Urindogermanischen (ca. 3000-2500). (→ Pieper & Stickel 1985<sup>ed</sup>: 435-466)

- Katičić, Radoslav. 1970. *A contribution to the general theory of comparative linguistics*. (Janua Linguarum, Series Minor, 83.) The Hague: Mouton.
- Kent, Roland G. 1953. *Old Persian. Grammar. Texts. Lexicon*. 2nd rev. ed. [= OldP] (American Oriental Series, 33.) New Haven (Connecticut): American Oriental Society.
- Kienle, R. von, Moortgat A., Otten H. Schuler, E. von & Zaumseil W. 1959<sup>ed</sup>. *Festschrift Johannes Friedrich zum 65. Geburtstag am 27. August 1958 gewidmet*. Heidelberg: Winter.
- Kloekhorst, Alwin. 2008. *Etymological Dictionary of the Hittite Inherited Lexicon*. [= HIL] (Leiden Indo-European Dictionary Series, 5.) Leiden: Brill.
- Kluge, Friedrich. 1975. *Etymologisches Wörterbuch der deutschen Sprache*. Berlin, Walter de Gruyter.
- Koerner, Konrad. 1975. Zu Ursprung und Geschichte der Besternung in der historischen Sprachwissenschaft. *KZ* 89: 185-190.
- 1982. The Schleicherian Paradigm in Linguistics. *General Linguistics* 22: 1-39.
- 1985. The place of Saussure's 'Mémoire' in the development of historical linguistics. (→ Fisiak 1985<sup>ed</sup>: 323-345)
- Korhonen, Mikko. 1974. *Über den Character der sprachgeschichtlichen Rekonstruktionen*. (Nachrichten der Akademie der Wissenschaften in Göttingen philologisch-historische Klasse, 3/1974.) Göttingen: Vandenhoeck & Ruprecht.
- Kortlandt, Frederik H. H. 1978. I.-E. palatovelars before resonants in Balto-Slavic (→ Fisiak 1978<sup>ed</sup>: 237-243).
- 1988. Remarks on Winter's Law. (→ Barentsen et al. 1988<sup>ed</sup>: 387-396)
- Krahe, Hans. 1958. *Indogermanische Sprachwissenschaft I: Einleitung und Lautlehre*. (Samlung Götschen, 59.) Berlin: de Gruyter.
- Krause, Wolfgang. 1952. *Westtocharische Grammatik*. Heidelberg: Winter.
- Krause, Wolfgang & Thomas, Werner. 1960-64. *Tocharisches Elementarbuch I-II*. Heidelberg: Winter.
- Kronasser, Heinz. 1956. *Vergleichende Laut- und Formenlehre des Hethitischen*. [= VLFH] Heidelberg: Winter.
- 1962-66. *Etymologie der hethitischen Sprache. Band 1. I Zur Schreibung und Lautung des Hethitischen. II. Wortbildung des Hethitischen*. [= EHS] Wiesbaden: Harrassowitz.
- Kuhn, Thomas, S. 1973<sup>4</sup>. *The Structure of Scientific Revolutions. Second Edition, Enlarged*. (International Encyclopedia of Unified Science, 2:2.) Chicago: The University of Chicago Press.
- Kuiper, Franciscus B. J. 1937. *Die Indogermanischen Nasalpräsentia. Ein Versuch zu ein morphologischen Analyse*. (Museum XLVI 1939, 1 Royen.). Amsterdam: Noord-Holland.
- Kümmel, Martin Joachim. 2012. Typology and reconstruction: The consonants and vowels of Proto-Indo-European. (→ Whitehead et. al 2012<sup>ed</sup>: 291-329)
- Kuryłowicz, Jerzy. 1927a. *ə indo-european et ʰ hittite*. (Symbolae Grammaticae in Honorem Ioannis Rozwadowski, 1:95-104.) Kraków: Drukarnia Uniwersytetu Jagiellońskiego.
- 1927b. Les effets du *ə* en indo-iranien. *Prace Filologiczne* 11: 201-43
- 1935. *Études indoeuropéennes I* (Polska Akademia Umiejętności. Prace Komisji Językowej, vol 21.) Kraków, Polska Akademia Umiejętności.
- 1948. Le degré long *en* indo-iranien. *BSL* 44: 42-63.
- 1956. *L'apophonie en indo-européen*. (Prace Językoznawcze, 9) Wrocław, Polska Akademia Nauk. Komitet Językoznawcze.
- 1962. Probleme der indogermanischen Lautlehre (Innsbrucker Beiträge zur Kulturwissenschaft, Sonderheft 15: II. Fachtagung für indogermanische und allgemeine Sprachwissenschaft, 107-115) Innsbruck, Sprachwissenschaftliche Institut der Leopold-Franzens-Universität.
- 1964. On the methods on internal reconstruction. (→ Lunt 1964<sup>ed</sup>: 9-36)
- 1968. *Indogermanische Grammatik. Band II Akzent · Ablaut*. Winter: Heidelberg.
- 1973. Internal reconstruction. (→ Sebeok 1973<sup>ed</sup>: 63-92)

- 1976. Phonologisches zum indogermanischen a-Vokalismus. (→ Morpurgo Davies & Meid 1976<sup>ed</sup>: 127-133)
- Lachmann, K. 1850. *Lucretius: De Rerum Natura*. Reprinted 1979. New York: Garland Publ. Inc.
- Ladefoged, Peter & Maddieson Ian. 1996. *The Sounds of the World's Languages*. Cambridge (MA): Blackwell Publishers.
- Lane, George Sherman. 1960. The Indo-European Labiovelars in Tocharian. (→ FSKrause 72-79).
- Laroche, Emmanuel. 1954. Rez. H. Otten, Luvische und Palaische Texte (KBo 35); Luvische Texte in Umschrift; Zur grammatikalischen und lexicalischen Bestimmung des Luvischen: Untersuchung der Luvili-Texte. *Bibliotheca Orientalis* 11: 121-124.
- 1957/8. Comparaison du Louvite et du Lykien I. [= Comp1.] *BSL* 53: 159-197.
- 1959. *Dictionnaire de la langue louvite*. [= DLL] (Bibliothèque archéologique et historique de l'institut français d'archéologie d'Istanbul, vol. VI.) Paris, Maisonneuve
- 1960. Comparaison du Louvite et du Lykien II [= Comp2.]. *BSL* 55: 155-185.
- 1963. Études lexicales et étymologiques sur le hittite. *BSL* 58: 58-79.
- 1965. Dictionnaire de la langue louvite, Addenda et Corrigenda. [= DLLAdd.] *RHA* 23/76: 44-50.
- 1966. *Les Noms des Hittites* [= NOMS.] (Études Linguistiques, 4.) Paris: Klincksieck.
- 1967. Comparaison du Louvite et du Lykien III [= Comp3.] *BSL* 62: 46-66.
- 1978. Problemes de l'écriture cunéiforme Hittite. *Annali della Scuola Normale Superiore di Pisa Classe di lettere e filosofia Serie III*, Vol. VIII, 3: 739-753)
- 1986. Les laryngales de l'anatolien: état des questions. *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*. 130<sup>e</sup> année, N. 1:134-140.
- Laver, John. 1994. *Principles of phonetics*. (Cambridge textbooks in linguistics.) Cambridge: Cambridge University Press.
- Lehmann, Winfred, P. 1951. The distribution of Proto-Indo-European /r/. *Language* 27: 13-17.
- 1952. *Proto-Indo-European phonology*. Austin: University of Texas Press & Linguistic Society of America.
- 1986. *A Gothic Etymological Dictionary Based on the Third Edition of Vergleichendes Wörterbuch der gothischen Sprache by Sigmund Feist*. Leiden: Brill.
- 1993. *Theoretical Bases of Indo-European Linguistics*. London: Routledge.
- Lejeune, Michel. 1953. *Grammaire homérique I*. Paris, Klincksieck.
- Leskien, August. 1876. *Die Deklination im slavisch-litauischen und germanischen*. Leipzig: Hirzel.
- Leumann, Manu. 1977. *Lateinische Laut- und Formenlehre*. (Handbuch der Altertumswissenschaft, II 2.1.) München: Beck.
- Liddell, H. G. & Scott, R. 1940<sup>9</sup>. *A Greek-English Lexicon, revised by Henry Stuart Jones with the assistance of Roderick McKenzie*. [= LSJ]. Oxford: Clarendon Press.
- Lindeman, Fredrik, Otto. 1982. *Introduction to the 'Laryngeal Theory'*. (The Institute for Comparative Research in Human Culture, Serie B LXXIV.) Oslo: Norwegian University Press.
- 1987. *Introduction to the 'Laryngeal Theory'*. Oslo: Norwegian University Press.
- 1997. *Introduction to the 'Laryngeal Theory' (Rev.ed.)*. (IBS 91) Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Lubotsky, Alexander. 1989. Against a PIE phoneme \* a. (→ Vennemann 1989<sup>ed</sup>: 53-66).
- Lunt, Horace. 1964<sup>ed</sup>. *Proceedings of the 9th international congress of linguists*. London: Mouton & CO.
- Lyons, John. 1968. *Introduction to theoretical linguistics*. London: Cambridge University Press.
- 1977. *Semantics I-II*. Cambridge: Cambridge University Press
- Machek, Václav. 1959. Neun hethitische Wortvergleiche. *Lingua Posnaniensis* 7: 77-84.
- Magnusson, Walter, L. 1967. Complementary Distributions among the Root Patterns of Proto-Indo-European. *Linguistics* 34: 17-25.

- Mallory, James P. 1989. *In Search of the Indo-Europeans: Language, Archaeology and Myth*. London: Thames and Hudson.
- Mallory, James P. & Adams, Douglas Q. 1997<sup>ed</sup>. *Encyclopedia of Indo-European Culture*. [= MA.] London: Fitzroy Dearborn Publishers.
- Marstrand Carl J. S. et al. 1913ff. *Dictionary of the Irish language*. [= DIL] Dublin: Royal Irish Academy.
- Martinet, André. 1953. Non-apophonic O-vocalism in Indo-European. *Word* 9: 253-267.
- 1955. *Économie des changements phonétiques. Traité de phonologie diachronique*. (Bibliotheca Romanica, Series Prima Manualia et Commentationes, X.) Bern: Francke.
- Martirosyan, Hrach K. 2009. *Etymological Dictionary of the Armenian Inherited Lexicon*. [= EtDiArm.] (Leiden Indo-European Etymological Dictionary Series, 8.) Boston–Leiden: Brill.
- Matthews, P. H. 1991<sup>2</sup>. *Morphology*. Cambridge: Cambridge University Press.
- Maurer, Theodoro H. Jr. 1947. Unity of the I-E. ablaut system: the dissyllabic roots. *Language* 23: 1-22.
- Mayrhofer, Manfred. 1956-1980. *Kurzgefaßtes etymologisches Wörterbuch des Altindischen I-IV*. [= KEWA] Heidelberg: Winter.
- 1983. *Sanskrit und die Sprachen Alteuropas. Zwei Jahrhunderte des Widerspiels von Entdeckungen und Irrtümern*. (Nachrichten der Akademie der Wissenschaften in Göttingen philologisch-historische Klasse, 1983/5). Göttingen: Vandenhoeck & Ruprecht.
- 1986. *Indogermanische Grammatik. Band I, 2. Halbband: Lautlehre*. Heidelberg: Winter. (→ Cowgill & Mayrhofer 1986)
- 1986-2000. *Etymologisches Wörterbuch des Altindoarischen*. [= EWA] Heidelberg: Winter.
- 1987. Die Vertretung der indogermanischen Laryngale im Lateinischen. *KZ* 100: 86-108.
- 1989. Review of Studies in memory of Warren Cowgill (1929-1985). *Language* 65: 135-141.
- 2004. *Die Hauptprobleme der indogermanischen Lautlehre seit Bechtel*. (Österreichischen Akademie der Wissenschaften, Philosophisch-historische Klasse Sitzungsberichte, 709.) Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Mayrhofer, Manfred & Peters Martin & Pfeiffer Oskar E. 1980<sup>ed</sup>. *Lautgeschichte und Etymologie*. (Akten der VI. Fachtagung der Indogermanischen Gesellschaft.) Wiesbaden: Reichert.
- Meid, Wolfgang. 1988. Einige persönliche und sachliche Bemerkungen zur Laryngaltheorie. (→ Bammesberger 1988<sup>ed</sup>: 333-535)
- Meillet, Antoine. 1894a. De quelques difficultés de la théorie des gutturales indo-européennes. *MSL* 8: 277-304.
- 1894b. Notes arméniennes. *MSL* 8: 153-165.
- 1903. *Esquisse d'une grammaire comparée de l'arménien classique*. Vienne: Mékhitharistes.
- 1910/11. Deux notes sur des formes verbales indo-européennes. *MSL* 16: 239-246.
- 1934<sup>7</sup>. *Introduction à l'étude comparative des langues indo-européennes. Septième édition refondue*. Paris: Hachette.
- 1935. Les sourdes aspirées en arménien. *BSL* 36: 109-120.
- 1936<sup>2</sup>. *Esquisse d'une grammaire comparée de l'arménien classique*. Vienne: Mekhitharistes.
- 1937<sup>8</sup>. *Introduction à l'étude comparative des langues indo-européennes*. Paris: Hachette.
- Meillet, Antoine & Vaillant, André. 1934<sup>2</sup>. *Le slave commun. Seconde édition revue et augmentée avec le concours de A. Vaillant*. (Collection de manuels publiée par l'Institut d'études slaves, II.) Paris: Champion.
- Meiser, Gerhard. 1986. *Lautgesichte der umbrischen Sprache*. (IBS 51) Innsbruck, Institut für Sprachwissenschaft der Universität Innsbruck.
- Melchert, H. Craig. 1987. Reflexes of \*h<sub>3</sub> in Anatolian. *Die Sprache* 33: 19-28.
- 1989. New Luvo-Lycian Isoglossen. *HS* 102: 23-45.
- 1993. *Cuneiform Luwian Lexicon*. [= CLuLex.] (Lexica Anatolica, 2.) Chapel Hill.
- 2003<sup>ed</sup>. *The Luwians*. Leiden: Brill.

- 2003. The Luwians: Language (→ Melchert 2003ed: 170-210)
- 2004. *A Dictionary of the Lycian Language*. New York: Beech Stave Press.
- Meriggi, Piero. 1936. Der Indogermanismus des Lykischen. (→ Arntz 1936<sup>ed</sup>: 2:257-282).
- 1966. Die Junggrammatiker und die heutige Sprachwissenschaft. *Die Sprache* 12: 1-15.
- Messing, Gordon M. 1947. Selected studies in Indo-European Phonology. *Harvard Studies in Classical Philology* 56-57: 161-232
- Meyer, Gustav. 1891. *Etymologisches Wörterbuch der albanesischen Sprache*. Straßburg: Trübner.
- Miller, D. Gary. 1976. Pure Velars and Palatals in Indo-European: a Rejoinder to Magnusson. *Linguistics* 178: 47-64.
- 1977a. Bartholomae's Law and an IE root structure constraint (→ Hopper 1977<sup>ed</sup>: 365-392).
- 1977b. Some theoretical and hypothetical implications of IE root structure constraints. *JIES* 5: 31-40.
- Møller, Hermann. 1879. Review of F. Kluge, Beiträge zur Geschichte der germanischen Conjugation. *EngStud.* 3: 148-164.
- 1880. Germanisch ā ē ō in den endungen des nomens und die entstehung des o (a<sub>2</sub>). *PBB* 7: 482-547.
- 1893. Review of Bechtel 1892 (Hauptprobleme der idg. Lautlehre seit Schleicher). *Zeitschrift für deutsche Philologie* 25: 382-384.
- 1906. *Semitisch und Indogermanisch I (Konsonanten)*. Kopenhagen: Hagerup.
- 1911. *Vergleichendes indogermanisch-semitisches Wörterbuch*. Göttingen: Vandenhoeck & Ruprecht.
- Monier-Williams Sir M. 1993. *A Sanskrit-English Dictionary. Reprint.* [= MonWil.] Delhi: Motilal Banarsidass.
- Monte, Giuseppe F. del & Tischler, Johann. 1978. Die Orts- und Gewässernamen der hethitischen Texte. [= OGH] (Répertoire Géographique des Textes Cunéiformes, 6.) Wiesbaden: Reichert.
- Morpurgo Davies, Anna & Meid, Wolfgang. 1976<sup>ed</sup>. *Studies in Greek, Italic, and Indo-European Linguistics. Offered to Leonard R. Palmer On the Occasion of his Seventieth Birthday June 5, 1976.* (Innsbrucker Beiträge zur Sprachwissenschaft, 16.) Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Müller, Friedrich Max. 1890. *Three Lectures on the Science of Language and its Place in General Education*. Chicago: The Open Court Publishing Company.
- Neu, Erich & Meid, Wolfgang. 1979<sup>ed</sup>. *Hethitisch und Indogermanisch. Vergleichende Studien zur historischen Grammatik und zur dialektgeographischen Stellung der indogermanischen Sprachgruppe Altkleinasiens.* (IBS 25) Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Neumann, Günter, N. 1961. Beiträge zum Lykischen I. [= BLyk. 1] *Die Sprache* 7: 70-76.
- 1962. Beiträge zum Lykischen II. [= BLyk. 2]. *Die Sprache* 8: 203-212.
- 1967. Beiträge zum Lykischen III [= BLyk. 3]. *Die Sprache* 13: 31-38.
- 1970. Beiträge zum Lykischen IV [= BLyk. 4]. *Die Sprache* 16: 54-62.
- 1975. Beiträge zum Lykischen V [= BLyk. 5]. *Die Sprache* 20: 109-114.
- Nyberg, Henrik Samuel. 1974. *A Manual of Pahlavi II: Glossary.* [= MPahl.] Wiesbaden: Harrassowitz.
- Nyman, Martti. 1977a. Where does Latin *sum* come from? *Language* 53: 39-60.
- 1977b. The Family Resemblance of Latin *caput* and *capillus* (and what can be gleaned from it). *IF* 82: 163-190.
- 1979. Morphosyntactic motivation in reconstructed words: Latin *tranquillus*. *IF* 84: 132-156.
- 1982. *Relational and Reconstructive Aspects of Grammatical Systematization. Data-Oriented Studies.* Helsinki: Helsingin yliopiston monistuspalvelu.
- 1984. Squibs: On evaluation, causation and validation: Pre-Latin \*-*tl-*. *Folia Linguistica Historica* 5/1: 185-191.

- 1985. ē/ō/a as an ablaut pattern in Indo-European. *IF* 90: 55-61.
- Oettinger, Norbert. 1976. Der indogermanische Stativ. *MSS* 34: 109-149.
- 1979. Die Stammbildung des hethitischen Verbuns. (Erlanger Beiträge zur Sprach- und Kunstwissenschaft, 64.) Nürnberg: Carl.
- 1988. Der indogermanische Nominativ Dual aus laryngalistischer Sicht (→ Bammesberger 1988<sup>ed.</sup>: 355-59).
- Onions, C. T. 1966<sup>ed.</sup>. *The Oxford Dictionary of English Etymology*. Edited by C.T. Onions with the Assistance of G. W. S. Friedrichsen and R. W. Burchfield. [= OxEngEt.] Oxford: Clarendon Press.
- Orel, Vladimir. 1998. *Albanian Etymological Dictionary*. [= AlbEtD.]. Leiden: Brill.
- 2000. *A Concise Historical Grammar of the Albanian Language*. [= CHGAlb.] Leiden: Brill.
- Osthoff, Hermann. 1876. *Zur Frage des Ursprungs der germanischen n-Deklination*. *PBB* 3: 1-89.
- 1878. Kleine beiträge zur declinationslehre der indogermanischen sprachen I. *MU* 1: 207-290.
- 1879a. Zur griechischen Vertretung der indogermanischen nasalis sonans. *KZ* 24: 415-26.
- 1879b. Kleine Beiträge zur Declinationslehre der indogermanischen Sprachen II. *MU* 2: 1-147.
- 1879c. Ueber einige altindische verba der V. und IX. conjugationsklasse. *KZ* 24: 286-293.
- 1881a. Die Tiefstufe im indogermanischen Vokalismus. *MU* 4:1-406.
- 1881b. Gustav Meyer, Griechische Grammatik. *Philologische Rundschau* 50: 1588-1597.
- 1884. *Zur Geschichte des Perfects im Indogermanischen*. Strassburg: Trübner.
- 1886. *Die Neueste Sprachforschung und die Erklärung des indogermanischen Ablautes*. Heidelberg: Otto Petters.
- Ostir, Karl. 1913. Zum Verhältnis des indogermanischen x-Lautes zu den sonantischen Kehlkopflauten. Ein Beitrag zur indogermanisch-semischen Sprachwissenschaft. *Anthropos* 8: 165-180.
- Palmer, Leonard, R. 1980. *The Greek Language*. London: Faber and Faber.
- Partee, Barbara H., ter Meulen, Alice & Wall, Robert E. 1990. *Mathematical Methods in Linguistics*. Dordrecht: Kluwer Academic Publishers.
- Paul, Hermann. 1880. Zur Geschichte des Germanischen Vocalismus. *PBB* 6: 1-256.
- 1898<sup>3</sup>. *Prinzipien der Sprachgeschichte*. Halle: Niemeyer.
- Pedersen, Holger. 1900a. Wieviel Laute gab es im Indogermanischen? *KZ* 36: 74-110.
- 1900b. Die gutturale im Albanesischen. *KZ* 36: 277-339.
- 1905. Die nasalpräsentia und der slavische akzent. *KZ* 38: 297-421.
- 1909-13. *Vergleichende Grammatik der keltischen Sprachen 1-2*. [= VGK] Göttingen: Vandenhoeck & Ruprecht.
- 1926. *La cinquième déclinaison latine*. (Det Kongelige Danske Videnskabernes Selskab. Historisk-Filologiske Meddelelser, XI:5.) København: Bianco Lunos Bogtrykkeri.
- 1931. *Linguistic Science in the Nineteenth Century*. Transl. John W. Spargo. Cambridge (MA): Harvard University Press.
- 1938. *Hittitisch und die anderen indoeuropäischen Sprachen*. [= HudA] (Det Kongelige Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser, 25:2.) København: Levin & Munksgaard.
- 1945. *Lykisch und Hittitisch*. (Det Kongelige Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser, 30:4.) København: Levin & Munksgaard.
- 1951. *Die gemeindoeuropäischen und die vorindoeuropäischen Verschlusslaute*. (Det Kongelige Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser, 32:5.) København: Munksgaard.
- 1962. The discovery of language. Linguistic science in the nineteenth century. Trans. John W. Spargo. Bloomington (IN): Indiana University Press.
- 1983. A glance at the history of linguistics with particular regard to the historical study of phonology. Translated from the Danish by Caroline C. Henriksen, Edited with introduction by Konrad Koerner. Amsterdam: Benjamins.

- Peeters, Christian. 1974. Gothic kaurus, Sanskrit guruḥ, Greek βαρούς. *IF* 79: 33-34.
- Persson, Per. 1891. Studien zur Lehre von der Wurtzelerweiterung und Wurtzelvariation. Uppsala: Akademiska Boktryckeriet Edv. Berling.
- 1912. *Beiträge zur indogermanische Wortforschung I-II*. [= Beitr.] Uppsala & Leipzig: Akademiska bokhandeln & Harrassowitz.
- Peters, Martin. 1980. *Untersuchungen zur Vertretung der Indogermanische Laryngale im Griechischen*. (Österreichische Akademie der Wissenschaften Philosophisch-historische Klasse. Sitzungsberichte, 377.) Wien: Österreichischen Akademie der Wissenschaften.
- Petersen, Walter. 1938. The Evidence for Schwa Secundum in Latin and Greek. *Language* 14: 39-59.
- Petersson, Herbert. 1911. *Studien zu Fortunatov's Regel. Beiträge zur altindischen Laut- und Sprachgeschichte*. Lund: Håkan Ohlssons Buchdruckerei.
- Pieper, Ursula & Stickel, Gerhard. 1985<sup>ed</sup>. *Studia Linguistica Diachronica et Synchronica Werner Winter sexagenario anno MCMLXXXIII gratis animis ab eius collegis, amicis discipulisque oblata*. Berlin: Mouton & de Gruyter.
- Pisani, Vittore. 1950. Studi sulla fonetica dell'armeno. *Richerche Linguistiche* I: 165-193.
- 1979. Lat. capillus e pullus. *IF* 84: 182-183.
- Pokorny, Julius. 1959. *Indogermanisches etymologisches Wörterbuch I*. [= P.] Tübingen: Francke
- 1969. *Indogermanisches etymologisches Wörterbuch II*. Bern: Francke.
- Polomé, Edgar. 1950. Réflexes de laryngales en arménien. (→ MélGrégoire II: 539-569)
- 1965. The Laryngeal Theory so far: a critical biographical survey. (→ Winter 1965<sup>ed</sup>: 9-79)
- Poucha, Pavel. 1955. *Institutiones Linguae Tocharicae I: Thesaurus Linguae Tocharicae Dialecti A*. (Monografie Archivu orientálního, 15.) Prag: Státní pedagogické nakladatelství.
- Puhvel, Jaan. 1960. *Laryngeals and the Indo-European verb*. (University of California Publications in Linguistics, 21.) Berkeley: University of California Press.
- 1965. Evidence in Anatolian. (→ Winter 1965: 79-92)
- 1984ff. Hittite Etymological Dictionary. [= HED] (Trends in Linguistics. Documentation, 1.) Berlin: Mouton.
- Pyysalo, Jouna. 2003. Laryngaaliteorian näköalattomuus. (University of Helsinki, MA Thesis [unpublished])
- 2010. Fourteen Indo-European Etymologies in honorem Klaus Karttunen (→ Butters & Tikkanen 2010<sup>ed</sup>: 249-269).
- Rask, Rasmus Kristian. 1818. *Undersøgelse om det gamle Nordiske eller Islandiske Sprogs Oprindelse. Et af der kongelige Danske Videnskabers-Selskap kronet Prisskrift*. Copenhagen: Gyldendal.
- Reichert, Hans. 1922. *Die Labiovelare*. *IF* 40: 40-81.
- Rix, Helmut. 1976. *Historische Grammatik des Griechischen. Laut- und Formenlehre*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Rix, Helmut & Kümmel, Martin & Zehnder, Thomas & Lipp, Reiner & Schirmer, Birgitte. 2001<sup>ed</sup>. *Lexicon der indogermanischen Verben: die Wurzeln und ihre Primärstambildungen*. Wiesbaden: Reichert.
- Robins, R. H. 1978. The Neogrammarians and their Nineteenth-Century Predecessors. *TPS* 1978: 1-16.
- Rosenkranz, Bernhard. 1959. Zur hethitischen Orthographie und Lautlehre. (→ Kienle et al. 1959<sup>ed</sup>: 417-426)
- Sadnik, Linda & Aitzetmüller Rudolf. 1955. *Handwörterbuch zu den altkirchenslavischen Texten*. [= Sadnik]. Heidelberg: Winter.
- Salmons, Joseph & Smith, Laura Catharine. 2005. On the status of IE. labiovelar stops. *IF* 110: 86-96.
- Salus, P. H. 1963. *The Compound noun in Indo-European*. A survey. New York University dissertation.
- Saussure, Ferdinand de. 1877. Essai d'une distinction des différents a indo-européennes. (→ Rec. 379-390)

- 1878 *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*. [= Mém.] (→ Rec. 1-268)
- 1891. *Contribution à l'histoire des aspirées sourdes*. (→ Rec. 603)
- 1916. *Cours de linguistique générale*. Paris, Payot [édition 1979 = 1916 = édition originale]
- 1922. *Recueil des publications scientifiques de Ferdinand de Saussure*. [= Rec.] Heidelberg: Winter.
- Schleicher, August. 1852b. *Die Formenlehre der kirchenslawischen Sprache, erklärend und vergleichend dargestellt*. Bonn: H.B. König.
- 1860. *Die Deutsche Sprache*. Stuttgart: J. G. Cotta.
- 1861. *Compendium der vergleichenden Grammatik der indogermanischen Sprachen. Kurzer Abriss einer Laut- und Formenlehre der indogermanischen Ursprache, des Altindischen, Alteranischen, Altgriechischen, Altitalischen, Altkeltischen, Altslawischen, Litauischen und Altdeutschen I-II*. Weimar: Böhlau.
- 1868. 'Avis akvasas ka' (Eine Fabel in indogermanischer Ursprache). *KZ* 2: 206-208.
- Schmidt, Johannes. 1877. Review of Curtius' Studien 9. *Jenaer Literaturzeitung* 4: 733-5.
- 1881. Zwei arische a-laute und die palatalen. *KZ* 25: 1-179.
- 1885. Der locativus singularis und die griechische i-declination. *KZ* 27: 287-309.
- 1889. *Die Pluralbildungen der indogermanischen Neutra*. Weimar: Böhlau.
- 1895. *Kritik der Sonantentheorie*. Weimar: Böhlau.
- Schmitt, Gernot. 1973. Die iranischen Wörter für 'Tochter' und 'Vater' und die Reflexe des interkonsonantischen H (ə) in den idg. Sprachen. *KZ* 87: 36-83.
- Schmitt, Rüdiger. 1975. Von Bopp bis Hübschmann: Das Armenische als indogermanische Sprache. *KZ* 89: 3-30.
- 1977<sup>ed</sup>. *Etymologie*. Darmstadt: Wissenschaftliches Buchgeschellschaft.
- Schmitt, Rüdiger & Skjaervø, Prods Oktor. 1986<sup>ed</sup>. *Studia Grammatica Iranica. Festschrift für Helmut Humbach*. München: R. Kitzinger.
- Schmitt-Brandt, Robert. 1967. *Die Entwicklung des indogermanischen Vokalsystems. Versuch einer inneren Rekonstruktion*. Heidelberg: Julius Groos Verlag.
- Schrijver, Peter C. H. 1991. *The Reflexes of the Proto-Indo-European Laryngeals in Latin*. (Leiden Studies in Indo-European, 2.) Amsterdam: Rodopi
- 1995. *Studies in British Celtic Historical Phonology*. (Leiden Studies in Indo-European, 5.) Amsterdam: Rodopi.
- Schwyzler, Eduard. 1939. *Griechische Grammatik auf der Grundlage von Karl Brugmanns griechischer Grammatik I: Allgemeiner Teil - Lautlehre - Wortbildung - Flexion*. [= GrGr.] (Handbuch der Altertumswissenschaft, II.1.1.) München: Beck.
- Sebeok, Thomas A. 1973<sup>ed</sup>. *Diachronic, areal and typological linguistics*. (Current trends in linguistics, 11.) The Hague: Mouton.
- 1975<sup>ed</sup>. *Historiography of Linguistics*. (Current trends in linguistics, 13.) The Hague: Mouton.
- Seebold, Elmar. 1972. *Das System der indogermanischen Halbvokale. Untersuchungen zum sog. "Sieversschen Gesetz" und zu den halbvokalhaftigen Suffixen in der indogermanischen Sprachen, bes. im Vedischen*. Heidelberg: Winter.
- 1988. Wissenschaftsgeschichte und Theorieformulierung. Oder: Wie nötig ist die Laryngalhypothese? (→ Bammesberger 1988<sup>ed</sup>: 497-525)
- Shields, Kenneth Jr. 1981. A new look at the centum/satem isogloss. *KZ* 95: 203-213.
- 1992. *A History of Indo-European Verb Morphology*. (Amsterdam Studies in the Theory and History of Linguistic Science, 88. Series IV: Current Issues in Linguistic Theory.) Amsterdam: Benjamins.
- Siebs, Theodor. 1904. Anlautstudien. *KZ* 37: 277-324.
- Sievers, Eduard. 1876. *Grundzüge der Lautphysiologie zur Einführung in das Studium der Lautlehre der indogermanischen Sprachen*. Leipzig: Breitkopf & Härtel.



- 1878. Zur Accent- und Lautlehre der germanischen Sprachen. *PBB* 5: 62-163.
- Sievertsen, Eva. 1958<sup>ed</sup>. *Proceedings of the Eighth International Congress of Linguists*. Oslo: Oslo University Press.
- Sihler, Andrew L. 1995. *New Comparative Grammar of Greek and Latin*. Oxford: Oxford University Press.
- Sommer, Ferdinand. 1914. *Handbuch der Lateinischen Laut- und Formenlehre. Eine Einführung in das Sprachwissenschaftliche Studium des Lateins*. Heidelberg: Winter.
- 1948. *Zur Geschichte der griechischen Nominalkomposita*. München: Verlag der Bayerischen Akademie der Wissenschaften.
- Southern, Mark R. V. 1999. *Sub-Grammatical Survival: Indo-European s-mobile and its Regeneration in Germanic*. (JIES Monograph, 34.) Washington D. C.: Institute for the Study of Man Inc.
- Speirs, A. G. E. 1978. *The Proto-Indo-European Labiovelars*. Amsterdam: Verlag Adolf M. Hakkert.
- 1984. *Proto-Indo-European Laryngeals and Ablaut*. (Bibliotheca Slavonica, 24.) Amsterdam: Verlag Adolf M. Hakkert.
- Speiser, E. A. 1940. Phonetic Method in Hurrian Orthography. *Language* 16: 319-40.
- Stang, Christian S. 1967. L'alternance des consonnes sourdes et sonores en indo-européen. (→ FSJakobson 3: 1890-94)
- Starke, Frank. 1990. *Untersuchung zur Stammbildung des keilschrift-luwischen Nomens*. [= KLuN.] (StBoT 31.) Wiesbaden: Harrasowitz.
- Stensland, Lars. 1973. *Die Distribution der urindogermanischen sogenannten Gutturale*. (Studia Slavica Upsaliensia, 12.) Uppsala: Almqvist & Wiksell.
- Streitberg, Wilhelm. 1900. Die Entstehung der Dehnstufe. *IF* 3: 305-416.
- Strunk, Klaus. 1967. *Nasalpräsentien und Aoriste. Ein Beitrag zur Morphologie des Verbums im Indo-Iranischen und Griechischen*. (Indogerm. Bibl., 3 Reihe.) Heidelberg: Winter.
- 1973/4. Methodisches und Sachliches zu den idg. Nasalinfixpräsentien (ai. 7. Klasse). *IF* 78: 51-74.
- Stüber, Karin. 1997. Urindogermanisch \*h<sub>1</sub>nóm-ŋ 'Name', \*h<sub>2</sub>óng<sup>u</sup>-ŋ 'Salbe' und der Ablaut der neutralen n-Stämme. *Die Sprache* 39: 74-84.
- Sturtevant, Edgar. 1928. Original h in Hittite and the Medio-Passive in r. *Language* 4: 159-170.
- 1941. The Indo-Hittite and Hittite Correspondences of Indo-European ə. *Language* 17: 181-188.
- 1941b. The Indo-European voiceless aspirates. *Language* 17: 1-11.
- 1942. *The Indo-Hittite Laryngeals*. (Special Publication of the Linguistic Society of America.) Baltimore: Waverly Press.
- 1943. The Indo-European reduced vowel of the e-series. *Language* 19: 293-312.
- Sturtevant, Edgar & Hahn, Adelaide. 1951<sup>2</sup>. *A Comparative Grammar of the Hittite Language, vol. 1*. (Rev. Ed.) New Haven: Yale University Press.
- Sundwall, Johannes. 1913. *Die Einheimischen Namen der Lykier nebst einem Verzeichnisse kleinasiatischer Namenstämme*. (Beiheft zur Klio, 11.) Leipzig: Dieterich'sche Verlagsbuchhandlung Theodor Weicher.
- Szemerényi, Oswald. 1954. The Latin Adjectives in -ulentus. *Glotta* 33: 266-282.
- 1956. Latin rēs and the Indo-European long-diphthong stem nouns. *KZ* 73: 167-202.
- 1962. Principles of etymological research in the Indo-European languages. (In: II. Fachtagung für indogermanische und allgemeine Sprachwissenschaft, Innsbruck, 10.-15. Oktober 1961) *Innsbrucker Beiträge zur Kulturwissenschaft, Sonderheft* 15: 175-212)
- 1964. *Syncope in Greek and Indo-European and the Nature of Indo-European Accent*. (AIVN, Sezione Linguistica, Quaderni III.). Napoli: Istituto Universitario Orientale di Napoli.
- 1967. The new look of Indo-European. Reconstruction and typology. *Phonetica* 17: 67-99.
- 1970. *Einführung in die vergleichende Sprachwissenschaft*. Darmstadt: Wissenschaftliche Buchgesellschaft.

- 1973. La théorie des laryngales de Saussure à Kuryłowicz et à Benveniste. Essai de réévaluation. *BSL* 68: 1-25.
- 1977. Principles of etymological research in the Indo-European languages. (→ Schmitt 1977<sup>ed</sup>:287-346). Darmstadt: Wissenschaftliches Buchgesellschaft.
- 1985. Recent developments in Indo-European linguistics. *TPS* 1985:1-71.
- 1990<sup>4</sup>. *Einführung in die vergleichende Sprachwissenschaft*. 4., durchgesehene Auflage 1990. Darmstadt: Wissenschaftliche Buchgesellschaft.
- 1996. *Introduction to Indo-European Linguistics. Translation from Einführung in die vergleichende Sprachwissenschaft; 4th edition, 1990 with additional notes and references*. Oxford: Clarendon Press.
- Thurneysen, Rudolph. 1993<sup>5</sup>. *A Grammar of Old Irish Rev. and enl. ed.* [= GOI]. Dublin: University Press.
- Tischler, Johann. 1972. Die Vertretung von idg. anlautendem r- im Hethitischen. *KZ* 86: 267-83.
- 1977ff. *Hethitisches etymologisches Glossar. Mit Beiträgen von Günter Neumann und Erich Neu.* [= HEG] (IBS 20). Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- 1980. Hethitisch *ḫ* und die Rekonstruktion des indogermanischen Phoneminventars. (→ Mayrhofer et al. 1980<sup>ed</sup>:495-522)
- 1981. Schwundstufige Formen von langvokalischen Verben im altindischen. (→ Arbeitman & Bomhard 1981<sup>ed</sup>: 311-323).
- 1990. Hundert Jahre kentum-satem Theorie. *IF* 95: 63-98.
- Trask, Robert Lawrence. 1996. *A Dictionary of Phonetics and Phonology.* [= DPhPh] London: Routledge.
- 2000. *The Dictionary of Historical and Comparative Linguistics.* [= DHCL] Edinburgh: Edinburgh University Press.
- Trautmann, Reinhold. 1910. *Die altpreussischen Sprachdenkmäler.* [= APrS.] Göttingen: Vandenhoeck & Ruprecht.
- Turner, R. L. 1966. *A Comparative Dictionary of Indo-Aryan Languages.* [= Tu.] Oxford: Oxford University Press.
- Twaddell, W. Freeman. 1948. The prehistoric Germanic short syllabics. *Language* 24: 139-51.
- Untermann, Jürgen. 2000. *Wörterbuch des Oskisch-Umbrischen.* [= WbOU.] (Handbuch der Italischen Dialekte, III.) Heidelberg: Winter.
- Vaan, Michiel de 1999. The PIE root structure \**Te(R)D<sup>h</sup>*-. *HS* 112: 1-25.
- Vaillant, André. 1936. Le problème des intonations balto-slaves. *BSL* 37: 107-115.
- 1950. *Grammaire comparée des langues slaves. Tome I: Phonétique.* Paris: IAG Klincksieck.
- Vasmer, Max. 1950. *Russisches etymologisches Wörterbuch. Erster Band A-K.* [= REW 1] Heidelberg: Winter.
- 1955. *Russisches etymologisches Wörterbuch. Zweiter Band L-Ssuda.* [= REW 2]. Heidelberg: Winter.
- 1958. *Russisches etymologisches Wörterbuch. Dritter Band Sta-Y.* [= REW 3] Heidelberg: Winter.
- Vendryes, Joseph & Bachellery Edouard & Lambert, Pierre Y. 1959ff. *Lexique étymologique de l'irlandais ancien.* [= LÉIA] Dublin: Dublin Institute for Advanced Studies.
- Vennemann, Theo. 1989<sup>ed</sup>. *The New Sound of Indo-European. Essays in Phonological Reconstruction.* (Trends in Linguistics. Studies and Monographs, 41.) Berlin: Mouton.
- Ventris, Michael & Chadwick, John. 1956. *Documents in Mycenaean Greek. Three hundred selected tablets from Knossos, Pylos and Mycenae with commentary and vocabulary.* [= DMycGr.] Cambridge: University Press.
- Verner, Karl. 1877. Eine Ausnahme der ersten Lautverschiebung. *KZ* 23: 97-130.
- Vries, Jan de. 1961. *Altnordisches etymologisches Wörterbuch.* [= ANEtWb.] Leiden: Brill.
- Wackernagel, Jakob & Debrunner, A. 1896. *Altindische Grammatik I. Lautlehre.* [= AiGr. 1] Göttingen: Vandenhoeck und Ruprecht.

- 1905. *Altindische Grammatik II, 1. Einleitung zur Wortlehre. Nominalkomposition.* [= AiGr. 2] Göttingen: Vandenhoeck und Ruprecht.
- 1930. *Altindische Grammatik III. Nominalflexion – Zahlwort – Pronomen.* [= AiGr. 3] Göttingen: Vandenhoeck und Ruprecht.
- Walde, Alois & Pokorny, Julius. 1927-32. *Vergleichendes Wörterbuch der indogermanischen Sprachen. Herausgegeben und bearbeitet von Julius Pokorny.* [= WP.] Berlin: de Gruyter & Co.
- Walde, A. Hofmann, J.B. 1938. *Lateinisches etymologisches Wörterbuch. 3., neuarbeitete Auflage von J. B. Hofmann I-II.* [= WH.] Heidelberg: Winter.
- Watkins, Calvert. 1992<sup>3</sup>. *The American Heritage Dictionary of the English Language.* Boston: Houghton Mifflin.
- Whitehead, Alfred North & Russell, Bertrand. 1962. *Principia Mathematica (Paperback edition to \*56).* Cambridge: Cambridge University Press.
- Whitehead, Benedicte Nielsen, Olander, Thomas, Olsen, Birgit Anette & Rasmussen, Jens Elmegård. 2012<sup>ed</sup>. *The Sound of Indo-European: Phonetics Phonemics and Morphophonemics.* Copenhagen: Museum Tusulanum Press.
- Whitney, William Dwight. 1885. *The Roots, Verb-forms and Primary Derivates of the Sanskrit Language. A Supplement to his Sanskrit Grammar.* [= Roots]. Leipzig: Breitkopf und Härtel.
- 1955<sup>8</sup>. *Sanskrit Grammar. Including both the Classical Language, and the older Dialects, of Veda and Brahmana.* Cambridge (MA): Harvard University Press.
- Wilbur, Terrence H. 1977<sup>ed</sup>. *The 'Lautgesetz'-Controversy 1885-65: A documentation.* Amsterdam: Benjamins.
- Windekens, A. J. van. 1976. *Le tokharien conronté avec les autres langues indo-européennes. Vol. 1: La phonétique et le vocabulaire.* [= LeTokh.] (Travaux publiés par le Centre de Dialectologie Générale de l'Université catholique Néerlandaise de Louvain, Fascicule XI.) Louvain, Centre internationale de dialectologie générale.
- Winter, Werner. 1950. *Studien zum "prothetischen Vokal" im Griechischen.* (Hamburger Arbeiten zur Altertumswissenschaft). Hamburg: J. Heitmann.
- 1965<sup>ed</sup>. *Evidence for laryngeals: work papers of a conference in Indo-European linguistics on May 7 and 8, 1959.* (Janua linguarum series maior, 11.) The Hague: Mouton.
- 1978. The distribution of short and long vowels in stems of the type Lith. *ėsti* : *vėsti* : *mėsti* and OCS. *jasti* : *vesti* : *mesti* in Baltic and Slavic languages. (→ Fisiak 1978<sup>ed</sup>: 431-446). The Hague: Mouton.
- 1995<sup>ed</sup>. *On Languages and Language: The Presidential Addresses of the 1991 Meeting of the Societas Linguistica Europaea.* (Trends in Linguistics. Studies and Monographs, 78.) Berlin: Mouton.
- Wood, Francis A. 1912. Notes on Latin Etymologies. *Classical Philology* 7: 302-334.
- Wyatt, W. F. Jr. 1964. Structural Linguistics and the Laryngeal Theory. *Language* 40: 138-152.
- 1970. *Indo-European /a/.* Philadelphia: University of Pennsylvania Press.
- 1972. *The Greek prothetic vowel.* (American Philological Association, Philological Monographs. 31.). American Philological Association.
- Zeilfelder, Susanne. 1997. Heth. hapusa(s)- 'Schaft, Penis' und die Frage des dritten Laryngals. *HS* 110: 188-210.
- Zgusta, Ladislav. 1951. La théorie laryngale. *Archiv Oriental* 19: 428-472.

## 7 Abbreviations

a.	adjective	CHGAlb.	Orel 2000
A	accusative	CHLu.	Hawkins 2000
A.	active	Cil.	Cilicean
Abl	ablative	CLu.	Cuneiform Luwian
absol.	absolute	CLuLex.	Melchert 1993
abstr.	abstract	comp.	comparative
ACSS.	Holder 1896-1904	Comp1.-3.	Laroche 1957-67
adv.	adverb	conj.	conjunctive
Aigin.	Aeginan (Greek)	Corn.	Cornish
AiGr.	Wackernagel (et al.) 1896ff.	Cos.	Cos (Greek)
Aiol.	Aeolian (Greek)	cpd.	compound
AIWb.	Bartholomae 1904	ḫ	Comparative reconstruction
Akd.	Akkadian	Cret.	Cretan (Greek)
Alb.	Albanian	CrimGo.	Crimean Gothic
Alkm.	Alcman	cs.	causative
AlbEtD.	Orel 1998	Cymr.	Welsh
ANetWb.	Vries 1961	Cypr.	Cypriot (Greek)
ao.	aorist	Czech.	Czech
APrS.	Trautmann 1910	D	dativ
Arc.	Arcadian (Greek)	Δ	root determinative
Arg.	Argos (Greek)	deict.	deictic
Arm.	Armenian	DELG	Chantraine (1968-80)
ArmGr.	Hübschmann (1897)	Dhātup.	Dhātupatha (of Pāṇini)
ASaxD.	Bosworth & Toller 1882-98	DHCL	Trask 2000
Att.	Attic (Greek)	dial.	dialectal
Av.	Avesta(n)	diff.	differently
AV.	Atharva-Veda	DIL	Marstrand et al. (1913)
BB	[Bezenbergers] Beiträge zur Kunde der indogermanischen Sprachen	dim.	diminutive
Beitr.	Persson 1912	DLL	Laroche 1959
BLyk.	Neumann 1961-75	DLLAdd.	Laroche 1965
Boiot.	Boeotian (Greek)	DMycGr.	Ventris & Chadwick 1956
Br.	Brahmani (Sanskrit)	dn.	denominative
Bret.	Breton	Do.	Dorian (Greek)
bs.	base	DPal.	Carruba 1970
BSL	Balto-Slav(on)ic	DPhPh.	Trask 1996
BSL	Bulletin de la Société de Linguistique de Paris	ds.	desiderative
BSOAS	Bulletin of the School of Oriental and African Studies	DS	de Saussure
c.	genus communis	DTochB.	Adams (1999)
C	consonant (C = *p, k, t, s...)	du	dual
Car.	Carian	EFL <sup>2</sup>	Winter 1965 <sup>ed</sup>
card.	cardinal number	EHS	Kronasser 1962-66
CHD	Hoffner, Harry A. and Güterbock Hans G. 1989ff. (eds)	El.	Elean (Greek)
		encl.	enclitic
		end.	ending
		EngStud.	Englische Studien
		EtDiArm.	Martirosyan 2009

EWA	Mayrhofer (1986-2000)	impf.	imperfect
f.	feminine	indecl.	indeclinable
Fal.	Faliscan	indef.	indefinite
Fär.	Faroe Icelandic	inf.	infinitive
FSJakobson	To Honor Roman Jakobson I-III (Janua Linguarum, Series Maior 32) The Hague: Mouton. 1967.	int.	intensive
FSKrause	Indogermanica. Festschrift für Wolfgang Krause zum 65. Geburtstage am 18. September 1960. Heidelberg: Winter 1960	intj.	interjection
FSPagliari 2	Studia classica et orientalia Antonio Pagliaro oblata II, Roma: Herder 1969.	interrog.	interrogative
fut.	future	intr.	intransitive
G	genetive	Ion.	Ionian
gAv.	gāṽā-Avestan	IPA	International Phonetic Alphabet
Germ.	Germanic	ipv.	imperative
GEW	Frisk (1960-1972 <sup>2</sup> )	Ital.	Italic
GI	The glottalic theory of Gamkrelidze & Ivanov 1977 & 1995	iter.	iterative
Glotta	Zeitschrift für griechische und lateinische Sprache	JAOS	Journal of the American Oriental Society
GN	god-name (Göttername)	JIES	Journal of Indo-European Studies
Go.	Gothic	KEWA	Mayrhofer 1956-1980
GoEtD.	Lehmann 1986	Khot.	Khotanese Saka
GOI	Thurneysen 1993	KLuN.	Starke 1990
Gortyn.	Gortynan (Greek)	Cpd.	Cappadocian
Gr.	Greek	KVG	Brugmann 1904
GrGr.	Schwyzler 1939	KZ	[Kuhns] Zeitschrift für vergleichende Sprachforschung
Grundr <sup>2</sup>	Brugmann 1895ff.	L	locative
HED	Puhvel 1984ff.	LAnat.	Later Anatolian
HEG	Tischler 1977ff.	Langob.	Langobard
Hes.	Hesychius	Lat.	Latin
HHand.	Tischler 2001	Latv.	Latvian
Ḫi.	Hittite	LAv.	Later Avestan
HIL.	Kloekhorst 2008	LEIA	Vendryes (et al.) 1959
Hind.	Hindi	Lesb.	Lesbian (Greek)
HLu.	Hieroglyphic Luwian	Lex.	Lexical (grammarian) form
Hom.	Homeric (Greek)	Li.	Lithuanian
HS	Historische Sprachforschung (Historical Linguistics)	LiEtWb.	Fraenkel 1962-1965
I	instrumental	Ligur.	Ligurian
IBS	Innsbrucker Beiträge zur Sprachwissenschaft	LinB.	Linear B (Old Mycenaean Greek)
IE	Indo-European	LIV	Rix et al. 2001
IE&IE	Gamkrelidze & Ivanov 1995	Locr.	Locrian (Greek)
IF	Indogermanische Forschungen. Zeitschrift für Indogermanistik und allgemeine Sprachwissenschaft.	LSJ.	Liddel-Scott-Jones 1940
Il.	Iliad (Greek)	LT	laryngeal theory
Illyr.	Illyrian	LuPG.	Cate 1961
		Lyc.	Lycian
		Lyd.	Lydian
		LydWb.	Gusmani 1964
		m.	masculine
		M.	medium
		MA.	Mallory-Adams 1997
		Maced.	Macedonian

MélGrégoire II	Mélanges Henri Grégoire I-II (Annuaire de l'institut de philologie et d'histoire orientales et slaves, Tome 10.)	OIr.	Old Irish
Bruxelles, Secrétariat des. éd. de l'institut, 1950		OLat.	Old Latin
Mém.	Saussure 1922	OldP.	Kent 1953
Mess.	Messapian (or Messapic)	ON	name of a place (Ortsname)
MidCymr.	Middle Welsh	OLi.	Old Lithuanian
MidHG.	Middle High German	OPers.	Old Persian
MidIr.	Middle Irish	OPr.	Old Prussian
MidLG.	Middle Low German	opt.	optative
MidPers.	Middle Persian	ord.	ordinal
ModBret.	Modern Breton	ORun.	Old Runic (Scandinavian)
ModHG.	Modern High German	ORus.	Old Russian
ModIcl.	Modern Icelandic	OSax.	Old Saxon
ModIr.	Modern Irish	Osc.	Oscan
ModNorw.	Modern Norwegian	OSpan.	Old Spanish
ModPers.	Modern Persian (Farsi)	Oss.	Osetic
MonWil.	Monier-Williams 1993	OSwed.	Old Swedish
MPahl.	Nyberg 1974	OxEngEt.	Onions 1966 <sup>ed</sup>
MSL	Mémoires de la Société de Linguistique de Paris	OxLatD.	Glare 1982
MSS	Münchener Studien zur Sprachwissenschaft	P	passive
MU	Morphologische Untersuchungen auf dem Gebiete der indogermanischen Sprachen	P.	Pokorny 1959
n.	neuter	Π	prefix
N	nominative	Pael.	Paeligni
N.act.	nomen actionis	Pahl.	Pahlavi
neg.	negation	Pal.	Palaic
Neogr.	Neogrammarian	Paleogr.	Paleogrammarian
NOMS.	Laroche 1966	Pamph.	Pamphylian (Greek)
Northumbr.	Northumberland	Pāṇ.	Pāṇini
Norw.	Norwegian	PBB	[Pauls und Braunes] Beiträge zur Geschichte der dt. Sprache und Literatur
num.	numeral	PCelt.	Proto-Celtic
OAnat.	Old Anatolian	Perl.	Perlative
obl.	oblique	pf.	perfect
OBret.	Old Breton	PGerm.	Proto-Germanic
OCS.	Old Church Slav(on)ic	PGr.	Proto-Greek
OCymr.	Old Welsh	Phok.	Phokis (Greek)
OEng.	Old English	Phonetica	Phonetica. Internationale Zeitschrift für Phonetik
OFal.	Old Faliscan	Phryg.	Phrygian
OFrank.	Old Frankish	PIE	Proto-Indo-European
Ogam.	Ogam	PIIr.	Proto-Indo-Iranian
OGaul.	Old Gaul(ish)	Pind.	Pindaros (Greek)
OGH.	Monte & Tischler 1978	Pis.	Pisidi
OHG.	Old High German	PItal.	Proto-Italic
OH̄i.	Old Hittite	pl	plural
OHP.	van Gessel 1998	PLi.	Proto-Lithuanian
OIcl.	Old Icelandic	PN	name of a person (Personenname)
OInd.	Sanskrit	Poln.	Polish
		poss.	possessive
		postp.	postposition

Poucha	Poucha 1955	Sum.	Sumerian
pr.	present	sup.	superlative
prec.	precative	SV.	Sāma-Veda
pref.	prefix	Swed.	Swedish
prep.	preposition	Syrac.	Syracusan (Greek)
pret.	preterite	TAPA	Transactions of the American Philological Association
pron.	pronoun	Tarent.	Tarentum
pt.	participle	Ther.	Thera (Greek)
ptcl.	particle	Thess.	Thessalian (Greek)
R	resonant (= *l, r, m, n, i, u)	Thrac.	Thracian
ʀ	root	TochA.	Tocharian A
Rec.	Saussure 1922	TochB.	Tocharian B
red.	reduplication	TPS	Transactions of the Philological Society
refl.	reflexive	tr.	transitive
rel.	relative	Tu.	Turner 1966
REW	Vasmer 1950-58	Ugar.	Ugaritic
RHA	Revue hittite et asianique	Umbr.	Umbrian
Roots	Whitney 1885	V	vocative
Rus.	Russian	V	vowel
RV.	Rig-Veda	vb.	verb
Σ	(derivational) suffix	Ven.	Venetic
σ	(inflectional) suffix	VGK	Pedersen 1909-13
Sadnik	Sadnik & Aitzetmüller 1955	VLFH	Kronasser 1956
Sāy.	Sāyana	vn.	verbal noun
sb.	substantive	VN.	name of a people (Volksname)
SCr.	Serbo-Croat(ian)	WbOU.	Untermann 2000
Serb.	Serbian	WbRV.	Grassmann 1996
sg	singular	WH.	Walde-Hofmann 1938
Shetl.	Shetland	wk.	weak
Sid.	Sidetic	WP.	Walde-Pokorny (1927-32)
Sogd.	Sogdian	YV.	Yajur-Veda
st.	strong	Žem.	Žemaitė (Lithuanian)
StBoT Texten	Studien zu den Boğazköy-		
Suid.	Su(i)da		

