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The Reception of Indian Grammatical Tradition in the Indo-European Linguistics: The Concept of the Root, the Ablaut and the Laryngeal Theory¹

ABSTRACT: This paper examines the reception and impact of the Indian grammatical tradition, especially of Pāṇini's *Aṣṭādhyāyī*, on the development of Indo-European linguistics. While Pāṇini's grammar was initially introduced to Europe in the context of Sanskrit studies, its methodological precision and systematic character influenced comparative and historical linguistics more broadly. After sketching European scholars' early encounters with the Indian grammatical tradition, the paper focuses on two main areas of reception: the concept of the root and its role in morphological analysis, and the problem of Ablaut and its reinterpretation in light of Indo-European reconstruction, culminating in the laryngeal theory.

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KEYWORDS: Indian grammarians, Pāṇini, Indo-European linguistics, Ablaut, laryngeal theory

1. Introduction

Human interest in language can be traced back to the earliest written records. Already in the ancient Near East, attention was drawn to language for practical reasons, namely, the creation of small glossaries acting as a bridge between the two most commonly used languages in that culture, namely Akkadian and Sumerian (Woods and Stauder 2023). In Egypt, according to the Greek historian Herodotus, the Pharaoh was interested in discovering which language was the oldest in the world (Heinz 1978: 12). Other ancient civilizations developed their own schools of linguistic inquiry, focusing on different aspects of language. In ancient Greece and Rome, these studies were often connected to philosophy and philology, aimed primarily at editing, standardizing, and commenting on the texts of Homer (Heinz 1978; Woodard 2023). In China, they originated in the context of poetry and the creation of manuals for poets (Peyraube et al. 2023).

The study of language and its aspects developed in ancient India very early on and, compared to other regions of antiquity, reached a remarkably high level of scientific sophistication—especially in the field of grammatical analysis. Heinz lists the following reasons for this early linguistic interest and the development of the Indian grammatical tradition (Heinz 1978: 19):

1. social stratification and the need to preserve linguistic distinctiveness;
2. the metaphysical attitude of Indians toward language;
3. philological needs—the study and analysis of religious texts to ensure their precise transmission to future generations.

Other scholars of Indian grammatical tradition emphasize above all this last aspect, which gave rise to linguistic reflection: the connection between reflection on language and the interpretation and recitation of the oldest Indo-Aryan texts from the Vedic canon. The

importance of precise textual transmission and performance is illustrated by Madhav Deshpande, who cites a passage from the late Vedic text, *Śatapatha-Brāhmaṇa*. In it, the demon Tvaṣṭar, by mispronouncing a word during a ritual, obtained the opposite of the desired result. Wanting to have a son who would kill the god Indra, he intended to utter the formula *indraśatrú-* (“slayer of Indra”) but pronounced it incorrectly as *indraśatru-* (“the one whose slayer is Indra”), which led to tragic consequences (Deshpande 2023: 78). This passage also demonstrates that Indian grammarians were fully aware of the importance of linguistic analysis for the proper understanding of texts. Yāska, in his treatise on etymology, observed that only a combination of grammatical analysis and correct contextual meaning of a word can lead to a successful interpretation (Sarup 1921; Cardona 1994: 31; on Yāska’s *Nirukta* see also Kahrs 1988, 2005).

Interestingly, at roughly the same time that Indian philosophy—including that concerning language—was developing, philosophy was also flourishing in ancient Greece. Greek traditions of linguistic analysis, like the Indian, also had textual origins (in addition to philosophical ones), namely, in an effort to edit and interpret older Greek texts, primarily those of Homer. However, differing philosophical approaches and the different nature of the source texts (religious in India, epic in Greece) led to divergent developments in both philosophy and linguistic thought (on similarities, see Seaford 2020).

Indian linguistic studies developed along several major lines (Heinz 1978: 19–26; Scharfe 1977; Cardona 1994; Wielińska 1994; Sajdek 2011):

1. Analysis of Vedic texts in terms of phonetics (*sandhi*), grammar, textual structure, and meaning (*Padapāṭha* of Śākalya, *prātiśākhya* of Śaunaka, *mīmāṃsā*);
2. Word-formation and semantic analysis (*Nirukta* of Yāska), often based on Vedic textual analysis and accompanied by a lexical corpus (*Nighaṇṭu*);
3. Grammar *sensu stricto* (*vyākaraṇa*)—the *Aṣṭādhyāyī* of Pāṇini, *Vārttika* of Kātyāyana, *Mahābhāṣya* of Patañjali, *Kāśikavṛtti* of Jayāditya and Vāmana, *Mugdhabodha* of Vopadeva;

4. Philosophy of language (*Vākya-padīya* of Bhartṛhari).

2. The Indo-European linguistics and Indian grammatical tradition

Indian linguistic inquiry was primarily synchronic in nature (Heinz 1978: 25; Sajdek 2011: 32). Interest in linguistic diversity or historical-comparative linguistics was minimal, though ancient scholars were certainly aware of differences between languages, as well as of variations within the Indo-Aryan itself (Cardona 1994: 46).

The only diachronic interest concerned the differences between various stages of the Old Indo-Aryan—the Vedic and the Classical Sanskrit—in the interpretation of religious texts. Alongside this, there developed a tradition of studying word-formation in a synchronic sense and by way of semantic analysis.

The most famous work on this subject in the Indian tradition is undoubtedly Yāska's *Nirukta*, which builds on an earlier scholarly lineage (it mentions antecedent grammarians such as Sākaṭāyana and the etymologist Gārgya, with whom Yāska debates; see Cardona 1994: 32; Sarup 1921). In the *Nirukta*, Yāska distinguishes four classes of words—later recognized as parts of speech: noun, verb, preposition, and particle (Sajdek 2011: 28).

However, as noted recently by Hans Hock, it took some time before European scholars fully appreciated the methods and analyses of Indian grammarians (Hock 2023: 329). Their early encounters with Sanskrit were usually by way of local Indian pandits like that of William Jones' (cf. Rocher 1995; Alfieri 2014, 2023, 2024), who, following the earlier claims of missionaries and scholars, famously observed the close proximity of Sanskrit to Latin, Ancient Greek and other languages used in Europe (Hock 2023: 330). Though, as noted by Hock and other scholars, the influence of Jones' statement on Indo-European linguistics is often overestimated, it did popularize the idea further (cf. *ibid.* with further references there).

Early European grammarians of Sanskrit, such as Colebrooke (1805) and Carey (1806), often followed the native Indian traditions

and engaged with Pāṇini's system more directly, though at times mediated by the rich commentarial traditions (cf. *ibid.*: 329; Milewska 2019; on Wilkins 1808 see Alfieri 2023: 190–191, 2024). Rocher (1995) has shown that while these early scholars relied heavily on Indian grammarians, they also reinterpreted them through the lens of European philology. The very first Western translations of the complete treatises of the Indian grammarians did not appear until the half of the 19th century with the editions of Pāṇini's grammar by Otto Böhtlingk (1840) and the phonetic treatises by Weber (1858) and Whitney (1862, 1868) (cf. Hock 2023: 329).

Despite the fact that it was the English scholars who first came into contact with Sanskrit and despite the fact that it was William Jones who made the claim of linguistic affinity between Sanskrit and the languages of Europe, claim that became popular as early as 1786, the science of Indo-European linguistics first developed in Germany and not in England (for the research on the reasons for such a development see Lehmann 1995, Rabault-Feuerhahn 2013). It was actually Franz Bopp, a German, who, in 1816, published the first systematic study of the system of conjugations in the Indo-European languages and became the founding father of the new scholarly discipline (Hock 2023: 358). In his correspondence and writings, Bopp acknowledged his debt to Indian grammatical traditions, but he also criticized Indian grammarians for lacking an organic perspective on language change (Lefmann 1891: 110*). This was understandable given their completely synchronic perspective. Bopp's goal, on the other hand, was to discover the path of language development and determine the laws according to which its forms evolved. He viewed the adherence of contemporary Sanskrit grammarians to Indian textbooks as unsatisfactory and claimed in his *Ausführliches Lehrgebäude der Sanskritsprache* that:

(...) further advancement of the subject could not come from a more extensive use of native grammarians, but only from an independent critique of the language itself, which strives to discover the path by which it arrived at its forms, or to determine the laws according to which they have developed. (Bopp 1827: v, English translation mine)

In his 1834 *Kritische Grammatik der Sanskrita-Sprache in kürzerer Fassung* Bopp explicitly stated that:

(...) my sole aim was to provide a critique and description of the nature of language itself, which could only have been disturbed and marred if I had wanted to interweave the techniques of native grammarians with it, for example, to teach that where in my grammar, as in the language itself, no word-forming suffix is contained, but a root appears in its naked form, such as *vid* “to know” in *arma-vid* “dutiful,” the Indian grammarians have proposed a fictitious suffix *kvip*, which would then have to be reported as consisting entirely of servile letters, all of which must be stripped away to arrive at the real suffix, i.e., none at all in the present case. In another place, it would have been worth mentioning that Indian grammarians have established, among other personal endings, *mip*, *sip*, and *tip* for our *mi*, *si*, and *ti*, where the *p* serves to indicate that an extension of the root or intermediate syllable takes place before the endings with which it has identified. (Bopp 1834: iv–v, English translation mine)

He did, however, borrow the notion of the linguistic root from Indian grammatical tradition and its specific morphological analysis of words though in a diachronic perspective, i.e. trying to trace back the words to their original roots (cf. Delbrück 1882: 73–74). As Sternemann aptly described, Bopp used a special kind of a combinatory method which was diachronic in principle but operated with synchronic instruments of comparison (Sternemann 1984: 24²). On Bopp’s method of research, his inspirations and views on language and its development see especially Jankowsky 1985: 328, Morpurgo Davies 1987, Rosiello 1967: 172, Timpanaro 1973: 573 n. 59, Koerner 1975: 730, 1984: 313 and Bologna 1992.

Despite Bopp’s reservations regarding the application of Pāṇini’s techniques, often due to lack of direct knowledge of Indian grammatical tradition, later generations of scholars found ways to utilize or

² I am grateful to the anonymous reviewer for drawing my attention to this observation.

parallel the Pāṇinian framework, especially thanks to Otto von Böhtlingk, whose edition of Pāṇini's *Aṣṭādhyāyī* still serves as a model (von Böhtlingk 1840). Interestingly, von Böhtlingk himself wrote a review of Bopp's Sanskrit grammar in which he meticulously pointed out its shortcomings (von Böhtlingk 1847).

It is probably not due to pure chance that the precision and rule-based nature of Pāṇini's system found conceptual parallels later in the 19th century Europe. The Neogrammarian movement emphasized methodological principles that resonated with Pāṇinian formalism, focusing on sound laws without exception, strict rule application, and a drive toward internal consistency (cf. Jankowsky 2023).

The ideal pairing of the Pāṇinian concepts and the Neogrammarian doctrine came in 1896 with Jacob Wackernagel's Old Indic grammar (Wackernagel 1896). As pointed out by Rüdiger Schmitt, Wackernagel's grammar was the first that had fully encompassed the achievements of the native Indian grammatical tradition of Pāṇini and his followers (cf. Schmitt 2014).

3. The root (*dhātu*) in Indian grammatical tradition and the Indo-European linguistics

Modern linguistics owes to Indian grammatical tradition its precise morphological analysis of words, which in ancient India reached its peak in works of Pāṇini and his successors and commentators.

This deep level of linguistic analysis may have partly resulted from the fact that writing was less frequently used in the Indian tradition than, for example, in Greek or Roman culture. As Paweł Sajdek notes, the Greeks and Romans never freed themselves from the analysis of "letters" and written words, whereas the Indian tradition from its very beginnings analyzed orally transmitted texts (Sajdek 2011: 14–18).

Futher, Paul Thieme remarked in his preface to Betty Shefts's work (1961: ix):

Nowadays, it is sometimes not clearly realized that the analysis of speech into its units—sentences, words, sounds (wrongly called ‘letters’)—as it was introduced by the Greeks (Dionysios Thrax, 2nd century B.C.) and practiced in Europe until the beginning of the last century, was deficient in one essential point: it ignored the abstract functional elements (morphemes) of words, taking the words, naively, to be natural, indissoluble wholes; and that it was only acquaintance with Pāṇini’s method that furnished the means to perfect it: now it became possible to dissect nominal and verbal forms of other Indo-European languages also into their elements – ‘root’, ‘suffix(es)’, ‘ending’ – each with its own shape and function, combining into word forms through strictly definable, regularly recurring processes.

The root (*dhātu*)—an abstracted result of linguistic analysis—is a hallmark of the Indian grammatical tradition and of the Indian mode of linguistic thought, in contrast to the Greco-Roman tradition, which did not operate with such an abstract notion.

Within the Indian etymological tradition, there was an on-going discussion concerning whether all nominal forms (nouns) were derived from verbal roots or whether some nouns existed independently of any verbal base. Both hypotheses appear in Yāska’s *Nirukta*: the derivation of all nouns from verbal roots is attributed to Sākaṭāyana, while the opposing view, that not all nouns can be explained in this way, is attributed to Gārgya (Sarup 1926; Sajdek 2011: 30).

Yāska sides with the latter hypothesis but admits that most forms may indeed be derived from verbal roots. Sajdek notes that the outcome of this grammatical tradition—reducing word analysis to the root—is visible even today in the didactic tradition of teaching Old and Middle Indo-Aryan languages, which is organized around verbal roots (Sajdek 2011: 30).

Interestingly, although this root-based approach is not used in teaching Latin and Ancient Greek—due to different linguistic concepts and reliance on the first person singular or infinitive verb forms—there is a growing number of pedagogical materials that analyze vocabulary in both languages in terms of etymological families based on lexical

morphemes (roots), most of which are verbal in nature. This may actually be traced back to the work of Theodor Benfey and his dictionary of Greek roots (Benfey 1839), quite parallel to the lexicon of roots of Sanskrit (cf. Benfey 1852: 71; Alfieri 2014: 77).

The Indian discussion on the derivation of nouns was, of course, descriptive rather than historical, yet it is fascinating that two millennia later a similar debate emerged in the Indo-European historical-comparative linguistics—a debate that continues to this day. It concerns the status and the origins of reconstructed Proto-Indo-European roots, the majority of which are verbal. Indeed, the very concept of the “root” as the smallest morphological unit carrying core meaning originates from the Indian grammatical tradition and has directly influenced European linguistic thought.³ As already mentioned above, Franz Bopp, despite his skepticism towards Indian grammarians, used the concept of “root” and added the diachronic dimension to the Indian notion of the term since he viewed “root” as the most primitive element of the word (cf. Delbrück 1882: 73–74). The discussion whether roots are the actual reality present in the mind of the speakers of a language or whether they are just linguistic abstractions used by linguists, is also currently debated – cf. the recent polemic on this very topic between Keydana (2022) and Alfieri (2016, 2021, 2023, Alfieri et al. 2025).

The vast majority of reconstructed Proto-Indo-European roots are verbal. Even basic words such as the -t-stem noun *nok^w-t-s ‘night’ are traced back to the verbal root *neg^w- ‘to get dark’ (Rix et al. 2001: 449, Wodtke et al. 2006: 504). The lexicon of the Indo-European verbs (*Lexikon der indogermanischen Verben*, in short LIV) lists 1,178 verb roots with their reflexes in individual Indo-European languages, serving as the basis for reconstructing proto-forms. In contrast, the lexicon of the Indo-European nouns (*Nomina im Indogermanischen Lexikon*, NIL in short) lists only 207 nominal formations,

³ Although it should be borne in mind that the knowledge of the Semitic languages and their analysis in terms of roots was probably also in part influential (cf. Rousseau 1984; Alfieri 2017 and Alfieri and Luinetti 2024).

many of which are secondary derivatives from verbal roots although it should be borne in mind that the nominal lexicon does not take into account all of the nominal formations since some of the basic words are absent and it concentrates on nouns which often have verbal counterparts or verbal derivatives parallel to the ones presented in LIV. Still, if we look at the data presented in the old dictionary of Proto-Indo-European roots by Julius Pokorny (1959) the situation is more or less the same – according to Alfieri (2024: 259) there are 1191 primary lexemes in Pokorny’s dictionary out of which 927 are verbs, 233 nouns and 31 adjectives (Alfieri 2024: 259).

Some formations today lack attested verbal roots, but this may be due to the loss of such base forms. Thus, in a sense, the ancient Indian debate among the grammarians continues even in modern linguistics. This is yet another testament to the sophistication and versatility of the Indian grammatical tradition in phonetic, phonological, and morphological analysis—especially when compared to the Greek and Roman traditions, which remained dominant in Europe until the discovery of Sanskrit (cf. Alfieri 2014).

4. Ablaut and the laryngeal theory

The most profound, though indirect, methodological influence may be attributed to Ferdinand de Saussure, who had an in-depth knowledge of Sanskrit and devoted his doctoral dissertation to the topic of the genitive absolute construction in that language (cf. D’Ottavi 2010; Joseph 2012). Most importantly, De Saussure’s earlier work focused on interpreting irregularities in the synchronic description to perform an internal reconstruction of the older system, prioritizing the system over diachrony. Before he published his doctoral dissertation, de Saussure became interested in the operation of the Proto-Indo-European Ablaut system—the synchronic alternation of vowels whose function was to differentiate words both in derivation and in paradigms (Fortson 2010: 79–80). The system which was usually reconstructed at the time was somewhat irregular since two different types of Ablaut

were assumed—one operating with short vowels and the other with long vowels. De Saussure’s great contribution was the reformulation of the system so as to explain the long-vowel Ablaut as similar to the short-vowel one with additional elements. The additional elements, termed by de Saussure as ‘coefficients sonantiques’ were not attested directly in any Indo-European language but had to be reconstructed because of the coherence of the Ablaut system. Indo-European scholarship before de Saussure recognized Ablaut in the following patterns: the short vowel type e.g. in the root **pet-* ‘to fly’ **pet-* E-grade, **pot-* O-grade, **pt-* Zero-grade and the long vocalism type in e.g. the root **dʰē-* ‘to put’ **dʰē-* E-grade, **dʰō-* O-grade, **dʰə-* Zero-grade. De Saussure considered this reconstruction uneven and irregular and tried to reanalyze the long-vowel Ablaut pattern using inferred, unattested phonemes (nowadays called laryngeals), leading ultimately to root forms like **dʰeh₁-* (E-grade), **dʰoh₁-* (O-grade), and *dʰh₁-* (Zero-grade) with the Ablaut pattern similar to that of the short vowels. This pursuit led to complete reinterpretation of the Proto-Indo-European Ablaut and the subsequent development of the laryngeal theory, following the work of Hermann Möller, Albert Cuny and especially Jerzy Kuryłowicz and the identification of the phonemes postulated by de Saussure with the phonemes attested in the Hittite language (cf. Fortson 2010: 81–83).

Interestingly, de Saussure also observed important indirect traces of the reconstructed phonemes in a certain irregularity visible in the pattern of the Sanskrit morphology (de Saussure 1879: 239–249), namely in the class seven and nine of Sanskrit verbs—originally nasal presents—he noticed that the parallel formations of the two classes of verbs—e.g. present *yunakti* ‘yokes’ and *punāti* ‘cleanses’ can be traced back to a similar pattern, i.e. **yu-na-k-ti* and, analogically, **pu-na-X-ti* where the postulated “X” element was the equivalent of “k” in *yu-na-k-ti* but developed as compensatory lengthening of the preceding vowel and it also surfaces as /i/ in the formation of the infinitive giving *pav-i-tum* ‘to cleanse’ as equivalent of *yo-k-tum* ‘to yoke’ (cf. Beekes 1986; Fortson 2010: 81–82). Again, with the use of the internal reconstruction and by observing irregularities in the synchronic state of

affairs, de Saussure was able to put forward a solution that solved the origin of this class of verbs in Sanskrit. And yet again, his hypothesis was vindicated after his death and became the standard view in the Indo-European linguistics (cf. Fortson 2010: 82–83). Interestingly, the twofold distinction of the roots was already observed by Pāṇini in his division of the roots into *seṭ* and *aniṭ* (i.e. with or without /i/). In today's Indo-European linguistics, this distinction is still used to discern between roots ending in laryngeals, as in e.g. **peuH* of **pu-na-H-ti* visible in Sanskrit *punāti*, and those ending in other consonants as in e.g. **yeug-* 'to yoke' of **yu-na-g-ti* continued in Sanskrit *yunakti* (cf. *ibid.*).

The connection between de Saussure's *Mémoire* and the *Aṣṭādhyāyī* lies in their similar methodological approach although in different dimensions—for Pāṇini the synchronic system and its basis is the ultimate goal, for de Saussure it is the diachronic aspect that is important though approached from a close review of the synchronic state. The common element in both of these approaches is the ordered and systematic arrangement of elements within the language (D'Ottavi 2013).

However, it is also important to note the warning mentioned by George Cardona (cf. Cardona 1987) against directly observing and transposing Ancient Indian grammatical concepts to the ones postulated in modern linguistics (and the linguistics of the 19th century). After all, the main perspective was crucially different for Indian grammarians and European scholars—the former were interested in constructing a synchronic grammar of the language, the latter's interest centered on explaining the historical development of the languages and on the search for their common source. Cardona also points out that the influence of Pāṇini on de Saussure's work was important but certainly not the sole one (cf. Cardona 2000).

6. Conclusion

In conclusion, Pāṇini's grammar provided a rigorous, formalized model that anticipated modern analysis of linguistic structures. While early Indo-European scholarship, led primarily by Franz Bopp, prioritized organic historical reconstruction over Pāṇini's synchronic mechanism, later scholars like Jacob Wackernagel fully integrated the system for both descriptive and historical purposes, and Ferdinand de Saussure utilized its mechanism to revolutionize the understanding of the Proto-Indo-European vocalism, confirming Pāṇini's lasting but often subtle and indirect legacy in the history of linguistic thought.

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