

RESEARCH PAPER

# On (the) sandhi between the Sanskrit and the Modern Western Grammatical Traditions: From Colebrooke to Bloomfield via Müller

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This article traces the history of how modern Western linguistics adopted the term *sandhi* from the Sanskrit grammatical tradition and adapted it to its theoretical needs. In particular, we will acknowledge the fundamental role played by Müller,<sup>1</sup> who combining both Indic (*Prakriyā* grammars and *Prātiśākhya*s) and Western approaches (those of Colebrooke and Bopp) to the representation of Sanskrit grammar, coined in 1866 the labels of *internal sandhi* and *external sandhi*. Such labels gained momentum thanks to the works of Whitney in the 19<sup>th</sup> century and Bloomfield in the 20<sup>th</sup> century and eventually became common parlance in Western linguistics.

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**Keywords:** phonology; Sanskrit; sandhi; Müller; Colebrooke; Bopp; Bloomfield

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## 1. Introduction

In 1986 a collective volume edited by Henning Andersen and entitled *Sandhi Phenomena in the Languages of Europe* offered a number of contributions that, as Douglas C. Walker (1989: 539) summarises in his review article, deal “with phonological behaviours at the boundaries of linguistic units”.<sup>2</sup> In his introduction, Andersen (1986: 1–2) encapsulates the advantages—and, indirectly, disadvantages—that characterise the use that has been made of the Sanskrit term *sandhi* in modern Western linguistics [MWL]:

“Sandhi became the general, loose semi-term, a handy label for a diversity of phenomena that individually require more specific names. [...]

But the general consensus seems to approve of the established usage which includes under the term allophonic variation, neutralization, morphophonemic alternations, however conditioned, as well as internal inflection which recognizes not only segmental, but also prosodic alternations as *sandhi* [...]; which sees no principal difference between continuous and discontinuous conditioning of alternations; and which has no difficulty accommodating vowel harmony or other vowel neutralization phenomena within its compass.

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<sup>1</sup> I would like to thank Pierre-Sylvain Filliozat and Christophe Vielle for discussing with me aspects of section 3 of this article. I would also like to thank Victor B. D’Avella and two anonymous reviewers for their remarks on a preliminary version of this article. All mistakes are of course mine only.

<sup>2</sup> Andersen’s volume has been reprinted in 2011.

Such a broad (and loose) understanding of the term has one advantage over any strict definition, the advantage that has helped the term to survive for so long; it makes the term useful as an **informal preliminary label** which can be used – unlike any strictly defined term – without prejudging the issue that a given set of data might give rise to.” (bold is mine).

In what follows we will trace the history of how Western scholarship adopted a term that originates from the Sanskrit grammatical tradition [SGT] and adapted it to its theoretical needs. In particular, we will acknowledge the fundamental role played by Friedrich Max Müller, who combining both Indic and Western approaches to the representation of Sanskrit grammar, coined in 1866 the labels of *internal sandhi* and *external sandhi*, which later became common parlance in MWL. Such labels are in fact still included, for instance, in Peter Hugoe Matthews’ 1997 *The Concise Oxford Dictionary of Linguistics*, where one finds the following entries:

“**external sandhi** Process of phonological modification that takes place at or across word boundaries. Thus by one common process of external sandhi in English, an initial [s] in words like *steak* is assimilated to an [ʃ] in e.g. *fish steak*.” (Matthews 2007<sup>2</sup> [1997]: 134).

“**internal sandhi** Process of phonological modification found within words, at or across boundaries of roots or affixes.” (Matthews 2007<sup>2</sup> [1997]: 199).<sup>3</sup>

Note that *s.v. sandhi*, Matthews (2007<sup>2</sup>: 353) also adds that the term was “Introduced into the terminology of 20th-century linguistics by Bloomfield especially.” Hereafter, we will precisely explore what happened from the time of the first Western grammars of Sanskrit to the time of Leonard Bloomfield.

## 2. The term sandhi in *vyākaraṇa*

At first, we need to establish a basic understanding of how sandhi phenomena—in the sense of the term given by Andersen—are accounted for by the SGT in order to understand what the term sandhi entailed in that very tradition. In this respect, this section will deal with the discipline of *vyākaraṇa*, the traditional field of knowledge (*śāstra*) that is usually translated as “grammar”. In a nutshell, the discipline of *vyākaraṇa* allows to analyse or produce a correct Sanskrit sentence by means of rules (*sūtras*) that regulate the combination in a derivational process of the various building blocks (verbal roots, pronominal affixes, etc.) that make up words, according to certain semantic considerations.<sup>4</sup>

The history of *vyākaraṇa* spans over two millennia and a half, and finds in Pāṇini’s *Aṣṭādhyāyī* (4<sup>th</sup> c. BCE) both its *post factum* seminal text and widely acknowledged paragon of scholarship.<sup>5</sup> Most of the history of *vyākaraṇa* is comprised of works that

<sup>3</sup> One can also check the entry “sandhi” in David Crystal’s *A Dictionary of Linguistics and Phonetics*, where one reads: “[...] In languages where sandhi forms are complex, a distinction is sometimes made between **external sandhi** (sandhi RULES which operate across word boundaries) and **internal sandhi** (rules which operate within words). [...]” (Crystal 2008<sup>6</sup> [1980]: 422).

<sup>4</sup> Below (§ 6), we will introduce how sandhi is dealt with by the *Prātiśākhya*s, a corpus of texts that deals with a special subdomain of Sanskrit grammar and has a somewhat different approach to sandhi.

<sup>5</sup> Pāṇini had indeed predecessors, he himself quoting the opinion of other grammarians in the *Aṣṭādhyāyī* (see, e.g. Cardona 1997<sup>2</sup>: 1–2). However, his work did in fact supplant the previous *vyākaraṇic* literature and was the reference work for the subsequent literature.

offer in-depth explanations of the rules compiled by Pāṇini (pāṇinian grammars) or works that, despite belonging to different grammatical schools, are, in fact, in a more or less explicit dialogue with the *Aṣṭādhyāyī* (non-pāṇinian grammars) (Belvalkar 1915).

The order of the rules in the *Aṣṭādhyāyī* has been reason for scholarly debate for centuries (Laddu 1987). Although a number of very authoritative commentaries of the *Aṣṭādhyāyī*—above all the *Mahābhāṣya* of Patañjali (2<sup>nd</sup> c. BCE?) and the *Kāśikāvṛtti* of Vāmana and Jayāditya (7<sup>th</sup> c.)—follow the order of the rules laid down by Pāṇini, both non-pāṇinian grammars, possibly beginning with the *Kātantra* of Śarvavarman (3<sup>rd</sup> c.?), and later on pāṇinian treatises, starting with the *Rūpāvātāra* of Dharmakīrti (10<sup>th</sup> to 12<sup>th</sup> c.) (Cardona (1976: 285), witnessed a remarkable paradigm shift that saw grammatical rules being arranged according to what were topic-oriented and, therefore, more intuitive categorises. Thus, in these new grammars, generally referred to as *Prakriyās* (lit. “Procedures”), we have sections devoted to sandhi, nouns, compounds, etc. This new system of ordering rules is other than that of the *Aṣṭādhyāyī*, which instead follows different, seemingly less self-evident organisational principles.<sup>6</sup>

In order to facilitate the understanding of the implications that the above-mentioned innovation entails in terms of how sandhi is outlined, we will at first focus on two particular phonological phenomena that, in MWL terms, could be respectively called (a) semivocalisation of single vowels and (b) gliding. These two rules will provide us with an intuitive understanding of the distribution of phonologically-related topics in vyākaraṇic texts and, furthermore, will give us two examples of how the SGT dealt with what most post-Müller Western grammars of Sanskrit would describe as cases of *internal sandhi* and *external sandhi*, respectively:

(a) Semivocalisation of single vowels:

- $i, ī \rightarrow y / \_V [ \neq i, ī ]$
- e.g. *devī āgacchati* → *devy āgacchati* [the queen comes]

(b) Gliding:

- $i, ī + \neq V \rightarrow iy + V$
- e.g. *prī-* + *-a-*<sup>7</sup> + *-ḥ* → *priyaḥ* [dear] (adj. nom. sing. masc.)

In the *Aṣṭādhyāyī*, the first phenomenon is described by rule 6.1.77 *iko yaṇ aci* [semivowels *y, v, r*, and *l* (*yaṇ*) [respectively] replace the vowel *i, u, ṛ*, and *l* (*ikaḥ*) before a vowel (*aci*) [in continuous pronunciation]].<sup>8</sup> This rule works, among others, under the heading rule (*adhikāra-sūtra*) 6.1.72 *saṃhitāyām* [in continuous pronunciation], which has in fact to

<sup>6</sup> This is not the venue to venture in detail into the topic of the order of rules within the *Aṣṭādhyāyī*. The interested reader can refer to, e.g., Tripathi (1991).

<sup>7</sup> The application of the affix *-a-* is in this case regulated by rule 3.1.135.

<sup>8</sup> This is true only if the following vowel is not the same as the preceding one. In that case, another rule applies, namely 6.1.101 *akaḥ savarṇe dīrghaḥ* [a long [vowel] replaces [both] *a, i, u, ṛ*, and *l* (*akaḥ*) and the [following] homogeneous vowel [in continuous pronunciation]]; e.g. *devī icchati* → *devicchati* [the queen desires].

Note the convention followed in the translations of the rules of the *Aṣṭādhyāyī* that are mentioned in this article of inserting in between square brackets instructions offered in rules that are given before the rule in question, and which have to be recalled for its correct interpretation.

be recalled in order to fully understand the scope of rule 6.1.77.<sup>9</sup> On the other hand, the second phenomenon is described by rule 6.4.77 *aci śnudhātubhruvāṃ yvor iyaṇuvarānu* [*iy* (*iyaṇ*) and *uv* (*uvaṇ*) [respectively] replace the vowels *i* and *u* (*yvor*) before [an affix beginning with] a vowel (*aci*) [when *i* and *u* are final sounds] of *-nu-* [i.e. the suffix of the present stem of verbs of the fifth class], or of a verbal root, or of [the nominal stem] *bhrū-* ‘eyebrow’]. Examples are *āpnuvanti* (← *āp-nu-anti*, present third person plural of the fifth class verbal root *āp-*; [they obtain]),<sup>10</sup> the aforementioned *priyaḥ* (adjective nominative singular masculine; [dear]), and *bhruvau* (← *bhrū-au*, noun nominative dual; [two eyebrows]). Rule 6.4.77 does not operate under the heading *saṃhitāyām*, but under the heading *aṅgasya* [concerning a stem] established by rule 6.4.1. The latter indicates that a phenomenon takes place at the end of a stem before an affix.

It is important here to remark that, within the vyākaraṇic framework, the *saṃhitāyām* domain of application of rules does not correspond to that of *external sandhi* as understood by MWL. To better appreciate this very important distinction, we can observe the domain of application of a third rule, which we shall call (c) semivocalisation of diphthongs:

(c) Semivocalisation of diphthongs:

- *e, o, ai, au* → *ay, av, āy, āv* / *\_V*
- e.g. *bhau* (← *bhū-GHaÑ-* A 7.2.115) + *-a-* → *bhāva-* (stem form of “existence”); *devau agacchatām* → *devāv agacchatām* [the two gods went]

These phenomena are accounted for in the *Aṣṭādhyāyī* by rule 6.1.78 *eco ‘yavāyāvaḥ* [*ay, av, āy, and āv* [respectively] replace *e, o, ai, and au* (*ec*) [before a vowel in continuous pronunciation]], which—as 6.1.77—operates under the heading of 6.1.72 *saṃhitāyām*.<sup>11</sup> From this example, it is clear that the domain carved out by the instruction *saṃhitāyām* does not correspond to that of *external sandhi*, since it pertains to both word internal phenomena and phenomena affecting the edges of adjacent words.<sup>12</sup> In other words, rules that operate within the scope of *saṃhitāyām* are applied at the end of the derivation of each word in a given sentence.<sup>13</sup>

<sup>9</sup> Most often, in order to properly understand a rule it is necessary to integrate its reading with the instruction of some of its preceding rules. This process is called *anuvṛtti* [continuation]; see, for instance, Cardona (1997<sup>2</sup>: 73).

<sup>10</sup> This actually happens only in case of a verbal root ending in consonant. If a verbal root ends in vowel, the *u* of the suffix *-nu-* is substituted by *v*, according to rule 6.4.87. E.g. *su-nu-anti* → *sunvanti* [they press out].

<sup>11</sup> It should be mentioned that rule 6.1.78 offers a general provision for these combinations of sounds, although their actual outcomes are much more varied. These further phenomena are described in detail by several rules in the *Aṣṭādhyāyī*, such as 6.1.109 *eṇaḥ padāntād ati* [[*e* or *o* respectively] replace [both] *e* or *o* (*eṇi*) that are at the end of a word and the *a* of [the following word in continuous pronunciation]]; e.g. *vane asti* → *vane ‘sti* [it is in the forest].

<sup>12</sup> It is important to note that within the *Aṣṭādhyāyī* there is more than one heading rule that contains the instruction *saṃhitāyām*; these are: 1.2.39, 6.1.72, 6.3.114, and 8.2.108.

<sup>13</sup> This latter statement necessitates a few caveats. First, the concept of “word derivation” adopted here should be understood in the sense provided by Lexical Phonology (see e.g. Kaisse & Shaw 1985 and Kaisse & Hargus 1993), a phonological theory according to which in each language a certain set of phonological rules apply when morphemes are combined together to form words and another set when those words (what is here meant by *derived words*) are put together in a sentence.

Second, in the *Aṣṭādhyāyī* the technical term *pada* [word] is assigned to two kinds of linguistic items. One is that ending in nominal or verbal affixes according to rule 1.4.14, thus corresponding to the intuitive Western category of a fully inflected word (see Matthews 1997 and Crystal 2008<sup>6</sup> [1980] *s.v. word*). The other kind is an item followed by a specific sub-set of nominal affixes (e.g. the instrumental plural *-bhis*). In Western terms, the latter item could be referred to as “stem”. Thanks to this provision, the *Aṣṭādhyāyī* can deal in the most economic way with certain sandhi phenomena that in Western terms would be classified as occurring both word internally and word externally. For instance, the item *tejas* [glow] in front of the affix *-bhis* is considered a *pada* according to rule 1.4.17, thus *tejas-bhis* → *tejar-bhis* (8.2.66) → *tejaii-bhis*

The term *saṃhitā*, of which *saṃhitāyām* is the locative singular, is defined in another rule (a *saṃjñā-sūtra*, [definition rule]), i.e. 1.4.109 *paraḥ saṃnikarṣaḥ saṃhitā* [*saṃhitā* means maximum contiguity (*saṃnikarṣa*)]. Two of the commentaries of the *Aṣṭādhyāyī*, namely the aforementioned *Mahābhāṣya* and *Kāśikāvṛtti*, understand the term *saṃnikarṣa* to refer to a contiguity speech-sounds (*varṇas*):<sup>14</sup>

*drutāyām eva hi paraḥ saṃnikarṣo varṇānām nādrutāyām* || (*Mahābhāṣya*, Abhyankar 1962: 354, ll. 18–19).

[For the maximum contiguity of speech-sounds (*varṇānām*) is [obtained] in the quick mode [of pronunciation] and not in the slow one.]

*paro yaḥ saṃnikarṣo varṇānām ardhamātrākālavayavadhānaṃ sa saṃhitāsaṃjñō bhavati* || (*Kāśikāvṛtti*, Shastri & Shukla 1965: 640–1).<sup>15</sup>

[The technical term *saṃhitā* is given to the maximum contiguity of speech-sounds (*varṇānām*), which is an interposition of a period of half a mora.]

It is important to note that *saṃhitā* is the only pertinent technical term one encounters in the *Aṣṭādhyāyī*: the word *sandhi* never occurs there in the sense of phonological phenomenon. Nevertheless, *sandhi* is a term that is found in virtually all *Prakriyā* grammars.

If we now look at the *Prakriyā* grammars, in particular those mentioned by Müller in the preface to his 1866 grammar, namely the *Sārasvatīprakriyā*, aka *Sārasvatavyākaraṇa*, of Anubhūtiśvarūpācārya (13<sup>th</sup>–14<sup>th</sup> c.?), the *Prakriyākaumudī* of Rāmacandra (14<sup>th</sup>–15<sup>th</sup> c.), and the *Siddhāntakaumudī* of Bhaṭṭojīdikṣita (16<sup>th</sup>–17<sup>th</sup> c.),<sup>16</sup> we can notice that each of them has a section devoted to *sandhi* towards the beginning of the text. This is further divided in subsections called *svarasandhi* or *acsandhi* [vocalic sandhi], *vyāñjanasandhi* or *halsandhi* [consonantal sandhi], etc. There one finds the rules that work under the heading *saṃhitāyām* in the *Aṣṭādhyāyī*. The sandhi rules that do not operate under *saṃhitāyām* are, instead, found later in the texts, in chapters devoted to nominal declensions, verbal conjugations, etc., i.e. to the derivation of single words. In this respect, it is crucial to notice that the word *sandhi* is never used by the *Prakriyā* grammars to refer to the latter category of phenomena.

(6.1.114) → *tejobhis* [because of the glows] (6.1.87), as in *tejas bhavati* → *tejo bhavati* [the glow exists] (see Cardona 1997<sup>2</sup>: 42–43).

Finally, a further point to keep in mind is that rules operating under *saṃhitāyām* do not disregard morphological and word-related boundaries, which are, on the contrary, essential within the system devised in the *Aṣṭādhyāyī* (pace Joshi & Roodbergen 1995: 258). Thus, we encounter there further specifications such as in rule 6.1.79 *vānto yi pratyaye* [Items ending in *v* [i.e. *av* and *āv* respectively substitute *o* and *au*] in front of an affix (*pratyaye*) beginning with *y* (*yi*)], rule 6.1.109 *eṇaḥ padāntād ati* [[*e* or *o* respectively] replace [both] *e* or *o* (*eṇi*) that are at the end of a word and the *a* of [the following word in continuous pronunciation]], and rule 8.3.23 *mo 'nusvāraḥ* [*m* replaces *m* [at the end of a word and before consonants in continuous pronunciation]]. In particular, rule 8.3.23 operates under the heading rule 8.1.16 *padasya* [concerning a word], here to be interpreted as indicating the last sound of the pertinent word in combination with rule 1.1.52 *alo 'ntyasya* [[A substitute replaces] the final sound [of the substituent]].

<sup>14</sup> Below (§ 6), we will observe that another branch of SGT account for the interpretation of the term *saṃhitā* as referring not just to the contiguity of speech-sounds, but also to that of words.

<sup>15</sup> Shastri & Shukla (1965: 640–1).

<sup>16</sup> Müller (1866: vi): “While availing myself therefore of the materials collected in the grammar of Pāṇini and in later works, such as the *Prakriyā-Kaumudī*, the *Siddhānta-Kaumudī*, the *Sārasvatī Prakriyā*, and the *Mādhaviya-dhātu-vṛtti* [...]”. I have not taken into consideration the *Mādhaviyadhātuvṛtti* in the current analysis, since this text is not a grammar of Sanskrit *stricto sensu*, but a commentary on the *Dhātupāṭha*, i.e. an “ancillary” text of the *Aṣṭādhyāyī* that lists Sanskrit verbal roots.

The following table summarises the position of the four selected examples within the three above-mentioned *Prakriyā* grammars:

	<i>Sārasvatīprakrīya</i> (non-pāṇinian)	<i>Prakriyakaumudī</i> (pāṇinian)	<i>Siddhāntakaumudī</i> (pāṇinian)
(a) Semivocalisation of single vowels <i>i, ī → y</i>	<i>svarasandhi</i> <sup>17</sup>	<i>acsandhi</i> <sup>18</sup>	<i>acsandhi</i> <sup>19</sup>
(c) Semivocalisation of diphthongs <i>e, o, ai, au → ay, av, āy, āv</i>	ditto <sup>20</sup>	ditto <sup>21</sup>	ditto <sup>22</sup>
(b) Gliding <i>ī → iy</i>	<i>svarāntastrīṅga</i> [feminine (nouns) ending in vowel] <sup>23</sup>	<i>ajantapuṅḷliṅga</i> [masculine (nouns) ending in vowel] <sup>24</sup>	<i>ajantapuṅḷliṅga-prakarāṇa</i> [section on the masculine nouns) ending in vowel] <sup>25</sup>

As it will be shown below, the first Western descriptors of Sanskrit, both Jesuit missionaries and British civil servants and Baptist missionaries, studied the *Prakriyā* grammars, and their account of sandhi reflects the way in which such a topic is taught in those texts in opposition to the *Aṣṭādhyāyī*.

### 3. A brief excursus on *sandhi* in the grammars of the Jesuit missionaries

The term *sandhi* already makes its first appearance in the first grammar of Sanskrit composed by a Western scholar. This is the Latin grammar of Heinrich Roth s.j. (1620–1668), who composed his work some time between 1660 and 1662. Here, the outline of sandhi phenomena follows the *Prakriyā* style with ff. 6r–6v devoted to *svarasandhi*, ff. 7r–8r to *vyāñjanasandhi*, etc.<sup>26</sup>

Another Latin grammar, composed by Jean-François Pons s.j. possibly before 1732,<sup>27</sup> mentions the term *sandhi* and follows the exposition of the matter that is found in the *sandhipāda* ([chapter on sandhi] of another non-pāṇinian grammar, the *Mugdhabodha* of Vopadeva (13<sup>th</sup> c.), which was particularly popular in the region of Bengal.<sup>28</sup>

The term is also used—sometimes misspelled as *sandi*—by Paulinus a Sancto Bartholomaeo (1748–1806) in his 1804 *Vyācarana seu locupletissima Samscrdamicae linguae institutio*.

<sup>17</sup> Rules 3.1, 3.5–7, see Śāstrī (1985: 29, 33–34).

<sup>18</sup> Trivedī (1925: 44).

<sup>19</sup> Rule 47 = *Aṣṭādhyāyī* 6.1.77, see Vasu (1906: 31).

<sup>20</sup> Rules 3.8–9, 3.11–12, see Śāstrī (1985: 34–35).

<sup>21</sup> Trivedī (1925: 53).

<sup>22</sup> Rule 61 = *Aṣṭādhyāyī* 6.1.78, see Vasu (1906: 36).

<sup>23</sup> Rule 8.15, see Śāstrī (1985: 114–116).

<sup>24</sup> Trivedī (1925: 163).

<sup>25</sup> Rule 271 = *Aṣṭādhyāyī* 6.4.77, see Vasu (1906: 140).

<sup>26</sup> A facsimile reproduction of Roth's manuscript is available in Camps & Muller (1988).

<sup>27</sup> Filliozat (forthcoming).

<sup>28</sup> Filliozat (forthcoming). It should be noticed that the term is not found in the *Grammatica Grandonica* of Johann Ernst Hanxleden s.j. (1681–1732), who composed his work between 1712–1732 (Van Hal & Vielle 2013: 8). However, this does not mean that Hanxleden does not deal with the topic: on ff. 40r–42v we find the relevant section, entitled *De conjunctione dictionum*.

There, one can read that among the chapters found in his reference grammar, the above-mentioned *Rūpāvatāra*, the second one is devoted to sandhi phenomena:

“Secundum [caput] dicitur *samhitāvatāra*, quod de nominum et casuum unione seu connexionione tractat; hoc enim innuit dictio *samhita*, nempe copula, unio, harmonía. Ad hoc caput referuntur *Tukrsandi*, *svarasandhi*, *prakrtisandi*, *vyadjanasandhi*, *visarggasandhi*, *svàdisandhi* [...]” (Paulinus a Sancto Bartholomaeo 1804: 127)

[The second [chapter] is called *samhitāvatāra*, since it deals with the combination and connection (*unione seu connexionione* ?) of nouns and cases; this in fact indicates the word *samhita*, namely copula, union, harmony. *Tukrsandi*, *svarasandhi*, *prakrtisandi*, *vyadjanasandhi*, *visarggasandhi*, *svàdisandhi* are recorded in this chapter [...].]

Sandhi phenomena are then presented in chapter VI, section I, *De conjunctione et separatione dictionum* [On the combination and separation of words], where the term sandhi is, however, never mentioned.<sup>29</sup>

Unfortunately, these works, with the exception of that of Paulinus, knew an extremely limited circulation and were never printed. Hence, one can assume that they virtually played no role in the dissemination of Sanskrit in Europe. The case of Paulinus’ work is different, since the text was printed in Rome and was known, although at times harshly criticised, by the community of Western scholars interested in linguistic studies.<sup>30</sup> Nevertheless, the work of Paulinus too had a rather limited impact in familiarising European scholars with Sanskrit.

#### 4. The grammars of the British descriptors

Much like the Jesuit missionaries, the first generation of British officers and Baptist missionaries studied Sanskrit in India under the direct guidance of Sanskrit traditional scholars (*paṇḍitas*) and learnt from traditional Sanskrit grammars composed in Sanskrit. Similarly, they also composed grammars of Sanskrit, which, contrary to those of the Jesuits, did help spread the knowledge of Sanskrit across Europe, allowing scholars who did not visit India to gain a sufficient knowledge of the language to be able to proficiently work on original sources. Eventually, these new tools for the study of Sanskrit turned out to be fundamental for the birth of MWL in general and comparative philology, i.e. historical comparative linguistics, in particular.

The first, and most influential, “British grammar” to go to press was that of Henry Thomas Colebrooke (1765–1837). Colebrooke published the first (and unfortunately only) volume of his work, entitled *A Grammar of the Sanscrit Language*, in 1805. This text stands witness of the high level of proficiency that Colebrooke reached in the field of Sanskrit studies and in particular of Sanskrit grammar, for the first time and just seldom matched by other non-Indians scholars who have ventured in the same field.<sup>31</sup>

Colebrooke (1805: iii–iv) was deeply indebted to the SGT. As he writes in his preface:

“In the composition of this grammar, I have followed the system taught by writers, whose works are considered by the prevailing sects of *Hindus* to be sacred, and to form an appendage of their scriptures.”

<sup>29</sup> Paulinus a Sancto Bartholomaeo (1804: 140–146). An Italian translation of this section is found in Mastrangelo (2018: 156–164).

<sup>30</sup> Mastrangelo (2018: 32–39).

<sup>31</sup> In Wilson’s words (1843: 18), Colebrooke “cultivated the language and literature of the Hindus with singular ability, untiring diligence, and unrivalled success.”

Afterwards, Colebrooke (1805: vi) specifies that three grammatical works, namely “[...] the *Cásiká vr̥tti* [= *Kāśikāvr̥tti*], *Sidd’hánta Caumudī* [= *Siddhāntakaumudī*], and *Mád’havīya vr̥tti* [= *Mādhavīyavr̥tti*] have been my chief guides [...]”.

Furthermore, he admits to have simply borrowed several terms from the SGT, one of which is indeed *sandhi*.<sup>32</sup> In this respect, Colebrooke (1805: 17) writes at the beginning of chapter III, *Permutation of Letters in Composition*:

“[...] the proximity of letters without an intermediate pause, or, in short their junction, is named *संहिता* [*saṃhitā*] or *संधिः* [*saṃdhiḥ*]. This proximity requires rules for the permutation of letters to obviate dissonances within the word, and in compound terms.”

Here, Colebrooke shows his familiarity with the *Prakriyā* grammars: *sandhi* is presented as a synonym of *saṃhitā*, and both are defined as a state concerning sounds—in Colebrooke’s terms a “proximity of letters”. Then, he further specifies that “this proximity requires rules for the permutation of letters”, among which the “general [rules], affecting the orthography of contiguous terms, are collected in the present chapter”, whereas “those precepts which are peculiar to etymology, will be mostly cited, as occasion arises, in the subsequent chapters” (Colebrooke 1805: 17). This passage is important because it shows that Colebrooke employs the terms *sandhi* and *saṃhitā* as general terms that are relevant also to the rules that exclusively pertain to “etymology”, i.e. to the formation of words.

Consistently, when it comes to present the rules that we have previously selected, we find that (a) semivocalisation of single consonants is mentioned in the same chapter under section II *Permutation of vowels* and described as follows:

“If (इक् [ik]) any other simple vowel, but अ (a), be followed by a heterogeneous vowel, a semivowel (यण् [yaṅ]), the most congenial to it, shall be substituted: viz. य् [y] for इ [i] (or ई [ī]); व् [v] for उ [u] (or ऊ [ū]); र् [r] for ऋ [ṛ] ; ल् [l] and for ऌ [ḷ] [...]”. (Colebrooke 1805: 19).<sup>33</sup>

Similarly, (c) semivocalisation of diphthongs is described in the same section as:

“When a diphthong (एच् [ec]) is followed by a vowel, or by a diphthong (even by a homogenous one), अय् [ay] shall be substituted for ए [e]; अव् [av] for ओ [o] [...]”. (Colebrooke 1805: 20).

On the other hand, we find the case of (b) gliding in chapter IV *On declensions*, section VI *Permutations of inflective roots* as follows:

“3. Before affixes, beginning with vowels, इयङ् (इय्) [*iyaṅ* (iy)] and उवङ् (उव्) [*uvaṅ* (uv)] are substituted respectively for the finals of verbs ending in इ [i] and उ [u] (or ई [ī] and ऊ [ū]), and of the words स्त्री [*strī*] and भ्रू [*bhrū*].” (Colebrooke 1805: 39).<sup>34</sup>

<sup>32</sup> Although he did not mention which ones, Colebrooke thought of rendering some Sanskrit terms into English in a possible second edition of his work (1805: iv–v): “On the same supposition of a new edition of this first volume, I should be desirous of altering some of the terms adopted by me in place of technical words in *Sancrit* grammar. An unwillingness to coin new words in English, led me to use some expressions, which are not sufficiently precise [...]”.

<sup>33</sup> An alternative outcome for a similar combination of speech-sounds is mentioned in Colebrooke (1805: 21).

<sup>34</sup> Note that in the *Aṣṭādhyāyī* the case of *strī-* → *striy-* is dealt with in under rule 6.4.79 *striyāḥ* [[i] replaces ī] in the case of *strī-*, which is in fact headed by rule 6.4.77. Also note that Colebrooke’s work covers only the first Sanskrit verbal class. The treatment of the other, including the fifth one, was reserved to the second volume of his work (Colebrooke 1806: xxii), which was never published.



By adopting the *Prakriyā* model, Colebrooke shapes a system in which semivocalisations and gliding are discussed in a general chapter on sound-change and in the chapter on declensions, respectively. The same model is found in all other grammars composed by the British scholars who studied in India.

This is the case, for instance, in the next “British” grammar to be published, i.e. that of the Baptist missionary William Carey (1761–1834), entitled *A Grammar of the Sungskrit Language* (1806). The section called *Of Sundhi, or the permutation of letters occasioned by the junction of syllables* begins as follows:

“The Sungskrit language is so written that a number of words coalesce as it were into one, by some alteration in the final of the preceding, or initial of the succeeding word; or by both of them suffering some change. This is called सन्धि [*sam̐dhi*], and is employed on three occasions, viz. the adding of the regular inflections, or affixes, to nouns or verbs; the simple joining of words one to another, as they occur in a sentence; and the joining two or more words so as to form a compound word. The same rules apply to all the three, except in a very few instances.”<sup>35</sup> (Carey 1806: 15).

Here, we find both rules of (a) semivocalisation of simple vowels and (c) semivocalisation of diphthongs under the heading *Of the substitution of other letters for vowels*:

“All the vowels, except अ [a] and आ [ā], are changed to other letters, when they precede a word or affix which begins with a dissimilar vowel [...]” (Carey 1806: 20).

On the other hand, the rule of (b) gliding is discussed a first time in the section devoted to the declension of “words” (*scil.* verbal roots) ending in *-ī* and *-ū*:

“3. Dhatoos [verbal roots] ending in ई [ī] or ऊ [ū] change the ई [ī] to इय्, [iy] and the ऊ [ū] to उव्, [uv] when they affix terminations which begin with a vowel.” (Carey 1806: 52).

In the same section, Carey (1806: 54) also explains that *bhrū-* [eyebrow], as well as for *strī-* [woman], are “classed with dhatoos”. Further in the text, the same rule concerning the verbs of the fifth class is discussed under the heading *Alterations occasioned by Sundhi, or the joining the terminations to the dhatoos* in section I, *Rules for conjugating verbs* within Book III, Chapter I, *Of verbs*:

“111. The इ [i] or ई [ī] of a dhatoo are changed to इय्, [iy], the उ [u] of the affix श्नु [śnu], (fifth conjugation), and the उ [u], or ऊ [ū], or of a dhatoo, are changed to उव्, [uv] when followed by a vowel which does not require goon [i.e. *ablaut* – GC]. [...]” (Carey 1806: 152).

Later in the text, the example of *aśnuvate* (← *aś-nu-ate*, present third person plural; [they reach]) is given (Carey 1806: 409).

The same distribution of the rules that is observed in Colebrooke’s and Carey’s works is also found in the grammars of Charles Wilkins (*A Grammar of the Sanskrit Language*, 1808), which was the first among the British grammars to be published in London

<sup>35</sup> As in the case of Colebrooke, Carey seems to extend the use of the term sandhi to include phenomena occurring when “adding of the regular inflections, or affixes, to nouns or verbs”, i.e. during the formation of words.

and not in India,<sup>36</sup> Henry Pitts Forster (*An Essay on the Principles of Sanskrit Grammar*, 1810),<sup>37</sup> and the Baptist missionary William Yates (*A Grammar of the Sanscrit Language*, 1820).

## 5. Bopp's innovative approach to the description of sandhi

Franz Bopp's (1791–1867) *Ausführliches Lehrgebäude der Sanskrita-Sprache*, published in 1827, marks a significant change in the way the rules of sandhi were outlined in Western grammars of Sanskrit. At first, however, we should observe that Bopp, contrary to his British predecessors, does not use the term *sandhi*, but prefers the German term *Wohllaut*, which can be translated as “euphony”.

A look at the table of contents of this book enables us to quickly understand how Bopp (1827: xiii) grouped all speech-sound related phenomena in one chapter, entitled “*Wohllautsregeln*” [Rules of euphony]:

“Wohllautsregeln  
 Verwandlung der End- und Anfangs-Vocale  
 Veränderung der Vocale in der Mitte eines Wortes  
 Verwandlung der End- und Anfangs-Consonanten  
 Verwandlung der Consonanten in der Mitte eines Wortes”  
 [Rules of euphony  
 Change of the final and initial vowels  
 Change of vowels in the middle of a word  
 Change of the final and initial consonant  
 Change of consonants in the middle of a word]

Further in the text, Bopp (1827: 33, fn \*) specifies the content of, for instance, the section *Veränderung der Vocale in der Mitte eines Wortes* as follows:

“Es sollen hier die Veränderungen angegeben werden, welche die Endvocale der Wurzeln und Grundformen, vor den mit Vocalen anfangenden Endungen oder Suffixen, erleiden.”  
 [The changes of the final vowels of roots (Wurzel) and basic forms [*alias* stems] (Grundform) before endings or suffixes beginning with vowels are to be given here.]

Concerning the rules we have selected, we find the rule of (a) semivocalisation of single vowels under the heading *Verwandlung der End- und Anfangs-Vocale* (Bopp 1827: 28):

<sup>36</sup> In his preface, Wilkins writes (1808: xi–xii): “I was so fortunate as to find a *Pandit* of a liberal mind, sufficiently learned to assist me in the pursuit; but as at that time (and indeed not till very lately) there did not exist, in any language I understood, any elementary books, I was compelled to form such for myself as I proceeded, till, with the assistance of my master, I was able to make extracts, and at length entire translations of grammars, wholly composed in the idiom I was studying. I put into English, sufficiently intelligible to myself, the greatest part of three very popular grammars; namely, the *Sāraswatī-prakriyā* of *Anubhūti-swarupāchārya*, the *Mugdha-bōdha* of *Vōpa-dēva*, and the *Ratna-mālā* of *Purushōttama*. These extracts and translations I brought with me to England, together with their originals, and several other eminent grammars; among which were the celebrated *Sūtras* of *Pānini*, the *Siddhānta-kaumudī* of *Bhattōji-dikshita* and the *Siddhānta-chandrikā* of *Rāmachandrāsrama*, with several useful commentaries, all of which have been either used, or consulted in this compilation.”

<sup>37</sup> Forster (1810: xi) mentions in the introduction of his grammar that the publication of the book was delayed until 1810, despite the fact that the work was completed already by 1804, thus one year before the publication of Colebrooke's grammar.

“Die Vocale इ, उ, ई, ऊ, ऋ, ॠ [i, u, ī, ū, ṛ, ṝ] gehen vor einem *unähnlichen* (R. 32.)  
Vocal in ihren entsprechenden Halbvocal über; nämlich इ, ई [i, ī] in य् [y], उ, ऊ  
[u, ū] in व् [v], und ऋ, ॠ [ṛ, ṝ] in र् [r]; [...]

[The vowels i, u, ī, ū, ṛ, ṝ turn into in their corresponding semivowels in front of a  
dissimilar vowel; namely i, ī into y, u, ū into v, and ṛ, ṝ into r; ...]

Under the same heading we also find the (c) semivocalisation of diphthongs (Bopp  
1827: 30):

“ए [e] und ओ [o] gehen vor jedem Anfangs-Vocal in अय् [ay] und अव् [av] über  
[...]

[e and o turn into ay and av in front of each initial vowel ... ]

Later in the same section, but under the heading *Veränderung der Vocale in der Mitte eines  
Wortes* (Bopp 1827: 35), the rule of (b) gliding is given as follows (Bopp 1827: 35):

“[...] findet keine Elision der Vocale इ, ई, उ, ऊ [i, ī, u, ū] statt, sie zerfließen aber  
nicht mit einem folgenden *ähnlichen* Vocal grammatischer Endungen, wie bei Regel  
35, in dem entsprechenden langen, sondern इ [i] und ई [ī] gehen sowohl vor *ähn-  
lichen* als *unähnlichen* Vocalen in य् [y] über [...]. उ [u] und ऊ [ū] gehen vor *ähn-  
lichen* Vocalen immer in उव् [uv], und vor *unähnlichen* in व् [v] oder उव् [uv] über.”

[...] no elision of the vocals i, ī, u, ū takes place, but they do not merge with a fol-  
lowing similar vowel of grammatical endings [...] in the corresponding long, but  
i and ī turn into in y in front of both similar and dissimilar vowels [...]. u and ū  
always turn into uv in front of similar vowels, and into v or uv in front of dissimilar  
ones.]

Furthermore, under the same heading, we find once more rule (c) semivocalisation of  
diphthongs since it also occurs inside words (Bopp 1827: 37):

“ए, ऐ, ओ, औ [e, ai, o, au] werden vor Vocalen grammatischer Endungen, in respek-  
tiver Ordnung, in अय्, अव्, आय्, आव् [ay, av, āy, āv] verwandelt; [...]

[e, ai, o, au are respectively changed into ay, av, āy, āv in front vowels of gram-  
matical endings ... ].

The choice of grouping all *sandhi*—or rather *Wohllaut*—rules together clearly does not  
mean that the distinction was lost, as it is clear by the titles of the subsections in which  
these phenomena are dealt with. The reason for such a choice could be understood as  
a particular interest in speech-sound related phenomena, which were the main focus  
of the emergent field of Indo-European studies (at the time known just as philology  
and nowadays falling under the scope of historical linguistics), of which Bopp was an  
acknowledged founding figure. What is particularly innovative here in comparison to  
Bopp’s predecessors is the fact that the rules are not described in terms of their application  
either inside or outside the domain defined by the Pāṇinian condition of *saṃhitāyām*, but  
they are described as applying either to the junction of morphemes or to that of words,  
with certain rules applying to both contexts.

The important innovations introduced by Bopp did not pass unnoticed in the community  
of scholars of Sanskrit. Horace Hayman Wilson (1786–1860) published in 1843 an article  
in which he gives a “short notice of those publications which within the last half century  
have been designed to promote, amongst Europeans, an elementary knowledge of the

Sanskrit language” (Wilson 1843: 13). Interestingly, when discussing the otherwise highly appreciated grammar of Bopp, Wilson (1843: 27) offers his sceptical remark about the idea of merging the two kinds of sandhis into one category:

“Prof. Bopp has extended his rules to changes which occur in single letters in the middle of words, having no regard whatever to the sounds by which they are preceded or followed, but dependent upon inflexional provisions, upon laws affecting declension and conjugation. How far these are to be treated as merely euphonic changes may admit of question, but most assuredly they are not changes resulting from the contact or contiguity of incongruous letters, and are so far inconsistently included under the denomination Sandhi. It may be convenient to bring these literal changes together under one head, and anticipate in some degree the laws of inflexion; but on the other hand, it confounds things essentially different, and is a departure from the precision and simplicity of the original system.”

It is meaningful to note that such an innovation appears in one of the first grammars to be composed and published in Europe by a scholar who did not study directly under the guidance of Indian scholars, but who relied on Sanskrit grammars and on the grammars composed by the British.<sup>38</sup> It is possible that the geographical distance from the Sanskrit scholars may have played a role in Bopp’s breaking with the tradition. However, one can ask to which extent this innovative way of presenting Sanskrit sound-related phenomena was more suitable for Bopp’s historical-comparative agenda. Further research in this direction remains for the time being a *desideratum*.

Bopp’s system is not followed by all of the many grammars of Sanskrit that came after his own. However, two major Western grammars of Sanskrit follow Bopp’s system, i.e. those composed by Friedrich Max Müller and William Dwight Whitney. The influence of these two scholars in both Sanskrit studies and general linguistics can hardly be underestimated (Morpurgo Davies 1998: *passim*), and the grammar of Whitney in particular remains until today a reference work in the field of Sanskrit studies due to its thoroughness and clarity.

## 6. Müller and the *Prātisākhya*s

Friedrich Max Müller (1823–1900) published his *A Sanskrit Grammar for Beginners, Davanāgarī and Roman Letters throughout* in 1866. In his preface he mentions the fact that he drew material from the Sanskrit grammars (*ibid.*: vi), but he openly acknowledges his indebtedness to Bopp’s grammar, which had a major impact on his formation as a Sanskritist (*ibid.*: viii):

“My first acquaintance with the elements of Sanskrit was gained from Bopp’s grammar. Those only who know the works of his predecessors, of Colebrooke, Carey, Wilkins, and Forster, can appreciate the advance made by Bopp in explaining the difficulties, and in lighting up, if I may say so, the dark lanes and alleys of the Sanskrit language. I doubt whether Sanskrit scholarship would have flourished as it has, if students had been obliged to learn their grammar from Forster or Colebrooke, and I believe that to Bopp’s little grammar is due a great portion of that success which has attended the study of Sanskrit literature in Germany.”

<sup>38</sup> Othmarus Frank’s 1823 grammar precedes that of Bopp, but it follows the “British system”.

As far as sound-related rules are concerned, Müller follows Bopp's plan, with all phenomena—both occurring between morphemes and between words—discussed together in chapter II *Rules of Sandhi* of his work, with subsections dealing with identical combination of sounds that, however, yield different outcomes according to the position in which they occur. This is the first occurrence of the two labels of *internal sandhi* and *external sandhi*:

“For shortness' sake it will be best to apply the name of *External Sandhi* to the changes which take place at the meeting of final and initial letters of words, and that of *Internal Sandhi* to the changes produced by the meeting of radical and formative elements.” (Müller 1866: 9–10).

As far as our selected examples are concerned, both (a) the semivocalisation of single vowels and (c) the semivocalisation of diphthongs are dealt with under the section *External Sandhi – Combination of Vowels at the end and beginning of words* (Müller 1866: 13). Later on, (b) gliding and, yet again, (c) semivocalisation of diphthongs are described under the heading *Rules of Internal Sandhi – Final Vowels* (Müller 1866: 50–51).

In this respect, Müller seems to have simply substituted—or rather translated—Bopp's *Wohllaut* with the term *sandhi*. And here lies our crucial terminological question: How did Müller decide to use the Sanskrit term “sandhi” to label the modifications of vowels and consonants inside words, when such a term is not used in this way by *vyākaraṇa*? The *Prakriyā* grammars do employ the term *sandhi*, but never use it for describing phenomena affecting the combinations of roots and suffixes.

As we saw above (§ 4), Colebrooke seems to have been the first Westerner to extend the application of the term *sandhi* to rules that according to the tradition would pertain only to the domain defined by the condition *saṃhitāyām*. However, Müller definitely goes a step further by coining the category of *internal sandhi*. As he himself puts it, it is a matter of “shortness's sake”. But if one digs a little deeper in the works of the German scholar, it is possible to observe that his familiarity with the work of Bopp and with a further, non-*vyākaraṇic* corpus of Sanskrit linguistically-oriented texts may have served as the basis for his extension of the scope of the term *sandhi*.

As we saw before (§5), Bopp shifts the focus of *sandhi* from a derivational system, i.e. the pāṇinian approach that is still at the basis of the *Prakriyā* works as well as the grammars of the British scholars, to a distributional one, where rules do not apply during or after the derivation of words, but according to their position in a given sentence, i.e. whether they affect sounds inside words or at the edges of words that are in contiguity with other words.

Furthermore, we can observe that Müller was by 1866 already rather familiar with the corpus of the grammatical text called *Prātiśākhya*s. In 1856, thus more than ten years before the publication of his grammar, Müller had already worked on an edition and translation of a Sanskrit grammatical text, entitled *Ṛgvedaprātiśākhya* and attributed to the sage of yore Śaunaka, in his *Rig-Veda oder die Heiligen Lieder der Brahmanen. Mit einer Einleitung, Text und Übersetzung des Prātiśākhya oder der Ältesten Phonetik und Grammatik Enthaltend*. According to most of the indigenous tradition, the *Prātiśākhya*s do not belong—or do not exclusively belong—to the domain of *vyākaraṇa*,<sup>39</sup> but to a different domain of the Sanskrit linguistic speculation that is particularly interested in describing the language of the Vedas, i.e. the oldest Sanskrit corpus we possess and, as it is mostly perceived by its many articulations, the foundational text of Hinduism.

<sup>39</sup> See Ciotti (2018).

In particular, the commentary to the third verse of the spurious beginning of the *Ṛgvedaprāṭisākhya* discusses both the words *saṃhitā* and *sandhi*.<sup>40</sup> The passage is particularly intricate and would require a long digression to be read in its entirety. Suffices here to mention that it openly describes our two terms as pertaining to both the combination of sounds and that of words: *dvayoḥ padayor akṣarayor vā sandhir* [sandhi of two words or sounds] and *dvividhā hi saṃhitā|akṣarasamhitā ca padasamhitā ca* [for the *saṃhitā* is double: *saṃhitā* of the sounds and *saṃhitā* of the words].<sup>41</sup>

It should be noted that in the context of the *Prāṭisākhyas*, the term *saṃhitā* has a particular scope that differs from that of the vyākaraṇic texts. These grammars in fact teach how to recite the continuous text (*saṃhitā-pāṭha*) of the Vedas starting from their word-by-word version (*pada-pāṭha*). Thus, each time two individual words are pronounced one after another, the *Prāṭisākhyas* teach the application of the required phonological change that occur at the edges of those two words when they meet in a sentence. In MWL terms, these are grammars of *external sandhi*. Bearing this in mind, the above mentioned passage is particularly relevant, since it allows to use the terms *sandhi* and *saṃhitā* to refer to the combination of both sounds and words, the latter case occurring in a domain that is not derivational, as the one laid down by vyākaraṇic texts, but distributional, i.e. where phonological phenomena occur at the edges of adjacent words.

About this passage Müller (1856: iv) writes as follows:

“Sanhitâ, welches sich durch Einheit übersetzen lässt, ist am bekanntesten als die Einheit, oder die ununterbrochene Aufeinanderfolge der Buchstaben, der Sylben und Worte, wie sie sich im hergebrachten Texte des Veda findet. Jeder Endbuchstabe hat nämlich einen Einfluss auf den folgenden Anfangsbuchstaben, und umgekehrt steht keine Sylbe, kein Wort für sich, sondern jeder Satz wird durch eine phonetische Kette zusammengehalten, und diese Kette heisst eben Sanhitâ, die Verkettung Sandhi.”

[Sanhitâ, which can be translated as unit (Einheit), is best understood as a unit, or the uninterrupted succession of letters, syllables and words, as one finds it in the traditional texts of the Veda. Each final letter influences in fact the initial letter, and in turn there is no independent syllable or word, but each sentence held together by means of a phonetic chain, and this chain is called Sanhitâ, the chaining [is called] Sandhi.]

On the basis of the available sources, it seems to me that Müller’s familiarity with the *Prāṭisākhyas* may have influenced him in coining the labels of *internal sandhi* and *external sandhi* more than his familiarity with Colebrook’s grammar.

## 7. The two labels gain momentum

Among the post-Müller grammars of Sanskrit that of William Dwight Whitney (1827–1894), entitled *A Sanskrit Grammar: Including Both the Classical Language, and the Older Dialects, of Veda and Brahmana* and published in 1879, has surely had the most long-

<sup>40</sup> The spurious nature of the first ten verses of the *Ṛgvedaprāṭisākhya*, and the title (*Vargadvayavṛtti*) and author (Viṣṇumitra) of their commentary is discussed in Shastri (1922). Müller had a different opinion on the matter (1856: i) and thought that the commentary had been composed by Uvaṭa, who is the commentator of the whole *Ṛgvedaprāṭisākhya*.

<sup>41</sup> The term *akṣara* is of difficult translation. It can in fact mean “sound” (in this case used as a synonym for *varṇa*), “syllable”, or even “letter” according to the context. It is not always possible to distinguish between these meanings, as in the passages discussed here where both “sound” and “syllable” would be suitable translations. I opted for the former.

lasting impact not only in the field of Sanskrit studies, but also in MWL.<sup>42</sup> Inspired, among others, by the works of Bopp (“a wonder of learning and method for the time when it was prepared”, Whitney 1879: vii) and Müller, Whitney is openly in favour of a unitary treatment of *external* and *internal sandhis*. In this respect he writes:

“To cast all statements, classifications, and so on, into a form consistent with the teachings of linguistic science. In doing this, it has been necessary to discard a few of the long-used and familiar divisions and terms of Sanskrit grammar – for example, the classification and nomenclature of “special tenses” and “general tenses” (which is so indefensible that one can only wonder at its having maintained itself so long), the order and terminology of the conjugation-classes, **the separation in treatment of the facts of internal and external euphonic combination**, and the like.” (Whitney 1879: vi; bold is mine).

Furthermore, he remarks that the principles of combination of sounds (hiatus, deaspiration, assimilation, etc.; Whitney 1879: 37ff.) are *mostly* the same despite differences in—what we could call—the morphological environment:

“109. The rules of combination are in some respects different, according as they apply a. to the internal make-up of a word, by the addition of derivative and inflectional endings to roots and stems; b. to the more external putting together of stems to make compound stems, and the yet looser and more accidental collocation of words in the sentence. Hence they are usually divided into rules of internal combination (or *sandhi*, ‘putting together’), and rules of external combination.

110. In both classes of cases, however, **the general principles of combination are the same** and — likewise, to a great extent, the specific rules. The differences depend in part on the occurrence or non-occurrence of certain combinations in the one class or the other ; in part, on the difference of treatment of the same sound as final of a root or of an ending, the former being much more persistent than the latter ; in part, on the occurrence in external combination of certain changes which have apparently phonetic but really historical ; and, most frequent and conspicuous of all, on the fact that vowels and semivowels and nasals exercise a sonantizing influence in external combination, but not in internal. Hence, to avoid unnecessary repetition as well as the separation of what really belongs together, the rules for both kinds of combination will be given below in connection with one another.” (Whitney 1879: 36–37; bold is mine).

Our gliding case is, of course, one of those exceptions that break with the application of the same principle both word-internally and between adjacent words. Hence, Whitney (1879: 43) writes:

“But in internal combination (never in external) the *i* and *u*-vowels are not seldom changed instead to *iy* and *uv* — and this especially in monosyllables, or after two consonants, where otherwise a group of consonants difficult of pronunciation would be the result. The cases will be noticed below, in explaining inflected forms.”

<sup>42</sup>For instance, concerning the extent of Bloomfield’s consideration for Whitney’s work, Jakobson (1971: xlv) writes: “Bloomfield retained his admiration for Whitney’s linguistic essentials and once, in the early 1940s, he said that his first guide to a synchronic study of language was Whitney’s *Sanskrit grammar* of 1879.”

## 8. The term sandhi in 20<sup>th</sup> century Western linguistics

The term sandhi seems to emerge outside the circles of Sanskritists and historical linguists around the end of the 19<sup>th</sup> century. As observed by Andersen (1986: 1), the adoption of the term sandhi in linguistic parlance was advocated by Georg von der Gabelentz (1840–1893) in his 1891 *Die Sprachwissenschaft: ihre Aufgaben, Methoden und bisherigen Ergebnisse*. In a section of this work entitled “Die Euphonik (Sandhi)”, Gabelentz writes (1901<sup>2</sup> [1891]: 198) “[...] das Wort *sandhi* ist nachgerade Gemeingut der Sprachwissenschaft geworden” [The word sandhi has gradually become common in linguistics]. Later in the same section, while talking about the various instantiations of euphonic phenomena, he asks the question “Geschieht die Beeinflussung innerhalb des einzelnen Wortes (innerer Sandhi), oder zwischen benachbarten Wörtern (äusserer Sandhi)?” [Does the influence [i.e. the phenomenon] occur in a single word (internal sandhi) or between words (external sandhi)?, Gabelentz 1901<sup>2</sup>: 199], thus *en passant* providing us with apt German translations of the categories of *internal sandhi* and *external sandhi*.

In the 20<sup>th</sup> century the indebtedness of MWL towards the SGT is not forgotten. For instance, Nikolai Sergejevich Trubetzkoy (1890–1938), one of the leading figures of the Prague linguistic circle, is very clear about the roots of ‘morpho-phonology’, within the scope of which falls also the study of sandhi, and writes in the 1930’s:

“If we compare the teachings of the ancient Greeks and Romans with those of the Hebrew, Arabic, and especially ancient Indian grammarians, the lack of interest in morphonological problems in classical and medieval Europe becomes apparent. Even now, the situation is basically the same. Contemporary Semitic philology has taken over the morphonological ideas of the Arabic and Hebrew grammarians without adapting them to the demands of modern scholarship. Indo-Europeanists used Indian morphonological teachings as the basis for a morphonology of the Indo-European protolanguage, which in an expanded form became the so-called system of Indo-European ablaut, roots, and suffixes.” (Trubetzkoy 2001 [1931]: 75).<sup>43</sup>

In the same decade, the term *sandhi* is overtly used by Leonard Bloomfield (1887–1949) in his very influential 1933 *Language* (revised in 1935), which distinctly marked a certain epoch of linguistic scholarship during the first half of the 20<sup>th</sup> century.<sup>44</sup> Furthermore, he also presents his ideas about sandhi in *Menomini Morphophonemics*, a short article dated 1939 about the sandhi of Menomini (an Algonquian language) that was published in Prague and dedicated to the memory of Nikolai Trubetzkoy.

In this latter publication, Bloomfield writes (1939: 105–106) about the distinction between internal and external sandhi as follows:

“Analysis of Menomini speech-forms by formal-semantic resemblances yields a fairly clean division of forms into phrases, compound words, and simple words. The words in a phrase and the members in a compound word differ but little in different combinations; such variations as occur, constitute the *external* or *syntactic* sandhi of the language and will not be discussed in this paper. Simple words and members of compounds, in turn, resolve themselves, under analysis, into

<sup>43</sup> In the same publication Trubetzkoy defines morpho-phonology (or morphonology) as: “[...] the study of the phonological structure of the morphemes, **the study of combinatory sound changes undergone by morphemes in contact**, and the study of sound alternation series serving a morphological function.” (2001 [1931]: 76; bold is mine). Translations are found in Liberman (2001).

<sup>44</sup> See e.g. Andersen (1986: 1) and Matthews (2007<sup>2</sup>: 353).



morphologic elements which vary greatly in different combinations: the present paper describes these variations, the *internal sandhi* or *morphophonemics* of the language.

[...] The process of description leads us to set up each morphological element in a theoretical *basic* form, and then to state the deviations from this basic form which appear when the element is combined with other elements. If one starts with the basic forms and applies our statement [...] in the order in which we give them, one will arrive finally at the forms of words as they are actually spoken.”

Here, Bloomfield writes about word-internal (morphological) boundaries and presents a categorisation of the sandhi phenomena according to whether they occur within words or at the edges of words. However, he implements this model incorporating the process of derivation in his representation of the grammar. As a consequence, word internal phenomena correspond to the phenomena occurring during derivation.

Bloomfield’s employment of derivation is not surprising. As reported by David E. Rogers (1987: 106, *passim*), the American scholar was well acquainted with the derivational techniques devised in *vyākaraṇa*: he had in fact studied the *Kāśikavṛtti*, of which he translated the first 154 rules into English.

In my understanding of Bloomfield’s intellectual production, this explicit combination of derivation and internal sandhi represents the maturation of ideas that were first formulated in *Language*. There, in fact, Bloomfield (1935: 189) speaks of two kinds of sandhi. A first kind is characterised by the fact of it occurring within words:

“[...] in some Dutch pronunciations the absolute forms *heb* [‘hep] ‘have’ and *stop* [stop] ‘stop’ behave differently in sandhi: *heb ik?* [‘heb ek?] ‘have I?’ but *stop ik?* [‘stop ek?] ‘do I stop?’ The forms which have the voiced consonant in sandhi have it also whenever it is not at the end of the word, as *hebben* [‘hebe] ‘to have,’ in contrast with *stoppen* [‘stope] ‘to stop.’ Sandhi-distinctions based on morphologic features like this, may be called *reminiscent sandhi*.”

In a further passage, this kind of *sandhi* is presented as closely connected to the concept of word derivation. In particular, it is said that there are cases in Tagalog in which the sandhi phenomena can be properly accounted for only if the proper order of composition of morphemes is understood:

“In all observation of word-structure it is very important to observe the principle of immediate constituents. In Tagalog, the underlying form [‘ta:wa] ‘a laugh’ appears reduplicated in the derivative [ta:‘ta:wa] ‘one who will laugh;’ this form, in turn, underlies a derivative with the infix [-um-], namely [tuma:‘ta:wa] ‘one who is laughing.’ On the other hand, the form [‘pi:lit] ‘effort’ *first* takes the infix [-um-], giving [pu‘mi:lit] ‘one who compelled,’ and is *then* reduplicated, giving [-pu:pu‘mi:lit], which underlies [nag-pu:pu‘mi:lit] ‘one who makes an extreme effort.’ Close observation of this principle is all the more necessary because now and then we meet forms which compromise as to immediate constituents. Tagalog has a prefix [paŋ-], as in [a‘tip] ‘roofing’: [paŋ-a‘tip] ‘that used for roofing; shingle.’ The [ŋ] of this prefix and certain initial consonants of an accompanying form are subject to a phonetic modification — we may call it *morphologic sandhi* — by which, for instance, our prefix joins with [‘pu:tul] ‘a cut’ in the derivative [pa-‘mu:tul] ‘that used for cutting,’ with substitution of [m] for the combination of [-ŋ] plus [p-]. In some forms, however, we find an inconsistency as to the structural order; thus, the

form [pa-mu-'murtul] 'a cutting in quantity' implies, by the actual sequence of the parts, that the reduplication is made "before" the prefix is added, but at the same time implies, by the presence of [m-] for [p-] in both reduplication and main form, that the prefix is added "before" the reduplication is made. A carelessly ordered description would fail to bring out the peculiarity of a form like this." (Bloomfield 1935: 189).<sup>45</sup>

This kind of sandhi is thus said to be morphological, in the sense that it occurs word internally, and sensitive to the order in which morphemes are combined, i.e. derivational.

Bloomfield (1935: 186) then presents a second kind of sandhi that is said to occur in syntactic contexts. This is first introduced in *Language* with an example from English:

"Features of modulation and of phonetic modification play a great part in many syntactic constructions; they are known as *sandhi*. The form of a word or phrase as it is spoken alone is its *absolute* form; the forms which appear in included positions are its *sandhi-forms*. Thus, in English, the absolute form of the indefinite article is a [ˈeɪ]. This form appears in included position only when the article is an emphatic element and the next word begins with a consonant, as in "not *a* house, but *the* house." If the next word begins with a vowel, we have instead a sandhi-form, *an* [ˈɛn], as in "not *an* uncle, but *her* uncle".

Later, this kind of sandhi is said to be "*special or irregular*" (Bloomfield 1935: 188) since it does not apply to each word in any suitable environment, but only to specific sets of words (such as the indefinite article in English). On the other hand, there are many languages in which one can find instances of a "*General or regular sandhi*" that, given the right environment, applies to every word that is found "in a short (*close-knit*) phrase" (Bloomfield 1935: 188–189). I argue that Bloomfield uses this expression, i.e. "short (*close-knit*) phrase", to translate the term *saṃhitā*. Even more so since, while discussing about it, he quotes Sanskrit examples:

"In Sanskrit there is a great deal of general sandhi; for instance, final [ah] of the absolute form appears in the following sandhi-variants: absolute [de:'vah] 'a god,' sandhi-forms: [de:'vas 'tatra] 'the god there,' [de:'vaç çarati] 'the god wanders,' [de:'va e:ti] 'the god goes,' [de:'vo: dada:ti] 'the god gives,' and, with change also of a following initial, before ['atra] 'here,' [de'vo: tra] 'the god here.'

...

"Sandhi may go so far as to restrict the word-final in a phrase beyond the ordinary medial restrictions of a language. Thus, the sequence [ta] is permitted medially in Sanskrit, as in ['patati] 'he falls,' but [t] at the end of the word is in close-knit phrases replaced by [d] before a vowel: absolute ['tat] 'that,' but ['tad asti] 'that is.'" (Bloomfield 1935: 189).

<sup>45</sup> Note that the same observation about the ordering of derivation in Tagalog found in *Language*, is already present in Bloomfield's 1917 *Tagalog Texts with Grammatical Analysis* (1917: 211): "The same morphological elements may be variously distributed; it is most convenient and corresponds most nearly to the speech-feeling to describe these differences as though they were due to different successions in which the modifications are applied: sumùsúlat is súlat reduplicated and with infix -um-; but (nag-)tùtumirà is tirà with infix -um-, then reduplicated (plus suffix nag-). The part of a word to which a modification is (in this sense) said to be added will be called the *underlying word* (or phrase): in sumùsúlat the infix -um- is added to the underlying word sùsúlat, in (nag-)tùtumirà reduplication is added to the underlying word tumirà; in ikasa-m-pù<sup>7</sup> the prefix ka- and i- are successively added to the *underlying phrase* sa m pù<sup>7</sup> ten." However, here Bloomfield does not distinguish between two kinds of *sandhi* and generally speaks of "*sound-variation and retraction of the accent*".

From these examples, it is clear that the idea of “*general sandhi*” that Bloomfield had in mind corresponds to that of a series of speech-sound modifications that occur at the edges of words when they meet in the sentence. As a consequence, the expression “short (*close-knit*) phrase” resembles that of *external sandhi* in Müller and Whitney’s grammars and that of *saṃhitā* in the *Prātiśākhya* model, rather than that found in the vyākaraṇic texts, where the idea of sound-related rules applying within the domain of *saṃhitā* is not sensitive to the delimitations imposed by the categories of *internal* and *external sandhi*.

## 9. Conclusions

The history of how the term *sandhi*, which was originally coined by the SGT, was adopted by Western linguistics clearly shows how profound has the impact of the study of Sanskrit been in the development of Western linguistics. As John Rupert Firth (1890–1960) wrote:

“Without the Indian grammarians and phoneticians whom he [William Jones] introduced and recommended to us, it is difficult to imagine our nineteenth century school of phonetics.” (Firth 1947: 119).<sup>46</sup>

William Sidney Allen (1918–2004), a member of the London school of linguistics founded by Firth, pushes this specific connection even further by writing:

“[...] the link between the ancient Indian and the modern Western schools of linguistics is considerably closer in phonetics than in grammar. For whilst Pāṇinean techniques are only just beginning to banish the incubus of Latin grammar, our phonetic categories and terminology owe more than is perhaps generally realized to the influence of the Sanskrit phoneticians.” (Allen 1953: 3).

In the previous sections, we first observed that the term *sandhi* already appears in the first grammars composed by European scholars. In particular, we observed that the works composed by British scholars, i.e. the works that enabled the dissemination of Sanskrit in the West, reflect above all the teachings of *vyākaraṇa* as outlined in the *Prakriyā* grammars: A certain set of sound-related phenomena is described as occurring during the derivation of single words, whereas a further set is described as applying across the board, i.e. both word internally and at the junction of words, when fully derived words are put together in a given sentence.<sup>47</sup> We also noticed that, despite the fact that the *Prakriyā* grammars reserve the term *sandhi* for the latter kind of phenomena, Colebrooke already introduces an innovation by timidly employing the terms *sandhi* and *saṃhitā* to refer also to rules of “etymology”, i.e. to rules that apply only to the formation of individual words.

Later on, a fundamental theoretical shift is brought about by Bopp, who does not employ what was a *de facto* derivational model, but rather a distributional one, i.e. a model in which sound-related phenomena occur either at the junction of morphemes or at the edges of words when they meet in a sentence, with certain rules occurring in both contexts.

Müller moves a step further and coins the categories of *internal sandhi* and *external sandhi*. Although he simply speaks of a matter of brevity, it seems legitimate to understand his new labels as the result of his familiarity with the work of Bopp, as far as the theoretical shift from derivational to distributional is concerned, as well as his familiarity with the *Prātiśākhya*s, which in a much more explicit way than Colebrooke, employ the terms

<sup>46</sup> At the end of this statement, Firth (1947: 119) adds a footnote where he writes: “[...] Modern grammar and phonetics are founded on the Indian science.”

<sup>47</sup> About this statement, see above fn. 13.

sandhi and *saṃhitā* to refer to phenomena that pertain to word boundaries, rather than to phenomena that occur once individual words are fully derived.

After Müller's work, the term sandhi and the labels *internal sandhi* and *external sandhi* gain momentum and thanks to Whitney in the 19<sup>th</sup> century and Bloomfield in the 20<sup>th</sup> century become part of the MWL parlance. Despite the fact that the term *sandhi* seems not to have enjoyed a widespread use in generative phonology, surely the mainstream approach—or rather group of approaches—to the study of phonology from at least the 1960's, one can observe that it enjoyed a certain fortune in MWL literature for at least a century as witnessed by Andersen's (1986: 1) volume mentioned at the beginning of this article.<sup>48</sup>

### Competing Interests

The author has no competing interests to declare.

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49

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<sup>48</sup>We can conventionally set the birth of generative phonology at the time of the publication of Chomsky & Halle's 1968 *The Sound Pattern of English*, where the term sandhi is never used. The term still occurs three times in Kenstowicz & Kisseberth's 1979 *Generative Phonology: Description and Theory*, a text that epitomises generative phonology in the period between *Sound Pattern* and before the formulation of Lexical Phonology. Later on, in Kenstowicz's 1994 *Phonology in Generative Grammar*, which in turn epitomises generative phonology in the period between the formulation of Lexical Phonology and that of Optimality Theory, the term sandhi appears only twice in quotations from works of Edward Sapir and a few times in chapters that deal with "tone sandhi". The latter is the topic of a special sub-field of phonological theory, apparently the only domain of the discipline where the term is still widely used. Despite this trend, Hock (1991<sup>2</sup>: 246) still notices: "The term sandhi, lit. 'putting together', originated in the essentially generative grammar of the ancient Indian grammarians, but it is now widely used both by generativists and non-generativists". I reserve to a future study to investigate in detail the use of the term sandhi in generative phonology.

<sup>49</sup>References with a digit in apex refer to the improved edition of the text.

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**How to cite this article:** Ciotti, G. (2019). On (the) sandhi between the Sanskrit and the Modern Western Grammatical Traditions: From Colebrooke to Bloomfield via Müller. *Journal of Portuguese Linguistics*, 18: 5, pp. 1–23. DOI: <https://doi.org/10.5334/jpl.215>

**Submitted:** 03 February 2019      **Accepted:** 03 June 2019      **Published:** 10 July 2019

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