Sanskrit $h < *\text{dh}, \text{bh}$

ALEXANDER LUBOTSKY

1. In Sanskrit we sometimes find $h$ instead of expected $\text{dh}$ or $\text{bh}$. A collection of the material can already be found in von Bradke 1886: 657ff. and, slightly enlarged, in Wackernagel (AIGr. I: 250ff.). More recently, Debrunner updated the collection in his Nachträge to AIGr. I (138ff.). One may argue about some items, which are not included in this collection of the material,¹ but the list given in AIGr. can serve as a good starting point. The material will be treated in detail later on, but in order to facilitate the following discussion I give at the beginning the main categories where we find $h < \text{dh}$ and $\text{bh}$.

$h < \text{dh}$:
- verbal ending of the 2 sg. impv. -hi next to -dhi, cf. Av. -\text{di};
- verbal medial endings of the 1st dual and plural: -vahe, -vahi, -vahai; -mahe, -mahi, -mahai, cf. Av. -maid, -maid;
- adverbs in -ha $< *$-\text{d}ha: iha `here', cf. Pā. Pkt. idha, iha, Aśoka hida (CDIAL 1605), GA v. idā, LAv. iōa; kūha `where?', cf. GA v. kuda, OCS kāde; sahā `with' and sahā in compounds next to sadhā, cf. Av. haīa; visvāhā next to visvādha `always';
- āha 1,3 sg., aṁhūr 3 pl. pf. `to say', cf. 2 sg. ātha, GA v. 3 pl. ādarā;
- grhā- m. `house', cf. A.V. gorhā
dā;
- rohī- f. `red mare', rohīta-, lohīta- `red' next to rudhīra- `id.', rudhī-krā- PN;
- hitī-, hiti- (vs. dhīta-, dhīti-) from $\sqrt{dhā}$ `to put';
- $\sqrt{vruh}$- `to rise', ṛuh- f. `plant', etc. next to $\sqrt{vruh}$- `to grow', $\sqrt{vṛuḥ}$- $\sqrt{dh}$- f. `plant', A.V. $\sqrt{vṛud}$-

$h < \text{bh}$:²
- $\sqrt{grah}$- `to seize' next to $\sqrt{grabh}$-
- kakuhā- `eminent' next to kakuḥh- f. `peak'.

¹ For instance, Burrow (1955: 69) also mentions nah- `to knot, tie', ptc. naddhā-, for which see M ayrhofer EWAia II: 31ff., and snuh- `to vomit', which he glosses as `to drip' and connects with A.V. snao- (?, probably snaoā- m. `cloud' is meant), but this root is attested only in very late texts and is unreliable as evidence for Vedic dh > h.
2. Explanations of this phenomenon are scarce in the literature. For instance, Burrow (1955) gives hardly more than a description of the facts: "in some cases, even in the earliest period dh and bh are weakened to h, an anticipation of their later fate in Middle Indo-Aryan" (p. 69). In almost the same words Gonda (1971: 38f.) states that "in anticipation of their later weakening to h in Middle Indo-Aryan dh and bh in definite positions are sometimes represented by the aspirate". One might conclude from this formulation that in all Middle Indic dialects dh and bh became h, but this is not the case. Pāli, for instance, has in general preserved dh, sometimes even where Sanskrit shows h (Pāli idha vs. Skt. ihā, for which see below). In Gāndhārī and some Aśokan inscriptions, dh became ḍ (v. Hinüber 1986: 95).

The explanation of h < dh, bh as a dialectal phenomenon is very old. Ascoli (1868: 258, 260) already calls h < dh a Prākritism, and this idea was further developed by von Bradke (1886). In spite of severe criticism by Wackernagel (AiGr. I: 252f.), this position is still repeated in Thumb-Hauschild (1958: 280): "Diese Formen mit h sind schon in vedischer Zeit aus einem Dialekt eingedrungen, in welchem der Wandel von dh, bh > h (vielleicht unter gewissen einschränkenden Bedingungen) gesetzmäßig war. Auf diesen Dialekt weisen tatsächlich Prākrit-dialekte, in denen Tenues und Mediae aspiratae zwischen Vokalen in h übergehen (ruhira- = ai. rudhirā-, sahā- = ai. sabhā- 'Versammlung', raha- = ai. rātha- usw.)."

It is certainly true that there are borrowings in Vedic, not only from non-Indo-European languages (Kuiper 1991), but also from other dialects. A typical example are words with l. This phoneme is alien to the Vedic dialect, so that all words which contain this sound must have been borrowed from another dialect. In the late parts of the RV, l is eight times more frequent than in the family books (AiGr. I: 215), and it is essential that this concerns individual words, often of a "popular" character, proper names and words of non-Indo-European origin (for a complete list of these words see Arnold 1897: 257ff.).

The situation with h < dh is totally different, however. First, the forms are solidly embedded in the RV from the family books onwards. Secondly, h < dh is attested not only in individual words, but in verbal endings (-mahi, -vahi, -hi) and in the adverbs in -ha. It is further important that beside these endings we find imperatives in -Vdhī and adverbs in -dha, which in the framework of the "dialectal" theory would lead to the conclusion that some verbal forms were taken from one dialect and some from another.

It must also be realized that if we assume that h < dh belongs to a younger phase in the development of Indo-Aryan, we must explain all cases of preserved dh as archaisms, which is not very attractive. This is the reason why scholars who adhere to the dialectal theory generally add that dh > h only occurred "in definite positions", "unter gewissen einschränkenden Bedingungen", etc.
2.1. Meillet (1912-3) tried to rehabilitate the "dialectal" theory by offering a rather complicated scenario of dialect mixture: "En réalité, il s'agit d'un phénomène historique: les parlers du Nord-Ouest sur lesquels repose en principe la langue du Rgveda ouvraient plus ou moins régulièrement dh et bh intervocaliques en h; mais cette langue religieuse a servi à d'autres Hindous qui n'avaient pas – ou du moins n'avaient pas encore – la même particularité de prononciation, et il y a eu de leur part réaction contre cette prononciation qui leur semblait incomplète et barbare; les mots ont donc été réintroduits en grande partie avec leur prononciation occlusive, de même que le sanskrit postérieur a réintroduit d et dh au lieu de l et lh intervocaliques" (p. 123). This scenario is theoretically possible but can hardly be substantiated. Moreover, it does not really help in explaining the vacillating forms.

2.2. It seems clear from the preceding discussion that we must try to explain the change dh, bh > h in terms of a sound law, which took place at a certain stage in the development of Sanskrit and in specific environments. As far as I know, there have been two attempts in this direction. Wackernagel (AiGr. I: 252f.) suggested that the change dh, bh > h only occurred in the position after unstressed vowels. Nevertheless, as he admitted himself, the counterevidence is so vast (on the one hand, rôhita-, viśvaha, etc. with -h- after an accented vowel, on the other hand, impv. kṛdhī, śrudhī, etc., adhās `under', preverb abhī, vidhāvā- `widow' and many others with preserved -dh- and -bh-) that he had to resort to assuming preserved archaisms and borrowings from a dialect where this change was not operative. In other words, back to the "dialectal" theory which he so vigourously opposed.

In his 1923 article, Bloch tried a very different approach. He noticed that the imperative ending -hi is predominantly used in polysyllabic forms (although a few of these forms with -dh- remain unexplained). As to the disyllabic forms, he assumed that -dhi is found after a short vowel and after consonants and -hi after a long vowel. Exceptions are: bodhī with -dh-, ihi, gahi, jahi, stuhi with -h-. For bodhī Bloch hesitatingly proposed to reconstruct *b(h)uzdhi with analogical -z- after *azdhi > edhi. In order to account for stuhī and jahī, Bloch assumed dissimilation. As to ihi and gahi, he thought that these forms belong to "la langue courante", i.e. that they are Prākritisms. Bloch proposed the same solution for "des mots accessoires" ihá, kūha and for grha-.

Although some elements of Bloch's theory are probably correct (e.g. his contention that the originally preceding *-z- and -z- are responsible for the preserved -dhi in edhi, sādhī, tāhī, for which see §5.2), his rules are too general and leave many forms unexplained, e.g. all disyllabic forms of the type sādhī- `straight', ādhar- `udder', médha- `sacrifice', polysyllabic forms of the type ṛṣabha- `bull', adverbs like bahudhā, viśvādha, just to mention a few examples.

---

3 Incidentally, Bloch's explanation, at least for the imperative endings, was accepted by Renou (1952: 53f.).
3. Attempts of Wackernagel and Bloch to explain dh, bh > h in terms of a sound law failed to convince the scholarly community, and this is presumably the reason why dialectal differences have been evoked time and again in order to account for the phenomenon.

3.1. Before subjecting the material to closer scrutiny, I would like to emphasize two points. First, the developments dh > h and bh > h must be dissociated because their conditions and chronology differ. Whereas dh > h is limited to intervocalic position (except for hita-, for which see §7.3), bh > h also took place when bh was followed by a consonant (grhṇātus, hasta-grhya). Moreover, the forms with h < dh are abundantly attested and solidly embedded in the RV while the change bh > h is limited to a few word families.

The grah- /grh- forms are only found in Maṇḍalas I and X and in the Anhang-hymn 4.57, cf. 3sg. impv. grhṇātu (4.57.7), impv. grhāna (10.103.12), pf. jagrāṇa (10.161.1), gerund pratigrhyā (1.125.1), hasta-grhya (10.85.26, 10.109.2), gerundive grāhyā- (10.161.1), grah- 'a measure of Soma' (10.114.5), grāhi- name of a female demon (10.109.3). In contradistinction to forms with h < dh, this chronology is compatible with a possible Prākrit influence. In the AV, the forms with -h- of this root became predominant.

The only other word with h < bh in the list of Wackernagel and Debrunner, viz. kakuha- (I1 IV1 V1 VII1 VIII1), belongs to a word family with many irregular forms. Next to kakuḥ- f. ‘peak, hump’, we also find in the RV kakūdh- ‘id.’, kakūdmant- adj. ‘with humps’, kākūd- ‘gullet’. The AV adds to this kakubhā- ‘humped (?)’ (8.6.10) and kakūda- ‘summit’. The IE origin of this word family is very uncertain. The etymological dictionaries connect Lat. cacūmen n. ‘peak’, assuming that its final part -ūmen was taken over from acūmen, which is no more than a guess. Moreover, the formation of kakūbh- is difficult. If this was a reduplicated noun, we expect *e in the reduplicating syllable and, consequently, *acakubh- . o-vocalism would have yielded **acakubh- with Brugmann’s Law. I do not believe in a PIE phoneme *a (cf. Lubotsky 1989), but even assuming original *a in this word does not help elucidate its formation. Finally, it is worth mentioning that the root structure of Ākubh- is impossible for PIE (tenues and mediae aspiratae do not co-occur within an Indo-European root, cf. Meillet 1937: 174). At any rate, whatever the origin of kakūbh-, it seems more plausible that kakuha- is due to some kind of dissimilation and does not bear evidence for a general rule bh > h.

We may add to the dossier of cases with h < bh one more word family: gāhana- n. (RV +) ‘abyss, chasm, thicket’, gāvāra- (AV +) n. ‘hiding-place, thicket’, gāhman- and gahmān- (Br.+ ) ‘abyss’, if these words are connected with ga(m)bhairā- ‘deep’ (cf. EWA i A: 481f.). Wackernagel and Debrunner connected gāhana- with grāh- ‘to wade’, which is less probable both phonetically and semantically, cf. above, §1. This word family runs parallel to grh- in two respects: 1) it

---

appears for the first time in the late books of the RV (the oldest attestation is gāhāna- in RV 1.132.6 and 10.129.1), and 2) -h- is even found when it is followed by a consonant (gāhāvāra-, gāhāman-). These considerations plus the rather specific meaning render it probable that gāhāna- is a borrowing from another dialect. See further §7.1.

3.2. Another point is that it seems useful to make a distinction between two types of evidence for h < dh: h in suffixes and endings, on the one hand, and h in the root, on the other. Whereas h in the root can be the result of some irregular changes or borrowing, this origin is in general improbable for grammatical elements. Therefore, we shall first concentrate on the "grammatical" group because that is where we must look for the original conditions of the change dh > h.

As far as I know, it has not been noticed before that the "grammatical" h (< dh) always occupies one and the same position in the word, viz. -VhV# (V is any vowel, # is the end of the word), cf. the medial endings -vahe-vahi-vahai, -mahe-mahi-mahai, 2sg. impv. -Vhi, adverbs in -Vha. Moreover, in the second group, the group with h in the root, this -h- stands in the same position in āha. We may therefore formulate a working hypothesis that -V dhV # yielded -VhV # phonetically. As -dh- is also found in the same position (-V dhV #), the next step is to find a distribution between -dh- and -h-. We start from those categories where both -h- and -dh- are attested, viz. the adverbs in -ha/-dha and the imperative ending -hi/-dhi (the medial endings -vahe -vahi -vahai, -mahe -mahi -mahai do not show any variants\(^5\) and are therefore irrelevant).

4. Adverbs in -ha/-dha.

Next to adverbs in -ha (ihá 'here',\(^6\) kuha 'where?', saha and sahaą 'together') with', viśvāhā 'always')\(^7\) we find adverbs in -dha, cf. adhā 'then' (GA v. adā, OP adą), viśvādhaą 'always' and compound forms sadhaą 'joint', kadhaą 'where'.\(^8\)

4.1. The opposition Skt. ihá vs. Pā. and Pkt. idha seems to indicate that we have to do with two different dialects: one dialect where dh became h in some cases, and the other without

---

\(^5\) Renou has ingeniously suggested (1952: 254) that the name Yudhyāmadhi- (7.18.24) is "une forme verbale apparentement employée comme n. propre". If this is correct, this form would prove that -dh- was preserved when V dhV was not word-final.

\(^6\) Grassmann also gives the meaning 'nun', but this meaning is everywhere dispensable, cf. Geldner's translation.

\(^7\) As I tried to show elsewhere (Lubotsky, in press), Vedic samaha does not mean 'in some way or other', as it is usually translated, but rather 'verily'. Therefore, it is probably an emphatic particle containing -ha < *ghe and does not belong here.

\(^8\) kadhā is only attested in the voc. of kadhapr-, kadhapriya-, the meaning of which is not very clear: 'gegen wen freundlich', 'wen erfreuend' (Grassmann), 'Freunde suchend', litt. 'wo sind die Freunde' (Geldner), 'wo sich freundlich stimmend' and 'wo den dir Lieben halten' (Oldenberg, Noten ad 1.30.1, p. 26, fn.1); AiGr. III: 444 glosses kadhā "wann?".
such a change (thus e.g. AİGr. I: 252: “M an hat hier die Meda asp. teils als Archaismus teils als Entlehnung aus einer Mundart zu betrachten, der der Übergang von dh bh in h fremd war. Das Dasein solcher Mundarten wird durch mi. idha : ai. iha “hier” gesichert”). On the other hand, -h- of other Sanskrit adverbs corresponds to -h- in Middle Indic, cf. Skt. kuha, saha next to Pkt. kuha (CDIAL 3384), Pkt. and Pāli saha (CDIAL 13297). In other words, only in iha does Vedic h correspond to Pāli and Prākrit dh. In such a situation it seems more promising to assume another scenario. In Proto-Indo-Aryan there were two competing forms: iha and idhā. Vedic has generalized the former variant, while the dialects which gave rise to Pāli and Prākrits have chosen the other form. Our task is to find out the original distribution between these two forms.

4.2. Very important in this connection is the distribution of the adverbs visvādhā and visvāhā, both meaning `always, on every occasion'. Wackernagel (AlGr. I: 252) refers to Zubatý (1890: 93), where we read that “vičvahā ... dürfte mit vičvādhā ein und dasselbe Wort sein; h für dh ist offenbar volksetymologisch eingedrungen; das Wort wurde als vičvā áhā aufgefasst.” The weakness of Zubatý’s explanation is that it does not account for the distribution of visvādhā and visvāhā. In other words, if -h- in visvāhā is “volksetymologisch”, how can we explain visvādhā? There is no indication that visvādhā (I3 IV V1 VII V11 IX) is older than visvāhā (I2 II IV V1 V2 VII V11 V111 X4).

If we look at the place of these adverbs in the pāda, we see that visvādhā always stands in the interior of a pāda, in seven out of its eight occurrences immediately preceding a verbal form. It has a long final vowel before a word beginning with a single consonant (e.g. 1.141.6d visvādhā vēti) and a short final vowel before a word beginning with two consonants (e.g. 1.174.10a, 4.16.18d visvādha syāh). In the AV, this adverb occupies the same position (6.85.3). Also the compound visvadhāvīrya- `always powerful', attested twice in the AV, points to a non-final position of this adverb. On the other hand, visvāhā stands in the RV 10 times (out of 17)9 at the end of the pāda and in the AV 4 times (out of 5).

This distribution seems to show that visvādhā was used when it formed one syntagm with the following word, whereas visvāhā normally stood at the end of a sentence.

Incidentally, it must be stressed that the suffixes -dhā and -dhā are not sufficiently distinguished in the literature. In all major grammars and handbooks they are treated as variants of one and the same suffix. However, the suffix -dhā always has a long final vowel and forms adverbs with the sense of `(so many) times, -fold', cf. dvīdhā 'double', trīdhā, tredhā 'triple', katidhā `how many times', etc. The suffix -dhā, on the other hand, has a long vowel only before a single consonant, which is a strong indication that we have to do with lengthening of a short vowel and not with shortening of a long vowel, which primarily occurs in pausa, i.e. before a

9 The proportion of the pāda-final cases is actually even higher because many of the counterexamples occur in the same context, cf. visvāhā dādivāmsam / in 2.35.14b, 6.1.3d, 10.88.14a; vayām ... visvāhā priyāsah in 2.12.15c and 8.48.14c.
caesura and at the end of a pāda (cf. Kuiper 1955). In other words, the original form of adverbs in -dhā is -dha. Therefore, purudhā / purudhā `on many occasions, on many places',\(^{10}\) (occurring 13 times in the RV plus 2 times in the compound purudhāpratikā-), which shows the same distribution of the final vowels as visvādhā and always occupies the position after the caesura, is likely to be an adverb in -dha. Alternatively, one can think of the influence of visvādhā (thus AGr. III: 429) but, in my opinion, adverbs in -dhal-/dha never mean `in so many ways', but rather `so many times'. On the adverbs in -dhal-/dha see further §4.6.

4.3. The distribution of sahā vs. sahaⁿ / sadhaⁿ is more or less parallel to that of visvāhaⁿ vs. visvādhā. Whereas in Avestan and Old Persian hadā/haaⁿ has become a preposition `(together) with', Vedic sahā is still an adverb `together', which may stand before or after a noun in the instrumental case but can also be used without a complement.

In compounds we find both sadhaⁿ and sahā, but there is a clear semantic difference between them. Let us first consider compounds with concrete nouns as the second member. In the RV, these compounds with sahaⁿ are adjectives with the meaning `accompanies by X', `including X'. For instance, a cow can be sahagopa- `accompanied by a shepherd' or sahāvatsa- `accompanied by a calf', the riches are sahāvīra- `including heroes', the demons must be exterminated sahāmāla- `including the root'. On the other hand, compounds with sadhaⁿ generally mean `joint X, simultaneous X' or `together with X', cf. sadhamāda- m. `joint feast', sadhāstuti-, stutya- f. `joint praise', sadhavīra- (6.26.7) `(fighting) together with men' (an epithet of Indra).

Instructive is the opposition between sahāvīra- `(riches) including heroes' and sadhavīra- `(Indra, fighting) together with men'.\(^{11}\) It is important that in Avestan both these functions are expressed by haō, on the one hand, haō.aēsma-, aiuuiiāhana-, baoō-, bar.asman- `(provided) with fuel, girdle, perfume, sacrificial twigs', etc. and, on the other hand, haō.data- n. `additional law', haōaouxta- n. name of a text, lit. probably `together with the spoken'.

If the second member is a root-noun, compounds with sahaⁿ mean `X-ing together', cf. sahāvāḥ- `drawing together', sahajā- `born together'. There is only one compound of this type with sadhaⁿ, viz. sadhamād-, which means both `(drink-)companion, friend', `together with' and `joint feast' (in 1.187.11). In Avestan, the type sahajā- is reflected in haō.zāta-brata- `brother from the same parents', lit. `born together', the type sadhamād- is reflected in haō.gāoṣa- adj. `living in the same house'. Note that the Avestan redactors of the text changed haō of these compounds into haō, in contradistinction to haō `provided with'.

\(^{10}\) This word is glossed by Grassmann `auf vielerlei Weise, vielfach' and translated by Geldner `vielfach' (6x), `vielerorts' (2x), `vielmals', `oftmals', `in Menge', `in grosser Zahl', `in vielen Gliedern'.

\(^{11}\) Note that sadhanī- must be analysed as sa-dhanī- `having the same goods' (cf. Geldner ad 4.1.9) and not sadha-nī- (Grassmann), as can be seen from sadhanitvā-. sadhāṣṭha- n. `seat, abode' is derived from the root v-sad- and does not contain sadhaⁿ (cf. Kuiper 1946).
The fact that compounds with saha" have more or less the same meaning as sahá, viz. "(provided) with", leads to the conclusion that the original distribution was: -h- in the adverb (sahá) vs. -dh- in compounds (sadhá`). Later -h- was introduced in those compounds which had the same meaning as sahá, whereas compounds with a deviating meaning retained their -dh-. Note that out of 61 occurrences of sahá in the RV, it stands 23 times at the end of a pāda.

4.4. Similar considerations account for ádhā `then' and kadha `where'. The latter only occurs in compounds and is therefore in accordance with the distribution of viśvádhá and sadhá`. As to ádhā, it primarily occupies the initial position in the pāda: 153 times out of its 196 occurrences. It never stands at the end of a pāda and only once (4.17.7a tīvám ádha prathamam jāyamānah) before the caesura. Moreover, ádha is often directly followed by other adverbs or particles, cf. ádha smá (18x), ádha yat (10x), ádha hí (9x), ádha dvitá (7x), ádha nú (6x), ádha cit (5x), ádha ha (3x), ádha ca (2x), ádha tmáná (2x), ádha caná, ádha ít. Consequently, ádha practically never stands in pause, which may account for its -dh-.

4.5. We may now return to iha. This adverb occurs in the RV 281 times (+ 8x iheha + 1x ihehamat-): 36 times it stands at the end of the pāda and 4 times before the caesura. The statistics shows that the position in pause was not typical for iha. If the distribution was iha in pause vs. *idhā elsewhere, the generalization could have gone either way. It is conceivable that iha was generalized in Vedic because of a secondary reshuffling of the two variants of the suffix: -ha became associated with the local adverbs and -dha with the temporal ones. Note that among the temporal adverbs, only viśvádhá has the suffix variant -ha. In the other dialects, the variant *idhā was generalized, which may explain the discrepancy between Vedic iha and the Middle Indic idha.

4.6. At the end of our analysis of the adverbs, we must account for the adverbs in -dhā / -dhā and the adverb ádhi, which seem to contradict the rule -VdhV # > -V hV #.

When used as a preverb, ádhi normally either immediately precedes the verb, or stands at the beginning of a pāda. In its function as adposition, ádhi much more often precedes the noun (cf. the statistics of Hettrich 1991: 41ff.). Moreover, ádhi forms numeral nominal compounds: in the RV there are 18 such compounds, plus ádhipatiya-, which presupposes ádhipati-, attested since the A V. It is clear that ádhi stood in pause only sporadically, which explains why it has preserved its -dh-.

The adverbs in -dhā/-dhā are derived from numerals and pronominal stems and in the oldest texts always have the meaning `(so many) times, -fold'. In the RV the following formations are attested: dvídhá, trídhá and tredhá, caturdhá, soḍhá, sahasradhá, and katidhá `how many times'. A creation of the later M anḍalas is bahudhá `manifold, often' (I1 VIII 2 X 6). A hapax saśvadhá (3.33.7) `again and again' is a nonce formation because an adverb in -dhā
derived from śāsvat- would be *śāsvaddhā. The pāda 3.33.7a reads pravācyam śāsvadhā
vār’yām tād and is evidently based on 3.32.5b pībā sōmam śāsvate vār’yāya. The AV adds
ekadhā, panaeadhā, saaptadhā, aśṭadhā, navadhā, dvādasadhā, yatīdhā, tatīdhā. The question is
why -dh- of this suffix did not become -h-. I would therefore suggest a different solution. The development
Root presents:

- mamandhi
- viddhi

would automatically explain the form of the adverbs in - and it is probable that exception is 4.35.2d,3a camasām caturdhā,
however, that in caturdhā and šoḍhā, -dh- stood after a consonant and was preserved. It is doubtful, however, that -dh- of these two adverbs would have prevailed over the phonetically regular -h-
elsewhere. I would therefore suggest a different solution. The development dh > h is generally
attested before a short vowel (-mahe, -mahai, -vahe, vahai can have their -h- from -mahī, -vahe),
and it is probable that -dh- remained unchanged in the position before a long vowel, which
would automatically explain the form of the adverbs in -dhā/-dhā. This also makes sense from
the phonetic viewpoint. The rule -VdhV # > -VhV # must be yet another example of weakening
at the end of a word, which is abundantly attested in Sanskrit (cf. -s#, -r# > -h, loss of consonants
in word-final clusters, etc.). It is understandable that the weakening of a consonant in the
penultimate position took place only when the final vowel was short.

5. 2sg. imp. -dhi and -hi.

The distribution of the variants of this ending has never been explained satisfactorily (see
above, §2.2), so that it seems necessary to present the complete evidence from the RV once
again. If a verbal form is given without an accent, the accent is not attested.

In the position after a consonant, we invariably find the ending -dhi, cf. addhī (√ad-),
viddhī (√vid-), pipṛgdhi (√pṛc-), vīviḍḍhi (√viṣ-), andhī (√anj-), undhī (√ud-), etc. in the present,
pūṛdhī (√pṛ-), yandhī (√yam-), randhī (√rṇ-), śagdhī (√sak-), etc. in the root aorist, avidḍhī
(√av1-) in the s-aorist, cākandhī (√kān1-), cikiddhī (√cit-), didiḍḍhī (√diś-), mamaddhī (√mad-),
mamandhī (√man-), etc. in the perfect. These forms are irrelevant for our problem. The ending
-dhi is also attested in two aorist forms, where the cluster *yd^h was simplified to *yd, viz.
bodhi < *bodh-dhi (√budh-). In the position after a vowel, the most frequent ending is -hi, which has become
productive.

Root presents: ihī, jahi, pahi, brahi, bhahi, yahi, vahi, vahi (also with irregular shortening
vahi), stuhī, AV snahi, AV psahi. After an it-vowel we find śathihī and stanihi.

Reduplicated presents: jāṛghī, didhī (dīdhī), pipṛghī, mimṛghī, rīṛghī (√rā-), sīṣhī (√śa-).

For dehī (√dā-) and dhehī (√dhā-) see below, §5.2.

Class V presents: asnūhi, inūhī, āṛṇūhi, kṛṇūhī, cīnuhī, taunuhī, ṭṛṇuhī, dhānuhī, śṛṇuhī,
sṛṇuhī, hinuhi.

Class IX presents: gṛṇhī, jāṇhī, punhī, śṛṇhī.
Perfect: pipṛhhī (śprī).
Root aorist: māhī (śmā- `to measure'), sāhī (4.11.2, śsā- `to bind') and gahi (śgam-), next to a hapax gadhi (8.98.4, an "Anhang"-hymn).
Intensives: barṛhī (śbrh-) (10.10.10), dāṛhī (1.133.6) and dardṛhī (śdṛ-).

5.2. We find -dhi after a vowel only in a few forms. We may distinguish the following categories:

A. Root present impv. edhi (7x) (śas-), sādhi (śsās-), tāḍhi (śtakṣ-); pf. impv. sāśādhi (śsās-).

As already noticed by Bloch (1923: 175), the development -dhi > -hi was blocked by a preceding *z/z, which accounts for the ending -dhi in these forms (edhi, sādhi, tāḍhi, sāśādhi < *azdhi, *sāzdhi, *tazḍhi, *sāsāzdhi). In other words, at the time when the rule dh > h was operative voiced sibilants were still extant, which points to a considerable antiquity of the development. In my opinion, this fact alone suffices to invalidate the theory of the Prākrit origin of h < dh.

The only counterexamples are dehī (śdā-) and dhehī (śdhā-), which were convincingly explained by Hoffmann (1956: 21 = 1976: 400) as coming from *d(h)adī [*d(h)ad ṛdī] > *d(h)azdī (by dissimilation). We expect *d(h)azdī to yield *d(h)edī, but the latter forms probably became further dissimilated to ṛdh(ī) (we shall come across another instance of this dissimilation below).

B. Root aorist impv. śrudhī (śśṛu-), class V present impv. śṛṇudhī.

In order to account for śrudhī, we must first look at its distribution. It is attested in the RV 39 times, 22 occurrences of which show lengthened final vowel. Most frequent is the formula śrudhī hávam (or śrudhī hávam), which is attested 13 times (plus two times where the words are separated: 8.66.12d śrudhī me hávam, 8.82.6a śrudhī sū me hávam). The formula was so usual that even when śrudhī and hávam are separated by a pāda boundary in 1.25.19ab (imāṁ me varaṇa śrudhī hávam adyat ca mṛlaya), śrudhī appears with the lengthened final vowel. The formula śrudhī nah is attested 5 times and the formula śrudhī gīraḥ is attested 3 times (in an identical pāda). Only four times do we find śrudhī at the end of a pāda and twice before the caesura. Accordingly, śrudhī does not normally stand in pausa, which may explain its ending. Especially the lengthening is essential, since it demonstrates that śrudhī formed a whole with the following word. This specific status of śrudhī can be made clear by comparison with other imperatives. For instance, gahi stands at the end of a pāda 77 times out of its 84 occurrences (note also that the exceptional form 8.98.4 gadhi stands in the interior of a pāda), stūhi occupies this position 13 times out of 27, etc.

In class V presents only śṛṇudhī (5x) has this ending (next to śṛṇuhī). It typically occurs in the same formulas as śrudhī, viz. śṛṇudhī hávam at the end of a pāda in 4.9.7c, 8.3.18d,
8.52.8d (8.13.7b śṛṇudhī jāritūr ṣāvam) and śṛṇudhī gīrāḥ (8.84.3b). It is therefore probable that the ending -dhi is due to the influence of śṛudhī (cf. Bloch 1923: 176).

C. Root aorist impv. bodhī (√bhū-), redupl. pres. impv. yuyodhī (√yu- `to keep away').

bodhī as the 2sg. imperative of √bhū- stands at the end of a pāda only four times (in 3.14.7c and 6.21.5d, bodhi belongs to √budh-) out of its 38 occurrences in the RV, but I am reluctant to see here the only reason for preserving the -dh-, primarily because bodhi stands 13 times before the caesura, cf. especially the formulas saśasā no bodhi (2.2.11a, 6.21.12a, 6.23.7a, 7.96.2c), asmākam bodhi (5.4.9d, 6.46.4c, 7.32.11c, 7.32.25c, 8.88.06c). It seems more plausible to me that the preceding *u in *ḅaḥdhi 12 (for this reconstruction see Lubotsky 1992: 267) prevented the development of dh to h, i.e. -dh- was not intervocalic at that stage. The monophthongization *-aḥ- > -o- is most probably of post-Rigvedic date (cf. Hoffmann 1976: 553, fn. 3), so that there are no problems with the chronology. The same condition explains -dhi in red. pres. yuyodhī (√yu- `to keep away'). There is no counterevidence.

D. Root aor. impv. kṛḍhī (√kṛ-), vṛdhī (√vṛ- `to cover'), spṛdhī (√spṛ-).

The position of kṛḍhī, vṛdhī and spṛdhī in the verse cannot account for the ending: kṛḍhī stands at the end of a pāda 62 times out of its 100 occurrences, vṛdhī 7 out of 8 occurrences, and spṛdhī 1 out of 2 occurrences. It can hardly be a coincidence that the only three disyllabic imperatives with a preceding r all have the ending -dhi. I would therefore suggest that the development dh > h was blocked by the preceding r. The Atharvavedic form of the intensive impv. carkṛḍhī may be yet another example of this condition, but the influence of kṛḍhī cannot be ruled out.

There are several forms, however, where we find -hi in the position after r, viz. red. presents jāṛṛhi, pipṛhi and intensives barṛhi, dāṛṛhi and dardṛhi. All these forms are trisyllabic, and it is conceivable that this was the decisive factor. On the other hand, the -ṛhi forms are not very strong. The hapax barṛhi (10.10.10) cannot be a phonetically regular formation from √brṛ- and is without any doubt analogical, with dardṛhi as a model. In dāṛṛhi and dardṛhi, the ending -hi may be due to dissimulation (cf. d(h)ehi). As to the reduplicated presents jāṛṛhi and pipṛhi, they could have acquired the productive ending. For jāṛṛhi cf. also below, §7.1.

E. Red. pres. impv. śīśāḥi (√śā- `to sharpen').

This form is a variant of the regular 2sg. impv. of this root śīṣāḥi and occurs four times in the formula sām śīśāḥi at the end of a triṣṭubh line (6.15.19d, 7.104.19b, 8.42.3b, 10.84.4b). All the four passages are late: 6.15.16-19 is a late addition to the hymn (Oldenberg 1888: 194), 7.104

---

12 It is remarkable that the usual explanation of bodhī as a Prākritism does not take into consideration the fact that the ending -dhi is alien to Prākrits.
is an "Anhang"-hymn. It is therefore probable that śisādhi is a secondary formation based on the strong stem śisā-. The ending -dhi is most probably taken from śādhi, śasādhi (cf. sub A. above).

F. For 8.98.4 gadhi see sub B. above.

6. Let us recapitulate our results so far. The analysis of h < dh in suffixes and endings has shown that this h is likely to be the result of a rule, which can be formulated as follows:

\[ dh > h/V_1\V_2^# \ (V_1 \neq r; \# \text{ is position in pausa}). \]

From a phonetical view-point, this rule is probably due to weakening of intervocalic -dh- at the end of the word. It must have taken place before the elimination of voiced sibilants z and ž in Sanskrit and before monophthongization. In other words, when the rule was operative, -dh- in *azdhi, *sāzdhi, *tażdhi, *sasāzdhi was not intervocalic. The same holds true for -dh- in *baydhi and *iyajdhi.

The fact that a preceding r blocked the rule is understandable. According to the Prātiśākhyas, the vocalic r was pronounced ["r"] in Vedic (cf. AiGr. I: 31 with Debrunner’s Nachträge). The shwas were very short (a quarter of a, according to some commentaries), so that dh in the position after r was not properly intervocalic. Moreover, it is very probable that the older pronunciation of r was [ər], as can be seen from several cases in Vedic where vocalic r loses its consonantal element and becomes i, u, or a, depending on the following vowel, cf. *mṛhur [mərhrur] > [məhur] > mührur, *śṛthrā- [sərthrā-] > [śirhrā-] > síthrā-, *durhref-a-[durhrə̃rə]- > durhra (Narten 1982: 140).

Another factor of importance was dissimilation, which is responsible for the ending -hi in d(h)ehi and probably in dādṛhi, dardṛhi.

7. h < dh in the root.

The -h- in endings and suffixes being clarified, we can now turn to h < dh in the root. The rule dh > h/V_1\V_2^# accounts for only one word in this group, viz. 1,3 sg. pf. āhə 'I/he said' (h- in 3 pl. āhuh is then analogical, which is only to be expected). As a matter of course, the conditions of this rule do not normally apply to consonants in the root, so that for the other words of this group we have to look for other explanations.

7.1. In contradistinction to the previous categories, grha- m. `house', due to its semantics, may have been a borrowing from another dialect where the process dh > h took place in more environments. As was mentioned above (§2.2), Bloch considered grha- to be a "mot sans doute vulgaire par rapport à l’archaïque dama-, dama- et aux synonymes comme duroña-, gāya-, harmya-, okas-, etc.".
On the other hand, it cannot be ruled out that the -h- in grhā- is due to a Vedic or Proto-Indo-Aryan sound change. Since the same development is probably found in jāgrhi, it looks as if *grḍh- > grh-, which implies assimilation *grḍh > grd > grh (the only counterexample is grdhra- m. `vulture', where -dh- remained unchanged, possibly due to the consonant cluster). In other words, dḥ was retracted in this specific environment. This kind of retraction is not unknown in Sanskrit, cf. the following examples of *d > *dḥ (assimilation) > j: PIE *dh3gṛḥ-mo- (Gr. δόχιος) > *didhā- > *dḥidhā- > Skt. jihmā- adj. `athwart'; PIE *dṛḍgeH₂- > *dḥidhā- (with secondary i) > *didhā- > Skt. jihvā- (Av. hizvā-) `tongue'. Likewise, s is retracted before ś or ṣ in the next syllable, cf. śuska- adj. `dry' < *suska- (Av. huṣka-), śvāṣura- m. `father-in-law' < *svasura- (Av. xāśura-), śmaśru- n. `beard' < *smāśru- (Lith. smakra), as well as after ś in the preceding syllable, cf. saśa- m. `hare' < *saśa- (Khot. saha-) and probably saśvant- m. `continuous' < *sāśvant- (Av. saśvant-, cf. Klingenschmitt 1975: 69f.).

In my opinion, it can moreover hardly be a coincidence that the only two clear examples of the development bh > h, viz. ṣvgrḥ- and the family of gahāna- (cf. §3.1), concern the environment gVbh-. They are later attested and -h- is not necessarily intervocalic, which is an argument in favour of a dialectal development, but conditions are conspicuously similar. Is this yet another sound law, which only took place in one dialect?

7.2. The root for `red' shows the following distribution. In the RV, we find -h- in rohīt- f. `red mare', originally `the red one' (cf. rohīḍaśva- `with red horses'), rohita- (fem. rohīṇ- f) `red', niḷ alohītā (10.85.28a) adj. `dark blue and red'; -dh- is attested in rudhirā- adj. `red', rudhi-krā- PN and, probably, lodhā- (3.53.23), if this hapax means `red, reddish'. We see that -h- is always followed by -t- in the suffix. Fem. rohīṇ- is likely to have its -h- from the masculine, while -h- in lohā- (Br.+) `reddish' may be influenced by lohītā-.

This distribution, if not based on a coincidence, presupposes a dissimilation dh...t > h...t.

7.3. It seems probable that hita- `hit- (vs. dhita-, dhiti-) from ṣv dhā- `to put' is due to a similar dissimilation. The situation in the RV is as follows. The normal participle of ṣv dhā- is hita-, which is also used in compounds with preverbs, cf. aṭhīta-, āpīhīta-, abhīhīta-, āvahīta-, āḥīta-, etc. In compounds with a nominal first member, hita- is generally found when the first member ended in *z or *z, cf. cānōhīta-, tīrōhīta-, durhīta- (8.19.26c), purohīta-, mānurhīta-. The only exception is devahīta- `determined by gods'. On the other hand, dhita- normally appears after a first member ending in a vowel, cf. mitrādhīta- (10.100.4c), yuvādhīta- (6.67ab), sūdhīta-. Here the only exception is the hapax dūrdhīta- (1.130.11a), which occurs in the same pāda with sūdhīta- and can therefore be a nonce formation.13

13 The formation and meaning of dhītāvan- (3.27.2c, 3.40.3a) are unclear. Renou EVP XII: 125 sees an allusion to sūdhīta- here. Geldner's doubts follow from his remark "Ob dhītāvanam für dhīhā-vānam?" (ad 3.27.2).
We observe a similar distribution with ṣvaḥiti- vs. ṣdhiti-. The former is found after first members in a consonant (before the loss of z and before monophthongization): asmēhiti- (10.108.1c), purōhiti- (VII2). The exception is again 7.103.9a ("Anhang"-hymn) devāhiti-. The other variant, dhiti-, occurs after first members in a vowel: nemādhiti-, mitrādhiti-, vanādhiti- (1.121.7a), vàṣudhiti-.

How can we account for this remarkable distribution? I see two possible solutions:

1). Since the form ṣvaḥiti- is productive, we may assume that the compound form ṣdhiti- is a preserved archaism. It is important to stress that the compounds caṇohita-, māṇurhita-, etc. cannot be original. The phonetically regular forms would have been **caṇaḥdhita- and **māṇaḥdhita-, respectively. When these compounds were analogically restored, the productive form ṣvaḥiti- was used. devāhiti- must then be a young formation. The consequence of this explanation is that the dissimilation only took place when dh- was word-initial, which means that we must resort to an ad hoc explanation for a similar development in *roḥihit(a) > rohit(a)-. As to ṣvaḥiti-, we must regard this form as analogical to ṣvaḥita- because ( ṣ)hita- has never been productive.

2). Another way to deal with the facts is to consider caṇohita-, māṇurhita-, asmēhiti- to be regular outcomes of *caṇaḥhita-, maṇuḥhita-, asmaiḥhiti- < *caṇaḥdhita-, maṇuḥdhita-, asmaḥdhiḥiti-, respectively. In other words, we may assume that dh...t became h...t only when dh stood in word-initial position or after a consonant. Elsewhere, dh is preserved. This explanation directly accounts for roḥiḥ-, roḥita- < *rauvahiti(a)-, where -dh- stood after a resonant in contradistinction to words like svāḥhita- `axe, knife', the infinitive praṇidhātave, etc., where -dh- was preserved in a postvocalic position. In this case, too, we must consider devāhita- and devāhiti- analogical formations.

It is difficult to choose between these alternative explanations. I tentatively opt for the second one, as it provides a more consistent and regular description of the facts. It may appear odd to look for regularity when describing such an irregular phenomenon as dissimilation, but Sanskrit is typically a language where even distant dissimilations have a regular character. I may refer to Grassmann's Law, ی > s / ... r (A iGr. 1: 232), ی > s / ... ś (ibid.: 233), न > n / ... C ret. (ibid.: 187), just to mention a few examples. It seems phonetically understandable that the dissimilation only takes place when dh is preceded by a consonant. When a consonant forms part of a tautosyllabic cluster, it is more liable to dissimilatory changes, cf. Skt. ksū- < *psu- in a labial environment, klomān- m. `right lung' < *plauman-, ․ s t h - < PIE *pju(H)-, etc. whereas single p is never changed.

7.4. The root ṛudh- `to grow' is moribund in Vedic. In the RV we find two attestations of the thematic present and one of the ya-present (Gotō 1987: 276). Further, there are several

14 A similar rule is probably responsible for the forms bodhi, yodhi < *baudh-dhi, yaudh-dhi.
nominal formations: ṇṛ-ṛūdh- f. `plant', anū-ṛūdh- adj. `nachwachsen' (Geldner) (3.55.5), nyag-ṛódha- m. `Ficus religiosa (= growing downwards)' (AV+). The other forms belong to ṇrūdh- `to obstruct' (about ārōdhana- see below).

On the other hand, ṇṛuh- `to grow, rise' is very frequent in the RV (and remains productive in the later texts), forming a thematic present ṛohati, perfect ruruhuh, thematic aorist ṛruhat, sigmatic aorist ṛruksat (10.67.10), causative ṛohāyati and desiderative ṛruksat (8.14.14). There are also various nominal formations, cf. ṛohaṇa-, ṛohas-, root noun ṛuh-, compounds ā-ṛuh-, upā-ṛuh-, gartā-ṛuh-. The forms ṛukṣat, ṛukṣat and nom.sg. gartā-ṛuk show that this root functions in the later parts of the RV as if ending in -h-. The Athravedic formations ṛuḍha- and ṛuḍhvā show that at some stage the root ṛuh- was inﬂected as if ending in a palatal.

It is certainly tempting to consider ṇṛuh- a secondary variant of ṇṛudh-, especially in view of the fact that Avestan only has ṇrud-, and this is indeed the communis opinio. A few phonetically regular forms would have been enough to create a new productive root ṇṛuh-, the motivation being the homophony of ṇṛudh- `to obstruct' and ṇṛuh- `to grow' (Gonda 1936: 182ff.). The forms ṛukṣat, ṛukṣat, etc. must then be considered secondary. The semantic development `to grow' – `to rise' is most probably already attested in the root ṇrudh-, as can be seen from ārōdhana- `staircase, ascending (to heaven)' (cf. Geldner ad 4.7.8, Renou EVP XIII: 100).

On the other hand, this is not compelling. We may consider h in ṇṛuh- as coming from a velar *gʰ or palatal *g̊ʰ and explain the parallelism of ṇṛuh- and ṇṛudh- by secondary association (this is the position taken by Minard 1956: 195, Gotō 1987: 278f., etc.). If our preceding analysis is correct, there is hardly any context where -h- could have been phonetically regular. The context V ḍhV# is only found in 2 sg. impv. ṛoha (4x RV, often in AV) and 1,3 sg. pf. ruroha (4x in the AV; in the RV only 4x 3 pl. ruruhuh), but there -h- stood after *y, and if we take the evidence of ṛohdi and yuyodhi seriously, -dh- was preserved in this position. The only candidate are the forms where -dh- was followed by t in the next syllable, e.g. rodhat(i), but rodhati and rodhat are precisely the forms which are attested in the RV.

The separation of these two roots can further be supported by etymological considerations. ṇṛudh- `to grow, rise' is generally connected with Goth. liudan `to grow', Gr. ἐλεύθερος `free', etc. < PIE *H₁ludʰ-. As to ṇṛuh-, it seems plausible to connect A rm. eluzanem, aor. eluzi `to make come out' < PIE *H₁ludʰ-/*H₁ludʰ-.

8. CONCLUSIONS.

8.1. The two developments dh > h and bh > h are normally taken together as two aspects of the same process. It is better to consider them separately, however. Whereas words with h < dh are solidly embedded in the RV and mostly concern intervocalic -dh-, words with h < bh are only attested in the late books of the RV and also involve bh followed by a resonant. It is further remarkable that all instances of bh > h are found in one and the same environment, viz. gV bh- >
gVh-. Considering the late attestation and specific meaning of words with h < bh (vṛghbh- `to grab' and gāhana- `abyss'), it seems probable that they represent borrowings from another dialect.

On the other hand, the analysis of the Vedic material for h < dh has shown that we can account for practically all instances without recourse to dialect forms. -h- in endings (1pl. -mahi, 1du. -vahi, 2sg. impv. -hi), suffixes (adverbs in -ha) and in 1,3 sg. pf. âha is explained by the rule

\[ dh > h / V_1 V_2 # \] (\( V_1 \neq f; # \) is position in pausa).

This rule was earlier than the loss of voiced sibilants z, ž and to monophthongization, which accounts for -dh- in edhī, sādhī, tāhī, sasādhi and in bodhī, yuyodhī. The condition concerning ž is necessary in order to account for kṛdhi, vṛdhi and sṛdhi (-hi in jāgrhi and pipṛhi is then secondary, but jāgrhi may also be phonetically regular, see below). If \( V_2 \) was long, the rule apparently did not apply (cf. adverbs in -dhā/-dhā).

Furthermore, the rule was only operative when a word stood in pausa. This accounts for sahā vs. sadha in compounds, for adverbs ādhā and ādhi, for viśvāhā at the end of a pāda vs. viśvādhā elsewhere, and for the imperative śrudhī, which normally appears with a complement, cf. the formulas śrudhī hávam, śrudhī nah, śrudhī girāḥ. The endings 1pl. -mahi, 1du. -vahi and 2sg. impv. -hi have generalized the form of the final position of the verb, which was normal in Vedic.

The -h- in other forms can be attributed to different processes. First of all, we find a rather straightforward dissimilation in d(h)ehi and dāḍṛhi/dardṛhi. Secondly, there was a rule

\[ dh > h / C_1 C_2 it (\text{where } C = *z, *ž, *j, *u) \]

which accounts for hitā- and Ĥita- in cánohitā-, tirōhitā-, dūρhitā-, purōhitā-, mānurhitā vs. dhita- after a vowel, for ṛhitī- in asmēhīti- and purōhitī- vs. ṛhiti- elsewhere, and for rohīt-, rōhitā- vs. rudhira-, rudhi-krā-. Exceptions are devāhīta- and devahīti-.

Thirdly, h from dh is attested in the context grC- (jāṛṛhi, grhā-), which may be due to retraction of dh in this context. It is also possible, however, that grhā- is a dialectal borrowing.

Finally, in the course of our analysis we have arrived at the conclusion that the root ruh- most probably is not derived from rudh-, but reflects PIE *H1lugʰ- / *H₁lugʰ-, related to Arm. eluzanem.

8.2. At the end of this paper, I would like to add a few remarks on the chronology of the development dh > h. We have already seen that this sound law was anterior to the loss of voiced sibilants in Sanskrit and to monophthongization. It seems logical to assume that dh > h took place simultaneously with another development which entailed loss of the buccal part of the
consonant, viz. *jʰ [dzʰ] (PIE *gʰ) > h and *jʰ [dzʰ] (PIE *gʰe/i) > h. Note that dissimilation dh > h / #C_ it is only attested before i and that all instances of the rule dh > h / V₁, V₂# concern V₂ = i or a [ə]. It is therefore conceivable that the development was *dʰ > *dzʰ or *dʒʰ > h.

Skt. jahi 2sg. impv. √han- `to slay' (PIE *gʰen-) < *jadʰi < PIIr. *jʰadʰi (Av. jai/o) shows that Grassmann’s Law was anterior to *jʰ > h. This leads us to the following relative chronology:

1. Grassmann’s Law.
2. *jʰ, jʰ, dʰ > h.
3. Loss of *z, ż.

REFERENCES

III: A. Debrunner-J.Wackernagel, Deklination der Nomina, Zahlwörter und Pronomina, 1930.
Arnold, E.W. 1897: Sketch of the Historical Grammar of the Rig and Atharva Vedas. JAOS 18, 203-353.
Bradke, P. von 1886: Beiträge zur altindischen Religions- und Sprachgeschichte. 4. Über skr. h = ig. dh, bh und die Stellung des V edischen unter den indo-arischen Dialekten. ZDMG 40, 657-698.
EWAia: M. Mayrhofer, Etymologisches Wörterbuch des Altindoarischen. Heidelberg, 1985-.
Gonda, J. 1971: Old Indian. (Handbuch der Orientalistik, zweite Abteilung (Indien), erster Band (Die indischen Sprachen), erster Abschnitt.) Leiden-Köln.
Renou, L. 1952: Grammaire de la langue védiue. Lyon.
Zubaty, J. 1890: Der Qualitätswechsel im Auslaut vedischer Wörter (Schluss), Wiener Zeitschrift für die Kunde des Morgenlandes 4, 89-112.