

# A Translation of the New Edition of the *Suśrutasamhitā*

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### Abstract

The [Suśruta Project](#) is producing [a new Sanskrit text edition](#) of the *Suśrutasamhitā* based on the early Nepalese manuscripts. As we gradually transcribe and edit the manuscripts, we are producing this new translation of the classic work.

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## The manuscripts and editions used in the vulgate editions by Yādavaśarman Trivikrama Ācārya

Yādavaśarman Trivikrama Ācārya produced three successive editions of the *Suśrutasaṃhitā* with the commentary of Ḍalhaṇa, in 1915, 1931 and 1938. These editions, especially the last, are generally considered the most scholarly and reliable editions of the work, and have been constantly reprinted up to the present day.<sup>1</sup>

The 1915 edition was based on three manuscripts. The 1931 edition used another seven plus two printed editions. For his final 1938 edition, Ācārya used a further three manuscripts.<sup>2</sup> These sources are described as follow, with an overview in Table 1.

### The sources of the 1915 edition

- 1 Calcutta, Royal Asiatic Society. Covers the *sūtra*, *nidāna*, *śārīra* and *kalpa sthānas*.
- 2 Jaipur, Pandit Gaṅgādharaḥṭṭaśarman, lecturer at the Royal Sanskrit University. Covers the *cikitsāsthāna* and the *uttaratantra*.
- 3 Bundi, my great friend the royal physician Paṃ. Śrīprasādaśarman. Covers the *uttaratantra*.

### The sources of the 1931 edition

- 1 Vārāṇasī, professor of literature, the great Gaurīnāthapāṭhaka. With the *Nibandhasaṅgraha*. Covers the *nidānasthāna* and *uttaratantra*.
- 2 Ahmedabad. My friend Sva. Vā. Vaidya Raṇachodālāla Motīlālaśarman. With the *Nibandhasaṅgraha*. Covers the *śārīrasthāna*.
- 3 From the personal library of my great friend Sva. Vā. Vaidya Murārājīśarman. Extremely old. No commentary. Covers the *śārīrasthāna*.
- 4 Pune, BORI library. With the *Nibandhasaṅgraha*. Covers the *śārīrasthāna*.<sup>3</sup>

<sup>1</sup> See also the study of these editions by **kleb-2021bwuja-2013**.

<sup>2</sup> The following account of the sources is paraphrased from **susr-trikamji3**'s own account of his sources (**susr-trikamji3**).

<sup>3</sup> Not one of the three MSS of the *śārīrasthāna* described in **shar-void**.

- 5 Pune, BORI library. With the *Nibandhasaṅgraha*. Complete. With some damaged folia.
- 6 Bombay, Asiatic Society. Incomplete.<sup>4</sup>
- 7 Varanasi, the private library of Vaidya Tryambakaśāstrī. Covers the *cikitsāsthāna*. The variant readings of this MS were compiled by Prof.
- 8 A printed edition together with the commentary *Suśrutasandīpana-bhāṣya* by Professor Hārāṇacandra Cakravārtti. Complete work. This is the 1910 Calcutta edition numbered “t” by **meul-hist**.<sup>5</sup>
- 9 A printed edition of the first 43 chapters of the *sūtrasthāna*, printed in Bengali script, with the commentaries *Bhānumatī*, *Nibandhasaṅgraha*, edited by Vijayaratnasena and Niśikāntasena. This is the 1886 Calcutta edition numbered “g” by **meul-hist**.<sup>6</sup>

### The sources of the 1938 edition

- 1 Gwalior, from the library of my great friend Paṃ. Rāmeśvaraśāstrin Śukla. Covers the *sūtra*, *nidāna*, *śārīra*, *cikitsā* and *kalpasthānas*.
- 2 Bikaner, from the library of the Royal Palace, supplied by Paṃ. Candraśekharaśāstrin. Contains the commentary *Nyāy-acandrikāpañjikāvyaṅkyā* by Gayadāsa. Covers the *nidānasthāna*. This is almost certainly MS Bikaner Anup 4390.<sup>7</sup>
- 3 Kathmandu, located in the private library of the Royal Guru Hemarāja Śarman. An extremely old palm-leaf manuscript. Readings from this MS were compiled by Paṃ Nityānandaśarman Jośī and sent to Ācārya. Covers from the beginning of the work to the end of the ninth chapter of the *cikitsāsthāna*.

4 Possibly MS Mumbai, AS B.I.3 or MS Mumbai, AS B.D.109 (**vela-1930**). But both these have the *Nibandhasaṅgraha*. The first covers only the *śārīrasthāna*; the second may be complete, but Velankar calls it only “disorderly.”

5 **bhat-1917**.

6 **sen-1886**.

7 See Dominik Wujastyk, “MS Bikaner AnupLib 4390.” *Pandit*. <<http://panditproject.org/entity/108068/manuscript>>.

Manuscripts (●) and print editions (○)															
edition sthāna	1915			1931									1938		
	1	2	3	1	2	3	4	5	6	7	8	9	1	2	3
sū.	●							●	?		○	○ <sup>(1-43)</sup>	●		●
nī.	●			●				●	?		○		●	●	●
śā.	●				●	●	●	●	?		○		●		●
cī.		●						●	?	●	○		●		● <sup>(1-9)</sup>
ka.	●							●	?		○		●		
utt.		●	●	●				●	?		○				

Table 1: The sources of Yādavaśarman T. Ācārya's three vulgate editions.

## Evaluation

Estimates show that there are approximately 230 extant manuscript witnesses for the *Suśrutasamhitā*.<sup>8</sup> Many of these manuscripts cover only one or more of its chapters. Nevertheless, this is an order of magnitude more evidence than was considered by Ācārya for his vulgate editions.

While the descriptions provided by Ācārya of his source materials seems at first to be moderately comprehensive, Table 1 reveals the real paucity of textual basis for these editions. Apparently, fifteen manuscripts were consulted. However, we quickly find that two of the sources were other people's printed editions, and one of those covered less than a quarter of the work. That reduces the manuscript base to 13 manuscripts. Ācārya does not appear to have seen two of the manuscripts at all, having been sent collations prepared for him by others (7 of 1931 and 3 of 1938). Thus, Ācārya's final edition was based on the personal consultation of eleven manuscripts. One of them, no. 6 of 1931, remains mysterious. Only a single manuscript covers the whole of the *Suśrutasamhitā*, no. 5 of the 1931 edition. Manuscript 1 of 1938 is the next most complete, but it omits the *uttaratantra*, which comprises a third of the work. Manuscript 1 of the 1915 edition is next, but it still omits both of the longest chapters, and thus offers less than half the work. For the rest, the evidence is spotty, with each part of the work being supported by only between four and eight

<sup>8</sup> This figure is arrived at by summing the MSS mentioned in **ncc** and in the **ngmcp**. The real figure could be many scores higher.

manuscripts, excluding the printed editions.

Two sources stand out for their historical importance. The first is no. 3 of 1931, which Ācārya calls “extremely old.” It covered the *śārīrasthāna* only, and unfortunately we know nothing of the later history of this manuscript. The second is no. 3 of 1938, which is one of the important Nepalese manuscripts being considered in the present project. Ācārya’s remarks and references to Hemarājaśarman’s introduction to the *Kāśyapasaṃhitā* allow us to identify this manuscript as MS Kathmandu NAK 5-333.<sup>9</sup> But that manuscript covers the whole work, not just up to the ninth chapter of the *cikitsāsthāna* as **susr-trikamji3** stated.<sup>10</sup> Perhaps the editors only received collations for this portion of the manuscript and did not know that it was a witness for the whole work.

## The 1939 edition

In 1939, Yādavaśarman Trivikrama Ācārya and Nandakiśora Śarman co-edited an edition of the *sūtrasthāna* of the *Suśrutasaṃhitā* that was published by the Swami Laxmi Ram ayurvedic centre in Jaipur, and printed at the famous Nirṇayasāgara Press in Mumbai.<sup>11</sup> The text was edited on the basis of the following sources.

### For the Bhānumatī

1. A printed edition. Covered the *Bhānumatī* up to chapter Su.sū.40. The siglum was 𑀧𑀺 for *mudrita*.<sup>12</sup>
2. A manuscript in the India Office Library library provided through

<sup>9</sup> **susr-trikamji3hema-1938**. Discussed by **kleb-2021b**. See also **meul-histwuja-2003**.

<sup>10</sup> **susr-trikamji3**.

<sup>11</sup> **acar-1939**. The description of the sources below is based on Yādavaśarman T. Ācārya’s remarks in his introduction (pp. 3–4).. See also the remarks on this edition by **kleb-2021a**. On the Swami Laxmi Ram centre, see **hofe-2007**.

<sup>12</sup> **sena-1893**. The manuscript on which this edition was based is probably in the library of the Calcutta Sanskrit College, and described in **sast-1917**, which is not available to me. See also **meul-hist** for mention of this manuscript. The reference at **rao-sans** to CACL accession number 97 in Bengali script may be this manuscript.



चरके—“लभोपायो हि शस्तानां रसावीनां रसायनम्” (च. चि. अ. १ पा. १) । पारिशेष्याद्वाजीकरणतन्त्रम् । अवाजिनं वाजीकुर्वन्ति येन तद्वाजीकरणम् । ‘अन्येषामपि दृश्यते’ (पा. अ. ६।३।१३७) इति दीर्घत्वम् । येन वाऽत्यर्थं स्त्रीषु व्यज्यते तद्वाजीकरणम् । तदुक्तं चरके—“येन नारीषु सामर्थ्यं वाजिवल्लभते नरः । प्रजेन्नाप्यधिकं येन वाजीकरणमेव तत्” (च. चि. अ. २, पा. ४) इति ॥ ५ ॥

अथास्य प्रत्येकाङ्गलक्षणसमासः—तत्र, शल्यं नाम विविधतृणकाष्ठ-पाषाणपांशुलोदलोष्टास्थिवालनखपूयास्त्रावदुष्टव्रणान्तर्गर्भशल्योद्धरणार्थं षष्ठ्या विधानैः, यन्त्रशस्त्रक्षाराग्निप्रणिधानव्रणविनिश्चयार्थं च; शालाक्यं नामोर्ध्वजत्रुगतानां श्रवणनयनवदनघ्राणादिसंश्रितानां व्याधीनामुपशमनार्थं; कायचिकित्सा नाम सर्वाङ्गसंश्रितानां व्याधीनां ज्वररक्तपित्तशोफोन्मादापसारकुष्ठमेहातिसारादीनामुपशमनार्थं; भूतविद्या नाम देवांसुरगन्धर्वयक्षरक्षःपितृपिशाचनैरागग्रहाद्युपसृष्टचेतसां शान्तिकर्मबलिहरणादिग्रहोपशमनार्थं; कौमारभृत्यं नाम कुमारभरणघात्रीक्षीरदोषसंशोधनार्थं दुष्टस्तन्यग्रहसमुत्थिनां च व्याधीनामुपशमनार्थम्; अगदतन्त्रं नाम सर्पकीटलृतामूषकादिदृष्टविषव्यञ्जनार्थं विविधविषसंयोगोपशमनार्थं च; रसायनतन्त्रं नाम वयःस्थापनमायुर्मेधावलंकरणं रोगापहरणसमर्थं च; वाजीकरणतन्त्रं नामारूपदुष्टक्षीणशुष्करेतसामाप्यार्थेनप्रसादोपचयजनननिमित्तं प्रहर्षणजननार्थं च ॥ ६ ॥

शल्यग्रविशेषाश्च शालुं प्रतिलक्षणं संक्षेपेणाह—अथास्येत्यादि । एकमेकमङ्गं प्रति लक्षणानां समासः संक्षेपः प्रत्येकाङ्गलक्षणसमासः । तृणादीनां, तथा दुष्टव्रणस्य, तथाऽन्तर्गत(र्भशल्य)स्य उद्धरणार्थमिति प्रत्येकमुद्धरणशब्दः संबध्यते । दुष्टव्रणस्यान्तस्तृणाद्याहरणार्थमित्यन्ये । षष्ठ्या विधानैरिति द्विव्रणीयोचैरपतर्पणाद्यै रक्षाविधानान्तैः; इत्थंभूतलक्षणे तृतीया । जत्रु ग्रीवामूलं, जत्रुण ऊर्ध्वमूर्ध्वजत्रु । घ्राणादीत्यादिग्रहणाच्छिरःकपालादिग्रहणम् । उत्तरतन्त्रे प्रतिपादितक्रमप्राप्त्या ज्वरानन्तरमतीसारः पठितः, तस्यान्ते पाठोऽतिसारस्य सर्वाङ्गीणदोषारब्धत्वात्, अन्येषामपि तन्मध्यपाठेन सर्वाङ्गीणदोषारब्धत्वप्रतिपादनार्थतिक्रमं वदन्ति । शान्तिकर्म बलिहरणादिना ग्रहाणां देवादीनामुपशमो यस्तदर्थः; यदि वा ग्रहणं ग्रहो देवानामावेशस्तदुपशमार्थम् । दुष्टस्तन्यग्रहसमुत्थितानामिति दुष्टस्तन्येन

१ ‘सर्वशरीरावस्थितानां’ व्याधीनामुपशमकरणार्थं, ज्वरशोफयुग्मरक्तपित्तोन्मादापसार-प्रमेहातीसारादीनां च’ इति ता. । २ ‘देवदानव’ इति ता. । ३ ‘विनायकनागग्रहोप-सृष्टचेतसां’ इति ता. । ४ ‘विषवेगोपशमनार्थं’ इति ता. । ५ ‘शुक्राप्यायन’ इति ता. । ६ ‘घ्राणादीनां शल्यान्तानां’ इति सु. । ७ ‘अन्ये तु तस्यान्ते पाठेन’ इति पा० । ८ ‘ग्रहणाद्’ इति सु. ।

Figure 1: A page of the 1939 *Bhānumatī* edition, showing the variant readings in the footnotes.

the Bhandarkar Oriental Research Institute in Pune.<sup>13</sup> This manuscript covered the *Bhānumatī* b up to the end of the *sūtrasthāna*. The siglum was ह for हस्तलिखित.<sup>14</sup>

### For the *Suśrutasaṃhitā*

1. A palm leaf manuscript from Hemarājaśarman's personal library.<sup>15</sup> The siglum was ता for ताडपत्र.
2. His own published edition. The siglum was ड for डल्हणसंमतः पाठः.<sup>16</sup>
3. Hārānacandra Cakravartī's published edition with his own commentary.<sup>17</sup> The siglum was हा.

### Evaluation

The main innovation of this publication was to present the only surviving part of the commentary on the *Suśrutasaṃhitā* by the great eleventh-century medical scholar Cakrapāṇidatta, namely the *Bhānumatī*.<sup>18</sup> A secondary purpose was to present the text of the *sūtrasthāna* as read in MS Kathmandu NAK 5-333, that had recently been brought to the editors' attention. In their judgement, the Kathmandu manuscript presented a text that was closer to what Cakrapāṇidatta had before him than the text according to Ḍalhaṇa. This was the first *Suśrutasaṃhitā* edition in which Ācārya used sigla to identify the sources from which variant readings were reported, so while it has limitations, it for the first time enables us to get some idea of origins of the text (see Figure 1).

Ācārya noted in his introduction that the manuscripts containing the Ḍalhaṇa's commentary all came together with the root-text of the *Suśrutasaṃhitā*, and thus the main *Suśrutasaṃhitā* text reflected the readings chosen by Ḍalhaṇa. But the manuscripts of the *Bhānumatī* contained the commentary alone, without the root-text, and had many explanations

13 At this time, manuscripts from Britain were routinely lent to scholars in India and vice versa.

14 MS London BL H. T. Colebrooke 908 ([PanditProject #109978](#), consulted on July 03, 2021).

15 I.e., MS Kathmandu NAK 5-333.

16 **susr-trikamji3**. It is noteworthy that Ācārya refers to his 1938 edition as representing "the Ḍalhaṇa recension."

17 **bhat-1917**.

18 **meul-hist**.

based on different readings of the root-text than those of Ḍalhaṇa. In many of these cases it was hard to know what the text that Cakrapāṇidatta had before him. But Ācārya noted that Cakrapāṇidatta had a text before him that had much in common with the text of the Nepalese manuscript.<sup>19</sup>

There is compelling evidence that Cakrapāṇidatta's *Bhānumatī* commentary once covered the whole text of the *Suśrutasamhitā*.<sup>20</sup> The loss of the rest of the work ranks amongst the greatest disasters in Āyurvedic literature. Remarkably, the whole *Bhānumatī* may still have existed in the early twentieth century. In 1903, Palmyr Cordier reported being privately informed of a complete copy of the work in a personal manuscript collection in Benares.<sup>21</sup>

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<sup>19</sup> acar-1939. See discussion by kleb-2021a.

<sup>20</sup> meul-hist.

<sup>21</sup> cord-1903.

## Features of the manuscript transmission

### Palaeographical features

- śrita for śṛta.
- ś and s in KL 699.

### Chart of characters

[[[Put a chart from QuickPalaeographer here.]]]

## Sūtrasthāna, adhyāya 1

- 1 Now I shall narrate the chapter on the origin of this knowledge.<sup>22</sup>
- 2 Now, as is well-known, Aupadhenava, Vaitaraṇa, Aurabhra, Puṣkalāvata, Karavīra, Gopurarakṣita, Bhoja, Suśruta and others addressed Lord Divodāsa, king of Kāśī, the best of the immortals, who was in his ashram surrounded by an entourage of sages.<sup>23</sup>
- 3 “O Lord, distress arose in our minds after witnessing people thrashing about with cries, assailed by different kinds of pain and injury (*vedanā-bhīghāta*), feeling helpless in spite of having friends, because of diseases arising from the body, the mind and external sources.
- 4 “To quell the illnesses of those who seek happiness and for our own purpose of prolonging life, we desire the science of life (*āyurveda*) that is being taught. Welfare, both in this world and in the next, depends upon it. Therefore, we have come to the Lord in pupillage.”
- 5 The Lord said to them:  
“Welcome to you! My children, all of you are beyond reproach and worthy to be taught.
- 6 “As is well known, Ayurveda is the name of what is said to be the subsidiary part of the Atharvaveda. Before creating people, Svayambhū composed it in hundreds of thousands of verses and a thousand chapters and, after observing the short lifespan and low intelligence of people, he presented it again in eight parts.<sup>24</sup>
- 7 “Surgery, treatment of body parts above the clavicle, general medicine, knowledge of spirits, care of children, and the disciplines of antidotes, rejuvenation and aphrodisiacs.

22 Dalhaṇa understood the word “knowledge (*veda*)” as specifically “medical knowledge.” He said that the word “longevity” (*āyur*) had been elided. After this opening statement, later manuscripts and commentaries include the attribution, “as the venerable Dhanvantari stated.” The absence of this statement in the early Nepalese MSS is highly noteworthy because it removes the outer narrative frame of the *Suśrutasaṃhitā* (**wuja-2013kleb-2021b**). On the figure of Dhanvatari in medical literature, see **meul-hist**.

23 On these persons, see **meul-hist**. The authority Bhoja does not appear in the list as published in the vulgate edition (**susr-trikamji2**), and was not included in **meul-hist** amongst “authorities mentioned in the *Suśrutasaṃhitā*.” **meul-hist** gathered textual evidence about Bhoja at **meul-hist**. **kleb-2021a** has discussed these authors in the context of an anonymous commentary on the *Suśrutasaṃhitā* that cites them.

24 Svayambhū is another name for Brahmā, the creator.

- 8 “Now, a collection of the characteristics of each component of Āyurveda.
- 9 “Among them, [the component] called surgery has the goal of extracting various grasses, wood, stone, dust, iron (?), soil, bone, hair, nails, discharge of pus, malignant wounds and foreign bodies inside the womb, and of determining the application of surgical instruments, knives, caustics and fire by means of sixty definitions.
- 10 “[The component] named the doctrine of treating body parts above the clavicles has the aim of curing diseases situated above clavicles that is, diseases located in ears, eyes, mouth, nose and so on.
- 11 “[The component] called general medicine has the goal of curing illnesses established in the whole body and [diseases] such as fever, tumour, swelling, hemorrhagic disorders, insanity, epilepsy, urinary diseases, diarrhoea and the like.
- 12 “[The component] called knowledge of spirits is for appeasing demons by pacification rites and making food offerings for those whose minds have been possessed by gods, their enemies,<sup>25</sup> Gandharvas, Yakṣas, demons, deceased ancestors, Piśācas, Vināyakas, <sup>26</sup> Nāgas and evil spirits that possess children.
- 13 “[The component] called care of children is for bearing children and purifying defects in a wet-nurse’s milk, and curing diseases that have arisen from bad breast milk and demons.
- 14 “[The component] called the discipline of toxicology is for [knowing] the signs of poison from snake and insect bites and for neutralising various combinations of poisons.<sup>27</sup>
- 15 “[The component] called the discipline of rejuvenation is maintaining youth, bringing about a long life and mental vigour and for curing diseases.
- 16 “[The component] called the discipline of aphrodisiacs brings about the increase, purity, accumulation and production of semen for those

25 Dānavas. The insertion marks (*kākapadas*) below the text at this point appears to be by the original scribe.

26 The vulgate doesn’t have *vināyakas* but does add *asuras*, probably under the influence of Ḍalhaṇa. Cite Paul Courtright, Ganesha book.

27 The scribal insertion marks (crosses) above the line at this point in MS K appear to be in a later hand and their referent is lost in the damaged part of the folio. Although MSS N and H include spiders (*lūtā*) and creepy-crawlies (*sarīsrpa*) in the list, it does seem that MS K had a shorter list, and the vulgate edition adds rodents (*mūṣika*).

- whose semen is minimal, bad, depleted, and dry [respectively] and for inducing an erection.
- 17 "Thus, this Āyurveda is taught with eight components."  
"Among these [components], tell us which is for whom."
- 18 They said, "After you have conveyed the knowledge of surgery, teach us everything."
- 19 He said, "so be it."
- 20 They then said, "Having considered the view of all of us, when we are unanimous, Suśruta will question you. We too will learn what is being taught to him."
- 21 He said, "so be it."
- 22 "Now, as is well-known, the aim of Āyurveda is eliminating the disease of one who have been assailed by disease and protecting the healthy; āyurveda is [that knowledge] in which they find a long life, or that by which long life is known. Learn its best component (i.e., surgery), which is being taught in accordance with tradition, perception, inference and analogy.
- 23 "For this component is first, the most important, because it is referred to first; it cures wounds and joins together the most important thing, Yajña's head. For, just as it has been said of old, 'the head that had been cut off by Rudra was joined again by the two Aśvins.'
- 24 "And also, of the eight disciplines of Āyurveda, [surgery] alone is the best because of the quick action of its procedures (*kriyā*), its application of blunt instruments, knives, caustics and fire, and it is common to all disciplines.
- 25 "Therefore, [surgery] is eternal, meritorious, leads to heaven, brings renown, bestows a long life, and affords a livelihood.
- 26 "Brahmā said this, 'Prajāpati learned it. From him, the Aśvins. From the Aśvins, Indra. From Indra, I. In this world, I will transmit to those who desire it for the benefit of people.'  
[There a verse about this].<sup>28</sup>
- 27 *For, I (i.e., Brahmā) am Dhanvantari, the first god, the remover of old age, pain and death of mortals.  
Having understood surgery, the best of the great knowledge systems, I arrived on earth again to teach it here.*

28 This is an expansion of the scribe's abbreviation *bha* for *bhavati cātra ślokaḥ* "There is a verse about this" (sometimes plural).

- 28 In this context, as far as this discipline is concerned, a human being (*puruṣa*) is called an amalgam of the five elements and the embodied soul. This is where procedures (*kriyā*) apply. This is the locus.

Why?

Because of the duality of the world, the world is twofold: the stationary and the moving. Its nature (*ātmaka*) is twofold, depending on the preponderance of Agni and Soma.<sup>29</sup> Alternatively, it can be considered as being fivefold. The multitude of beings in it are fourfold: they are termed “sweat-born, stone-born, caul-born and egg-born”.<sup>30</sup> Where they are concerned, the human being is the main thing; others are his support. Therefore, the human being (*puruṣa*) is the locus.

- 29 Diseases are said to be the conjunction of the person and suffering (*duḥkha*). There are four of them: invasive, bodily, mental and inherent. The invasive ones are caused by an injury. The bodily ones are based on food, caused by irregularities (*vaiṣamya*) in wind, bile, phlegm and blood.<sup>31</sup>

The mental (*mānasa*) ones, caused by desire (*icchā*) and hatred (*dveṣa*), include: anger (*krodha*), grief (*āśoka*), misery (*dainya*), overexcitement (*harṣa*), lust (*kāma*), depression (*viśāda*), envy (*īrṣyā*), jealousy (*asūyā*), malice (*mātsarya*), and greed (*lobha*).

The inherent (*svābhāvika*) ones are hunger, thirst, old age, death, sleep and those of the temperament (*prakṛti*).

These too are located (*adhiṣṭhāna*) in the mind and body.

Scarification (*lekhana*), nourishment (*bṛṃhana*), purification (*saṃśodhana*), pacification (*saṃśamana*), diet (*āhāra*) and regimen (*ācāra*), properly employed, bring about their cure.

- 30 Furthermore, food is the root (*mūla*) of living beings as well as of strength (*bala*), complexion (*varṇa*) and vital energy (*ojas*). It depends on (*āyatta*) the six flavours (*rasa*). Flavours, furthermore, have substances as their substrate (*āśrayin*). And substances are remedies (*oṣadhī-*).<sup>32</sup> There are two types: stationary (*sthāvara*) and moving

29 wuja-2004.

30 This fourfold classification of beings is paralleled with closely-related vocabulary in *Bhelasamhitā* 4.4.4 (kris-2000mook-1921).

31 Note that four humoral substances are assumed here.

32 Pāṇini 6.3.132 provides that the final vowel of the noun *oṣadhi* may be lengthened (→*oṣadhī*) under certain conditions. These conditions require that the word be used in a Vedic mantra and not in the nominative. Neither condition is met in this passage,



- (*jaṅgama*).
- 31 Of these, there are four types of stationary ones: fruit trees (*vanaspati*), flowering trees (*vrkṣa*), herbs (*oṣadhi*) and shrubs (*vīrudh*).<sup>33</sup> Amongst these, the “fruit trees” have fruit but no flowers.<sup>34</sup> The “flowering trees” have flowers and fruit. The “herbs” die when the fruit is ripe. “Shrubs” put out shoots.
- 32 As is well known, moving remedies are also of four types: those born in in a caul (*jarāyuja*), those born from eggs (*aṇḍaja*), those born of sweat (*svedaaja*), and shoots (*udbhid*). Amongst these, those born in a caul include animals (*paśu*), humans, and wild animals (*vyāla*). Birds, creepy-crawlies (*sarīṣṛpa*) and snakes are “born of eggs.” Worms (*kṛmi*), small insects (*kunta*) and ants (*pipīlika*) and others are born of sweat.<sup>35</sup> Shoots include red velvet mites (*indragopa*) and frogs (*maṇḍūka*).<sup>36</sup>
- 33 In this context, among the stationary remedies, skin (*tvak*), leaves (*patra*), flowers (*puṣpa*), fruits (*phala*), roots (*mūla*), bulbs (*kanda*), sap (*kṣīra*), resin (*niryāsa*), essence (*sāra*), oil (*sneha*), and juice extract (*svarasa*)<sup>37</sup> are useful; among the moving remedies pelt (*carman*), hair, nails, and blood (*rudhira*) and so forth.
- 34 And earthen products (*pārthiva*) include gold and silver.<sup>38</sup>
- 35 The items created by time (*kālakṛta*) are clusters (*samplava*) as far as wind and no wind (*nivāta*), heat and shade, darkness and light and the cold, hot and rainy seasons (*varṣā*) are concerned. The divisions of time are the blink of the eye (*nimeṣa*), a trice (*kāṣṭhā*), minutes (*kalā*), three-quarters of an hour (*muḥūrta*), a day and night (*ahorātra*), a fort-

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yet the author uses the form *oṣadhī*. This form is in fact not uncommon in medical literature as well as in epics, purāṇas, smṛtis, and other parts of Sanskrit literature.

- 33 Ca.sū.1.71–72 also describes these four types of medicinal plant in similar terms but with slightly differing names: *oṣadhi* is a plant that ends after fruiting, *vīrudh* is a plant that branches out, *vanaspati* is a tree with fruit, and *vānaspatya* is a tree with fruit and flowers.
- 34 The MSS agree in reading *phalavantyaḥ* “having flowers” which is grammatically non-standard. This form is also found in the *Viṣṇudharmottarapurāṇa* (1.92.27, **sarm-1912**).
- 35 The word *kunta*, though marked as “lexical” in most dictionaries, is in fact found in literature, commonly as a compound with *pipīlika*; the compound sometimes seems to be understood a type of ant (*tatpuruṣa* compound) rather than as a pair of insects (*dvandva* compound).
- 36 On *indragopa*, see **lien-1978**.
- 37 On juice extract (*svarasa*) see CS 1.1.73, 1.4.7; Ḍalhaṇa on SS 4.10.12 (**vulgate**).
- 38 The flow of concepts in the treatise seems to be interrupted here.

night (*pakṣa*), a month (*māsa*), a season (*rtu*), a half-year (*ayana*), a year (*saṃvatsara*), and yuga (*yuga*).<sup>39</sup>

36 These naturally cause accumulation (*sañcaya*), irritation (*prakopa*), pacification (*upaśama*) and alleviation (*pratīkāra*) of the humours (*doṣa*). And they have practical purposes (*prayojanavat*).

[There are verses about this:]<sup>40</sup>

37 *This fourfold category is taught by physicians as a cause for the agitation and quelling of bodily diseases.*<sup>41</sup>

38 *There are two kinds of invasive diseases. Some certainly<sup>42</sup> affect (ni√pat) the mind, others the body. Their treatment (kriyā) is of two kinds too.*

39 *For those that affect the body there is physical (śārīravād) therapy, whereas for those that affect the mind there is the collection (varga) of desirable sensory experiences like sound that bring comfort (sukha).*

40 Along these lines (*evam*), this brief explanation of the four factors (*caturṣṭaya*) is given:

- human being (*puruṣa*),
- disease (*vyādhi*),
- remedies (*oṣadhi*),
- the time for therapies (*kriyākāla*).

In this context,

- from the mention of the word “human,” the collection of substances that arise from it, such as the elements, and the particulars (*vikalpa*) of its major and minor parts (*aṅga*) such as skin (*tvak*), flesh (*māṃsa*), ducts (*sirā*), sinews (*snāyu*), bones (*asthi*) and joints (*sandhi*) are meant.

39 These units are presented at SS 1.6.5 (**vulgate**) and discussed by **haya-2017**.

40 See footnote 28.

41 On the topic of the “group of four,” the commentator Ḍalhaṇa considers them to be “food, behaviour, earthen products and items created by time.” He refers to the author of the lost commentary entitled *Pañjikā*, and to Jejjāṭa (**meul-hist**). In his view, these early commentators do not agree that the fourfold grouping (*caturvarga*) refers to the quartet of stationary (*sthāvara*), moving (*jaṅgama*), earthen products (*pārthiva*) and items created by time (*kālakṛta*) (**vulgate**).

42 The text uses an archaic interjection here, *ha*.

- From the mention of “diseases,” all diseases caused by wind, bile, phlegm, congested humours (*sannipāta*), external factors (*āgantū*) and inherent factors (*svabhāva*) are intended (*vyākhyāta*).
- From the mention of “remedies,” there is the teaching of substances, tastes, potencies, post-digestive tastes.
- From the mention of “procedures (*kriyā*),” therapies (*karman*) such as oiling and excision (*chedya*) are taught.
- From the mention of the word “time,” every single teaching about the times for procedures is meant.

[There is a verse about this:]<sup>43</sup>

41        *This seed of medicine has been declared in brief. Its explanation will be given in one hundred and twenty chapters.*<sup>44</sup>

42        There are one hundred and twenty chapters in five sections (*adhyāya*).<sup>45</sup>  
In that regard, having divided them, according to their subject matter, into the Ślokaśthāna, the Nidāna, the Śārīra, the Cikitsita and the Kalpa, we shall mention this in the Uttaratantra.<sup>46</sup>

[There is a verse about this:]<sup>47</sup>

43        *Someone who reads this eternal proclamation of the King of Kāśī, that was declared by Svayambhu, will have good karma on earth, will be respected by kings and upon death will achieve the world of Śakra.*

43 See footnote 28.

44 This is the number of chapters in the first five sections of the work, namely the *Sūtra*-, *Nidāna*-, *Śārīra*-, *Cikitsā*- and *Kalpa*-sthānas. These have 46, 16, 10, 40 and 8 chapters respectively. The *Uttaratantra* has 66 chapters.

45 On *viṃśa* in the sense of “greater by 20” see P.5.2.46 *śadantaviṃśateś ca*.

46 The end of this sentence reads oddly. The vulgate edition adds an object: “[we shall mention] the remaining topics [in the Uttara]” which smooths out the difficulty, but this is supported in none of the Nepalese MSS. At the start of the *Uttaratantra* (**susr-trikamjī**) there is indeed a statement that picks up the point about there being 120 chapters.

47 See footnote 28.

## **Sūtrasthāna, adhyāya 2**

### **Literature**

meul-histprei-2007wujad-2012.

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## Sūtrasthāna, adhyāya 17

- 1 Now we shall expound the method for piercing the ear.<sup>48</sup>
- 2 One may pierce a child's ears for the purpose of preserving and decorating. On renowned days, half days, hours and constellations during the first half of the sixth or seventh lunar month, the boy who has received a benediction (*kṛtamaṅgala*), – blessings pronounced (*svastivācana*)<sup>49</sup> – should be placed on the lap of a wet-nurse.<sup>50</sup> Then, while pacifying him and having pulled his ear with the left hand, the physician should use his right hand to pierce the ear straight through at a naturally occurring cleft.<sup>51</sup> For a boy do the right ear first; for a girl do the left one. Use a needle on a thin ear; an awl (*ārā*) on a thick one.<sup>52</sup>

48 The topic of piercing the ear (*kaṇavyadha*) is not discussed in the *Carakasamhitā* (**meul-hist**), but it is mentioned in some texts that followed the *Suśrutasaṃhitā*, such as the *Kaśāpyasaṃhitā* (**meul-hist**). The instrument for piercing the ear is described in the *Aṣṭāṅgahṛdayasūtra* (1.26.26). Both Ḍalhaṇa and Cakrapāṇi's versions (SS.1.16.1) describe the topic of this chapter as the method of piercing and joining the ear (*kaṇavyadhabandhavidhi*), instead of simply 'the method for piercing the ear.' Although it is omitted in the Nepalese's version's opening statement to this chapter, joining the ear (*kaṇabandha*) is mentioned in passages 17–20. Also, the Nepalese version omits the opening remark on Dhanvantari recorded by both Cakrapāṇi and Ḍalhaṇa (1.16.2). For a discussion of the frame story in the Nepalese version, see [SushrutaProject](#), accessed July 26, 2021. Both commentators state that only the ears of healthy people, whose bodies are free from disease, should be pierced, and he quotes Bhoja to affirm this: 'When piercing the ears of children who are free of disease at these times, their ear flaps and apertures, as well as limbs, increase.' (*kāleṣv eteṣv adoṣāṇāṃ bālānāṃ kaṇayor vyadhe | saha gātrair vivardhante kaṇapālyāś ca khāni ca || eteṣv adoṣāṇāṃ ] acar-1938 : eteṣu doṣāṇāṃ acar-1939. vyadhe ] acar-1938 : vyadhaḥ acar-1939*).

49 The syntax here is unclear. The expression *svastivācana* may have been a gloss inserted into the text at an earlier period to clarify *maṅgala*. But as it stands, it is not syntactically connected to the rest of the sentence. Both Cakrapāṇi and Ḍalhaṇa (1.16.3) record a reading in which the words are united in a compound that reads more naturally.

50 Cakrapāṇi and Ḍalhaṇa's versions (1.16.3) includes the option of placing the child in the lap of a man (*kumārādharaṇka*), the gender of whom is made clear by Ḍalhaṇa's gloss 'a man who holds the child' (*bālagrahipuruṣa*). Both versions also add that the child should be enticed with toys (*krīḍanaka*), which according to Ḍalhaṇa include replica elephants, horses, bulls and parrots (*kṛtrimahastyaśvabalīvardaśukādi*). Ḍalhaṇa mentions that others read 'or by special treats' (*bhakṣyaviśeṣair vā*) before this.

51 Cakrapāṇi and Ḍalhaṇa's versions (1.16.3) add that this cleft is illuminated by sunshine (*ādityakarāvabhāsita*).

52 Ḍalhaṇa (1.16.3) clarifies that the awl is a shoe-maker's knife for piercing leather (*carmabhedana*).

- 3 If there is excess blood or pain one should know that it was pierced in the wrong place. The absence of side-effects is a sign that it has been pierced in the right place.<sup>53</sup>
- 4 In this context, if an ignorant person accidentally pierces a duct (*sirā*) there will be fever, burning, swelling (*śvayathu*), pain, lumps (*granthi*), paralysis of the nape of the neck (*manyāstambhā*), convulsions (*apatānaka*), headache or sharp pain in the ear.<sup>54</sup>
- 5 Having removed the wick (*varti*) in the hole because of the aggravation of humours or a culpable piercing,<sup>55</sup> one should smear it with a paste of the roots of barley, liquorice, Indian madder (*mañjiṣṭhā*), and the castor oil tree (*gandharvāhastā*), thickened with honey and ghee. When it has healed well, one should pierce it again.
- 6 One should treat the properly-pierced ear by sprinkling it with raw sesame oil. After every three days one should apply a thicker wick (*varti*) and sprinkle oil right on it.<sup>56</sup>
- 7 Once the ear is free from humours or side-effects, one should loosen it with a light dilator (*pravardhanaka*) in order to enlarge it.<sup>57</sup>

53 At this point, manuscript KL-699 is missing a folio, so the rest of this chapter is constructed on the basis of witnesses N and H.

54 This passage is significantly augmented in both Cakrapāṇi (1.16.4) and Ḍalhaṇa's (1.16.5) versions to outline the specific problems caused by piercing three ducts called *kālikā*, *marmikā* and *lohitikā*. In fact, the order of the problems mentioned in the Nepalese version has been retained in the other versions and divided between each duct. Cakrapāṇi's commentary cites several verses attributed to Bhoja on the problems caused by piercing these three ducts in the ear flap: '*Lohitikā*, *marmikā* and the black ones are the ducts situated in the earflaps. Listen in due order to the problems that arise when they are pierced. Paralysis of the nape of the neck and convulsions, or sharp pain arise from piercing *lohitikā*. Pain and lumps are thought to arise from piercing *marmikā*. Piercing *kālikā* gives rise to swelling, fever and burning' (*lohitā marmarī kṛṣṇāḥ karṇapālīśritāḥ sirāḥ | tāsāṃ tu vyadhane doṣān anupūrvveṇa me śrṇu || manyāstambho 'patānaś ca śūlo vā lohitāvyadhāt | vedanā granthayaś caiva marmarīvyadhanāt smṛtāḥ || kālikāvyadhanāc chotho jvaro dāhaś ca jāyate*).

55 In addition to these reasons, Cakrapāṇi (1.16.5) and Ḍalhaṇa's versions (1.16.6) add 'piercing with a painful, crooked and unrecommended needle' (*kliṣṭajihmāpraśastasūcīvyadhā*) and 'a wick that is too thick' (*gāḍhataravartitva*). Ḍalhaṇa was aware of the reading in the Nepalese version because he notes that some read 'because of the accumulation of humours' (*doṣasamudāyāt*) rather than *kliṣṭajihmāpraśastasūcīvyadhā* *gāḍhataravartitvād*. On the meaning of *samudāya*, see Meulenbeld 1992: 1–6 (REVISE).

56 The manuscripts support the reading *sthūlatarīm* that is either a non-standard form or a scribal error.

57 Cakrapāṇi (1.16.6) and Ḍalhaṇa (1.16.8) point out that the dilator can be made of

8        *A person's ear enlarged in this way can split in two, either as a result of the humours<sup>58</sup> or a blow. Listen to me about the joins (sandhāna) it can have.*

9    Here, there are, in brief, fifteen ways of mending the ear flap.<sup>59</sup> They are as follows: Rim-join (*nemīsandhānakaḥ*), Lotus-splittable (*utpalabhedyaka*), Dried Flesh (*vallūraka*), Fastening (*āsaṅgima*), Cheek-ear (*gaṇḍakarṇa*), Take away (*āhārya*), Ready-Split (*nirvedhima*), Multi-joins (*vyāyojima*), Door-hinge (*kapāṭasandhika*), Half door-hinge (*ardhakapāṭasandhika*), Compressed (*saṃkṣipta*), Reduced-ear (*hīnakarṇa*), Creeper-ear (*vallīkarṇa*), Stick-ear (*yaṣṭīkarṇa*), and Crow's lip (*kākaṣṭha*).<sup>60</sup>

In this context, among these,

“Rim-join” (*nemīsandhānaka*): both flaps are wide, long, and equal.

“Lotus-splittable” (*utpalabhedyaka*): both flaps are round, long, and equal.

“Dried flesh” (*vallūraka*): both flaps are short, round, and equal.

“Fastening” (*āsaṅgima*): one flap is longer on the inside.

“Cheek-ear” (*gaṇḍakarṇa*): one flap is longer on the outside.<sup>61</sup>

“Take-away” (*āhārya*): the flaps are missing, in fact, on both sides.

“Ready-split” (*nirvedhima*): the flaps are like a dais (*pīṭha*).

“Multi-joins” (*vyāyojima*): one flap is small, the other thick, one flap is equal, the other unequal.

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wood, such as that of the Prickly Chaff Flower (*apāmarga*), the Neem tree (*nimba*) and the Cotton Plant (*kārpāsa*). Ḍalhaṇa adds that it can also be made of lead (*sīsaka*) and should have the shape of the datura flower (*dhattūrapuṣpa*).

58 Ḍalhaṇa (1.16.9) notes that the word *doṣa* here can refer to either a humour, such as wind (*vāta*), as we have understood it, or a disease generated from a humour.

59 The Nepalese version uses the word *sandhāna* to refer to joining a split in an ear flap, which is consistent with the terminology in the verse cited above (8). However, the vulgate uses the term *bandha* here and at the very beginning of the chapter (1.16.1) to introduce the topic of repairing the ear.

60 For an artist's impression of these different kinds of joins in the ear flap, see Figure 3.2 in **wuja-1998**.

61 For an artist's impression of this join, see Figure 3.3 in **wuja-1998**.



“Door-hinge” (*kapāṭasandhika*): the flap on the inside is long, the other is small.

“Half door-hinge” (*ardhakapāṭasandhika*): the flap on the outside is long, the other is small.

“These ten options (*vikalpa*) for joins (*sandhi*) of the ear should be bound. They can mostly be explained as resembling their names.<sup>62</sup> The five from compressed (*saṃkṣipta*) on are incurable.<sup>63</sup> Among these, “compressed” has a dry ear canal and the other flap is small. “Reduced ear” has flaps that have no base and have wasted flesh on their edges. “Creeper-ear” has flaps that are thin and uneven. “Stick-ear” has lumpy (*granthita*) flesh and the flaps are stretched thin and have stiff (*stabdha*) ducts (*sirā*). “Crow-lip” has a flap without flesh with compressed (*saṃkṣipta*) tips and little blood. Even when they are bound up, they do not heal because they are hot, inflamed, suppurating (*srāva*), or swollen.<sup>64</sup>

- 10 A person wishing to perform any of these joins should therefore gather together the supplies prepared according to the recommendations of the ‘Preparatory Supplies’ chapter.<sup>65</sup> And in particular, he should gather decanted liquor (*surāmaṇḍa*), milk, water, fermented rice-water (*dhānyāmla*), and powdered earthenware crockery (*kapālacūrṇa*). Next, he should prepare the woman or man, who have had the ends of their hair tied up, have eaten lightly, and are firmly supported by qualified attendants.

62 Cakrapāṇi (1.16.1–13) and Ḍalhaṇa (1.16.10) provide examples of how the names of these joins describe their shapes. For example, the rim-join (*nemīsandhānaka*) is similar to the join of the rim of a wheel (*cakradhārā*).

63 Ḍalhaṇa mentions that some do not read the statement that only five are incurable, and they understand the causes of unsuccessful joins given below (i.e., heat, inflammation, suppuration and swelling) as also pertaining to the first ten when they do heal.

64 The vulgate (SS.1.16.11–12) has four verses (*śloka*) at this point that are not in the Nepalese manuscripts. The additional verses iterate the types of joins required for ear flaps that are missing, elongated, thick, wide, etc. All four verses were probably absent in the version of the *Suśrutasaṃhitā* known to Cakrapāṇi. He cites the verses separately in his commentary, the *Bhānumatī*, introducing each one as ‘some people read’ (*ke cit paṭhanti*). The root text in Ācārya’s edition of the *Bhānumatī* (acar-1939) appears to be identical to the one commented on by Ḍalhaṇa (acar-1938).

65 SS.1.5.



Then, he should ready the bindings (*bandha*) and carry out the procedure with cutting (*chedya*), splitting (*bhedya*), scarification (*lekhyā*), or piercing (*vyadhana*). Then, he should examine the blood of the ear to know whether it is tainted (*duṣṭa*) or not. If it is tainted by wind, the ear should be bathed with fermented rice-water (*dhānyāmla*) and water; if tainted by choler, then cold water and milk should be used; if tainted by phlegm, then decanted liquor (*surāmaṇḍa*) and water should be used, and then he should scarify it again.

Then, arranging the join in the ear so that it is neither proud, depressed, nor uneven, one should make the join. Having seen that the blood has stopped, one should anoint it with honey and ghee, bandage each ear with cotton (*picu*) and gauze (*prota*), and bind it up with a thread, neither too tightly nor too loosely. Then, the earthenware powder should be sprinkled on, and medical advice (*ācārika*) given. And he should supplement with food as taught in the ‘Two Wound’ chapter.<sup>66</sup>

- 11 *One should avoid rubbing, sleeping during the day, exercise, overeating, sex, getting hot by a fire, or the effort of speaking.*
- 12 One should not make a join when the blood is too pure, too copious, or too thin.<sup>67</sup> For when the ear is tainted by wind, then it is obstructed by blood (*raktabaddha*), unhealed and will peel. When tainted with choler, it becomes pinched (*gāḍha*), septic (*pāka*) and red. When tainted by phlegm, it will be stiff (*stabdha*) and itchy. It has excessively copious suppuration (*srāva*) and is *śopha* (*puffed up*). It has a small amount of wasted (*kṣīṇa*) flesh and it will not grow.<sup>68</sup>
- 13 When the ear is properly healed and there are no complications, one may very gradually start to expand it. Otherwise, it may be inflamed (*saṃrambha*), burning, septic or painful. It may even split open again.
- 14 Now, massage for the healthy ear, in order to enlarge it.  
One should gather as much as one can the following: a monitor

<sup>66</sup> SS.4.1.

<sup>67</sup> The vulgate reads “impure” for the Nepalese “too pure,” which would appear to make better medical sense. Emending the text to *nāśuddha*- for *nātiśuddha*- in the Nepalese recension would yield the same meaning as the vulgate.

<sup>68</sup> In his 1938 edition of *Suśrutasaṃhitā*, Ācārya includes in parentheses the following treatment for these conditions, which according to a footnote is not found in the palm-leaf manuscript he used (**susr-trikamjī3**): ‘One should sprinkle it with raw sesame oil for three days and one should renew the cotton bandage after three days’ (*āmatailena trirātram pariṣecayet trirātrāc ca picuṃ parivartayet*).

lizard (*godhā*<sup>69</sup>), scavenging (*pratuda*) and seed-eating (*viṣkira*) birds, and creatures that live in marshes or water,<sup>70</sup> fat, marrow, milk, and sesame oil, and white mustard oil. <sup>71</sup> Then cook the oil with an admixture (*prativāpa*) of the following: purple calotropis (*arka*<sup>72</sup>), white calotropis (*alarka*<sup>73</sup>), country mallow (*balā*<sup>74</sup>), ‘strong Indian mallow’ (*atibalā*<sup>75</sup>), country sarsaparilla (*anantā*<sup>76</sup>) beggarweed (*vidāri*<sup>77</sup>), liquorice (*madhuka*), hornwort (*jalaśūka* → *jalanīlikā*<sup>78</sup>),<sup>79</sup> items having the ‘sweet’ savour (*madhuravarga*),<sup>80</sup> and ‘milk flower’ (*payasyā* → *vidāri*<sup>81</sup>).<sup>82</sup> This should then be deposited in a well-protected spot.

- 15        *The wise man who been sweated should rub the massaged (mardita) ear with it. Then it will be free of complications, and will enlarge properly and be strong.*
- 16    Ears which do not enlarge even when sweated and oiled, should be scarified at the edge of the hole (*apāṅga*), but not outside it.
- 17    In this tradition, experts know countless repairs to ears. So a physi-

69 *Varanus bengalensis*, Schneider (Daniel 1983:58)

70 For such classifications, see **zimm-jung** and **smit-clas**.

71 The vulgate (SS 1.16.19 includes ghee (*sarpis*). However, both Ḍalhaṇa and Cakrapāṇi appear to have been aware of a version (perhaps, similar to the Nepalese one) that does not. Ḍalhaṇa notes that others read simply four oils and not milk, whereas Cakrapāṇi says some read that it is made with milk and four oils.

72 *Calotropis gigantea*, (L.) R. Br. (ADPS 52, AVS 1.341, NK #427, Potter 57, ID 306)

73 *Calotropis procera*, (Ait.) R. Br. (NK #428, GIMP 46b, ID 306)

74 *Sida cordifolia*, L. (ADPS 71, NK #2297)

75 *Abutilon indicum*, (L.) Sweet; *Sida rhombifolia*, L.? (NK #11, IGP ,4 1080; NK #2300)

76 *Hemidesmus indicus*, (L.) R. Br. (ADPS 434, AVS 3.141–5, NK #1210)

77 *Desmodium gangeticum* (L.) DC (Dymock 1.428, GJM 602, cf. NK #1192; ADPS 382, 414 and IMP 2.319, 4.366 are confusing)

78 *Ceratophyllum demersum*, L. (IMP 2371, AVS 2.56, IGP 232)

79 This name is not certain: in fact, the commentator Ḍalhaṇa notes that some people interpret it as a poisonous, hairy, air-breathing, underwater creature.

80 The items which exemplify the ‘sweet’ savour (*madhuravarga*) are enumerated at SS.1.42.11.

81 *Pueraria tuberosa* (Willd.) DC. (ADPS 510, IMP 1.792f., AVS 4.391; not Dymock 1.424f. See GJM supplement 444, 451, IMP 1.187, but IMP 3.1719 = *Ipomoea mauritiana*, Jacq.)

82 The vulgate (SS. 1.16.19) adds several ingredients to this admixture, including *apāmārga*, *aśvagandhā*, *kṣīraśuklā*, *madhuravarga* and *payasyā*. Also, it has *vidāriḡandhā* instead of *vidāri*. When commenting on this passage, Ḍalhaṇa notes that some do not read *madhuravarga* and *payasyā*. Therefore, there were probably other versions of this recipe with fewer ingredients, as seen in the Nepalese version.

- cian who is very intent (*suniviṣṭa*) on working in this way may repair (*yojayed*) them.
- 18 If an ear has grown hair, has a nice hole, a firm join, and is strong and even, well-healed, and free from pain, then one can enlarge it slowly.
- 19 Now I shall describe the proper method of repairing a severed nose. First, take from the trees a leaf the same size as the man's nose and hang it on him.
- 20 Next, having cut a slice of flesh (*vadhra*) with the same measurements off the cheek, the end of the nose is then scarified.<sup>83</sup> Then the diligent (*apramatta*) physician, should quickly put it back together (*pratisandhā-*) so that it is well joined (*sādhubaddha*).<sup>84</sup>
- Having carefully observed that it has been well sown up, two tubes should be fixed in place. Then, having lifted them up,<sup>85</sup> the powder of sappanwood (*pattāṅga*<sup>86</sup>),<sup>87</sup> liquorice (*yaṣṭīmadhuka*<sup>88</sup>), and Indian barberry (*añjana*<sup>89</sup>) should be applied to it.
- 22 The wound should be covered properly with cotton (*picu*) and should be moistened repeatedly with sesame oil. Ghee should be given to the man to drink. His digestion being complete, he should be oiled and purged in accordance with the instructions specific to him.<sup>90</sup>
- 23 And once healed and really come together, what is left of its flesh (*vadhra*) should then be trimmed. If it is reduced (*hīna*), however, one should make an effort to stretch it, and one should make its overgrown

añjana

- 83 The vulgate reads bound, connected (*baddham*) for slice of flesh (*vadhra*). This is a critical variant from the surgical point of view. If the slice remains connected, it will have a continuing blood supply. This is one of the effective techniques that so astonished surgeons witnessing a similar operation in Pune in the eighteenth century (**wuja-roots3**).
- 84 Or '... off the cheek, it is fixed to the end of the nose, which has been scarified'. The Sanskrit text is unfortunately not unambiguous on the important point of whether or not the flap of grafted skin remains connected to its original site on the cheek.
- 85 The Sanskrit here, *unnāmayitvā* is non-Pāṇinian.
- 86 *Caesalpinia sappan*, L. (AVS 1.323, IMP 2.847f.)
- 87 For *pattāṅga* there are manuscript variants *pattrāṅga* (MS H) and *pattāṅga* (N). We read with H and K (f. 14r:1) on **vulgate**. The vulgate reads *pataṅga* and this reading is propagated in modern dictionaries.
- 88 *Glycyrrhiza glabra*, L. (AVS 3.84, NK #1136)
- 89 *Berberis aristata*, DC. (Dymock 1.65, NK #685, GJM 562, IGP 141)
- 90 The expression *svayathopadeśa* is ungrammatical but supported in all available witnesses.

flesh smooth.

Draft of August 17, 2021 for private study only

## Sūtrasthāna, adhyāya 28

- 1 Thus, living creatures and their strength, complexion (*varṇa*) and energy (*ojas*) are rooted in food. That (food) depends on the six flavours (*rasa*). Thus, the flavours depend on substance (*dravya*), and substances depend on medicinal herbs. There are two kinds of them (herbs): stationary and mobile.<sup>91</sup>

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<sup>91</sup> SS 1.1.28 (**vulgate**), tr. **shar-susr**.

# Kalpasthāna, adhyāya 1

## Literature

A brief survey of this chapter's contents and a detailed assessment of the existing research on it to 2002 was provided by Meulenbeld.<sup>92</sup> Translations of this chapter since 2000 have appeared by **wuja-2003****shar-susr**.

More recently, a discussion of the fourth chapter of this section in the light of the Nepalese manuscripts was published by Harimoto.<sup>93</sup> After a close comparative reading of lists of poisonous snakes, Harimoto concluded that, "the Nepalese version is internally consistent while the [vulgate] editions are not." Harimoto showed how the vulgate editions,<sup>94</sup> had been adjusted textually to smooth over inconsistencies, and gave insights into these editorial processes.

## Manuscript notes

- MS Kathmandu NAK 5-333 has foliation letter numerals, for example on f. 323a, that are similar to MS Cambridge Add. 1693,<sup>95</sup> dated to 1165 CE noted in Bendall's chart of Nepalese letter-numerals **bend-budd**

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<sup>92</sup> **meul-hist**.

<sup>93</sup> **hari-2011**.

<sup>94</sup> The two editions **susr-trikamji3** and **bhat-1889**, that Harimoto noted present identical texts.

<sup>95</sup> Scan at [cudl.lib.cam.ac.uk/view/MS-ADD-01693/1](http://cudl.lib.cam.ac.uk/view/MS-ADD-01693/1).

## Translation

- 1–2 And now I shall explain the procedures for safeguarding food and drink, as were declared by the Venerable Dhanvantari.<sup>96</sup>
- 3 Divodāsa, the king of the earth, was the foremost supporter of religious discipline and virtue. With unblemished instruction he taught his students, of whom Suśruta was the leader.<sup>97</sup>

### [Threats to the king]

- 4–5 Evil-hearted enemies who have plucked up their courage, may seek to harm the king, who knows nothing of it. He may be assailed with poisons by or by his own people who have been subverted, wishing to pour the poison of their anger into any vulnerability they can find.<sup>98</sup>
- 6 Therefore, a king should always be protected from poison by a physician.
- 7 The racehorse-like fickleness of men's minds is well known. And for this reason, a king should never trust anyone.<sup>99</sup>
- 8–11 He should employ a doctor in his kitchen (*mahānasa*) who is respected

96 MS H adds in the margin अथ खलु वत्स सुश्रुतः “Now begins Vatsa Suśruta.” This phrase has been copied here by the scribe from the beginning of the *Suśrutasaṃhitā* chapter in the *sūtrasthāna* on the rules about food and drink (SS 1.46.3 (**vulgate**)). The scribe presumably felt, not unreasonably, that this section had common subject matter with the present chapter. Further, SS 1.46.3 is the only place in the Nepalese transmission of the *Suśrutasaṃhitā* that names Dhanvantari and integrates him into the narrative of the *Suśrutasaṃhitā* as the teacher of Suśruta.

The mention of Dhanvantari here is the only other time in the Nepalese transmission that this authority is cited as the source of Ayurvedic teaching, and the unique occurrence of this actual phrase, “as was declared by the Venerable Dhanvantari.” See the discussion by **kleb-2021b**, who concludes that the earliest recoverable recension of the *Suśrutasaṃhitā* may have had the phrase only at this point and not elsewhere in the work.

97 This is a quite different statement from the vulgate (**susr-trikamjī3**) that has Dhanvantari as the teacher, and calls him the Lord of Kāśī (*kāśīpati*). Dalhaṇa followed the vulgate but explicitly noted the reading before us with small differences: दिवोदासः क्षितिपतिस्तपोधर्मश्रुताकरः “Divodāsa, the king of the earth, was a mine of traditions about discipline and virtue.”

98 Verses about the use of Venemous Virgins as a weapon do not appear in the Nepalese manuscripts. Cf. **wuja-2003**. This material is present in the commentary of Gayadāsa.

99 The verb √śvas is conjugated as a first class root in the Nepalese manuscripts.

- by experts, who belongs to a good family, is orthodox, sympathetic, not emaciated, and always busy.
- 12–13 The kitchen should be constructed at a recommended location and orientation. It should have a lot of light,<sup>100</sup> have clean utensils and be staffed by men and women who have been vetted.<sup>101</sup>
- 17–18ab The chefs, bearers (*voḍhāra*), and makers of boiled rice soups and cakes and whoever else might be there, must all be under the strict control of the doctor.<sup>102</sup>
- 18cd–19ab An expert knows people’s body language (*iṅgita*) through abnormalities in voice, movement and facial expression. He should be able to identify a poisoner by the following signs.
- 19cd–23 Wanting to speak, he gets confused, when asked a question, he never arrives at an answer, and he talks a lot of confused nonsense, like a fool. He laughs for no reason, cracks his knuckles and scratches at the ground. He gets the shakes and glances nervously from one person to another. His face is drained of colour, he is grimy (*dhyāma*) and he cuts at things with his nails.<sup>103</sup> A poisoner goes the wrong way and is absent-minded.
- 25–27 I shall explain the signs to look for in toothbrush twigs, in food and drink as well as in massage oil (*abhyāṅga*) and combs (*avalekhana*); in dry rubs (*utsādana*) and showers, in decoctions (*kaṣāya*) and massage ointment (*anulepana*); in garlands (*sraja*), clothes, beds, armour and ornaments; in slippers and footstools, and on the backs of elephants and horses; in nasya (*snuff*), inhaled smoke (*dhūma*), eye make-up (*añjana*), etc., and any other things which are commonly poisoned. Then, I shall also explain the remedy.
- 28 Flies or crows or other creatures that eat a poisonous morsel (*bali*) served from the king’s portion, die on the spot.

Cf. Arthaśāstra 1.21.8.

100 We read महच्छुचिः with the Nepalese manuscripts and against the vulgate’s महच्छुचि. We understand शुचिस् as a neuter noun meaning “light” following **apte-prac**.

101 Verses detailing the ideal staff are omitted in the Nepalese manuscripts. Cf. **susr-trikamji3wuja-2003**.

102 The word सौपोदनैकपूपिक “chefs for the boiled rice soups and cakes” is grammatically interesting. The term सूपोदन (as opposed to sūpaudana) is attested in the *Bodhāyanīya-grhyasūtra* 2.10.54 (**shas-1920**). More pertinently, perhaps, सूपोदन is attested in the Bower Manuscript, part II, leaf 11r, line 3 (**hoer-bowe**).

103 The word ध्याम is glossed by Ḍalhaṇa (in a variant reading) as someone who is the colour of dirty clothes SS 5.1 (**vulgate**).



- 29 Such food makes a fire crackle violently, and gives it an overpowering colour like a peacock's throat.
- 30–33 After a chukar partridge looks at food which has poison mingled with it, its eyes are promptly drained of colour; a peacock pheasant drops dead. A koel changes its song and the common crane rises up excitedly.<sup>104</sup> It will excite a peacock and the terrified parakeet and the hill myna screech. The swan trembles very much, and the racket-tailed drongo churrs.<sup>105</sup> The chital deer sheds tears and the monkey releases excrement.<sup>106</sup>
- 34 Vapour rising from food that has been abused gives rise to a pain in the heart, it makes the eyes roll, and it gives one a headache.<sup>107</sup>
- 35, 36cd In such a case, an errhine and a collyrium that are costus, *lāmajja* grass (*lāmajja*), spikenard (*nalada*) and liquorice (*madhus*);<sup>108</sup> a paste of sandalwood on the heart may also provide relief.<sup>109</sup>
- 37 Reaching the hands, it makes them burn, and the nails fall out. In such a

104 The verb अर्च्छति “rises up” is a rare form best known from epic Sanskrit (ober-2003). The transmitted form क्रौञ्च is obviously a colloquial version of Sanskrit क्रौञ्च. Commenting on SS 1.7.10 (vulgate), Ḍalhaṇa interestingly gives the colloquial versions of several Sanskrit bird names, even singling out pronunciation in the specific location of Kānyakubja. For क्रौञ्च he says that people pronounce it कुरञ्च and कौचि. The form क्रौञ्च is found in Pāli (see cone-dict, who notes that Ardhamāgadhī has the same form). Elsewhere, Ḍalhaṇa calls the bird क्रौञ्चिर, क्रौञ्चि, and कैचर (SS 1.46.105 (vulgate), SS 6.31.154 (vulgate) and (SS 6.58.44 (vulgate) respectively).

105 Ḍalhaṇa seemed confused about the racket-tailed drongo (भृङ्गराज). He called it a generic drongo (भ्रमरक), a word that can also mean “bee,” (dave), and then said that it is like the black drongo (धूम्याट) (dave) and that people call it “the king of birds.”

106 MS KL 699 reads bull (वृषभ) for Chital deer (पृषत). The latter may perhaps be mistaken for the former in the Newa script, although the reading of MS KL 699 is hard to read at this point.

107 “Abused” translates उपक्षिप्त. The word’s semantic field includes “to hurl, throw against,” and especially “to insult verbally, insinuate, accuse.” The commentator Ḍalhaṇa glossed the term as, “spoiled food given to be eaten” (विदूषितस्यान्नस्य भोक्तुं दत्तस्य), but he noted that some people read “उखाक्षिप्त” or “thrown into a pan.” Other translators have commonly translated it as “served,” perhaps influenced by Ḍalhaṇa’s “given (दत्त).”

108 The vulgate supplies another phrase and verb at this point that is not present in the Nepalese transmission, but that makes the text flow more easily.

109 sing-1972 discussed the difficulties in identifying लामज्ज, a plant cited more often in the *Suśrutasamhitā* than in the *Carakasamhitā*; Ḍalhaṇa adopted the common view that it is a type of *uśīra* or vetiver grass. The grammatical neuter form मधुस् of the Nepalese manuscripts is less common than neuter मधु “honey, sweetness, liquorice”.

case, ointment (*pralepa*) is made of beautyberry (*śyāmā*) lac (*indragopā*) 'gentle' (*somā*) and water-lily (*utpala*).<sup>110</sup>

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<sup>110</sup> "Beautyberry" (*Callicarpa macrophylla* Vahl.) is one identification of *śyāmā*, but vaidyas and commentators have different ideas about the plant's identity (see [sing-1972avsnadk-1954](#)).

## Uttaratantra, adhyāya 16 (17 in the vulgate)

### Literature

Survey of this chapter and the existing research on it to 2002: **meul-hist**.

History of couching in India: **wujad-2019**; **desh-2000**; **desh-1999**; **bret-1826**; **leff-2020**; **shas-kaly**; **jack-1884**; **scot-1817**; **elli-1918**; **hend-1895**, **wuja-root3**.

### Translation

- 1 Now I shall explain the counteraction (*pratiṣedha*) of diseases located in the pupil (*drṣṭi*).
- 2 There are three curable (*sādhya*), three incurable (*asādhya*), and six mitigatable (*yāpya*) diseases located in peoples eyes. Among these, three are curable (*sādhya*). Amongst these three, the remedy (*pratīkāra*) has been stated for the one called “seeing smoke (*dhūmadarśin*)”.<sup>111</sup>
- 3–5ab When the eye is inflamed (*vidagdha*) by bile and when it is inflamed by phlegm, one should apply the method for removing bile and phlegm, using nasal medicines (*nasya*), irrigation (*seka*), application of collyrium (*añjana*), liniment (*ālepa*), and medicines cooked in a crucible (*puṭapāka*), together with a balm (*tarpaṇa*),<sup>112</sup> but not cutting with a blade (*śastrakṣata*).<sup>113</sup>  
One should drink ghee (*sarpis*) prepared with the three fruits (*triphalā*) and in the first [case where the problem is bile], and prepared with turpeth (*traivṛta*) in the latter [case, of phlegm].  
And ghee prepared with tilvaka (*tailvaka*) is wholesome in both cases, or else aged ghee on its own.
- 5cd–7ab In a collyrium, these four compounds (*yoga*) are beneficial in both cases:
  - ochre (*gairika*), Sind salt (*saindhava*), long pepper (*kṛṣṇā*) and the black soot (*maṣī*) from cow’s teeth;

where is cutting with a knife related to removing bile or phlegm.

maṣī burned charcoal. Find refs.

<sup>111</sup> This disease and its cure are described earlier (SS.6.7.39 and SS.6.10.16 (**vulgate**) respectively). The latter part of this verse is hard to construe and the text here may have been altered at an early period.

<sup>112</sup> These therapies are described in SS.6.18 (**vulgate**).

<sup>113</sup> Dalhaṇa interprets this as blood-letting (*sirāvedha*), which is discussed in SS.1.14 (**vulgate**).

- Cow's flesh (*gomāṃsa*), black pepper (*marica*), siris (*śirīṣa*) and red arsenic (*manahśilā*);
  - stalk (*vr̥nta*) from a wood apple (*kapittha*) with honey (*madhu*);<sup>114</sup>
  - or the the fruits of the velvet bean (*svayaṃgupta*).
- 8 The physician should make a collyrium with ground up metal (*kupyaka*),<sup>115</sup> Asoka tree (*aśoka*), Sal tree (*śālā*), mango (*amra*), beautyberry (*priyaṃgu*), Indian lotus (*nalina*), blue lotus (*utpala*), together with hareṇu (*hareṇu*), emblic (*āmalaka*), myrobalan (*pathyā*), long pepper (*pippali*). It should be combined with ghee and honey (*kṣaudra*).
- 9–10 Also, when bile and phlegm have developed, the physician should apply hareṇu (*hareṇu*) with the expressed juice (*svarasa*) of the flowers from mango (*amra*) and Jambu (*jambū*) trees. Then this collyrium, matured (*vipakva*) with ghee and honey (*kṣaudra*), should then be applied.
- 10–11ab Filaments (*kiñjalka*) of Indian lotus (*nalina*) and blue lotus (*utpala*), with ochre (*gairika*), and the juice of cow-dung (*gośakṛt*) are a collyrium in the form of a pill (*guḍikā*). This is good for both day and night blindness.
- 11cd–12ab Elixir-salve (*rasāñjana*), honey (*kṣaudra*), ghee, scrambleberry (*tālīśa*), together with gold and ochre, with the juice of cow-dung (*gośakṛt*) are for an eye afflicted with bile.
- 12cd–13 Alternatively, wise physician should first grind together elixir-salve (*śīta*) and stibnite (*sauvīraka*), infused (*bhāvita*) with the blood of birds and animals (*rasa*).<sup>116</sup> Then he mixes it with the bile of a tortoise or with extract of rohu carp (*rauhita*). It should always be used with powdered collyrium to quell the bile.
- 14 Thus, a collyrium of white teak (*kārśmarī*) flowers, liquorice (*madhuka*), tree turmeric (*dārvī*), lodh tree (*lodhra*) and elixir salve (*rasāñjana*) is always good as a collyrium in this case.
- 15 Alternatively, for those who cannot see during the day, this pill (*guḍikā*), with sandalwood, is recommended: salt (*nadīja*), conch shell and

114 Wood apple (कपित्थ) in this verse is ablative singular or accusative plural, neither of which construe obviously.

115 A metal other than gold or silver, according to **josi-maha**. Perhaps lead, which is used in making contemporary collyrium.

116 This is Ḍaḥṇa's preferred interpretation of *rasa* "juice" in this context. He also notes that some take elixir-salve (*śīta*) to be camphor.

- the three spices, collyrium, realgar (*manaḥśilā*), the two turmeric (*ra-jana*)<sup>117</sup> and liver extract (*yakṛdrasa*).<sup>118</sup>
- 16 One should grind up kohl (*srotoja*),<sup>119</sup> and Sind salt (*saindhava*) and long pepper and also hareṇu (*hareṇu*). Such wicks with goats urine are good in a collyrium for night blindness (*kṣaṇadāndhya*).
- 17–18ab Alternatively, in such a case, grind together Indian sarsaparilla (*kālā-nusāriva*)<sup>120</sup> long pepper, dried ginger (*nāgara*) and honey, the leaf of the scramberry (*tālīśapatra*), the two turmeric (*rajana*), a conch shell and liver extract (*yakṛdrasa*). Then shade-dried wicks take away illness (*ruj*).
- 18cd–19ab Wicks made of red arsenic (*manaḥśilā*), chebulic myrobalan (*abhayā*), the three spices (*vyoṣa*). Indian sarsaparilla (*sāriva*), cuttlefish bone (*samudraphena*), combined with goat’s milk are good.
- 19cd–21ab One should cook a honey collyrium (*kṣaudrāñjana*) either in the juices of cow’s urine (*gomūtra*), and bile, spirits (*madirā*), liver (*yakṛt*), and emblic (*dhātṛī*) or else in the juice of the liver (*yakṛt*) of something different, or else with the extract of the three fruits (*triphalā*). One of these should be mixed with cow urine, ghee and cuttle fish (*aṇṇavamala*)<sup>121</sup> with long pepper, honey and box myrtle (*kaṭṭphala*). It is placed in sea salt and stored in a bamboo tube.
- 21cd–22 One should cook the liver of a sheep, the ghee of a goat, with long pepper and Sindh salt, honey and the juice of emblics. Then one should store it properly in a catechu box. Prepared thus, the honey collyrium is good.
- 23 Alternatively, a collyrium that is hareṇu (*hareṇu*) mixed with long pepper (*māgadhi*), the bone and the marrow of a goat, cardamom (*elā*) and liver, together with liver extract, is good for eyes afflicted by phlegm.<sup>122</sup>

117 Turmeric (*Curcuma longa* Linn.) and tree turmeric (*Berberis aristata* DC). The term *rajana* is unusual; the normal term is *rajanī*. *Rajana* occurs in *Suśrutaniḥṣaṇṭu* 158 in the sense of *Ferula asafoetida*, Linn.

118 This verse appears as no. 27 in the vulgate.

119 Glossed by Ḍalhaṇa as a kind of collyrium. Cf. **nadk-1954** and **shar-1982**

120 There are two forms of *sārivā* mentioned widely in Ayurvedic literature, the white and the black. Ideas on the identity of the black form are particularly fluid. See **adps** for a clear discussion.

121 At SS 6.12.31, Ḍalhaṇa glossed *aṇṇavamala* as cuttlefish bone (*samudraphena*). It may be worth considering whether the unusual term *aṇṇavamala* “ocean-filth” might refer to ambergris.

122 On the identities of *elā* and *hareṇu*, **watt-comm** described the former as “true” or

- 24 Over a fire, one should cook the liver (*yakṛt*) of a monitor lizard (*godhā*) prepared with entrails (*antra*) and stuffed with long pepper (*māgadhi*). As is well known, liver (*yakṛt*) which is used (*niṣevita*) with collyrium certainly destroys night blindness.
- 25 After preparing both a spleen (*plīhan*) and a liver on a spit, one should eat them both with ghee and oil.<sup>123</sup>
- 25cd–26ab As is well known, there are six diseases that can be alleviated (*yāpya*); in those cases (*tatra*) one should release the blood by bloodletting. And for the sake of wellbeing one should also purge using aged ghee combined (*upahita*) with purgative aids (*aṅga*).
- 26cd–27 When an eye-disease is caused by wind (*pavanodbhava*) they say that castor oil (*pañcāṅgulataila*) mixed with milk is good.<sup>124</sup> In the case of diseases of blood (*śonita*) and bile (*pitta*), one should drink ghee with the three fruits; it is particularly cleansing.<sup>125</sup> In the case of phlegm, a purgative by means of turpeth (*trivṛt*) is recommended. In the case of all three humours, sandal (*sugandhi*) in oil is prepared with it (turpeth).<sup>126</sup>
- 28 In cases of partial blindness (*timira*), aged ghee is recommended. It is good if it is kept in an iron vessel.
- 28cd–29ab One should know that ghee with the three mylobalans is always good, and it is made with what is called periploca of the woods (*meṣaviśāṇa*). A man who is suffering from partial blindness should lick the finely-

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“lesser” or “Malabar” cardamom, *Elettaria cardamomum*, Maton & White. In contrast, the “greater” cardamom is *Amomum subulatum* (that Watt discussed on p. 65) that is commonly used as an inferior substitute for *E. cardamomum*. **sing-1972** provided an interesting discussion of *hareṇu*, noting that the term refers to two substances, first the *satīna* pulse (*Pisum sativum*, Linn.), and second an unknown fruit such as perhaps a *Vitex*. They noted, “None of the text commentators have attempted to disclose the nature of its source plant,” although Ḍalhaṇa described it as aromatic and identical to *reṇukā* (SS.ci.2.75).

123 We read the locative as if an instrumental; if the locative were intended then it would be the spit that would be coated with oil and ghee.

124 Ḍalhaṇa says that the unexpressed topic of this recipe is partial blindness (*timira*).

125 Blood-bile (*śonita-pitta*, *rakta-pitta*) is a widely-recognized disease in ayurveda, but the compound here is definitely dual, which rules out that interpretation. One would expect blood-bile because the previous verse

126 The expression “the fragrant one in oil (*tailasugandhi*)” is puzzling. The word *sugandhi* has different referents in the *Nighaṇṭu* literature but is not common as a noun in the extant literature. “Sandal” is just one of its possible meanings.

- ground three fruits mixed with ghee off his hand (*sapāṇa*).<sup>127</sup>
- 29cd Alternatively, someone afflicted by phlegm should apply them (the three fruits) mixed with oil and steeped (*pragāḍha*) in honey.
- 30 The very best oil, well-cooked with a decoction of cow-dung, is good in cases of partial blindness, taken as an errhine.  
In cases caused by bile, ghee by itself is good, as is oil when it arises from wind and blood.
- 31 And in the case of wind one should apply turpeth (*trivṛt*) based on strong mallow (*atibalā*), and country mallow (*balā*) in an errhine (*nasya*).<sup>128</sup>  
Ghee which has been extracted from milk cooked with the meat of aquatic creatures and those from marshlands should be prescribed.
- 32 †An enclosed roasting (*puṭākhyā*) with Sindh salt and the product of the meat of a carnivore (*kravyabhuj*) and a deer (*eṇa*), is combined with honey and ghee.<sup>129</sup>  
Fat (*vasā*) from a horse, a vulture, a snake, and a cock (*tāmracūḍa*), combined with mahua (*madhūka*) is always good in a collyrium.†<sup>130</sup>
- 33 Having prepared (*niṣevita*) a collyrium made of kohl (*srotas*) and gradually combine it with juices (*rasa*), milk and ghee.<sup>131</sup>  
For thirty days, this collyrium is put in the mouth of a black snake that

127 “Off his hand” translates the adverbial *sapāṇam*, an unusual word. Ḍalhaṇa reproduces a reading close to the Nepalese recension but says that Jejjāta rejects it and so he also does (**susr-trikamjī**).

128 “Based on” translates *-āśrita* “depending on” which does not construe easily here. The vulgate has *śṛta* “cooked” which makes easier sense but is not supported by the Nepalese MSS.

129 Ḍalhaṇa notes (**vulgate**) that *puṭāhvaya* (see verse 35 below) is a synonym for *puṭapāka*, and that the process is described in the *Kriyākālpa* chapter, i.e., SS.6.18.33–38 (**vulgate**). On the *puṭa* process in the *Suśrutasaṃhitā*, which is earlier and different than that of *rasaśāstra* literature, see the discussion by **wujad-2019**:

The term ‘enclosed roasting’ (*puṭapāka*) does occur in the *Suśrutasaṃhitā* in the context of eye treatments, but designates a method of obtaining juice from substances by wrapping them in leaves pasted with earth and cooking the bolus on charcoal to finally extract a juice.

130 This verse contain irresolvable difficulties. There are no significant variants in the Nepalese MS transmission, but the text is ungrammatical. The vulgate reads substantially differently but we have nevertheless made some emendations in line with it and read the verse as two sentences.

131 Ḍalhaṇa specifies that the juices are meat soups of various animals (**vulgate**).



- is covered with kuśa grass (*kuśa*).
- 34 Next, a collyrium that is milk containing long pepper (*māgadhi*), lye (*kṣāraka*) and Sindh salt (*saindhava*) that has been repeatedly prepared with the mouth of a black snake, is good in the case of bloodshot blindness (*rāgin timira*).<sup>132</sup>
- 35 They say that ghee may be produced from that and combined with sweet herbs is good as an errhine for eye-diseases caused by bile. And here, a balm (*tarpaṇa*) is good that is a combination that is the flesh of wild animals taken hot (*puṭāhvaya*).<sup>133</sup>
- 36 And realgar (*manaḥśilā*) mixed with elixir salve (*rasāñjana*) and honey is a liquid collyrium (*dravāñjana*) which is, in this case, combined with mahua (*madhūka*).<sup>134</sup>
- Alternatively, experts on this say that finely ground blue vitriol (*tuttha*) extracted from a gold mine is the “same collyrium (*samāñjana*)”.<sup>135</sup>
- 37 Conch mixed with equal parts of sheep’s horn and stibnite (*añjana*) removes the impurity of the glassy opacity (*kāca*) because of the application of collyrium (*añjana*).<sup>136</sup>
- The extracts (*rasa*) produced from aflame of the forest (*palāśa*), Rohīta tree (*rohīta*),<sup>137</sup> mahua (*madhūka*), ground with the supernatant layer (*agra*) of the spirits (*madira*) is applied.
- 38 Alternatively, one should cook an errhine with cuscus grass (*uśīra*), lodh tree (*lodhra*), the three fruits (*triphalā*), beauty berry (*priyaṅgu*) to pacify eye diseases caused by phlegm.<sup>138</sup>
- One should apply smoke of the bark of embelia (*vidaṅga*), velvet leaf

132 Ḍalhaṇa describes this blindness as a type of *kāca* disease caused by wind (**susr-trikamji3**). The expression “bloodshot blindness” is an attempt to capture the idea of a blind eye that is dyed or coloured (not colour-blindness). This verse is quite different from the vulgate and also syntactically challenging.

133 The expression taken hot (*puṭāhvaya*) is a guess.

134 The expression liquid collyrium (*dravāñjana*) is only known from Ḍalhaṇa’s comments on SS.6.17.11ab (**vulgate**). The recipe in the present collyrium is different from that discussed by Ḍalhaṇa.

135 The expression “same collyrium (*samāñjana*)” is a hapax legomenon glossed inexplicably by Ḍalhaṇa as “a collyrium with an equal amount of fermented barley” (*tulya-sauvīrāñjana*) (**vulgate**).

136 The ablative “from collyrium” is hard to construe, but Ḍalhaṇa uses this term and phrase in his commentary on SS 6.17.41ab (**vulgate**).

137 Probably *Soymida febrifuga* A. Juss.

138 Ḍalhaṇa invokes a general rule (*paribhāṣā*) to indicate that this mixture should be cooked with sesame oil.



- (*pāthā*), white siris (*kinihī*), and desert date (*iṅgudī*); and cuscus grass (*uśīra*) alone.
- 39 A ghee that is cooked (*bhāvita*) from a decoction of a non-flowering tree (*vanaspati*)<sup>139</sup> as well as turmeric (*haridrā*) and spikenard (*nalada*) is good in a balm (*tarpaṇa*).  
Alternatively, one may have an enclosed roasting (*puṭapāka*) done with arid-land animals (*jāṅgala*)<sup>140</sup> and a plentiful amount of long pepper (*māgadha*), Sindh salt and honey.
- 40 A treatment (*kriyā*) with realgar (*manaḥśilā*), the three spices, conch, honey, along with Sindh salt, green vitriol (*kāsīsa*) and elixir salve (*rasāñjana*).<sup>141</sup>  
They say that an elixir salve (*rasāñjana*) combined with myrobalans, treacle and dried ginger is good.<sup>142</sup>
- 41 Alternatively, a collyrium that has been prepared many times in the eight types of urine<sup>143</sup> is put into water with the three fruits. Having stored it in the mouth of a nocturnal creature (*niśācara*)<sup>144</sup> one should place it in a conch (*salilotthita*) for two months.<sup>145</sup>
- 42 One should apply that collyrium together with the flowers of mahua (*madhūka*) and horseradish tree (*śigru*) when [the disease] is caused by all [the humours].  
But alternatively, all treatments apply when blood is the cause. The procedure that removes bile is good when there is blue dot cataract (*mlāyin*).<sup>146</sup>
- 43 For one who has a humour, the physician should consider the rule in

find ref.

Check out these refs.

139 These are fig trees. The *Sauśrutanighaṇṭu* (252) specifies the Uḍumbara. Cf. the classification in CS.1.1.71–72, 1.8, *et passim*.

140 On this term, see SS.1.35.42 (**vulgate**) and the discussion by **zimm-1999**.

141 Ḍalhaṇa glosses treatment (*kriyā*) specifically as inspissation (*rasakriyā*) (**vulgate**).

142 We emend *hite* to *hitam*, against the MSS.

143 See SS *mūtravarga*

144 Ḍalhaṇa glosses nocturnal creature (*niśācara*) as “vulture,” although elsewhere in the SS it is more commonly interpreted as a spirit or demon. In the present context, following verses 33 and 34, it is probably a snake.

145 We interpret “water-born (*salilotthita*)” as “conch” in line with *jalodbhava*, but the term is uncertain.

146 The vulgate follows Ḍalhaṇa in glossing *mlāyin* as *parimlāya*. The description of this condition at SS.6.7.27–28 appears to refer to “blue dot” or “cerulean” cataract. √*mlai* derivatives can mean “dark” or “black.”), which is normally a different ailment.

- all humoral cases and then smear the ointment on the face.<sup>147</sup>  
 The treatment that is good for removing watery eye (*syanda*) should be properly applied in all these humoral cases, according to the individual.<sup>148</sup>
- 44 The physician should not employ substances in errhines etc., when the humours intensify, and also when disease spreads. And further, in the *Kalpa*, there is a good deal more said about collyriums, and that should be considered and then applied.<sup>149</sup>
- 45 Someone who uses matured ghee, the three fruits, wild asparagus (*śa-tāvarī*), as well as mung beans (*mudga*), emblic and barley has nothing to fear from cases of severe blindness (*timira*).
- 46 Blindness is dispelled by milk prepared with wild asparagus or in emblics, or again cooked barley (*yavaudana*) followed by the water of three fruits with plenty of ghee.
- 47 When there is bloodshot blindness (*rāgiṇi timire*), the wise physician should not cut a vein. A humour injured (*utpīḍita*) by the instrument rapidly destroys vision.
- 48 Non-bloodshot blindness (*araga timira*) in the first layer (*paṭala*) is treatable. And bloodshot blindness (*rāgiṇi timire*) in the second layer, with difficulty. And in the third layer it is mitigable (*yāpya*).
- 49 I shall explain the therapy for success when there is a cataract (*liṅga-nāśa*) caused by phlegm. It may be white, like a full moon, an umbrella, a pearl (*muktā*) or a spiral (*āvarta*).
- 50 Or it may be uneven, thin in the middle, streaked or have excessive shine (*prabha*). A humour (*doṣa*) in the pupil may be characterized as being painful or having blood.<sup>150</sup>
- 51–52 At a time that is neither too hot or too cold, the patient who has been oiled and sweated is restrained and seated, looking symmetrically at his own nose.  
 The wise physician should separate (*muktvā*) two white sections from

147 The vulgate edition omits part of this verse (ab) combining earlier and later passages.

148 The term watery eye (*syanda*) refers to the specific disease *abhiṣyanda*. See SS.6.6.5, 1.46.51, etc.

149 Ḍalhaṇa notes that *Kalpa* means the Uttaratānta adhyāya 18 (**vulgate**).

150 In the vulgate, and in parallel passages in the AS, the reading “it may be (*bhavet*)” is replaced with the negative “if, then not (*na ced*)” (cf. AS utt.17.1–3 (**atha-1980**)). These characteristics are then read as conditions that preclude surgery; for the Nepalese recension, they are simply descriptions of the appearance of a cataract.

the black part (*kṛṣṇa*) and from the outer corner of the eye (*apāṅga*). Having pīḍ- (*pressed*) properly into the eye,<sup>151</sup> at the naturally occurring (*daivakṛte*) hole (*chidra*) with the probe (*śalākā*) made of copper or iron, with a tip like a barley-corn that is held by a steady hand with the middle finger, forefinger and thumb, the left one with the right hand and the other one contrariwise.

When the piercing is done, there is the simultaneous issue of a drop of liquid and a sound.<sup>152</sup>

- 55 The expert should moisten the exact place of piercing with a woman's breast-milk. Then he should scratch the circuit of the pupil (*drṣṭimanḍala*) with the tip of the probe (*śalākā*).<sup>153</sup>
- 56 Without injuring, gently pushing the phlegm in the circuit of the pupil against the nose, he should remove it by means of sniffing (*ucchiṅgana*).<sup>154</sup>
- 57 Whether the humour is solid (*styāna*) or liquid (*cala*), one should apply sweating to the eye externally, with leaves (*bhaṅga*) that remove wind, after fixing the needle (*sūcī*) properly.<sup>155</sup>
- 58 But if the humour cannot be destroyed or if it comes back, one should apply the piercing (*vyadha*) once again, with appropriate oils and so on.
- 59 Now the pupil (*drṣṭi*) shines like the sun (*hari*) in a cloudless sky; then, when objects become visible, one may slowly remove the probe (*śalākā*).<sup>156</sup>
- 60 Having smeared ghee on the eye, one should cover it with a bandage.

151 We understand the locative *nayane* as the place of pressing; other interpreters take it as an accusative dual. The idea is that the eye is held steady by the surgeon.

152 Ḍalhaṇa interprets simultaneous (*samyak*) rather as "proper," referring to the proper kind of incision.

153 The anatomy of the eye is described in SS 6.1.14–16 (**vulgate**) The disks or *maṇḍalas* are the circuits or disks of the eye.

154 Ḍalhaṇa describes sniffing (*ucchiṅgana*) at SS 6.19.8 (**vulgate**), clearly intending inward sniffing.

155 We interpret *bhaṅga* as leaves, following the usage elsewhere in this sthāna SS 4.32.9, 6.11.5 (**vulgate**) where *bhaṅga* means shoots (*pallava*). A similar procedure is described at AS 6.17.25 (**atha-1980**), where sweating of the eye is done by means of the leaves of a castor-oil plant.

156 There are many problems with the MS readings and interpretation of this half-verse. We have inferred "sky" and emended from "free from the point (*agramukta*)" to "free from clouds (*abhramukta*)". The latter meaning is supported (in different words) by the vulgate and occurs elsewhere in Sanskrit literature.

- Then, he must lie down supine in a house free from disturbances.<sup>157</sup>
- 61 At that time, he should not belch, cough, sneeze, spit or shiver. Afterwards there should be restrictions (*yantraṇā*) as in the case of someone who has drunk oil.<sup>158</sup>
- 62 Every three days one should wash it with decoctions (*kaṣāya*) that remove wind. After three days, one should sweat the eye externally because of the danger of wind.
- 63 Having restrained himself in this way for ten days he should thereafter take a beneficial regimen (*karma*) that clears the pupil (*dṛṣṭi*) and also he should take light food in measure.

### [Complications]

- 64 When there is a misshapen eyeball (*vilocana*), the eye may fill because of the release of blood from a vein.<sup>159</sup>  
A hard probe leads to shooting pain (*śūla*), a thin to unsteadiness of the humours (*doṣapariplava*),<sup>160</sup>
- 65 a thick-tipped probe leads to a large wound, and a sharp one may cause harm in many ways; a very irregular one may cause a discharge of water, a rigid (*sthirā*) one brings about a loss of function (*kriyāsaṅga*).<sup>161</sup>
- 66 Therefore, one should make a good probe that is free from these defects.

### [Characteristics of the probe]

The probe should be eight finger-breadths long and in the middle it is wrapped with thread and is as thick as a thumb joint. It is shaped like

- 157 Ḍalhaṇa explains disturbances specifically as dust, smoke, drafts and sunlight SS 6.17.67 (**vulgate**).
- 158 Ḍalhaṇa glosses "restrictions (*yantraṇā*)" as having a controlled diet and the other restrictions appropriate to someone who is taking oil as a preparation before further therapy (SS 6.17.68 (**vulgate**)). These restrictions are also described at SS 6.18.28 (**vulgate**) and Ah 1.16.25cd (**kunt-1902**).
- 159 The condition of "misshapen eye" is referred to briefly in SS 6.61.9 (**vulgate**), where Ḍalhaṇa glosses it as "bent brow and eye (*vakrabhrūnetra*). The vulgate's reading of "with blood (*śonitena*)" is easier to construe.
- 160 There is a medically significant difference here from the vulgate, which reads "a rough (*khara*) probe" not a "thin" probe.
- 161 This translation of loss of function (*kriyāsaṅga*) is given on the basis of Ḍalhaṇa's gloss of *kriyāsaṅgakarī* as "causing the destruction of actions such as moving (*gamanādikriyāvināśakarī*)" at SS 3.8.19 (**vulgate**).

- a bud at both ends (*vaktra*).
- 67 A commendable probe should be made of silver, iron or gold (*śātaku-mbhī*).<sup>162</sup>

### [Complications]

- Redness, swelling, lumps, driness (*coṣa*), bubbling (*budbuda*),<sup>163</sup> pigs' eye (*sūkarākṣitā*),<sup>164</sup> irritation (*adhimantha*), etc. and other diseases arise from faults in the piercing,
- 69–70 or even from bad behaviour. One should treat them each accordingly. Listen to me once again about compounds for painful red eyes. Red chalk (*gairikāḥ*), Indian sarsaparilla (*śārivā*), panic grass (*dūrvā*), and ghee ground with barley.
- 71 This face ointment is to be used for quelling pain and redness. Or else it may be taken combined with the juice of citron (*mātulūṅga*) with sesame gently fried, mixed with white mustard (*siddhārthaka*).<sup>165</sup> This is immediately beneficial when someone is looking for relief.
- 72 A paste with *Holostemma* (*payasyā*),<sup>166</sup> Indian sarsaparilla (*śārivā*), cassia cinnamon (*patra*), Indian madder (*mañjiṣṭhā*), and liquorice (*madhukair*) stirred with goat's milk, pleasantly warmed, is said to be healthy.<sup>167</sup>
- 73 Alternatively, it can be made in this way with Himalayan cedar, Himalayan cherry (*padmaka*) and dried ginger. Or, in the same way, with grapes, liquorice and the Lodh tree mixed with Sindh salt.
- 74 Alternatively, goats' milk with the Lodh tree, Sindh salt, red grapes and

162 The vulgate reads "copper (*tāmra*)" in place of "silver."

163 Ḍalhaṇa glosses "bubbling (*budbuda*)" as "prolapse (*māṃsanirgama*) that looks like bubbles."

164 The expression "pigs' eye" appears to be a *hapax*. It is glossed as "downward vision (*adhodṛṣṭitva*)" by Ḍalhaṇa.

165 On the adverbial use of gently (*mṛdu*), see **gomb-1979**.

166 The identity of *payasyā* is debated (**sing-1972**), and was already in doubt at the time of Ḍalhaṇa but likely candidates may be those suggested by Ḍalhaṇa, who suggests either *arkapuṣpī* or *kṣīrakākoli*, that may be *Holostemma adakodien* Schult. and *Leptadenia reticulata* (Retz.) Wight & Arn. (**adps**). The *Sauśrutaniḥṣaṇṭu* glosses it as *kṣīrikā* or *arkapuṣpikā* (**suve-2000**).

167 The expression "stirred with goat's milk (*ajākṣīrārdita*)" is difficult. It may be connected with the rare root *ard* documented by **whit-root**. Cf. *√ard gatau* (*Dhātupāṭha* 1.56).

- liquorice, cooked, should be used in irrigation because it removes pain and redness.
- 75 Having cooked it with liquorice, water-lily, and costus, mixed with grapes (*drākṣā*), lac (*lākṣā*), white sugar (*sitā*), with wild asparagus, Hare Foot Uraria (*pr̥thakparṇī*),<sup>168</sup> nutgrass (*mustā*), liquorice, Himalayan cherry (*padmaka*), and Sindh salts, one should apply it [irrigation] gently warm.
- 76cd–77ab Ghee that has been cooked in four times the amount of milk that has itself been cooked with drugs that destroy wind.<sup>169</sup> This has an admixture of cottony jujube (*kākolī*) etc., should be prescribed in all treatments.<sup>170</sup>
- 77cd–78ab If pain does not end in this way, one should administer blood-letting to the vein of someone who has previously been oiled and sweated. Then the wise physician should apply cauterization in the advised manner.<sup>171</sup>
- 78cd–80ab Now listen to two excellent collyriums for making the pupils clear. After grinding the flowers of periploca of the woods (*meṣaśṛṅga*), siris (*śirīṣa*), axelwood (*dhava*) royal jasmine (*jātī*), pearl and beryl (*vaiḍūrya*) with goat's milk, one should put it in a copper pot for seven days.
- 80cd–81 Having made it into wicks (*vartti*), the physician should apply it as a collyrium. Alternatively, one should make kohl (*srotoja*), coral (*vi-druma*), cuttlefish bone (*phena*), and realgar (*manaḥśilā*) and peppers into wicks as before. One should apply these wicks, which are good in a collyrium, to steady the pupil.
- 82 I shall again discuss the foremost collyriums at length in the *Kriyākālpa* section. Those various methods may be applied here too.

or a dual?

<sup>168</sup> suve-2000.

<sup>169</sup> Ḍalhaṇa mentions that these drugs include Deodar (*bhadradāru*) and other wind-destroying drugs. The *vātasamśamana* group is listed in *Suśrutasaṃhitā sūtrasthāna* 1.39.7.

<sup>170</sup> Ḍalhaṇa notes that this would include errhines, ointments, etc.

<sup>171</sup> The vulgate reads *vāpi* for *cāpi*, so Ḍalhaṇa sees blood-letting and cautery as alternatives, not a sequence of treatments. Ḍalhaṇa lists the places that cauterization may be applied, such as the brow, forehead, etc.

## Abbreviations

Ah1902	Kuṁṭe, Ananta Moreśvara and Navare, Kṛṣṇaśāstrī Rāmacandra (1902) (eds.), श्रीमद्वाग्भटविरचितम् अष्टाङ्गहृदयम्, सूत्र-शारीर-निदान-चिकित्सा-कल्प-उत्तरस्थानविभक्तम् श्रीमदरुणदत्त-प्रणीतया सर्वाङ्गसुन्दर्याख्यया व्याख्यया समलंकृतम् (Kṛṣṇadāsa Āyurveda Sīrīja, 3; Mumbayyām: Nirṇayasāgara Press).
AS 1980	Āṭhavale, Anaṁta Dāmodara (1980) (ed.), <i>Aṣṭāṅgasan̄grahaḥ. Śrīmad Vṛddhāvāgbhaṭaviracitaḥ Induvyākhyāsahitaḥ</i> (Pune: Maheśa Anaṁta Āṭhavale, Śrīmad Ātreya Prakāśanam), <a href="https://nopr.sri-ganga.ac.in/handle/123456789/13960/t9773bb9z">ark:/13960/t9773bb9z</a> .
Bhela 1921	Mookerjee, Ashutosh and Ananta Krishna Shastri, Vedantabisharad (1921) (eds.), <i>The Bhela Samhita. Sanskrit Text</i> (Calcutta: University of Calcutta), <a href="https://nopr.sri-ganga.ac.in/handle/123456789/13960/t3sv3157j">ark:/13960/t3sv3157j</a> ; Based on two copies made of the Thanjavur codex unicus (MS Thanjavur TMSSML 10773, <b>burn-clas, sast-desc16</b> ).
Bhela 2000	Krishnamurthy, K. H. (2000), <i>Bhela-saṁhitā. Text with English Translation, Commentary and Critical Notes</i> (Haridas Ayurveda Series, 8; Varanasi: Chaukhambha Visvabharati).
HIML	Meulenbeld, Gerrit Jan (1999–2002), <i>A History of Indian Medical Literature</i> , 5 vols. (Groningen: E. Forsten), ISBN: 9069801248.
NCC	Raghavan, V. et al. (1949–), <i>New Catalogus Catalogorum, an Alphabetical Register of Sanskrit and Allied Works and Authors</i> , 39 vols. (Madras University Sanskrit Series; Madras: University of Madras); v.1: revised edition, 1968.



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## Glossary

‘a man who holds the child’  
*bālagrāhipuruṣa*: 21  
 ‘a wick that is too thick’  
*gāḍhataravartitva*: 22  
 ‘because of the accumulation of humours’  
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Kathmandu NAK 5-333: 8, 10, 30

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Kathmandu, NAK 1-1079: 2

Kathmandu, NAK 5-333: 2

London BL H. T. Colebrooke 908: 10

Mumbai, AS B.D.109: 6

Mumbai, AS B.I.3: 6

Thanjavur TMSSML 10773: 47

## Appendix

### On digital critical editions

- **pric-2013.**  
A survey of the field in 2013, with a focus on the presentation of electronic texts rather than on critical editing as such.
- **mour-2015.**  
Useful discussion about the *apparatus criticus* in general, and an evaluation of the plus and minus points of positive and negative apparatuses.
- **burg-2016.**  
Discussion of a software tool, including the handling of positive and negative apparatus. Makes the assumption that online displays are notational variants only.
- **burg-2017.**  
Discussion of how to express various kinds of apparatus in TEI.
- **baus-2015b.**  
A huge book that disappointingly says nothing at all about Sanskrit manuscripts. Nevertheless there are many interesting case studies and remarks applicable to the Indian manuscript tradition.