

8.18 Lexicographic Traditions in India and Sanskrit

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Abstract— Lexicographic Tradition of Sanskrit (Vedic age, Classical age [Amarakoṣa, other 11 lexica, analysis, the concept of synonymy and homonymy], Modern age [Wörterbuch, Monier Williams, Encyclopaedic Dictionary of Sanskrit on historical principles])... Grammatical lexicon... Application of Panini's grammar to create new lexica)

Index Terms— Dictionary, Lexicographic, Lexica, Panini, Sanskrit, Synonymy, Homonymy

I. INTRODUCTION

THIS paper is aimed at two things- 1) to take an overview of the lexicographic tradition of Sanskrit, highlighting the main features, and 2) to present a model of Sanskrit grammar towards developing new Lexica of newly coined terms for the purpose of creation and use of scientific and technological terminologies. The lexicographic tradition of Sanskrit is divided under three heads - a) Descriptive, b) Historical and c) Etymological. We here, propose to give a brief overview of the first two classes. Amongst them, we can demarcate three stages, chronologically-the Vedic age, the classical age and the modern age.

II. VEDIC AGE

Preservation of Vedic literature was the biggest motivation for the Linguistic activity in India some approximately 2500 years ago. This activity resulted in segmenting Vedic sentences into words, and words into root-suffix components. In this activity were rooted morphological, phonological as well as morpho-phonological theories that were developed and applied by Panini and his tradition in the grammar of Sanskrit. The oldest known lexica of Sanskrit are entitled Nighantu (700BC) on which Yaska is believed to have written a commentary called Nirukta. There are believed to be several works known as Nighantus. These lexica are domain specific. They have only Vedic words as Lexemes. We find references in the Pali literature to Nighantus as well. The Nighantus have arranged lexical material from the point of view of Synonymy as well as Homonymy. Yaska in his commentary tried to explain these word-forms from the etymological point of view.

III. CLASSICAL AGE

Researches in the field of Philology and Linguistics in the past two hundred years or so have made available to us many lexica in the printed form. We propose to take stock of some of these in the present section and to comment on their methodologies.

A. Amarakoṣa

The first and the foremost popular name of a lexicon in Sanskrit is that of Amarakoṣa written by Amarasimha before 6th century AD. Much has been said

about this lexicon and its arrangement. In fact, in one of the most valuable modern contributions to the subject at hand, namely, "History of Sanskrit Lexicography" by M. M. Patkar (being the revised version of the Ph.D. dissertation submitted to the University of Mumbai), the author devotes entries 9-27 out of the total 106 to Amarakoṣa and the commentaries thereupon and the mention of nearly 40 commentaries on this work in the Catalogous Catalogorum, speaks volumes of the importance and the popularity of this lexicon.

B. Arrangement of Amarakoṣa

The name of this lexicon is "Nāmaling-ānuśāsana", which means a work that deals with the lexemes and their genders. It is also known as Trikaṇḍaśeṣa and as the name suggests, it is divided into three chapters. Each chapter is further divided into sub sections called vargas. In the 1st Chapter, also known as Svargādikāṇḍa, there are nine subsections- Svarga (heaven), vyomadig (Ether and space), kāla (time), dhī (intellect), śaila (mountains), nāṭya (dramaturgy), pātālabhogi (nether world), naraka (hell), and vāri (water). In the second chapter, known as bhūmyādikāṇḍa, there are ten subsections – Bhūmi (earth), pura (city), śaila (mountains), vanaśadhi (Forest herbs), simhādi (animal), nṛ (human), brahma (Brahmin), kṣatriya (warrior), vaiśya (trader) and śūdra. The last chapter, known as sāmānyakāṇḍa, has five subsections- Viśeṣyanighnavarga (adjectives), samkīrṇa (miscellaneous), nānārtha (homonyms), avyaya (indeclinables), liṅgādisamgraha (miscellaneous).

Apart from a small subsection of the third chapter, this entire lexicon is devoted to Synonyms. In this small subsection the words are arranged after the final consonants. The formal arrangement is the unique aspect of the arrangement of this lexicon. The gender of a particular word is demonstrated by actually using the word in that gender. In the introduction, the author has clarified the point. He says-

(1) **prāyaśo rūpabhedena sāhacaryācca kutracit / stripuṃnapuṃsakam jñeyam tadviśe-ṣavidheḥ kvacit //**

(Normally, the gender of a word is distinct from the difference of the form. Sometimes that is to be ascertained from the association of the other synonymous words, sometimes however, it is to be ascertained from the word which it qualifies.) Thus for example-

(2) **kaumodakī gadā khaḍgo nandakaḥ kaustubho maṇiḥ /**

The formal difference between "gadā" and "khaḍga" tells the gender difference between two

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words. In the same line the gender of the words “nandakaḥ”, etc. is ascertainable from the association of it with the other words in the line. There is a line at the end of dhīvarga of the first chapter-

(3) **guṇe śuklādayaḥ puṃsi guṇiṅgās tu tadvati /**

(The words “śukla”, etc which when denote the *quality*, are in masculine. However, when they denote the *qualified*, they take the gender of the *qualified*.)

(4) **triliṅgāṃ triṣviti padaṃ mithune tu dvayoriti /
niṣiddhaliṅgaṃ śeṣārthaṃ tvantāthādi na
pūrvabhāk//**

(The word “triṣu” [in all the three genders] is mentioned after the word which appears in all the three genders, the word “dvayor” [in two genders] is added after the words which appear in masculine as well as in feminine. The negation of a particular gender indicates that that word appears in the rest of the genders. The words, “tu”, “anta” and “atha” added before, suggest the demarcation of the previous synonym. Thus-

(5) **vyomayanaṃ vimāno 'strī**

This indicates that the words vimāna and vyomayāna are not to be used in feminine. The instruction here points out that they can be used in other two genders.

(6) **tikto 'mlaśca rasāḥ puṃsi tadvatsu ṣaḍamī
triṣu /**

The words tikta, amla, etc. are used in masculine gender when used to indicate the fluids. However, when used to indicate the entity possessing them they can be used in all the three genders. This is indicated by the word *triṣu* used in the line.

C. Features of Amarakośa

Following are some of the features of this lexicon:

- Arranged in the verse form.
- No alphabetical arrangement.
- Classification of words according to Synonymy.
- Classification of words hyponymy. Names of Gods are stated first and then synonyms of each subset of god are stated. It records ISA relations.
- Syntactic features of words are pointed out. (Ex-adjectival relation mentioned).
- The important feature is that words are recorded not in the form of stem but in the form of inflected forms. That does not deny the awareness of the type of the stem on the part of the Lexicographer. Some words are mentioned in big compounds.

(7) **śukla-śubhra-śuci-śveta-viśada-śyeta-
pāṇḍarāḥ**

Only stems are mentioned here. Thus it is noted that the processes of grammatical alteration of sounds, augmentation etc. are known to Amarasimha. Apart from Amarakośa several lexica are constructed; many of which are often quoted by traditional commentaries. Some of them are –

Vaijayantī of Yādavaprakāśa
Halāyudha of Halāyudhabhatta
Abhidhānacintāmaṇi of Hemacandra

D. Other Lexica

These lexica were constructed more or less in the style of Amarakośa. There were some other lexica available in this period. Let us look at some of them closely. They are–

1. Nāmamālikā of Bhoja- 11th Century
2. Siddhaśabdārṇava of Sahajakirti- 17th Century
3. śāradīyākhyānāmamālā of Harsakirti- 17th Century
4. Paryāyaśabdaratna of DhananjayaBhatta
5. Kośakalpataru
6. Nānārtharatnamālā of Irugapa Dandadhīnatha- 14th Century
7. Nānārthamañjarī of Raghava
8. Dharaṅikośa of Dharanidasa- 12th Century
9. śivakośa of SivadattaMisra
10. Ekārthanāmamālā-dvyakṣaranāmamālā of Saubhari.
11. Paramānandīyanāmamālā of Makrandadasa.

They can be classified broadly into three groups

- (i) Lexica of Synonyms- 1-4
- (ii) Lexica of Homonyms- 5-10
- (iii) Lexicon of both Synonyms and Homonyms- 11

E. Arrangement of These Lexica

It is worthwhile to note the system of arrangement as well as some of the features of some of these lexica. The lexica of Synonyms are normally arranged topic wise. Lexica of Homonyms are constructed in a somewhat different manner. Thus for example, in the “8” mentioned above, words are arranged after the final consonants and the number of syllables. The homonyms are as a system arranged in the quarter as well as in half verse or sometimes in the entire verse. In this the conjunct “kṣ” as a letter of alphabet comes after h.

Thus if the words ending is 'k', we have following verses-

(8) **śloka yaśasi padye syāt lokas tu bhuvane jane /**

(The word 'śloka' is used in the sense of fame as well as a verse; the word 'loka', however, is used in the sense of world and people.) In this, it is noted that one word is treated only in a quarter of the verse. Amongst such cases words having only two

vowels, namely, śloka, loka, stoka, etc. appear first. Then come the words- ānaka, sāyaka and jambuka, etc. with three vowels, and then the words with four vowels- utkalikā, etc. The same procedure is followed everywhere.

Later on we find a verse half portion of which deals with one word. Thus-

(9) śulkam ghaṭṭe vivāhārthe jāmātur gṛhyate ca yat /

(The word 'śulka' is used in the sense of a ghat, as well as in the sense of what is collected from the son-in-law for the sake of marriage.) In this half line of the verse only one word, namely, śulka is treated. Sometimes one word is treated as the entire verse. Thus

(10) śikhā jvalā śikhā cūḍā śikhā śākhā śikhā śiphā /śikhā śikhaṇḍinām cūḍā śikhā syād agramātrakām //

This verse is devoted entirely to the word ṣikhā and its meanings.

In "6", homonyms are arranged in the order of the last syllable and not of the last consonant. This lexicon is seen to be influenced by Southern vernaculars. Thus in this lexicon, words with one akṣara are listed first then with two and three and then four. Amongst them again words are arranged according to the alphabet. The words kuḍōha (kuḍōa in kannada meaning dwarf), prāya (prāya in kannada meaning age), saḍēa (saḍēa in kannada meaning small) and koḍa (koḍe in kannada meaning room) are used in this lexicon in the same sense in which they are used in kannada. Normally these traditional lexica are constructed in anuḥōubh metre, however, "5" is constructed in more than 15 metres like vasantatilakā, ṣāliné, māliné, etc.

"9" is a specialized homonymous lexicon restricted to the names of plants, trees, and herbs that go to form the Materia Medica in the Ayurvedic system of Medicine and it records about 2860 principal and about 4860 words denoting the meaning thereof. There are almost 44 names of authors as well as works in the field of Ayurveda and about 44 works and names of authors of general lexica are found quoted in this lexicon. This lexicon provides the names of the original homelands of the medicines mentioned. Thus, words like ṣriparrē, gambhāre, kaḍphalā, hirā, etc., which indicate names of the plants, are stated to be originated in the region of Kashmir. Kalinga is mentioned as the homeland of lāigala, kuḍaja, gaura, etc.

"10" is a very peculiar type of lexicon, perhaps unique of its kind. It mentions words of only one and two syllables. Thus-

(11) kuḍ pāthvé kuḍ kucaḍ kulam kuḍ kātyā bhūrapismātā /

This line records words with one vowel with k consonant at the beginning with their meanings. They have not been recorded by the modern Lexica.

In "11", following features can be highlighted- a) the homonyms are arranged into groups according to the initial letters and the number of syllables in each letter. b) In the section of Synonymous words a desi word is also recorded. c) Vernacular phrases are tagged before each set of synonyms.

Compound words are not used as far as homonyms are concerned. Cases for anusvara are not dealt with. 'k ṅ' appears after 'h'. We find-

(12) jambhéro jambhālo jambho jambéro deṣyasamgrāhe /

(13) preiakhitāndolite cāpi deṣye hinicitam iṅyate //

In a nutshell we can summarize the features of the traditional lexica as follows. Features of this phase are-

- The alphabets were ordered systematically according to phonetic principles; to this corresponded the macrostructure of the lexicon. However, alphabetical order, as far as the beginning of the word is concerned, was not followed.
- Lexicography was developed systematically. The stem (or root) was used as the lemma.
- A theory of apophony was devised.
- A theory of compounding was developed.
- Dialect differences were noted.

F. The Concept of Homonymy and Synonymy

It is worthwhile to study a little about the concept of Homonymy and Synonymy that these lexicographers used. The Synonymous lexica include both simple as well as compound words, whereas the homonymous lexica include only simple words and rarely the compounded words.

The concept of Synonymy is not very well defined by these traditional lexicographers. As Ghatge(1973:28), points out, "The only criterion which they would like to use appears to be the idea of parivāṭtisahatva or the possibility of replacement. This is taken by them as a purely semantic criterion and a difference of gender alone is not sufficient to destroy the quality of paryāyatva. We are thus left with their practice to see what they mean by a synonym." Words are classified into three categories, rūḍha (Conventional), yaugika (derivational) and yogarūḍha (derivational but restricted in usage by the convention). There are various kinds of relations which lead to

synonymy as listed by the traditional lexicographers. As far as the Homonymy is concerned there are several problems. The traditional lexicographers do not define the concept of *anekārthaçabda*. At the same time the concept of Polysemy and Homophony remains undecided for these lexicographers.

IV. MODERN LEXICA OF SANSKRIT

The first Sanskrit Dictionary with western system of alphabetical order was the Sanskrit-English Dictionary compiled by Professor Horace Hayman Wilson and published in 1813. Two Indian works, viz. the *Sabdakalpadruma* compiled by Pandit Sir Raja Radhakanta Dev and the *Vacasptya* compiled by Pandit Taranatha Tarkavacaspati, followed suit.

A. *Wörterbuch*

But it was the Sanskrit-German Dictionary, *Sanskrit Wörterbuch*, compiled by Otto Böthlingk and Rudolph Roth, published from St. Petesberg during a span of 24 years-1852 to 1875 - which is considered to be the benchmark as far as the lexicography related to Sanskrit is considered. The arrangement of meanings on historical principles is the methodology followed by this lexicon, which we see is adhered to by all later lexicographers. It drew its material from 450 books.

B. *Monier Williams*

This dictionary was compiled by Monier-Williams. Though he acknowledged his indebtedness to the *Sanskrit-Wörterbuch*, he worked for his dictionary on a plan of his own. It contained several features which had not been found in the *Wörterbuch*. One can have an idea of those features from the subtitle of the dictionary, 'etymologically and philologically arranged, with special reference to cognate Indo-European languages.' The first edition of the dictionary was published in 1872 and the author, as soon as he became aware of the likelihood of his volume becoming out of print, set about preparations for a new improved and enlarged edition. He revised his original work in view of the criticisms, which the first edition invited from competent scholars and many Sanskrit texts that had been coming to light since the publication of the first edition. The second edition contains words and derivatives culled from more than four hundred Sanskrit texts. The author, while recording different shades of meaning of the words, has taken the meanings given by Indian lexicographers *Kosa-karas* and also the contexts of actual places of occurrence in the texts into consideration. The developments of meanings have been shown in chronological order. The author has also utilized the results of the research in comparative philology as available in his time. It drew its material from 515 books.

The main feature of these two lexica is that they record the lexemes in the forms of stems. They also provide ample evidence in the form of the references where a meaning of a particular word occurred. 'kñ' occurs as a conjunct consonant at the end of 'k'. Negative compound is treated as independent lexeme. Compounds with prepositions are mentioned under that preposition. Thus the words *upakāra*, *upakāt*, etc. are found under *upa*. The immediate constituent cut is the essential feature of these two lexica. These are the lexica of both nominal as verbal stems. The derived roots are mentioned under the original roots. Thus the desiderative roots like *cikérñā* are mentioned under *kā*. However, not all such derived roots are treated in these lexica.

C. *Encyclopedic Dictionary of Sanskrit on Historic Principles*

This is an encyclopedic dictionary drawing its lexemes from 1500 works, thrice more than that of the *Monier Williams*. It records lexemes from Vedas up to the end of 18th century. The basic aim and plan of this dictionary seems to be the following-

- (i) To indicate the earliest and the latest (in case it has become obsolete) occurrence of the vocable in Sanskrit Literature.
- (ii) To indicate whether a word existed throughout the history of that language or was confined to certain periods.
- (iii) To show the provenance of the word, i.e. whether it is used in many branches of learning or if it is system specific.
- (iv) To show all available meanings, common as well as technical, and by arrangement, to show their historical relationship if traceable.

It is an important question as to how these lexica are related to Sanskrit grammar and more specifically to the grammar of Panini? How does Panini treat them for different grammatical processes? But this will not be dealt with in detail in the present paper.

V. GRAMMATICAL LEXICA

It is important to note that there are strictly system specific lexica in Sanskrit, significant among them are the lexica built for the purpose of grammar. The most important among them is the *Lexicon of verbal roots or dhatupatha* as is traditionally known. This is believed to have been composed by Panini himself and awaits attention for its scientific arrangement from the point of view of grammatical functioning. The lexemes are arranged in ten groups according to the morphological operation they get in some specific environment. These groups are called as *gaëas*. Lexemes in each *gaëa* are further classified according to the application of certain types of suffixation. Based on this, the lexemes are

called “.padin”s. (ātmanepadin, parasmaipadin and ubhayapadin). Each lexeme is enjoined with a marker to indicate certain types of suffixations, certain augments, certain modifications and other grammatical operations. The rules in the grammar of Panini are aware of these classifications and this arrangement. They often refer to the sub-classification amongst these gaēas. We can say that this lexicon is very much system specific and leads to generation of specific forms. The rules related to these lexica generate adjectives and can be used to denote anything which performs a particular action. This is supported partly by the theory recorded by Yaska that all nouns are derived from verbal roots.

As far as the lexica mentioned above deal with the nouns, Panini's grammar reclassifies all the nouns on formal basis. He classifies them on the basis of the final element of the word. Thus the first classification is - words ending in vowels and those ending in consonants. We do not find this kind of classification in any of the lexica.

Panini's grammar talks of Karaka relations and the generative aspect of this grammar is closely related to the Karaka theory. With the help of this theory words can be generated from a given lexeme which will indicate the relation to a particular action.

Below given is a table in which a sample number of forms are shown to be generated with the help of grammatical rules of Panini from the lexicon of verbal roots, which can be used for coining new terms for scientific and technological purposes.

Root	Suffix	Karaka	Form	Meaning	Rule	Comment
Kr	A	kartā	Kara	One who does	3.1.133	Adj
	Ta	karma	Kāta	One which is done	3.2.102	Adj
	Ana	karaēa	Karaēa	The instrument of doing	3.3.117	Adj
	Tya	karma	kātya/kārya/ kartavya/ karaēya/	What Should be done	3.1.93	Adj

I have not taken here the addition of the preverbs which are known as upasargas. They will be helpful in generating further meaning variations, and in fact, some new meanings altogether. In this manner any verbal root taken from the verbal lexicon can generate with the help of a grammatical rule and a suffix n number of forms.

VI. APPLICATION OF PANINI'S GRAMMAR FOR CREATING NEW LEXICA:

It is this feature of the grammar of Sanskrit as well as that of compounding that can be effectively used for creating new technical terminology for Indian languages. I here take the 30 + lexica published by the Government of Maharashtra, as a case study for illustrating this point in brief. Ever since 1967, the Directorate of Languages, Government of Maharashtra started the activity of preparing the lexica of technical terminology for all fields of Science and Technology as well as human sciences. The underlying principles for

this activity are elaborately stated in the introduction to the lexicon for technical terminologies for Linguistics. It is a 19 points decree for such an activity. These points include Exhaustive reference, Relevant reference, Amenability to testing referential fit, amenability to calibration, etc.

These technical terms are two types- “technical terms collected into a technical terminology” and “technical terms collected into a technical nomenclature”. For creating technical terminology of both these types verbal morphology as well as compounding features of Sanskrit are seen very effectively used in these lexica. Thus for example in the Lexicon on Linguistics, for 'acronym' the term coined is 'ādyākñāra çabda'. This is of the second type mentioned above. It is formulated by the process of compounding and taddhita formation (derivational process of an adjective from a noun by adding a suffix) We can show the process as follows-

Ādya + akñāra = ādyākñāra
ādyākñāra + in = ādyākñārin

This becomes the adjective of çabda, which together with this adjective can be considered to be the coined technical term for acronym. Thus in order to coin the terminology for magnet and related words all the methods mentioned above are used. The technical nomenclature of a magnet is grasped in the word formed by adding the suffix "aka" after the root "cumb".

Cumb
Cumb + aka = cumbaka

By the process of compounding other words are added to the above word and as many words are coined.

Vidut + cumbaka = vidyutcumbaka (electromagnet)
Nāla + ākāti + cumbaka = nālākāti cumbaka (horseshoe magnet)
Cumbaka + éya = cumbakéya (magnetic)

It is possible to add a taddhita suffix after the compound. It is also possible to compound after the taddhita suffix is added.

Thus we have following terms by the abovementioned process-

Cumbakéya pravardhi (magnetic amplifier) Cumbak éya ak ñā (magnetic axis)	([cumbaka + éya] + [pra + {vrth + in}])
Cumbakéya paripatha (magnetic circuit)	([cumbaka + éya] + [pari + patha])
Cumbakéya nati (magnetic dip)	([cumbaka + éya] + [nam + ti])
Cumbakéya kñetra (magnetic field))
Cumbaka sūci (magnetic needle)	
Cumbakana (magnetization)	(cumbaka + ana)
Cumbakatva (magnetism)	(Cumbaka + tva)
Cumbakatvamiti (magnetometry)	([Cumbaka + tva] + [ma + ti])
Cumbakana bala (magnetizing force)	

In the same way, in almost all the lexica mentioned above, we find this principle used. In future as well we can make use of this feature of Sanskrit grammar in order to coin new terminologies for upcoming branches in the field of Science and Technology. We can also borrow certain grammatical elements from other languages and some elements from Sanskrit for this purpose. Thus in Linguistics, the terms “rūpima” is coined for Morpheme and “svanima” for phoneme. These are created out of the Sanskrit roots “rūp” and “svan” respectively and the English morpheme “eme”. In this way, keeping in mind the 19 points mentioned above it is possible to borrow linguistic elements from different Indian languages and terms can be coined.

APPENDIX

Some more Lexica (traditional as well as modern)

1. Anekārthadhvanimajjaré of Mahakshapanaka (H = Homonymous)
2. Anekārthasamgraha of Mankha (H)
3. Anekārthasamgraha of Hemacandra (H)
4. Abhidhānaratnamālā of Halayudha
5. Anekārthasamuccaya of Sasvata (H)
6. Trikāēōaṣeña of Purushottamadeva
7. Nānārthasamgraha of Ajaya (H)
8. Medineof Medinikara
9. Viṣvaprakāṣa of Mahesvara
10. Viṣvalocana of Sridhara
11. Dhaturatnākara
12. Dictionary of Panini by S.M.Katre
13. Nyayakoṣa by Jhalakikar
14. Mēmānsākosa by Kevalananda Sarasvati
15. Dictionary of Sanskrit Grammar by K.V.Abhyankar
16. Sanskrit Catalan Dictionary

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www.sub.uni-goettingen.de/ebene_1/fiindolo/gretil/1_sanskrit/6_sastra/2_lex/amark1hu.htm - 65k

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