CHAPTER IV
A) Phonetics

Phonetics was known to ancient Indians as Shikṣa, which formed one of the six lores pertaining to the Vedas (गदेंगों of Vedas). The phonetics of the Vedas can be seen in the Shikṣas. Since sikṣa was a separate branch in ancient India, grammatical literature did not deal with this aspect in detail. Phonetics, therefore, has received limited attention in śabdamāni Darpana.

Kesirēja starts with the origin of sound. About the origin of sound he says: 'Due to the favourable air, and with the desire of the individual, the substance of sound originates, at the root of the navel as in a trumpet. It's colour is white.'

In this sūtra, the process of the origin of sound is given. The air flows through a column, and if there is obstruction to the air-column the sound is produced. According to Kesirēja, the air starts from the root of the navel. This view of Kesirēja is based not just on

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1 The number of the sūtras is according to the edition of D.L. Narasimhachar - 1964.

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3 S.D. sūtra - 9.
the importance of the navel in our body, but because it is a fact. There is an organ called 'diaphragm' below the lungs and just above the navel, which is bow-shaped, from where the air originates. From this place, the air is coming through lungs to lips, and beyond for our respiration. This air is used for the production of sound when the individual desires to produce it. Sounds are of two types: explosives and implosives. These varieties are found in stops only. If the sounds produced are the results of exhaling they are called explosives. And those produced by inhaling are implosives. Kannada sounds are produced only in the process of expelling the air out of the lungs. Kesiraja uses the term 'jīvanistadim' in this context. The air coming from the diaphragm, becomes sound when the individual so desires. There are many impediments in the process. It is an observed fact that speech sound can not be produced if the organs are defective. Kesiraja, therefore, says there should be favourable air for producing sound. The poet Kesiraja gives a fine simile here. The sound is like a trumpet blow. The trumpet and air both make sound. But the simile does not stop here. The trumpet is narrow at the root, and wide at the end. Similar is the phenomenon

4 H.A. Gleason, p. 249.
observed in the air that is producing speech sound. According to Kesirēja, sound is a substance, and its colour 'white'. Though these matters are philosophical and quasi-philosophical problems, since Kesirēja repeats them twice, they can not be ignored. In Jainism, Saraswati is called Dhvālam (white). Saraswati is the Goddess of language. Hence, the words which constitute language also come to be white, and the sound material which is responsible for words is too came to be known as white in colour.

Sūtra in question says the birth of the sound-matter (sābda-drayya) due to pavana and jīva (soul)’s īṣṭa- desire and the sābda dravya’s result and function is the audibility or sound manifestation.

The next sūtra about phonetics is: 'The body is a drum; and the tongue an instrument to beat. Individual soul is the performer. On account of the operation of his mind, sound is produced. It is white in colour and has the form of sound.  

The idea of the points of articulation, the articulator, and also the motivation of sound is suggested here metaphorically.

5 For details see Aloka - p.20.
6 S.D. sūtra - 44.
ally. But here the 'body' should mean a portion of the body from diaphragm to lips only. The drum itself cannot produce any sound in the absence of some instrument of beating. Here the tongue is the instrument, which, in league with the place, is responsible for the production of sound. Technically, the instrument is called an articulator. The organs which are responsible for the production of sound are termed 'speech-organs'. Kesiraja mentions tongue as the instrument in the production of sound. But it is not the only articulator. It is the prominent articulator which is responsible for the production of majority of sounds. The tongue as an articulator is divided into four parts: dorsum or the back of the tongue, the centre of the tongue, the blade of the tongue and the tip of the tongue. There is a lower-lip, which is also an articulator and is responsible for the production of some sounds.

Granting that every organ is alright, still, as already stated, the motivation is also equally important. Only when an individual so desires, the various organs will be useful in the production of sound.

7 See Allen, p.17.
8 A Course in Modern Linguistics - p.69.
9 Ibid.
This sound has the form of varna. We will discuss about the form of the varna while dealing with phonemics.

In the next sutra, the various points of articulation are listed: 'The throat, the root of the tongue, the chest, the palate, the lips, the nose, the head, and the teeth are the eight places where the varna are produced.'

'Aksara' is used as the synonym of 'sabda' which is translated as sound here. The term 'aksara' is variously used to signify sound and syllable.

To understand and evaluate this sutra, the whole phenomenon of the production of sounds is to be reviewed. For the production of the sound, the air coming from the lungs and which goes to the lips and beyond, is obstructed. Unless there is some kind of obstruction to the air-passage, no sound can be produced. The channel through which the air is passing is called the speech-tract. The air that is passing through the speech-tract, meets with the obstruction, not in one place, but in many places. Such places which are

10 SiD. sutra - 40.
11 Present sutra.
12 SiD. sutra - 20.

In this chapter we use 'sabda' for sound, 'vera' for letter and aksara for syllable.
obstructing the air-passage to produce sound are called 'points of articulation'. Various organs which are responsible for the production of sound, are situated on the lower and upper sides of the speech-tract. The organs situated on the lower-margin are articulators. These organs are immovable. The organs which are on the upper margin of the speech-tract are termed as the points of articulation. These are immovable. The point of articulation and the articulator together constitute the position of articulation. The various organs which play their part in the production of speech-sounds are:

1) Nasal cavity 2) Lips (lower and upper lips)
3) Teeth 4) Alveolar ridge
5) Palate 6) Dome
7) Velum 8) Uvula
9) Tongue 10) Velo
11) Epiglottis 12) Vocal cords
13) Larynx 14) Pharynx

13 yad upakramyate tat sthanam - See Allen, p.17.
14 A Course in Modern Linguistics - p.69.
15 Ibid.
16 Ibid.
Among the organs listed, following are the points of articulation:

1) Upper lip  
2) Teeth  
3) Alveolar ridge  
4) Soft palate  
5) Hard palate  
6) Velum  
7) Uvula  
8) Epiglottis  
9) Larynx  
10) Pharynx

The articulators are:

1) Lower lip  
2) tip of the tongue  
3) blade of the tongue  
4) Centre of the tongue  
5) back of the tongue

In addition to the points of articulation and the articulators, there is also a third factor which contributes in the production of sounds. That is the manner of articulation. The procedure of obstruction of the air coming from the lungs, at various points from the vocal cords to the lips is called manner. Manner will be responsible for many a variation of sounds. Usually, each sound is given a name. Based on the position of articulation, the articulator, the resultant sound, and an example for Kannada, therefore, are given below:
There will be many classes of sounds for which manner will be responsible. They are as follows:

1) **Stops**

   Stops are the sounds involving the complete closure of the air column at some point of articulation by some articulator. All the classified sound of Kannada are the stops.

   Some scholars include sounds of t-class except n in the dental series and only n in the alveolar series.
2) **Nasals**

Nasals

For the position being the same as for the stops, the passage of the nasal cavity is open. Thus, if air is passing through the nasal cavity, the sounds are nasal stops or nasals. m, n, n, n are the nasal sounds in Kannada.

3) **Fricatives**

Instead of the partial closing of the air passage, there is a narrow constriction due to which there will be friction. Kannada s is the fricative sound.

4) **Laterals**

If the air coming from the lungs is obstructed at a certain point, but the air is allowed to pass through one or both sides of the tongue, the sounds produced are called laterals. 1, l, l sounds of Kannada are lateral sounds.

5) **Trills**

Trills are sounds caused by the rapid vibration of the articulator. r, is the example for trill.

6) **Flaps**

If there is a single tap by the articulator, the flap is produced. Kannada r is a flap.

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18 M.A. Gleason - p. 21.
7) **Affricates**

The procedures of both stops and fricatives are seen here. They start with a stop procedure and end in a fricative procedure. c, j are usually affricates.

8) **Semi-vowels**

Semi-vowels are in between the fricative sounds and closed vowels. Examples are w and y. The other svarţaya sounds also have vocalic quality, that is, intervocally. They are consonantal. When followed by stops or other consonants they are vocalic. This is the reason why we have sithila dvitva.

All these are consonants. Similarly, there are vowels.

There is not much importance of the points of articulation for vowels. Articulator is very important here. The main factors in the classification of the vowel are as follows:

1) **Height of the tongue**: i, e etc. (in all seven) are the sounds caused by the variation in the height of the tongue. Varieties here are high, lower high etc.
2) **Advancement of the tongue**: Depending upon which part of the tongue (front, central or back) is in action, there will be three varieties.
i, e etc. are the front sounds, ə (as in the kari - 'black') is the central sound; and u, o, etc. are the back sounds.

Vocal cords will be responsible for many a variation in sounds. While passing the air, if the vocal cords vibrate, 'voice' will be produced. Sounds accompanied by voice were voiced sounds. (e.g., b, d, d, j, g, etc.) While producing a sound, if the vocal cords are silent, the sounds will be voiceless, (e.g., p, t, t, c, k, etc.)

If there is an extra puff of air, while producing the sound, it will be called an aspirated sound (e.g., ph, th, bh, dh etc.). If there is no such extra puff of air, the sounds are called unaspirated (e.g., p, t, b, d, etc.)

With this background, let us consider the points of articulation given by Kesirāja. Velum (Kantha), root of the tongue (jihvamula), chest (ura), palate (talu), lips (ōṭha), nose (Nāsika), head (sira) and teeth (danta) are the points of articulation listed by him. Of these eight, the root of the tongue is also an articulator like centre and tip of the tongue. Nose need not be listed in the points. It is true that the nasal sounds are produced in the nasal cavity; but, the points of articulation are in the mouth. About chest, the role of the chest is important while
producing the sounds. In general, when the sound 'अ' is produced, probably Kesiraja meant that chest also plays a role in articulation of sounds.

The idea of co-articulation is enunciated in the following sutra: "The letters य, व and 1 are called nasals as well as non-nasals. The sounds य, व and 1 are pronounced in two ways: 1) without nasality, and 2) with nasality. Here, the idea of co-articulation is expressed. If a sound is produced, with one position of articulation, it belongs to a single or primary articulation. In addition to one articulation, there may be combined more than one positions of articulation in a particular sound. Such a phenomenon is called double-articulation or co-articulation. The ordinary य, व, and 1 without any nasal feature belong to the primary articulation, and when nasality is added to them, they are co-articulated sounds.


21 'It is customary to define a sound by describing only the movement or position of the organs directly involved in its articulation, leaving the concurrent activity of the other organs unspecified; but very often the activity of one or several of these organs has a marked effect on the resulting sound' - Block and Trager - p.29.
The phenomenon of free-variation is found in the gloss on sūtra 39. 'The r of 'maral' also changes to n thus being 'manal'. The word 'manal' is also pronounced as 'majal'. The point to be noted is that whether there is r or n in the word, there is no change in the meaning. Such a phenomenon is free-variation. If two sounds freely-vary in a word without affecting the meaning, it is called free-variation.

B) Phonemics

'Aksara', 'varṇa' and 'suddhāksara' are synonymous. [Those that can be written, but can not be pronounced are varṇas. For example, the sounds of the clouds etc. are not varṇas.]

There is a difference in explanation of this sūtra even in Kesirāja's gloss itself. Whereas the sūtra reads 'barepambokkuccharisalbāraduvakkarmaltu' etc. The vritti reads 'bareya alumuccharisalbāraduvu' etc. The purport is that those that can not be written and cannot be pronounced are the aksaras. In this sūtra, Kesirāja considered 'aksara' 'varṇa' and 'suddhāksara' as synonyms, though in different

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22 H.A. Gleason, p.232.
23 S.D. sūtra - 12.
There is an extensive treatment of these terms in Sanskrit grammars. The interpretation of varṇa in Sanskrit grammars is problematic. Generally, it means sound-unit. Now, aṅgara means syllable. Though Kesirāja has stated in this sūtra that 'aṅgara' and 'varṇa' are synonyms, it appears that he is aware of the distinction between aṅgara and varṇa, though not clear to define the terms in sādāsārmanī Darpana.

What is Suddhāṅgara then? What is the meaning of suddha here? One view of suddhāṅgara is that it is non-nasal sound. Perhaps, that is the meaning intended here. Suddhāṅgara and suddhage, according to Kesirāja seems to be the basic sound units, because he says 47 suddhage are there for Kannada.

24 'While it there has much in common with the modern term 'phoneme', no phonemic theory is implied by it, and it would be reading at once too much and too little into the term thus to translate it'. See Allen, p.15.

25 'The term smaṇāsika is used, as opposed to the suddha or pure non-nasalised vowels', see Allen, p.14.

26 Kesirāja while listing the Kannada vernas says that y, w, and l are both smaṇāsika and nirā-punāsika, but does not include the nasal sounds in the suddhage.
The modern definition of the syllable is: syllable is a principle phonological term for grouping of consonants and vowels with the status of a unit. It is the attachment of the consonants to the vocalic nuclei. Every syllable consists of one peak of sonority; and the vowel is that peak. Hence, either a vowel alone, or a vowel with consonant, constitute a syllable. Then how does this aksara which is a unit with a vowel and consonant, came to be considered as a synonym for a 'varpa'? Firstly, as the vowel is the nucleus of the syllable, there are as many syllables as there are vowels, so much so that the aksara itself was likely to have been confused with the vowel. Secondly the orthography, the writing system of Kannada is a mixture of phonemic and syllabic system. Basically, it is a phonemic system where every sound is given a symbol. So, all the letters from a to 1 have symbols based on the sounds. But, in the Kāguṇita - the combination of consonants and vowels (e.g., ka, kā, ki, etc.) also each

27 R.H.Robins, p.137.
28 savyavanah sānasvāraḥ suddho vāpi avaro 'aksaraḥ' - RP. XVIII. 32. See Allen, p.29.
29 In a phonemic writing system, graphic shapes are assigned, in an arbitrary fashion, to the phonemes. (phonemic system) or to some sort of recurrent combinations of phonemes (syllables). Hockett - p.340.
unit has the symbol. In actual usage, it is these combinations that are more. These combinations are syllables and each syllable has a symbol in such a system. Hence the syllable also was confused as the basic unit. As 'varna' is a basic unit in writing and the syllable also was confused with the same function, partly, they are considered as synonyms. Aksara is also used in the sense of a syllable by Kesiraja himself.

To know the concept of 'varna' in the sutra, we have to understand the modern concept of phoneme. To begin with, the phoneme has two characteristics:

1) Phonemes are the part of the system of one specific language; they are the features of the structure of a particular language. Hence, phonemes of different languages are different.

2) Phonemes are the features of a spoken language. That is, they are the units of the spoken language, as opposed to the written language, which is having its own unit viz., grapheme. This feature is important for our purpose,

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31 H.A. Gleason, p.9.
because we are studying the written work.

Phoneme is a minimum unit of expression, the function of which is to keep two utterances apart. If we take two words 'kudi' and 'gudi', one can observe that each word has four units viz., k, u, ḍ, i and g, u, ḍ, i. Of these, three units are the same for both words, and in one place there is a difference. In 'kudi' there is k, and 'gudi' it is g. Because of the difference of these sounds, two words are created. Hence, we can say that the sounds k and g are having significant behaviour and are called the phonemes.

Another definition of the phoneme is that it is a class of sounds. Phoneme is not just one sound, but a bundle of many sounds. For example, take three words, kivi, kannu, and kudi. The sound k in these words though appears to be the same for ordinary person, is different in each word. K in kivi is slightly fronted (pre-velar), k in kudi is slightly back (post-velar), and k is kannu is between the two (medio-velar). But, while phonemicing, we take only k, and consider others as the positional variants. Hence, the phoneme /k/ here is a bundle of three sounds.

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32 C.F. Hockett - p.15.
There are also more important sounds which contribute to make a phoneme. Consider the nasal sounds of Kannada, viz., n, ñ and ñ. It can be observed that all the three sounds occur in a particular context of their own. If the sounds have a definite environment, they are not important. Here, n occurs before dental stops, ñ before palatal stops and ñ before velar stops. That means, each of these sounds is having its own environment which is exclusively of its own. One sound will never occur where the other occurs. Such a phenomenon is called mutually exclusive environment or complementary distribution. In such a case, one of these sounds which is more widely used, may be taken as the representative of the class, and the rest may be considered the sub-members. Here /n/ is the phoneme and n, ñ and ñ are the sub-members of it. The purport of this is: though we write /n/ a phoneme, in the place of ñ and ñ sounds, still the pronunciation will be the same.

Now the difference between the varna and a phoneme can be attempted. As shown above, n, ñ and ñ are the varnas, but only n is a phoneme.

The discussion of the phoneme so far, leads us to conclude that sound is the basic material for the language. Language is the combinations of sounds with meaning. But,
sound is produced by many bodies. If the table is hit, particular sound is produced; rumblings of the trees also produce a sound; the cloud produces sound. But, all these are not germane to the language. Only those sounds which are produced by the human vocal organs are useful to the language. There too, the sounds of cough, sneeze etc. are out of question. Excepting these, all the sounds produced by the human organs are important. Hence, the rumblings of the trees, sounds of the clouds etc. are not varṇas. The definition of the varṇas given in the sūtra is of negative nature. It says what are not varṇas, rather than what varṇas are.

Incidentally, a question may be asked here: whether Kesirāja had any idea about something like the concept of phoneme? The question may appear out of place, as the concept of phoneme is modern one, and Kesirāja belongs to an ancient era. How can he know the concept of the present times?

In every science there are certain concepts, processes etc. to explain the science. And the grammar which was a much respected science in the ancient India, had its own concepts and processes. As the knowledge advances, some of the old concepts and processes may be reinterpreted or some
times new ones may be stated.

A notable feature of our ancient grammars (including Pāṇini) is that they do not state and explain the processes that are responsible for particular results. Kesirāja is no exception to this. In this situation, what is left for us is to guess the processes on the basis of the results. Let us try this with regard to the phoneme.

Kesirāja in the sūtra 28 says: "If 'r' is pronounced with more force 'r' is produced; 'ḷ' pronounced with more force gives rise to 'l' of Kannada, known as kula....'  

more - more    mare - mare
kale - kale    mole - mole

In setting up the phonemes, the most important step is the minimal pair. If there is a minimum of contrast between two words, it is called minimal pair. The two sounds which contrast in that pair, are two phonemes. The examples given above viz., kudi and guḍi constitute a minimal pair, and the sounds k and g are separate phonemes. What about more - more, mole - mole etc.? Are they not minimal pairs? Kesirāja gives these examples to prove that r and ṛ and l and ḷ are separate varnas. Examples given for this point are perfect minimal pairs. It appears, on the basis of the
above, that some idea of the phoneme (though crudely) was known to Kesirāja.

"The letter has got sound and form. When it is heard, it is called Srāvāna. When the letter is seen in its different forms, it is known as Cāksuṣa."

The sound has two forms. That which is of the form of sound and is the subject of the ear, is called auditory (srāvāna). Visual (cāksuṣa) is that sound which, due to the difference of orthography, is of many forms. This view is found since ancient times.

Of the two, the auditory aspect of the sound is having, ordinarily, the same form. It is not to deny the difference in the pronunciation of the same sound. If different people, say males, females, children, old people etc., pronounce the same word, there will be difference in the pronunciation of a sound in the word. Even if a single individual pronounces a particular sound many times, there will be variation. But, for the people who are concentrating on the import of the statement, and not the sound of it, the difference is not noticeable. Hence, the sound appears to be the same. Hence

the auditory aspect of the sound is to have only one form.

But the case with the visual aspect of the sound is different. We give a particular symbol for a particular sound. (It applies only to the languages having a writing system. Ancient grammarians considered only the languages which are written.) The various symbols for the sound, used in a particular language constitute the orthographic system of that language. As sounds of different languages are different, similarly the written symbols also are different. The symbol for a particular sound in Kannada is ಅ in Hindi अ and in English a. Hence, the visual aspect of the sound is of various forms.

In the next sutra the sounds in the orthography are given: "The order of the varṇas is well-known. The varṇas are from अ to ई."

The order of the varṇas in the inventory which is known to everybody, is of Sanskrit, though it is not stated so. He gives the following order of the alphabet.
These letters enumerated above are classified into five categories: "All the letters are divided into five kinds viz., vowels, classified sounds, unclassified sounds, yogavahas sounds and desiya sounds (indigenous to Kannada language)."

Kesirāja has classified all the varṇas in the Kannada alphabet into 1) vowels, 2) classified sounds, 3) unclassified sounds, 4) yogavahas and 5) sounds indigenous to Kannada.

The whole range of sounds mentioned here may be divided into two viz., 1) vowels and 2) consonants. And among the consonants 1) classified consonants, and 2) unclassified consonants. Yogavahas too are included in the alphabet. Both vowels and consonants are seen in the list of indigenous sounds.

35 S.D. sūtra - 41.
Now the meaning of 'svara' (vowel) and 'vyāhjena' (consonant) may be considered.

According to the ancient Sanskrit grammarians 'svara' is independent entity and 'vyāhjena' is dependent. It is really a moot question to decide the nature of svara and vyāhjena. According to Patanjali 'svara' is sva-ra 'self-ruling'. That is, it is having independent existence. Uvata derives the word Vyāhjena from vi-anj- 'to manifest' and explains that the consonants are so called because 'they manifest the meanings'. But, we cannot say that consonant has no existence at all. The time specified by our grammarians for the pronunciation of a vowel and a consonant proves the existence of them. For the pronunciation of a vowel one mora is required, while for the pronunciation of the consonant half a mora is required. Usually, vowel forms the nucleus of the syllable. But, even a consonant, if pronounced with sufficient prominence, may become an independent syllable, as the basis of syllable is prominence. र, ल, द, भ, स of Sanskrit. This means that consonant is not absolutely dependent on vowel, according to Indian grammarians. Yet, 'consonants

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36 sāpeksāṁ svarastu nirapetṣah - I. p.XXI. 1.
38 R.P. 1.6. See Allen, p.81.
are like pearls in a necklace, but the thread which supports
them is the vowels.*

Now, let us consider the modern linguistic concept of vowel and a consonant. Generally, vowel is used as an equivalent of 'śvara' and the consonant of the 'vyāñjana'. The definition of a vowel according to the modern concept is: "Vowels are modification of voice-sound that involve no closure, friction or contact of the tongue or lips.*

The definition of the consonant is: 'consonant is a sound for whose production the air-current is completely stopped by an occlusion of the larynx or the oral passage, or is forced to squeeze through a narrow constriction, or is deflected from the medium line of its channel through a lateral opening or causes one of the supra-glottal organs to vibrate.'

Put in simple words, the sound which is produced without any obstruction to the air current is a vowel; and if there is any obstruction anywhere in the mouth, the resultant sound is called the consonant.

40 Bloomfield, p.
41 Bloch and Trager, p. 18.
As to the point whether vowel and consonant are equivalents of 'svara' and 'vyañjana' Dr. Siddhesvara Varma says:

"It seems to me probable that the Indian terms 'svara' and 'vyañjana' did not exactly correspond to the vowel and consonant of modern phonetics. The Indian term may have denoted 'a syllabic sound' and 'non-syllabic sound' respectively. For the essential difference between svara and vyäñjana lay in their relative dependence. The svara was said to be 'self-dependent'. While the vyäñjana (literal meaning 'manifested by another' 'accessory') was dependent upon the svara."

This point is realized by the modern linguistics also. Hence, at least, some scholars do not use the terms vowel and consonant, but use 'vocoides' and 'contoides' instead. Those which are vowel-like are vocoides, and those which are consonant-like are contoides. But, the terms vocoides and contoides are used on a phonetic level, and vowel and consonant on a phonemic level. Any vowel or consonant which can become a syllable is a vocoid, and others are contoides.

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42 Dr. Siddhesvara Varma, p.57.
43 C.P. Hockett, p.67.
44 'Use of terms 'vocoid' and 'contoid' enables us to reserve the terms 'vowel' and 'consonant' as labels for structurally defined classes of phonemes in specific languages. See Hockett, p.67.
45 Pike -
That means we can use the terms vowel and consonant as equivalents of svara and vyādja in this section where we are dealing with the phonemics of Kannada.

Now, consonants are, usually, divided into 1) classified (vargiya) and 2) unclassified (avargiya). In the classified category, there are twenty-five consonants beginning from k and ending in m of our alphabet. What is the basis for such a classification? A point that can be observed about the classified letters, at the outset, is that they are all stops, including the nasal stops. All these stops are having a well-defined principle of classification. There are two such principles viz., 1) points of articulation and 2) manner of articulation. According to the first principle, viz., points of articulation, there are five points of articulation involved in these consonants. They are: 1) velum, 2) palate, 3) top of the oral cavity, 4) teeth, and 5) lips. Accordingly, there will be 1) velar, 2) palatal, 3) retroflex, 4) dental and 5) labial sounds. Each of these categories has five consonants:

1) velar: \( k \ kh \ g \ gh \ n \)
2) palatal: \( c \ ch \ j \ jh \ ñ \)
3) retroflex: \( t \ th \ ð \ ðh \ ñ \)
4) dental: \( t \ th \ d \ dh \ n \)
5) labial: \( p \ ph \ b \ bh \ m \)
Second principle viz., the manner of articulation is responsible for the voiced, aspirated and nasal varieties. So, from top to bottom these consonants are arranged on the basis of the points of articulation, and from left to right, they are arranged on the basis of the manner of articulation. In each case there are five members. Hence, a well-defined classification is found in these consonants. Therefore, they can be termed as classified consonants. Usually, the first member of each class, represents the whole class. For example, k-varga which represent k, kh, g, gh, n and so on.

As against these classified sounds no such arrangement is seen in the nine consonants listed as unclassified (śvar-śīya). Among the nine consonants, many categories can be seen. Y and w are semi-vowels, r is a trill, l and l are laterals, s, st and st are fricatives, and h is a glottal fricative. These can not be arranged in a systematic way like the classified letters. Even modern linguists have the sounds termed 'left-overs'.

About yogavaha, yogavehas are called dependent sounds.

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46 After enumerating the well-arranged consonant, the leftovers of which do not fit in any arrangement are listed - Manual of Phonology - Hockett, p.109.

47 anusvāro visargaśca ska-śpau oṣpi paraśrayau. P.5. See Allen, p.16.
These yogavahs are not included in the inventory of letters by Panini. All these four dependent sounds are having a very limited occurrence. In Sanskrit grammatical works five yogavaha sounds are listed: viz., 1) -½-visarga, 2) -o anusvare, 3) -x jivhámitiya, 4) -upadhnániya and 5) the faucal plosives (yams). But all the Sanskrit grammarians are not unanimous in the use of terminology. While some use yogavaha, others like Panini use the term ayogavaha. Ayogavaha literally means 'drawing unyoked'. Patanjali explains the term as "because they draw unyoked i.e. are heard though not mentioned (i.e. though not included in the Paninian varna samányaya). It is the Kannada grammarians who used the term Yogavaha, appropriately so, instead of ayogavaha. All these dependent sounds share the place of articulation of the sounds whereon they depend.

Then Kesiraja talks about the letters peculiar to Kannada language. It may appear strange that when he is writing a Kannada grammar, what made him to talk of some letters as peculiar to Kannada. The reason is: the framework of his alphabetical system is taken from Sanskrit. He lists the

48 Katham punar ayogavahah: yad ayuktavahanty emape digtac ca suruyante - Mahabhasya - 1.1.2. See Allen, p. 17.
49 Allen, p.17. f.n.4.
Sanskrit alphabets and adds to the list the letters peculiar to Kannada language. Such letters are five in number. They are r, ṛ, ṭ, e, o.

After the classification of the sounds, Kesiraj gives the details of them in sutra viz., "There are fourteen vowels, twenty five classified letters, nine unclassified letters and four dependent letters in the alphabet. Thus, the total letters come to fifty-two."

In the previous sutra Kesiraja had classified the sounds into five kinds. Now, he enumerates the various letters in each of the five kinds. The whole list, presented in a tabular form, will be as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vowels</td>
<td>14</td>
</tr>
<tr>
<td>Classified letters</td>
<td>25</td>
</tr>
<tr>
<td>Unclassified letters</td>
<td>9</td>
</tr>
<tr>
<td>Yogaveha</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
</tr>
</tbody>
</table>

After the classification of the sounds, Kesiraja lists the vernas of Kannada language in the following sutra: "There are five desiya sounds in Kannada. These five along with the previously mentioned fifty-two come to fifty-seven sounds."

50 S.D. sutra - 42.
Out of these sounds, the ten sounds ri, ri, liri, liri, s, s, (visarga), x₂ (jihvamulya), ṭ (upadhmaniya), and Ṭ (kṣala) are not in Kannada. So, when these are deducted, we get forty-seven sounds which are in pure Kannada.

The sounds given in the sutra may be tabulated as follows:

<table>
<thead>
<tr>
<th>Vowels</th>
<th>-</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classified consonants</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Unclassified consonants</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Yogavahas</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Add five sounds peculiar to Kannada</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Deduct ten letters peculiar to Sanskrit</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>--</td>
<td>57</td>
</tr>
</tbody>
</table>

The fourteen vowels are: a ā i ē i u ū ri ō lī ē e ai ē au.

Twentyfive classified consonants are:

<table>
<thead>
<tr>
<th></th>
<th>k</th>
<th>kh</th>
<th>g</th>
<th>gh</th>
<th>ā</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c</td>
<td>ch</td>
<td>j</td>
<td>jh</td>
<td>ū</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>th</td>
<td>d</td>
<td>dh</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>th</td>
<td>d</td>
<td>dh</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>b</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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51 S.B. sutra - 43.
Nine unclassified consonants are:
\[ y, r, l, w, s, s, s, s, h, l. \]
\[ 0 \text{ (anusvāra)}, \delta \text{ (visarga)}, x_\gamma \text{ (jihvāmūliya)}, \]
\[ \lambda^\text{ (upadhmēniya)}. \]

Five sounds peculiar to Kannada are:
\[ r, l, l, e, o. \]

Ten sounds peculiar to Sanskrit are:
\[ \pi, \tilde{\pi}, l\pi, l\tilde{\pi}, s, s, s, x_\delta, \lambda, l(ka\text{ksa}). \]

Thus, forty-seven is the inventory of Kannada varṇas, according to the sutras. Really, Kesirāja has followed a very cumbersome method in listing the Kannada varṇas. He first mentions forty-two varṇas supposed to be common both for Sanskrit and Kannada; when he adds five varṇas which are exclusive to Kannada structure; and finally deducts ten sounds found only in Sanskrit. Instead, he would have said there are forty-seven sounds for Kannada and listed them. He was forced to this gymnastics as he had started with Sanskrit system instead of Kannada.

In this sūtra and the previously mentioned one, Kesirāja mentions five sounds as peculiar to Kannada. Among these five, there are two vowels viz., e and o. He had to mention
these separately, as the list given is of Sanskrit, where there are only the long varieties, whereas in Kannada both short (e, o) and long (ē, ō) varieties are found.

(More details about these vowels and r, l, l will be given presently when dealing with vowels and consonants.)

Among the ten sounds peculiar to Sanskrit, i.e. not found in Kannada four are vowels, viz., r, ɪ, ɐ, and ŋ, and six consonants, viz., s, ṕ, ṭ, ṅ, ṭ, and ṭ (ṅ). About the four vowels it can be said that ɐ and ŋ are never found in any of the words whether in modern Kannada or old Kannada. Hence, there is no question of them using in the Kannada. About, ɪ, it is also never seen in any of the Kannada words any time. But, the case of r is slightly different from those mentioned. There are many words which contain r. For example, in the words like ritu, rupa, rita, etc. r appears to be there. There is no question of r being there in Sanskrit words. But these words in Kannada have different pronunciation. The pronunciation of these words in Kannada is like rutu, rūpa, rūta etc. That is, wherein Sanskrit r is a vocelic consonant with a high unrounded central vowel-like pronunciation at the end, in Kannada, it is clearly consonantal vowel. This vowel may be sometimes i (high front unrounded) or sometimes u (high
back rounded). For example, along with the words, rusi, ran, rutu etc., the words risi, rin, prithivi etc. are also found. Whatever the vowel that is found, the pronunciation of ri in Kannada is ru vowel. Hence, this vowel is also not necessary for Kannada language.

The letters s and ž are peculiar to Sanskrit i.e. they are not in Kannada language. The letter ž is not found in any of the Dravidian languages including Kannada. In Kannada the non existence of ž was noticed. And this point is especially noticeable in the corrupted words from Sanskrit. Where in Sanskrit there is s, Kannada has ş for it. For example,

Sasi (skt) - Sasi (kan). Sańke (skt) - Sańke (kan)
Kalasam (skt) - Kalasam (kan), Sulam (skt) - Süleram (kan)

 ş is still rarer. It also is not found in any of the Dravidian languages. No grammarian of Kannada has included it in the Kannada alphabet. Like s, ş also has been proved to be not there in Kannada on the strength of the borrowings from Sanskrit. Kesiraja states that for Sanskrit ş, there

52 It is so obvious that these vowels are not in Kannada. Still it is strange even then they have found a place in Kannada orthography.

will be s in Kannada. For example, (Skt) bhāge (Kan), base (Skt) vēsam (Kan), vēsam (Skt), visam (Kan), visam (Skt), vargam (Kan), varisam (Skt). Hence, these two sounds are not found in Kannada.

As Kesirāja has clearly excludes visarga, jihvāmūliya and upadhmaniya from the list, we can easily omit them. All these three occur only in Sanskrit words. For example,

rāmēḥ  dēveḥ  (visarga)
Prāṭekhāla  (jihvāmūliya)
Psahpanam  (upadhmaniya)

About kṣaṇa, we will deal with it exhaustively while dealing with consonants.

After giving all the sounds, their division etc., Kesirāja now starts the treatment of vowels. The sutra is:

'There are fourteen vowels beginning with a. The first ten vowels are monophthongs (samānem), of which each pair is of the same class - a homogen - (svaśvānem), irrespective of the order.'

S.D. sutra - 16.

But in modern Kannada in the educated speech, the pronunciation of s is noticed sometimes. For example, the pronunciation of the words astu, istu etc.

S.D. sutra - 237.
The sounds from a to au are called vowels. Among these, the first ten viz., a, ā, i, ī, u, ū, ārī, īrī, lārī, līrī — these ten vowels are called monophongs (samanam). Again, among these ten monophongal vowels, the units of two serially (e.g., a, ā and so on), whether they are read according to the regular or reverse order (e.g., a, ā or ā, a and so on) are termed as sloka (savarna).

After the plain listing of the vowels, Kesiraja in this sutra has used some technical jugglary. But they are not going to add anything. The two technical terms used are 'samana' and 'savarna'. These technical terms are taken from the Katintra grammar. Similarly, he has used two more terms viz., anuoma (regular order), viloma (reverse order). It is very difficult to say why Kesiraja has used these terms. Only explanation may be: as he was following the Katintra grammar closely, he has used the terms therein without considering their viability for the Kannada language.

The same idea is continued in the next sutra. 'Among the pairs, if a short vowel is followed by a short vowel and long vowel is followed by a long vowel, a homogen takes place'.

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57 See Aloka — p.37.
58 S.D. sutra — 17.
Among the five pairs of these homogen, whether you read a short vowel after a short vowel, or long vowel after a long vowel, they get the term of a homogen. In continuation with the idea in the previous sutra, viz., of regular order and reverse orders, in this sutra he states that two short vowels or two long vowels, of the homogen also can come. For example, the short vowels like ā ā or two long vowels ē ē can come.

So far Kesirāja has listed the vowels from a to lī as savarṇas. In the next sutra, he states that ē ē and o, ṣ also are homogen. 'The vowels e ē o ē are inherent in Kannada. They are homogen also. They are technically called varṇa in grammar'.

Kesirāja's note on this sutra is: The pair of letters e ē o ē are not only used as particles (nipāta) to express doubt (visankā) and emphasis (avadhāraṇa), but are also found to be inherent in Kannada. For them also the term savarṇa is possible. In grammar savarṇa is also called varṇa.

ele (leaf), elavam (silk-cotton tree) 59
ēri (a raised bank), ētām (a picotter) sirkal (a tenant), oregal (a touch-stone)
ētām (reading), ērage (equality)

59 S.D. sutra - 18.
So far Kesirāja was dealing with the Sanskrit alphabet. Now, he turns to the Kannada letters. The letters e ë and o ð are natural to Kannada. So far he had listed only ë and ð among the vowels which alone are found in Sanskrit. But now gives the short counterparts of these viz., e and o. He has noticed the fact that both these vowels form the words in Kannada. The examples given here (e.g. elē, ēri etc.) are to show that short and long vowels both have distinct occurrence in Kannada. Hence, they can be given the status of varṇa.

We have already described the method of establishing phonemes on the basis of minimal pairs. These are not minimal pairs; not even sub-minimal pairs. But, they are not a must anyway. He has listed e and o in a separate sūtra because other vowels found in the Sanskrit alphabet are also there in Kannada. Hence, there is no necessity of listing them. Because Sanskrit alphabet does not contain short varieties e and o it was necessitated to list them.

Kesirāja has used, though not very precisely, varṇa as an equivalent of savarna. The varṇa (varṇaveēba sanje) can be there (odavugum) even for savarna (savarnaveēba sanje yalliyum). Usually, we say a-kāra, i-kāra etc. But in the place of kāra here the term varṇa is not used. If the term a-varṇa, i-varṇa etc. is used, it implies a, ë and i, ð (savarnas). Of course, such a phenomenon can be seen in a
limited environment.

In the next sutra the idea of short and long vowels is clarified. 'The preceding letters of the monopthongs (samāna) are short and the following letters are long. The vowels except a ṣ are called 'nāmis'.

The vowels which are called samāna (monopthongs) are ten. They are: a ā i ī u ā ṛi ōā ṛī lṛi lṛī. The first letters of these ten are called short vowels. But, according to Kāsirījā's own delineation, there is no regular order for these samānas. Either first one may come next (a, ā) or second one may come first (ā, a). Hence, there is no order specifying the short vowel as the first member of the samānas. Instead, we can take five pairs of these ten samānas. Then it will be all right to take the first member as the short vowel. Then there will be five short vowels viz., a, ī, u, ṛi, lṛi. And the five second members will be long ones. They are: ā, ī, ōā, ṛī, lṛī. All this (unnecessary?) technicality is because of his imitation of Sanskrit grammar apishly.

Similar is the situation with e and o (ē ō eṅbuvinī teradol' vartisuvuvu' - gloss). The first one is the short
one (e and o) and the second long (ē and ō). But why is it that in the sutra Kesirāja included only ten homogens and left out these four? Is it that still he wants to maintain the chastity of the system (of course, Sanskrit) and considers e and o as additions?

Then there is one more technical term introduced which is, also, not for any purpose. That is nāmi. All the vowels excepting a, ā, i.e., i, ī, u, ē, ri, ri, lṛi, lṛi, ō, ai, o, au are nāmis.

In the next sutra, he talks of the remaining vowels:

The dipthongs like ē are by their nature guru and long. Short letter has single mātra; long letter has double mātra; pluta has three mātras.

The dipthongs ē, ai, ō, au are by their nature guru and long. The time required for pronouncing each vowel is given.

The dipthongs mentioned here are those found in Sanskrit.

a - i yields ē; a ē yields ai; a u yields ō; and a ō yields au. The examples are: for

a - i - ē = nija-istāṣidāhi - nija-istāṣidāhi
a - e - ai = sāmasta-ākāṣeram - sāmastaikāṣeram
a - u - ō = vidita-ubhaya - viditūbhaya
a - ō - au = vidita-okeram - viṭaukṣram
Kesiraja adds a note on this viz., there are inherent in Kannada, diphthongs like ekära which are guru, long and having guḍhesandi. These letters are ॅ, ॆ, े, ै, ॉ, ौ.

In this sutra, Kesiraja gives quantitative division of the vowels. Basis for sucha division is duration of time. A vowel which has one mora (mātra) is a short vowel; that which has two māras is a long vowel; and the vowel with three māras is protracted (pluta) vowel. How to measure this mora? According to him a time taken for pronouncing the consonant is ¼ mora. Twice as long is required for the pronunciation of a vowel i.e., 1 mora is required. If time taken for pronouncing a vowel is two, māra, it is called long vowel. For the protracted vowel, three māras is required. It is all right for short and long vowels. But what about protracted (pluta) vowels. Three māras is the duration required for it. But its occurrence is very rare. It is the over-lengthening of the final vowel of a word or a phrase and is used in cases of questioning, for calling a distant person etc. It may be noted that pluta never occurs in the middle of the word. The context is so

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61 mātra hrasvah; dve dirghah; tisrah pluta ucyate svaraḥ—R.P. 1.55.58. See Allen, p.83.
rare that it occurs only three times in the whole of Rgveda. Hence, except for technical purposes, it has no value.

Extra concept as far as it relates to consonant has no justification. It may give a general idea of relative duration; but not a phonetic basis.

According to Kesirāja ē, ā, ō, au are guru (heavy) and long. Short one is called laghu (light) long one (heavy). Here, obviously, he has mixed up two different levels. He has also extended the concept of moras to prosody, which has led to much confusion.

As we have already seen, the concept of duration in terms of moras applies to vowel. And vowel forms the nucleus of a syllable. It is so important in the syllable that sometimes syllable is called vowel. This has led to the confusion of the identification of different branches. These two divisions must be kept clearly apart. The division into short (brasava) and long (dirgha) is confined to

62 See Allen, p.84.

63 One result of this phonological interdependence of syllable and vowel is that the term aksara is frequently extended to mean vowel - Mahabhasya - 1.1.2 See Allen, p.80.
vowels on the phonetic level. The division into light (laghu) and heavy (guru) are to be constructed with syllable in prosody. And in prosody, it is not the vowel (whether short or long) that is important but the syllable which is of importance. The terms light and heavy refer to the quantity of the syllable for metrical purposes. For the metrical purposes, we have to know the rules of syllabic quality.

a) For guru (heavy):

1) (A syllable containing) a long vowel (including the nasalized vowel) is guru.
2) (A syllable containing) a short vowel followed by a consonant group or by a final consonant in pause is guru.

b) For laghu (light):

1) (A syllable containing) a short vowel not followed by a consonant group is laghu.

A final short vowel may be lengthened. Hence, it forms a heavy syllable.

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64 'The description in terms between the difference of long and short in vowel-sound and that of heavy and light in syllable-construction is valuable and should be observed'. - Sanskrit Grammar - Whitney.

65 Allen, p.85. See also Siddheshwar Varma, p.91.
In the light and heavy syllables also, there are further gradations. For example, (a syllable containing) a long vowel is heavy; and heavier if accompanied by a consonant; (a syllable containing) a short vowel with a (preceding) consonant is light; and lighter without a consonant. Even then, their designation will be only heavy and light.

The above discussion implies that the syllabic division is an important factor in deciding the heavy and light syllables. Let us take some representative examples for explaining the idea of syllabic boundary. The Kannada words, ā, ī, bā, tā, kal, kāl, hālu, anna, hambale and so on. The fundamental basis of syllable is a vowel. There will be as many syllables as there are vowels. Hence, ā, ī, bā, tā, kal, kāl are mono-syllabic. Hālu, anna are having two syllables and hambale three syllables. The real question lies in the words with more than one syllable and the question is that of fixing the syllabic boundary. Hālu has two syllables, viz., hā and lu. anna is having two syllables, viz., an and na. (The rule is the first member of the word-medial double consonant goes with the previous vowel and the second consonant goes with following vowel). In hambale there are three. hām, ba, and la. Now, according to the rules of guru and

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66 R.P. XVIII 41-44. See Allen, p.36.
67 The discussion on syllabic division. See Siddheshwar Verma, p.61.
laṅgu discussed above, ś, ṭ ṭ, tā, kāl, hā, kāl, en, haṁ are heavy syllables: and lu, na, ba and la are light syllables.

ē, ai, ō and au are termed as diphthongs by Keśiraja.

Before considering the question as to whether diphthongs are there in Kannada or not, let us present the concept of diphthongs in Sanskrit, which has formed the basis for our grammarians. The term for diphthongs is 'sandhyākṣara' in Sanskrit. The term sandhyākṣara is found in Kātantra Vyākaraṇa. In Pāṇini the terms guna and vrddhi are found. ē and ō (including a) are termed as 'guna', and ai and au (including a) are vrddhi.

What is diphthong? Diphthong has two aspects: 1) phonetic and 2) phonemic. In phonetic aspect, diphthong is defined according to its pronunciation. As per this view, diphthong has the pronunciation of more than one vowel. In

68 A distinction is made between pluta and vrddha vowel. So, when a short vowel becomes pluta, it was aptly called 'pluta' ('having jumped' - from plu - 'to jump') owing to the abrupt change that it underwent. But, when a long vowel becomes pluta, it was called only vrddha ('increased') the change being comparatively graduated. Siddheshwara Varma, p.180.

69 Diphthongs may be considered as vowels in which there is appreciable change of quality during the course of their pronunciation. - Gleason - p.254.
such a case, there is one prominent vowel and the other not a prominent one. This prominent vowel may either be the first member, or the second member. The diphthong with first vowel as prominent is termed the falling diphthong; and the one with prominent second vowel is rising diphthong. According to the ancient works on grammar, there are at least, three pronunciations of the diphthongs.

1) In the diphthongs e and o, the 'a' has only half a mora; and in ai and au it has two moras.

2) It is not known where a ends and i or u begins, as the two coalesce like milk and water.

3) In the pronunciation of e the raising of the middle of the tongue towards the palate is less than in the case of i, owing to the fact that the former is mixed with e.

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70 Ibid, p.255.
72 māṭrāyoh samayoh kāśīrodakavat saṁsargat na jñeyate kvāvarṇa - mātrakva vevarṇavarnayor iti - Allen-84.
73 ivarṇe yathā jihvāmedhyopamasaharo na khalvevam, ekēre kim tu tato nyūna ityarthah: kutaḥ: akēva-misritatvād ekārasya - See Allen, p.64.
Perhaps, this is the reason why Kesirāja uses the term gudhasandhi.

According to the phonemic aspect, the diphthong is considered as the sequence of vowels. For example, a - i e; a - u o; a - e ai; a - o au.

The four diphthongs are transcribed as e, o, ai, au. As the transcription suggests, there is no doubt about ai and au being diphthongs. But for e and o the case is not so clear, though they were diphthongs historically. The time required for pluta was three moras, whereas the time required for the diphthongs ai and au was four moras. That is, the second element of ai and au was pluta. But, this suggestion is objected by other grammarians. According to Sākaṭāyana, when ai and au become pluta, 'both their elements should uniformly increase in quantity. Kātyāyana interprets

74 Diphthongs may be considered as sequences of vowels or of vowels and semi-vowels. Gleason, p.254.
75 Avestan vaeda besides Sanskrit Veda - See Allen, p.62.
76 Siddheshwar Varma, p.180.
78 Ibid.
the pluta of i and u as 'long', and so. According to his opinion, the total moras of pluta diphthongs ai and au would have been three. According to the view of both of these authors, the second element tended to be longer in pluti. There is also a view that the first element should be pronounced as pluta. So, it can be said that there was no unanimity about the quantity of the diphthongs, though the view that the second element was longer, was more in vogue.

The above discussion may be concluded with the statement that whereas the phonological value of e and o was a - i and a - u, that of ai and au was a - i and a - u.

This is all about the nature of diphthongs in Sanskrit. Now, the question is whether those diphthongs exist in Kannada or not. About, ō and ō there is no question, as Kesirēja has admitted that they are not diphthongs. The evidence for this point is his inclusion in the category of monophthongs (samēnas) the short (e, o) and long (ē, ō) counterparts. About ai and au there is a considerable discussion.

79 Ibid.
80 See Allen, p.63.
There are two aspects of this discussion. One, whether the diphthongs are found in Kannada or not. The answer is, there are no diphthongs. As the word Kannada is written (of course, the basis for this writing is the pronunciation) as Kavunja, Kaigai as keygey and mai is written mey, according to Kesiraja etc.

Another point is: if Kesiraja admits the existence of the diphthongs in Kannada it is not clear why he talks about only two diphthongs viz., ai and au. These are not the only diphthongs, if they are there. To this list we can also add ui and oi which have a similar behaviour. The reason for the exclusion of ui and oi by Kesiraja is obvious. The reason is: they are not listed in Sanskrit alphabet.

After admitting that there are no diphthongs, what is the pronunciation of ai and au? When it is said that these are not diphthongs it means that the second component of these units was either a full-fledged vowel or a consonant. As, in Kannada two vowels cannot come one after another, it

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81 a) For the exhaustive discussion of ai and au See Kannada Varnagalu - Sediyapu Krishnabhatta.

b) The vowels ai and au do not belong to Kannada - Kaypidi - p.137.

c) Kannada Bhasaya Charitre, p.145.
must be a consonant. And that consonant is y (in ai) and w(au). What remains, now, is the pronunciation of the vowel a. Whether it was a-like or e-like? Here again, there is no controversy about the pronunciation of a in aw. It is admitted to be a only. But about the quality of e in ay, there is a considerable controversy. Dr. Caldwell says that ai, unlike the Sanskrit diphthong, represents e and i, not a and i. For this, he cites the example of the proto-Dravidian talai represented in Kannada as tale. He also cites Kumarilabhatta to say that he (Kumarilabhatta) evidently considered Dravidian ei nearer e than ai. In old Kannada literature, it is to be noticed that the pronunciation of ai was both ay and au. So can we say that it was both ay and ey? Let us see some words. For example,

mai - 'body'; mey - 'to graze'

kai - 'hand'; key(gey) - 'to do'

In these words, some pattern is to be noticed. The pronunciation of the words meaning 'body' and 'to graze' is different; and similarly, it is different in the words meaning 'hand' and 'to do'. The first words of these pairs is written in Kannada with ai. In the second set, the

82 Caldwell - p.136.
words are written regularly with final consonant, viz., mey, key, etc. It means that there are two sets of words with no relation at all. In the words where consonants are written word-finally, the vowel is e; whereas in the words written with diphthongal written symbol, the pronunciation is a. That means, the pronunciation of 'a' in 'ai' is 'a' only. Then there are other words like Keidu (kaydu) and aaidu (aydu) etc. where we have only a and never e. Hence, the pronunciation of a in ai was a (sometimes e in old Kannada) and not e as is maintained by Dr. Caldwell etc.

Though Kesiraja has said that there are fourteen vowels in Kannada, according to his own rules they will be more. These fourteen vowels are divided into seven short, and seven long vowels. But, what about pluta? We have to add seven pluta vowels. Thus, it makes the vowels into twenty-one. Added to this, there will be two diphthongs. So, the number 84 will be twenty-three.

But, the foregoing discussion helps us to establish only ten vowels for Kannada. Because, firstly, the four vowels ni, ri, lri and lri are not found in Kannada. Secondly, there are no diphthongs ai and au. This reduces

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84 Pandit Pujar says that they are twenty-five - Kannada Varnagalu - p.12.
the vowels to: a, ă, i, ă, u, ă, e, ă, o, ă. As pluta is not necessary, as discussed, there are no pluta varieties. Hence, there will be ten vowels. This is from the conventional point of view.

This number of vowels i.e. vowel-phonemes can further be reduced. According to modern linguistics, the significant units get the symbol. If a particular unit is found universally in that language, it also may be given a separate symbol. The ten vowels includes five short vowels and five long vowels. It is alright to give symbols for short vowels. But, is it inevitable that the long counterparts also should be given separate symbols? In Kannada there is a significant variation between short and long vowels in all the instances. Hence, length of the vowel may be indicated by writing it twice. Because consonants also are long, where they can be written twice to indicate length. Moreover, length is neither vocalic nor consonantal. Totally, there will be five vowel-phonemes for Kannada. They may be represented as follows:

/a i u e o/
We may begin the treatment of the consonants with the sūtra, where consonants are enumerated. The consonants are from k to m. The first twenty-five sounds are the classified consonants (varga). The next nine consonants are called the unclassified (avarga).

These varnas from k to m are termed as consonants. These are in all 34 in number. The first twenty-five from k to m are called the classified sounds. They are grouped into five classes, each class having five sounds. The whole class is known by the first member of the class e.g. k-varga means the five sounds k, kh, g, gh and n and so on.

These five classes with their members are as follows:

- k - class - k, kh, g, gh, n
- c - class - c, ch, j, jh, n
- t - class - t, th, d, dh, n
- t - class - t, th, d, dh, n
- p - class - p, ph, b, bh, m

The basis for this classification is already given (under sūtra No.41).

85 S.D. sūtra - 23.
The nine unclassified sounds are:

y, r, l, w, s, š, s, h, l.

These are called unclassified sounds as there is no principle of arrangement as seen in the classified consonant. Hence, they are listed as unclassified.

After the enumeration of all the consonants, the particular treatment of second and fourth letters of the varga is found in the next sutra. The second and fourth letters of each varga are the aspirate. They are used by the wise in numbers and imitative words.

The second and fourth sounds of each varga are called aspirate (mahāprāṇa). As opposed to the aspirate sounds, the first and third sounds are called unaspirate (alapaprāṇa). They are listed below:

Aspirates: kh, gh, ch, jh, th, dh, th, dh, ph, bh.
Unaspirate: k, c, c, j, t, d, t, d, p, b.

The aspirate sounds, in the case of Kanna language, are used, mostly, in the words indicating numbers, and in the imitative words. For example, irchēsira, enchēsira etc. (number).
Khanilene, chummene, bhorene (imitation).

In this sutra, Kesirajasa has indicated the aspirate sounds. He has not given any basis on which sounds are divided into aspirated and unaspirated. But, this process is explained in the Sanskrit grammars. The TP says: 'More breath is emitted in the other voiceless consonants (i.e. the aspirated stops and the fricatives) than in the unaspirated stops. And the sounds with more breath are called aspirate (mahāprāṇa) sounds, and those with less breath are called unaspirate sounds (alpaprāṇa).

Modern concept of aspiration is not different from that found in the Sanskrit texts. If, while producing a stop, there is an extra puff of air, the feature is called aspiration. And the sound accompanied by this aspiration is called aspirated stop. Aspiration may be found both in the voiced and voiceless stops.

In addition to the aspirated sounds, there is also another feature of classification which is not touched by


88 'When the pressure is great, the release of the occlusion is followed by an outrush of air, often described as a puff of breath. This is aspiration, and the stops formed in this way are aspirated'. — Block and Trager, p.32.
Kesiraja, but used by him for the classification. That feature is voicing. In the list of classified sounds, every third and fourth sounds of the class are voiced sounds. For example, g, gh, j, jh, d, dh, d, dh, b, bh. These sounds are called 'nāda (voice) sounds, nāda being 'force of voiced breath'. 'When the glottis is closed, voice is produced, when it is open, breath.' There is another statement which explains the relation of the voicing process to the various sounds. 'The breath is emitted in the case of the voiceless consonants, and voice in the case of voiced consonants and the vowels.' Whilst 'ghogavat' and 'aghoṣa' are generally used for voiced, and voiceless, the usual term for voice is 'nāda' and not 'ghoṣa'. The sound with nāda is ghogavat (not 'nādavat') and without 'nāda' is aghoṣa(not 'anāda').

If, at the time of a pronunciation of a particular sound, the vocal cords are vibrating, there will be 'voice'. The sounds accompanied by voice are voiced sounds. If the vocal

89 samyṛte kanthe nādaḥ kriyate; vivṛte svāṣaḥ.
TF. ii 4-5. See Allen, p.34.

90 śvāṣo' ghoṣasya' vanupradāmaḥ; nādo ghoṣavat svaretu, 
AP. i. 12-13. See Allen, p.34.

91 Allen, p.34. f.n. 2.
cords are silent, then there will be no voice. Sound in such a situation are called voiceless sounds. Voicing is not confined to the consonant only. The vowels are almost always voiced. The voiced and voiceless consonants among the classified letters are:

Voiceless - k, kh, c, ch, t, th, p, ch,
Voiced - g, gh, j, jh, d, dh, b, b.

After delineation of the aspirated and unaspirated distinction, the question as to whether the aspirated sounds exist in Kannada is found in the next sutra. The aspirates are also found used naturally in some Kannada words.

The aspirate sounds are natural to Kannada, according to Kesirāja. He has already said in the previous sutra that these aspirated sounds are used in the numerals and imitative words. Here, he does not seem to restrict his statement. As examples, he gives, dekkhānam, pakkhālem, kharige, jhalakem, ḍhage, ḍhali, bhāvam etc.

Now, the question is: are these aspirates inherent for Kannada, as Kesirāja supposes? All the words in the list are either from Sanskrit or from Prakrit. None of these is
natural to Kannada. Even Kesiraja is not uniform in his opinion. In the previous sutra he has stated that the aspirates occur only in the numerals and imitative words; and here, he states that they are inherent. The examples given for the present sutra are not Kannada ones. As for the examples given for numerals, it can be seen that the second member of these compounds is 'sāsira' only. And this 'sāsira' is the corrupted word from Sanskrit Saheera. That is also not Kannada word. When this word 'sāsira' is combined with some numeral, s - the first sound of that word becomes ch -. But what about other cases where the words beginning with s are found without such a change? For example, eradu seragu - irseragu. In such cases, it is, perhaps, due to the influence of Sanskrit Sandhi. The numeral compounds given above are not really native Kannada compounds.

About imitative words. These are borrowed words. Most of them may be originally unaspirated. These were aspirated as Prof. M.M. Bhat thinks because of the thought that they

93 Just as in Sanskrit Srimat - Sesanka = Srimacchaksana, so in the internal aspiration of Kannada numerals, there seems to prevail some Sanskrit Sandhi influence - M.M. Bhat. 'Aspirates in Kannada'.

94 Ibid.
would enhance the emphasis of the concerned sound. There too, aspiration is not universal in these words. All the people do not pronounce these words with aspiration. If aspiration was natural, they would have been uniformly pronounced with aspiration. Prof. M.M. Bhat shows that there are some words which in Sanskrit are unaspirated, but in Kannada they are aspirated. For example, Khoppar (Kan) is derived from Sanskrit word 'Karpara 'shoulder-blade' or Karpara 'coulbou'.

Karnataaka Bh{a}sa Bh{u}sana, the predecessor of Sabdmani Darpana, is more doubtful on the matter. It states: 'There are, perhaps, no second and fourth letters of the varga.' By 'perhaps' it is meant that they are found in the numerals and imitative words etc.' They, as shown above, occur in a very restricted environment, that too, not Kannada.

Kaypidi (Part I) gives three reasons as to why aspirates are not native to Kannada: They are:

1) The examples given by Kesiraja for the numerals begin only with 'Sasira' as the second member. 'Sasira' itself

95 'natra prayega vargaana dvitiyacaturtham; pruyeneti
vacanat senkhyamuharadau drsyante.'
Kar. Bh{a}. Bhu.

96 Kaypidi (Part I) - p.317.
is not a Kannada word, it being a corrupted word from Sanskrit.

2) Imitative words which have aspirates, can not form the
basis, as they may be unaspirated also.

3) The examples given by Kesirāja to show that aspirates are
natural, are not Kannada words.

So, the aspirated sounds are not natural to Kannada.

The latter half of their sutra deals with 'bindu'. The
fifth letter of each classified group of consonants is called
as nasal', and the nasal letters are ṅ, n, ṇ, n, m.

Nasal (anunāsika) sound, as we have already explained,
is produced when both oral and nasal cavities are open, the
articulation being in oral cavity. For nasal sound, every
activity being the same as that of oral sound, there will be
nasal passage open. Nasals, also, are stops.

Bindu is called anunāsika and is included among the four
yogavāhas. The idea of the four yogavāhas is given in the
next sutra. 'The bindu, visarga, jīvhāmūlīya, and upadhāmāniya
are called the yogavāha letters. The jīvhāmūlīya stands

97 For a detailed information of this see, Karnāyaka
vyākaraṇopanayāsa manjari, p.22.

98 a) nāsikāvivarṣaṇānunāsikyam T.P. ii. 52.
b) anunāsikam mukhanāsikam - A.P. 1.27. See Allen, p.39.
before 'k', and the upadhmāṇiya before 'p'.

The 'k' of jihvāmūliya is to facilitate pronunciation. If this 'k' is deleted, the remaining letter looks like a pasumbe. The form of the letter along with k is ச.

The 'p' in upadhmāṇiya is also for helping pronunciation. The upadhmāṇiya is in form like the pair of breasts of a young girl. The form of the letter along with 'p) is போ.

The sonne is circular in shape like the circling of a kāivāra (a compass). It's form is 0.

The two such bindus are arranged one above the other to form the visarga. It has the shape.

In this sutra also Kesiraja only gives the graphic picture of the yōgavāhas and not their nature. In the sutra 43, he has omitted the three of these yōgavāhas viz., visarga, jihvāmūliya and upadhmāniya. Hence, they are not necessary for the Kannada language.

However, let us study the nature of these yōgavāhas. Visarga is the short form of visarjēniya, which means
terminator, terminal sound'. The symbol given for it is. It may be transcribed as h. The Sanskrit grammatical treatises classify 'visarga' with the fricative s, s and s.

Along with the 'visarga' there are two others, viz., jihvāmūliya (lit. 'of tongue-root'), and the symbol given for it in Kannada grammar is. It may be transcribed as a fricative X. The 'upadhānīya' (lit. 'breathed-at') has the symbol in our grammar. It may be transcribed Ø - bilabial fricative.

Whatever the different symbols are given for these three, the pronunciation of these is not independent. The jihvāmūliya sound is pronounced only before k. For example, ushākēla. Upadhānīya is pronounced only before p. For example, payāhpāna. Visarga occurs before pause and before the sounds of other class. When it occurs in the final position, it is pronounced as h (e.g. rāma, dēva, etc.) and before other sounds as s, s, or s (e.g. deva ca, devas tiṣṭati etc.) The striking point about all these sounds is that they have no single fixed position of articulation, there being no agreement about the 'point of articulation' or 'the articulator'.

100 For an excellent exposition of the 'visarga'. See, 'A Phonemic Interpretation of Visarga'. A.H.Fry 'Language' - Vol. XVII-1941.
Limiting ourselves, here, to jihvāmūliya, upadhāṃniya and visarga (without its various representations like s, ś, ś etc.) we may say this: as well the three sounds have well defined environment of their own, it may be concluded that, visarga may be taken as a phonemic representative, with jihvāmūliya and upadhāṃniya as positional variants of it, i.e. the allophone s. That means, there is only one phoneme visarga, and it has three allophones - jihvāmūliya occurring before k, upadhāṃniya occurring before p and visarga elsewhere.

As Kesirāja has retained bindu in his alphabets, discarding the three yogavāhas, he is treating of the bindu in the next sūtras: 'The cipher is called bindu and anusvāra. It is, like a pearl, circular in shape. If two such ciphers are arranged vertically one over the other, just like the ornament, that symbol is called visarga.'

For 'sonne' (cipher) there are two names, bindu and anusvāra. It is like a single pearl. It is the corrupted form of Sanskrit word 'śūnya'. As it is like a cipher, it

101 The Tamil 'aytam' (represented in the alphabetical system as '...') is commonly considered as identical with visarga - 'Some problems in Kannada linguistics' p. 18.
102 S.D. sūtra - 21.
is called bindu. It's shape is ो.

It is strange that Kesirāja is dealing with visarga, though, according to him, it is not necessary for Kannada. This is done because first he is describing the sounds whether they are of Sanskrit or Kannada. Only after this is done, he is deducting the sounds which are not necessary for Kannada. This was not necessary. As we have dealt with visarga in detail we are not dealing with it here.

In the next sutra, Kesirāja gives the pronunciation of bindu (and visarga also). 'The bindu and visarga take their positions next to a vowel, and they by themselves can not be pronounced. They are called dependents on vowel, and dependents on consonant.'

As they come after the vowels, and have no independent pronunciation, the bindu and visarga are termed as svarāṅgas and vyanjanāṅgas.

As bindu and visarga have no independent pronunciation, they are pronounced with the help of some other sound. In the sutra it is said that they are both svarāṅga and vyanjanāṅga. As bindu and visarga go with vowels, it is correct to say that they are svarāṅga. Probably Kesirāja meant that

103 S.D. sutra - 22.
while all the other vyanjans's occur as syllabic onsets, at least in graphic representation, e.g. = kʰ, = gʰ, the visarga and anusvara do not have this status, since they occur as syllabic codas. Moreover, etc., independent of the vowels can be written, but not bindu or visarga, which in Kannada varnamāle are written as and . But what about vyanjana? Vyanjans themselves are mostly svarangas.

In the sutra there are two terms used as equivalents, viz., anusīka and anusvāra, which, in fact, are different. (Detailed explanation of all this will follow after the enumeration of the sutras on bindu).

The next sutra is: 'After m and n, whether there is a consonant or not, bindu is born. If there is one of the classified consonants, it becomes optionally the fifth letter of the class'.

After m and n, whether there is a consonant or not, m and n become bindu; that means, at least in certain environments, there is neutralisation of m and n. But, if after the bindu, there is one of the sound of the class, it will be nasal of that class.

104 Vyanjanam svārangaḥ. TP 1.6.
105 S.D. sutra - 172.
There are three varieties in the nasality.

1) Along with the oral cavity if the nasal cavity also is open, the sounds produced are called nasal sounds. Such nasal sounds are five in number viz., m, n, ŋ, n, ŋ.

2) Another variety having nasality is the nasalised vowels. In such vowels, nasality is the additional feature. However, they are not very frequent.

3) The third variety of nasality is anusvāra. This anusvāra may be given a symbol m. The environment in Sanskrit, in which the anusvāra comes is: after the vowels and before the fricatives s, s and ŋ (and sometimes h) in the first stage. For example, aṁsa, haṁsa etc. That is, the nasal sound which comes before the fricative sounds in Sanskrit has a special name 'anusvāra'. During the second stage this environment widened and it began to occur before r, v and y also. About anusvāra, there are, prominently, three views.

1) Anusvāra is a nasalized vowel. The literal meaning of anusvāra can be seen here viz., "after-sound". This is the opinion of the Sūtrakāra. According to him the phenomenon where there is an elision of m and n and the previous vowel is nasalised, is anusvāra. (This opinion is expressed in the sūtra No.172 of Kesirāja).
2) **Anusvara** may have the feature of either a vowel or a consonant or it is either a vowel or consonant. Sūtra 22 of Sabdāṇuṇḍi Darpaṇa fits in this scheme.

3) **Anusvara** is a consonant. Its pronunciation is g.

According to the scholars no Dravidian language has this anusvara. Only approximation to the anusvara is Telugu 'ardhānusvara'. Kannada has taken the nomenclature from Sanskrit, and applied it to the nasal sound before the consonants of each class.

It is clear that the nasal sound before the varga consonants, is different from that found in the environment of fricatives, and y, r, v. The articulation in hamsa, simha is different from that found in hambal, pampa etc. Similarly, in sanyama, svayamvara, etc. The nasal sound before the varga consonants is a stop; and the one before the fricatives and y, r and v is different. This fricative nasal sound is anusvara; and others anunāsika.

The purport of the above discussion is that anusvara and nasal are theoretically different, being bound by the

106 anusvara vyānjanaṁ vā svarō vā - See Allen, p.43.

107 Dr. Caldwell, p.167. But P.G.Kulkarni differs with Caldwell - See Kannada Bhaseya Charitre, p.146.
environment. But, this difference in due course, vanished, perhaps due to confusion or ignorance. Hence, the anusvara came to be used before the varga consonants also. In the beginning perhaps, it was due to the convenience of writing. (In the writing of Sanskrit for anusvara, a separate symbol ( ' ) is used above the letter (e.g., \( \overline{\text{a}} \)) and before the varga consonants the fifth letter of the class is used. Wherever anusvara was there, (before s, s, s, h, r, y, w), this cipher (bindu) was used. The same symbol, because it was convenient, came to be used before other consonants.

The next stage is seen in Kannada. Bindu, when it lost its original nature, began to be used everywhere, and it became the representative of all the nasal sounds in Kannada. It is all right if bindu comes in \( \overline{\text{a}} \) etc., but it was used in the words ganga, tande, antu etc. But, this is not to suggest that the pronunciation also was changed. What happened in Kannada was the borrowing of the Sanskrit nomenclature with orthographic symbol, but leaving its function.

Another question here is: How many are the nasal phonemes in Kannada? Kesiraja (as also other grammarians) lists five nasal sounds viz., m, n, \( \tilde{n} \), \( \tilde{n} \) and \( \tilde{a} \). But are all of these significant for Kannada? Of these five /m/, /n/, /\( \tilde{n} \)/ occur in the minimal pairs like amma, anna, \( \text{anna} \). Hence
they are separate phonemes. But, there are no such minimal pairs for ñ and ñ, ñ and ñ have got a definite and predictable environment. Hence they can be grouped as allophones of /n/, the environment being the consonant of its class. Hence though there are five nasal sounds, there are only three nasal phonemes in Kannada. Each of these nasal sounds have a symbol in the writing system. And bindu (०) is a common symbol for all these nasal sounds. As the existing system has provided for the nasal sounds, bindu is not necessary for Kannada (on both the phonological and orthographic levels).

In the next sutra, Kesiräja gives some nasal consonants.

'The letters y, w and l are called nasals as well as non-nasals.'

The consonants y, w and l are both nasals and non-nasals. Examples for the nasal y, w, l are as follows:

- y — mēyisidam; mayam etc.
- w — sēve, jēvam, mēvam.
- l — allēnage, ollēnage, hallēga.

108 Also, a) 'Kannada Bhaseyalli Bindu' J.S.Kulli 'Karnataka Bharati' Vol.I. Part I.


The question is: these examples given for nasal consonants have nasality? and, if so, is it significant so as to give it a phonemic status? In the examples like māyisidam, nāyisidam, etc., the nasality is due to the adjacent consonant. If the nasality is found due to the influence of the neighbouring sound, it is not significant. Some other words like jāvēm, kōvānēm are from Sanskrit, and -m- between two vowels becomes nasalized v. In some words, it is just due to the ideosyncracy of a particular individual, not a general phenomenon.

If these y, w and 1 are nasalized, why Kesirāja did not give them the status of a varṇa? He says that there are both the varieties, nasal and non-nasal sounds, but does not include them in the alphabet. Hence, we have to say that this nasalization in y, w and 1 is allophonic.

Now, Kesirāja explains the nature of some individual letters in the next śūtras. 'The letter 'l' which stands as a substitute for 'l' occurring in Sanskrit words is called the ksāla'.

The letter l in Kannada which comes in the place of 'l' in Sanskrit is given a name of ksāla. For example, the 'l'.

110 Ibid.
occurring in the words jalam (Skt. jalam), phalam (Skt. phalam),
tilam (Skt. tilam), balam (Skt. bala) etc. is called kṣalā.
(A detailed treatment will be given after the enumeration of
all these sūtras).

In the next sūtra, Kesirāja explains the nature of the
kṣalā, and the reason why he is stating about kṣalā. 'In a
poetical composition where kula is employed kṣalā has not
the option of being used as 'l'. In a poetical composition
where 'l' is employed as prāsa, kṣalā should not be used
even optionally. There is no option for 'l' of Sanskrit
except in the exigency of a kṣalā. Hence, I told about the
kṣalā here'.

Kula means the l found in Kannada words. Kṣalā is a l
which has no difference with l (of Sanskrit) as there is
no difference between l and l.

The gloss on this sūtra reads: As the Kannada poetical
composition in which there is kula prāsa includes kṣalā also,
'l' should not be used optionally. In the Kannada composition
where l is for prāsa, kṣalā is not used optionally. Hence
that too is not possible. As Kṣalā is not used except for

111 S.D. sūtra - 15.
the 1 in Sanskrit words optionally, kṣaḍa is treated here.

The examples given are:

For kula-kṣaḍa prāsa:

'kiliṛe hayangal garjise
jaḷaṇa nibhangal gagangal'

For kula the kṣaḍa can come as a prāsa. So the example is all right. The word 'kiliṛe' is a Kannada word; and hence contains kula. The word 'jaḷaṇa' which is Sanskrit word (jala) contains kṣaḍa. This sort of prāsa is allowed.

For kṣaḍa not being used for '1'.

ōlagadolorme naṭanera
pālaka uḍgamanīdyutipluta carṇam.

Many have found fault with this example. The example is given here for showing that kṣaḍa is not used for '1'. The example is not for the fault, but the proper example of the point. If the example for the fault was given, it would

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112 There are many controversies raised for this sūtra. See, 'Kula-kṣaḍa-vicēra'. P.K. Vol. 45. pt.IV.

113 Ibid. and Ālūke, p.35.

have 'Slaga' and 'palaka'.

In the next sutra, he gives the nature of r, l etc. If 'r' is pronounced with more force, 'r' is produced. 'd' pronounced with more force results in l. 'l' pronounced with more force gives rise to 'l' of Kannada known as kula. This kula, as we have already seen, can not be used as prāsa with 'l'.

To bring harmony between the idea expressed in the sūtra and the gloss (which apparently is found) there is a suggestion that in place of 'samane sallada' in the sūtra be read as 'beṭṭitenisida'.

And sūtras: 'These sounds (r, r, d, l, l, l (kula) are used in the alankāra known as varṇāvṛtti (alternation of letters). But, these should not be used for the purpose of prāsa. They are, also, not used in connection with alankāra 'yamaka'. These four letters along with the short sounds e and o are indigenous to the (Kannada) language.'


117 S.D. sūtra - 29.
If 'r', 'd' and 'l' are pronounced with more force 'r', 'l' and 'l' (kula) are produced respectively. r is alveolar. 
also belongs to the same point of articulation. 'd' is retroflex. 'l' belongs to that point of articulation. 'l' is dental; kula belongs to that point of articulation. Hence, they are used in varnāvrtti. But not for prāsa and yamaṇa.
by pressing hard seems to exist in following points:

May be like in Tamil, Kesirāja, might have come across with an alveolar variety of the dental lateral. Otherwise, it is difficult to explain why Kesirāja being such a grammarian, should stumble in identifying 'l' as a resultant from 'l'.

for r and 'r' - more - more, mare - mare, kore - kore. 
for 'd' and 'l' - kalāl - kalāl 
for 'l' and 'l' - mole - mole, kale - kale.

As all these are of the same point of articulation, they are used in varnāvrtti. There is phonetic similarity among these sounds. Moreover, they are articulated at the same point of articulation; and are different because of their pronunciation with more force - See K.K.Gowder Pra. Ka. 43.3.

Then there are some verses for these points. Then there are examples where 'l' comes in place of 'd'. Kāligou, Kolkattu, nilkarisidam, mālpam, nālpam, nāli, etc.
Kësirëja has mixed grammar and prosody here. Since his analysis is based on poets' works, examples are to be necessarily taken from them and to determine 'sound value' of the different symbols, 'prësa' is just necessary.

In the next sūtra, the examples are given. 'The ð letter of Sanskrit dâdima, kûsmëndâ, goudâ, gûdë, jhëgadë, vidënga ëdëka change into l, when these words take tadbhava forms in Kannada. This l in the above words is a further corruption of l'.

The words dâlimbâm, kumbalâm, goulâm, gulâm, jaëlë, vilangëm contain l (kula) which is from l that is born of ð. The word elaga contains kula born of ð.

In the next sūtra, he states some other letters that give rise to l. In the poetical compositions t, t, th, r and l (kṣala) change into l in tadbhava.

Examples:

\[\begin{align*}
\text{t l} & : \text{ghatike - galike, dhāti - dhāli, lātam - lālam etc.} \\
\text{t l} & : \text{pratihastam - palihattam, pratipādikam - palivāvuge} \\
\text{th l} & : \text{mathike - malige, pithike - pīlige.}
\end{align*}\]

117 S.D. sūtra - 30.
The examples are continued in the next sūtra. 'Letter t is changed into 1 in the words sphatika, petike, viṣike, gnutike, varēta, raghate, sruṭa, sphoṭaka, and lampāta, when they are tadbhavas.'

He states the word hōlige, the corrupted word from sphoṭaka, and lampāla from lampāta and doubtful examples for 1, but, however, they are 1.

In the next sūtra a list of words with letter 1 is given. 'The list of words with letter 1. The meanings of these words vary from one to as many as five. These words are from the works of the great poets of early times'.

He has selected 181 words from the works of the great poets of the yore. The list contains the words with one meaning to five meanings.

In the next sūtra he gives the rule for the double consonants with r: 'In prāsa, long consonants with r are

119 S.D. sūtra - 32.
120 S.D. sūtra - 33.
sometimes used along with long consonants with 1. The usage is correct though the r with double consonant can not be pronounced as 1'.

In the next sūtra he gives the words of which he is not sure whether there is kula or rala. 'It is doubtful whether the 1 in the following words is kula or rala. The letter is to be determined on seeing the usages. All examples given here go to prove that they are all kula'.

In the words jhalakam, jhalapisidam, jānguli, bombuli, thamālam, thamālam, valige, onduli, janguli, puttali, ṣāli, phēli, it is not clear whether there is 1 or rala.

'ilidaliyam, ēlidēm, sūkali, őkuli, kālaru, pelaru, marukuli, aliyam, kuliyam, mālige, jālige, talige, balasu, 123 balasiya, nōle, tālem'.

In the next two sūtras the list of examples is continued. Ālisidam, pelisidam, kēlam, jūdāli, aliyle, kalavālam, 124 meymālam, mālam, talige, ilige, irukuli are having kula.

121 S.D. sūtra - 34.
122 S.D. sūtra - 35.
123 S.D. sūtra - 36.
124 S.D. sūtra - 37.
Next śūtra gives the words where tending words are pronounced with 1. 'The words beral, eral, oral, koral, saral, aral, paral, maral, naral, and mungaysaral end in 1. People ignorant of this pronounce them wrongly as ending in (kuḷa).

The above ending words should not be confused as ending in (kuḷa).

All these words are ending in 1. Hence, they should not be pronounced with 1 at the end. In Kesirāja's time, -1 was changing to -1, and this trend increased in later period and so now, we have only -1 in all such places.

In the next śūtra, the optional use of 1 is permitted. 'The medial r in the words maral, aral and eral becomes optionally 1. Thus through interchange of 1 and r, the words are also pronounced as malar, alar and elar'.

The word 'vikalpa' (option) means it has both the usages.

Now, let us start with r and r. There is no doubt about the existence of two r's in old Kannada and to some extent in middle Kannada. In modern Kannada there is only one r, two r's having merged into one. And there is also

125 S.D. śūtra - 38.
no doubt about the difference existed in the pronunciation of these two. The examples given by Kesiraja to prove the existence of two r's are: more-more, mare-mare, kore-kore.

About the pronunciation of these two, Kesiraja says that 'if r' is pronounced with more force, 'r' is produced. In the gloss he says 'r' is retroflex; and r is also having the same point of articulation. Is or was the pronunciation of r retroflex? Position of articulation in retroflex sounds is, the tip of the tongue is curled towards the soft palate, especially in the region of dome. Such retroflex sounds in Kannada are Ɂ, Ʌ, ɳ, ɘ, Ʉ. But in r such a pronunciation is not found. While pronouncing r, the tip of the tongue touches the alveolar region, that too, for a very short period. Hence, r is, in terms of phonetics, voiced alveolar flap. Then how could Kesiraja say that it is a retroflex?

The answer is, Panini had said so, hence he too said the same thing. But, Panini's statement itself is refuted. 'As regards r, all the Pratisakhya state that its place of origin is either the teeth, the roots of the teeth or teeth-ridge'. That is, according to the Pratisakhyas, r was

128 Syurmūrdhanya riṭuṛṣaḥ - Panini - 17. See Allen, p.74.
129 Siddheshwar Varma, p.6.
either dental or alveolar, and not retroflex as Panini thought. Hence, the pronunciation of \( r \) is not retroflex as Kesiraja says in imitation to Panini, but alveolar.

The \( r \) usually pronounced in Sanskrit to-day is more the trilled variety, where the tongue touches the teeth ridge, and delivers a rapid series of taps there on. This \( r \) according to Daniel Jones has at least, six varieties, of course not in Kannada.

In difference to this \( r \), there is another \( r \), called Sakata \( r \). This is not found in Sanskrit. Hence, it is included by Kesiraja in the list of the letters peculiar Kannada.

\( r \) is included in the semi-vowels by Rev. Caldwell, and is considered as an exclusive property of the Dravidian languages. And he also notes its peculiarity. It can not be pronounced without the help of preceding vowels. The use of \( r \) is one of the distinguishing features of old, as distinct from modern Kannada.

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131 Elements of the Science of Language. D.244.
133 Caldwell, p.144.
134 Ibid.
The use of \( r \) has two peculiarities in Tamil.

1) \( r \) when doubled, is pronounced as ttr, written as \( rr \). The t of this compound sound differs both from the varga consonant t and the retroflex t. In Kannada, it becomes t, e.g. Ta.marru - becomes matu in Kannada. In old Kannada also the same phenomenon is noticed.

If \( r \) is pronounced with more force, \( r \) is produced. As there is no \( r \) in the modern Kannada, it is difficult to decide its pronunciation. In the old Kannada, \( r \) had its distinct existence. \( r \) is maintained throughout the 8th, 9th, 10th and 11th centuries. We find \( r \) used for \( r' \). But this change started much earlier, even in the 10th century. There is another suggestion that the phoneme \( r \) in Kannada seems to be a partial '\( \bar{a}yatam \)' correspondent, because it is used for representing the upadhamaniya before P in old Kannada inscriptions.

The \( r \) is found even to-day in the speech of the soligas. On the strength of this and other Dravidian languages we may say that \( r \) was back alveolar trill. That is, in

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135 Ibid.
136 Grammar of old Kannada inscriptions, p.25.
137 Historical grammar of Old Kannada, p.15.
138 C.R. Sankaran, p.15.
difference to r where one or two taps of the tip of the tongue were there, (so it is flap), here more vibrations of the tip of the tongue are found. It is more back than the r. It is called 'rephasrita' because firstly, it is produced by r with more force and in some contexts r is changed to r.

Now, let us consider l, l and l (kaala). l is called kula, l gala and l (kaala). About l (kula) there is not a controversy as regards its pronunciation. It is retroflex lateral. The tip of the tongue is curled towards the domal region, and while pronouncing it the air is passing through one of the sides of the tongue.

In addition to this phoneme in Kannada, there was one more phoneme in old Kannada, which is no more there on the Kannada tongue now, except being used in old Kannada poetry. This was found in such words as: alti (love), kalite (darkness), palatu (old), poltu (time), elu (seven), kalte (donkey) pulu (worm) etc.

About the pronunciation of l, it is very difficult to decide as it is ceased to be used long back. The Tamil...

139 'It's pronunciation may be somewhere between t and t'. See Kannada Bhageya Charitre, p.152.
language still retains it. The of Tamil is a corresponding phoneme of Kannada 1. The pronunciation of this 1 according to Kesiraja is: If 'd' is pronounced with more force, 1 is produced. What about the pronunciation of 1 first? This 1, now, is pronounced as flap between two vowels and in other contexts, it is a stop. This 1 if pronounced with more force, yields 1. But in 1 the tip of the tongue is slightly back, perhaps. The pronunciation of 1 may inferred on the basis of the following facts: 1) Its pronunciation in Badaga language. 2) The fact that the pronunciation of 1 is indicated with the help of 1. 3) In the words galde - garde, bilda - birdu etc. 1 changes to r 4) The fact that 1 and r can come in the präsa. 5) 1 comes as a substitute for 1 in the words kâdige kâlko, nādi nāli etc. 6) The Kannada words with 1, 1 are found in Sanskrit with 1. 7) The fact that d pronounced with more force yields 1. These factors indicate that the pronunciation of 1 was somewhere between 1 and 1.

But there is no definiteness found in his treatment of 1. He says, sometimes 1 comes as a substitute for 1 and gives as examples such as kādī - kiccu - kālko, nāda - kāde - nālkade, nādi - nāli etc. In other sūtra, he says 140 S.D. Madras Edition - intro. p.59.
1 comes as a substitute for d. The examples are: gaudāḷī, gaulēm, gula, grulā etc. In some other words, he is not clear whether there is 1 or 1, e.g. jhalaka, janguli, etc. In such words, one should decide on the basis of the usages.

He has said that 1 comes as a substitute for d; but again he says (sūtra 31) that 1 may come as a substitute for t, th, t, r or ksala. The examples are:

\[
\begin{align*}
\text{t} - 1 & \quad \text{ghatike - ghalige, lātā - lālā} \\
\text{t} - 1 & \quad \text{pratibastam - palihattem} \\
\text{r} - 1 & \quad \text{krūram - kūl, jhallari - jhallali} \\
(\text{ksala}) 1 - 1 & \quad \text{tālām - tāl, pulina - pulina}
\end{align*}
\]

In another place, he says 1 (kula) comes as a substitute for t e.g., sphaṭikam pālikam, pēṭike pēlīge. That is, for t sometimes 1 may come; and some other time 1 may come. Any way, it is clear that Kesirāja has not been able to give precise rules for these sounds. They were already disappearing, and it was only a vain attempt by Kesirāja to establish them, where he failed. For the divergent views expressed by Kesirāja the reason is that 1 was disappearing giving its place to 1. Hence, similar words contain 1 and 1 both. What we can say here is: 1 was changing and 1 was occupying its place.
Now, about ksāla (І). This is found in Kannada in addition to the two Іs. The definition of this І given by Kesirāja is: the І which comes in place of І of Sanskrit words'. The І in Sanskrit words optionally becomes І in Kannada. This is for the sake of prāsa, because Sanskrit І and Kannada І cannot come in prāsa. The examples for ksāla are: phaḷam (Skt. phalam), jāḷam (Skt. jalam) etc. There is no difference in the pronunciation of kula and ksāla. Hence, this distinction is not of much importance. This is for the purpose of prosody. The phonetic value of the ksāla is the same as kula. The only place it comes is in prāsasthāna as a substitute for І. Hence, ksāla is just a functional nomenclature and not a different sound.

Was ksāla found in Sanskrit? Kesirāja in the enumeration of the Sanskrit alphabet includes І also ("lakārāmbaregām"). There is ksāla because while deducting the letters peculiar to Sanskrit, he deducts ksāla also. Then how to reconcile this ksāla in the Sanskrit alphabet where no І is found? Though Sanskrit had only І, at least some people were pronouncing it as І e.g.

141 Kannada varṇagalu - p.113.
This pronunciation is noticed mostly in the southern. But at least some of the Northernns had their pronunciation e.g. 'causāṭti mūlavāṃśāu' etc. All this confused the scholars and gave rise to two sets viz.: 1) Those with a view that as 1 and 1 are same in meaning, it is not necessary to give the varna-status for 1 in Sanskrit. Kesireja belonged to the first set.

Now, out of the three 1's of old Kannada 1 has merged into 1 (kula) and ksala is nothing but a functional nomenclature for the same, we can say that only one 1 is sufficient for Kannada.

After the treatment of r, r, l, l and 1 (ksala) Kesirēja notes some peculiarity in the pronunciation of some letters. 'There are Kannada words with i) obligatory and ii) optional anusvāra, and with i) true and ii) slack consonants and iii) with double consonants which may be treated either as true or slack'.

142 'Panchatantra of Durgāsimha.'
143 Kannāḍa varṇagalu - p.116.
144 S.D. sūtra - 46.
There are certain words where the nasal sound is always found. As example, Kesiräja gives the list of 64 words, where nasality was regularly found. Then he gives 18 words which were pronounced with or without nasality. What does it indicate? By the time of Kesiräja the nasality was disappearing from the words. The list of 18 words where nasal sound was pronounced optionally, has completely disappeared now. In the list of words where nasality was regularly pronounced, nasality is lost in majority of words. Is it possible to give any rule for the loss of nasality? In all the dysyllabic words where the first vowel is long, nasality at the end of the first syllable is lost. For example, dāntu - dātu, tōnta - tōta, sīntu - sīpu etc. In polysyllabic words (which contain only three syllables in the list) whether there is a short vowel or a long vowel, the nasality after the second or third syllable is lost. For example, aḍangā aḍagū, kaḍumbu kaḍubu, kusumbe kusube etc.

Then, strangely, Kesiräja gives a list of words containing double consonants like aggaram, alti, aldam etc. There are two kinds of consonant clusters in the words.

145 Now, only Kunṭani and Kavunkūr retain nasality. See Kloka - p.133.
The clusters where the same consonant comes twice e.g. aggam (gg), ukkam (kk), oppam (pp), kuppu (pp) etc. 2) The clusters where different consonants come together e.g. alli (lt), eldam (ld), kalldam (ld) etc. It is seen that modern Kannada very rarely contains the clusters of different consonants. A further study in this direction is a necessity.

Why Kesiraja gave such a list? It would have been sufficient if he had indicated where slackness in consonant occurs. Naturally, in all other contexts the clusters indicated above occur. The reason why Kesiraja had to give such a list was, by his time, the system was affected, where double consonant was to be written, only single consonant was found. The people were not clear about the consonant clusters. Hence, Kesiraja had to give a list containing the consonant clusters.

The list of words 'sithiladvitva' is given. Now, what is meant by 'sithiladvitva'? We have already given two kinds of consonant clusters. We have to add one more variety of clusters where one of the two consonants in the clusters is slack. 'Sithiladvitva' is a phenomenon where the clusters are found with r, l and l as the first members and are pronounced with slackness. There is a slight release.

after this consonant and before the second consonant begins. Kesirāja himself has said that this should be delicately 'sulalitamāgi' or softly pronounced. The time required for pronouncing this sithiladvitva consonant is one metre.

Before the treatment of 'sithiladvitva' Kesirāja gives some more examples where consonant clusters - but with repha - are found: 'urdū, birdu, tardu, mardu, gurdū, tirdu, pardu, garduvu, urdīduvu, garde, and garde - all these words have repha in them'.

In all these words, there is a short penultimate vowel. The penultimate letter is termed as 'upadhā' in ancient grammatical literature. 'nurgidudu, nergidudu, kargidudu, jargvildudu, pergattu, vorgādar, pergālam, kurgidudu,-

These words also have repha.'

Here also only short vowel is found in penultimate position.

147 S.D. sūtra -
148 S.D. sūtra - 47.
149 antyād varnāt pūrvaṃ upadhā. V.P. 1.35.
Irpu, tōrpū, karpu, nērpū, sirpe, sārpū, ārpū, kūrpū, parparike, erpu, keygarpū, all these words are having repha'.

All these words are having repha. Three words have penultimate long vowel, and the rest short vowel.

Ārdam, sārdam, pārdam, tīrdam, pōrdam, pārdam, kārdam, nōrdam, bārdam, gōrdam, sōrdam', 'ūrgal, kērgal, bērgal, nārgal, tērgal, nēgalteyergal, kūrgal, nīrgal, sīrgal, tērgal, sūrgal, kārgal' - all these contain long vowel and repha.

What is the reason for giving these words with double consonants where only repha is found? The reason appears to be that in the previous sūtras, he had given words with double consonants where not a single word had repha. It may be to show that the double consonants with repha also occur that he has given these words.

Now, Kesirāja gives conditions for the occurrence of sithiladvitva in the next sūtras'. Slack consonants often occur in the plural formed of gal, and dative

151 S.D. sūtra - 50.
152 S.D. sūtra - 49.
153 S.D. sūtra - 51.
singular formed with -ge of nominal bases which end in 1, 1 or r with short penultimate vowel.

If the nominal bases ending in 1, 1 and r contain short vowel, and get the suffixes -gal, akke, and -ge (dative) there will be mostly slackness.

This is the condition No.1.

- gal - agalgel, esalgel, negalgel
- ge - esalge, agalge, negalge, ugulge,

If long vowel or guru there is no slackness.
basulgal, ikkulgal etc.

- gal - mugalgel, pugalgel,
- ge - mugalge, pugalge, amalge,

Sometimes not slack: kurulgal, purulgal, narulgal.

- r
- gal - kanargal, konargal, talirgal etc.
- ge - mosarge, esarge, osarge, etc.

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154 S.D. sutra - 52.
For r which is a substitute of r also, there is slackness.

alirgaḷ, pesargal, edergal.

In Kādalrgaḷ, though first vowel is long, still it is slack.

'Slack consonant occur in compounds when g, d, v and j are preceded by words which terminate either in r or 1 with short penultimate vowel.'

In the compounds if the second member contains g, d, j or v as its first member, the second member contains r or l at the end and one having short penultimate vowel (in the first member), then there will be slackness.

For example

- r kulirgaḷi, alerdōntam, alargoncal, bidirdatti,
opargavatte, belargenpu, talirdoranaṁ,
  bemarvani, elarjompu, kedarjonnam.

- l mugulgaṛ, amaldongal, esalvese, amaljantram

155 S.D. sūtra - 53.

156 Slackness is also occurs after l as found in Gedāyuddha. See K.K. Gowda - Pra. Ka.43.3.
This is condition No. 2.

'Slack consonants occur in compounds when 1) the affixes da, dapa, ve, 2) -ge suffix of the third person optative (vidhi) or 3) -gum suffix of third person present or future are joined to the verb which has a short syllable in the beginning and which ends in 1", 1" or r'.

For the polysyllabic roots ending in 1", 1" and r and having short vowel, if the affixes da, (past), dapa (present) ve (future) and -ge of third person optative, and -gum indicating present or future are added the verb forms become slack.

Example:

- 1 - jaguldan, jaguldepan, jagulven.
    tegalge, negalge, pogalge.
    tegalgum, negalgum, pogalgum

- 1 - nusulden, nusuldepan, nusulven
    nusulge, masulge
    nusulgum, masulgum

In some places there is no slackness e.g. teraldem,

157 S.D. sutra - 54.
poreldam,

- r - tojardan, nimirden, nimirdapen, nimirven
toderge, adirge, bidirge, ederge.
amargum, nimirgum

If long consonant, no slackness e.g. ārdam, sārdam, pārdam.

This condition No. 3.

'Slack consonants are inherent in the words berdila -
the name of the heaven, gardugu, amārdvalli, kumpalardu, erdevay, adirmutte, erde'.

All these words have slackness of consonants inherently.

This is condition No. 4.

It is seen that the slackness occurs in four environ-
ments. The environments are:

1) To the nominal bases ending in l, l and r and
having a short vowel, if the suffixes - gal and -ge are
added there will be slackness.

2) In the compounds where the first member ends in g, d,
j or v, there will be slackness.

158 S. D. Sūtra- 55.
3) In the verbs containing tense suffixes like da, dasa, va, the suffix -gum indicating present or future, and the optative -ge, there will be slackness.

4) In the words where r is found with d.

In all these four environments where slackness is found, one feature is common, i.e. the words terminate in either l, l or r. It means that slackness is found in the double consonants, where the first member is either l, l or r. The second member is d (in majority of cases), g (next in order) j or v (rarely). This v also developed from p in compounds e.g. bemar - pani bemarvani. Of these four environments, the slackness found in the words erde, bardila etc. is termed natural. In other words it has resulted after compounding process. In addition to the environments listed by Kesiraja sithiladvitva also occurs with l.

If we consider the present pronunciation of the stops, it is seen that it is tense (kathina) in the beginning of the word, and lax (saraLa) between two vowels. For example, pati, pettige, bâle, banga, tamma, âtanu, âna, nadi, tâku, pêta, caluvu, icsal, jalaka, râja, kõju, háku, guru, ugaru.

159 Darpanavalokana - Pra. Ka. 45.3.
In all these words the stop in the beginning of the words requires more effort, and so tense; and the stop in the middle of the words does not require much time, and hence lax. In the consonant clusters where equal effort was found, both the consonants were found pronounced fully. And such clusters were written in old Kannada with the consonant again. For example.

arddakkanduga, avargge, idarkke, irkkula, irppettu, urgge etc.

But, this distinction of writing the double consonant with repha with dvita as above, in due course began to be lost in writing. There are instances of words, where double consonants are to be written, have a single consonant. For example, apudu, geye, etc.

Perhaps, this was the reason why Kesiraj gave the list of words having double consonants, and had to give rules for the double consonants where one consonant is pronounced softly.

In the 'slackness of consonants' the first member which is either Dragging, 1, or r is pronounced softly. And there is

160 Ibid.
161 Ibid.
a short release after this member, before the second consonant was pronounced. But, what about the quality of the second consonant (which is either d, g, j or v)? One feature is common. That is, all these consonants which occur as second members of this cluster were stops. Now, whether the quality of these stop consonants changed in the slackness. We have noted that the stop at the beginning is tense, and between two vowels is lax. It is fricativized after l, l and r. That is, the stop coming after l, l and r becomes a fricative. But, this was not in all the environments. It had a definite condition. Hence, it was not given the status of a phoneme. The symbol for these fricatives are: ٸ (d) and Wildcard (g). These were the allophones of a phonemes d and g. This may be represented as follows:

\[
\begin{align*}
\text{[ٸ]} & \quad \text{occurs after l, l and r (e.g. erőe, tegalsam nusuldam)} \\
/d/ & \\
\text{[d]} & \quad \text{else where (e.g. dēri, dīpa)} \\
\text{[Wildcard]} & \quad \text{occurs after l, l and r (tegalye, nuslye, adirye)}
\end{align*}
\]

162 I am grateful to Dr. K.K. Gowda, who in response to my suggestion that these are fricative sounds, brought to my notice his article 'Darpanavālōkana' published in Prā. Ka. 43.3.
[g] - elsewhere (gāli, megalu)

What is the reason for this slackness in cluster? Is it because of the shift of stress? The stress on the syllable other than the first (e.g. negāte, nirgāli, karpūm, ardām etc.) was shifted to the first syllable (e.g. jāgulīam, tegalye, bārīla, ēmarīam etc.) This fact has to be further investigated.

The fricativisation of the stops in the slack double consonants, appears to be the remnant of the Dravidian feature, wherein such environments, the stops were fricativized.

Now, we can establish the nasal consonants in the light of the above. Of the twenty-five consonants listed by Kesirāja, there are five nasal consonants. But, we could show that there only three nasal phonemes. Hence, his varga letters are reduced by two. Of the twenty-three consonants, it has been shown that aspirated sounds are not

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164 Even today, in Tamil we can see the initial stops being fricatives between two vowels, (e.g. mahām) and after r (mārpu), l(ōyālyal), etc. In Kannada also, the word ahudu contains fricative.
inherent in Kannada. The aspirated sounds listed by Kesiräja are ten. They are kh, gh, ch, jh, th, dh, t, dh, ph, bh. They are to be deducted from the list. Aspirates deducted the list of consonants comes to thirteen.

Of the svarga consonants, Kesiräja himself, after having deducted, has established nine consonants. They are y, r, r, l, l, l, w, s, h. The total number of consonants will be 13 - 9 = 22. Including ten vowels the inventory of Kannada varṇas will be 32. The final list, now, is as follows:

1) vowels - 10: a, ā, i, ī, u, ū, e, ē, o, ō.
2) svarga letters - 13: k, g, c, j, t, d, t, d, p, b, m, n, n.
3) averga letters - 9: y, r, r, l, l, l, w, s, h.
   total 32

The letters may be rearranged according to the point of articulation etc. (in the case of consonants) advancement, and height of the tongue etc. (in the case of vowels).