

Vedic Adhidaivata Roots of Purāṇic and Hindu Astronomy

Prof. R N IYENGAR
Centre for Ancient History & Culture
Jain University, Bengaluru
(IKS Centre of Ministry of Education, GoI)

*International Conference on Purāṇic and Siddhāntic Cosmology
4-6, November, 2022 Mumbai*

CONCEPT NOTE OF THE CONFERENCE

For people trained in the modern sciences, Vedic knowledge offers many concepts that may at times appear incomprehensible, or even contradictory..... In fact, traditional texts such as these encompass a rational system of thought also grounded in observational data that can offer significant contributions to contemporary scientific discussions.....

The above concept note has been put up thoughtfully by the organizers, with carefully chosen words. I have highlighted five key phrases that I like to touch upon in my talk.

- Practice of Vedic concepts/tenets/principles; Purāṇas & Śāstras have diffused into daily life of Indians for centuries with many variations, interpretations, sampradāyas, paramparā etc.
- Academically, we can study only published works.
- Vedic texts from the Ṛgveda onwards: Samhitās, Brāhmaṇās, Āraṇyakas,....., ancillary texts, about 100 texts spread over a period of 3000-4000 years. Not homogenous in style, date, composers.
- Nevertheless Vedas consistently uphold three fundamental principles- Tattva ākāśa:Space
- Prthivi, Antarikṣa, Dyauh, not exactly translatable as Earth, Atmosphere, Sky.
- In a sense, these are the minimum number of categories into which humans can put all of their sensory experiences to explain the world/universe around them.

* WHAT IS *ADHIDAIVATAM* IN THE VEDAS
WHAT IS ITS RELATION TO
ADHIYAJÑĀ AND *ADHYĀTMA* ?

Adhidaivatam-> Regarding *devatas* (cosmic deities/natural forces/agents/actions of celestial bodies/time/rythm/number counts...)

•*ADHIYAJÑĀ* ALL INFO THAT IS ABOUT *YAJÑĀ* WHICH

i) REFERS TO *YAJÑĀ* BY **COSMIC DEITIES** → 3 or 33 or 3339 or 33 Crore or Infinite?

OF *PRITHIVI, ANTARIKṢĀ, DYAUH*

ii) PRIMARILY FIRE RITES ON EARTH BY HUMANS:

ŚRAUTA KARMA: SOCIETAL GROUP ACTIVITY

iii) *GRHYA*: FAMILY RITES

ADHYĀTMA IS ABOUT "MANAS, ĀTMAN,...INNER SPACE
...SPIRITUAL....."

It is known from the time of Yāskācārya that some RV hymns are being interpreted in different ways. Sāyanācārya while remaining primarily Yājñika, gives occasionally other meanings, without opposing them.

When the *adhidaivata* and also the *adhiyajña* explanations are given, along with the *Viniyoga* (application in a particular rite as per the Shrauta sutras) one starts seeing a figurative similarity between the two 'meanings'.

Here the *word meaning* does not refer to lexical/ etymological meanings but something like two images/sceneries having close similarities, in colour, numbers, elements,... that is most likely not due to chance.

There are persons who insist that all of the RV is to be interpreted as *adhyātma*. There are traditional sayings that 'Vedās' are meant only for carrying out *yajña*. I will not go into such arguments.

My intention is to demonstrate with examples how, the

devatā → *daivata* → *adhidaivata*

leads from cosmological ideas to astronomical observations. This is closely linked to explain or experience or understand **TIME** that eventually merges with *adhyātma*.

I like to present two or three examples to explain my studies.

SOMAPĀNA LEGEND: INDRA DRINKS 30 LAKES OF SOMA

एकया प्रतिधा पिबत्साकं सरांसि त्रिंशत्तम् ।

इन्द्रः सोमस्य काणुको ॥

RV. 8.77.4

In a single draught Indra drank 30 lakes full of Soma. Indra is lover of Soma.

एकेन प्रतिधानेनापिबत् । साकं सहेत्यर्थः । इन्द्रः सोमस्य काणुका । कान्तकानीति वा । कान्तकानीति वा । कृतकानीति वा । इन्द्रः सोमस्य कान्त इति वा । कणेघात इति वा । कणेहतः । कान्तितहतः ।

तत्रैतद् याज्ञिका वेद्यन्ते । त्रिंशदुक्थपात्राणि माभ्यन्दिने सघन एकदेवतानि । तान्येतस्मिन् काले एकेन प्रतिधानेन पिबन्ति । तान्यत्र सरांस्युच्यन्ते । त्रिंशदपरपक्षस्याहोरात्राः । त्रिंशत्पूर्वपक्षस्येति निरुक्ताः । तद् या एताश्चान्द्रमस्य आगामिन्य आपो भवन्ति रश्मयस्ता अपरपक्षे पिबन्ति । तथापि निगमो भवति ।

Nighaṅṭu & Nirukta by Lakshman Sarup

यमक्षितिर्माक्षितयः पिबन्ति । इति ।

तं पूर्वपक्षे आप्यायन्ति । तथापि निगमो भवति ।

यथा देवा अंशुमाप्याययन्ति । इति ।

→ The imperishable one whom the imperishable drink

→ As the gods cause the moon to grow.

Sāyaṇa Bhāṣya:

नैरुक्त्यप्रसिद्ध्या तु कालाभिमानि इन्द्रः

In the *adhidaivata* sense Indra's drinking Soma that is Moon is passage of time. The interesting point is about quantification as 30 = 15 days+15 nights

Suryā Vivāha Sukta

N&N by Lakshman Sarup

सोमं मन्यते पपिवान्यत्संपिपन्त्योपधिमि ।
सोमं यं ब्रह्माणो विदुर्न तस्याश्नाति कश्चन ॥ RV 10.85.3

सोमं मन्यते पपिवान्यत्संपिपन्त्योपधिमिति ब्रह्मासुतमसोममाह । सोमं यं
ब्रह्माणो विदुरिति । न तस्याश्नाति कश्चनायन्वेत्यधियहम् ।
अथाधिदेवतम् । सोमं मन्यते पपिवान्यत्संपिपन्त्योपधिमिति यजुःसुतमसो-
ममाह । सोमं यं ब्रह्माणो विदुश्चन्द्रमसम् । न तस्याश्नाति कश्चनादेव इति ।

अथैपापरा भवति । चन्द्रमसो वा । एतस्य वा ॥ ४ ॥

यच्चा देव प्र पिबन्ति तत् आ प्यायन्ते पुनः ।
वायुः सोमस्य रक्षिता समानां मास आकृतिः ॥ RV 10.85.5

यत् त्वा देव प्रपिवन्ति तत् आप्यायसे पुनरिति नाराशासनभिषेत् । पूर्व-
पक्षापरपक्षाविति वा । वायुः सोमस्य रक्षिता । वायुमस्य रक्षितारमाह । साह-
चर्यात् । रसहृणाद्वा । समानां संवत्सराणां मास आकृतिः सोमः । रूपविशेषै-
रोपधिः । चन्द्रमा वा ।

Ayajva ←→ Adeva.

Soma is moon in the *adhidaivata* sense.
Somapāna is the decrease in the digits of
moon's orb in the dark fortnight.

Because they grind the herbs together, one thinks that he has drunk the
soma. Of the soma which the Brāhmaṇas know, none whatsoever partakes.²
The hemistich, 'Because they grind the herbs together, one thinks that
he has drunk the soma', refers to the uselessly-pressed soma, which is not
soma at all. Of the soma which the Brāhmaṇas know, none whatsoever,
i. e. no one who does not offer sacrifice, can partake. This is with reference
to sacrifice.

Now with reference to the deity. The hemistich, 'Because they grind
the herbs together, one thinks that he has drunk the soma', refers to the
soma pressed with the Yajus formula, which is not soma at all. Of the
soma which the Brāhmaṇas know, i. e. the moon, none whatsoever, i. e. no
one who is not a god, can partake.

The following, another stanza, is addressed to him, or to the moon.

(Here ends the fourth section.)

O god, when they drink thee, forth thenceforward thou thriveest again.
Wind is the protector of soma; the month is the maker of years.

O god, when they begin to drink thee, forth thenceforward thou again
thriveest; this refers to some particular libations, or to the first and second
fortnights of the lunar month. Wind is the protector of soma. The seer
calls wind its protector on account of companionship or extracting the juice.⁴
The month is the maker of years, of annual periods, i. e. the plant soma on
account of its (assuming) particular shapes, or the moon.

It is seen that the hymns have (so to say) three dimensions ! Several people have noted this
feature from the time of Yāska onwards. In practice lay Hindus, include all the three in different
proportions in their day to day life. Scholars, however have developed Shāstras (theories)
strongly focussed on adhiyajña, adhidaivata, adhyātma individually or in combination or in
some subsets.

Vedic devatās are traditionally as per Brhaddevata, Nirukta, Śrauta sutras and some Purānas
Their outreach as observable phenomena associated with sky pictures of Vedic texts, and
interaction with humans is also *adhidaivatam*.

What is Yajña? There are some definitions and descriptions on the sacrifices carried out by
humans on earth; darśa-purṇamāsa, cāturmāsya, paśubandha, atirātra, somayāga, aśvamedha,
Rājasuya, agnishtoma etc All these have association with type of actions or rites done by
devatas, most likely in the sky or connected with Time.

Darśa-Purṇamāsa rite is a well recorded śrauta yāga/yajña observed even now a days. This is
typically astral as it is linked with Full Moon and New Moon.

यजुर्वेदेन्द्रिभिरपि । उक्तं चाऽऽपस्तम्बेन—“यज्ञं व्याख्यास्यामः । स त्रिभिर्वेदैर्विधी-
यते ऋग्वेदयजुर्वेदसामवेदैः । ऋग्वेदयजुर्वेदाभ्यां दर्शपूर्णमासौ । यजुर्वेदेनाऽभिहोत्रम् ।
सर्वैरभिष्टोमः” (आप० प० १. १-५) इति

Where in Rgveda DP rite is described or
prescribed? The only clue we get is that RV
10.53.2 & 4 are used in DP rite. This is
regarding Saucikāgni & Viśvedeva. This has
to be read with the previous suktas 10.52
& 10.51

Hymn (10.51) is in the form of a conversation between *devāḥ* and *agni*, where in (v.2), *agni* wonders 'how many gods have clearly beheld my form'. There is also an allusion, like in RV (3.9) to *agni* hiding in secret places. The legend outlined in the hymn is briefly as follows. *Agni* had three elder brothers who were doing the work of carrying sacrificial offerings to gods. The three died due to the harsh *vaṣat* sounds uttered during the sacrifices. Hence the youngest fire known as *Saucīka* fearing the same treatment will befall him was hiding in waters, till *viśvedevāḥ* found him and requested him to come out and help in carrying sacrificial offerings to gods.

(6)	52	(म.10, अनु.4)
ऋषिः सोचीकः अष्टिः	छन्दः त्रिष्टुप्	देवता विश्वे देवाः
विश्वे देवाः शास्तनं मा यथेह होता वृतो मुनवै यन्निषद्यं		
प्र मे ब्रूत भागधेयं यथा वो येनं पृथा हव्यमा वो वहानि	1	
अहं होता न्यसीदं यजोयान् विश्वे देवा मरुतो मा जुनन्ति		
अहरहरश्चिनाश्वर्यवं वां ब्रह्मा समिन्द्रवति साहुतिवाम्	2	
अयं यो होता किरु स यमस्य कमप्यहं यत्संमृजन्ति देवाः		
अहरहर्जायते मासिमास्यथा देवा दधिरे हव्यवाहम्	3	
मां देवा दधिरे हव्यवाहमपम्लुकं बहु कृच्छ्रा चरन्तम्		
अग्निविद्वान्यज्ञं नः कल्पयाति पञ्चयामं त्रिवृतं सप्ततन्तुम्	4	
आ वो यक्षयमृतत्वं सुवीरं यथा वो देवा वरिवः कराणि		
आ ब्राह्मोर्वचमिन्द्रस्य धेयामथेमा विश्वाः पृतेना जयाति	5	
त्रीणि शता त्री सहस्राण्यग्निं त्रिशञ्च देवा नवं चासपर्वन	VIŚVEDEVĀH	
औक्षन्वृतेरस्तृणन्वहिरस्मा आदिद्धोतारं न्यसादयन्त	COUNTED AS 3339 IN THIS HYMN	9

The number 3339 appears in RV 3rd Book; in the RV-Khilasuktas; Shukla YV and the Taittiriya Brāhmaṇa. Katha Samhita, Kapiṣṭhala KS also state this number. The symbolism preserved precisely in the Brahmanāṇḍa purāṇa.

The verse (v.3) alludes to counting of days or nights, where the reference is to one *who springs to life month by month and each day (aharaha jāyate māsi māsi).*

The conclusion that this should be a reference to moon is unavoidable.

Agni being honoured by 3339 gods (300+3000+39) is the theme of the last verse of this hymn.

Hymn(10.53):

Agni has arrived with the life (TIME) given to him by the gods and has made our offerings to the gods auspicious. We have obtained (UNDERSTOOD) the secret of the sacrifice.

Hymn (10.55)

He is woken up from his slumber running his course with many around him. He who died yesterday is living today. (V.5). The next verse (v.6) is even more cryptic mentioning the arrival of the ancient *red bird which has no nest to rest (arunah suparnah anidah).*

The night sky is described when moon's colour turned red due to the arrival of saucīkāgni brought in by viśvedevāḥ numbering 3339

If the poetic language is disentangled the context is of a celestial event in which moon is seen and an apparition of red colour also appears. Mention of the red colour of moon makes a strong case for taking this hymn to be alluding to a total lunar eclipse.

ब्रह्मण्डमहापुराणम् Chapter. 23.v 66-70

भक्तार्थममृतं सोमः पौर्णमास्यामुपासते
एकां रात्रिं सुरैः सर्वैः पितृभिः सर्षिभिः सह ६६
सोमस्य कृष्णपक्षादौ भास्कराभिमुखस्य तु
प्रक्षीर्यते पितृदेवैः पीयमानाः कलाः क्रमात् ६७

त्रयश्च त्रिंशत्तथैव त्रयस्त्रिंशत्तथैव च
त्रयश्च त्रिसहस्राश्च देवाः सोमं पिबन्ति वै ६८

इत्येतैः पीयमानस्य कृष्णा वर्द्धति वै कलाः
क्षीर्यति तस्माच्छुक्लाश्च कृष्णा आप्यायन्ति च ६९
एवं दिनक्रमात्पीते विबुधैस्तु निशाकरे
पीत्वाद्धमासं गच्छन्ति चामावास्यां सरोत्तमाः ७०

Three hundred and three, then thirty-three and again three thousand and three gods drink soma. (33+303+3003=3339) Being drunk this way, the dark digits increase with corresponding decrease in the bright digits.

The above number is the number of Viśvedevāh of the Rgveda ! These are important in rituals connected with ancestral rites.

The ritualistic correlation between moon and pitrs is well known but the astronomical link is intriguing!

47, 7. 8. 9.] कपिष्ठलकठसंहिता [३५३
समीचीनाः सुदानवः प्रीणन्ति तं नरो हितमवमेहन्ति
पेरवः ॥
देवा देवेषु श्रयन्ताम् । प्रथमा द्वितीयेषु श्रयन्ताम् ।
द्वितीयास्तृतीयेषु श्रयन्ताम् । ये स्थ त्रय एकादशास्त्रयश्च
त्रिंशच्च त्रयश्च त्री च 'शतास्त्रयश्च त्री च सहस्रास्त' इमं
यज्ञमवन्तु ते मामवन्तु । अतु व आरभे ऽतु मारभध्वम् ॥७॥

Katha Sam. 35.39
देवा देवेषु श्रयन्तां प्रथमा द्वितीयेषु श्रयन्तां तृतीयास्तृतीयेषु श्रयन्तां च स्थ त्रय एका-
दशास्त्रयश्च त्रिंशच्च त्रयश्च त्री च शता च त्रयश्च त्री च सहस्रा त इमं यज्ञमवन्तु ते मामवन्तु

11

The count started on a Full Moon to proceed till *amāvāsya* and stopped till the next Full Moon, to repeat again in the same fashion with gaps in the bright fortnight.

This number is the count of *tithis* in the dark fortnights summed up as **3339** sequentially for a special purpose. If both the fortnights were to be included, this count would be $3339 \times 2 = 6678$ *tithis*.

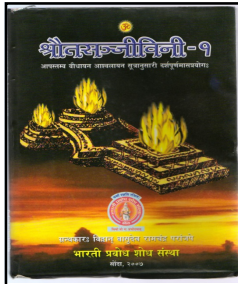
$6678/30 = 222.6$ lunations, in round figures is the eclipse cycle of **223** synodic months. Vedic months were lunar but the year was solar. It is known one solar year was taken to have **371-372** *tithis*.

$3339 \times 2 = 6678 = 371 \times 18$

Hence 3339 is a proxy for the 18 year eclipse period, when a lunar eclipse occurs near the same nakshatra in the visible sky.

This the Rāhu-daśa of Hindu astrology !
If the Sāvana year of 360 days is presumed
 $6678/360 = 18.55$ years the Rāhu (pāta) period of the siddhāntas.

Vrddhagarga and Lagadha seem to have known the following relation to propose the Five Year Yuga calendar $223/18 \rightarrow 12/1, 25/2, 37/3, 62/5$
 $241/223 \rightarrow 13/12, 27/25, 40/37, 67/62$



Pt. V.R. PARANJAPE
PROFESSOR OF
PURVA-MIMĀMSA,
SANSKRIT COLLEGE,
MYSORE

DP Yāga in Progress



Dārśiki Vedi, No fire on this altar. Not built in five layers like the other altars. Construction of this special vedi is given in the śulba sutras. It is cut out from a trapezium of height $h=96$, with parallel sides 48 and 64 angulas. The area of the curved geometrical figure $(\pi/6 - \sqrt{3}/4) h^2$ desired by the Vedas can be shown to be between 3333 & 3345 angula with π taken to be 3 to 3.0885; $\sqrt{3} = 26/15$ in the Sutas. The area of DP Vedi is nearly 3339 angulas

Tai.Br. Describes the background of the Vedi and why it should not be deeper than four angulas.

(If the *vedi* should be) excessively (i.e. too deeply) excavated, it would belong to the Fathers (i.e. the deceased ancestors) (and it would not be fit for the sacrifice to the gods). He (the *Adhvaryu*) excavates it to such an extent that it is equal to Prajāpati, the mouth of the sacrifice. (Formerly) the *vedi* hid itself from the gods. They found it four *angulas* deep (in the earth). That is the reason why it should be excavated four *angulas* deep.⁵³ Tai.Br. III.2.9 Transl. By Du Mont

पुरा क्रूरस्य विसृपो विरशिन्नुदादाय पृथिवीं जीरदानुर्या ऐरयन् चन्द्रमसि स्वधाभिः तां धीरासो अनुदृश्य यजन्ते॥ TS (I.1.9)

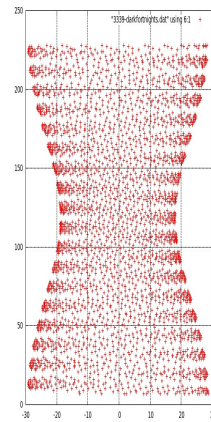
...you are the self-law...you the glorious one, take the earth... by means of its self-law and place it on the moon.

Sāyana's interpretation also the altar was used by the ancestors of the current practitioners to establish earth on the moon as per natural self-law (*svadhā*).

पूर्वे यजमाना वेदिरूपं यां पृथिवीं कृत्स्नभूमेरासुर्याः सकाशादूर्ध्वमादाय चन्द्रमस्यमृतकिरणैः सार्धं स्थापितवन्तः इदानीन्तनास्तु धीमन्तः तामिमां वेदिं मनसानुचिन्त्य तस्यां यजन्ते॥

Sāyana Bhāṣya (TS I. 1.9)

Plot of position (rise azimuth/declination) of moon for 3339 consecutive nights only in the dark fortnights starting from 7th Sept 2006 a lunar eclipse, Bhādrapada month, Moon near Nakṣatra: Purvā-Bhādra. 18th Sept.2024 is predicted to be LE night, moon near the same nakṣatra P.B.



मित्रावरुणौ त्वोत्तरतः परिधत्तां ध्रुवेण धर्मणा॥ TS (I. 1.11.12)

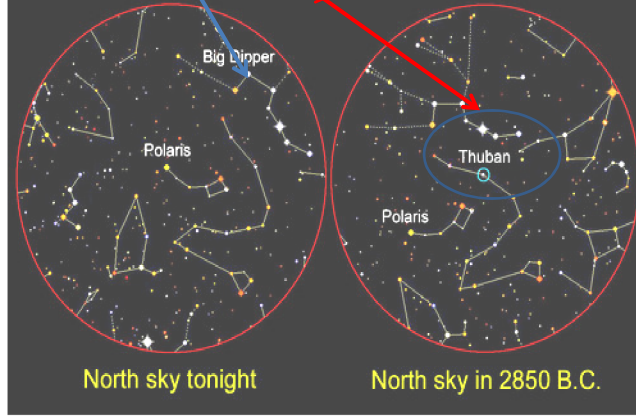
THE SACRIFICER PRAYS TO THE DP-VEDI SO THAT HE COULD ATTAIN A PLACE NEAR THE SAPTARSHI-MANDALA (U.MAJOR) IMPLIED TO BE ABOVE THE NORTHERN LIMB OF THE DP-VEDI.

The consent of Brahmā is conveyed in the following words. “प्रणय , यज्ञं देवता वर्धय त्वं नाकस्य पृष्ठे यजमानोऽस्तु । सम ऋषीणां सुकृतां यत्र लोकः - तत्रेमं यजमानं च धेहि ” ३. ‘ॐ प्रणय’ - इति ॥

Cosmography: Where is nāka? Where is the loka of Saptarshi?

अम्मस्यपारे भुवनस्य मध्ये नाकस्य पृष्ठे महतो महीयान् ।
शुक्रेण ज्योतीषि समनुप्रविष्टः प्रजापतिश्चरति गर्भे अन्तः ॥

Heaven was perceived to be near Saptarshi constellation U.Major near the Centre of Universe, i.e North Celestial Pole- Dhruva which was not the present day Polaris in U.Minor. This was due to precession. Vedic texts are aware of this phenomenon.



Taittiriya āraṇyaka is the first known text that cites Saptarshi and Agastya to be staying with the Nakṣatras of the same name.

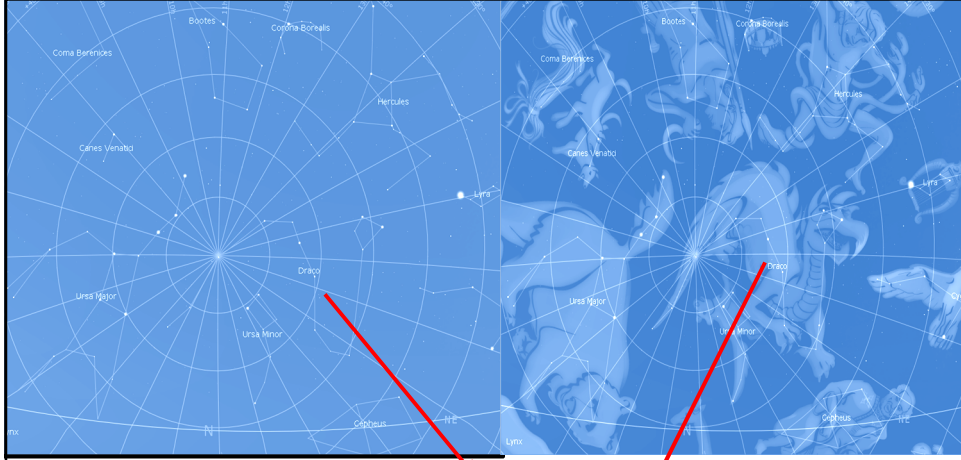
ऋषयः सप्तात्रिंशत् यत् । सर्वेऽत्रयो अगस्त्यश्च । नक्षत्रैः शंकृतोऽवसन् (तै० आ० १-११)

It also refers to Meru, and says ‘Kaśyapa’ does not leave the Meru. This indirectly says that the star named Kaśyapa was circumpolar. Most importantly the constellation Draco is described.

२३ भूः प्रपद्ये भुवः प्रपद्ये स्वः प्रपद्ये भूर्भुवस्स्वः प्रपद्ये ब्रह्म प्रपद्ये ब्रह्मकोशं प्रपद्येऽमृतं प्रपद्येऽमृतकोशं प्रपद्ये चतुर्जालं ब्रह्मकोशं यं मृत्युर्नावपश्यति तं प्रपद्ये देवान्प्रपद्ये देवपुरं प्रपद्ये परीवृतो वरीवृतो ब्रह्मणा वर्मणाऽहं तेजसा कश्यपस्य यस्मै नमस्तच्छिरो धर्मो मूर्धानं ब्रह्मोत्तरा हनुर्यज्ञोऽधरा विष्णुरहृदयं संवत्सरः प्रजननमश्विनौ पूर्वपादावत्रिर्मध्यं मित्रावरुणावपरपादावग्निः पुच्छस्य प्रथमं काण्डं तत इन्द्रस्ततः प्रजापतिरभयं चतुर्थं

स वा एष दिव्यः शाक्रः शिशुमारस्त ह य एवं वेदाप पुनर्मृत्युं जयति जयति स्वर्गं लोकं नाध्वनि प्रमीयते नाग्नौ प्रमीयते नाप्सु प्रमीयते नानपत्यः प्रमीयते लघ्वाच्चो भवति ध्रुवस्त्वमसि ध्रुवस्य क्षितमसि त्वं भूतानामधिपतिरसि त्वं भूतानागु श्रेष्ठोऽसि त्वां भूतान्युपपर्यावर्तन्ति नमस्ते नमस्सर्वं ते नमो नमः शिशुकुमाराय नमः ॥ ०१ २१ ११॥ २३॥ ॥ ११॥

Fourteen stars with their names and location on the body of the celestial animal Śiśumāra are mentioned. This constellation is said to be Dhruva-> Fixed around which all beings circumambulate. The last star, the fourth on the tail, is ABHAYA, which became the POLE STAR Dhruva in the Puraṇa.



Śísúmāra of Tai. Āranyaka c 3000 BCE

Abhaya-Dhruva (α -Draconis) was the Pole Star during 3200-2400 BCE. In this long period, the declination of this star varied from $87^{\circ} 56'$ to $87^{\circ} 36'$, reaching $89^{\circ} 53'$ in 2830 BCE. The concept of Meru (peak or mountain or just a pole) connecting Prthivi and Dhruva goes to this period. One could model all the celestials to be circling Dhruva, around the Axis-Meru. **Roots of Purāṇic cosmology and astronomy are here.**

<p>[Brahmaṇḍa Purāna] पुराणम् MAHARISHI UNIVERSITY OF MANAGEMENT VEDIC LITERATURE COLLECTION</p> <p>यदह्ना कुरुते पापं द्रष्टु तन्निशिमञ्चते यावत्यश्चैव तारास्ताः शिशुमारश्रिता दिवि १०० तावत्येव तु वर्षाणि जीवताभ्यधिकानि तु साकारः शिशुमारश्च विज्ञेयः प्रविभागशः १०१ भ्रौत्तानपादस्तस्याथ विज्ञेयो ह्युत्तरो हनुः यज्ञः परस्तु विज्ञेयो धर्मो मूर्द्धानमाश्रितः १०२ हृदि नारायणः साध्यो ह्यश्विनौ पूर्वपादयोः वरुणश्चार्यमा चैव पश्चिमे तस्य सक्थिनी १०३ शिशुनं संवत्सरस्तस्य मित्रोऽपानं समाश्रितः पुच्छेऽग्निश्च महेंद्रश्च मारीचः कश्यपो ध्रुवः १०४ तारकाः शिशुमारस्य नास्तं याति चतुष्टयम् नक्षत्रचन्द्रसूर्याश्च ग्रहास्तारागणैः सह १०५ उन्मुखा विमुखाः सर्वे वक्रीभूताः श्रिता दिवि ध्रुवेणाधिष्ठिताश्चैव ध्रुवमेव प्रदक्षिणम् १०६ परियातीश्वरश्रेष्ठं मेढीभूतं ध्रुवं दिवि अग्नीद्रकश्यपानां तु चरमोऽसौ ध्रुवः स्मृतः १०७ एक एव भ्रमत्येष मेरुपर्वतमूर्द्धनि ज्योतिषां चक्रमेताद्ध गदा कर्षन्नवाङ्मुखः मेरुमालोकयत्येष पर्यते हि प्रदक्षिणम् १०८ इति श्रीब्रह्मांडे महापुराणे वायुप्रोक्ते पूर्वभागे द्वितीयेऽनुषंगपादे ध्रुवचर्याकीर्तनं नाम त्रयोविंशतितमोऽध्यायः २३</p>	<p>One who knows the 14 stars correctly lives longer by that many years!</p> <p>Names of the 14 stars of the śísúmāra constellation and the corresponding body parts making up the animal figure</p> <p>The last four stars ending with Dhruva are circumpolar</p> <p>Dhruva-Meru centric astronomical model</p>
--	--

ततो मन्दतरं नाभ्यां चक्रं भ्रमांत वै यथा
 मृत्पिंड इव मध्यस्थो ध्रुवो भ्रमति वै तथा ६४
 त्रिंशन्मुहूर्तनिवाहुरहोरात्रं ध्रुवो भ्रमन्
 उभयोः काष्ठयोर्मध्ये भ्रमते मंडलानि तु ६५
 कुलालचक्रनाभिश्च यथा तत्रैव वर्त्तते
 ध्रुवस्तथा हि विज्ञेयस्तत्रैव परीवर्त्तते ६६
 उभयोः काष्ठयोर्मध्ये भ्रमते मंडलानि सः
 दिवानक्तं च सूर्यस्य मन्दा शीघ्रा च वै गतिः ६७



THE OIL MILL COMPARISON OF THE PURĀṆA
 SHOWS THE MODEL MAKING ABILITY OF THE
 OBSERVERS OF THE SKY IN THE MOST ANCIENT
 PERIOD. THEY LOOKED FOR PHYSICAL
 EXPLANATIONS THAT CAN DESCRIBE
 MOVEMENTS OF PLANETS. THIS WAS POSSIBLE
 ONLY BECAUSE **DHRUVA** WAS ALMOST FIXED
 WITH DAILY ROTATION AROUND THE POLE IN
 THOSE DAYS

around 1200 BC



Vishṇu-sahasranāma-Bhāshya; on the
 441st name Nakshatranemi

पराशर भट्टार्यः भगवद्गुणदर्पणे 11 cent

शाङ्करभाष्ये 800
 CE

नक्षत्रनेमिः

भाष्यम्

“ *नक्षत्रतारकैःसार्धं चन्द्रसूर्यादयो ग्रहाः ।
 वायुपाशमयैर्बन्धैर्निबद्धा ध्रुवसंज्ञके ॥ ” इति ।

स ज्योतिषां चक्रं आमयंस्तारामयस्य शिशुमारस्य ¹पुच्छदेशे
²व्यवस्थितो ध्रुवः । तस्य शिशुमारस्य हृदये ज्योति
 श्चक्रस्य ³नेमिवत्प्रवर्तकः स्थितो विष्णुरिति— नक्षत्रनेमिः
 शिशुमारवर्णने “ विष्णुर्हृदयम् ” (तै. आ. २-१९) इति

(४४०) महामखः, । (४४१) नक्षत्रनेमिर्,

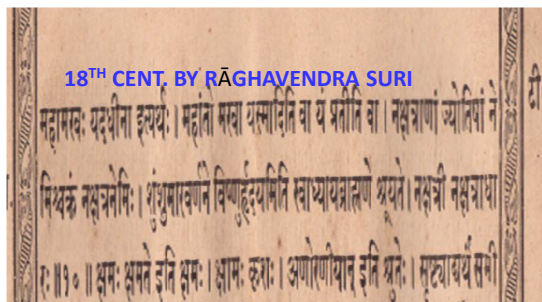
ॐ महामखाय नमः । ॐ नक्षत्रनेमये नमः ।

१ भा०— “ कुयुःभ्याञ्च ” इति पप्रत्ययः. बहुलवचनादीर्घश्च.

(२) “ धर्मो पूर्वनिमाश्रितः ”

(३) “ तच्छिरो धर्मः ” इति च. ❀

भाष्येऽपि नक्षत्रनेमिः नामोक्तः (पराशरभाष्ये) / (शाङ्करभाष्ये) / (तै. आ.)



Icon of Vishṇu as Śiśumāra
 with Dhruva at the tail.
 1500-1600 CE

How did Siddhānta astronomers handle “Dhruva” ?

Brahma Gupta (7th cent) Bhāskara II (12th cent.)

“ यदा भरणीस्थो रविर्भवति तदा तस्यास्तमयकाले ध्रुवमत्स्यस्तिर्यक्स्थो भवति । तस्य मुखतारा पश्चिमतः । पुच्छतारा पूर्वतः । तदा मुखतारासूत्रे रविरित्यर्थः । अथ निशावसाने मुखतारा परिवर्त्य पूर्वतो याति । पुच्छतारा पश्चिमतो याति । ततो मुखतारासूत्रगतस्यैवाकस्योदयो दृश्यते” (सिद्धान्तशिरोमणिः)



Figure 2: Dhruva/brama-yantra, made for Yado Joshi, resident of Ukala-grāma (Akola), latitude 20 degrees. Reverse side, with the sine quadrant. Raja Dinkar Kelkar Museum, Pune.

Siddhānta astronomers say nothing about Purāṇic or Vedic Dhruva or Śiśumāra. They knew U.Minor with 7 stars as Dhruva-Matsya or Polar-Fish.

“The star at the mouth of the fish was Polaris (α Ursa Minoris) and the one at the tail end is called Markaṭī in Sanskrit (β Ursae Minoris or Kochab). If these two were joined by a straight line, this line would rotate like the hand of a clock and make a full circle in a sidereal day of 23 hours and 56 minutes.” Padmanābha used this to make his Yantra for finding time. But they very well knew their Vedas and Purāṇas. They also knew that Dhruva may not be fixed as thought popularly. They were true to their science. Kamalākara in 1658 CE proclaimed that in marriages the star α Ursa Minor should be shown to the bride as Dhruva. Obviously he should have known about the meaning of the Vedic Mantra that says the star shown is Fixed. He chose the spirit of the Vedas and not the letter.

चलेऽचरेऽपि ध्रुवमे स्वमेधा

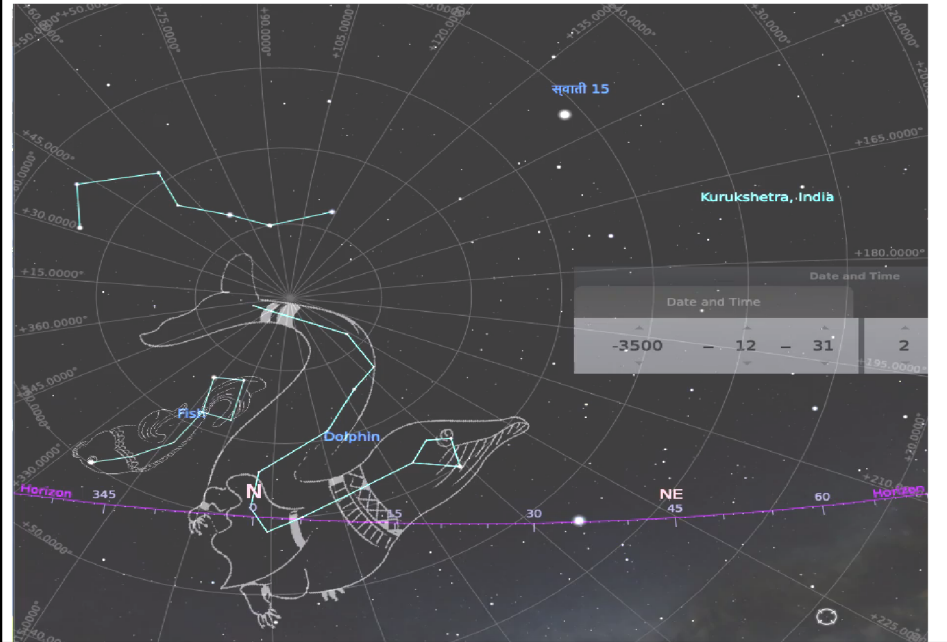
द्राशित्रयं तद्भुवकः शरस्तु ।

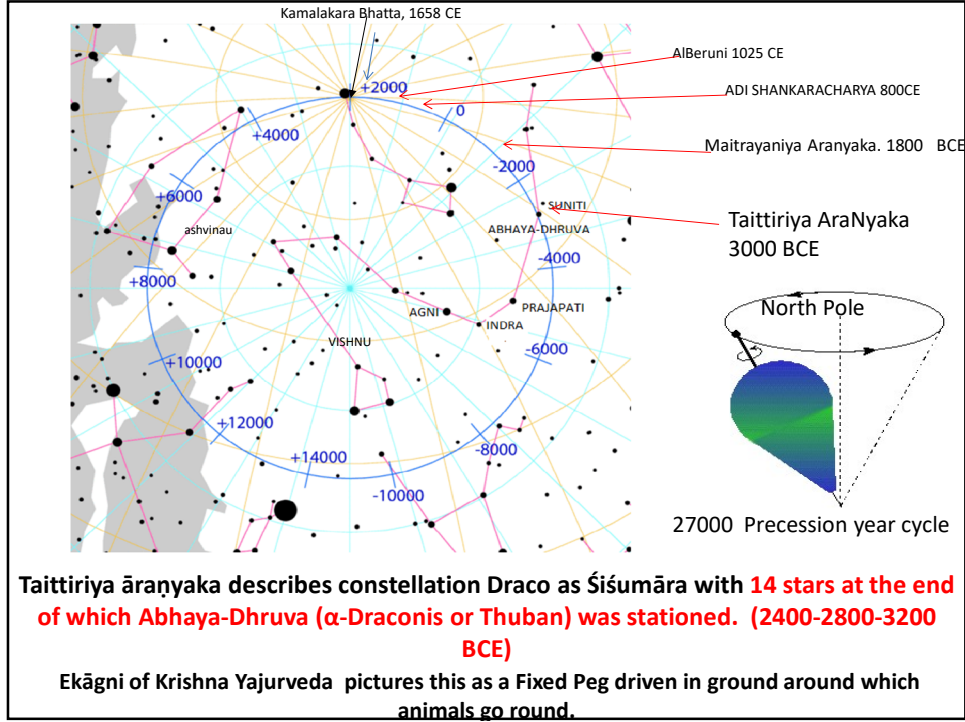
षट्षष्टिभागाः ६६ परिणीतनार्था(२)

यदत् फलं दर्शनतोऽस्ति यस्य ॥ १८ ॥

शिशुमारस्य व्याकृत्या तारामत्स्यस्य धीमतः ।

ज्योतिषां च गति विद्यादातवीं पूर्वदर्शनात् ॥ Vrddhagarga Jyotisha





वेदा हि यज्ञार्थमभिप्रवृत्ताः कालानुपूर्व्यां विहिताश्च यज्ञाः ।
तस्मादिदं कालविधानशास्त्रं यो ज्योतिषं वेद स वेद यज्ञम् ॥ (याजुष ज्योतिषम्)

This is a famous verse, which says all Veda is for carrying out rituals. This of course is an exaggeration. Some of the rituals were for measuring time, and others just for worship of **Kāla** that is **Time!** Or lament like King Bhadratha (Mai. Āraṇyaka) that even Dhruva moves and every thing in the world is transient.

सर्वं चेदं क्षयिष्णु पश्यामो यथेमे
दंशमशकादयस्तृणवन्नश्चतयोद्भूतप्रध्वंसिनः ॥ ४ ॥

अथ किमेतैर्वाण्यानां शोषणं महार्णवानां शिखरिणां (किमेतैर्वाण्यानां)
प्रपतनं ध्रुवस्य प्रचलनं (वश्चनं वातरज्जुनां)
(स्थानं वा तरूणां)
निमज्जनं पृथिव्याः स्थानादपसरणं सुराणं

MAU 6.15 -

द्वे वाव ब्रह्मणो रूपे कालश्चाकालश्चाथ यः प्रागादित्यात्सोऽकालोऽकलोऽथ य आदित्याद्यः स कालः सकलः सकलस्यवा
एतद्रूपं यत्संवत्सरः संवत्सरात् खल्वेमाः प्रजाः प्रजायन्ते संवत्सरेणेह वैजाता विवर्धन्ते संवत्सरे प्रत्यस्तं यन्ति
तस्मात्संवत्सरो वै प्रजापतिः कालोऽन्नं ब्रह्मनीडमात्मा चेत्येवं ह्याह ।।

Philosophical categorization: **Kāla and Akāla.**

Our interest is in the **kāla** which begins with Sun and has parts, particularly days, months & years. The number of day-nights (*ahorātra*) can be counted by observing the sunrises. By observing the Full Moon and the No-moon, number of days in a month can be estimated.

In similarity with the *śukla*- and the *kṛṣṇa-pakṣa* (bright- and dark-fortnight) being presided over by the number 15, the day and also the night are equated with 15 *muhūrta* of time, that is

1 *ahorātra* (day-night)= 30 *muhūrta*

counted from sunrise to next sunrise.

In the Rgveda there are three instances where the number 30 is invoked referring to *Uśas* (twilight) or Sun specifically illuminating and crossing 30 divisions every day.

अनवद्याः त्रिंशत् योजनान्येकैका क्रतुं परि यन्ति सद्यः । RV (I.123.8 b).

But in the next hymn we have *mināti dhāma aharaḥ niṣkṛtam ācaranti*

Further;

हिल्वी शिरो जिह्वया वावदच्चरत्त्रिंशत्पदा न्यक्रमीत् ।। RV (VI. 59.6 b)

त्रिंशद्भ्राम विराजति वाक्पतङ्गाय धीयते । प्रति वस्तोरह द्युभिः ॥ RV (X.189.3)

The context of the hymns is about **time as *aharahaḥ* (day by day)** and hence Sāyaṇācārya's interpretation of 30 *dhāma* and 30 *pada* as equivalent to 30 *muhūrta* of time should be acceptable. Space and time divisions were congruent or similar. In the *Parāśaratantra* it is asserted ***kāla-kṣetrayoḥ sāmyam. Purāṇas also say, sun covers 1/30th of pṛthvi in one muhūrta***

Declaring that day-night is made of 30 *muhūrta* similar to the month having 30 divisions (Tithi) is a principle of similarity. But measuring the parts of Time within a day or night demands considerable thought and ingenuity. In RV (5.76.3) the day is divided into FIVE parts from sunrise to sunset. These intervals are named

prātaḥ, saṅgava, madhyāhna, aparāhṇa, sāyam.

Each of these intervals are dependent on the position (*kṣetra*) of sun in the sky. These are notionally **three *muhūrta* long, as stated in the *Viṣṇu Purāṇa*.**

But what about the night ? Aitareya Brāhmaṇa through a legend explains the method. Indra wanted to pass through the Night and asked for help. But the Devas being afraid of Death refused to accompany Indra. Only the Chandas (meters) agreed. With their help in **three *pariyāya* (three equal cycles)** Indra passed through the night.

अहर्वै देवा आश्रयन्त रात्रीमसुरास्ते समावद्वीर्या एवासन्न व्यार्तन्त सोऽब्रवीदिन्द्रः कश्चाहं
चेमानितोऽसुरात्रात्रीमन्ववेष्वाव इति स देवेषु न प्रत्यविन्ददबिभूयू रात्रेस्तमसो मृत्योस्तस्माद्भाप्येतर्हि
नक्तं यावन्मत्रमिवैवापक्रम्य बिभेति तम इव हि रात्रिर्मृत्युरिव तं वै छन्दांस्येवान्ववायंस्तं
यच्छन्दांस्येवान्ववायंस्तस्मादिन्द्र श्रैव छन्दांसि च रात्रीं वहन्ति न निविच्छस्यते न पुरोरुङ्घन धाय्या नान्या
देवतेन्द्र श्र ह्येव छन्दांसि च रात्रीं वहन्ति तान्वै पर्यायैरेव पर्यायमनुदन्त
यत्पर्यायैः पर्यायमनुदन्त तत्पर्यायाणाम्पर्यायत्वं तान्वै प्रथमेनैव पर्यायिणा पूर्वरात्रादनुदन्त मध्यमेन
मध्यरात्रादुत्तमेनापररात्रादपि शर्वर्या अनुस्मसीत्यब्रुवन्नपिशर्वराणि खलु वा एतानि छन्दांसीति ह स्माहैतानि
हीन्द्रं रात्रेस्तमसो मृत्योर्बिभ्यतमत्यपारयंस्तदपिशर्वराणामपिशर्वरत्वम् ॥ AB 4.5 ॥

Reference to Real Time in Vedic Rites

Allegorical explanation of how the night rites are to be carried out during the *Atirātra* sacrifice, which is a one day *soma-yāga* is available in the *Aitareya Brāhmaṇa* (16.5). This starts with the legend of Indra clearing away *asurās* through the night with the help of the seven *chandas* (meters), that are defined in terms of the number of syllables contained in the hymns. This night ritual is carried out by the ordained group of priests in three cycles (*paryāya*) each comprising four *camasa-gaṇa*. The text reads:

तान्वै प्रथमेनैव पर्यायेण पूर्वरात्रादनुदन्त मध्यमेन मध्यरात्रादुत्तमेनापररात्रात्।

Here, there is clear mention of three part division of the night each of which was taken to be of equal duration. Sāyaṇācārya the renowned representative of the practicing sacrificial tradition explains that each division of the night is meant to be of ten *ghaṭikā* (five *muhūrta*)

क्रमेण निराकरणप्रकारं दर्शयति – दशदश घटिका एकैको भाग इत्येवं रात्रेस्त्रयो भागाश्चत्वारश्चमसगणा एकः पर्याय इत्येवं द्वादशानां चमसगणानां त्रयः पर्यायास्तैः क्रमेण रात्रिभागत्रयादसुरानपानुदन्त ॥ (Sāyaṇācārya's Commentary)

The time unit *ghaṭikā* is not met in Vedic texts, but widely used in the medieval period as measured by a water clock. Hence we can infer that Sāyaṇācārya refers to actual practice during his time.

Vedic rituals continue to be performed in India to this day and it should not be surprising to find modern time keeping methods in vogue. How equality of time periods was kept up in the most ancient period is not known but mention of *paryāya* indicates chanting, oblations and ritual acts that should have been nearly identical in the three cycles and carried out at the same speed. Section (16.6) of the above Brāhmaṇa text describes in detail the hymns to be sung in the three cycles on the night of the *Atirātra-yāga* which is a type of *Agniṣṭoma* sacrifice.

17th Chapter of the text prescribes the *Aśvinaśastra* hymns to be chanted covering a part of the night till sun rise. These lauds are made up of all the meters such that the recitation consists effectively 1000 *bṛhatī* verses.

This is a modification of the standard *prātarānuvāka* composed of 1000 *bṛhatī* verses which is chanted in the night during the *somayāga* and several other Vedic sacrifices.

The earliest reference to the *prātaranuvāka* is in the Taittirīya Sāmhita (TS) where it is enjoined that this should be completed before other voices are heard, indirectly meaning the chant should end by early morning before sun rise.

पुरा वाचः प्रवदितोः प्रातरनुवाकमुपाकरोति यावत्येव वाक् तामवरुद्धे । TS (6.4.3)

The same text in another place mentions that the chant should commence in the deep of the night

यदि सोमौ संसृतौ स्याताम् महतिरात्रियै प्रातरनुवाकमुपाकुर्यात् । TS (7.5.5)

The chant had to start after midnight when large part of the night was remaining and should end before the birds started chirping in early morning. The Sūtra texts that give the procedural details also say that the chant starts in the *mahārātri* part of the night such that the 1000 verses could be completed (before sunrise)

अथ महारात्रे महाव्रताय प्रातरनुवाकमुपाकुर्वन्ति । यथा परिसहस्रमनुब्रूयात् ।
Śāṅkhāyana Śrauta Sūtra (17.7)

Śabdakalpadruma, states that *mahārātri* starts two *muhūrta* after midnight

महारात्रिः - अर्द्धरात्रात् परं मुहूर्त्तद्वयम्

If we take the night (sunset to sunrise) to be of 15 *muhūrta*, the chanting had to start ½ to 1 *muhūrta* after midnight and end ½ to 1 *muhūrta* before sunrise. This essentially means the time taken for chanting would have been 5½ to 6½ or on average 6 *muhūrta*, at the rate of
6000 vedic akṣara per *muhūrta*, that is 3000 vedic akṣaras per *ghatika*
Depending on the season this may be faster also.

The traditional *anukramaṇi* texts have preserved the meters of all the hymns with the stipulated number of *akṣara*. This is the only unambiguous definition we get for counting syllables in continuous recitations or records of the R̥gveda.

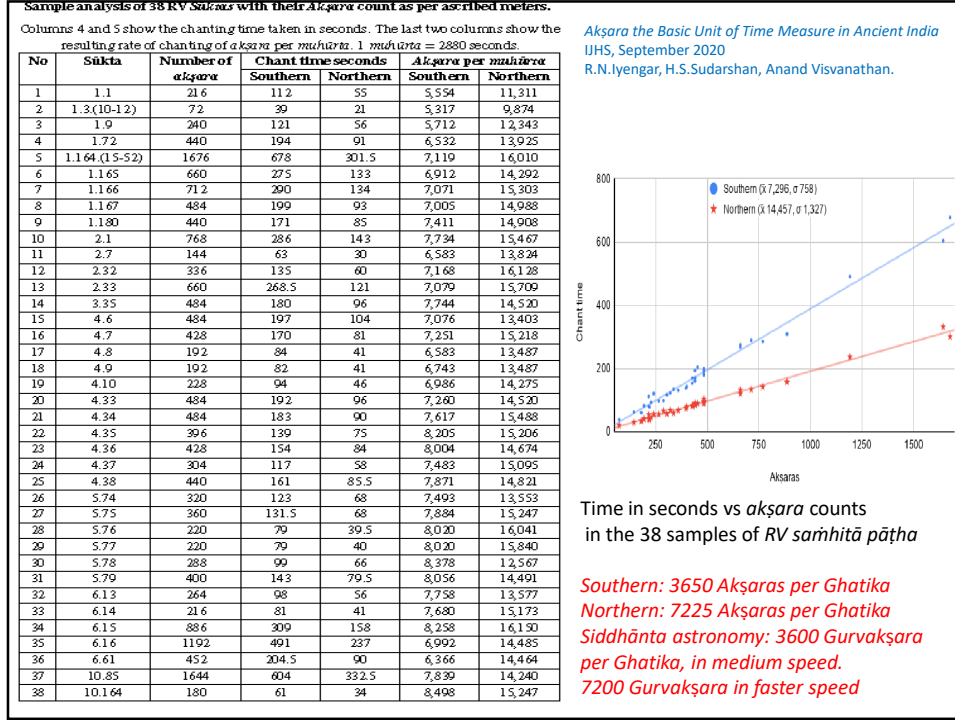
Recorded R̥gveda

1. R̥gveda audio record of S.S.Sharma and S.K.Bhatta. Published by Sri Ranga Digital Software Technologies (Pvt.) Ltd. Mysore, 2012.
2. R̥gveda audio record of Vishvanatha Sharma from *Vārāṇasi*, Private Collection



ऋक्सप्रतिशाख्ये -
तिस्रो वृत्तीरुपदिशन्ति वाचो विलम्बितां मध्यमां च द्रुतां
च । वृत्त्यन्तरे
कर्मविशेषमाहुर्मात्राविशेषः प्रतिवृत्त्युपैति ॥18

अभ्यासार्थं द्रुतां वृत्तिं प्रयोगार्थं तु मध्यमाम् ।
शिष्याणामुपदेशार्थं कुर्याद्वृत्तिं विलम्बिताम् ॥19



Siddhānta astronomers before and after Āryabhaṭa being aware of the prevalent use of *akṣara* count as a time measuring artifice, standardized one *vināḍī* (*vighaṭī*) to the audible scale of 60 *gurvakṣaras* embedded by verses in a particular meter known as *līlākhela*, with 15 long/heavy syllables per quarter. The speed of recitation is said to be neither too fast nor too slow but in medium pace as pointed out by Bhāskara.

गुर्वक्षरेषु मध्यमवृत्तिग्रहणम् । "गुर्वक्षराणि षष्टिः" इत्यत्र मध्यमायां वृत्तौ षष्टिः गुर्वक्षराणि विनाडिकाकाल इति वक्तव्यम् । अन्यथा हितिसुषु अपि वृत्तिषु अविशेषेण ग्रहणं प्राप्नोति । तद्यथा - द्रुतायां वृत्तौ षष्टिः गुर्वक्षराण्यल्पेन कालेन पठ्यन्ते, विलम्बितायां महता कालेन इति, मध्यमायां पुनर्न अल्पेन, न महता कालेन । तत्तर्हि मध्यमवृत्तिग्रहणं कर्तव्यम् । कथमनुच्यमानमवगम्यते, लोकप्रसिद्धेः । तद्यथा - लोके अनिर्दिष्टेषु कार्येषु मध्यमप्राप्तिः ॥

Commentary of Bhāskara-I on the Āryabhaṭīya

1 Muhūrta = 13500 laghvakṣara (Purāṇa)
=16000 vikṛtākṣara (Parāśara Tantra)
=12462 akṣara (Lagadha's Vedāṅga-jyotiṣa)
= 7200 gurvakṣara (Siddhāntic astronomy)



Govt. Museum, Chennai.
Coconut shell bowl of 1- *Ghatikā* measure=24 minutes

The time of the astronomers being real their 60 gurvākṣara audio scale had to be made phonetically accurate by selecting a particular meter, among many possibilities, such that 3600 syllables span half-muhūrta. For arriving at such specific refinement there must have been precedence for quantifying a part of day or night by a long count of akṣara. Apart from the Purāṇas and Tantra texts, the still more ancient traceable source for such an effort is the importance given in the **Vedas for the meter ṛhatī of thirty-six akṣara for representing time intervals**. This cannot be treated as a fortuitous coincidence since the astronomical **half-muhūrta of 3600 akṣara is numerically congruent, in true Vedic style, with 100 ṛhatī verses**.

This eventually was achieved with the calibration of the *vighāṭikā* (24 seconds) by the medium pace recitation of Bhāskara's humorous verse

मा कान्ते पक्षस्यान्ते पर्याकाशे देशे स्वाप्सीः कान्तं वक्रं वृत्तं पूर्णं चन्द्रं मत्वा रात्रौ चेत् ।
क्षुत्क्षामः प्राटंश्चेतश्चेतो राहुः क्रूरः प्राद्यात् तस्माद्धान्ते हर्म्यस्यान्ते शय्यैकान्ते कर्तव्या ॥

with sixty *gurvākṣara*. This also lead to the final design of the sinking bowl type water clock. **It can be verified by any one, that this verse takes about 24 seconds for medium speed chanting.**

Indra's (Atirātra) overnight sojourn with the **छन्दांसि** (seven meters) eventually helped our siddhānta astronomers in their *Kālanirṇaya Śāstra*.

Summary & CONCLUSION

1. The Devatā (deity/god) of the RV is a cosmic entity
2. The Vedas laud/worship/pray/describe forms/actions of several devatā in the visible sky.
3. In many cases 'quality' is used as the Name of the entity. 'Śukra' one who is white/bright
This may lead to ambiguity; but with the actions and location the ambiguity can be reduced.
4. Somapāna is the astral phenomenon of the waning moon
5. Indra is closely connected with TIME through Soma that is Moon.
6. SUN is the generatrix of human time.
7. RV number 3339 stands for the 18 year eclipse period (**Saros attributed wrongly to Chaldeans**)
8. **The forgotten Śīsumāra Constellation with Dhruva as the Pole Star is the origin of Meru centric cosmology of the Purāṇa**
9. Precession has been responsible for observing the sky closely; [Maitrāyaṇīya, Parāśaratantra, Vrdhagārgīya Jyotiṣa, Yoga sutra]
10. Indra taking help from the Chandas (meters) is an allegory for estimating passage of night time by chanting 1000 RV suktas, in Ṛhatī meter.
10. The Brahmanāṇḍa, Vāyu, Viṣṇu, Matsya Purāṇa seem to have retained much of Vedic concepts.
12. Siddhānta Astronomy is basically founded on the *adhidaivata* perception of the Vedas.

THANK YOU