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Vṛddhagārgīya Jyotiṣa (Part 1)

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Introduction

The Vedas, the most ancient known literature of India carry interesting astronomical information of historical importance. The Samhitā, Brāhmaṇa, Āraṇyaka, texts of all the four Vedas (Ṛk, Yajus, Sāma and Atharva) describe the visible sky, seasons, lunar and solar phenomena and a variety of natural events including felt effect of precession in either figurative or matter-of-fact language. However, quantitatively speaking, compared to the bulk of Vedic corpus which is esoteric, religious, ritualistic, and philosophical the amount of material that is retrievable as astronomy in the modern sense of the term is not large, but is still too precious and significant for delineating the cultural history of greater India and countries influenced by Vedic culture. A particular topic that is often invoked, discussed and meditated upon by the Vedic seers is Time, both the abstract and the concrete, in its various ramifications. This preoccupation with Time, it may not be wrong to claim, must have been closely related with rtam the natural rhythm associated with the visibility cycles of celestial bodies and their spatial location in the visible sky as seen from earth. That Time is continuous like a flowing river but experienced in terms of discrete elements such as nimeṣa, muhūrta, ahorātra, paksā, māsa, rtu, ayana, samvatsara, yuga is well described in several Vedic texts. It appears some of the rituals in the Vedas were originally designed to measure or demarcate time periods whereas some others were prescribed to be observed on specific dates like the New Moon, the Full Moon and solstice days, predicted as correctly as possible in advance.

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The inclusion of the subject of jyotiṣa (or jyautiṣa) among the canonical six vedāṅga or the six ancillaries of the Vedas points to the coexistence of time measurement based on sky observations in the Vedic Samhitā and Brāhmaṇa texts that for us appear cryptic and at times unintelligible whereas for the ancients such style might have been just a scientific symbolism or convention. Any measurement would demand an instrument, either natural or manmade. The natural supports for marking time in the earliest period were obviously the Sun and the Moon gradually encouraging naked eye observation of the night sky out of curiosity and wonder. The Rgveda in many places unambiguously refers to the visible sky although the description of the celestial picture may not always be clear without further analysis with the help of the ancillary texts denoted by the generic word vedāṅga. For example, the Rgvedic soma stationed in the sky can be a reference to the visible moon and not necessarily always mean a drink of that name to be extracted from a herb of the same name during a Vedic ritual. This follows quite clearly from the Nirukta of Yāska which is one among the traditionally recognised vedāṅga texts. Soma as one of the names of moon is widely listed in Sanskrit lexicons and is also prevalent in several regional languages of the subcontinent. This brings up the question whether by vedāṅga one should refer to the subject proper including all later developments or to those particular texts that were prevalent among the Vedic people before the Common Era. While one may debate this question in view of the practice of oral transmission of knowledge from generation to generation, for historical purposes it is preferable to take the period of vedāṅga textual tradition to have closed around 500 BCE.

This corpus, it is reasonable to infer, was for the first time written down in script form during the early centuries straddling the beginning of the Common Era. Since writing on perishable medium needs to be rewritten afresh every 200-300 years, the Indic knowledge manuscripts available now, even when their contents originated before CE, may contain conflated information contemporaneous with the period of the redactor, which present day readers at this distance in time, may believe to be the teachings of the original expounder of the Vedāṅga. Thus, comparative analysis of available manuscripts is essential to sift the relatively modern elements in a text from the clearly more ancient. For example, the tradition of a manuscript that refers to auspiciousness of a date based on the tithi, nakṣatra, vāra (weekdays) can be treated as being later in comparison with the ones assigning such properties based only on tithi and nakṣatra. This brings up the larger question of what should be the meaning of chronology as far as ancient Sanskrit texts are concerned, in relation to
history of science, observation of nature, mathematical concepts and overall growth of Indic knowledge systems.

**Vedāṅga Astronomy**

Texts with their authorship assigned by tradition to Parāśara, Garga, Kaśyapa, Nārada, Lagadha, Vasiṣṭha, Viśvāmitra and many other Sages were orally transmitted and later copied in different scripts several times. Hence it would be futile to assign a specific date for the purported ancient author (other than the copier who might have written his date) or to argue that all the contents of the currently available text must belong to the original author of an unknown ancient date. A well-known case in point is the Vedic ancillary calendar text attributed to Lagadha available widely in print. This is popularly known as the *Vedāṅga-jyotiṣa* a misnomer, since this may not be the only unique astronomical work formulated in the *vedāṅga* period before CE. This text enunciates the Vedic five-year cyclic calendar starting with the winter solstice day occurring when Sun together with Moon occupies the first point of asterism *dhaniṣṭhānah*, traditionally identified with star β-Delphini. It can be demonstrated that such a condition was astronomically valid *circa* 1300-1400 BCE and hence existence of such Vedic tradition should also be dated to the same period. However, the same text also refers to planet Jupiter in the *mīna-rāśi* which name is typically used to denote the division (330°-360°) of ecliptic longitude, by authors of a later period starting from around the beginning of CE. This apparent contradiction can be explained only by accepting that such a tradition of calendar (not as a finished scholarly text) originated around the third quarter of 2nd millennium BCE but this oral tradition attributed to Lagadha was fixed and frozen nearly a thousand years later by unknown scholars interested in the subject of *jyotiṣa*, by adding some information valid for their own period. Such an explanation finds support by textual evidences transmitted by Varāha-Mihira (VM) in the *Brhat Samhitā* (BS), by Bhaṭṭotpala and Bhāskarayogi in their respective commentaries on BS and by Ballālasena in the *Adbhuta Sāgara* (AS) for the above winter solstice marker. However, these historically known authors, with the exception of Bhāskarayogi, do not refer to Lagadha but cite two other sages

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Parāśara and Vṛddha-Garga. Parāśara states the six season solar zodiac starting from winter solstice at the first point of dhanisthā. With the help of the seasonal visibility of stars stated in the Parāśara Tantra, this tradition is found to be observationally valid for 1350-1130 BCE\(^3\). Vṛddha-Garga perhaps knew this older tradition as recounted in the chapter ādityacāra of the Vṛddha-Gārgīya Jyotiṣa (VGJ) to be discussed later.

However, as mentioned earlier, scripted material available for our analysis on the work of Parāśara and Vṛddha-Garga is mixed with data that can sometimes be shown to belong to the early centuries of CE. Nevertheless, it is only proper to recognize the above chronological marker of \(c\) 1400 BCE as valid evidence for the existence of Vedāṅga-jyotiṣa as a scientific discipline of astronomical observation and calendar, sprouting out of the already existing Vedic culture. Verifiable chronological memory of this culture goes back to 3\(^{rd}\)-4\(^{th}\) millennium BCE, as can be demonstrated from the Taittirīya Āranyaka of the Yajurveda, which commands great respect in the continuing oral tradition of the Vedas and in Hindu cultural practices. This text available in print with several commentaries, describes the fixed Pole Star abhaya-dhruva in the constellation śiśumāra with fourteen stars, which in terms of modern astronomical knowledge correlates with the epoch of \(c\) 3000 BCE when star \(α\)-Draconis (Thuban) in constellation Draco was looking fixed at the north celestial pole in the night sky to be literally named Dhruva\(^4\). The Maitrāyaṇīya Samhitā and the corresponding Āranyaka allude to the shifting of this fixed Dhruva, a first order anomaly of deep philosophical significance to the Vedic people, which could have been experienced only due to the inviolable effect of precession of the rotational axis of the earth\(^5\). Thus, to treat the available Vedic corpus in its present form as a group of texts composed in a particular time period of a few centuries would be naïve and simplistic. At the present time we can only perceive the Vedas as a culturally inherited and well preserved Indic knowledge cloud, the central part of which had already nucleated in the Bronze Age. This body due to its inherent momentum grew organically over time manifesting many other limbs, as we see them now, at later periods. In such a panoramic scenario the formal

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\(^5\) Maitrāyaṇīya Samhitā 4-6-6, Maitrāyaṇīya Āranyaka Upaniṣad 1-4.
school of *Vedāṅga* Astronomy germinated *c* 1400 BCE with questions and explanations about Creation taken from known Vedic celestial descriptions, mysticism and metaphors but followed by scientific observation of the sky and associated natural events.

**Vṛddha-Garga, Gārgya, Kroṣṭuki**

Textual materials in the name of Parāśara, Vṛddha-Garga and Lagadha have been inherited by various Hindu intellectual schools as belonging to the Vedic tradition. Such inherited texts on astral sciences of the first and the third authors are available in print. Sage Garga the originator of the second school is famous as an astronomer quoted and cited in many places. Large number of Sanskrit manuscripts ascribed to the general authorship of Vṛddha-Garga and/or Garga is available in specialized libraries within the country and abroad. For tracing history of natural sciences in India, as also to understand the roots of Hindu astronomy and astrology before Kauṭilya, Āryabhaṭa and VM, it is necessary to critically review the contribution of the school of Vṛddha-Garga (VG) with the help of such manuscripts.

A sage by name Garga is well known as a composer of several Vedic hymns, the most famous one being the *Nakṣatra Sūkta* of the Atharvaveda. Equally well known is the *Garga-samhitā*, a purāṇa style text available in print, attributed to the authorship of Gargācārya the family priest of Nandagopa and Yaśodā, the foster parents of Kṛṣṇa during his childhood days in Gokula. It should not be surprising to find several other texts on widely different topics under the authorship of some Garga, which is a family name. In the broad field of astral sciences, we find *samhitā, jyotiṣa, horā, praśna, śakuna, mūhūrtā, siddhānta* works attributed to either VG or Garga styled as *vrddhagārgīya, vrddhagārgya, gārgīya, gārgya* listed in manuscript catalogues. In current parlance, the word *jyotiṣa* is usually taken to mean astrology in India. However, in the Vedic period *jyotiṣa* as *vedāṅga* encompassed observation of celestial bodies, time keeping, computation, calendar, seasons, atmospheric phenomena, omens, correlated effects on earth including rainfall, earthquakes and prognostication. It was only after mathematical methods got continuously refined for proposing a theory for eclipses and planets in the early centuries of CE, *jyotiṣa* came to be treated under three different heads, namely, *samhitā, horā* and *siddhānta*. *Samhitā* texts as the name indicates are collection of information on any or all aspects of *jyotiṣa* over a period of time prior to their final redaction. *Jyotiṣa* works attributed to VG and Garga have existed in the country.
since a long time. Usually these works are broadly denoted as Vṛddha-Garga Samhitā (VGS) and Garga Samhitā (GS) in the literature. Garga’s works were known to Mīnarāja (2nd cent.), Varāhamihira (6th cent.), Somākara (7th cent.?), Bhāṭṭotpala (10th cent.), Ballālasena (11th cent.), Bhaṭkaṭayogī (13th cent.) and Nīlakanṭha (15th cent.). These authors have cited or reproduced verses from either VG or Garga or both.

_Atharva-veda-pariśiṣṭa_ (AVP), an appendix to the Atharvaveda, is a text fixed before CE. AVP mentions Garga and also his son Kroṣṭuki in the 50th chapter _candra-prātipadikam_ on description of Moon. In the 61st chapter on atmospheric halos AVP reports the opinion of Vṛddha-Garga. But the 70th chapter on _uptātalakṣaṇa_ is completely ascribed to Gārgya that means son of Garga. This gives the impression that AVP may refer to the same person as Garga in some places but qualifies him as Vṛddha or Senior in a few other places. This may be because AVP knew both the Senior Garga and his son Kroṣṭuki, who in some places might have been cited as Gārgya. The Mahābhārata (MB) in the _śalya-parvan_ refers to the Senior Garga as a specialist in interpreting celestial anomalies. In another place Gārgya directly says that he was given the knowledge of the subject of _Jyotiṣa_ of 64-aṅga (limbs/sections) by Śiva on the banks of River Sarasvatī. The _Nīrūkta_ of Āṣkācārya cites a grammarian by name Gārgya and also an interpreter of Vedic hymns by name Kroṣṭuki (Krāṣṭuka). Śaunaka’s _Brhaddevatā_ (4.137) also knows Kroṣṭuki as an interpreter of the Rgveda. Probably, this same seer is reverentially cited by Pīṇgalanāga in his *Chandaśūtra* (3.29) to say that the Vedic meter _nyaṅkusāriṇī_ is called _skandhogrīvī_ by Krāṣṭuka, as further explained by the commentator Halāyudha. Gārgya as a name can refer to any progeny of Garga, (_e.g._ Gārgya Bālāki in the _Brhadāraṇyaka Upaniṣat_ ) but Kroṣṭuki is unusual and

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6 गाजिवीक्षणानि चार्बीयीर्य वदि गच्छिति चतुर्त्रा:। गर्गस्य वचनं यथा॥
अत् र्षीसंविविन चत्तृत्रयुक्तियानि वदे व। नोस्थायी लहरीं चेव तृतीयतांस्रोच्चत।॥ (AVP 50.4.4;5)

7 अथात: परिश्रमणानि लहर्यां चेव वन्ये। वृद्धार्गानि यथा पृथ्वीवाच मम सुविन्या॥ (AVP 61.1.1)

8 गार्ग्येऽक्षमिक्षयां तृतीयतां चेव देवस्य च तस्मात:॥ (AVP 70.23.1)

9 यत्र गर्ग्यं वृद्धं तस्मात भावितात्मम। कालानात्मात्मिक्षयां च तस्मात:॥ (Śalya Parvan 36.15)

10 चतुः प्रथमस्तद्वतां कालानि ममहम्मादृतम्। सर्वस्तत्त्वस्तिनि त्यो तर्यस्य मनोक्षेत्रो पाण्डव॥ (Anuśāsana Parvan 18.25)

11 सक्तोक्षीयप्वेक्षयां कौटुकं:॥ ३.२९॥ इयमेव न्युसारिणी वल्तानं सक्तोक्षीयी नाम सन्ध्यो भवित। आचायर्ष्ट्राण पूर्णर्थम॥

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we do not meet this personal name in later literature except in passing in a few early
purānas and in one instance in a Jaina legend. On the other hand, Kroṣṭuki by name
is specially cited in several Vedic ancillary texts, hinting his date to be somewhere
in the middle of first millennium BCE.

Even though nothing personal is known about the two Gargas we can confidently
say that Vṛddha-Garga and Garga known to Indian astronomical tradition must have
been two different persons, the former being earlier in time followed by another
author by the same family name Garga. This becomes evident as VM, Utpala,
Ballālasena, Nīlakaṇṭha Somayāji, and Bhāskarayogi the famous South Indian
commentator on BS, cite VG and Garga and quote their texts that read differently.
Nīlakaṇṭha (1444-1544 CE) the celebrated Kerala mathematician in his
commentary on the Āryabhaṭīya (NAB) explicitly says that two astronomers by
name Garga are famous, the first being Vṛddha-Garga and then again another
Garga. He further says that as per Parāśara the second Garga wrote on jātaka and
also adds that this Garga (punargarga) has written on ganita in his text known as
Garga Samhitā. From this information we infer that the second Garga should have
lived in the early centuries of CE when horoscope astrology (jātaka/horā) and
mathematical astronomy (ganita/siddhānta) had gained ascendency in India. It also
indicates that Nīlakaṇṭha had access to an ancient text by name Garga Samhitā on
mathematical astronomy that was not titled as Siddhānta.

Quite realistically Sanskrit manuscript tradition on astral subjects has inherited two
broadly different sets of texts in the lineage of Garga as Vṛddha-Garga-
jyotiṣa/samhitā and Garga/Gārgya-samhitā/horā/siddhānta. But, over the centuries
copyists might have brought together different scientific knowledge due to Garga,
hoping to preserve the essentials of ancient jyotiṣa and name such compilation as
Vṛddha-Garga Samhitā (VGS). This could possibly make a modern reader
conclude that there must have been only one astronomer by name Garga. But, such
conclusion would be an over simplification since Hindu tradition celebrates ancient

12 The verse attributed to Parāśara, is not found in known works: Parāśaratantra or Brhat-Parāśara Horāśāstra.
authors mainly by their family names as linked to the mass of knowledge propounded by them. The moniker Vṛddha would have been applied to the older author only after the advent of texts by another Garga a few decades or centuries later. In the intervening period between the time of the first and the second one of the same family, the works and concepts of VG, the earlier Garga, might have been cited simply as gārgya/gārgīya that is ascribed to the sons or students of Garga. Thus, it is all the more important to survey several different manuscripts related to Garga, for filtering out later astronomy and astrology and to pin point ancient concepts of the VG school of vedāṅga-jyotiṣa. With this in the background we have collected from libraries far and wide apart, manuscripts labeled in the name of either Vṛddhagarga or Garga as source material.

**Primary Source**

The following fifteen Sanskrit manuscripts (Mss) prominently titled as either *Vṛddhagarga Samhitā* (VGS) or *Garga Samhitā* (GS), except for minor variations, are collected as the primary source for the present critical study. All the Mss with the exception of no. 6, 9 and 15 are in Devanāgarī script.

1. *Vṛddhagārgīyajyotiṣa* (K1) National Library of India, Kolkata (Th. 319)
2. *Vṛddhagargasamhitā* (A1) Rajasthan Oriental Research Institute, Alwar (2602)
3. *Vṛddhagargasamhitā* (A2) Rajasthan Oriental Research Institute, Alwar (2603)
4. *Vṛddhagargasamhitā* (B1) IGNCA, Bangalore (SLR A-1799-1800, Vārāṇasī S 34)
5. *Vṛddhagargasamhitā* (U1) Cambridge University Library, UK (R 15.96)
7. Vṛddhagārgīyasamhitā (P1) Bhandarkar Oriental Research Institute, Pune (345)

8. Gargasamhitā (P2) Fergusson College, Pune (399)

9. Vṛddhagārgyasamhitā (M1) Oriental Research Institute, Mysore (P 4665) *Grantha script*

10. Vṛddhagargasamhitā (C1) DAV College, Chandigarh (VVRI 2348)

11. Vṛddhagargasamhitā (N1) National Archives, Kathmandu (5-1099), Nepal

12. Gārgyasamhitā (P3) Bhandarkar Oriental Research Institute, Pune (210, 1883/84)

13. Gargasamhitā (B2) Central Library, Baroda (9277)

14. Gargasamhitā (K2) Asiatic society of Bengal, Kolkata (8199/2)

15. Gargasamhitā (C2) DAV College, Chandigarh (VVRI 2069) *Malayālam script*

There are still more manuscripts available with same or derivative titles. In some cases, there is recognizable difference between the official title and the chapter end colophons. A few of the Mss above are marked *Brhadgarga Samhitā* on the frontispiece. This may be because the colophon at the end of the first chapter reads *Brhadgarga-kṛte jyotiṣe*. However later chapter endings read as *Vṛddhagārgīye-jyotiṣe* or *gārgīye-jyotiṣe*. The tendency of using the honorific *brhad-* and *vṛddha-* as equivalents is seen in the *dharmaśāstra* literature also, where the *Vṛddhavāsiśṭha Smṛti* and the *Brhadvāsiśṭha Smṛti* refer to the same text\(^{13}\).

Attribution of Authorship

\(^{13}\) *Vyavahāra-mayūkha*, V.N. Mandalik, Asian Publication Services, Delhi, 1880
While going through the manuscripts that have come down to us as VGS, a doubt arises; whether the work belongs to a unique school of Garga/VG or are there other contributions finding place in the Mss. This question is natural since although several chapters start in the form of a conversation between Garga/VG and Kroṣṭuki as scholarly sages sitting in a typical ancient hermitage, there are several exceptions to this narrative style. There are verses that read like opinion of Garga/VG inherited from unknown sources, which perhaps got added at a different period to the main thread. Such changing style and retelling of the same information in different words appear in some chapters with specified astral phenomena. Also there are chapters attributed to Śukra in response to questions by Nārada. The ādityacāra chapter is presented as a conversation between Garga and Nārada. The vātacakra is attributed to a not so well known teacher Śyāmacandra, as a lecture by him in an assembly of seven kings. In the chapter śukracāra on Venus, after stating interesting astronomical visibility numbers, a portent that causes distress to King Dhruvasena is mentioned. A few verses further, another Venus related portent is said to indicate death of the king of Saurāṣṭra. From the context and reference to yavana, hūna, tukhāra warriors, one can surmise that the above reference to Dhruvasena is to a ruler of the Maitraka dynasty (5th-6th cent CE) reigning at Valabhī, who had to face an attack from outsiders. Another instance of a possible historical footprint is the chapter called yugapurāṇa that appears as a conversation between divine personalities Śiva and his son Skanda, and hence marked in some Mss as Skandapurāṇa. Notwithstanding such inconsistencies as above, large number of chapter colophons connects the content with VG or Garga. Thus, before embarking on a detailed study of VGS and GS it is necessary at the first level to match the chapter contents with the text mentioned in the colophon. A preliminary survey indicates that the topic name mentioned at the chapter end matches well with the content. About the attribution to an author or to his school, doubts persist since all combinations of Garga, Gārgiya, Gārgya with and without the prefix Vṛddha and suffixes jyotisa and samhitā occur in the Mss. This situation is a pointer to accretion of material over time with no conscious effort by the copyists at sequencing the contents chronologically. At this stage it would be advantageous to group the above 15 Mss as per their broad contents with a view to find some discriminating characters between VGS and GS that could provide a basis for further analysis.

Garga Samhitā, Gārgya Samhitā
There are five Mss in the collection (F1, P2, B2, K2, C2) that are listed as Garga Samhitā and one as Gārgya Samhitā. Mss no. 13 (B2) is wrongly shown as Garga Samhitā in the official catalogues, but it is Gārgya Samhitā as seen inside the manuscript. It is noted here that the difference between the use of expressions Garga and Gārgya is getting diluted over years. One can easily make out Mss no. 12 (P3) and no. 13 (B2) above are almost identical but written by different hands. The contents are same starting from the benedictory verse followed by a promise to explain knowledge of Rainfall following Garga. Both (P3, B2) know the twelve rāśi (meṣa, vṛṣabha etc.) zodiac and also the seven weekdays. This Garga/Gārgya-samhitā (GS) is a typical hāra and phala-jyotiṣa text. After briefly listing the five planets and Rāhu with their transit period in a rāśi, the seventh verse of this GS declares that the beginning of meṣa and tulā are the viṣuva (equinox); beginning of karka and makara are the dakṣiṇa- and uttara-ayana (solstice). This condition was valid around 300 CE and hence this GS is probably connected with the second Garga mentioned by Nīlakaṇṭha. This text has emerged out of the antecedent VG tradition as can be easily made out from the contents, colophons and the nakṣatra, tithi, karaṇa, muhūrta characterization. The nakṣatra list starts from aśvini and not from kṛttikā as in the ancient tradition of VGJ. In addition to the four astral elements of VGJ a fifth one namely vāra is included to define the pañcāṅga. A critical comparison between VGJ and GS (P3, B2) with list of contents will be provided in a future publication.

Among the remaining four GS texts no. 6 (F1) and no. 8 (P2) should be more appropriately referred to as VGS, since they have chapters in common with other VGS texts.

Manuscript no. 14 (K2) is a short incomplete text haphazardly assembled with many missing chapters but it has some folios matching with the GS and VGS texts. Manuscript no. 15 (C2) in Malayalam script with four missing folios is a siddhānta text perhaps attributable to the second Garga as mentioned by Nīlakaṇṭha. Mss no.

14 सर्वस्तोकाधिनाथयः सर्व्याग्निहिताय च। सर्व्यान्याधिनाथयः सर्व्याय नमस्तुनयः।
बुधग्रहं च कथामाग्निहितानुभागतः। मन्यं महाभागायदनमयं सर्व्यान्याधिनाथः॥ (GS v.1,2)

15 मेषतौ jौव षुव kौलीरं दक्षिणायनम। मकरं चोत्रं हेवव सर्वसंकालिनिर्दृश्यः॥ (GS 1.7)
9 in *Grantha* script (M1) and Mss no. 10 in *Devanāgarī* (C1) named after VG are more about astrology with no special information on the astronomy of Vṛddha-Garga. These two texts carry content in common with the spirit of GS texts P3 and B2. The remaining Mss no. 11 (N1) from Nepal is entirely on vāstu-vidyā with no relation to other VGS or GS manuscripts on astral sciences. For further work the listed manuscripts 1 to 8 together are referred to as VGJ and occasionally as VGS.

**Database Augmentation**

Mss 1 to 8, forming the primary source for further work are broadly identical in their contents with same or similar chapter names and endings. A difficulty, in varying degree, common to all the manuscripts is the orthographic idiosyncrasies of the writer which can be quite taxing to decipher. Another common limitation is the missing word, sentence and occasionally a page which sometimes can be addressed by comparing with other Mss. It is also the case at some places all the Mss may have the same unintelligible text or missing word indicating a common origin for our source material of VGJ. One way of improving the quality of such database is to assemble statements attributed to Vṛddha-Garga and Garga by reputed ancient authors on astral sciences for critical comparison. Thus the vivṛti (gloss) of Bhaṭṭotpala (UV) on the *Bṛhat Samhitā*\(^{16}\), the commentary titled *utpala-parimala* (UP) on BS by Bhāskarayogi\(^{17}\), Somākara’s commentary on Lagadha’s *Yājuṣa-jyotiṣam*\(^{18}\), and the *Adbhuta Sāgara* (AS) of Ballālasena\(^{19}\) containing original texts of Vṛddha-Garga and Garga become important. Several authors cite Garga in a general way; but Bhaṭṭotpala, Ballālasena and Bhāskarayogi quote Vṛddhagarga and Garga separately, attesting the existence of two sets of texts during their time. The above texts on BS and AS are available in print for ready reference. However, caution has to be exercised with these print versions, since the quality of antecedent editions and manuscripts used to prepare them, except for the work of

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\(^{16}\) *Bṛhat Samhitā with the utpala-vivṛti of Bhaṭṭotpala*, (Ed.) K.C. Dvivedi, Sampurnanda Sanskrit Univ. Varanasi, 1996.

\(^{17}\) *Bṛhat Samhitā with the utpala-parimala of Bhāskarayogi*, (Ed.) K.V.Sarma, Rāṣṭriya Sanskrit Sansthan, N.Delhi, 2007.


\(^{19}\) *Adbhuta Sāgara*, Muralidhara Jhā (Ed.) The Prabhakari & Co, Varanasi, 1905.
Bhāskarayogi, are not known. An important case in point is the half-verse that reads in the second chapter aṅgasamuddeśa in all our VGS Mss as:

साम्राज्यं पौणंस्य ज्योतिषामयानत्यपरम् ॥ (VGJ 2.21)

The word sāmrājyam meaning empire/sovereignty does not fit with the context, but it has the required three syllables suited to the metre of the verse. Hence all copies seem to have taken the same word irrespective of the contextual meaning of carrying out prescribed Vedic rituals such as the New Moon-Full Moon rites on earth, based on specific positions of celestial bodies in the sky. The quarter-verse jyotiśāmayanātparam is also not very apt, since the same partial text appears three verses before. In such cases reference to independent versions is essential. Fortunately, a group of sixteen verses including the above ascribed to VG is quoted by Utpala in his gloss. Reference to the print version of K.C. Dwivedi, which in turn is based on an earlier edition brought out by Pt. Sudhākara Dwivedi leads to:

साम्राज्यं पौणंस्य च पितृदेवतत्पर्यम् ॥

This reading is better, but retention of the word sāmrājyam fits the metre but still not the context. In order to address such situations, we have added two Mss of BS with UV and one of the Adbhuta Sāgara into our collection. For the above half-verse the BSUV manuscript VVRI-2602 has the most appropriate reading:

साम्राज्यं पौणंस्य च पितृदेवतत्पर्यम् ॥

Here the word sānnāyyam, an astronomical term with Vedic ritualistic connotations refers to the alignment of Moon with Sun, known as amāvāsyā in popular parlance. On similar lines a few more ancient texts, wherever appropriate, are referred in preparing the present critical edition of VGJ.

Organization and Sequencing
R.N. Iyengar, H.S. Sudarshan, Anand Viswanathan

The VGS text in its content, style and organization as it appears within a given manuscript, is neither homogenous nor internally consistent. One gets the feeling that considerable addition has taken place at different periods onto a smaller, Vedic Brāhmaṇa type text that was mainly in prose. Correspondingly there must have been deletions also to the original version. Basically, the work as it stands is a compilation of astral information spread over centuries. Among such compilations BS is the best known samhitā work that claims to preserve the ancient tradition of Parāśara, Garga, Asita Devala and a few others. VM acknowledges his debt to the above sages although he is more matter-of-fact in his treatment. In the first chapter of BS, the ancient origin legends of celestial bodies are alluded to but are ignored as mere stories to keep the students amused. However, Utpala in his commentary profusely quotes from the Parāśaratatantra, the questions raised by the students of Parāśara and in some cases the answers also. Authors such as VM were not interested in exploring the chronological connections that might exist between the above student-teacher legendary dialogues and the more ancient Vedic sky pictures and creation legends. It needs no emphasis to point out that scientific enquiry is essentially to raise questions about nature and seek answers, within the constraints of contemporary society, from available traditions and by independent intellectual efforts. Students of history of science including astronomy cannot afford to ignore such ancient questions and answers unique to India however strange and obscure they may sound to the modern man influenced by Western models of history. VGS retains many such portions either in original diction or in reworked verses, but placed without proper sequence. All Mss contain scattered passages in prose that read archaic, in terms of ancient legends and observations about celestial bodies. The section Mahāsalila with long questions and answers is probably the most ancient content going to the beginnings of Vedāṅga astronomy proper. So also are the chapters about Moon and Rāhu. We can infer that the prose parts are the originals due to the school of VG not only in spirit but also in letter.

The sequence of presentation of the subject matter including colophons is nearly same in all the eight scripts, except for missing verses and incomplete assembly. None of the manuscript copies now available are older than 1500 CE. Notwithstanding recognizable differences due to copying errors and accretion of textual material, it can be made out that the Mss owe their origin to a medieval school of jyotiṣa interested in preserving ancient inherited information in whichever form that was available readily. We conjecture that various VG and Garga/Gārgya related texts and oral material in vogue were redacted in script form sometime after.
VM (6th cent.) but before Bhaṭṭotpala (10th cent.) and later copied multiple times in different regions by different hands eventually reaching modern libraries. The text is made up of about 4000 verses of 32 syllables each, with further prose text equivalent in bulk to about 2000 verses. All Mss begin with the same benedictory verse22 with the first chapter (sāmvatsara-nirdeśa) narrated in prose emphasizing tithi, nakṣatra, muhūrta, karaṇa without mention of vāra (weekdays). The second chapter titled aṅga-samuddeśa lists the contents of the proposed work sequentially in 64-aṅga (64 limbs/sections/parts) made up of 24-aṅgas and 40-upāṅgas (sub-sections). However, there are important differences between the list of contents and the actual text found in the manuscripts. The most conspicuous one being the yugapurāṇa text found in all Mss but not listed in the contents and also unknown to the traditional list of 18 mahā- and 18 upa-purāṇas.

Yugapurāṇa (YP)

The 41st chapter of 115 verses is the yugapurāṇa also referred to as skāndapurāṇa in some Mss with no verifiable relation to the famous Skāndapurāṇa of the same name with 84,000 verses. This chapter is of historical importance as noted by Mankad23 and Mitchiner24 among a few others. YP narrates briefly the story of attack of Śakas (Scythians) on the Magadha Kingdom in an attempt to characterize the classical four yugas in a fashion different from mainstream Purāṇa texts. Mitchiner has prepared a critical edition of YP chapter from out of a collection of VGS manuscripts several of which are in our database also. He dates the contents of the YP chapter to a period before 25 BCE. He argues in the introduction to his book that YP is an integral part of an ancient astral text that he denotes as Gārgīya-jyotiṣa (GJ) belonging to the same period as above. While the dating of YP based solely on external evidences may be reasonable, considering it to be an integral part of the astronomical tradition of the VG-school does not stand scrutiny. The major inconsistency is about the absence of yugapurāṇa in the aṅgasamuddeśa chapter but existence of a text called YP as a section between the tulākośa and

22 जमल्लुप्राते तमसान्धिष्ठे गोप्रेये प्रजानां फलसम्पदाते । महेश्वरणोत्सि भावकर्तेः तस्मै नमो धीविष्ये सत्यं ॥ ।

sarvabhūtarūta chapters which are specifically authenticated in the list of contents. Mitchiner’s interpretation of the phrase bhavaśṛṅgī, between the above two āṅgas, as worldly affairs and hence as a reference to YP is not convincing. There is no astral portent or event, or passing information in YP that has any type of link with other chapters. The word yuga, has many popular connotations but in VGS yuga is used in the sense of Vedic five-year cycle, the eclipse cycle (Rāhu yuga) and the Jupiter cycle of 12 years (Brhaspati yuga). The meaning of the word yuga in YP is different as it attempts to relate the longer Purānic Kṛta, Treta, Dwāpara and Kali yuga concepts to a historical socio-political upheaval circa 200 BCE.

Varāhamihira in BS, as pointed out previously, follows older traditions closely. A comparison between BS and VGJ brings out this fact. VM includes a chapter each on Saptarṣicāra and Agastyaścāra that is the movement of the stars of constellation U.Major and of star Canopus, knowing well that these celestial bodies are not planets. VM categorically states that Saptarṣicāra is as per Vṛddha-Garga and explains the artifice of linking the Śaka Era with the time of MB when saptarṣi constellation was with star maghā (Regulus). Bhaṭṭotpala in his commentary quotes VG and Kaśyapa to highlight the more ancient nature of this tradition. Many of the earlier Purāṇas such as the Brahmāṇḍa, Vāyu, Matsya texts support this method of linking MB, Kaliyuga, and genealogy of Indian Kings c 600 BC onwards. This theory of movement of saptarṣi was an attempt by VG to provide a temporal link between King Parīkṣit of MB and the Nanda Kingdom of Pāṭaliputra. This was done by starting an era supposedly dependent on the station of the Seven Sages for 100 years with each nakṣatra. Here we are not concerned with the correctness or otherwise of this artifice. However, it should be noted that the YP text is also an attempt to create a link between MB and the Magadha Kingdom of a later period, but without any astral reckoning of the type in BS and the original Purāṇas. In the VGJ manuscripts, although not listed in the āṅgasamuddeśa, a chapter on agastyaścāra which originated due to Parāśara as per BS and Bhaṭṭotpala is available. A comparison shows that all the first 24 chapters of BS are closely reflected in the Mss of VGJ except for the saptarṣicāra, which appears to have been substituted by YP. Thus, there is a strong case to treat YP as not integral to the most ancient Vṛddha-gārgīya or Gārgīya. Inclusion of contents not intended by the original author is a pointer to a relatively later date for our samhitā-type assembled manuscripts (not to their content) in comparison with the text of VG quoted by authors such as VM and Bhaṭṭotpala. This also indicates the possibility of more layers added over the original prose work by students and followers of VG making
the text to be known as *Vṛddha-gārgīya*, which otherwise would have had a more compact structure before the *graha-karma-guṇa* on week days and the *yugapurāṇa* with no astronomy got added.

There are still other differences and peculiarities between the stated contents and the actual material in the manuscripts. In a few Mss a stray word *that reads like kendra* without any contextual need or meaning appears in the colophon of a short section in prose that has questions about the nearness of moon with the *nakṣatras*. This word supposedly of non-Sanskrit origin, does not figure within the body of the concerned chapter or elsewhere in any of the manuscripts. The corresponding word for the listed content from the second chapter is *nakṣatrendusamam*.... The language of VGS is not refined classical Sanskrit. The compound word *nakṣatrendu-samam* that sounds unusual seems to have been read by the early copyist as *nakṣatrendra-samam* and further mechanically altered to *nakṣatra-kendra-bham*²⁵, since in his time the word *kendra* was popular in Hindu astronomy and astrology. The alleged existence of this spurious word *kendra* of Greek origin in VGJ, as claimed in the introductory note on Mss U1 of Cambridge University, U.K. has no basis.

**Title of the Text**

The attribution of authorship in the Mss is too varied as already noted. This brings up the difficult question of what should be the appropriate title for the natural science content in the Mss which reflects cultural history in a fair and reasonable framework of Vedic, Vedāṅga and Siddhānta astronomy. The natural choices are between *Vṛddhagārgīya Jyotiṣa* and *Gārgīya Jyotiṣa*. Mitchiner in his work on YP (*f.n.* 23) argues for the text to be called as *Gārgīya-jyotiṣa* in the name of Garga but not in the name of Vṛddha-Garga. His main argument is that whereas VM and Utpala quote both VG and Garga, the Mss under study contain only the Garga quotes of the above famous authors. But a careful reading of the Mss shows that such conclusion is not correct. References to Garga are more numerous than to VG, but many quotations attributed to VG by Utpala, Ballālasena and Nīlakaṇṭha are

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²⁵ नक्षत्रेतुसम्यक्—नक्षत्रेत्रसम्यक्—नक्षत्रकेतटसम्यक्—नक्षत्रकेतटभः
found in our manuscripts. A complete list of these will be presented later. Also, there is no strong evidence to indicate that the prefix \textit{Vṛddha}- might have been added to the colophons at a later period. In fact, a few of the starting verses in the chapter \textit{aṅgasamuddeśa} of our text, are found in the text quoted by Utpala in his commentary of BS (Ch.1 v.11) where the name of VG occurs as the speaker of the subject. In two chapters towards the end of the Mss the colophons read \textit{Vṛddha-gārgīye-tantre}. Thus, it is likely the text has come down to us with different names in different places. As with any \textit{samhitā} text, VGS is expected to contain most ancient, later and modern material. This is indeed the case. A simple count shows that the name of VG occurs 13 times, Kroṣṭuki 18 times and Garga 54 times in the text proper not including the colophons. Kroṣṭuki is clearly said to be the eldest son of Vṛddha-Garga in the chapter on \textit{Rāhucarita}\textsuperscript{26}. The name Garga theoretically can refer to another person of the same name of a later period; but equally well at least in a few cases Garga may be a short form reference to VG only. The principle of minimum assumption would dictate us to consider the archaic prose parts of the Mss to be the earliest teachings of the VG School, where the name of Vṛddha-Garga as the teacher is explicit. This over a few centuries could have accumulated further contemporaneous material in verses, added by a later Garga, to be reckoned as gārgya, gārgīya or \textit{vṛddha-gārgīya}. Hence, our preference is to name the present text as \textit{Vṛddha-gārgīya-jyotiṣa} (VGJ).

It is not necessary to insist that there must have been 64 aṅgas from the very beginning in the VGJ text to be considered it to be complete. The MB quote (f.n.9) refers to Gārgya, the son of Vṛddha-Garga (f.n.8), who inherited the subject and developed it further. The original astronomical content was perhaps limited to 24 primary sections into which more chapters were added later. The 40 secondary sections are not all astronomical. It is likely several of these are from the popular 64\-kalā list similar to the ones available in Buddhist texts and added to the Mss at a later period by successors of VG\textsuperscript{27}.

\textbf{Chronological Markers}

\begin{flushright}
\textsuperscript{26} अथ भवान्ते अमितपरं आश्रमस्थमार्यान्त महर्षिपिविद्वते वृद्धगर्गं ज्ञेष्टः पुत्रः कोष्ठकोङ्गम संस्कर्यं प्रत्यक्षः \|

\textsuperscript{27} \textit{The Kalās}, Venkatasubbiah, A., The Vasanta Press, Madras, 1911.
\end{flushright}
VGJ has two specific sections stating the seasonal position of Sun in particular naksatra segments. The first is the ādityacāra in which the six seasons start with śiśira rtu extending from the first point of dhaniṣṭhā to middle of revati. Each of the other five seasons sequentially span four-and-half naksatra segments. This is same as the six season solar zodiac of Parāśara that can be shown to have been valid for 1350-1130 BCE\textsuperscript{28}. VGJ states that Sun not reaching star dhaniṣṭhā at winter solstice is a bad omen. VG should have been obviously aware of the traditional Vedic year starting with the winter solstice. It is quite likely during his period the dhaniṣṭha condition was not valid. Besides the versified version of the seasonal zodiac of Parāśara, towards the latter half of VGJ appears another chapter titled ṛtu-svabhāva (nature of seasons). This chapter states the names of the twelve months (madhu, mādhava etc.) in the six seasons and also the naksatra expected to be transited by Sun. One can easily make out that this second set of solar stations is different from the first one. Taking into consideration effect of precession the stated season description would be valid for 800-300 BCE. This figure is too wide as a date, but considering the vagueness of the text, at present this is the best possible approximation. Significantly as in a long held tradition, both the above chapters (ādityacāra; ṛtu-svabhāva) are included in the original promised contents of the aṅgasamuddeśa chapter and hence are integral to the tradition of VGJ. Thus, it would be reasonable to take the school of VG to have branched c 500 BCE out of the then existing discipline of Natural Sciences including astronomy. In ketucāra, the chapter on comets, it is found that VGJ lists gadāketu in detail, which is an addition to the list of twenty-six comets of Parāśara. Similarly, VGJ has long chapters on Moon, definition of the synodic month, time spent by moon with each naksatra, explanation of Tithi and other astronomical topics not explained or ascribed by tradition to Parāśara. VG extols importance of both ganita (computation) and darśana (observation) as important to find the conjunction of moon and the stars\textsuperscript{29}, whereas Parāśara remained mainly observational. This again points in the direction of the original VGJ being later than the Parāśara Tantra but antecedent to the Garga/Gārgya Samhitā (P3, B2) which, in turn precedes the better known Brhat Samhitā by two to three centuries.

\textsuperscript{28} Iyengar, R.N., Parāśara’s six season solar zodiac and heliacal visibility of star Agastya in 1350-1130 BCE. Indian Journal of History of Science, 49.3 (2014); pp. 223-238.

\textsuperscript{29} न हि सर्वं गणितं न हि सर्वं दर्शनं। दूर्दशां गणितेऽधितः युगप्योऽसाधनेऽधितः॥ (VGJ Ch. चन्द्रमार्गः)
Provenance

As far as Garga or Vṛddha-Garga traditions about astronomy, astrology and meteorology are concerned, these are fairly wide spread all over India. However, it may be noted here that the GS and VGS manuscripts from South India are not same as the astronomical VGJ that is being studied here. For understanding presiddhāntic astronomy, the collected MSS that are about 500 years old are valuable in pointing out the beginning of VG-School to the middle of the first millennium BCE. The place of origin of this school must have been closely connected with a Garga, who later became famous as Vṛddha-Garga. Holy places, villages, temples, hermitages in the name of Sage Garga are found all over India. But, the ancient textual information available to us from the MB30, says that VG was living on the flood plains of River Sarasvatī, the place being known as gargasrota. A forest habitat by name Gargāraṇya finds mention in several Purāṇas as the hermitage of Garga. A bilingual inscription of 1501 CE mentions Gargāraṇya as Gāguraṇa31 which is now identifiable as Gagron (24.63° N, 76.18° E) famous for its water fort in the Jhalawar district of Rajasthan. Thus, based on available geographical evidence one can take the school of VGJ to have originated in the present day Rajasthan region. About the mode of transmission of the VGJ tradition we can only speculate that this must have been oral over a period of time, like with Vedic texts. It is likely the observational approach of the sky and physical happenings on earth was known by the technical term Tantra, or procedure. In the second chapter the word graha-tantram is used in the sense of a procedure for characterizing planets, but graha are not just five but one-hundred and eight as explained in the chapter ketumālā (Comet-strand). This tantra was not just limited to physical observation

30 गर्गोत्तो महातीर्थमाजगामामकुरुत्तराम। यत्र गर्गो तत्र्येन तपस्वा भवितात्त्मना॥
कालज्ञानमातिषे ज्योतिषां च व्यतिक्रमः। उत्पातं दाक्षण्यौ शुभाश्च जनमेजय॥
सर्वस्वता: शुभे तीर्थ विहिता वेमहात्तमना॥ तत्त्व नाशस च तत्तीर्थ गर्गोत्त मेया स्मृतम्॥
तत्र गर्ग महाभागमृषयः सुकृता नृपः॥ उपासां च चक्रेऽनित्य कालज्ञानं प्रति प्रभो॥ (MB Śalya Parvan 36.14-17)
but included Vedic mysticism, rituals, divination, and when necessary śānti-karma (appeasement rites) for the benefit of the community.

Format of Presentation

The present effort, is to prepare a working edition of the text of VGJ to bring out the outlines of astral science that was taught by VG to his early followers as one of the vedāṅga of the Vedas before CE. The presentation follows the collected manuscripts closely, pointing out variant readings in the foot notes. The text is organized chapter wise, following the topic as indicated in the Mss colophons when they match with the contents. The chapter titles are given by us for easy reading. It is pointed out here that the colophons in the Mss are neither organized uniformly nor numbered properly. In some places these are based on the aṅga classification subdivided into further adhyāya (chapter) that seems to be the original pattern. However, in several colophons no such principle is detectable. An additional difficulty is the variation in the colophon readings. In the edited text no end colophons are shown except for the chapter numbers. But all the hundred and odd Mss colophons will be presented with variant readings as an Appendix, in the hope that some pattern may emerge in the way copyists from different places have attributed the authorship of the text. The prose text, wherever it appears, is organized into numbered paragraphs followed or preceded by verses sequentially within every chapter. VGJ being a technical text transmitted from the BCE period with additions and modifications, we have not attempted any emendation of the language. In places where the meaning is not clear and where an alternate better version is available from a well-known past author, we have used the latter in the main text giving all variants in the foot notes. When such preferred alternates are not available and the overall meaning is clear, we have added a letter or a word mainly to overcome a scribal mistake or as a help in punctuation of a long prose text. Such editorial interventions are always prominently shown within square brackets. In a few places, VG text as attested by ancient authors, is added for sake of completeness and for comparative study. Such parts are preceded by editorial statements in the main text on the sources.

The work will be presented serially in parts, following the order of the topics in the Mss even though this is not the natural order in which the VGJ manuscript tradition has achieved its present size. It may be highlighted here that a first reading of the Mss shows that the prose section titled Mahā-salila, with a long list of questions
and answers forms the earliest part of the VG tradition. The prose part distributed over the text provides a conceptual frame work of appreciating the evolution of Indian astronomy from the early Vedic cosmological questions, legends, speculations and observations leading to counting, recognition of pattern through numbers and Ganita over time. Apart from collating the manuscripts to arrive at a readable text, the aim is to bring out a coherent picture of the scientific contributions of VG who is hailed as one of the founders of Hindu astronomy leading to the various mathematical siddhāntas. Hence it would be necessary to critically compare VGJ with BCE texts such as the Parāśara-tantra, the Vedāṅga-jyotiṣa of Lagadha, the early Purāṇas and also the astronomical texts of the Jaina and Baudhā traditions.

In what follows, the first three chapters of the Vṛddhagārgīya Jyotiṣa are presented with a brief summary covering only such points that are essential to the narrative.
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॥ वृद्धगार्गीयज्योतिषमु ॥

॥ श्रीगणेशाय नमः ॥

जगद्गढिध्रुवेन तमसा निहोशे गोपने प्रजानां फलसंपदेः।
मन्त्रे२क्षण-शोतश् 3 भावक्रः 4 तस्मि नमो धीविवधे 5 सविवे। ॥

१ ॥ सांवत्सरनिर्देशः 6 ॥

अथात्: सांवत्सरनिर्देशं व्याख्यायामः।

तत्र संवत्सरो नाम सूर्या-चन्द्रमसो। 7 यद्ध-नक्षत्र-तारणाः 8 च उद्यास्तमय-कालाभि९-निर्वर्तकम्। 10। निमेय-क्षण-कालाभि२-जुट७-चिर-मुहुःतांहरात्र-पक्ष-मासित्व्यान-विचुवत । इत्यवयमादिने प्रबृत्ततुष् 11। भूत-भव्य-भविष्यत-कालाभि३। निर्वर्तकस्तु। 12। जरायुत-अणज-वेरुव्य-उद्विघ-उपरान्तिकरस्तु । चन्द्रकरस्तु । भूतायाम्यु । जन्मनिविधानमुग्गुणाभि४। निर्वर्तकस्तु। 13। श्रीसुणा-वर्षिततालाभि-धानकरस्तु। 15। सांवत्त्वका-योग-गतन्त्रवस्त्त्व[वेत्ता] । रक्षणविद्यमसंवत्सर-अपीते । उपस्थित-वर्तमानेनु अर्थेवू आदेशान। 17। अधिकुरुते इत्यधिकारादमि ।

सांवत्सर: 18 ॥ १ ॥

1 B1 नम: श्रीसूर्याय; K1 ex गुर्जरसिंहो विजयते तरां
2 A1 गात्रे; A2, B1, F1, P1 गात्रे
3 F1 -शोतारि
4 F1 नावक्रः; B1 तावक्रः
5 F1 धीविवधे
6 B1 सांवत्सरनिर्देशः
7 F1 चंद्रमसो
8 A2, K1, P2 -वारणाः; P1 -चारणाः
9 em; all -काला
10 A1, B1, F1, P2 -निवर्तकस्; K1 -निवर्तकस्
11 B1 -काला
12 A1, A2, B1 -निवर्तकस्; F1 -निवर्तकस्
13 B1 जन्ममरणाभि; F1 जन्मनिविधानमुग्गुणाभि
14 A2 -निवर्तकस्; B1 -निवर्तकस्; P2 -निवर्तकस्; F1 -निवर्तकस्
15 F1 -घातकस्
16 A2, P1 अतिव आदेशान
17 A1, B1, F1, K1 देशान
18 F1, P1, P2 सांवत्सरः
यथा 3 च मन्त्रः अन्निः भूमपीते 4 सुराणाः च। तथा संवत्सरमुखः पार्थिवः पार्थिवमुखाः प्रजः। तस्मात् विजितीयुणा पार्थिवन इह च अमुन्त च श्रेयः अवातुकामेन संवत्सरः। अथिन्त्वः। पुरुषाध्येति॥३॥

पुरुषार्थादिविग्रहे यदानो [अ]शकृष्णन्तुतमुन असुराणन तदात ते सुराः पितामहामंत्रितः। अभिमन्यः॥ प्रणिपत्तः भक्तिः तु १० स्माराणां इति अस्मान ११ व्यवधाति॥४॥

ततो मुहर्तमुक्तित्व ग्रहा सुरानववात्। गच्छतु वृहस्पतिमुखः देवः शुकः आर्तिविजः संवत्सरं के चानाने॥ १२ वर्यथम् इति। ततः ते देवः ऋक्ष्य-साम-प्रवश्च। अर्थः-प्रक्रृतः। मन्त्रः। अभिमन्यु शुकः सर्वराधिकपत्यं च सृजः॥ आर्तिविजः संवत्सरं च ज्ञाने अवृणन्॥५॥

1 F1 यथोग 2 F1 संवत्सरानां 3 A1, A2, F1, P2 तथा 4 F1 क्षणाभिमाणार्थ 5 A1, A2, F1, P1, P2 संवत्सरः 6 cf Parāśara Tantra 2.3 7 irr; F1 अतिन्त्व 8 A1 -कृतुक्षणस्य; U1 -कृतुक्षणस्य; K1 - कृतुक्षणस्य; P2 -कृतुक्षणस्य 9 A1 कर्मकथा; F1 कर्मकथनस्य 10 A1, A2, B1, F1, K1, U1 मु 11 K1, F1, P1, P2, A1 अस्मान 12 K1 चकाने; P1 चकाने; A1, P2 चकाने; B1 mt; U1 संवत्सरकारी 13 irr 14 irr 15 F1 ज्ञातेवरा
तत: तानुवचः। सुरा:। यदि यहा: सर्वेऽ एव ममानुवर्तते यदि च मवयात त्रां प्रजानं शुभं भवित यदि मे यज्ञाभाग्: स्यात्, इति च। कामेवार्त्तनम् उजु: देवा:। तत: प्रभुत्व सर्वताराध्याणोऽयोगक्षेत्रम् प्राधान्यं च आधार्य शुके सुरस्ते: ते च अवरे यज्ञाभागः कल्ययन्त्वः।

तत: प्रीतमना: शुक: शान्ति स्वस्त्ययन्त वदिहोम। मायत्यं प्रायठिता मुक्तक्ष: योगक्षे मादिभि: तेजोजज- बलं-सत्त-रूपं-धृति-पराक्ष: अतिवरयामासः। देवा:। स[ह]वहस्पतिना' ततस्ते देवा: तान् असुरान् अविज्ञ: च सवार्तोकम् उपाश्रूः। एवमेव खलु पार्थिवो भवितः। तौ सावत्सर-पुरोहितोऽसाधो पृथिव्यां साधतिराजयम्। अवासुवन्ते इति ॥ ७॥

भवित चत्र।

अनवतं समाधिता चेन्डयि निरिङ्गना निषपिथियहा:। अयि ते परिपूण्नति ज्योतिषो ज्ञानकोविदम्।

अप्रदीया यथा रात्रिनादित्यं यथा नम:। तथासांवत्सरो राजा न्यमत्तपं इवाधिनः। अमुहोर्तिनक्षस्तत्वाध्यायनादि च। पवर्षवेश वाकुलानि स्युरं स्यातसांवत्सरो यदि ॥ १०॥

तस्माद्राजाधिगल्वत्वयो विद्यु चावत्सरो अग्राः। जयं यथा: थिर्यं भोगानु श्रेयथ महदीप्तताः।

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1. *em*: A1, A2, K1, P1, P2, U1 प्रभुत्व सर्वताराध्याः।
2. A2, P1 सुरस्ते; K1 सुरस्ते।
3. A1, B1, F1, P2, U1 चरसावानः।
4. A1, A2, F1, P1, P2 अक्षयान्तः। B1 snc; U1 अक्षयान्तः।
5. B1 चलिहत्येव।
6. A1, A2, P1, U1 अतिवरयामसः। K1, B1 अतिवरयामसः।
7. *irr all*: सवहस्पतिना।
8. *irr*: B1 अपाश्रूः।
9. U1 *mt*
10. A1, A2, B1, K1, P1, P2 *mt*

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नासांवतसरकें देशो वस्तवं भूतिमिच्छता। चब्बुभूतो हि चत्रेष पार्थ तत्त्र न विच्यते॥ १२॥

१[भास्करयोगिकृतायम् उत्पत्तिपरिमलाव्युहसंहितायैवायायायां सांवतसरसृवायाये उद्वृतानि
वृद्धगर्वचक्तानि।]

तथा च वृद्धगर्वः।

अथ देवज्वरणं व्याख्यायायः। राजः अभिपठित पूर्वमेव कुर्यात्। कुलीनम् आचारणस्तम्
अविकलाव्यवसं कन्यायकं प्रियं दृश्यम् स्वेदोवास-निर्विश्वशेषको परिष्य युक्त। स्वतंत्रक्षुशालं
स्कन्धश्रावांगतवां श्रावणम् उद्यास्तमल-कारणाभिर्में सूर्योंचन्द्रस्मिीः प्रग्रहण-मोक्ष-विभेद-
कारणाभिर्में पोडश-कर्माध्याय-कुशां सर्वां प्रसादवृद्धि परिष्य पूर्वपक्षः कुर्यात्॥ १३॥

राजा शुचि: स्वगृहं नानालभाराः रूढः मण्डे उपोषित कृत्यानं प्राणिप्यमासीनं देवमां आत्मां वस्त्र-
मात्यानुषेमैः नानाभरणं: सौर्यः समपृज्ज्व दृश्यंहस्तम् आलम्बण जन्मम उच्चर्यायेऽं हंसोऽहं लोकपालो
भवायि। युयमपि तथा प्रभावः: शुभवकारो भवन्तु इति त्रिः उचार्य देवज्व विसर्जयेत। अनेनेव पुनःरितवरण
विज्ञायेः॥ १४॥

आचार्यः: शुचिमभूता देवज्वावेदितकाः राजान्मु अभिपूजतेऽः। ततो देवज्वारोहित्योः विनातुहारिणीं दृश्यानं
दृश्या वास्तु-वाहन-शिविका-च्छत्र-चामरादिवः समपृज्ज्वेत। अनेनेव सांवतसरिको जन्मक्षेत्रे आयुःसूत्रं
बधीयात् चेन यस्यायुः प्रवाहम्। स तस्य गुरुमेव भवति। तस्मात् तं नाववन्मेत्। तस्य वचनं शुभकरं
भवति। तस्य किंयातुनपति। पुरोहितः: तदनुमतो भूत्वा उक्तेनेव कुर्यात्।'आयुः आरोग्यं सांग्रायं च
भवति।' इति॥ १५॥

[प्रथमोऽध्यायः]

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1 Extra text of VG quoted by Bhāskara
Yogi in his commentary on BS

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2 अज्ञसमुदेशः

2दैवविष्णवमार्गमार्गस्मे देवदर्शनम् । क्रुद्गगर्गम् कृष्णग्रंथोऽविनिश्चितम् परिवारितम् ॥ ॥
अभिगम्योपसहायो विनयावत संशितवत् । क्रोडकोः परिप्रथ्य श्रोतश्योऽविनिश्चितम् ॥ ॥
भगवंद्रे पुराणाः आत्मानहस्तयिन्तु तुराण ज्योतिषग्नी चापि यहांनाः चरितार्थिनिन्तु ॥ ॥
तदिव्यामो चते ितसर्गो याहान्त्रे सुविश्वसुतमः ॥ श्रेष्ठु श्रुतवते श्रेष्ठ्यं परं कौन्तेहर्द्वोःहि । नः ॥ ॥
ज्योतिषाज्ञानसुतप्तः कथमेतददुत्तमम् । केन वा पूर्वतः। प्रोक्तमृङ्गिण मैण्डे भवेतन वा ॥ ॥
कस्माच चतुःपठ्यः कार्लोक्षानहिन्धीयते । नामभावानुपूव्या च कान्याज्ञानयस्य चेत हि ॥ ॥
एवमुक्तस्तु मुनिनः क्रुद्गगर्गोऽधाययः । ऋवाच तान्नीयपरं सर्वानः ॥ ॥
क्रोडकोः परिप्रथ्य श्रोतश्योऽविनिश्चितम् । ज्ञान ॥ ॥
तश्रुताः स्वर्गमायुधमृतमें पुर्ण्य यशस्वकरम् । त्रानाः ॥ ॥
पूर्वायोश्ये दैवेशुः प्रजामिरार्थम्-कर्तुः ॥ ॥
पठातुलप्ताः वेत नक्षत्रग्रहसहजितात् ॥ ॥
सुरासुभानः प्रजानांप्राच्छिन्तास्तु लोक्तकिते रतः । विद्या स्वभूतत्वानम कृत्त्वा सर्वज्ञासम्मितम् ॥ ॥
श्रीपानां घोरनाथर्च हितार्थचापि देहिनाम् । कालस्य च प्रसिद्धचर्चितयाचरपियः ॥ ॥
प्रदक्षिणातैं सततं सन्तप्तराष्ट्र भागिनां । परिग्राह्य: तैतेतं सरलं वायुविग्निनः ॥ ॥

1 A1, U1 समूदेशः; K1 समूदेशः
2 In BS (Ch 1) of UV (1.11) these preliminary verses appear in slightly different fashion. Notably the phrases आत्मानहस्तयिन्तु & महतन्त्र (v 3 & 4) are not found in UV. Some of these verses are in UP (2.12) also.
3 B1, K1 वृद्धर्गः; A1, A2, F1, P1, P2 वृद्धर्गः; U1 वृद्धर्गः
4 F1, U1 सुविश्वसुतम
5 F1 ज्योतिषाज्ञानसुतप्त; U1 ज्योतिषाज्ञानसुतप्त
6 K1, U1 पूर्वतः
7 U1 चतुःपठ्यः
8 em as in UV; all/विधिनः
9 B1 वृद्धर्गः
10 K1 सर्वान; A1, F1, U1 गारः
11 F1 ज्ञानः
12 A1, A2, P1, P2, U1 देवेशुः; F1 पूर्वायोश्ये; K1 देवेशु
13 K1 कर्मसः
14 em; all/सुरासुभानः
15 F1 सर्वनांसवातितमा
16 B1 त्रियाणाः
17 U1 संतवतः
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तत्त्वातिपि च पश्चायं तेजस्वी ज्योतिष्य वरः। प्रभुः प्रतिच्छप्रभवः प्रधानस्थोपिधि भास्कर्। ॥ १३॥
सर्वस्वयमः पुरुषोगमनः। कालानं पुरुषोगमनः ॥ १४॥\n
स केलकुमारः दिवस्मितश्चत्तस्मां शाबरीः ॥ प्रतिज्ञ दुर्घटेन मानुः परावर्ण यथाकालमः ॥ १५॥
कालानिमद्विपुण्यमार्गः हि ज्ञानमुच्यतममः। बहुर्भवानु सुजङ्गा वेदनतः ॥ १६॥
यद्ग्रहान्वितः ब्रह्माण्डः क्रियाणं च प्रमाणकमः। ज्योतिः सर्वेदानाममतो वेदः ॥ १७॥

ज्योतिः के हि सर्वस्य लोकस्योक्त सुभासुभामभा। स स्वतेष्य नयने स वेति ॥ १४॥
परमां गतिः ॥ १५॥

चन्द्रनक्षत्ताराणी ग्रहाण्म भास्करस्य च। ॥ १६॥

ज्योतिः ज्ञातः ज्ञाते ज्ञातिषयामयिस्मापनमः ॥ १९॥

तत्त्वावभवितनः ॥ १६॥ चुक्ते ते देवत ब्रह्माण्डः विदुः। ॥ तत्सतां पूर्वदेशीये ज्योतिषमयमे च ॥ २०॥

धर्मसृजोः ॥ १७॥ तत: प्राचायकर्मिविधिक्रियः। यद्भावायुः ॥ १९॥
होमाध भीमत्रन्यावानिः च। ॥ २१॥

सागरायः ॥ २०॥ पौर्णमास्य च पितृदेवतपर्याणं ॥ २१॥

सर्वार्दमश्च जगत्तो ॥ लोके च विविधा: क्रियाः: ॥ २२॥

न ज्योतिः विना ॥ २३॥ तासः प्रकृतिरूपलम्ब्यतो। आयामान्ये देवानां यद्या: प्राचायः क्रियाश्रयः ॥ २४॥

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1 A2, B1, K1 प्रकाशः P2 प्रतिपुष्ट
2 A1, F1 प्रज्ञानस्तोपि
3 A1, A2, F1, K1, P1, P2 सर्वस्य त्वं
4 U1 पुरुषनां
5 A1, A2, F1, P2, U1 सुदर्शनं; K1 सुवर्तकः; K1 सुवर्तकः; B1 सुवर्तकः;
6 K1 सकालव्र्तस्तृतनापि; B1 सकालाय प्रत्येकाण्विः; U1 प्रत्येकाण्विः
7 A1, A2, B1, K1, P1, P2, U1 त्वमः
8 A2 सुमेधस्वामः; K1 समेधस्वामः
9 em; all|सवर्तके
10 F1 ज्याश्रुतमः
11 A1 वेदान्तं; U1 वेदान्तं
12 B1, U1 पद्मामर्गः; A2, K1, P1, P2 पद्मामर्गः
13 em as in UV वेदः; all|वेदः
14 K1 चेति
15 B1, K2, U1 परमः गति: 16 v 19.6 em as in UV; all|ज्योतिषमयमनः हि ज्योतिषमयमनः ॥ १७॥
17 em as in UV; A1, A2, F1, K1, P1, P2, U1 उद्यावभवितः; B1 उद्यावभवितः
18 em as in UV; all|धर्मसृजः
19 F1 ज्याश्रुतमः
20 em as in UV Mss. M2602; all|सागरायः
21 em as in UV; A1, A2, F1, K1, P1, P2 ज्योतिषमयमनः ॥ १९॥
22 em as in UV; all|भागस्
23 em as in UV; all|n देवते ज्योतिः
24 em as in UV; all|क्रियाश्रयः या:
यज्ञार्थमपि च प्रौद्योगिकिता:  1  स्वयं वेदाः स्वयमभुवाः । न ते च समप्रवर्तते  2 कालानुपात कथवन ।  ॥ 24 ॥
यज्ञकथायामित्रोत्र च कथाधान्या जगदिता:  1  तसमात पूण्य समे  3  वेदविहः । सनातनम:  4  ॥ 25 ॥
स्वर्गसमधेययामयामोऽधार्मिकाः: सनातनम:  5  ततः कार्यार्थान्या राष्ट्र: पूर्वमिति:  ॥ 26 ॥
अहोरात्रिविभागभवितीना च कथाविधिः:  1  सोमसूर्यविलक्षामुक्त्याः च विनिधाय:  ॥ 27 ॥
आधानयोगभोगाः  6  विसर्गावर्षकस्यो:  1 दिनतुपक्रमानानो चन्द्रार्कानाच निष्कर्ष:  ॥ 28 ॥
कर्मोपमोगमानानाः तेल्व्यप्रशस्वविधिस्थाः  7 । अवमधा वहुविधाः: किया ज्योतिषसङ्क्रिता:  8  ॥ 29 ॥
  9  स्वयं स्वयमभुव सृजं चक्षुपूर्वत मराधिना ।  10  वेदाः  11  ज्योतिः वहाः समे वेदविनिमितम:  ॥ 30 ॥
नया स्वयमभुव:  प्रासं क्रियाकारप्रसाहकम: ।  वेदनामुरुस्तम शाश्वा जैत्यक्षेतिकारकम:  12  ॥ 31 ॥
मत्विश्वान्यथाः: प्रास: पारम्परिण युक्तम:।  ती:  13  तपोहितिमृत्यूयोः प्रवक्त: । स्व:  व्यूहः ।  14  ॥
वयेव व्यद्याम्यिन युक्तादनिन मनीपित्वम:।  चतुः  15  शष्टिद्वाराध्यान्या ज्योतिः परशुराठ्या: ।  16  ॥
योग्यमप्रशस्वल्याज्ञात्रा कथिताः  17 । समयपवनयायणः क्रमें वेदविनिधाय:  ॥ 32 ॥
राखी हितार्था नियंत्य चतुः  18  पिण्डात्म: ।  ज्योतिषार्थानमं कुर्वन कालानुपपुवित्तम:  ॥ 33 ॥
तसमात कूलनो महामन्यायावावस्या शुष्क:।  कृत्योपनयन  19  वेदवीणा वेदक्ष:  20 ।  16  ॥
कालानुपातमपित्येच गणितेनोपाद्यतेऽ । न हि सुहाविहिनस्य भवत्येतियोऽधकम: ।  ॥ 34 ॥

1 A1, A2, K1, U1 प्रौद्योगिकिता; P2 प्रौद्योगिकिता;
2  em as in UV; A1, A2, B1, P1, P2 तेलरक्षीत्र; K1 चक्रेवर्ती; U1 तेलरक्षीत्र
3 A1, A2, P2, U1 ततु पूण्य समे; B1 snc
4 F1 वदवद्र; U1 वदवद्र
5  em as in UP; A1, F1, B1 सचित्रत्रते; A2, U1 संधित्रत्रते;
6  em as in UV Mss. M2602; A1 दानाधिकार्थम्बध; A2, F1 दानाधिकार्थम्बध; B1 snc; K1 िहानादानाधिकार्थम्बध; P1 --दानाधिकार्थम्बध; P2 दानाधिकार्थम्बध; U1 दानाधिकार्थम्बध
7  em as in UV; all कर्मयोगो मानाना तेल्व्यप्रशस्वविधिस्थाः
8  em as in UV; All यज्ञोत्थल: श्रायः
9  v 30,31,32 is found in NAB & MD att VG; UV & UP att G, with extra half-verse वेदनामुरुस्तम शाश्वा जैत्यक्षेतिकारकम, also in MD.
10 F1 मलानिनाना
11  em as in NAB; P1, F1 उदर्घ; A2, B1, K1 उदर्घ; A1, P2, U1 उदर्घ
12 added half verse from UV
13 B1 तथा द्रवित्मन्यूयो
14 A1, A2, F1, P1, P2, U1 हिताठ्या
15 Em; All चतुः:प्रक्षात
16 A2, B1, P1, K1 कृत्योपनयन वेदवीणाः
17 A2 वेदवीणाः
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तस्माद्विमितविद्वारः: ¹ कालज्ञानविनिधित्वः। दाने°ऽज्ञापकोऽत्रे च सदसत्वमवामुरात्॥ ३८॥
क्षयाण् तत् यथाशास्त्रः गणितेनोपपादेत। ज्योतिःशास्त्रहोऽकोऽहिः पूरं च राजसु॥ ३९॥
तस्मात् कृत्वचन्द्रयतः वेदाद्वार कालज्ञानम। ज्योतिःशास्त्रोपपानात्मथर्तः। पृथिवीः॥ ४०॥
येषामेव कर्मणायत्वद्वारमाण्यास्तन्तत्तः। नक्षत्रेनुदसे ³ चैव भवमः।। ४१॥
रत्नो छत्रस्तौ चुके पूर्बकत्वो शनाइवे। अज्ञाते वृष्णके च चारानाथे तत्: पृथिवी॥ ४२॥
चक्रेन्तरः च मूनचकन तथेव च। शचक वातचक् च चक्रकुशः च चुनुप्तः॥ ४३॥

वास्तुवियाज्ञविवा च वायसाः तथेव च। ज्योतिस्तम्भतु विचित्रं नवगममतः। शुभः॥ ४४॥
स्वातियोगमथाधारा रोहिष्या धोमेव च। कृत्वान्येवनविजन्नातिष्ठतु त्रीन्दोगान्त: वै विशेषः॥ ४५॥
त्तौतेऽषु च नेषिंकृ प्रक्षन सर्वं शततः तत:। रहस्यं चेत्याज्ञानी चतुर्विषालशिरिण्यातः॥ ४६॥
अत: उत्सवं प्रवक्ष्यमानि उपाध्यावानां नामितः। आनुपुष्प्येद्विधानेन चासरविकल्पितेऽ॥ ४७॥
ग्रहश्रों ग्रहयुद्धः ग्रहालाकर्त: तथा। कृत्वं ग्रहप्राप्यायं ⁶ च ग्रहपाकास्तत्वः च॥ ४८॥

यात्रा चाय्मित्रिवार्त्तः ⁷ सेनायून्तं स्थाप्य च। मयूरचित्रोपनिष्टपत्ताः। प्रशान्तयः॥ ४९॥
तेषामन्तः ⁸ तुषुकोशो भवथ्यांपपायः।। ५०॥
सर्वभूतस्तः ⁹ चैव तथा पुष्पताः। चित्वा॥ ५१॥
उपाध्यानां तथा चेतोऽक्रमः च ज्ञानान्तः दुक्कारितमः॥ ५२॥
निर्यातः भूमिकम्पात्च परिवेशणतत्वः च। ॠतुरवाचः। सन्त्वेऽच तथोकान्यचारितः॥ ५३॥

¹ Em; A1, A2, B1, K1, P1, P2, U1 गणितविद्वारः; F1 गणितविद्वारः
² B1 क्रिया
³ A1, A2, P1, P2 नक्षत्रेनुदसे; B1 नक्षत्रेनुदसे; F1 नक्षत्रेनुदसे; U1 नक्षत्रेनुदसे
⁴ A2, P1, P2, U1 द्विवर्ण: F1 द्विवर्णः
⁵ F1 विशपाधनः
⁶ A1, A2, P1, U1 यहेश्वराण्; B1 यहेश्वराण्
⁷ Em as per all Ch यात्रास्तिभाषणम्: A1 नियमात्मानिवर्षाः; A2 नियमात्मानिवर्षाः; F1, P2, U1 नियमात्मानिवर्षाः; K1, B1 नियमात्मानिवर्षाः; P1 नियमात्मानिवर्षाः
⁸ ed.em; A1, A2, B1, K1, P1, P2 त अतिकर: F1 ते मानितके; U1 ते आति
⁹ A1, A2, P2, U1 भवं चोपकाराय; B1 snc, F1 भवस्वरं चोपकारायेत; P1 भवं चोपकाराय।
¹⁰ F1 सर्वभूतस्तः
¹¹ A1 r 59b, 51, 52a mt
¹² Em as in BS Ch 53; A1 mt; A2 श्राङ्गरः; K1 दसाङ्गरः; B1 दसाङ्गरः; P1 श्राङ्गरः; P2 श्राङ्गरः; U1 श्राङ्गालागतः
¹³ F1 सत्यः; U1 सत्येः

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रनामानानि कार्याणि नृणाः सिद्धान्तसंवेषणं। कर्मणि हि शरीरं स्थानं नक्षत्रं सोमं-सहितम्।
योनिस्थिति: कर्मं करणं समुद्रम (?)। पद्मं मुहतं विशेषं चतुःसम्पदं कर्मं सम्पदतः वरा।
कर्मणि हि चतुष्कृतं: तिथियोगात्र प्रसिद्धिति। तिथ्युत्सौराचारशोयेश्वरकरणं सह।

1 A1 विशेषं
2 F1 षड्गोमनससः; B1 एल्टते सांवतसर
3 एम; A1, A2, B1, P1, P2, U1 चतुःसम्पदः; K1 चतुःसम्पदः
4 v 55-57 are found in BS (2.7-11) as original to VM with minor variations. v 55-56 are same as v 1.11-12 in Ch 1 in all Mss.
5 B1 संवतसरपाठी
6 B1 प्रावदं
7 इर देत।
8 B1 -करणं
9 K1 शर:।
10 A2, U1, P2 नक्षत्रे
11 K1 -सहितं; P1, U1 -सहितं; A1, B1 -संस्कारं; A2, P2 -सहितम्।
12 A1, A2, U1 बयः; K1 घर:।
13 K1 तिथ्युत्सौराचारशोयेश्वरकरणं; A2 तिथ्युत्सौराचारशोयेश्वरकरणं
14 A1 योगकरणलम्यं; A2 योगकरणं: सह।
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चत्वारिष्ठिनित्वत्रमुहत्तकरणे परः। श्रीणि कर्मणि सिद्धन्ते तस्मात् कार्याणि सम्मदा । ॥ ॥
सुरभेदः ॥ चतुर्योशोऽन्तो कर्म कार्य नृसम्पदा ॥ मुहत्तिनित्वत्रकरण हि बहियसाम ॥ ॥
करणामाणिनयत: कालस्तु तिथिसंस्थ्रयत। अहोरात्रेशु भिनेशु तिथिरादि: समासित: ॥ ॥
मासे मासे समा पद्ध: करणामिनिद्:च्यते । दकान्तरे नास्ते शिष्यते करणाद्यम ॥ ॥
कर्म कार्य महृतः च दिनादावेव जापते। तिथयोशसम्पद्या कुर्यात्त्रकरणोगत: ॥ ॥
सोमसंयोगतो ॥ ॥

करणानाम होनयतः कालसुष्ठु संस्थ्रयत:। अहोरात्रेशु भिनेशु कालस्तु कारणांत्:हि समाति ॥ ॥
समाति ॥ ॥

मासे मासे श्रीमुनित्वत्र समाति ॥ ॥

करणानाम होनयतः कालस्तु कारणांत्:हि समाति ॥ ॥

[तृतीयोऽध्यायः]

Abbreviations

G Garga
GS Garga Samhitā
VG Vṛddha-Garga
VGJ Vṛddhagārīya Jyotiṣa
BS Brhat Samhitā
UV Utpalāvṛti commentary on the BS
UP Utpalaparimalā commentary on the BS
VM Varāhamihira
MD Muhūrtadīpikā of Viṣṇusūri
YP Yuga Purāṇa
NAB Nīlakaṇṭha’s Āryabhaṭṭya Bhāṣya
PT Parāśara Tantra

1 F1 सम्मदा ॥ ॥
2 A2 नसादा; K1 भृसादा; F1 नसादा ॥ ॥
3 K1 कलीयाः; F1 बलायाः ॥ ॥
4 F1, P1 शस्त्तः ॥ ॥
5 Em; F1 दिनादेव; K1 दिनादेव; A1, A2, B1, U1, P1, P2 दिनादेव

6 A1 सोपसंयोगतो; K1, P1 सोपसंयोगतो
7 F1 संयु: ॥ ॥
8 F1 v 12b, 13a mt
9 em; P1 -हः; A1, U1, P2 -हः; K1 -हः; F1 -हः; B1 -हः; A2 -हः ॥ ॥

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Editorial notation

all All except defective Mss
att Attributed to
Ch Chapter
cf Compare with
em Emended
irr Irregular usage
mt Missing text
snc Script not clear
v Verse
[..] Editorial addition

Brief Summary

1. Sāmvatsara-nirdeśa

The chapter begins by explaining what is meant by *samvatsara*. This subject is about *kālajñāna* (knowledge of *Time*) which involves observation and study of Sun, Moon, *nakṣatras* and planets in order to measure time in terms of *nimesa*, *ksana*, *kāṣṭhā*, *kalā*, *truti*, *lava*, *muhūrta*, *ahorātra*, *pakṣa*, *māsa*, *rtu*, *ayana* and *viṣuvat* for finding suitable time to carry out various vedic rites. This would also lead to a calendar comprising of *tithi*, *nakṣatra*, *muhūrta* and *karaṇa* for day to day activities. These concepts lead to the five-year cycle: *samvatsara*, *parivatsara*, *idāvatsara*, *anuvatsara* and *idvatsara*. The legend of Śukra (Venus) and Brhaspati (Jupiter) respectively becoming the *sāmvatsarika* (astronomer) and *purohita* (priest) to the *devās* (gods), is briefly described.

2. Aṅga-samuddeśa

This chapter starts with Kroṣṭuki questioning his father VG sitting in an assembly of sages. VG enumerates the list of primary and secondary topics of the subject of *Jyotiśa*. The primary topics: *karmaguna*, *candramārga*, *naksatrendusama*, *rāhucāra*, *brhaspaticāra*, *śukracāra*, *ketucāra*, *śanaiscaracāra*, *aṅgārakacāra*, *budhacāra*, *ādityacāra*, *antaracakra*, *mṛgacakra*, *śvacakra*, *vātacakra*, *vāstuvidyā*,
After this a list of secondary topics are given. Upāṅgās: grahakośa, grahayuddha, grahaśṛngāṭaka, grahamāṇa, grahapāka, yāträlakṣaṇa, agnivāraṇa, senāvyūha, mayūracitropaniṣad, upahāra, praśānti, tulākośa, bhavaśṛṅgī, sarvabhūtarūta, puṣpalatā, upānahaccheda, vastraccheda, bhuvanakośa, garbhādhaṇa, dakārgala, nirghāta, bhūmikampa, pariveśa and ṛtusvabhāva.

3. Paribhāṣā

This chapter emphasizes that activities must be done in accordance with the knowledge of *tīthi*, *nakṣatra*, *karaṇa* and *muhūrtā*. Work done with the full knowledge of the characteristics of 15 *tīthis*, 27 *nakṣatras*, 11 *karaṇas* and 30 *muhūrtas* will be successful. The text continues in the next chapter explaining the nature of the activities to be carried out in each *nakṣatra*. The meaning of some of the verses is not very clear.
Appendix

The author-attribution in the end-colophon of each chapter are symbolically shown in tabular form.

<table>
<thead>
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<th>Ch</th>
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Legend:

B = Brhad, V = Vydda, G = Garga, Gk = Gargakte, Gy = Gārya; Gyk = Gāryakte; Gi = Gāryie, J = Jyotise, S = Śāstre, Sm = Samhitāyam, NA= No attribution.

Examples:

B1, Ch 2, VGiJS = वृद्धगार्गीचि ज्योतिःशखे
A2, Ch 3, VGiJSSm = वृद्धगार्गीचि ज्योतिःशखे सहितायां
(To be continued)

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