BRAHMASIDDHĀNTA
in Śākalyasaṁhitā

Critically edited text, transliteration, notes and explanation in English

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Critically edited text, transliteration, notes and explanation in English

Editor and Translator
Somenath Chatterjee

राष्ट्रीय पाण्डुलिपि मिशन
॥ विज्ञानमुपास्व ॥
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Foreword

The concept of Astronomy can be traced back to Vedic literature. Vedāṅga Jyotiṣa, dated 1370 B.C. is considered to be the first compiled astronomical text in India. Thereafter, as the Greek knowledge of astronomy evolved in the West, in the East, India was proceeding in its own way. During the second half of the first century, when Paitāmaha Siddhānta was being compiled, a considerable amount of progress had already been made in the field of astronomy.

David Pingree, in the later half of twentieth century had made considerable contribution by discovering astronomy related manuscripts from various libraries in India and abroad.

Brahmasiddhānta in Śākalyasaṃhitā is one such work which contains many astronomical references that were first noticed by Dikshit, Pingree, Jñānarāja and others. This work was compiled in ninth century A.D. and the layout of this particular text was not similar to other astronomical texts of the Siddhantic era. The work, as the part of a Saṃhitā, not only dealt with religious rituals, similar to other Saṃhitās but additionally also included details of timing of the religious rituals based on positions of the Sun, Moon and the Stars. Thus the contemporary astronomical knowledge has been reflected over the whole text.

Shri Somenath Chatterjee, an ardent researcher of science and astronomy, while preparing the critical edition of this text, has aimed to explain those verses which are related to astronomy. The scholar has also transliterated the text in Roman script. The work contains English translation with explanatory notes. Shri Chatterjee has done a commendable job by explaining the concept of some of the verses with diagrams. The technical terms given in the appendix are important to initiate the understanding of Indian astronomy.

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Needless to say, all these add to usefulness of the critical edition not only to the students of science but to a vast section of interested readers. The National Mission for Manuscripts does hope that Shri Somenath Chatterjee will in future do further work with the old manuscripts containing scientific information.

PRATAPANAND JHA
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Introduction

The Brahmasiddhānta in Śākalyasaṁhitā is one of the important astronomical works compiled in 9th century AD noticed by Kamalakara Bhatta and many famous historians of science like Thibaut, Pingree etc. This work belongs to the school of Sūryasiddhānta but has its own characteristics. This text has six chapters and 764 verses. This was described by Brahmā to Nārada. The original verses nowhere mention the name of Śākalya but at the end of each chapter, the concluding line is the notice of the second problem (ditiye praśne) of the Brahmasiddhānta in Śākalyasaṁhitā. It covers all important subjects of astronomy like time measurement, position of planets, risings and settings of planets, eclipses, etc.

Brahmasiddhānta in Śāklyasaṁhitā was first published in Jyatisasiddhāntasaṁgraha edited by Pt. Vidhyeśvari Prasād Dvivedi in Benaras Sanskrit Series 152 (1912 AD). This text is in the form of dialogue between Brahmā and Nārada. The copies of the manuscript are preserved in Bhanderkar Oriental Reasearch Institute, Pune; The Asiatic Society, Kolkata; Government Oriental Manuscripts Library, Madras. According to S. B. Dikshit, this text was compiled not before first half of 9th century AD.

This project was initially supported by Indian National Science Academy, New Delhi. I am grateful to Indian National History of Science Commission for this research-project. The critical edition of Brahmasiddhānta in Śākalyasaṁhita along with notes and explanations prepared by me has been considered for publication by the National Mission for Manuscripts. My sincere thanks goes to the Competent Authority of the Mission for bringing out the work. My heartfelt gratitude goes to my respected teacher Dr. A. K. Bag, the Editor of Indian Journal of History of Science for his inspiration and guidance all throughout my research work. I thank Mr Madhavendra Narayan, Associate Editor of IJHS and Prof. Nikhilesh Chakraborty, Former Professor of Jadavpur

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University for their help whenever I needed it while working on the project.

Brahmasiddhānta in Śākalyasaṁhitā belongs to the school of modern Sūryasiddhānta. S B Dikshit noticed five modern siddhāntas which are divine in character, Sūryasiddhānta, Somasiddhānta, Vasiṣṭhasiddhānta, Romaśasiddhānta and Brahmasiddhānta in Śākalyasaṁhitā. The elements given by these five modern pañcasiddhāntika are almost same as, revolution of stars, savana days, revolution of the moon, revolution of Mercury etc. Actually the astronomical works of India belong to three main schools (pakṣas); the Saurapakṣa, the Āryapakṣa and the Brahmapakṣa. The basic works of the first school is Sūryasiddhānta which is followed by many astronomers as this present work. The reason for this formation of the three different schools is that the length of the year according to each school is somewhat different and the motions of planets in a particular period of time are different. This present text follows the Sūryasiddhānta in these two cases.

E Burgess notices that in the history of Indian astronomy, the number of Brahmasiddhāntas known is four: Brahmasiddhānta (Paitāmahasiddhānta) summarized in Pañcasiddhāntika of Varāhamihira, Brahmasiddhānta in Vishnudharmottarapurana, Brāhmasphuṭasiddhānta (noticed as Brahmasiddhānta in Albiruni's India) of Brahmagupta and the Brahmasiddhānta in Śākalyasaṁhita. David Pingree argued that the earliest siddhānta that has come down to us is the Paitāmahasiddhānta of the early fifth century. This is preserved because of its incorporation into the Vishnudharmottarapurana and copied by Vindhyasvari Prasad Dvivedi in BSS 39, 2 Benaras, and 1912 AD.

At the end of each chapter the author called the second question of Śākalyasaṁhitā. In the later period, historians of astronomy do not make comments on this point. D G Dhavle pointed out that within eight siddhāntas the position of Brahmasiddhānta is second, so it is called second question. He sequenced the praśnas according to extra verses thus:

> Praśna: I Sūryasiddhānta, II Brahmasiddhānta, III Pauliśasiddhānta, IV Somasiddhānta, V Romaśasiddhānta, VI Gargasiddhānta, VII Bṛhaspatisiddhānta and VIII Vasiṣṭhasiddhānta.

The identification of the author is difficult as other astronomical works of Indian astronomy because there is no mention of the author's

name except at the end of each chapter "iti Śākalyasaṁhitāyāṁ ditīyepraśne brahmasiddhānte ..". Now the problem is to search Śākalya. Kamalākara Bhatta noticed this name in his Siddhāntatattvaviveka and has taken some verses from this text. Kamalākāra writes in his book,

śākalyasaṁñjamuninā kathitā sabanāḥ /
saptarṣitārakabhabāḥ dhrubakāścalāśca //

He quotes Śākalya as muni but he is different from known Śāklya of Vedic period. The author of this siddhānta is also compiler of other siddhāntas who is positively other person of Vedic period, as Dikshit considers the epoch pramāthī could be the first solar year. He also concludes that this text was composed after the compilation of pañcasiddhāntikā because some verses are identical with modern Śūryasiddhānta.

Perspective

The word 'astronomy' comes from the Latin word 'astronomie' which is developed by Greek as 'astronomos' means 'star law'. From the very early civilization man started to observe sky in day-time when sun is in blue perspective and during night he saw the moon, innumerable glimmering stars, and a few bright objects called planets. When the man became food producer, his main concern was to search the relationship between cloud and rain, moon and tide etc. Actually man started to search the language of nature. Wisdom grew up.

There are two prominent objects in the sky, the Sun and the Moon. When Sun is in the sky, the Moon is dejected. The Sun gives life, the Moon becomes time keeper. The Sun is as important for Earth, as the Moon.

The Sun rises in the east. This statement is not always true. It does not set exactly in the west as it does not rise. It varies from a point of north-east to south-east in a periodic cycle of about 365 days. It only rises exactly in the east and sets exactly in the west only twice a year, days of equinoxes. These days are marked by 12 hours of sun-light and 12 hours of darkness. 21st March and 23rd September are these days. The hour angles of these days of rising Sun become 90 degree. The Sun rotates 15 degree in every hour, so, it takes 6 hours to reach at central meridian. Therefore the span of forenoon becomes 6 hours. The day-time is 12 hours. At summer, the Sun rises from away to north and so,

the length of the day becomes larger. A simple formula may help to determine the length of day, night, time of sunrise and sunset. This formula is cosH = −tanθ cotp; where H = hour angle of rising Sun, θ = terrestrial latitude and p = polar distance. The day of northern most extreme point of sunrise, is the longest day in the northern hemisphere, called summer solstice. The day of southernmost sunrise is the shortest day of northern hemisphere is called winter solstice. In pre-siddhāntic age the Indian astronomy based on observation only. Mathematical astronomy was introduced later, from 6th century CE. Āryabhat was the pioneer of mathematical astronomy.

The next bright object is the Moon. It is the closest celestial object to Earth. It is larger and brighter than any other object in the night sky. It orbits Earth in 27.32 days. Twelve full moon cycles bring the sunrise point nearly to the same place, short by a little more than 11 days. So it makes an important calendar. The relation between the phases of the Moon and its rise time is a complex one. It rises at sunset on full moon. It rises at midday when the Moon is half way towards the full moon. It rises at midnight when the Moon is halfway to new moon. Indian astronomers observed the Moon within the stars. The Sun and the Moon seem to have a fixed relation to the stars in the sky, moving in a narrow band of stars. To comprehend and memorize the stars they divided the stars into small constellations. These constellations would certainly have an important position amongst other constellations and are separately called Zodiacs. In Indian context, the constellations of Sun are called rashi while the lunar mansions are called nakshatras. Constellations are two-dimensional view of objects in three dimensional spaces. Seen from Earth, the stars seem to form patterns in the sky, which is supposed to represent a mythological object. The constellations are connected with the seasons and the month of the year. In ancient times the Sun was in Aries in March but this is now no longer true. This is because of the precession of equinoxes.

Ancient Indian astronomers observed five planets in the night sky. They recognized them from six thousand objects which are visible in the night sky. Each of these planets has its own period. From Vedic time these observations were made. In Puranas, also, there are many indications of sky observations. Eclipses were fearful occurrences like comets. The ancient people tried to escape them from such celestial events which were unnatural to them. It was difficult to notice the

events like equinoxes. 'The last of naked eye observations would be the drift in the zodiacal signs in which sunrise at equinoxes occurs. This result of precession of equinoxes also changes the time of the year when a specific season occurs. With its annual drift of 0.72 minutes of arc per year, the motion is very subtle and requires truly long-range observations before it can be noticed.'[1]

Astronomy in pre-siddhāntic Period

S B Dikshit traces the history of Indian astronomy in two distinct periods called pre-siddhāntic and siddhāntic.[2] The pre-siddhāntic period ends at the Paitāmahasiddhānta (80 CE). This pre-siddhāntic period is considered from Vedic age. To understand the tradition of Indian astronomy one has to look into four Vedās and their associated texts including six Vedāngas, specifically Vedānga Jyotiṣa. The origin of Indian astronomy is Ṛk Veda.

Ṛk Veda is the origin of any section of knowledge of early India. Many Vedic hymns are concerned with the celestial phenomena. But these hymns are devoted to the functions and praise of certain divinities that are loosely connected with heavenly bodies. 'The intertwined trinity of the Sun, the Moon and the nakṣatra constituted the core of Vedic astronomy'.[3] Vedic priests had been keen observers of the sky, and this led them to map 27 or 28 nakṣatras in relation to the path of the Moon and the Sun. In Indian tradition, nakṣatra means a star, a group of stars in the zodiacal belt and 27 equal parts of zodiac. Actually a complete list of 27/28 nakṣatras occurs in the Taittirīya Brāhmaṇa, Saṃhitā, Atharvaveda and also Vedānga Jyotiṣa. In the Śatpatha Brāhmana, there are references of nakṣatras, with their presiding deities, that are fit for religious rituals.

Śatapatha Brāhmaṇa (SB), the text which is not properly examined for its astronomical contents since Seidenberg's discussion published. It speaks of seven Ṛṣis creating seven persons in the beginning, who are later assimilated into one person, fire-alter (agni) who is prajāpati, where the body represents four and the wings and the tail the other three[4] (SB 6.1.1.5-6). Prajāpati is a metaphorical representation of time.[5] Time was represented by the constellations in the sky. The fire alter is a symbolic representation of time in relation to man. The SB (12.3.2.5) speaks of the year having 10,800 muhūrtas (I muhūrta = 48 minutes)

and I puruṣa = 120 aṅgulas. The area of 7.5 sq. puruṣa for the basic alters is equal to 108,000 aṅgulas. Considering 360 years as one divine year, 2700 years equal to 7.5 divine years. This theory led to the popularity of the system of 27 nakṣatras.

Many Vedic rites went on for the full year and they were clearly meant to mark the passage of time. The SB deals with altar construction in the agnicayana rite. Agni is the year; so, this rite is about a representation of the reckonings of the year. The most significant observation from the agnicayana ritual is that it described a 95 year cycle as represented by the altars going from the size 7.5 square puruṣa to 101.5 square puruṣa. As the authorship of SB this cycle is called Yājñavalkya cycle.

Several scholars have pointed out that a class of texts called Saṃhitā, containing astronomical information, authored by Parāśara, Garga, and many others should have existed in the pre-siddhāntic period. Pānini, the great grammarian, cites Parāśara, Garga, so, these astronomers should have lived before 700 BCE.[5] The texts of these authors are not available in original form. Scholars depend for these contents on the commentaries of Utpala (10th Century CE) on Bṛhat saṃhitā of Varāhamihira and the Adbhuta-sagāra of Ballāla-sena (11 – 12th Century CE). William Jones in 18th century had access to a copy of Utpala's commentary, which had quoted Parāśara. In the available published version Utpala refers to Parāśara Saṃhitā as parāśara-tantra.[6] Adbhuta-sāgara is a compilation of scientific information, myths and religious belief. It has three sections, called celestial, atmospheric and terrestrial anomalies. Parāśara siddhānta was widely known in India till at least 12th century CE. It preserves a tradition of nakṣatra (stars along with ecliptic) as the background for observing the sky.[7] This text also indicates the seasons in terms of nakṣatra divisions, though it is silent about Rāśi.

Garga and Parāśara being the family names there are several claimants for the authorship of the saṃhitās. Pingree's Census lists more than twenty-five individual titles attributed to Garga and Parāśara with several hundred manuscripts over libraries in India and abroad.[8] In pre-siddhāntic era, the manuscripts found in different oriental libraries indicate that the learned men having family names Garga and Parāśara were very important.

Besides Vedānga Jyotiṣa, the Vedic Saṁhitā texts contain astronomical information. S B Dikshit has attempted to unearth astronomical hymns

from the bore of Vedic texts. The special number 3339 arising for the first time in the Ṛk Veda demonstrated to be related to the eighteen year eclipse period. The text of Parāsara, even though available in fragments as quotations by later authors, represents an ancient observational tradition of Hindu astronomy which got merged into the algorithmic siddhāntic astronomy of later centuries. A critical appraisal of Parāsara Saṃhitā and its successors is at present not possible. Only the texts attributed to Parāśara and Garga available only in manuscript form are edited and published the structure of pre-siddhāntic astronomy could be better understood. Ancient Vedic and Puranic literatures of India exhibit an intimate relationship with eclipses that is although mythological in many respects, is still pervasive in its cultural influence. Sharma Shastri, the celebrated editor of Arthaśāstra, has made a detail study of the subject, to find clues to knowledge about eclipses in Vedic culture. He emphatically points out that the whole Indian culture is derived from the cycle of eclipses. He points out a few hymns, which are remarkable in their poetical imagery and probable reference to eclipses. Ṛk Veda (RV.5.40) clearly indicates as referring to a solar eclipse. The specific word āsura used in this hymn is celestial in purport, referring to the eclipse shadow figuratively. ṚV mentions not only small numbers such as one, two, three but also large ones like 1000 to 10000. The most intriguing number is 3339 occurs twice in Ṛk Veda (3.9.9 and 10.52.6)

> "Three times thousand Gods and thrice a thousand, and three times ten and nine have worshiped Agni / For him spread sacred grass, with oil bedewed him, and established him as priest and sacrifice" – Griffith

> "Gods three thousand and three hundred and thirty nine waited upon the fire / they anointed him with many streams of the clarity, they spread for him the seat of sacrifice, and seated him within as priest of the call" – Aurobindo

This hymn has Agni as its deity, which from the overall context of the hymn can be seen to be celestial. Sukta (10.52) is about Viśve-devās, by Saucika Agni. This context of this sukta is seen to be, some type of time measurement. Agni being honoured by 3339 Gods is the main theme of the last hymn of this sūkta (10.52.6). Sūktas 53 to 56 contains

the term asura which could be an allusion to the eclipse shadow. In hymn (10.55.5), there is reference to vidhu that is, Moon, being 'woken up from his slumber, who runs his course with many around him'. Later authors explains this hymn as describing a total lunar eclipse. Mention of the red colour of the Moon makes a strong case for taking this hymn to be describing a total lunar eclipse. At present this Moon is called 'Blood Moon'. Blood Moon is called because of the colour it takes on during a total lunar eclipse, when the Earth passes between the Sun and the Moon and casts a shadow of itself on the Moon. During the eclipse the atmospheric condition of the Earth decides the shade of colour of the Moon. The mystery of the number 3339 was explained by many commentators like Sāyana of 14th century CE, in his work on the Taittirīya Brahmaṇa (TB. II.7.12.2), where this number occurs, declares that over and above 33 the remaining Gods are supernumeraries. K V Sarma explains that this number apparently refers to a period of 30 years consisting of 371 lunar months. Wison, a translator of RV, referring to the hymn writes that these explanations are not satisfactory. But all commentators tried to explain rationally.

Vedāṅga Jyotiṣa: Important Astronomical Text of pre-siddhāntic Era

Vedāṅga Jyotiṣa (VJ) is the earliest astronomical text in India. It is the astronomical auxiliary of the Vedas. This work is traced back to the teachings of Lagadha. This text was a hand-book used by Vedic priests. From historical point of view this text is important, especially of the position of solstices recorded therein, attracted scholars, like Colebrooke, Sir William Jones, B G Tilak and many others. The text appears in two recensions, one belonging to Ṛkveda and the other to the Yajurveda. The first one was published by Captain Jervis, at the end of 1834 *and* the Yajurvedāṅga Jyotiṣa by Prof. Weber in 1872. Dr Thibaut published a paper in the journal of the Asiatic Society of Bengal on Vedāṅga Jyotiṣa. In his paper, he mentions the name of Shankar Balakrishna Dikshit for his monumental work, 'The History of Indian Astronomy' published in 1896. Pandit Sudhakar Dvivedi published a pamphlet in 1906, at the Medical Hall Press, in Benaras. Pt. S Dvivedi indicated the weak points of the explanation of Bārhasotya's work which is seriously defective.[9]

The VJ belongs to late Vedic era. During this time astronomical knowledge was necessary in their daily life, like knowledge of seasons, religious rituals etc. This religious life of people depends on New moon, Full moon etc. The name of Moon's asterism were known and used to indicate days. The knowledge of astronomy improved with time, so that in the Yajurveda period the accuracy of astronomical knowledge was comparatively high. In this period, the evidence proved that the solar year was known to priests as 365 days and a fraction more. Taittirīya Saṃhitā belongs to Kṛṣṇa Yajurveda mentioned that roughly 360 days consistiong 12 months of 30 days was known as a solar year where (7.2.6) extra 11 days over 12 lunar months or 354 days to complete the ṛtus. The six ṛtus in the solar year, with the names of twelve tropical months are given: madhuśca mādhavaśca vāsantikāvṛtū, śukraśca śuciśca graiṣmāvṛtū, nabhaśca nabhasyaśca vārṣikāvṛtu, iṣaśca ūrjaśca śāradāvṛtū, sahaśca sahasyaśca haimantikāvṛtu, tapaśca tapasyaśca śaiśirāvṛtū.[10]

The astronomical contents of VJ by Lagdha have come down in two recensions, one belonging Ṛkveda and the other Yajurveda. The main astronomical features of these two recensions are almost same. The five-year cycle of 1830 sāvana days or civil days, 1835 sidereal days, 61 months of 30 sāvana days each, 62 synodic months and 67 sidereal months, 1860 tithis, 1768 lunar days are the main contributions of VJ.

Calculations of elements of VJ:

The apparent path by which the planets, the Moon and the Sun move in the sky on the background of starts called zodiac. In Greek astronomy, we get 12 pictures of animals on this path. These pictures indicate 12 constellations on the zodiac of equal length i.e. 30° each. The central line of this zodiac is called the ecliptic. It is imagined that the Sun's disc is supposed to move on the ecliptic in its journey.

Indian astronomers divided ecliptic path into 27 divisions called nakṣatras. The distance travelled by the Moon in the sky from one place of the full-Moon to the next is more than a complete cycle. The Moon was expected to travel one nakṣatra in a day. It is therefore travelled 29 or 30 nakṣatras in alternate months. Indian astronomers presumed the existence of an auxiliary nakṣatra called Abhijit. The numbers of nakṣatras were therefore 27 and 28.

If the length of the month and the year are measured in tithis, the lunar year has duration of 30 × 12 = 360 tithis, and the solar year consists of 371.05 tithis. The difference is same and is called Ṛtu-śeṣa in Vedāṅga Jyotiṣa. At the end of every solar year, the ṛtuśeṣa gets added and ultimately the total tithis exceed 30. In 19 years cycle there are seven such additional lunation. In Ṛk vedāṅga Jyotiṣa (RVJ) a yuga of 19 years with one leap year in each yuga. In Indian astronomy, vriddhi or kṣaya tithi come from calculating lunar days. The ṛtuśeṣa is given 11 tithis, but it is assumed that for five year cycle 12 tithis are taken. If 12 tithis are taken, it is multiplied by 5 and we get 5 × 12 = 60 additional tithis i.e. two intercalary months to be added in a 5-year cycle. From this point, a yuga of 5 years consists of 60 + 2 = 62 months.

The accuracy of VJ is not comparable with modern time. It explains 1830 civil days in a yuga, and 62 lunar synodic months. This gives 366 days for the year but it is roughly $365^{1}/_{4}$ days. It is also interesting that the VJ says, at the end of one yuga, the new-moon appears on the day next to the 1830^{th}.[11]

1830 is divisible by 5, giving 366 days for the year; it is also divisible by 6, gives 61 days for each season (1830 ÷ 6 = 305; 305 ÷ 5 = 61). The ayana has 183 days. Two intercalary months, over 60 normal months can come. The difference from actuality of calculation is clear because the computation of mean sun and mean moon were known. According to B G Tilak, Yajur Vedāṅga Jyotiṣa (verse no. 15, 20, 21, 25, and 26) has dealt this subject more correctly.[12]

VJ as a hand book of astronomy should be familiar in contents i.e. contents should be sequenced properly, but the text does not present its content in a systematically arranged manner. As a result, topics on the same subject are distributed in different places in the text.

Vedāṅga Jyotiṣa : A Short Analysis

To enter the siddhāntic age, it is important to know about the status of previous astronomical knowledge. VJ is the most important and effective text before siddhāntic era. This discussion will help to focus light on that point from where siddhāntic era begins.

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Vedāṅga Jyotiṣa and Calendrical Items

i) the tithis
ii) the omission of tithis
iii) the solstices
iv) increase and decrease of the durations of days and nights in the ayanas
v) the seasons
vi) the equinoxes
vii) the apparent revolutions of the Sun and the Moon, as seen from Earth
viii) the intercalary month

The VJ is useful to measure the longest and shortest day. It measures the duration of longest day and shortest day on the two solstitial days are 14 hours 24 minutes and 9 hours 36 minutes.

Origin of Indian Calendar

P C Sengupta constructed the chronology of ancient India as :

a) Vedic Indians recognize the coming of the spring and the rains — c. 4000 B C E
b) Bhārata war — c. 2449 BCE
c) Śatpatha Brāhmaṇa — c. 2100 BCE

This work is an extension of a line of inquiry that was started in 1893, when B G Tilak in Bombay and H Jocobi in Bonn independently of each other arrived at the opinion that at the period of the Brāhmaṇas, the pleides (Kṛittikā) coincided with vernal equinox and that earlier at the time of the Vedic texts vernal equinox fell in Orion (Mṛgaśirṣa). Now about 2500 B CE, the vernal equinox lay in the Pleiades and about 4500 BCE in Orion. In this point B G Tilak differs with Jacobi. Tilak dated the beginning of Vedic civilization at 6000 BCE, while Jacobi told it about 4500 BCE. He concluded that Vedic age to last 4500 to 2500 BCE and as a proof he collected a few hymns. Jacobi believed to be confirmed in his view because in a post-Vedic marriage custom the bridegroom showed his bride the pole star as a symbol of constancy. At present a star of second magnitude, in the little bear is the pole star of the Northern hemisphere. This star cannot be meant when the pole star is mentioned in Vedic literature because 2000 years ago it was far removed from the

pole. In 2780 BCE, we meet with Alpha Draconis which for 500 years stood so near the pole that it must have appeared constant in naked eye. The custom when exists, Alpha Draconis was the pole star. In the Ṛkveda, there is no mention of such custom.

Tilak's conclusion was based on an interpretation of astronomical allusion in the Vedic literature. Tilak wrote, 'It appears that the oldest Vedic calendar, like the oldest hymns was sacrificial; and that the sacrifice on the year commenced with Aditi at the vernal equinox in or near Punarvasu. The phases of the Moon, the seasons and the ayanas further guided the ancient Aryas in measuring time for sacrificial purposes. The asterism of Avijit marked the approach of Vishuvan or the central day, with Purnavasu, which soon after came to be called Yamakau, perhaps Yama and Yami, indicated the beginning of the year. Sometimes after this and before the vernal equinox had receded to Orion, the lunar months and tithis or days appear to have come in use; and in fact, the whole calendar seems to have been rearranged, the year being made to commence from the winter solstice in the Chitra full Moon.'

Indian Calendar

The panchānga that which has five limbs, concerns chiefly five elements of time-division, viz., the vāra, tithi, nakṣatra, yoga and karaṇa. The natural or solar day is called a savanna divasa in Indian astronomy. A vāra begins with Sunrise. The week-days, with their serial numbers as used in this work and their various Sanskrit synonyms, are given.

Days of the week:

1. Sunday	Ādi, Āditya, Ravi, Arka, Aruna, Bhaṭṭāraka, Aharpati, Bhāskara, Bhardhana, Bhānu etc.
2. Monday	Soma, Abja, Chandramas, Chandra, Indu, Nishipati, Kṣapākara etc.
3. Tuesday	Maṇgala, Aṇgāraka, Bhauma, Mahīsuta, Rohitāṅga.
4. Wednesday	Budha, Baudha, Rauhiṇeya, Saumya
5. Thursday	Guru, Āṅgirasa, Bṛhaspati, Dhiṣaṇa, Surāchārya, Vāchaspati, etc.
6. Friday	Śukra, Bhārgava, Bhṛgu, Daityaguru, Kāvya, Uśanas, Kavi
7. Saturday	Śani, Saurī, Manda

Time-Divisions:
A prativipala is equal to .006 of a second.
60 prativipalas make 1 vipala = .4 of a second.
60 vipalas make 1 pala = 24 seconds
60 palas make 1 ghatikā (ghati, daṇda, nādi, nādikā) = 24 minutes
60 ghaṭikās make 1 divasa (dina, vāra, vāsara) = 1 solar day
Again
10 vipalas make 1 prāṇa = 4 seconds
6 prānas make I pala = 24 seconds

The tithi, amāvasyā, pūrnima:
The moment of the new Moon, or that point of time when the longitudes of the Sun and Moon are equal, is called amāvasyā. A tithi is the time occupied by the Moon in increasing its distance from the Sun by 12 degrees; in other words, at the exact point of time when the Moon, moving eastwards from the Sun after the amāvasyā, leaves the Sun behind by 12 degrees, the first tithi, that is called pratipada, pratipada ends; so, with the rest, the complete synodic revolution of the Moon occupying 30 tithis for the 360 degrees. Since, however, the motions of the Sun and Moon are always varying in speed; the length of a tithi constantly alters.

The moment of the full Moon, or that point of time when the Moon is furthest from the Sun, - astronomically speaking when the difference between the longitudes of the Sun and Moon amounts to 180 degrees – is called pūrnimā.

The nakṣatra:
The 27 parts of the ecliptic is called nakṣatra, and therefore each nakṣatra occupies 360° ÷ 27 = 13°20′. The time which the Moon or any other heavenly body requires to travel over the 27th part of the ecliptic also called a nakṣatra.

The yoga:
The period of time during which the joint motion in longitude, or the sum of the motions, of the Sun and Moon is increased by 13°20′, is called yoga.

The karaṇa
A karaṇa is half of a tithi or the time during which the difference of the longitudes of the Sun and Moon is increased by 6 degrees.

The pakṣa
It is Moon's fortnight. The first fortnight begins with the end of amābasyā and lasts up to the end of pūrnima; the second lasts from the end of pūrnima to the end of amābasyā.

The Lunar Month

The period of time between two successive new or full moons. It is also called 'Chāndra Māsa' or lunar month, and is the time of the moon's synodic revolution. (The synodic revolution of the Moon is the period during which the Moon completes one series of its successive phases, roughly $29^{1}/_{2}$ *days*. The period of of its exact orbital revolution is called 'sidereal revolution'. The sidereal revolution of the Moon is less by about two days than its synodic revolution in consequence of the forward movement of the earth on the ecliptic.

A short account of Indian astronomical knowledge in Siddhāntic era:

Paitāmahasiddhānta is the first detected text as siddhānta, though pañcasiddhāntikā compiled by Varāhamihira noticed this text and said it is not a good siddhāntic text. He probably selected five couplets for this text. Āryabhata is the first astronomer who introduced himself and wrote his master piece Āryabhatiya.

If main contributors of astronomy are arranged sequentially, the development of astronomical knowledge will be clear.

Contributor	**Main contribution**
1. Āryabhata (b. 476 CE)	Āryabhatiya
2. Varāhamihira (b.485 CE)	Pañcasiddhāntikā Bṛhatsaṃhitā
3. Brahmagupta (b. 598 CE)	Brahmasphutasiddhānta Khandyakhādaka

4. Bhāskara I (b. 629 CE)	Mahābhāskariyam Laghubhāskariyam
5. Lalla (b. 748 CE)	Siṣyadhivṛddhida tantra
6. Vateswara (b. 880 CE)	Vateswarasiddhānta
7. Sripati (b. 999 CE)	Siddhāntaśekhara
8. Bhāskara II (Bhāskarāchārya) (b. 1114 CE)	Siddhāntaśiromaṇi

Characteristics of Siddhāntic Texts

The astronomical computations described in the Vedānga Jyotiṣa were in practical use for a long time. Around the beginning of the Christian era, a new type of astronomical literature, called siddhāntas, emerged. These texts contain much more materials and topics than the premier, VJ.

1. Along with nakṣatra system, twelve sign of the zodiac were introduced.
2. A precise value for the length of the solar year was adopted.
3. Computations of the motions of the planets, the solar and lunar eclipses, ideas of parallax, determination of mean and true positions of planets, projection of eclipses formed the common contents of siddhāntic texts.

According to Indian tradition, there are 18 siddhāntas, namely, Sūrya, Pitāmaha, Vyāsa, Vaśiṣtha, Atri, Parāśara, Kāśyapa, Nārada, Gargya, Marici, Angirā, Romaka, Pauliśa, Cyavana, Yavana, Bhṛgu and Śaunaka. Among these siddhāntas only five siddhāntas were newly compiled by Varāhamihira. These five siddhāntas are Sūrya, Brahmā, Vaśiṣtha, Romaka and Pauliśa. S B Dikshit states that these five old siddhāntas described in the Pañcasiddhāntika are different from the five modern siddhāntas. These five modern siddhāntas are Sūrya, Soma, Vaśiṣtha, Romaśa and Brahmasiddhānta in Śākalyasaṃhitā. Varāhamihira stated in his compilation that 'the siddhānta made by Pauliśa is accurate; near to stand the siddhānta by Romaka; more accurate still is the Sāvitra (saura)'.[13]

Āryabhatiya is the important astronomical book written by Āryabhata of Kusumpur. It is the more ancient available 'pauruṣa' work

which introduced mathematics for astronomy. This work is divided in to four chapters, called pāda (section).

Chapter 1 (Gitikā-pāda), consisting of 13 verses of which 10 are in gītikā metre, contains the basic definitions and suggested large unit of time. It states the number of rotations of the earth, revolutions of the Sun, Moon and the planets in a period of 4320000 years. It defines the orbits of the Sun, Moon and planets, the diameters of the Earth, Sun, Moon and the planets; the obliquity of the ecliptic, the inclinations of the orbits of the Moon and the planets, the epicycles of the Sun, Moon and the planets.[14]

Chapter 2 (Gaṇita-pāda), consists of 33 verses and the name indicates this chapter deals with mathematics. It is the first Indian text book where mathematics is a subject for astronomy. This chapter deals with problems on the shadow of the gnomon; simple, quadratic and linear indeterminate equations, series, interest etc.

Chapter 3 (Kālakriyā-pāda), consists of 25 verses deals with time and its various units; determination of true positions of the Sun, Moon and the planets. It covers the very important topic the motions of the Sun, Moon and the planets by means of eccentric circles and epicycles.

Chapter 4 (Golā-pāda), consists of 50 verses, deals with motion of the Sun, Moon and the planets on the celestial sphere. It deals with very important topic, spherical astronomy. It explains the graphical representation of the eclipses and duration of eclipses.

Āryabhatiya is the epoch of modernization of Indian astronomy. In the later age, astronomical knowledge proceeds considering this text as base.

The unique contributions of this astronomical text are:

i) Āryabhata gives the value of π as the ratio of 62832 to 20000 and also he points out the value is approximate (āsanna). This treatment is expressed in verse 10, gaṇitapāda;
caturadhikaṃ chinnāt tribhujāccatubhujāccaiva
ayutadvayaviṣkambhasyāsattro vṛttapariṇāhaḥ
ii) The author gives the rule for the formation of the sine table (verse 11, gaṇitapāda). The sine values for the angle between 0° to 90° at intervals of 3°45′.[15]

iii) Theory of Earth's rotation is the best and important feature of Āryabhatiya. At that time geocentric theory was believed and imagined as the Earth lay at the centre of the universe. All heavenly bodies revolved around the Earth. Āryabhata was the first scientist who believed that Earth rotates about its axis and the stars are fixed in space. According to the author the period of one sidereal rotation is 23h 56m 4s which is closely nearer to modern value (verse 3, Gitikāpāda).

Sūryasiddhānta is the most popular and effective book at the time of Āryabhata and later. According to Varāhamihira's opinion it is the book of high accuracy. The main problems of Indian astronomy are : i) calculation of positions of planets, ii) determination of direction (dik), space (deśa) and time (kāla); iii) projection of eclipses of the Sun and the Moon.

Indian astronomers measured longitudes of the planets assuming a starting point called epoch. The epoch of the Sūryasiddhānta, called 'the time of creation of the world', is the mid-night at Lanka (a hypothetical place)[16] which occurred 1,95,58,83,179 years before 78 CE. At this epoch, all planets, including the apogees and ascending nodes of their orbits, are supposed to have the first point of the nakṣtra Aśvini.[17]

The number of days elapsed since the epoch is called ahargaṇa, and the mean longitude of a planet is obtained from the formula Mean longitude = $\frac{A \times R}{C}$ where A is the ahargaṇa, R is the revolutions of the planet and C is the civil days. According to Sūryasiddhānta, the mean longitudes of the Sun and Moon obtained from the epoch correspond to mean midnight at that imaginary place Laṅkā. Applying corrections true longitudes of the Sun and the Moon are derived. These corrections are i) the longitude correction, ii) correction for the equation of time due to eccentricity of the ecliptic.

The Sūryasiddhānta has 14 chapters and assumed that it was compiled in a period earlier than 349 CE. It was written by Lata. Albiruni says. But before that Brahmagupta said that the work by Lata is different from Sūryasiddhānta. It may be assumed that Albiruni noticed Sūryasiddhānta which is the new one and another Sūryasiddhānta (SS) were there. Varāhamihira compiled old S S and the teachings of this text were summarized in chapters I, ix, xxi, xvi, xvii in his Pañcasiddhāntikā.

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In old SS, the calculation of diameter of shadow in case of lunar eclipse is obtained by the formula;

Diameter of the shadow = Earth's diameter -

$$\frac{(\text{Sun's diameter} - \text{Earth's diameter}) \times (\text{Moon's true distance})}{\text{Sun's true distance}}$$

The times of the four contacts are obtained by successive approximations.

Solar eclipse is also explained in this text. Chapter 6 is devoted for the explanation how to project an eclipse on a plane surface.

Brahmasiddhānta in Śākalya saṃhitā is in the school of SS. Actually texts included in the modern Pañcasiddhāntikā are all the followers of SS.

Brahmasiddhānta in Indian Astronomy

Give us sight for our eyes
Give us strength to our bodies
Let us see the world as one
Let us see the world clearly - Ṛg veda

In the Muṇḍaka Upaniṣad, astronomy is included in the several branches of Vedic studies. In the Chāndogya Upaniṣad, Nārada is being interrogated by Sanat Kumara about the scope of astronomy along with other knowledges. After Vedas, six vedāngas are used. VJ is one of them. Of which, Jyotiṣa and Kalpa are significant to the history of astronomy. Kalpa consists of practical manual on the performance of Vedic sacrifices and rituals contain Sulba sutra, use of geometry, irrational numbers and other mathematical ideas. Vedānga Jyotiṣa, three texts are available, Ṛgveda, Yajurveda and Atharvaveda; of which the first two containing 36 and 43 verses respectively. Ṛgvedāṅga are ascribed to Lagadha and Yajurvedāṅga-Jyotiṣa to Śeṣa. The basic contents of these two are almost same, the latter having manuals for civil calendar and time measuring for rituals. Both the recensions are practically identical and give an account of months, years, days, day divisions, nakṣatras, new moons and full moons. Solstices and seasons occurring in the cycle of five solar years, is taken to begin at the solstice in the beginning of the month Māgha when the sun and the moon simultaneously crossed

in to the nakṣatra Śraviṣṭhā. The five year cycle contains 1830 civil days, 1835 sidereal days, 62 lunar months, 5 revolutions of the sun and 67 revolutions of the moon. It can be noted that the phenomenon of the winter solstice at the beginning of the nakṣatra Śraviṣṭhā, with which five-year cycle is taken to begin, occurred about 1300 B.C. Artharvajyotiṣa belongs to a later date. It mentions the name of the seven planets, seven karanas of the calendar. It consists of 162 verses deals with both astronomy and astrology.

From the writings of Varāhamihira, Pancasiddhāntikā, we get a compilation of astronomical texts. It summarized the siddhantas; i) the Paitāmahasiddhānta, ii) the Suryasiddhānta, iii) the Vaśiṣthasiddhānta, iv) the Romakasiddhānta and v) the Pauliśasiddhānta; were written in the early centuries of the Christian era. It is assumed that Paitāmahasiddhānta, the earliest siddhānta, written in 80 CE, Vaśiṣtha-siddhānta was written about 264 CE and referred by Yavaneśvara in yavanajātaka.

Actually after Vedāṅga Jyotiṣa, Indian astronomical works are the siddhāntas. The period witnessed the advent of the class of texts called siddhāntas, characterized by a better scientific approach and more comprehensive treatment. These texts adopted more sophisticated mathematics, incorporated the planets in the system, and devised a system of coordinates for the determination of the periods of the planetary revolutions and relative sizes of the Earth, the Sun, and the Moon. The length of the year, days were correctly determined. Planetary positions were counted using eccentrics and epicycles. The eclipses were computed with greater accuracy by correcting the results of parallax.

According to Thibaut, 'The Pitāmaha (Brahmā) siddhanta known to Varāhamihira has thus to be distinguished from the Brahmasiddhānta on which Brahmagupta's Sphutasiddhānta is based. The Brahmasiddhānta or the Paitāmahasiddhānta is a short treatise in prose, forming part of Vishnudharmottorapurana, and belonging altogether to the modern phase of the Hindu astronomy. The number of Brahmasiddhānta, known at present, thus amounts to four, viz, the Paitāmahasiddhānta summarized in the Pancasiddhāntika, the Paitāmahasiddhānta forming part of Vishnudharmottorapurana, the Sphuṭa Brahmasiddhānta by Brahmagupta, and that Brahmasiddhānta whose more ordinary name is

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Śākalyasiddhānta.' So there is a conflict on the name Brahmasiddhānta in Indian astronomy.

a) Brahmasiddhānta (Paitāmahasiddhānta) in Pañcasiddhāntikā: According to G.R.Kay, 'The Paitāmahasiddhānta gives us the earliest date, namely 80 CE and makes the year begin with the Sun in Śraviṣṭhā; if Śraviṣṭhā is to be identified with α and β Delphini, this would make the year begin about twenty days after the winter solstice'. Varāhamihira compiled Paitāmahasiddhānta, represents hindu astronomy as not yet affected by Greek influences. This Paitāmaha (Brahmā) siddhānta belongs to the same category as the Jyotiṣa-Vedānga, the Gargasaṁhitā and similar works. The basic principles underlying in the Paitāmahasiddhānta have been given in the twelfth chapter of the Pañcasiddhāntikā. This chapter contains five couplets. The first two couplets tell this –

> 'According to the teaching of Pitāmaha, five years constituted a yuga of the sun and the moon. The adhimāsas occur after thirty months and an omitted lunar day once in sixty three days. Lesson the time of the Śaka King by two and divide the reminder by five; with the remaining years find the ahargana, counting from the first day light half of māgha. The ahargana thus found begin with sunrise'.

The fifth couplet describes the method of calculating the length of the day. The rule is applicable for finding the length of any given day of the year. The supposition being that the length of the shortest day is 12 muhurtas and that of the longest day is 18 muhūrtas.

The length of any day of the year is found by adding to twelve with the product of six and the number of the day, divided by 183. The number of the day is counted forward from the winter solstice, while in the case of a day in the Dakṣināyana it is counted backward from the same point of time. This can be expressed as

$$12 + 6 \times \textit{given day} \div 183$$
$$= 12 + 2 \times \textit{given day} \div 61$$

The verses describe the method of calculating the nakṣtras and stated that nakṣatras should be calculated from Daniṣṭha, in which sun

and moon are in conjunction at the beginning of the Yuga. This concept is similar with vedānga jyotiṣa.

b) Paitāmahasiddhānta (Brahmasiddhānta) in Viṣnudharmottora Purāṇa:

David Pingree stated that, 'The earliest siddhānta that has come down to us is a Paitāmahasiddhānta of the early fifth century. This is preserved because of incorporation into the Viṣnudhrmottora Purāṇa, though it has been copied as an independent treatise'. In spite of a contradiction on the date of composition, it is true that Brahmasiddhānta incorporated in Viṣnudharmottora Purāṇa has been compiled separately in prose form. It is a cast in the form of a lecture by Brahmā to Bhṛgu. Chapter 166-174 of vol. 2 (khanda-2) presents Paitāmahasiddhānta which is not a corrected version. It is referred by Āryābhat and as a part of Vishnudhrmottorapurāṇa, should be dated before 500 CE. The astronomical portion of this Siddhāntic text spreads over chapter III to chapter IX. Dr. Pingree translated the Benaras edition, corrected from Bombay edition.

This portion consists of 73 verses covering all astronomical knowledge of that time. The special characteristic of this text is that mathematical astronomy is included. According to Pingree, this text is important because no other text exist except Vedānga Jyotiṣa. But it is not true. A few siddhāntic texts were written before Vishnudharmottora Purāṇa.

Chapter III describes time measurements, sine and ver-sines, the declination of the sun and latitudes of the planets, etc. Chapter IV deals with the computation of ahargaṇa, the computation of the mean and the longitudes of the planets, etc.; chapter V covers with eclipses (lunar), saṅkrāntis, tithis, karaṇas, yogas, etc.; chapter VI covers some problems in spherical trigonometry etc. ; chapter VII is devoted to the computation of the ascendant and of the time elapsed since sunrise; chapter VIII discusses the method of computing the time and longitudes of the first and last visibilities of the planets and fixed stars; chapter IX states the rule for computing the illumination of the moon and longitudinal and latitudinal parallax (for solar eclipses).

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c) Brāhmasphuṭasiddhānta (Brahmasiddhānta) of Brahmagupta: Brahmagupta was born in 599 CE in the reign of king Vyāghramukha, belonging to the Capa family, wrote his famous astronomical treatise Brāhmasphuṭasiddhānta at an age of 30 (628 CE). This is corroborated by the statement in the Vishnudhormattara purana. H.T. Colebrooke translated 18th chapter known as kuṭṭaka in 1817 and chapter 21 is translated by Setsuro Ikeyama in 2003. The Vasanā commentary by Pṛthudakasvamin (860 CE) is available (a few couplets). The Brāhmasphuṭasiddhānta was edited by Sudhākara Dvivedi with his own commentary and Ram Swarup Sharma comments with the help of Pṛthudakasvāmi and Dvivedi's commentaries. Brāhmasphuṭa-siddhānta is a comprehensive astronomical treatise consisting of 24 chapters covering all major events of astronomy. Brahmagupta states in one verse that he has composed the treatise containing 1008 verses. In this text, Brahmagupta accepts the astronomical day to begin with the sunrise at Lankā, and the calculation of days, months, years, yugas, kalpas, all begin from Caitra suklā pratipada and the first day is regarded as Sunday.

Brahmagupta does not accept the five year yuga system, as Vedānga Jyotiṣa, Pitāmahasiddhānta, etc. He criticizes Varāhamihira in his adhimāsa calculation. Varāhamihira regards one adhimāsa is a period of thirty solar months where Brahmagupta admits one adhimāsa is 32 months and 16 days. Brahmagupta differs from Āryabhata I in the length of yuga. Āryabhata regards all four yugas of equal length (1,080,000 years); whereas Brahmagupta regards Kaliyuga to be 432,000 years, Dwāpara to be twice of it, Tretā to be thrice and Kṛtāyuga to be four times of the length of the Kaliyuga. Śākalyasaṁhita was composed in 9th century AD. Dikshit considers the epoch when 'Pramāthi' could be the first solar year;

'pramāthi prathama varṣe sauraṁ kalpasya sarbadā' – 1 (37).

This edited text is prepared on the basis of three manuscripts and one printed text.

Description of the manuscripts:

1. **B1** A copy from the Asiatic Society, Kolkata (G 767, 38 F.1-38), 33 × 10.5 cm, language – Sanskrit, script – Devnāgari, has been

classified better condition manuscripts where discrepancies are less.

2. **Be** Asiatic Society manuscript [SC I B 12(v1\2), 23498, 27(P. 6-38), 31×21 cm, language – Sanskrit, script – Bengali], starts from page 6 where Śākalyasaṁhitā is present.
3. **D1** Bhanderkar Oriental Research Institute manuscript. [no. 345 of 1882-83, Extent foll. 22, language- Sanskrit, script- Devnāgari], has many resemblances in B1 and printed text.
4. **Ba** jyotishasiddhāntasaṁgraha, published text in Benaras Sanskrit Series, no. 152, editor Pt. Vindyeswari Prasad Dvivedi (1912 AD), found in the Sanskrit Sahitya Parisat, Kolkata.

No mss shows the title of the chapter as Spaṣṭādhikāra, Tripraśnādhikāra, etc. but the number of adhyāyas. Another peculiarity is its sequence. All astronomical contents are distributed throughout the text. From bibliography of Sanskrit works on astronomy and mathematics by S N Sen (with research assistance of A. K. Bag and S. Rajeswar) it is observed that there are some errors, omission of words and lines, but they all have the same origin. The manuscripts are collected from the Asiatic Society, Kolkata; Bhanderkar Oriental Research Institute, Pune; and printed material 'Jyotiṣasiddhāntasaṁgraha' edited by Vindyeśvari Prasād Dvivedi collected from Sanskrit Sahitya Parisat, Kolkata. All manuscripts and printed texts are in Devnāgari Script except one which is in Bengali script. From the above mentioned book the title of the chapters is found; as kālanirupaṇa, grahāṇāṁ-uccanīcasthānam etc.

Chapter one, kālanirupaṇa, contains 111 slokas, begins with a conversation between Brahmā and Nārada. According to questions of Nārada, Brahmā agrees to explain Jyotiṣa. In this chapter we find the names of eight authors with eight Praśnas. It covers the definitions of kāla, yuga, ahargaṇa, etc. It deals with the subjects existing in madhyamādhikara chapter in other texts.

Chapter two, grahānāṁuccanicasthānakathanam, contains 261 slokās, deals with position of planets with manda, śīghra, ucca, nīca, pāta, etc. which are discussed in spaṣṭādhikara chapter in other treatises. Many verses are devoted to explain the difference between spaṣṭagraha and madhyagraha, the causes of manda and śīghra of the

planets. Polar longitudes (dhruva) are tried to be explained in this chapter. An instrument, Golāyantra, and discussion on measurement of coordinates are the speciality of second chapter.

Chapter three, tithinakṣatrādinirūpaṇa, contains 171 slokās, describes the karaṇa and method of calculation. But major portion of this chapter is devoted to discuss religious rituals like śrāddha, lunar tithi [Amābasyā (new moon), Pūrṇimā (full moon), etc.]

Chapter four, udayāstādinirūpaṇa, contains 122 slokās, deals with many topics of astronomy e.g. udayāsta, phases of the moon, instructions for setting up an observatory, instruction for constructing an instrument like kapālayantra for measuring time.

Chapter five, grahasamāgamayuddhādinirūpaṇa, contains 83 slokās, discusses samāgama and yuddha (conjunction) of planets, eclipses. Author tested the traditional concept on eclipses i.e. Rāhu and Ketu and concluded as

Śīghragāmi śaśī suryachāyāṁ paścīmatopi ba |
Prāgetyatītya tatpścād grahanaṁ bhāskarasya hi II 28 II

Chapter six, chedakādinirūpaṇa, contains 15 slokas, deals with projection of eclipses. Total number of verses in Brahmasiddhānta of Śakālyasaṁhitā is 763.

Brahmasiddhānta in Śākalyasaṁhitā is a text following modern Sūryasiddhānta. There are many slokas similar to Sūryasiddhānta. This compilation shows that the contents dealing with first chapter in Brahmasiddhānta are same as eighth chapter of Sūryasiddhānta. The contents dealing with chapter four in Brahmasiddhānta in Śākalyasaṁhitā are same as the discussion of chapter nine and thirteen of Sūryasiddhānta. When Śākalya discussed eclipses and commented on new idea, it is seen that this idea already exists in Āryabhata and Varāhamihira's work. Projection of eclipses is discussed in 6th chapter in both texts, Brahmasiddhānta and Sūryasiddhānta.

A serious reader of history of astronomy in India can detect the differences of these texts. The Paitāmahasiddhānta in Pañcasiddhāntikā follows the older text Vedāṅga-Jyotiṣa and belongs to the same category as the Gargasaṁhitā. Only five couplets are devoted by Varāhamihira in his compilation. D. Pingree stated that "The earliest siddhānta that

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has come down to us is Paitāmahasiddhānta of the early fifth century. This is preserved because of incorporation into the Viśnudharmottara Purana, though it has been copied as an independent treatise." It is a cast in the form of a lecture by Brahmā to Bhṛgu compiling all major astronomical events and its sequence is as the other texts. Albiruni noticed Brāhmasphuṭasiddhānta as Brahmasiddhānta in his book several times. This text is large and popular. This text contains 24 chapters. The last one is the present text, BrahmaSiddhānta in Śakalya Saṁhita.

Comparison

Example: There are differences when measuring the year according to different BrahmaSiddhāntas:

- Paitāmahasiddhānta of Pañcasiddhāntikā 365 days 21 ghaṭi 30 pala
- Paitāmahasiddhānta of Viśnudharmottara Purana 365 days 15 ghaṭi
- Brāhmasphuṭasiddhānta of Brahmagupta 365 days 15 ghaṭi 30 pala
- Brahmasiddhānta of Śākalya 365 days 15 ghaṭi 31 pala Etc.

S B Dikshit mentioned Śākalya's Brahmasiddhānta as one of the five modern siddhāntas e.g. Surya, Soma, Vaśiṣṭha, Romaka and Brahama-siddhānta of Śākalya. Śākalya mentioned his treatise as second praśne and the other six are Chandra, Pulastya, Vivasvata, Romaka, Garga and Bṛhaspati. The above mentioned five modern siddhāntas measure the year as 365 days 13 ghati 31 pala 31 vipala 24 prativipala. This measurement is different from VedāṅgaJyotiṣa as 366 days. Comparing with other siddhāntas, except Romaka, differ from one another by more than 2 palas. The savanāha or civil day is defined as the interval between two consecutive Sun-rises at a given place (1-16). The interval of time between two consecutive conjunctions of the Sun and the Moon is called chāndramāsa or a lunation. This is divided into thirty parts which is called tithi or lunar day. The third chapter deals with the study of Mahāpāta of the Sun and the Moon. From 34th verse to the end of the

chapter covers the offshoot of the main astronomical contents. In this text the idea of valana is discussed with importance.

The second chapter is started from the concept of sighracca, mondacco. Śākalya's concept on the motions of planets was clear. He knew that the motions of the planets are not always uniform, sometimes it is fast, and sometimes it is slow. The motion of a planet calculated on the basis of revolutions is different from the actual motion. To know the exact motion of a planet three variable points are considered e.z. mondacco (apsis), śigrhracco (conjunction) and pāta (nodes). The mondacco and śighracco move eastward and complete the respective circles and reach their beginning place. The circles are known as bhagnas of the mondacco and śighracca respectively. The node is the point where the orbit of a planet appears as crossing the ecliptic. There are two nodes opposite to each other. The point of intersection, from where the planet's direction is turned northward, is known as north node or ascending node and the other is descending node. These two nodes of the Moon are known as rāhu and ketu respectively. In this chapter a few verses are devoted to explain the causes of the difference between a spaṣṭagraha and a madhyagraha. The causes of manda and śīghra of the planets are explained due to mahavāyu or upagraha which means 'presiding spirit which directs a planet's motion'. Śākalyasaṁhitā does not mention any epicycle but the concept lies in the second chapter. According to S B Dikshit 'The second chapter begins abruptly after an incomplete line of the verse, which is given after 111 verses of the first chapter. This chapter opens with an unexpected question. It seems that the epicycles may have been mentioned in between.' Brahmasiddhānta mentions mandaphala i.e. the equation of centre which is the addition of modern siddhāntic texts. No Western astronomer before Ptolemy knew the calculation of the true places of the five planets. The maximum value of the equation as given by Ptolemy does not agree with those given in Indian works. The calculations of the true places of the Sun, Moon and the five planets are important in mathematical astronomy. The equation of centre is found by the formula: The equation of time = *epicycle* × *sine of anomaly of planet* ÷ *semi diameter.*

The Kendra (anomaly) is the difference between the places of planet and that of aphelion. A large number of verses (138) have been devoted to explain including saṁkrānti, tithi covering pradoṣa time, proper time of ekādaśi, Ganesha caturthi etc. Eclipses and projection of eclipses are nicely discussed in the last part of this text.

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Notes

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|| अथ शाकल्यसंहितोक्तः ब्रह्मसिद्धान्तः||

|| प्रथमोऽध्यायः||

ध्यानयोगसमारूढं ब्रह्माणं त्रिजगद्गुरुम् |
अभिवाद्य सुखासीनं नारदःपरिपृच्छति ||१||

देव देव जगन्नाथ सर्वज्ञ कमलासन |
ज्योतिषां चरितं ज्ञानं ब्रुहि कालाशयं महत् ||२||

अधीतमखिलं छन्दः स्थाणुरूपं प्रतीयते |
अङ्गैर्विना यथैवाङ्गी तस्मादेतत्प्रसीद मे ||३||

इत्येवमुक्तो विश्वात्मा नारदेन महर्षिणा |
पुत्रेण धीमता प्रीत्या वाक्यमेतदभाषत ||४||

साधु साधु महाभाग यन्मां त्वं परिपृच्छसि |
विस्तरेण प्रवक्ष्यामि तन्मे निगदतःशृणु ||५||

नारायणःसुरश्रेष्ठो वेदाकारेण वर्तते |
छन्दःशास्त्रं तस्य पादौ कल्पःपाणी मुखंस्तथा ||६||

शब्दशास्त्रं श्रोत्रयुग्मं निरुक्तं घ्राणमेव च |
शिक्षाशास्त्रं ज्यौतिषं तु नयने षष्ठमेव तु ||७||

एतैरंगैरसावङ्गी राजते वेदविग्रहः |
प्रधानमङ्गमेवेदमङ्गेष्वेतेषु षट्सु च ||८||

एतच्चमत्तःशीतांशोःपुलस्त्याच्च विवस्वतः |
रोमकाच्च वसिष्ठाच्च गर्गादपि बृहस्पतेः ||९||

अष्टधा निर्गतं शास्त्रं स्वयं परमदुर्लभम् |
एतेऽपि कालाधीनानि ज्ञानानि विदुरीश्वराः ||१०||

गतागतं चिरं कार्यं कालस्तत्प्रभावात्यये |
हेतुःकारणकालोऽसौ सर्वाधारस्त्रिविक्रमः ||११||

तत्कार्यं कालकलनं वक्ष्यते नारदाधुना |
अष्टादश निमेषास्तु काष्ठा त्रिंशत्कला च ताः ||१२||

तासां त्रिंशत्क्षणस्तेऽपि षण्णाडीति प्रशस्यते |
यद्वा गुर्वक्षराणां तु दशकं प्राण उच्यते ||१३||

षड्भिःप्राणै र्विनाडी तु तत्षष्टया घटिका तथा |
श्वासःप्राणस्तु सर्वेषां तदायुस्तेन निर्दिशेत् ||१४||

नाडीषष्टया ह्यहोरात्रं मासस्तत्रिंशता भवेत् |
मानमार्क्षमिति प्रोक्तं सावनाद्यमथोच्यते ||१५||

उदयादुदयं भानोर्भूदिनं मृत्युलोकजम् |
स्यात्तेनार्कोदयो मासस्तथायं सावनश्च हि ||१६||

भास्वद्वियोगतश्चन्द्रो यावतैति रविं पुनः |
स्यात्तावानैन्दवो मासस्थिथीनां त्रिंशता च सः ||१७||

तत्पूर्वोत्तरपक्षौ तु स्वतःसिद्धौ सितासितौ |
कृत्तिकादि द्वन्द्वगतात्पूर्णेन्दोः कार्तिकादयः ||१८||

त्रिधा मासा उपान्त्यान्त्या प्रथमास्तु त्रयोऽत्र हि |
पितरश्चन्द्रबिम्बस्था अग्निष्वात्तादयो रविम् ||१९||

उदितं कृष्णपक्षार्धे पश्यन्त्यन्यत्र चास्तगम् |
अहोरात्रं तत्पितृणां चान्द्रो मासःप्रकीर्त्यते ||२०||

मासपक्षावसाने तु तद्दिवारात्रमध्यमौ |
संक्रान्त्या सौरमासस्तु मासद्वयमृतुर्भवेत् ||२१||

वर्षषड्ऋतवो दिव्यमहोरात्रं च तन्मुने |
कपित्थाकारभूगोलमध्यगो मेरुपर्वत: ||२२||

नानारत्नचयो हैम उभयत्र विनिर्गत: |
तस्योपरिष्टान्मन्विन्द्रामरास्तस्थुर्महर्षयः ||२३||

अधस्तादसुरास्तद्वन्महाबलपराक्रमाः |
ग्रहो मेषायने प्रोदयन्सञ्चरन्नुदगुत्तरम् ||२४||

पूरयेत्प्रागहर्मध्यं देवानामृतुभिस्त्रिभि: |
याम्यायनाद्यैस्त्रिग्रहैरह्नःपश्चार्धमेव सः ||२५||

तथा तुलादैर्दैत्यानामपि सौम्यायनादिभिः |
सुरासुरानामन्योन्यमहोरात्रं विपर्ययात् ||२६||

दिवारात्रप्रमाणं च भानोर्भगणपूरणात् |
विकलानां कला षष्टया तत्षष्टया भाग उच्यते ||२७||

तत्त्रिंशताभवेद्राशिर्भगणो द्वादशैव ते |
तुलादि षडशीत्यंशैःषडशीतिमुखं दिनम् ||२८||

तच्चतुष्टयमेव स्याद् द्विस्वभावेषु राशिषु |
षड्विंशे धनुषो भागे द्वाविंशेऽनिमिषस्य च ||२९||

मिथुनाष्टादशे भागे कन्यायास्तु चतुर्दशे |
ततःशेषाणि कन्यायां यान्यहानि तु षोडश ||३०||

क्रतुभिस्तानि तुल्यानि पितृणां दत्तमक्षयम् |
यत्र क्षेत्रे भवेदेतत्षडशीतिमुखं दिनम् ||३१||

षडशीतिमुखं नाम तस्य क्षेत्रस्य कीर्त्यते |
सौम्ययाम्यायने यत्स्यात्क्षेत्रं तदयनाभिधम् ||३२||

त्रिशृंगद्रेर्मध्यदेशादुपरिष्टाद्विवाकरः |
तुला मेषायने याति विषुवद्विषुवं च तत् ||३३||

चरस्थिरद्विस्वभावैः फलैस्ते च मृगादयः |
शिशिरादिगुणैर्वृद्धैःपुनश्च शिशिरादयः ||३४||

स्थिरं विष्णुपदं चेति तन्नाम स्थिरभं स्मृतम् |
मेषचैत्रादिमासास्तु मध्वाद्या इति कीर्तिताः ||३५||

क्वचिदेते वसन्ताद्या यजमानेच्छया पुनः |
वादयः सम्परीदान्विताद्यास्तु वत्सराःप्रभवादयः ||३६||

प्रमाथी प्रथमं वर्षं सौरं कल्पस्य सर्वदा |
दिव्यैरहोभिर्ब्राह्मैर्वा वर्षसंज्ञा पुरोक्तवत् ||३७||

दिव्याब्दानां सहस्राणि द्वादशैव चतुर्युगम् |
युगस्य दशमो भागश्चतुस्त्रिद्व्येकसंगुणः ||३८||

क्रमात्कृतयुगादीनां षष्ठांशः सन्धयः स्वकाः |
युगेषु तत्र वर्तते गतागतयुगस्थिनी ||३९||

कृतादीनां व्यवस्थेयं धर्मपादव्यवस्थया |
सन्ध्यासन्ध्यांशसहितं विज्ञेयं तच्चतुर्युगम् ||४०||

चतुर्युगाणां सैका स्यात्सप्ततिर्मनुसञ्चरः |
कृताब्दसंख्या तस्यान्ते सन्धिर्धात्रीजलप्लवः ||४१||

मन्वन्तरव्यवस्थेयं प्राजापत्यमुदाहृतम् |
कल्पे ससन्धयो ज्ञेया मनवस्ते चतुर्दश ||४२||

कृतप्रमाणःकल्पादौ सन्धिःपञ्चदशःस्मृतः |
इत्थं युगसहस्रेण भुततारादिमानकः ||४३||

संहारकारकःकल्पःकथितस्तव नारद |
सहस्रयुगपर्यन्तमहर्यद्ब्रह्मणो विदुः ||४४||

रात्रिं युगसहस्रान्तां तेऽहोरात्रविदो जनाः |
यावत्ब्रह्माखिलं विश्वं तावत्तिष्ठति तिष्ठति |

शतायुःपुरुषःसर्वः स्वयाऽहोरात्रसंख्यया |
ग्रहर्क्षदेवदैत्यादि प्रतिकल्पं चराचरम् ||४६||

क्रिताद्रिवेदैर्दिव्याब्दैः शतघ्नैःसृज्यते मया |
ज्यामिण्डमध्ये परिधिक्रमेण लबणार्णवः ||४७||

मेखलावस्थितस्तस्या देवासुरविभागकृत् |
योजनानां शतं त्रिंशद्युतं तस्यापि विस्तरः ||४८||

तन्मध्ये तुल्यभागे तु स्वर्णप्राकारतोरणाः |
चतस्र एताःपूर्वाद्या नगर्यो देवनिर्मिता: ||४९||

यमकोटिश्च लङ्का च रोमकं सिद्धपुर्यपि |
उपरिष्टाद् व्रजत्यासां भचक्रं ग्रहसंयुतम् ||५०||

विशेषाद्विषुवत्यर्कस्तन्नाम्ना विषुवत्प्रभा |
पुष्करद्वीपमध्यस्थे महापुष्करभूरुहे ||५१||

तिष्ठता सिद्धपुर्या तु ग्रहाःसंस्थापिता मया |
कल्पादौ सृष्टिकाले तत्पुरीष्वेव तदादिषु ||५२||

मध्योदयार्धरात्र्यस्तकाले वार: प्रजायते |
तदा पश्चान्मुखं सर्वं ग्रहनक्षत्रतारकाः ||५३||

सृजन्त्यग्राग्रभूपादेष्वसुभि: सावनोद्भवै: |
ग्रहनक्षत्रताराणां समोद्गमनकारणात् ||५४||

पूर्वोक्तं तु दिनं त्रिंशन्नाडिकं नक्तमप्यथ |
विषुवत्युदयस्थानात्प्राच्यवापश्चिमोत्तराः ||५५||

प्रादक्षिण्येन ककुभश्चतस्रश्च विनिर्दिशेत् |
एवमुक्तपुरीभ्योऽयमुत्तरो मेरुरामरः ||५६||

आसुरो दक्षिणाःकाष्ठानियमो न तयोःसमः |
लिप्तासु चक्रतुल्यासु दृश्यते सकलं यदि ||५७||

विषुवद्दिवसे भूस्थे तावतीने कुतो दिशः |
इति पर्यटतां यो यद्भाति यद्यदुडून्यपि ||५८||

अतीत्य तरसा याति यत्प्रत्यक्प्राग्गतिश्च सा |
तुल्यमेवातिक्रमणं नवतिर्वा स्वकक्षया ||५९||

ऊर्ध्वं तत्परिवर्तेन पौष्णान्ते भगणःस्मृतः |
सर्वत्रेच्छाकलवधे प्रमाणाप्तं च तत्फलम् ||६०||

जात्येच्छामानसाम्यं दोःकोटिवर्गयुते: पदम् |
कर्णो दशपदाभ्यस्तो विष्कम्भात्परिधिर्भवेत् ||६१||

हानिवृद्धिधियामार्गव्यत्ययादिष्टमिष्टजात् |
युगे स्युःप्राग्गतेर्भानो: ज्ञस्य शुक्रस्य चात्मज ||६२||

कुजार्किगुरु शीघ्राणां भगणाःसुर्यवत्सरा: |
इन्दोस्तर्कामराग्न्यर्थ सप्तशैलशरास्तथा ||६३||

रदेभतर्कगोनेत्रनयनानि कुजस्य च |
बुधशीघ्रस्य वै षष्टिखाद्यग्न्यङ्कमुनीन्दव: ||६४||

शून्याश्विनयनाम्भोधिषड्गुणा वाक्पतेस्तथा |
काव्यशीघ्रस्य षट्शैलगुणाकृतिवियन्नगा: ||६५||

अष्टतर्कशरर्त्वब्धिशशाङ्काःसूर्यजस्य च |
त्रिनखेभाष्टवर्णास्तु मन्दोच्चस्य निशापतेः ||६६||

वामपातस्य वस्वग्निद्विदस्राग्नियमा मुने |
कौजात्कल्पे क्रमादिन्द्रकरा अष्टाष्टसागराः ||६७||

कृतात्यष्टिस्त्रिशून्याङ्का नासत्यर्तुरसास्तथा |
प्राग्गतेःसूर्यमन्दस्य सप्तकुञ्जरपावका: ||६८||

कौजात्कृतनरवा नागषड्गुणाःखवियन्नव |
शरपावकबाणाश्च तथा नवहुताशना: ||६९||

अष्टाश्वीभाद्रिविकृतिद्व्यष्टबाणेन्दवो युगे |
भोदयाःप्राग्गतेरेते भगणैस्तु विवर्जिताः ||७०||

पातानां भगणैर्युक्ता स्वोदया: परिकीर्तिताः |
नक्षत्रोदयतःपूर्वं प्रत्यग्गाति रुदेति हि ||७१||

पश्चात्प्राग्गतिरेतस्मादभिकल्पोदया युगे |
अर्कोनचन्द्रभगणाःशशिमासाःप्रकीर्तिताः ||७२||

दिनीकृतास्ते तिथयो भुदिनोनाःक्षयक्षषाः |
अर्केन्दुमासविश्लेषो भवेत्पुत्रादिमासका: ||७३||

अत्र चक्रकलाश्चन्द्रकक्षा पञ्चदशाहताः |
व्योमकक्षा भवेदेषा कल्पेन्दुभगणाहता ||७४||

कक्षा ग्रहाणां सैवेह हृता चैव पृथक्पृथक् |
स्वकल्पभगणै: कक्षाषष्टिघ्नं भ्रमणं रवे: ||७५||

स्वकक्षाव्यासभूव्यासविश्लेषार्धं तु मध्यमम् |
सर्वेषां प्राग्गतिःकल्प्या भूदिनैर्व्योममण्डलम् ||७६||

एकस्य भूदिनस्यास्य कल्प्या प्रत्यग्गतिस्त्विह |
छायाशङ्कूव्यासकोटी कर्णोऽतो विषुवत्प्रभा ||७७||

छाया या सा विषुवती स्वदेशे स्याद्दिनार्धजा |
शङ्कुःस्याद्विषुवत्कर्णो यत्र न क्षीयते ततः ||७८||

वर्धमानो महीकर्णःस्वारिवर्जो निरक्षकः |
अक्षाख्यौ द्वौ ध्रुवौ मेरोरुपरिष्टान्भःस्थितौ ||७९||

भूभचक्रान्तरं भूमिध्रुवान्तरमपि ध्रुवम् |
समुद्रे मध्यकक्षास्याःक्षितिजस्थौ ध्रुवाविति ||८०||

तत्रस्थाःपरिपश्यन्ति दक्षिनोत्तरयोर्मुने |
अक्षोन्नतेरभावात्स व्यक्षदेश इति स्मृतः ||८१||

अन्यत्राक्षोच्छ्रयो यावत्तावच्चक्रावलम्बनम् |
मेरोरभिमुखं यातुरुपर्युपरि दृश्यते ||८२||

ध्रुवस्ततस्ततश्चक्रं नीचैर्नीर्चेस्तु नारद |
निरक्षाभिमुखं यातुरन्यथा तद्द्वयं भवेत् ||८३||

अक्षांशा नवतिर्मेरौ व्यक्षे लम्बांशकास्तथा |
लंबाक्षौ दक्षिणौ ग्राह्यौ गणितेषु तथापि च ||८४||

लम्बजीवा त्रिभज्या चेद्वर्धमाना महीश्रव: |
वर्धमानःखखर्त्विन्दुयोजनानि क्षितेस्तु सः ||८५||

भूकर्णानुगुणं तस्य ज्याया बृद्धेरदर्शनात् |
भूकर्णबृद्ध्यनुगुणं क्षीयतेऽक्षो दिनोऽधिक: ||८६||

तथाप्यक्षो न नवतेस्तत्क्रमज्यापि गृह्यते |
अक्षाद्विलोमगमनाल्लम्बाक्षावधिकोनकौ ||८७||

अक्षज्यात्रिज्ययोःश्लेषो यद्यक्षक्षय इत्यथ |
लम्बो हि भवता तत्र गृह्यते तर्हि यत्नतः ||८८||

तत्पृच्छानुगुणं लोके सुसिद्धं तन्निराकृतम् |
स्यात्सुसाधयिता स्वेष्टः स्वाध्यायस्तदुपाधयः ||८९||

तस्मात्पञ्चसुसिद्धान्तेषूक्तमार्गोऽवधार्यताम् |
धृतं मधुघ्नं विषवन्मधुनाज्यं विषं तथा ||९०||

सम्सर्गस्याविशेषेऽपि तथैतदनुमीयते |
मध्याह्ने विषुवत्यर्कस्तस्याक्षांशा नतांशकाः ||९१||

तन्नतात्पलभा चातःसाक्षच्छाया प्रकीर्त्यते |
चक्रलिप्तार्धवर्गस्य दशमं करणीपदम् ||९२||

व्यासार्धं तच्चतुर्विंशो ज्यार्धपिण्ड इतीर्यते |
बृत्तस्य षण्णवत्यंशोदण्डवद्यः समःस तत् ||९३||

प्रथमं ज्यार्धमेवैतद्वर्गोन करणीपदम् |
त्रयोविंशो ज्यार्धपिण्डः परखण्डान्तरं ज्ययोः ||९४||

द्विघ्नेष्टहीना खण्डज्या यत्रार्धेन्दुयुता न चेत् |
खण्डे शताधिके वेत्र वियद्वेदयुता तु चेत् ||९५||

खाद्रिनेत्रखखण्डा स्यादेष्यखण्डयुता सती |
स्वखण्डरहिता जीवा स्वात्पूर्वज्या तु मौर्विका ||९६||

प्रायोदशैव सन्त्यासां मध्यैकादशवर्जिताः |
हित्वा कुखण्डमूलानि तत्रान्याःस्युर्यथोदितम् ||९७||

यद्वास्यस्य भाज्ये ज्ये तत्र गुणषट्चन्द्रसंयुते |
द्वितीयभान्त्यजास्तिस्रो नगगोवह्निसंयुताः ||९८||

तत्पञ्चमी खखान्त्याद्या चेज्ज्या प्राग्वत्तत: स्फुटा |
इत्येतौ द्वौ च सामान्यौ मार्गौ नानागुणैर्युतौ ||९९||

विकृत्यधिकचक्रव्यासार्धमार्गस्य किञ्च यत् |
आद्यमार्गे त्रिभज्यार्धं प्रथमज्या न यद्भवेत् ||१००||

करणीपदपादो न करणी मुखमेव हि |
एकद्विभज्या द्वादशज्या करणीज्या पदं किल ||१०१||

एवं न स्यादाद्यमार्गे तत्सर्वानुगुणःस्फुटः |
वर्गो निरूप्यते प्रोक्ता त्रिज्या प्राग्वत्करण्यपि ||१०२||

चक्रस्य षण्णवत्यंशो विलिप्ताश्रयकोऽक्षतः |
प्रथमज्यार्धमेतत्स्याद्विकृतिज्या पुरोक्तवत् ||१०३||

द्विघ्नस्य खण्डहीनज्या नवाध्विनियुतां त्यजेत् |
तदाध्विद्वितयं व्योमवह्निनेत्रयुतं क्रमात् ||१०४||

यद्वात: खण्डसंशुद्धिलिप्ता योज्या क्रमाञ्चताः |
सप्तविश्वैर्नगाष्टाभीरसशैलैर्नगाद्रिभिः ||१०५||

अतिभृत्यावर्धिशैलैरसाम्भोनिधिभिस्तत: |
द्वितीयभान्ते या ज्यारव्या युगनेत्रेन्दुसंयुताः ||१०६||

तत्पञ्चमी सेभ सूर्या तच्चतुर्थ्यष्टशैलभाक् |
सेन्द्रा तत्र तृतीयाद्या द्वितीये द्वादशान्विते ||१०७||

आद्यभान्त्या खदृग्भागा विश्वाद्रिस्तु स्फुटाध्वनि
तत्सप्तमी खभेत्याद्या तत्षष्टी रदवर्जिता ||१०८||

तत्पञ्चमी चतुर्थी सा खात्यष्टिगोग्निसंयुता |
तृतीया विकला सा तत्फलं भूतिथिसम्युतम् ||१०९||

द्वितीया यत्फलं वेद विकलाद्यमथोक्तवत् |
सुस्फुटज्या विधिश्चात्रोत्क्रमज्याखण्डभेदनं ||११०||

ज्या त्वाभावानुलोम्येन सषड्वर्गान्यभाक्षभा
परखण्डफलं प्रोक्तं स्वखण्डात्स्वस्वपूर्वया ||१११||

इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते प्रथमोऽध्यायः

||द्वितीयोऽध्यायः||

आकर्षतःस्वसम्बन्धाद्भवतीति स्फुटस्थितिः |
मन्दोच्चाभ्यामर्कचन्द्रौ यदा मन्दफलं मुने ||१||

आकृष्येते एव तस्मान्मन्दकर्मैकमेतयोः |
चत्वार्यानयने द्वारौ परेषां द्वे तु तत्र हि ||२||

तत्कर्मणां चतुर्णां च क्रमःप्राक्सूचितो मुने |
ग्रहभुक्तेःफलं कार्यं ग्रहवत्तद्विलोमगे ||३||

फलव्यस्ते केन्द्रभुक्तिर्यदि वा त्रिज्यया हता |
तत्कर्णाप्ता स्वोच्चभुक्तेर्विशोध्या सा गतिःस्फुटा ||४||

ग्रहोच्चभुक्तियोगात्तु हित्वा केन्द्रगतिं स्फुटाम् |
शीघ्रोच्चभुक्तिशेषार्धं ग्रहकेन्द्रगतिर्यतः ||५||

शीघ्रोच्चभुक्तिरेकाहे तदैक्ये योक्तवद्गतिः |
शीघ्रार्धभुक्तौ तादृशां फलाध्याय ग्रहस्य तु ||६||

ग्रहापक्षेपणं चार्धं करणं तत्प्रकीर्त्यते |
ग्रहाणां भुक्ति रेवास्मिन्केन्द्रभुक्तिश्च भुक्ति मान्दयोः ||७||

स्फुटकेन्द्रगतिस्तस्मात्स्फुटभुक्तिर्ग्रहस्य च |
फलार्धार्धं तु मन्दार्धग्रहे भुक्तियुतार्धिता ||८||

सा भवेद्विद्यमानत्वात्केन्द्रभुक्तिर्विधोस्तु सा |
स्वोच्चभुक्तिर्भवेद्यत्सा प्रागुच्चेन्दुगतिस्ततः ||९||

अथवा केन्द्रभुक्तिःसा त्रिज्याकर्णान्तराहता |
कर्णाप्तार्धाख्येऽर्धिता च ग्रहभुक्तेर्धनं त्वृणम् ||१०||

कर्णे त्रिज्याधिकोने तु व्यस्तं मान्दे विधीयते |
उच्चैर्नीचैर्गते सूर्ये उच्चैर्नीचैर्ययुर्ग्रहाः ||११||

किञ्चित्तस्मात्फलं भानोस्तद्गत्या च तदा नतम् |
ग्रहभुक्तिहतं भक्तं चक्रलिप्ताभिरर्कवत् ||१२||

अर्कभुक्तिवदप्येवं ग्रहे कार्यं च तद्गतौ |
मध्यग्रहेषु चोच्चेषु तद्भुक्तिषु च तत्कृते ||१३||

आदावेवाखिलेष्वेवं कृतं यत्तद्धितं मतम् |
स्वोच्चैःस्वनीचैस्ताभ्यां स्वादन्यस्यैतद् द्वयं भवेत् ||१४||

अन्यस्यैवान्यदीयाभ्यां नातोऽर्कस्यैतदिष्यते |
क्रियते या दुराशङ्का ग्रहस्फुटविधिं प्रति ||१५||

सापरं हीयते पुत्र सांप्रतं तत्र तत्फलम् |
मध्यसंज्ञाग्रहाःपञ्चैवार्केन्दू नेति मध्यमौ ||१६||

यदि स्यात्तिथिसंबृद्धिःह्रासाभाव: प्रसज्यते |
तिथयःसावनाहानि भगणा: ह्रासबृद्धितः ||१७||

यदि स्युरधिमासो न रात्र्यभाव: प्रसज्यते |
शुक्रज्ञयोःकर्षकौ च शीघ्रा तदितरस्य च ||१८||

विक्षेपा न विकल्प्यन्ते फलहेतुर्न कल्पना |
अर्केन्द्वोरपि शीघ्रार्धमन्दार्धादिप्रकल्पना ||१९||

निष्फलत्वान्निरस्तैव महावायौ प्रधावति |
तिरोधानेन षडजादीन्वाद्यांश इव खेचरान् ||२०||

नुदति प्रवहश्चेति मार्गभेदादिदं न सत् |
कर्माणि यानि चत्वारि ग्रहस्यैवेति तानि च ||२१||

शीघ्रार्धं स्याच्छीघ्रफलं चतुर्थे द्विगुणं तथा |
मन्दार्धं स्यान्मन्दफलं तृतीयमिति नान्यथा ||२२||

किञ्चोच्चाभ्यां निरुक्ताभ्यामपकृष्ट: पुनस्तथा |
कल्प्यं चेत्पुनरप्येवं तथार्केन्दू च नारद ||२३||

ग्रहोपरि न शीघ्रोच्चमिति चेदुच्चताऽस्य न |
त्रिज्योनशीघ्रकर्णश्च सर्वदा मुनिसत्तम ||२४||

नाधःशीघ्रोच्च इति चेद् ग्रहस्तर्ह्यल्पगोऽस्तु सः |
अधःकक्षा कल्प्यते चेत्कक्षासौ तत्र कस्य वा ||२५||

तूष्णीं कक्षा कल्प्यते चेत्सर्वेषां तर्हि कल्प्यताम् |
निष्फलत्वान्न सर्वेषामिति चेत्कल्प्यतां फलम् ||२६||

निरर्थत्वात्कल्पनाया यथाकार्यं तु कारणम् |
कल्प्यते चेत्कल्पितं तन्मयैव न तु किं पुनः ||२७||

अतीन्द्रियार्थविज्ञाने प्रमाणं श्रुतिरेव हि |
यथाश्रुति मया दृष्टं यत्तदेवावबुध्यताम् ||२८||

मध्यमाःस्थायिनःसन्ति नेति चेन्मध्यमानुगाः |
ग्रहश्चतुष्कर्मवन्त इति यत्तन्निराकृतम् ||२९||

मध्यशीघ्रार्धमन्दार्धफलमेति तदाश्रयैः |
उपग्रहैश्चापकृष्टा मन्दोच्चैश्च ग्रहा ययुः ||३०||

इति चेन्मन्दभागे च नैवाकस्मादुपग्रहाः |
युज्यन्ते ते प्रकृष्टाश्चेदपकृष्टा ग्रहाश्च तैः ||३१||

इति चत्वारि कर्माणि ग्रहस्येव न तन्मतम् |
उपग्रहापकर्षेऽपि पूर्वमेवेदमुच्यते ||३२||

अतो मन्दार्धशीघ्रार्धा न सन्तीति हि नोच्यते |
असत्वेऽन्यतरस्यापि ग्रहयोरर्धसंज्ञयोः ||३३||

एकापकर्षणं कल्प्यं ग्रहस्यापि तथा पुनः |
उपग्रहा न सन्तीति यदि ब्रूयाच्चतुष्टयम् ||३४||

कर्मणां स्याद् ग्रहस्यैव सन्ति तस्मादुपग्रहाः |
अर्धाख्येनापकृष्टश्चेन्नोच्चैर्नीच्चैर्यथा तथा ||३५||

उपग्रहोऽपकृष्टःस्यात्सग्रहस्तेन चेदिति |
नैवमर्धग्रहस्थानज्ञानमेव तथोच्यते ||३६||

स्वच्छन्दगमनं तद्धि किं तूच्चैरुच्चनीचता |
अर्धाख्यस्त्वपकृष्टश्चेदपकृष्ट उपग्रहः ||३७||

ग्रहश्चाप्यपकृष्टःस्यात्तदभावान्न तद्भवेत् |
विक्षेप्यौ च न चेद्धर्मौ पाताभ्यां शुक्रचन्द्रजौ ||३८||

विक्षेप्यैस्तां तथा क्षेपलिप्ताश्चेन्न स्फुटास्वदिक् |
अपकृष्टैर्ग्रहैःसाकं कर्षका यान्ति यत्ततः ||३९||

तेऽपकृष्टा: स्वमन्दोच्चै: पातास्तैश्च ततःफलम् |
तृतीयमपि पातानां ग्रहवन्नेति कल्प्यताम् ||४०||

तस्मान्मन्दार्धमन्दोच्चमध्ये यावदुपग्रह: |
याति यद्दिशि तावत्येवास्ते तद्दिशि मध्यमात् ||४१||

स्वच्छन्दगःकर्षकस्तु क्षेपश्चलनमन्यथा |
शीघ्रोच्चावेव शीघ्राख्यौ बुधशुक्रौ न चेतरौ ||४२||

इति चेत्तादृगुच्चाभ्यां ग्रहस्थानं च बुध्यताम् |
याम्योत्तरगती यद्वदुत्क्रमाद्भास्करस्य च ||४३||

तथैवानपकृष्टानां गतेराधिक्यमल्पता |
ग्रहाकर्षकद्वस्तु किं न चेदित्युपग्रहै: ||४४||

स्वच्छन्दगमने तेषां मन्दोच्चाःकल्पिता बृथा |
मृषावादी च वेद: स्यात्तत्सर्वानर्थकारणम् ||४५||

मन्दार्धाद्यो यद्दिशि च याति तन्मध्यमो ग्रहः |
यावन्ति कल्पे मन्दार्धा यो गच्छेत्सोऽप्युपग्रहः ||४६||

स नास्ति यस्य गमनं कल्पजं गमनं न च |

मन्दस्फुटाद्रोमशे हि सोमे च क्षेपसाधनम् ||४७||

कीर्तितं तत्कर्षकाःस्युर्न सम्बन्धान्तरं क्रमात् |

सूर्यरोमशसोमेभ्यो यथा लम्बग्रहा इह ||४८||

कल्पिताःस्युःसनामानो भिन्नसंज्ञास्तथैव च |

मन्दापकृष्टैर्मन्दाख्या ग्रहैर्देवा ययुःसह ||४९||

विक्षिप्यन्ते च पातैस्तैस्ते ग्रहा इति कल्प्यताम् |

इति चेत्कर्षकाणां तु प्रोक्तं नामान्तरं भवेत् ||५०||

त्यक्तं श्रुतिकृतं नाम नैतदप्यस्ति पौलिशे |

ग्रहैःकृतं यत्तत्पाते कृते नेति च वर्तते ||५१||

सोमरोमशयोःपाताःशोध्या मन्देभ्य ईरिता: |

शुक्रज्ञपातयोर्वामक्रमणं सूर्यकीर्त्तितम् ||५२||

त्रितीयेऽस्य न चेदिष्टं तत्तवाप्यस्ति दूषणम् |

श्रुत्यन्तरविरोधस्तु पौलिषेऽत्र च गम्यते ||५३||

तद्वास्य गमनं तावन्निर्णीतं च सहेतुकम् |

उपग्रहनिमित्तं वा न तावत्प्रथमक्रम: ||५४||

यथेष्टकल्पनापत्तेर्द्वितीय: कल्प एव चेत् |
पातमन्दोच्चमध्येन फलं साध्यं न तन्मतम् ||५५||

कल्पतृतीयश्चेदुच्चैर्नापकृष्ट उपग्रहः |
अश्वेनेव रथं पातमाकर्षति न वा स तम् ||५६||

स्तम्भच्छाया दीपवच्चेन्न मन्दोच्चोऽत्रकारणम् |
परस्परं भचक्रार्धपातोपग्रहसञ्चरः ||५७||

वामं निष्कारणं यातीतीयं वा कल्पना सती |
स्वोच्चादुपग्रहाद्वापि नाक्स्माद्धि तदिष्यते ||५८||

सहेतुकं कल्प्यमानं कल्प्यते न तु हेतुकैः |
मन्दोच्चैर्नापकृष्टस्तु यावत्व्रजति भास्करः ||५९||

तेनाकृष्टा ग्रहस्तावत्ते तथोपग्रहैर्ययुः |
भृत्यैस्तत्क्रियते कर्म स्वामिना क्रियते हि यत् ||६०||

प्रत्यक्प्राग्बहिरन्तर्वा तद्ग्रहोऽर्कसमं व्रजेत् |
इति चेन्नैतदिष्टं स्याद्भोगादावधिकं नृपः ||६१||

सेवादावधिकं भृत्या वर्तन्ते न हि तत्समाः |
यावान्यस्याधिकार: स्यात्तावत्तस्य प्रवर्तनम् ||६२||

सर्वचक्राधिप: सूर्य इयद्याति स्वभुक्तित: |
इयद्यातीति युक्तिःस्याद्राजानुचरक्लृप्तितः ||६३||

श्रुतिर्यत्र प्रमाणं स्याद्युक्तिःका तत्र नारद |
जिज्ञासोर्युक्तिरिष्टास्ति यदि श्रुत्यनुसारिणी ||६४||

श्रुत्युक्तेष्टतरा युक्तिर्नान्यद्बाधेत यच्छुतिम् |
कृत्वादौ मन्दकर्मान्ते क्रियते शीघ्रकर्म यत् ||६५||

तस्मान्मन्दापकृष्टःप्राक्शीघ्रेणायोऽपकृष्यते |
किञ्चित्किञ्चिद्विलम्ब्यैव इति चेदपकर्षति ||६६||

नैतदेवं यदेवं चेद्गतिर्नानाविधान्वहम् |
बिम्बं च सममर्कस्य तद्वदेतदभावत: ||६७||

ननु बिब्माल्पताधिक्यं खमध्ये क्षितिजेऽन्वहम् |
इति तु क्षितिजे ब्रह्माण्डांशवो न ह्यधो भुवः ||६८||

पूर्णकृष्णांशवस्तस्माद्दृशःप्रतिहते महत् |
बिम्बं भृभाभिसंछन्नं खतवर्णं च दृश्यते ||६९||

असंमुखत्वान्मध्यात्स पार्श्वाद्यं खखरत्वत: |
स्तोकस्तोकेन भूरश्मिह्रासे चण्डांशुदर्शनात् ||७०||

दृष्टिप्रतिहते बिम्बं क्षीयमाणमिते गते |
आरात्खमध्ये चण्डांशुरश्मि: प्रागल्भ्यते भुवः ||७१||

रश्म्यभावाच्च पादोनं क्षितिजादिव दृश्यते |
त्रिभिश्चतुर्भिःक्षितिजे खमध्येऽथ कलाहृताः ||७२||

अङ्गुलानि भवन्त्यस्मादित्युक्तं हि महर्षिभिः |
भूमिकक्षाचतुर्भागे स्वास्थितस्यात्मनस्तु य: ||७३||

क्षितिजस्थ खमध्यस्थ इत्येवासौ पुरोदितः |
तिस्रश्चतस्रस्ता लिप्तास्तदानीमङ्गुलद्वये ||७४||

दृश्यते महदेकेन बिम्बमन्येन वान्यथा |
एकस्मिन्दिवसे तस्मात्बिम्बाधिक्याल्पता न हि ||७५||

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त्रिचतुःकर्णर्यगार्धं स्फुटकर्णोऽस्य मस्तके |
ग्रहश्चरत्यतःकिञ्चित्विलम्ब्याकर्षणं न हि ||७६||

उच्चद्वयानुगुण्येन ग्रहो यद्यपि सञ्चरेत् |
तथापि युगपत्कर्मद्वयं न क्रियते यतः ||७७||

तथा नीताग्रहास्तद्वद्दृश्यन्ते नैव वै ततः |
उपदेशक्रमोऽप्येवं स च कर्मद्वयक्रम: ||७८||

यावता सोऽधिकःकर्णस्तावतार्धेन तादृशी |
त्रिज्यातःस्फुटकर्णोऽपि नार्थसिद्धेःसवर्जित: ||७९||

उपग्रहाणां यज्जातकक्षा सिद्धिर्ग्रहस्य तु |
सुतरां मन्दशीघ्राख्ये कर्मणी कथिते क्रमात् ||८०||

उच्चैर्नीचैर्ब्रजन्ते वार्कानुरुपं समश्रव: |
मध्यकर्णस्ततःकर्णान्तरत्वं याति तन्मुने ||८१||

अन्तरुन्नतबृक्षाश्च वनप्रान्तस्थिता इव |
दूरत्वाच्चन्द्रकक्षायां दृश्यन्ते सकलास्तथा ||८२||

भौमार्किबुधजीवानं त्रिंशदम्भोधिवर्धिता: |
विष्कम्भाश्चन्द्रकक्षायां षष्टिःशुक्रस्य कीर्तिताः ||८३||

त्रिज्याघ्नाःस्फुटकर्णाप्ता विष्कम्भास्ते स्फुटाः |
तिथ्याप्ता बिम्बलिप्ताःस्युरङ्गुलानि पुरोक्तवत् ||८४||

कक्षाश्च भगणामानं विधोरिच्छेतरस्य तु |
विष्कम्भ: फलमस्येति विष्कम्भःपारमायिकः ||८५||

तथार्कस्य स्वकक्षायाम्विष्कम्भ: खखपञ्चषट् |
षष्टिरष्टाहताराज्ञस्तथा बिम्बस्य नारद ||८६||

निजमण्डलबिष्कम्भःस्वकक्षायां फलं विधो: |
कक्षेच्छामानमन्या वा मानेच्छा भगणौ द्वयोः ||८७||

इतीन्दुमध्यकक्षायां विज्ञेयं बिम्बयोजनम् |
कक्षा वा भगणा मानमित्येवेच्छाधिकेन तु ||८८||

अर्केन्दुमण्डलव्यासौ स्फुटभुक्तिहतौ तयोः |
मध्यभुक्त्युद्धृतौ स्पष्टौ प्राग्वल्लिप्तास्तदङ्गुलम् ||८९||

दूरस्थत्वात्तु बिम्बस्य सौक्ष्म्यं स्थौल्यं प्रकल्पितम् |
लोकदृष्ट्या यथाद्रेःस्वस्थाने नित्यं समात्मनः ||९०||

अर्ककक्षेन्दुकक्षाप्ता सूर्याबिम्बश्रुतिर्यतः |
इन्दुबिम्बश्रवाप्ताया क्रोशो नावा न वा ततः ||९१||

अर्केन्दुकक्षा व्यासार्धे तद्विष्कम्भाववेहि ते |
तन्मध्यभुक्तिगुणिते स्फुटभुक्त्युद्धृते स्फुटे ||९२||

भानोर्भार्धे महीच्छाया महत्वान्मण्डलस्य तु |
अर्कस्य भूम्याःसुच्यग्रमानं शेषमिलार्कयोः ||९३||

असङ्कुचितशुद्धार्ककक्षाव्यासदलं फलम् |
भूकर्ण इच्छाछायाग्रं ततो लिप्तास्तदङ्गुलम् ||९४||

अर्केन्दुकक्षाव्यासार्धे स्फुटे संकुचिते क्रमात् |
मानेच्छा फलमार्के लावेषं प्रोज्झयतःफलम् ||९५||

भूकर्णादिन्दुकक्षायां छायाव्यासस्तदा तनम् |
युक्त्या कालाङ्गुलं वक्ष्ये युक्त्यन्तरमतिस्फुटम् ||९६||

भूछाये लागतस्याथ तरणिभ्रमणे विधोः |
सूचीमध्यमकक्षायां कियतीति महीश्रवः ||९७||

स्फुटेन्दुभुक्तिघ्नो भक्तो मध्यमा च समं फलम् |
स्फुटार्कचन्द्रकर्णान्तं फलमर्कमृगाङ्कयोः ||९८||

मानेच्छा मध्यकर्णास्तु प्रोज्झ्यसुच्यापि भाश्रवः |
तिथ्या कलायासन्त्येवमेतदर्धं विधोः श्रवः ||९९||

मध्यमिच्छाधिकाल्पार्कबिम्बाभ्यां तादृशं त्वृणम् |
मध्यार्कश्रवणे माने तथा स्यादिति तन्मतम् ||१००||

तथा स्फुटार्ककक्षायां व्यासार्धेनाधिकेन वा |
अधिकाल्पमृणं मानेनाधिकल्पेऽर्कमण्डले ||१०१||

परिध्यंशहतो बिम्बव्यासो बिम्बश्रवो भवेत् |
उच्चेन समं येन योऽपकृष्येत्स तत्समः ||१०२||

योऽत्यल्पउच्चो नीचाल्पःस्वबहुस्वल्प एव च |
तेनापकृष्यते स्वर्णं महदल्पं बहुस्वतः ||१०३||

उच्चैर्नीच्चैर्गते स्वोच्चपरिध्यंशाः स्वभावतः |
अल्पाधिका यथाशक्ति क्षेपाः मातैस्तथेदृशैः ||१०४||

स्यादेतच्च फलं कर्णे शैध्येऽल्पा गतिरन्यथा |
अधिकाल्पाधिका भुक्तिरुच्चैर्नीचैर्गतस्य हि ||१०५||

त्रिज्याधिकाल्पे यदि तु बहिश्चरति स ग्रहः |
स्वतःशीघ्रानभिमुखं मान्दं तु क्वचिदस्ति हि ||१०६||

मैवं यदि स्यादेवैवं स्यात्पूर्वापरमार्धयो: |
उच्चैर्ग्रहस्त्वृणधनं वा यद्येतत्फलं क्रमात् ||१०७||

यदा स्याद्विकला भुक्तिस्तदा यातु भूमण्डलम् |
ग्रहंप्राग्गतिहीनं वा प्राक्प्रत्यग्गतिवद् ग्रहात् ||१०८||

सर्वोच्चपातान्पातीति ब्रह्माण्डं वै तु नारद |
प्रतिपादयितुं शक्या वक्रता न यतःपरम् ||१०९||

प्राग्गतिर्नास्ति यन्नास्ति केवलं तु न कारणम्। |
शनिमन्दात्परं चेत्को हेतुःखेटोऽप्यदर्शनात् ||११०||

वक्रता चाधिकगताविव कल्प्यो यदि ग्रहः |
गतिरन्यानुरूपा सा भूयसीति न कीर्त्यते ||१११||

उच्चैर्नीचैर्गतस्याधिकाल्पकर्णेन सूक्ष्मता |
स्थौल्यं बिम्बस्य चातो हि प्रसज्यते मुनीश्वर ||११२||

हानिबृद्धिगतेनैव युक्तियुक्तं यदीरिते |
उभयोरक्षिसिद्धे ते तन्मे निगदतःशृणु ||११३||

उच्चाख्यं प्रोज्यकेन्द्रं तद्गतगम्यान्तरं तयोः |
यदि कल्प्येत दोःकोटी तदा बाहुःप्रसज्यते ||११४||

गतात्भुजज्या विषमे गम्यात्कोटिःपदे इति |
युग्मभावाद्गतैष्याभ्यां कोटिबाहु युजीति च ||११५||

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लिप्तास्तत्वयमैर्भक्ता लब्धं ज्यापिण्डका गताः |
गतगम्यान्तराभ्यस्तं विभजेत्तत्वलोचनैः ||११६||

तदवाप्तफलं योज्यं ज्यापिण्डे गतसंज्ञके |
इत्येवं नैव विचरन्सदा ज्यापिण्डशक्तितः ||११७||

गतज्याभावतस्त्विन्दोश्चतुर्थीज्या सदा भवेत् |
एवं संवर्तमानायां तच्चतुर्थी गता ह्यपि ||११८||

न तात्कालिकसिध्यै स्याद्वर्तमाना यथा स्वतः |
इष्टनाडीहता केन्द्रगतिः षष्ट्यौद्धृतापि सा ||११९||

बाहुकोटी ज्यान्तरघ्नेतत्वनेत्रैस्तयोः फले |
प्रत्यहं वर्धमानत्वाच्छीघ्रकेन्द्रस्य वर्धते ||१२०||

बाहुरोजपदे युग्मे क्षीयते कोटिरन्यथा |
प्रत्यहं क्षीयमाणत्वान्मन्दकेन्द्रस्य वर्धते ||१२१||

कोटिरोजपदे युग्मे क्षीयते बाहुरन्यथा |
तद्वत्तद्ग्रहवच्चास्य फलं ग्रहफलोदितम् ||१२२||

धनाख्यमन्यद्धीनाख्यं धनाख्यं ग्रहवद्गतौ |
ऋणाख्यमन्यथा प्रोज्झ्य बहुभुक्तिं गते फलात् ||१२३||

ज्यान्तरघ्ना गतिर्यद्वा दोःकोटिज्याथ दृक्क्वचित् |
व्यंशत्र्यंशादिभिर्मन्दे त्रिचन्द्रायैर्हता हृता ||१२४||

शैघ्ये त्रिभज्यया तुल्या दोर्ज्या चेत्क्षीयतेऽन्वहम् |
वर्धन्ते स्फुटबृत्तांशास्तथा व्यस्तास्तु नान्यथा ||१२५||

तद्व्यस्तं जीवशन्योस्तु शैध्येयुक्तिश्च सैव हि |
स्फुटबृत्तान्तरहते दोःकोटिज्ये ग्रहस्य तु ||१२६||

गतार्धं स्फुटबृत्तघ्नं बाहुकोटिज्ययोर्धनम् |
वर्धमाने परिध्यंशे क्षीयमाने ऋणं मुने ||१२७||

गत्यर्था बाहुकोटिज्या ग्रहार्था वर्धते यदि |
धनात्मिका क्षीयते चेदृणरूपेति सैव च ||१२८||

निश्चित्य फलजान्योन्यैःकृत्वायोगान्तरं मुनेः |
भगणांशैर्बाहुकोट्योःफलजे तां विभज्य च ||१२९||

ग्रहभुक्तेर्दोःफलज्या वर्गान्तरमितीरिता |
कर्णदोःफलजावर्गैर्नाडिका यावता भवेत् ||१३०||

गतेःकोटिफलज्या तु द्विधा स्यात्तावता हता |
कर्णयोर्बहुबृद्धौ तु स्वल्पायां गतिखेटयोः ||१३१||

ग्रहदोःफलजा वर्गं यावतो नाधिकं व्रजेत् |
यावद्वर्गो गतिःकर्णस्तावत्येव न संशयः ||१३२||

तां तु वर्गान्तरात्कर्णो दोःकोटिज्यां विशोधयेत् |
क्षीयमाणे वर्धमाने तूभाभ्यां तद्वये धनम् ||१३३||

कूर्याद्यथोक्तनिष्पन्नकर्णबाहू यथा तथा |
वर्धते क्षीयते चापि मृगात्कोटिफलेन च ||१३४||

कर्क्यादि केन्द्रे तद्व्यस्तं चलकर्णस्तथा कृतः |
कर्णे कक्षागते कोटिफलमौर्व्यां महामुने ||१३५||

छेदोऽसौ द्विगुनस्तेन स्वच्छेदासफलेन च |
दोः फलानुगुणश्चेन्दोःस्वकादूनाधिको भवेत् ||१३६||

स्थिरीकृतफलेनैव कर्णःकल्प्यःस्फुटःकृतः |
गत्यर्धं चलकर्णे स्यात्त्रिज्या दोःफलजावधे ||१३७||

ग्रहबाहुफलज्या तु कर्णान्तरहतोत्तरा |
स्वमूलाधिककर्णेन ग्रहकर्णविवारिणा ||१३८||

ऊनाधिका गुणस्तादृक्फलं यत्तच्छिदान्यथा |
स्वकाभ्याम्बृत्तकर्णाभ्यां ग्रहात्सिद्धाद्ग्रहं मुने ||१३९||

तत्पूर्वकालिकं हित्वा भुक्तौ सत्यांगतेःफलम् |
तादृक्स्यादिति संस्कारो बृत्तात्कर्णादिहाधिकः ||१४०||

निष्पन्नराशेःकर्णेन गतिर्दोःफलमौर्विका |
ज्यां प्रोज्झ्यातत्वयमलैर्हत्वातद्विवरोद्धृतम् ||१४१||

सङ्ख्या तत्वाश्विसंवर्गे संयोज्य धनुरुच्यते |
इति क्रिया यदा तत्र तत्वाश्विभ्य: फलं लघु ||१४२||

यज्ज्याखण्डफलं यावत्तावत्तत्वाश्विसंगुणम् |
तज्ज्याखण्डोद्धृतं भुक्तेःफलं लिप्तादिकं स्फुटम् ||१४३||

यथा ग्रह फलं यत्र तद्भुक्तौ च गतेःफलम् |
तथान्यथा त्वृणफलं वक्रभुक्तिस्त्वृणाधिके ||१४४||

भुजज्या क्षीयमाणत्वादत्यल्पं श्रवणस्य च |
परार्धादौ महदृणं पूर्वाहादुत्तरे दिने ||१४५||

अतो वक्रानुवक्रेति परपूर्वार्धयो: क्रमात् |
प्रत्यग्गतेर्हानिबृद्धी वक्रोत्था त्वन्वहं गतौ ||१४६||

मन्दमन्दार्धयोःकर्णःस्याच्छेदत्वादवक्रता |
अर्धितत्वात्फलस्यैव शीघ्रार्धे मुनिसत्तम ||१४७||

दूरस्थित: स्वशीघ्रोच्चाद्ग्रह:शिथिलरश्मिभिः |
सव्येतराकृष्टतनुर्वक्रभुक्तिर्भवेदिति ||१४८||

नाकृष्यन्ते हि शीघ्रार्धादाकृष्यन्ते ग्रहा इति |
विशेषोऽस्तीति चेन्नित्यं तत्तद्भावप्रसक्तित: ||१४९||

अर्धितत्वात्फलस्यैवमित्युक्तं कारणं त्विह |
इति चेद्वक्रभुक्तिश्च किं न स्यात्तादृशी सखे ||१५०||

अतो न रश्मिशैथिल्यं वाङ्मात्रा रश्मयःकिल |
चुंबकभ्रमकन्यायेनोच्चाभिमुखमेव च ||१५१||

स्वयं याति ग्रहो भुक्तिस्तत्फलानुगुणा भवेत् |
उपचारं सर्वमन्यन्मुख्येयमिति हि स्थितिः ||१५२||

शीघ्रवृत्तांशानुरूपं विप्रकर्ष: प्रकल्प्यते |
शीघ्रञ्चात्सप्तमे भौमःशुक्रो ज्ञेयस्तथाष्टमे ||१५३||

शनैश्चरस्तु नवमे वक्रिणस्ते त्ववक्रिण: |
षष्ठे च पञ्चमे तद्वच्चतुर्थे मुनिसत्तम ||१५४||

अष्टौबिंशतिरर्धोनगजाग्निव्यर्धखेषव: |
त्रितर्काःसत्रिभागाद्रिरसाङ्का: सष्टशतम् ||१५५||

नवाशा नवसूर्याश्च वेदेन्द्राः शरबाणभूः ।
खात्यष्टिः खधृतिर्गोऽतिधृतिर्विश्वाश्विनस्तथा ॥१५६॥

वेदाकृतिर्गो द्विदस्राः क्वब्धिहस्ता युगार्थदृक् ।
खोत्कृतिस्त्र्यंशहीनागरसहस्ताःखादन्ति दृक् ॥१५७॥

खगोऽश्विनः खदन्ताःषड्दन्ताःशैलगुणाग्नयः ।
मेषाद्यश्वयादि मध्यांशाःषड्शोनाःखषड्गुणाः ॥१५८॥

द्वित्रिषट्पञ्चवह्नीन्दुद्वित्रिपञ्चार्थदृक्शराः ।
शरेन्दुभूद्विवह्नित्रिगोऽब्धिवेदत्रिवह्नयः ॥१५९॥

शराःशतं द्विद्विरदास्तारासङ्ख्याः स्युरश्विभात् ।
पुनर्वसोरुत्तरर्क्षे दक्षिणर्क्षे च नारद ॥१६०॥

प्राङ्मात्रमपि वाश्विन्यां सहायमुपकारणे ।
अश्वयोनिक्षुरप्रख्यं शकटैण शिरोनिभम् ॥१६१॥

माणिक्यगृहबाणाभं चक्रप्राकारसन्निभम् ।
द्विपर्यङ्कनिभं हस्तमुक्ताविद्रुमसन्निभम् ॥१६२॥

तोरणं वलिसङ्काशं कुण्डलं सिंहपुच्छवत् ।
गजकर्णाकृतिःकर्णःशृङ्गाटकनिभोऽभिजित् ॥१६३॥

अश्विन्यामुरजाभं तु द्वे मूले ह्यन्यादार्थिकम् ।
आषाढद्वितयं चैव योगताराथ वक्ष्यते ॥१६४॥

उत्तरा द्विभसोम्यानां मध्यमा त्रिभमेव हि ।
ब्रह्मादित्यभदैत्यानां प्राची हस्तस्य वायवी ॥१६५॥

सा पश्चिमा तद्द्वितीया श्रविष्ठायाश्च पश्चिमा |
पितृपौषयमाग्नीनां श्रवणाभिजितोस्तथा ||१६६||

मूलार्द्रा सार्धसप्तांशो स्वस्थानात्प्रागवस्थिता |
दृश्यते यस्य तस्यास्ति न स्वप्नेऽपि शिवस्मृति: ||१६७||

यत्र यावस्तु विक्षिप्तास्तारा अंशेषु वेधसा |
मयैव तत्र तावन्तो विक्षेपांशा उपग्रहाः ||१६८||

द्विदेवात्षट्त्रयं स्रष्टुस्त्वष्ट्रार्का हि प्रचेतसः |
स्वक्रान्तेर्दक्षिणस्थानात्तदन्येभ्यस्तथोत्तरे ||१६९||

आशार्कापञ्चबाणाशा नवषट्खाद्रिखांशुमान् |
विश्वेशहस्तसप्ताग्निरध्यर्धत्रिकृतान्तकाः ||१७०||

व्यर्धत्तर्का: शराःषष्टिस्त्रिंशत्षट्त्रिंशदेव हि |
अध्यर्धकृत्युत्कृतिःखं विक्षेपांशाःस्युरश्विभात् ||१७१||

क्षेपार्धांशो वारुणस्य छायाया भिन्नमङ्कतः |
विक्षिप्तो दक्षिणेऽशीत्यामगस्त्यो मिथुनान्तगः ||१७२||

मिथुनांशे मृगव्याधो विंशे याम्ये नभार्णवे |
हुतभुग्ब्रह्महृदयौ बृषे द्वाविंशभागगौ ||१७३||

अष्टाभिस्त्रिंशता चैव विक्षिप्तावुत्तरेण तौ |
पूर्वास्यां ब्रह्महृदयात्पञ्चांशैस्तु प्रजापतिः ||१७४||

सौम्येऽष्टत्रिंशदंशैस्तु निर्देश्यःसर्वदा मुने |
उत्तरेऽशैरपांवत्सश्चित्राया: पञ्चभिस्तथा ||१७५||

आपस्ततोऽधिकःस्वल्पं षड्भिरंशैस्तदुत्तरे |
यदैवादौ तदान्यस्मिन्ज्ञाते तारागणेऽपिच ||१७६||

फलाभावान्न तं सर्वमुत्सहे कथितं मुने |
युगादौ विष्णुतारायाःऋतुर्भाद्यैः समाहितः ||१७७||

प्राच्यात्रिहस्तैःपुलहःपुलस्त्योऽतो दशांशकैः |
अत्रिस्ततस्त्रिभिर्भागैरङ्गिरा ह्यष्टभिस्ततः ||१७८||

वसिष्ठः सप्तभिस्तस्मान्मरीचिर्दशभिस्ततः |
प्रत्यब्दं प्राग्गतिस्तेषामष्टौ लिप्ता मुनीश्वर ||१७९||

बाणार्था भूशराः खार्थाःषड्बाणाःसप्तसायकाः |
षष्टिर्नभोरसास्तेषां विक्षेपांशाःस्युरुत्तरे ||१८०||

क्वचित्क्वचिदकस्मात्ते भगवन्नुत्तरे चराः |
खखनक्षत्रवर्षाणि तिष्ठन्ति मुनिवल्लभाः ||१८१||

कालान्तरेण तज्ज्ञानं स्वयं युक्तिमतो भवेत् |
कर्क्यादिस्था मृगादिस्थाःसृष्टेरुदग्वाङ्मुखाः ||१८२||

प्रत्यब्दं यान्ति याम्योदग्गमने विहितेऽपि यत् |
तत्पश्चाच्चलितं चक्रमुपचारोऽयमित्यपि ||१८३||

तत्तत्पश्चाल्लवक्रान्तिप्रसङ्गादद्रिदृग्लवाः |
ततोऽन्यथाथ प्रत्यब्दं किञ्चित्किञ्चित्व्रजन्त्यपि ||१८४||

तत्तत्प्रागशकक्रान्तिप्रसङ्गेऽपि निजास्पदात् |
पश्चिमांशक्रमप्राप्तेःप्राक्चक्रं चलितं न हि ||१८५||

यावत्सृष्ट्यादिनिर्दिष्टस्थानं तावत्प्रयान्ति ते |
आद्यैवं चरतां तेषामन्तरांशास्तदास्पदात् ||१८६||

तत्तत्प्रागंशकक्रान्तिप्राप्तेःस्वात्प्राग्लवस्य च |
प्राक्चक्रं चलितं चेति नारदैवोपचर्यते ||१८७||

प्रागंशकक्रमप्राप्तेःप्राक्चक्रं चलितं भवेत् |
प्राक्पश्चाच्चलनांशोनःस्वांश: स्याद्भास्करादिषु ||१८८||

क्रान्तिकालांशलग्नानां लम्बनं द्युगतं द्वयोः |
स्फुटार्थमयनार्थे च प्रत्यहं द्युदयास्तयोः ||१८९||

यद्दिने यस्य या कक्षा तत्र तेषां प्रबृत्तितः |
इत्येतदेकं चलनं प्राग्युगे तानि षट्शतम् ||१९०||

युक्त्यायनग्रहस्तस्मिंस्तुलादौ प्राक्चलं भवेत् |
यद्वा तच्छुद्धचक्रे वा मेषादौ प्राक्चलं भवेत् ||१९१||

अयनांशस्तद्भुजांशास्त्रिघ्नाःसन्तो दशोद्धृता: |
प्राक्प्रत्यक्चलनं चक्रस्यैवेति मनुते तु यः ||१९२||

चलांशसंस्कृतस्तस्य ग्रह एव स्फुटग्रहः |
अनभ्युपगमादेतस्योपचारश्च चेदिति ||१९३||

दोर्ज्या त्रिज्या क्रान्तिजीवा चेत्सप्ताङ्कगुनेन्दव: |
चापक्रान्तिरुदग्याम्या चक्रपूर्वापरार्धयो: ||१९४||

सा तुल्यभिन्नदिक्क्षेपयुतोना स्यात्स्फुटा च दिक् |
एवोभयोरधिकदिङ्न्यायोऽयमितरत्र च ||१९५||

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रक्षोगणत्वात्पातानामपसव्यं युयुर्ग्रहाः |
प्राक्पश्चार्धगतःपातो ग्रहात्भ्रामयति ग्रहम् ||१९६||

याम्योत्तराशाभिमुखं केन्द्रदोर्ज्या च पूर्ववत् |
क्रान्तेःपूर्वे वा परार्धे याम्यक्षेपो यदेष्यति ||१९७||

पातं संशोध्यापकृष्यात्केन्द्रदोर्ज्यां च विद्धि भोः |
दोर्ज्या त्रिभज्या चैकाशीत्यंशकाःपरमं ययुः ||१९८||

विक्षिप्यते राहुणा तु दोर्ज्या क्रान्तिलवाश्रया |
तन्नवांशं द्विगुणितं जीवस्त्रिगुणमुर्विजः ||१९९||

बुधशुक्रार्कजाःपातैर्विक्षिप्यन्ते चतुर्गुणम् |
दशघ्नत्रिघनाङ्कार्करसार्कार्कहतस्य च ||२००||

बिम्बस्य पातबिम्बत्वात्क्षेपस्तद्धनुरुच्यते |
त्रिगुणास्त्वंशकैर्भक्तास्त्रिज्यार्धं बिम्बयोजनम् ||२०१||

दस्रादीनां स्फुटं नास्ति स्फुटं ताराग्रहस्य तु |
इन्दोरपि समीपत्वान्नैवं स्याद्बिम्बयोजनम् ||२०२||

रूपसाम्यात्समीपत्वादन्येषां भगणस्य च |
समानन्यायतापत्तिःकक्षाभेदान्न सा सती ||२०३||

अपक्रमास्त्वक्षेपान्ते दृश्यन्ते खेचरा यतः |
क्रान्तिमित्यपुरःक्षेपं पश्चादेतीति चेत्ततः ||२०४||

उभयानुगुणं शुद्धक्रान्त्यन्ते खेचरो ब्रजेत् |
नान्यथापत्तिरित्येवं प्रोक्ता शङ्का निरास्पदा ||२०५||

दोःकोट्योरिष्टजीवोना त्रिज्यान्या क्रमामौर्विका |
चक्रक्रान्तिमहीकक्षामानेच्छाफलमित्यतः ||२०६||

व्यक्षाग्रहस्याधस्थानं क्रान्तिदिक्कं विनिर्दिशेत् |
तस्मिंश्चक्रविशालार्थं क्रान्तिकोट्युत्थमौर्विका ||२०७||

स्वाहोरात्रार्धकर्णःस्याद्दिनव्यासदलं मुने |
स्वाहोरात्रार्धमित्यार्यैरुच्यते नामभिस्त्रिभिः ||२०८||

क्रान्त्यैति यावत्तावत्तु व्यक्षादोजपदोत्थया |
तन्मेरुमध्यात्तावन्ति स्याच्चक्रार्धस्य तावती ||२०९||

यावती युगपत्क्रान्तिस्तावती रात्रिरुच्यते |
अन्यद्दिवात्र तन्मेरुःपरो मेरुरितीरितः ||२१०||

मेरुभ्यां भूमिकक्षायां भागे पञ्चदशे मुने |
विलोमेनायनान्ते तु सुरासुरविभागयोः ||२११||

नाडीषष्ट्या सकृदहर्नाडीषष्ट्या सकृन्निशा |
तदन्तरे मर्त्यलोके क्षयबृद्धी दिवानिशोः ||२१२||

तथैव घटिकाषष्ट्या ते यत्सर्वं यथोदितम् |
दारुभिर्विषुवत्कक्षा क्रान्तिकक्षा उभे अपि ||२१३||

आधारकक्षे क्षितिजं मण्डलं पञ्च वै समाः |
राश्यन्तकक्षाःषट्तिस्र उदक्तिस्रस्त्वपागतिः ||२१४||

कृत्वा तद्वद्दिनव्यासदलैर्बध्वा यथोचितम् |
आधारकक्षयोर्योगो ध्रुवयोःस्थानमत्र तु ||२१५||

रथचक्रबिले मेरुर्दण्डद्वीपाद्रिसागरैः ।
नदीभिःपट्टनवनैर्भूगोलेन युतेन च ॥२१६॥

क्रान्तिकक्षाश्चतुःषष्टिस्तदाबृत्तेन सर्वतः ।
मध्योन्नतं प्रसार्याग्रे उभयत्र विनिर्गतम् ॥२१७॥

यथा ध्रुवौ ध्रुवसमौ स्तम्भयोःस्थापयेत्दृढम् ।
अष्टभिर्मध्यकक्ष्याद्यैर्ध्रुवद्वयगतैरपि ॥२१८॥

विभज्य गोलं द्वादशधा मेशादीन्निर्दिशेत्समाः ।
तुलमेषादितःकर्किमृगादि च लवद्वयोः ॥२१९॥

तन्मुखाधारकक्षायां योगकक्षां प्रवेशयेत् ।
क्रान्तिसंज्ञा तिर्यगेवं तुलामेषादितःसुत ॥२२०॥

स्वपरध्रुवयोःकक्षा मध्यस्था क्षितिजाभिधा ।
अक्षांशमानोपरिष्टाद्योजयेद्यन्त्रमुत्तमम् ॥२२१॥

आच्छाद्यशुक्लवस्त्रेण निर्दिश्यांशांश्च नाडिकाः ।
मेषोन्नतस्थानतस्तु तच्छुद्धक्रान्तिमस्तके ॥२२२॥

नतं वियच्चरं स्थाप्यकालयन्त्रैश्चकालवित् ।
सूर्याद्दिनगति सूत्रैरुन्नयेदुदयस्तुलात् ॥२२३॥

क्षितिजादुदयं लग्नात्तद्वशाच्च खमध्यगम् ।
अस्तं गच्छंश्च विज्ञेयःसर्वं प्रत्यक्षतामियात् ॥२२४॥

पञ्चाचली मही मेरुध्रुवौ क्षितिजमण्डलम् ।
अवटस्थमधोभागं क्षितिजादत्रकारयेत् ॥२२५॥

उपर्यधगता नाड्यःक्षितिजात्स्युरहर्निशोः |
साक्षे चक्रस्य तिर्यक्त्वादुदयस्योदगुत्तरम् ||२२६||

क्षपा सञ्चरतोऽल्पा स्यादनल्पं दिनमात्मज |
अन्यदेस्य संयातु लङ्का क्षितिजमण्डलात् ||२२७||

अत ऊर्ध्वं प्राप्तदृष्ट्या क्षितिजा तादृशात्स्वकात् |
एवं सत्युत्तरक्रान्तौ त्रिंशतोऽल्पाधिकं दिनम् ||२२८||

पूर्वापरामरांशे तु याम्यक्रान्तौ विपर्ययात् |
अक्षच्छाया द्वादश चेन्मेषादिक्षितिजान्तरम् ||२२९||

क्रान्तिज्या लघुकक्षायां तत्क्षितिज्येति चोच्यते |
तच्चापार्धं दिनव्यासदलं त्रिज्येति कल्प्यताम् ||२३०||

सा विशिष्टा तच्चरज्या चरप्राणा हि तद्धनुः |
नाड्यःपञ्चदशैतेन द्युक्षपार्धादिसंस्कृताः ||२३१||

दिनक्षये तद्द्विगुणे षष्टिरेव तयोर्युतिः |
कक्षायामधिकाल्पायां महत्यल्पा च नाडिका ||२३२||

महान्तोऽल्पास्तथांशा यद्वैषुवत्यां ततोऽधिकाः |
भान्तकक्षासु षट्स्वल्पास्तोकस्तोकेन नारद ||२३३||

तदेवैवं भवेदोजपदे क्षिप्त्वादितोऽन्यथा |
अनोजपदभेष्वेवं दुःसाध्यत्वाच्च कस्यचित् ||२३४||

उक्तिसिद्ध्यैव कक्षाणां कल्प्यं व्यासदलं समम् |
इष्टद्युभुक्तिकर्णार्धमेकद्वित्रिभमौर्विकाः ||२३५||

फलं चापानुरूपं तत्तत्कक्षासु प्रकल्पिताः |
अहोरात्रार्धकर्णःस्यात्तस्य तस्य मितिर्भवेत् ||२३६||

इच्छायामन्यकक्षायां त्रिज्या त्रिज्याधिका न तत् |
इच्छा कक्षा चापखण्डा मेषाल्लङ्कोदयासवः ||२३७||

खागाष्टयोऽर्थगोऽश्वैकाःशरव्यङ्कहिमांशवः |
कर्कटान्ते विलोमेन तुलायाःषट् च ते मुहुः ||२३८||

अनल्पा राशयोऽन्योन्यं तल्लग्नादीदृशा अपि |
मध्यप्रान्तमहावायुमन्दवायुवशाद्गतिः ||२३९||

शीघ्रमन्दा सतीखेटान्दर्शयेत्समसञ्चरान् |
मध्यामध्यमहास्वल्पमार्गाभ्यां भ्रामकं समम् ||२४०||

सर्वेषां चित्रमस्तीति मा शङ्कास्तु तदेव च |
खेचारिणःखगाःखेटाः खेचराश्च वियच्चराः ||२४१||

इति हि व्यवहारोऽयमृषीणां महतां मुने |
पूर्णं मेषादिभिर्गोलं चक्रं स्यान्न तु चेन्न तत् ||२४२||

ग्रहमैत्रादिवद्भावा मेषाद्या हि प्रकीर्तिताः |
वस्तुबृत्तेन मेषाद्या ग्रहमैत्रादिता न हि ||२४३||

व्यक्षादुत्तरतस्तत्तदुदगुत्तरतो नतम् |
पार्श्वयोःक्षितिजं व्यक्षं क्षितिजादुत्तरे दले ||२४४||

तथा दक्षिणचक्रार्धे दृश्यते ह्यन्यथा मुने |
तावत्प्रतीच्यै क्षितिजं तावत्तदुभयास्पदम् ||२४५||

कल्प्या निरक्षाःक्षितिजप्रकारं स्थानतस्ततः |
उत्तरोत्तरतोऽधोऽधो मृगषट्कमुदेति हि ||२४६||

निःशेषं स्वोदयस्थानं पश्चात्सृष्टेन गच्छति |
अतो मृगाद्याःषट्स्वस्वचरखण्डविवर्जिताः ||२४७||

स्वोदयाःकर्कटाद्यास्तु दृश्यन्ते षट् ततोऽन्यथा |
तत्कालक्रान्तिकक्षातो राशीनां क्षितिजात्स्वकात् ||२४८||

उदयास्तमयावेव स्वकार्येणान्यथा यतः |
लग्नानयनवेलायां संस्कारोऽत्रायन्स्य च ||२४९||

इष्टस्य क्रान्तिकक्षातो यदन्यत्तत्र चापि तत् |
मर्त्यलोकोत्तरा वाच्यो रक्षभा सप्तविंशति: ||२५०||

तयोर्मृगाद्या: कर्काद्या युगपत्षष्टिदर्शनात् |
अतो देवासुरांशे तु व्यस्ता लग्नदिनक्षपाः ||२५१||

अमर्त्यलोके गणितं नैतदेवं महामते |
यद्राशिस्थो यत्र दृश्यस्ते मासास्तत्र दृश्यकाः ||२५२||

तद्राशेस्तद्ग्रहःप्राणास्तत्स्थभुक्तेःकतीत्तितैः |
अधिकत्वं त्वहोरात्रं ताराहोरात्रतो भवेत् ||२५३||

नाक्षत्रानाड्यस्ता नाड्यस्तास्तु स्वर्णचरं यदि |
कुर्वीत चरनाडीश्च प्रोक्तं तन्मानजं फलम् ||२५४||

इच्छा तत्तदहोरात्रं नाक्षत्रं मानमित्यपि |
षष्टिश्चरं तं नक्षत्रं संस्कुर्यात्तादृशे मुने ||२५५||

स्वाहोरात्रचतुर्भागे नाक्षत्रं द्युक्षपादलम् |
सौरनाड्यो भुक्तिसिद्धास्तत्तन्नाड्योऽन्यथोद्भवाः ||२५६||

ग्रहद्वयान्तरा षष्टिस्तन्नाक्षत्रं दिनान्तरम् |
भवन्ति फलमानेच्छास्ताश्चाक्ष्र्योनाडिकाःस्मृताः ||२५७||

नाक्षत्रनाड्यःकथने सौरास्तात्कालिकागमे |
छायालग्नागमे तत्तन्नाड्यो ग्राह्या इति स्थितिः ||२५८||

अनुक्तं रोमशेन्द्वर्कैराद्यैस्तत्ते स्मृतं स्वतः |
इत्येवं कथितं पुत्रान्यद्वै शृणु समाहितः ||२५९||

इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते द्वितीयोऽध्याय:

||तृतीयोऽध्यायः||

तिथयस्त्रिंशदृक्षाणि सप्तविंशतिरेव हि |
तावन्तो भगणे योगाः करणानि नभोरसाः ||१||

अर्कोनचन्द्रलिप्ताभ्यस्तिथयः करणानि च |
प्रहस्य भानि सार्केन्दोर्योगाः स्युर्भोगभाजिताः ||२||

प्रवेशनिर्गमौ तेषां तादृक् भुक्त्या मुहुस्तथा |
तौ कार्यौ वर्तमानानां तत्तन्मध्यस्फुटग्रहैः ||३||

मासादि करणं हित्वा किंस्तुघ्नं स्थिरसंज्ञितम् |
तिथ्यर्धराशेः सप्तैव ववादि चरसंज्ञितम् ||४||

मासेऽष्टकृत्व एकैकं वर्तते करणं चरम् |
स्थिराणि त्रीणि मासान्ते शकुनं तु चतुष्पदम् ||५||

नागं तदनु कृष्णायाश्चतुर्दश्याः परार्धतः |
पुर्वापरार्धजा विष्टिर्विष्टिरेव दिवानिशोः ||६||

सा त्याज्या त्वन्यथा भद्रा सर्वकर्मसु भद्रदा |
पुच्छाख्या दशमे विद्या अपि तद्वच्छुभावहः ||७||

सा कृष्णात्युन्नतस्थूलहनुगण्डस्थला मुने |
उग्रदंष्ट्रा दीर्घनासा वह्निनेत्रा महोदरा ||८||

क्रोडी च भीकराकारा सर्वारिष्टकरी तदा |
लांगुलिनी वह्निलक्षमुद्गिरन्ती त्रिपाज्जगत् ||९||

सर्वम् व्याप्नोति पातोऽपि तद्रुपस्तत्क्रियः क्रमात् |
द्विपादपुच्छ एवासौ संज्ञाभेदेन वैधृतिः ||१०||

सप्तदशे सप्तविंशे योगे च स हि वर्तते |
क्वचिच्च तस्मात्प्रबलः क्वचित्तस्मात्सुदारुणः ||११||

चलांशसंस्कृतार्केन्द्वोस्तदसंस्कृतयोस्तु वा |
भिन्नैकायनगतयोर्युतौ भार्धेन मण्डले ||१२||

क्रान्त्यस्तुल्ये क्रमात्पातो वैधृतश्च सुदारुणः |
विषुवत्क्रान्तिसाम्यं द्विर्यदा स्युर्द्विविधास्तदा ||१३||

द्वितीयः प्रबलः पातो द्विर्भवेदिति निश्चयः |
क्रान्त्याभिचरतोरेव भास्करेन्द्वोः परस्परम् ||१४||

तावदेवास्य पातोऽयं व्यतिपातोऽयमित्यतः |
अयं प्रसिद्धोऽतस्तावदेवास्यापि च सम्भवः ||१५||

परस्परं वानुचरतोरर्केन्द्वोः प्रबलोद्भवः |
स्यात्तदर्थोक्तविषुवे चलसंस्कृतसम्भवे ||१६||

अर्केन्दोः पथिके क्रान्तिस्तद्विदा तद्विधे गती |
अपि ग्रहस्येव कल्प्ये प्राग्गतिश्चेति वक्रता ||१७||

मन्दाधिकोनशीघ्रे स्यात्तद्योगो गतगम्यजः |
अवक्रिणोर्द्वयोरेवम् वक्रिणोस्तु विपर्ययात् ||१८||

प्राक्चर्यात्यधिकेऽतीतो भावहीने तु वक्रिणः |
गत्यन्तरेण तद्वक्रादनुलोमविलोमयोः ||१९||

दिनादि वक्रिण्येतस्मिन्भुक्तियोगेन नारद |
तात्कालिकौ ग्रहौ तेन छेद्यमिच्छामितिर्हरः ||२०||

स्वभुक्तौ फलमिष्टं वा तौ भवेतां मुहुर्मुहुः |
क्रान्तिदिनादि गणयन्क्रान्तिसाम्यं विचारयेत् ||२१||

क्रान्तिर्यदापनीतेन्दो: शोध्या क्षेपात्तदास्तु सा |
कल्पौजयुग्मपदजा युग्मौजपदजेति हि ||२२||

सुर्यक्रान्त्यधिकोनेन्दोः स्फुटक्रान्तिर्गतैष्यजा |
पात ओजपदत्था चेद्वामं त्वन्यपदोद्भवा ||२३||

परमक्रान्तिजीवाघ्नी क्रान्तिज्यात्रिज्यया फलम् |
तच्चापान्तरमर्धं वा शताल्पं शीतगोः फलम् ||२४||

तत्संस्कृतेभ्यः क्रान्तीते समे यावत्पुनः पुनः |
उपक्रमोपसंहारग्रहान्तरकलादिकम् ||२५||

तद्भुक्त्या परमे हीने भावी पातो गतोऽधिके |
पातश्च मध्यकालश्च क्रान्तिसाम्यमपीति वा ||२६||

चतुःशती शताल्पा वा ततोऽनल्पार्धमत्र वा |
क्रान्तिगत्यन्तरं षष्टिर्मानैक्यार्धमिति फलम् ||२७||

इच्छास्थित्यर्धनाड्यः स्वमृणं काले च मध्यमे |
निर्गमश्च प्रवेशश्च पातस्येत्थं विबुध्यताम् ||२८||

गत्योरैक्यं चान्तरं वा गत्यन्तरमितीरितम् |
न चेत्क्रान्त्यन्तरं चादौ वान्तरैक्यम् न मानयोः ||२९||

स्यादेतत्प्रथमप्रश्ने तूष्णीं गत्यन्तरं यतः |
कथितं तत्क्रान्तिभुक्तिगतैक्यं च न संस्थितिः ||३०||

एवम् चेद्ग्रहयोर्मध्यं मानैक्यार्धं भवेल्लये |
स्य (?स्या) त्तदा समलिप्तौ तौ मध्यकालौ यदापि च ||३१||

क्रान्तिर्न कारणं यस्मात्तस्मादेतन्न सम्मतम् |
उपायः क्रान्तिसाम्यार्थं कश्चिदत्र निरूप्यते ||३२||

दिग्भेदेऽपीति दिक्कौल्यमेतावत्कल्प्यमेव च |
प्रज्वलज्ज्वलनाकारे कालेयावत्पतत्यसौ ||३३||

तत्र स्नानेन दानेन दत्तश्राद्धजपादिभिः |
यत्प्राप्तं सुमहच्छ्रेयस्तत्कालज्ञानतोऽपि च ||३४||

अविशेषेण सर्वाणि नक्षत्राणि व्रतानि तु |
रात्र्यर्धव्यापिनक्षत्रे कुर्याद्वा तदुपस्थिते ||३५||

सर्वत्र या याः संनिहिता नाड्यस्तास्ताः सुपुण्यदाः |
त्रिधा विभज्य रात्रिं तां मध्यांशे यन्न तारकम् ||३६||

उपोषितव्यम् यद्यत्र येनास्तं याति भास्करः |
श्रोण्या श्रविष्ठया युक्ता ग्राह्या तद्द्वादशीव्रते ||३७||

ज्येष्ठा श्लेषा रेवतीच पादा अन्त्या भसन्धयः |
तेषां च तत्परर्क्षाणामन्त्या आद्याश्च षोडश ||३८||

भसन्धयश्च गण्डान्तं सर्वकर्मसु वर्जितम् |
यथैव लग्नगण्डान्तं नास्ति जीवे बलान्विते ||३९||

तथैव तिथिगण्डान्तं नास्तीन्दौ बलशालिनि |
प्रदोषव्यापिनी ग्राह्या तिथिर्नक्तव्रतेषु च ||४०||

अभावे द्विगुणच्छायाव्यापिन्याम् काल इदृशे |
दिवा नक्तं चरेदर्वाग्व्यापिन्याम् वा तथा ततः ||४१||

उपवासदिने रात्रौ स्यान्नक्तं हरिवासरे |
एकभक्तेन नक्तेन तथैवायाचितेन च ||४२||

उपवासेन दानेन न निर्द्वादशिको भवेत् |
व्रतम् दैवम् द्विजम् चोक्तं न याचेत कुतश्चन ||४३||

मध्याह्नव्यापिनी तद्वदेकभुक्तव्रतम् व्रती |
उपवासदिनेऽप्येवम् पूर्वाह्णव्यापिनी मुने ||४४||

द्विरात्रव्यापिनी येष्टा व्रते सा तदुपस्थिता |
ज्येष्ठोपवासे पूर्वविद्धा सा ग्राह्या चास्तगामिनी ||४५||

तदैक्ये परविद्धा तु क्षीयमाणेन तन्मतम् |
ओजयुग्मे तिथिः पूर्वा परविद्धा च पक्षयोः ||४६||

व्रतोपवासादौ ग्राह्या बृद्धिह्रासाबकारणम् |
पूज्या स्वल्पापि सर्वत्र या तिथिः बृद्धिगामिनी ||४७||

महत्यपि न सा पूज्या या तिथिः क्षयगामिनी
व्रतादौ त्रिमुहुर्तापि स्वीकार्या बृद्धिगामिनी ||४८||

तत्र व्रतादि कुर्वीत बृद्धिह्रासाबकारणम् |
यदा पक्षक्षयं याति तदा स्यादपराह्णिकी ||४९||

उदयास्तगता पूज्या तिथिर्बृद्धिक्षये तिथेः |
व्रतस्वीकरणस्यैतदुक्तं श्लोकचतुष्टयम् ||५०||

गृहीत्वोदङ्मुखं पात्रं वारिपूर्णमुदङ्मुखः |
उपवासं तु गृह्णीयाद्यद्वा संकल्पेयद्बुधः ||५१||

मैत्रे मुहूर्तं एतच्च कार्यं नो चेद् वृथा फलम् |
आषाढशुक्लैकादश्यां याम्यायनदिनेऽथवा ||५२||

चातुर्मास्यव्रतम् सर्वम् स्वीकार्यम् भुक्तिमुक्तिदम् |
हविष्यभोजनं स्नानं सत्वमाहारलाघवम् ||५३||

ब्रह्मचर्यमधःशय्यां नक्तोभोजी षडाचरेत् |
दिवानिद्रानृतं द्यूतं ताम्बूलं मद्यमासवम् ||५४||

कांस्यं मांसं मसूरं च चणकोद्रवदूषकम् |
एकं मधु परान्नं च सुरा क्षौद्रं च मैथुनम् ||५५||

असकृज्जलपानं च लोभं वितथभाषणम् |
क्षारं प्रतिग्रहं तैलं तिलपिष्टमहंकृतिम् ||५६||

व्यायामं व्यवसायं च कामं क्रोधं मदं तथा |
दम्भं मोहं च मात्सर्यं तिलमुड्गा दिभक्षितम् ||५७||

पुनर्भोजनमभ्यङ्गं षट्त्रिंशच्च महामुने |
उपवासदिनात्पूर्वापराहे च विवर्जयेत् ||५८||

असकृज्जलपानं वा कुर्यात्पूर्वापराह्णयोः |
एकादश्यां निराहारः स्थित्वाहनि परेत्वहम् ||५९||

भोक्ष्यामि पुण्डरीकाक्षशरणं मे भवाच्युत |
अज्ञानतिमिरान्धस्य व्रतेनानेन केशव ||६०||

प्रसीद सुमुखो नाथ ज्ञानदृष्टिप्रदो भव |
संकल्प्य पारणं चेति मन्त्राभ्यां क्रमशो मुने ||६१||

एकादशीं प्रति स्त्रीणां शूद्राणामप्ययं विधि: |
त्रयोदशीम् च दशमीम् कृष्णप्रतिपदं मुने ||६२||

रात्रिद्वयव्यापिनीं तां स्वीकुर्यात्सततं मुने |
घटिकैकाप्यमावस्यां स्याच्चेत्प्रतिपदिष्यते ||६३||

सैव व्रतोपवासादौ परविद्धा हि सोत्तमा |
तृतीयां पौर्णिमां तद्वत्पूर्वविद्धां मुनीश्वर ||६४||

इमास्तिस्रः पूर्वविद्धा अपि वा तदसम्भवे |
द्वादशी पूर्वविद्धैव सर्वदा मुनिसत्तम ||६५||

व्रतादौ पूर्वविद्धैव भवेत् कृष्णचतुर्दशी |
कृष्णाष्टमी क्षीयमाणे यद्येतेनान्यथा मुने ||६६||

व्रतादौ क्षीयमाणस्तु परविद्धोऽसितेस्मरः |
ग्राह्य: शुक्लो वर्धमान इति वा नान्यथैव तु ||६७||

शुक्लतृतीया वैशाखे पूर्वविद्धैव साक्षया |
विनायकचतुर्थी च तथा भाद्रपदामला ||६८||

मध्याह्ने त्वनतिक्रान्ते यद्येवं स्यान्मुनीश्वर |
स्वीकुर्यादुपवासेऽपि तद्विधानात्तदुत्तमे ||६९||

ते चापराह्णव्यापिन्यौ परविद्धे सुशोभने |
दिने पूर्वार्धगामिन्यौ कलयावसरे इमे ||७०||

तयोः सत्योश्चापराह्णव्यापिन्यावपि तेन हि |
तृतीयाद्यं षडंशं तु पूर्वम् व्याप्यैव दूषयेत् ||७१||

अपराह्णस्योर्जशुक्लचतुर्थी नागसंज्ञिता |
परोपवास एवम् चेन्न चेत्पूर्वैव गृह्यते ||७२||

नास्मिन्विचार्ये हानिबृद्धी चतुर्थ्यन्या तु नेदृशी |
अत्यल्पमतिवेधाय वोपवासाय चाप्यलम् ||७३||

तदन्ते पारणं तच्चेत्प्रदोषव्यापि तत्र च |
सर्वमन्यद् व्रतम् काम्यं नित्यमेकादशीव्रतम् ||७४||

पुण्याङ्गानां विना योनिजातिभेदोऽपि नोच्यते |
यदैव वा व्रतम् कुर्याज्जीवेद्भर्तर्युपोष्य चेत् ||७५||

पत्युरायुः क्षयं कृत्वा स्वयम् च नरकं व्रजेत् |
पत्युरा भोजनात् स्त्रीणां भोजनत्याग एव हि ||७६||

व्रतम् शुश्रूषणं तस्य तदाज्ञापालनं चरेत् |
कामाकामकृतं पापमार्द्रशुष्केन्धनं क्रमात् ||७७||

भस्मसात्कुरुते वह्निरेकादश्युद्भवो मुने |
यावन्त्यश्नाति सिक्थानि मोहाद्वा हरिवासरे ||७८||

व्याधितो वापि तावन्ति व्रजेत्पापानि नारद |
प्राशयेन्नवनीतम् वा नैकादश्यां शिशूनपि ||७९||

योगिनोऽपि महात्मानो नाश्नन्त्यस्या व्रते रताः |
एकादश्युपवासेन म्रियते यदि मानवः ||८०||

क्षुधार्तः शिवसालोक्यम् गच्छेन्निष्कल्मषो मुने |
विस्मृत्यैकादशी मोहाद्द्वादशी परतः स्थिता ||८१||

उपोष्या द्वादशी तत्र यदीच्छेत्परमं पदम् |
शोके वा यदि वा मोहे हर्षे वा समुपस्थिते ||८२||

सूतके मृतके वापि न त्याज्यं द्वादशीव्रतम् |
सूतकान्ते हरिं विप्रान्भोजयेदर्चयेत्स्वयम् ||८३||

एवम् चोपवसेद्विष्णुं विप्रां श्चान्यांश्च पूजयेत् |
काम्यव्रतेषु सर्वेषु सर्वत्र च विधिस्त्वयम् ||८४||

तथापि गणयेत्काम्यं न तथा कृतमेव तु |
असामर्थ्ये शरीरस्य काम्यव्रत उपस्थिते ||८५||

पुत्रं वा धर्मपत्नीं वा कारयेन्मुनिवल्लभ |
पत्नीव्रतं पतिः कुर्यादसामर्थ्ये तयोः सुतः ||८६||

अन्यथा व्रतभङ्गेन त्वौषधैश्चैव सूतकैः |
यः कुर्यात्पुत्रवित्तादिकाम्यं एकादशीव्रतं ||८७||

आ व्रतोद्यापनात्तस्य नामानि त्रीणि नारद |
पुत्रवान्धनवान्मुक्त: पर्यायास्तेष्वनेकश: ||८८||

दिनक्षयेऽपि संक्रान्त्यां ग्रहणे चन्द्रसूर्ययोः |
एकादश्यां तु कृष्णायां शुक्रार्कदिवसे गृही ||८९||

न पारणं नोपवासं कुर्यात्पाते च मन्मते |
एकादशीव्रतस्यैव लक्षयित्वा यथोचितम् ||९०||

नामभिस्त्रिभिरुक्तैश्च कथ्यते सकलव्रते |
उक्तदोषेषु चानुक्तवेधेषु व्रतमाचरेत् ||९१||

व्रतम् तत्पारणाहात्प्राक्तिथिसंख्यानि हन्ति च |
तेषु नक्तं हविष्यान्नमनोदनफले तिलाः ||९२||

क्षीरान्नाद्यं पञ्चगव्यम् प्राणायामत्रयं क्रमात् |
एवम् यदैव वा गच्छेदुत्तरोत्तरमुत्तमम् ||९३||

ब्रतभङ्गो हि नैवम् चेद् व्रतम् नैक उपस्थिते |
अन्यं कुर्वीत दानार्चा होमैरन्यं च वर्तयेत् ||९४||

ब्रह्मचारी वनस्थश्च मुमुक्षुर्यतिरित्यपि |
वार्च्य: सर्वाश्रमस्थोऽपि कुर्वन्नित्यव्रतम् मुने ||९५||

न तस्य सन्त्युक्तदोषा यत्तंभक्षं च नोचितम् |
परबिद्धोत्तमा कार्या नारदैकादशी तिथिः ||९६||

पूर्वविद्धापि सा ग्राह्या परतो द्वादशी न चेत् |
शुद्धाधिका विद्धसमा चोत्तरानधिका यदि ||९७||

पूर्वा पुण्या गृहस्थानां यतीनामुत्तरा स्मृता |
विद्धाधिकोत्तरा हीना व्यवस्थेयं यदिष्यते ||९८||

उत्तरानुक्तरूपा सा सर्वेषामुत्तरैव चेत् |
शुद्धा हीना शुद्धसमा विद्धहीना च नारद ||९९||

सर्वेषामविशेषेण पूर्वैव फलदायिनी |
फाल्गुनद्वादशी पुष्ययुक्ता गोविन्द संज्ञिता ||१००||

शुक्ला गोद्वादशी तु माघे भीमाभिधा स्वयम् |
आषाढे शयनाख्या स्यात्प्रबोधाख्या च कार्तिके ||१०१||

एकाब्दद्वादशीपुण्यं पञ्चैता दद्युरेकशः |
पारणं द्वादशीविद्धित्रयोदश्यां निहन्ति च ||१०२||

द्वादशद्वादशीपुण्यं परोर्धाया प्रयच्छति |
सिंहार्के रोहिणीयुक्ता कृष्णा भाद्रपदाष्टमी ||१०३||

रात्र्यर्धपूर्वापरगा जयन्ती कलयाऽपि वा |
अभावे रोहिणीयुक्ता नभःकृष्णाष्टमी यदि ||१०४||

मुहूर्तमपि वा सेष्टा सैवाभावे तिथिर्मता |
कार्या विद्धापि सप्तम्या रोहिणीसहिताष्टमी ||१०५||

अविद्धा केवला सा चेदिति वेदविदो विदुः |
मध्यरात्रिगता माघे शिवरात्रि चतुर्दशी ||१०६||

कृष्णपक्षे जयन्ती च नोपेक्ष्ये विदिते अपि |
नरस्य द्विगुणां छायामतिक्रम्य यदा रविः ||१०७||

तदा सौरं चरेन्नक्तं न नक्तं निशि भोजनम् |
दिनद्वयेऽप्यमावास्या मध्याह्नव्यापिनी यदि ||१०८||

दैवे पित्र्ये व्रते ग्राह्या क्रमात्पूर्वापरापि च |
अमा दूष्या भूतविद्धा मध्याह्नव्यापिनी न चेत् ||१०९||

ग्राह्या मा भूतविद्धापि पूर्वाह्णे प्रतिपद्यदि |
पूर्वमध्यापराह्णेषु देवमर्त्यपितॄन्यजेत् ||११०||

द्विगुणात्माधिकच्छ्राये चतुर्थे प्रहरेऽधमः |
यः श्राद्धं कुरुते याति नरकं स तदा ध्रुवम् ||१११||

अतोऽपराह्णव्यापिन्यां पूर्वस्याम् तु तिथिक्षये |
कुर्वीत पार्वनश्राद्धम् सर्वतिथ्या ब्रतेतरे ||११२||

दिनद्वयेऽपि सा नो चेदपराह्णे मुनीश्वर |
साल्पापि परविद्धेष्टा कुरुते सास्ति किं ततः ||११३||

शुक्रलग्नं शुक्रवारम् त्यजेच्छाद्धे खजन्मभम् |
आमश्राद्धं दैविकम् तु पूर्वाह्णे ग्रहणे निशि ||११४||

पूर्वाह्णे लग्नकाले वा बृद्धिश्राद्धं विधीयते |
निशापि पुत्रोत्पत्या(?त्त्या)दि निमित्तं श्राद्धमिष्यते ||११५||

विना प्रातरादिनार्धादेकोद्दिष्टं विधीयते |
अन्नेन वा हिरण्येन श्राद्धं माध्याह्निकं विदुः ||११६||

चतुर्दश्येव वर्ज्या स्यात्काम्ये नित्ये च पैतृके |
एतयोस्तिथिवारर्क्षमन्यत्सर्वम् च पूज्यते ||११७||

प्रत्यब्दं प्रतिमासं वा मृताहःश्राद्धकर्मसु |
सायन्तुन्युत्तराभावे पूर्वसिद्धा पराह्णिकी ||११८||

सायन्तनीया भावे स्यात्परविद्धैव शस्यते |
नित्यनैमित्तिकश्राद्धदर्शश्राद्धादि चेतरत् ||११९||

अधिमासे न कर्तव्या सेवाद्यंदेवतादिषु |
नभस्य कन्यकोर्ध्वार्धभागयोगेऽभिधीयते ||१२०||

श्राद्धं त्वपरपक्षाख्यं नभस्योर्ध्वदलेऽन्यथा |
मीने धनुषि सिंहेऽर्के न व्रतारम्भ(?म्भ) इत्यपि ||१२१||

माघे मासि न सिंहेज्ये चेति केचिन्न तन्मतम् |
ऋतेऽन्नदानग्रहणं व्रतं कार्यं मनीषिभिः ||१२२||

सुतके मृतके वापि केचिदार्तव एव च |
पुनः पुनः शुभः कालः सुर्यग्रहणसुव्रते ||१२३||

सोमग्रहणकृत्येषु श्लाघ्यः कालः परः परः |
नाद्याद्यामत्र यादर्वाग्ग्रहणे चन्द्रसूर्ययोः ||१२४||

विशुद्धमण्डलं दृष्ट्वा एवोर्ध्वं वा प्रहरत्रयात् |
रात्रौ स्नानं न कर्तव्यं दानहोमबलिक्रियाः ||१२५||

प्रतिष्ठाजातकोद्वाहयज्ञग्रहणवर्जितम् |
मध्यन्दिने पर्वसन्धिस्ततः पूर्वमथापि वा ||१२६||

यागस्तद्दिवसे कार्यः परतश्चेत्परेऽहनि |
संधिश्चेत्सङ्गवादूर्ध्वं प्राक्पर्यावर्तनाद्रवेः ||१२७||

सा पौर्णमासी विज्ञेया सद्यःकालविधौ विधिः |
यागात्पूर्वादिने कुर्यादन्वाधानम् द्विजोत्तम ||१२८||

अन्वाधानं तु सङ्कल्पः प्राणायामपुरःसरः |
अन्वाधानं पाकहोमं नित्यहोमादनन्तरम् ||१२९||

कुर्यान्नैमित्तिकं कर्मानन्तरं नित्यकर्मणः |
पर्वण्यौदयिके कुर्युः श्रावणं तैत्तिरीयकाः ||१३०||

बह्बृचः श्रवणे कुर्युः सस्यसंपत्तिदर्शने |
विशिष्टः श्रावणो मासः स्वाध्यायानामुपक्रमे ||१३१||

तद्दर्शोपात्तदर्भैस्तु कुर्यात्कर्माणि वत्सरम् |
अयने विषुवे चैव शयने बोधने हरेः ||१३२||

अनध्यायं प्रकुर्वीत मन्वादिषु युगादिषु |
कार्तिके नवमी शुक्ला तृतीया माधवे तथा ||१३३||

माघे मन्वादयः कृष्णे नभस्ये च युगादयः |
अश्वयुक् शुक्लनवमी कार्तिके द्वादशी तथा ||१३४||

चैत्रे तृतीया ज्येष्ठस्य पौर्णिमा द्वादशी शुचौ |
चतस्रः फाल्गुने द्वादश्यूर्जे कृष्णाष्टमी मुने ||१३५||

मन्वन्तरादयस्तेषु तेषामेवोद्भवः क्रमात् |
नभः फाल्गुनपौषाणाममा चैकादशी सिता ||१३६||

वैशाखजैष्ठपौषाणाम् पौर्णिमा फाल्गुनोर्जयोः |
माघामलद्वादशी च नभस्यामलचन्दिका ||१३७||

शुचिस्त्रिंशोऽष्टमी कृष्णाद्वितीयाश्वयुजेऽमला |
मन्वन्तरान्तस्तेषामेष्वनध्यायेषु निर्गमः ||१३८||

यथा ज्ञप्तजनो मन्त्री राजानं प्रतिगच्छति |
तथा मन्वादय: सर्वे ब्रह्माणमुपतस्थिरे ||१३९||

तिस्रोऽष्टका अनाध्यायः सप्तम्याया मुनीश्वर |
पर्वगादिषु मासेषु विषुवायनसंयुता: ||१४०||

प्रशस्ता इति पञ्चाशत्तिथयः पार्वणे मुने |
उपक्रमाच्च त्रिदिनं क्षपाः पञ्चदशापि च ||१४१||

उपक्रमेण पर्यन्तपौष उत्सर्जनात्परम् |
रात्रयः शुक्लपक्षेषु कृष्णपक्षेषु कृत्स्नशः ||१४२||

अनध्यायास्तथान्ये ते ये च बृद्धप्रचोदिताः |
तथा सेयं मुहूर्ताढ्या यानध्यायस्य सापि च ||१४३||

अङ्गाध्ययन इत्युक्तः स्वाध्याया: सकला अपि |
अधिकर्तव्यमेवाङ्गमङ्गित्वैकप्रयोजनात् ||१४४||

शुचेस्तद्व्य तिरेकेण त्वङ्गित्वाभावसम्भवात् |
पक्षादिमध्यन्त्योपान्त्या अङ्गानामङ्गिनामपि ||१४५||

अनध्यायः प्रदोषश्च संध्यास्त्रिर्मध्यमा निशा |
त्रयोदशी चतुर्थी च सप्तमी कलयापि वा ||१४६||

रात्रिं स्पृश्यति मौनी स्यात्प्रदोषो यदि तत्र सः |
रात्रेर्दिनचतुर्थो वा प्रहरः कथ्यते बुधैः ||१४७||

तावानेव प्रदोषश्च पूर्वत्र्यं शस्तु कैश्चन |
आद्यत्र्यंशान्तनाडी वा चतुर्थी त्वितरे मुने ||१४८||

प्रदोषः पूर्वरात्र्यर्धम् विरामघटिकापि वा |
मध्यन्दिने पूर्वसन्धिरित्यादिषु न चिन्तयेत् ||१४९||

दिनक्षपायुक्तदोषां श्लोकानां त्रिगुणाऽष्टसु |
अर्कमानकलास्तस्य भुक्तिश्चेत्षष्टिनाडिका ||१५०||

संक्रन्तिकालस्तद्बिम्बं यावत् क्षेत्रद्वयेऽपि सः |
बिम्बमध्यं ग्रहस्यास्ते यत्र तत्र स्थितश्च सः ||१५१||

तस्मिन्परापरक्षेत्रे ग्रहे द्विस्थे यथोच्यते |
भुक्तक्षेत्रमभुक्तर्क्षं न तथान्यत्र नारद ||१५२||

तिथिनक्षत्रयोगादेर्बिम्बमध्यं प्रबोधकम् |
शुभाशुभंकृतस्तस्मान्नैव चेत्तद्वृथाफलम् ||१५३||

संक्रान्तेः प्रागभुक्तर्क्षं सार्धाः षोडश नाडिका: |
भुक्तक्षेत्रं च तावत्य: पश्चादिति हि नाडिकाः ||१५४||

त्रयत्रिंशत्संक्रमस्य सर्वकालस्य नारद |
या याः संनिहिता नाड्यस्तास्ताः पुण्यतमा मताः ||१५५||

भुक्तर्क्षे वाप्यभुक्तर्क्षे स्नानदानादि कारयेत् |
पर्याप्तमुभयं रात्रावेव चेत्तदथोच्यते ||१५६||

भवनान्तं बिम्बमध्यं रात्र्यर्धात्प्रागुदेति चेत् |
स्नानदानादिमध्याह्नात्कुर्यादूर्ध्वं गते दिने ||१५७||

रात्र्यर्धादुपरि क्षेत्रं याति चेदन्यथार्यमा |
अहन्यागामिनि मध्याह्नात्पूर्वम् स्नानादि कर्म यत् ||१५८||

यद्यर्धरात्र एव स्यात्संपूर्णे रविसंक्रम: |
तदा दिनद्वयम् पुण्यं स्नानदानादि कर्मसु ||१५९||

भुक्तक्षेत्रमभुक्तर्क्षं चोभयं चेद्दिवास्ति वा |
याम्यायनं विष्णुपदं चाभुक्तर्क्षेऽतिपुण्यदम् ||१६०||

षडशीतिमुखं चोदगयनं भुक्तवेश्मनि |
निषुवत्युभयम् तुल्यं सर्वमेतत्तु नान्यतः ||१६१||

चलसंस्कृततिग्मांशोः संक्रमो यः स संक्रमः |
नान्योऽन्यत्र च तत् क्षेत्रं नैति तत्क्रान्तिकक्षया ||१६२||

भुक्तक्षेत्रमभुक्तर्क्षं वा विहायाह्नि सम्भवम् |
बृथान्यत्र कृतं कर्म भस्मनीव हुतं हविः ||१६३||

तदभावे तदासन्ने काले चापि वृथेतरत् |
क्रान्तेः पूर्णफलं त्वर्धम् प्रवेशादुभयो: समम् ||१६४||

कालस्य निर्णयो ह्येतन्मृगकर्क्योः क्षपादले |
अर्काह शुक्लसप्तम्यां पुष्यर्क्षे चोत्तरायणे ||१६५||

सप्तमीव्रतमन्विच्छेत्सर्वकामार्थसिद्धये |
अष्टमीनवमीद्वन्दे ह्यर्धनारीश्वरं व्रतम् ||१६६||

नभस्ये रोहिणी षष्ठी व्यतिपाते यदीरिते |
पुण्या कपिलषष्ठीह द्वादशी विजया हरौ ||१६७||

श्रोणामार्क व्यतीपाते दिवा पौषी यदा भवेत् |
अर्धोदयं पुण्यराशेर्हरत्यर्धमुपेक्षितम् ||१६८||

योगरुपाः पुण्यकालास्तिभ्यादीनां मुनीश्वर |
कथ्यन्ते तेन येष्वस्ति वेधदोष इति स्थितिः ||१६९||

अलं मुहूर्तमात्रं वा स्नानादिभ्यो हि योगजम् |
रात्रौ दिवा पञ्चदशो मुहूर्तः कुतपोऽष्टमः ||१७०||

मैत्रः तृतीयोऽह्नः पुत्र पुन्नक्षत्राणि रोहिणी |
अश्विनी कृत्तिका हस्तो मैत्रं पुष्यः पुनर्वसुः ||१७१||

प्रोष्ठपद्द्वितयं विष्णुः केचित्सौम्यमिति स्थितिः |
इति ते कथितं वत्सान्यच्च वक्ष्यामि तत्त्वतः ||१७२||

इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते तृतीयोऽध्यायः

||चतुर्थोऽध्यायः||

अविक्षेपः स्फुटक्रान्तेरुदक् क्षिप्तस्ततः पुरः |
उदेति पश्चादेत्यस्तंवा क्षिप्तस्तथान्यथा ||१||

पश्चिमस्थः प्रागुदेति पश्चात्प्राक्स्थोऽस्तमेति हि |
अन्यथा चेदन्यथा दृक्कर्म यत्कल्पितं तथा ||२||

विक्षेपस्तत्फलं स्याद्यद्यक्षभा द्वादशाङ्गुलम् |
खमध्यग्रहयोर्मध्यं नतं क्षितिजकल्पना ||३||

तन्नतात्तदिनार्धं च फलं प्राक् सिद्धमेव हि |
ग्रहणादन्ययोगे च कालभा लग्नसाधने ||४||

शृङ्गन्नत्युदयास्तेषु दृक्कर्मादाविदम् स्मृतम् |
क्रमचापोत्क्रमज्याभ्यां क्रान्तिः सन्निग्रहस्य च ||५||

त्रिज्या चेन्मध्यदृष्टानां क्षेपलिप्तान्तरे पुनः |
दृक्कर्मस्थानतः प्राक्स्थ इव पश्चादिति स्थितः ||६||

दृश्यक्षेपः क्रान्तिदिशो भेदाभेदे यथा क्रमम् |
तत्तन्मेरुदिगंशानामल्पः स्याद्दृश्यते तथा ||७||

स्खलनं मध्यकक्षायामधिकं स्वल्पमन्यगम् |
तदर्धमुत्क्रमज्यैषा तादृक् खण्डैर्हि सान्विता ||८||

द्वादशीज्या समैः खण्डैरुत्क्रमं धनुरुत्तमम् |
अल्पत्वात् स्खलनस्यैवम् क्रमचापं स्मृतं त्विह ||९||

त्रिभदानं मध्यमार्गे महत्स्खलनसूचकम् |
क्रान्तिक्रान्त्यूनपरमम् क्रान्त्योस्त्वेवम् तदल्पतः ||१०||

द्वितीयम् पापदृष्टीनां दृक्कर्म मुनिसत्तम |
द्वितीयमेव दृक्कर्म नेच्छन्त्युत्तमदृष्टयः ||११||

शास्त्रीयव्यवहारो हि लौकिकं निष्प्रयोजनम् |
केचिदन्येऽपि नेच्छन्ति तादृक्प्रत्यक्षकारणात् ||१२||

खमध्यस्थो मध्यलग्नमुदयात् क्षितिजोदयः |
अस्तलग्नं सषड्भं तात्कालिकं स्वेष्टकालिकात् ||१३||

गतागतैष्यं कालाच्च गतैष्यं लग्नमात्मज |
लङ्कोदयैर्मध्यलग्नं स्वमध्ये क्षितिजं न हि ||१४||

लग्नग्रहाभ्यां कालश्च मुहुर्मुहुरिति स्थितिः |
सूर्यात्प्राक्पश्चिमार्धस्थे शुक्लकृष्णे प्रकल्पयेत् ||१५||

सूर्यास्तकालिकौ सूर्यात्ग्रहौ कृत्वा सषड्ग्रहौ |
ततस्तत्काललग्नार्थं कृष्णे त्वर्के तु षड्भवान् ||१६||

अर्कात्तदन्तरप्राणैर्भास्करास्तमनात्परम् |
स्थिरीकृतैरुदेत्यन्यः शुक्ले कृष्णेऽस्तमिते हि ||१७||

दिनरात्रिग्रहा: पूर्वापरभार्धोदया: स्वका: |
आसन्नार्कस्य तद्रश्मिच्छन्नो मूढ इतीरितः ||१८||

शुक्ले प्रागुदितः प्राणात्कालांशाः षष्टिभाजिताः |
कृष्णे तु तौ सषड्भौ तु भास्करोदयकालिकौ ||१९||

कार्याः कालांशकास्तद्वदनर्कास्ते सकृद्द्वयो: |
सुर्यात्पश्चिमतोऽत्यन्तं यातु यः सक्षमः स तु ||२०||

कृष्णेऽस्तमुदयं शुक्ले गच्छन्त्यन्येऽन्यथा मुने |
द्वादशात्यष्टिमन्वीशदिक्तिथि: शीतगोः क्रमात् ||२१||

अस्तांशा द्वादशाष्टौ च वक्रिणोर्बुधशुक्रयो: |
तथा महत्त्वादनयोर्दूरत्वादितरस्य च ||२२||

मूलत्रयं विशाखार्द्रा मित्रदस्रा हि वह्नय: |
दृश्यन्ते पञ्चदशभिः शेषाण्यत्यष्टिभागकैः ||२३||

मघा चतुष्कं श्रवणद्वयम् धाता भवासवै: |
पुनर्वस्वभिजिच्चात्र मृगव्याध: प्रभञ्जनः ||२४||

अगस्तो ब्रह्महृदयं शक्रांशैरनलेन्दुभिः |
मृगशीर्षं च भरणी पुष्यस्त्रिः सप्तकांशकैः ||२५||

तत्त्वाधिकः स यस्योदक् क्षेपांशा नास्तगो भृशम् |
एभ्योऽधिकोनैः कालांशैः क्रमादृश्या अदर्शनाः ||२६||

तदन्तरा दिनादिः स्यात्कालगत्यन्तरैक्यजम् |
तत्कालांशोदयप्राणा स्वांशराशिकलामितिः ||२७||

फलेच्छया तत् क्षेत्रांशैः दृश्यत्वात् दृश्यतापि वा |
सैव व्येकोदितांशैस्तु दृक् सिद्धं स्यात् क्वचिन्मुने ||२८||

अल्पायुषां पाखण्डिनां गन्धर्वनगरादिवत् |
खमध्यक्षितिजे दोःकोट्याश्रयैर्मौर्विके तयोः ||२९||

दृग्भाशङ्कुर्मुने छाया व्यवहार इतीर्यते |
त्रिज्या भवेच्छाया यदि कर्णोऽत्र कोटिजा ||३०||

लम्बज्यायां कोटिजीवां परमायां तु सोद्भवा |
त्रिज्यायां कोटिजीवायां कियतीति विशेषता ||३१||

परिधिः वियतीत्येव शङ्कुच्छेद इतीरितः |
खदिनव्यासार्धकर्णौ तौ च शङ्कौ स एव च ||३२||

कियान्स तस्मिंस्त्रिज्यायामुन्नतज्येति साधिता |
त्रिज्याधिकोनोदगर्वाक्चरमौर्व्यन्त्यमौर्विका ||३३||

मध्यक्षितिजमध्यज्या सा नतज्योन्नतोदिता |
तदुत्क्रमधनुः प्राणा नतप्राणाः प्रभायते ||३४||

व्यासार्धे लब्धजीवायाम् च समा मुने |
कल्प्यः शङ्कुस्तदा तत्सत्रिज्यश्चेद्द्वादशाङ्गुलः ||३५||

छायाकर्णौ वा दिनार्धे क्रान्त्यक्षाभ्यां भुजांशकै: |
शृङ्गोन्त्यून बिम्बार्धयुवा छाया नतासुभिः ||३६||

कृष्णे शुक्लेऽपि पक्षे प्रागिनेन्द्वोश्चेन्न भिद्यते |
तज्ज्योनं च दिनार्धाप्तं नतघ्नं चापि तत्किल ||३७||

अनुक्तं यत एवैतदन्यप्रश्नचतुष्टये |
अबिम्बकस्तु दर्शेऽध: स्थितः सूर्यान्न दृश्यते ||३८||

पौर्णिमायां तदन्तःस्थै: संपूर्णः सूर्यरश्मिभिः |
अन्यत्र यावान्विप्रकर्षस्तावच्छुक्लं विधोर्विधि: ||३९||

चन्द्राद्यत्र तदाशायां शप्तो दक्षिणत: शशी |
अङ्गाध्यायी शौनकस्य मेरूवासीत्यत: समम् ||४०||

हानिबृद्धी ययौ दक्षवरेणास्य तिथिं प्रति |
क्षीयमाणां कलां देवा अश्नन्त्येककलं तथा ||४१||

वर्धयति क्षीयतेऽसौ य एवम् वेद न क्वचित् |
अबिन्धनानामन्येषां दूरस्थत्वादिदम् न हि ||४२||

येन दर्पणवत्स्वच्छा जायन्ते तेषु चांशव: |
लाञ्छनं प्रतिबिम्बं गोर्गोमतीन्दाविनांशुभि: ||४३||

चन्द्रेण शौक्ल्यं वान्येषां तद्दर्शेऽप्यस्ति यत्ततः |
बिम्बं सितासिते षड्भे व्यर्केन्दोरविभावतः ||४४||

रवीन्दुमध्यक्रान्तिज्या विषुवत्कर्णसंगुणा |
मध्याह्नाच्चन्द्रशङ्क्वाप्ता उत्तरा वाग्विधौ रवेः ||४५||

ऋणं धनं चाक्षभायां भुजोऽर्कादिन्दुदिग्मुखः |
यस्याल्पा ज्या खमध्येन्दुच्छायाकर्णाहता तथा ||४६||

द्वादशघ्नाक्षजीवाया: कल्पनाया रविं विधुम् |
खमध्याद्विषुवत्कक्षा मध्यतो ज्यां शिरस्यपि ||४७||

भुजाङ्गुलं लवम् पातः कर्णो द्विदशकोटिजः |
अर्कसंज्ञितदिङ्मध्याद्बाहुं शङ्कुं तथादिशम् ||४८||

प्राक्पश्चात्संमुखीं शुक्ले कृष्णे कोटि प्रसार्य तत् |
बाहुकोट्यग्रकं कर्ण कोटिकर्णयुतो विधो: ||४९||

बिम्बं तदूर्ध्वमानेन लिखेत्कोट्याश्रयेण च |
प्राग्रेखे याम्यरेखे च तदन्तर्मत्स्यमध्यगे ||५०||

कर्णेन तन्मुखं शुक्लं कृष्णं वा परभागतः |
दत्वा तदग्रयाम्योदन्मध्यमत्स्यद्वयस्य च ||५१||

मध्यसूत्रयूतेश्चापम् विन्दुं त्रिस्पृग्लिखेदिह |
कोट्या साधित याम्योदग्रेखान्ते शृङ्गमुन्नतम् ||५२||

अनेकगुणकच्छेदभवांशांश्छेदसंमितान् |
द्वन्द्वशो नाशयेद्वापवर्तयेदिच्छयैव तु ||५३||

बाहुसिद्धो हि यश्च्छेदस्तदुत्पतौ हरा गुणाः |
गुणगुण्यहरा व्यस्तं विक्षेप्या अन्यथा यदि ||५४||

तावत्स्वदेशलम्बज्या स्वव्यासार्धं यथार्थतः |
तां त्रिज्यां कल्पयेच्छायां व्यवहारसुखप्रदाम् ||५५||

तथा क्रान्तिज्याधिका सत्यग्रज्येति प्रकीर्त्यते |
क्रान्तिज्या विषुवत्कर्णहताग्रज्यापि भास्करैः ||५६||

सा चेत् त्रिज्येष्टभाकर्णस्तदा ग्राह्योऽङ्गुलादिका |
क्रान्तिज्या चेष्टकर्णघ्ना लम्बज्याप्ताऽङ्गुलादिका ||५७||

स्वशङ्कुतुल्यक्रान्तिज्याग्राङ्गुलं विषुवच्छ्रवः |
अर्धाङ्गुलफलं वारमध्येषु कर्णमितीरिते ||५८||

रेखा प्राक्पश्चिमायां सा सममण्डलमुच्यते |
सा वृत्तमध्येऽत्यन्यत्वम् मेरुश्चेदङ्गुलद्वयम् ||५९||

उद्भागस्था प्राच्यपरा या रेखा सममण्डलात् |
उन्मण्डलं तयोर्मध्ये सर्वत्र विषुवत्प्रभा ||६०||

विषुवन्मण्डलं चैषा छायाग्रे विषुवात्रहि |
इष्टच्छायाग्रविषुवन्मध्यमग्रार्धगं मुने ||६१||

सा रेखोन्मण्डलाद्भाग्रे सदेत्यग्रात्प्रतिष्ठिता |
उन्मड(?ण्ड)लादुदक्छाया याम्यक्रान्तावावागुदक् ||६२||

भुज इत्युच्यते मध्यं सममण्डलभाग्रयोः |
अतो माध्याह्निकी छाया नित्यं माध्याह्निको भुजः ||६३||

यदा दिनार्धोदक् क्रान्तिः स्वर्क्षच्छाया तदा न हि |
रवेः शङ्क्वग्रसंस्थत्वाद्भा यास्तत्प्रतिदृश्यते ||६४||

यदोदक्क्रान्तिरक्षोना तदोदगुदितो ग्रहः |
उदगस्तं यथाबृद्धिः सममण्डलमेति च ||६५||

क्रान्तिज्या विषुवच्छाया यदि स्याद्विषुवच्छ्रवः |
सममण्डलशङ्कुः स्याच्छायाकर्णौ तु पूर्ववत् ||६६||

अक्षभा द्वादशाभ्यस्ता लंबाक्षज्या विभाजिता |
सममण्डलंगे सूर्ये कर्णौ क्रान्तिज्यया सकृत् ||६७||

इच्छाकर्णेऽक्षभाद्यातादग्रया वा श्रवः स तु |
सममण्डलशङ्कुर्वा त्रिज्या तेनार्कताडिता ||६८||

शङ्कुर्याम्योत्तरा त्रिज्या कल्प्यार्थं तत्कृतेस्तथा |
दिक्कोटिमध्यज्यावर्गं तन्मध्यं सार्धभं यतः ||६९||

पूर्वापरां कोटिकृतिं तदेव मनुतान्मुने |
दोर्ज्याक्षमा कोटिकृत्योः कल्प्या त्रिज्याकृतिर्युतिः ||७०||

अर्कच्छायार्कवज्ज्ञेया यदातावत्तदाऽग्रजा |
फलमित्युच्यते तावत्तद्व्यक्षक्षितिजान्तरम् ||७१||

त्रिज्यावर्गार्धमध्यार्धराशिर्ज्यावर्गमेव तु |
अग्रज्यावर्गहीनं तत्कोणार्कोदयमध्यगम् ||७२||

तत्कल्पत्रिभजावर्गम् यदि शङ्कुकृतिर्भवेत् |
कोटिज्याकृतिरेषां हि करणीत्याहुरागमाः ||७३||

फलवर्गो बाहुवर्गः कर्णः शङ्कुदयोद्भवः |
स कोणस्थग्रहो व्यक्षक्षितिजान्तर एव हि ||७४||

सदृक्फल: स्वस्वशङ्कुः स्वस्वार्धफलवर्जित: |
ऊर्ध्वाधःस्थं स्वकं व्यक्षं क्षितिजाद्यादवागुदक् ||७५||

याम्याया विदिशो: शङ्कुः स शङ्कोर्दक्षिणो रवौ |
मध्यच्छायातो भुजज्या सौम्यातो दक्षिणोत्तरा ||७६||

याम्यतोऽक्षक्रान्तिरस्या अक्षज्या लम्बजा यदि |
चरत्युत्तरयोः सौम्ये प्राग्वत्कोणाक्षभाश्रुतिः ||७७||

द्वादशाक्षप्रभा क्रान्तिक्षेत्रं मेषादिको रवि: |
कर्क्यादौ प्रोज्झ्य चक्रर्धात्तुलादौ भार्धसंयुतः ||७८||

मृगादौ प्रोज्झ्य भगणात्बाहुर्गम्याद्वियुक्पदे |
चलसंस्कृतसूर्योनच्छायार्के भाजिते क्रमात् ||७९||

प्राक्पश्चान्मध्यरेखातो देशः स्वीयस्तदन्तरम् |
देशान्तरफलं भानोर्युक्त्यान्यत्सकलं मुने ||८०||

छायार्कार्कान्तरांशा: स्युश्चलाः स्वस्वमिनादिके |
छायार्के त्वृणमूने प्राक्पश्चाच्चक्रं च लम्बते ||८१||

कोणच्छायाकृतिदलात्पदं वा त्रिज्यया हतम् |
कोणात्कर्णहृतं क्रान्ति ज्यातस्छायारविस्तत: ||८२||

क्रान्तिज्येष्ठाग्राङ्गुलाद्वा भाकर्णाभ्यां समाध्वनि |
भुजाङ्गुलं भुजच्छाया कर्णः कोटिस्तलाभिधः ||८३||

शङ्कुपूर्वापरा रेखा तथान्या मध्यमत्स्यजा |
अब्धिः समीकृते स्थाने कल्प्यमाद्वादशाङ्गुलम् ||८४||

व्यासार्धाङ्गुलमुत्सेधः षडंशव्यासमेव वा ।
छायामध्यशलाकाभ्यां छायाग्रज्ञानदुर्बलः ॥८५॥

मध्ये तून्नतशिखरं नखाद्रि व्यङ्गुलोचितम् ।
स्वाङ्गुलेनैव सर्वत्रात्राङ्गुलज्ञानकारणम् ॥८६॥

सूच्यग्रेणेष्टकृत्तस्य प्रोतेनाङ्कितमध्यगम् ।
स्थापयेत्प्रान्ततच्छायां शङ्कोर्यत्तदमध्यतः ॥८७॥

छायाग्रं यत्र भूवृत्ते पूर्वाह्णे प्रत्यगेव तत् ।
मध्यात्तथापराह्णेऽर्के दिशि शङ्कुं निधाय च ॥८८॥

प्राचीं निर्दिश्य भाग्रेण व्यस्तम् बाहुं प्रभाग्रतः ।
कोटिं यथार्हं संप्रसार्य दोःकोट्येर्योगयुग्मगाम् ॥८९॥

रेखां प्राच्यपरां कुर्याद्भुजाज्ञाने फलं यदि ।
ततस्तयोर्याम्यगेऽर्के वर्धते बाहुरुत्तरः ॥९०॥

प्राचीति वै जायतेऽर्के ततस्तत उदग्गते ।
ततस्ततो दक्षिणगो भुजा प्राच्यग्निदिग्गता ॥९१॥

अग्रान्तरं तत्प्राग्विन्दोर्यन्मुखोऽर्कस्तदाचरेत् ।
तद्दिङ्मुखं प्रसार्य प्राग्बिन्दुशुद्धं हि निक्षिपेत् ॥९२॥

तत्र पूर्वापरा रेखा तन्मध्याद्दक्षिणोत्तरा ।
सममण्डलमेतत्स्यान्मत्स्येन मुनिसत्तम ॥९३॥

द्वित्र्यङ्गुलादिको मध्यच्छायावृत्तदलं यदि ।
अग्राज्ञानेन चैवम् स्याच्छङ्कुश्चेदुन्नतं किल ॥९४॥

कालस्तु पञ्चनाड्यस्तन्मध्यमस्तत्वलिप्तिका: |
नाभ्येति क्रान्तिरेकाहे मध्या स्याद्भाःकलापि वा ||९५||

अतोऽग्राङ्गुलमेकं वा व्यङ्गुलं न हि सिध्यति |
दिशश्च सुस्फुटा एव भवन्ति मुनिसत्तम ||९६||

चतुरस्रं यावदिष्टं तत्कर्णार्धशलाकया |
कोणं वापिशलाकाभ्याम् तावतीभ्याम् दिगन्ततः ||९७||

यदा विस्तर सूत्राग्रदिशोर्मध्यं विदिश्यपि |
निक्षिप्य चतुरस्रं तु वंशे तु स्थापनादिषु ||९८||

सत्युन्नतेऽर्धनाड्यूने दुर्दशा स्यात्प्रभा मुने |
दुर्दशायां यथा छाया विन्यस्तस्य यथादिशम् ||९९||

चापमृक्षत्रयस्याग्रे छायामार्गे मुनीश्वर |
ज्यासंख्या चेच्चतुर्विंशत्या(?त्य)धिका नतसम्भवा ||१००||

तदाधिक्यक्रमज्या त्रिज्यान्विता हि नतोत्क्रमा |
चरक्रमज्या सत्रिज्या भवेदन्त्या ततः सुत ||१०१||

त्रिज्याधिकक्रमधनुः सत्रिभासुतया धनुः |
अन्यत्र तूत्क्रमज्याभिराधिक्यादुभयं तथा ||१०२||

शङ्कोस्त्रिज्यांशाङ्गुलैस्तु वृत्ते क्रान्त्या यथोदितम् |
उदयास्तमनस्थानं मध्यं ज्ञात्वा नतांशकै: ||१०३||

तच्चापदिननाड्यंशैर्दिङ्मध्ये न प्रभापदम् |
विभज्य वा कालबोधः कालखण्डं प्रकल्प्य वा ||१०४||

निधायशङ्गे प्राक्पश्चाच्छङ्कोर्मध्याह्नभागगे ।
कोटिज्यांशाङ्गुलोत्सेधं मध्यं शङ्कोरुपर्यपि ॥१०५॥

ब्रह्माण्डमध्यं सूच्यग्रं शङ्क्वग्रं नाडिकांशतः ।
शङ्क्वग्राच्च प्रभामार्गस्पृक्सूत्रैः कालसाधनम् ॥१०६॥

गोलार्धमध्ये व्यासार्धयष्ट्या वा कालवेदनम् ।
क्रान्त्या मध्यनतेन प्रत्यग्रमत्राङ्कनं सुखम् ॥१०७॥

धनुर्वेद्यं विधिं कल्पं नतदिश्युपमस्तकम् ।
धरारन्ध्रेण मध्ये प्राप्तातपेन च मध्यतः ॥१०८॥

लम्बसूत्रेण चक्रस्य क्रमाङ्कैः ज्ञायते क्वचित् ।
समाङ्कैः कालविज्ञानं मासं प्रत्यनुपाततः ॥१०९॥

चेष्टावान्प्रतिनाडीनां पक्ष्मनिश्वासतो यदि ।
कुजो मयूरो वा स्यातां किं ततः शाल्मतोद्भवै ॥११०॥

नरं कपिं मयूरं वा स्थूलवेनूदरं मुने ।
कर्णदघ्नं पूर्णजलं पृष्ठच्छिद्रं प्रकल्पयेत् ॥१११॥

न्यस्त्वा तोये प्लवत्काष्ठं तं बद्ध्वा वदनाद्बहिः ।
तावत्येवाङ्कनं कालश्चित्रेणानेन गम्यते ॥११२॥

गोपयेज्जलनिः स्रावं मध्येऽक्षं नमनं तथा ।
लम्बसूत्रं पृच्छमानं षष्ट्यङ्कं च समान्तरम् ॥११३॥

रक्ततन्त्वा दिना यावन्नाडीषष्ट्यन्तरेति तत् ।
ततो रन्ध्रेण पृष्टास्तान् पूरयेच्चोपकज्जलैः ॥११४॥

अमलेऽम्भसि वा कुण्डे पलानां दशभिः कृतम् |
ताम्रपात्रमधच्छिद्रं चतुरङ्गुलमुच्यते ||११५||

हेममाषचतुष्केण ग्राह्यात्राननविस्तृतौ |
दशाङ्गुलकमुत्सेधे षष्टिर्मज्जत्यहर्निशम् ||११६||

तत्पात्रं यादृगपि वा यद्येवं तच्च गृह्यताम् |
कपालयन्त्रेणानेन कालो ज्ञेयः स्फुटेन वा ||११७||

देवदारु: शिवतरु: खदिरो रक्तचन्दनः |
शङ्क्वर्यं वशंनिम्बाद्या ग्राह्या यज्ञीयभूरुहाः ||११८||

एवं हस्तोच्छ्रितः शङ्कुरधोहस्तनिखातग: |
उत्सेधश्चक्षुषा कल्प्यो द्वादशाङ्गुलवानिति ||११९||

पश्येद्यत्र स्थितो योऽयं तदग्रे दर्पणे मुखम् |
दिवा निरुप्यौ भाकर्णौ निरुप्यौ चक्षुषः सुखम् ||१२०||

तादृक् शङ्कुद्वयं ग्राह्यं यथा दिग्भ्रमणस्थितम् |
ग्राह्यान्तरक्षेपमध्यमागमानां विवेचने ||१२१||

इति ते कथितं विप्र तथान्यत्तत्वत: शृणु|
इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते चतुर्थोऽध्यायः

||पञ्चमोऽध्यायः||

समागमो वा युद्धं वा भौमादीनां परस्परम् |
नो भावीति मुनिश्रेष्ठ चन्द्रेणैव समागमः ||१||

समलिप्तौ यदा स्यातां दृक्कर्माणौ मुहुः समौ |
तदा तदन्तरक्षेपे मानैक्यार्धसमे सति ||२||

अन्योन्यस्पर्शमानत्वादुल्लेखं युद्धमेव तत् |
हीने भेदं समुच्यते चापसव्यं तथाधिके ||३||

आरादंशार्धमंशूनां व्याप्तिर्हि तु शशीनयोः |
आब्रह्माण्डं कपालं तत्सृत्यंशे तद्ग्रहान्तरे ||४||

रश्मिसम्मीलनादंशुविरुद्धमधिकांशुकात् |
समागमश्चेत्प्रभवति ताराबिम्बसमागमः ||५||

त्रिज्यांशाङ्गुलयष्ट्यग्रे तिर्यङ्मध्यांशकाङ्गुलम् |
शलाकां स्थापयेन्मध्ये दण्डमूलं च पश्यता ||६||

अभेदयोगे दृश्येते द्वौ शलाकाग्रयोः खगौ |
मनःपूर्त्यै ग्रहाणां चाप्येवं योगं प्रसाधयेत् ||७||

बृषेऽत्यष्ट्यंशके यस्य याम्यः क्षेपोऽशंकद्वयात् |
भवेदभ्यधिको भिन्द्याद्रोहिण्याः शकटं हि सः ||८||

नाणुरेकोऽपसव्ये चेन्नपसव्यं तदिष्यते |
तथा समागमेऽणुश्चेदेकोऽसावसमागमः ||९||

अस्थूलावनणू द्वौ चेदुदक्स्थो दक्षिणाश्रितः |
स्थूलाणूप्रथमप्रश्नेऽपीत्येवार्धत्रयं स्मृतम् ||१०||

साम्येऽपीत्यपिशब्देन सौम्येऽपीति हि कीर्तितम् |
तदुद्दिष्टाविमौ शब्दावुदकस्थो दक्षिणाश्रितः ||११||

अदीप्तिमान्विवर्णश्च वेपथू रुक्षदर्शनः |
दुर्बलश्चापि योऽणु: स स्थूलस्तु स्वयमन्यथा ||१२||

जयी जितश्च स्थूलोऽणुर्यद्वादृष्टान्तवाचकौ |
इमौ शब्दौ बृथा स्यातामुदक्थो दक्षिणाश्रितः ||१३||

ताविमावेव याम्यादि स्थूलाख्यत्वं वृथोदितम् |
याम्येऽपि युक्त एवोक्तस्थानादिबलमत्र चेत् ||१४||

अन्यत्र नैतदित्याज्ञावैकृतात्तत्सदीरितम् |
स्थानादि बलाभिन्नात्र व्यर्था नैकापि भा स्मृता ||१५||

प्रश्नत्रयेऽप्येवान्यस्मिन् स्थितौ सूक्ष्मफलं स्मृतम् |
समागमेऽपि सव्ये वा स्वल्पौ द्वावपि वेपथू ||१६||

स्वोत्कटौ विग्रहौ द्वावादीप्तौ यदि समागमौ |
उदकस्थो दक्षिणस्थो वा भार्गवःप्रायशो जयी ||१७||

जगतः कल्पनैवेयं भावाभावाय केवलम् |
अन्योन्यमतिदुरस्थाः कथं युद्धं प्रकुर्वते ||१८||

छादकोऽथः स्थितश्छाद्य उपरिस्थः शशी रवे: |
छादकश्छादिका राज्ञो भूच्छाया मुनिसत्तम ||१९||

यद्येवं प्रतिशुक्लान्तं स्याद्दर्शं प्रत्युपप्लव: |
सम्भवाद्रवि तुल्येन्दोर्भूच्छाया तुल्यशीतगो: ||२०||

छादकौ राहुकेतू स्तामन्योन्यस्यार्धचक्रगौ |
एवं यद्युक्तदोषोऽपि नेति चेत्तद् ब्रुवे मुने ||२१||

तथा चेच्छुक्लकृष्णान्तादुपरागास्तथान्यदा |
न चेत् द्विरिन्दोर्मासं प्रत्यर्कस्य प्रतिवत्सरम् ||२२||

यद्येक एव राहुः स्यान्न ग्राह्यस्तस्य भार्धगः |
एकैकं ग्रहणं मासं प्रतिवर्षं प्रतीति च ||२३||

शश्येण वटवल्मीकलक्षेऽङ्के बालिशः फणी |
तद्वल्मीकस्थितोनात्ति कल्प्यो नार्कग्रहोऽस्ति चेत् ||२४||

किं न स्याद्ग्रहणं शश्वत्कुतस्तत्र समं सदा |
ग्रहाणान्तरकालानां वैषम्ये किं नु कारणम् ||२५||

बहुप्रलापास्तन्नोक्तास्तस्माद्वेदविरोधिनः |
निमित्तकारणं राहुर्द्वयोरेवोपरागयोः ||२६||

विक्षिप्तः फणिना चन्द्रः सुर्यमाच्छादयेदिव |
मेघः स्वयं वा भूच्छायां प्रविशेद् ग्रहणं भवेत् ||२७||

शीघ्रगामी शशी सूर्यं छाया पश्चिमतोऽपि वा |
प्रागेत्यतीत्य तत्पश्चात्ग्रहणं भास्करस्य हि ||२८||

प्राङ्नोक्षः शीतगोस्तु प्राग्ग्रहणं प्रत्यगेव हि |
ब्रह्मेन्दुशक्रवित्तेशवरुणाग्नियमाः क्रमात् ||२९||

फणी नभगणैक्यघ्नद्विमितग्रहणाधियाः |
समलिप्तौ यदा छाद्यच्छादकौ तत्र चेद्भुजः ||३०||

विक्षेपजनको राश्यर्धोनः सोमग्रहस्तथा |
अर्कग्रहोऽप्याशङ्क्येत वृत्त्यंशान्नाधिकः स तु ||३१||

सर्वत्र सोमग्रहणं सममेव हि दृश्यते |
उभयोरन्तराभावाद् भूच्छायेन्दोश्च सर्वदा ||३२||

ग्रहान्तरं शशिक्षेपस्तेनोद्देश्य उपप्लवः |
पूर्वापरान्तराभावादभावो लम्बनस्य च ||३३||

पर्वप्रतिपदोरेव ग्रासमोक्षौ विधोर्मुने |
न हि लम्बनहेतुः स्यादेव याम्योत्तरान्तरम् ||३४||

तस्मिन्सति त्रिपादस्थेऽप्युपरागोऽस्ति तद्दिने |
तावत्कः पुत्र याम्योदग्गत्या गत्वा प्रसिध्यति ||३५||

तदन्तरेणावनतेः सम्भवाद्भास्करग्रहे |
सेन्दुक्षेपयुतोना दिक्तुल्यभेदे ग्रहान्तरम् ||३६||

साभाक्षोदङ्मध्यलग्नक्रान्योः साम्येन सम्भवः |
पूर्वापरान्तराभावान्मध्याह्ने मास्तु लम्बनम् ||३७||

अस्त्यन्यदा तु पूर्वाह्णे ग्रासमोक्षौ तु दर्शगौ |
प्रतिपद्यपराह्णे तु तथा स्तो वा तदा क्वचित् ||३८||

अर्केन्दोरतिदूरत्वात्समीपत्वादिदं भवेत् |
दृक्कर्मणैव तत्सिद्धेर्भग्रहग्रहसङ्गतौ ||३९||

लम्बनावनती न स्तामपि सत्यन्तरद्वये |
इष्टलंबनमन्यत्र यदीष्टेऽवनतिर्भवेत् ||४०||

दृक्कर्म च तथा विप्र प्रत्यक्षं च न तत्तथा |
दृक्कर्मणी द्वे च कृते व्यर्के भासति तादृशे ||४१||

बृथा ह्यवनतेर्भावोऽखण्डत्वाच्च यथा तथा |
मध्यज्या मध्यलग्नस्य नतज्या हर्दलेऽर्कवत ||४२||

चरसंस्कृतलग्नज्या लम्बज्या चेद्भवत्यपि |
अन्त्यक्रमज्योदयज्या त्रिज्या चेन्मध्यमौर्विका ||४३||

कोटिजीवोदयज्या स्यादित्यूह्यं कोटिज्यास्फुटम् |
मध्यज्या कर्णजा दोर्ज्या दृक्क्षेपो दक्षिणोत्तरः ||४४||

अस्य दिङ्मध्यजीवानि कुज्या विक्षेपवर्गयोः |
विक्षेपो दृग्गतिर्मूलम् शङ्कुरित्यपि चोच्यते ||४५||

नतांशस्फुटदोः कोटीजीवे दृक्क्षेपदृग्गतीः |
छेदः शङ्कुहृतैः कुज्याकृतिश्छेदसमा यदि ||४६||

मध्यलग्नार्कोत्थ दोर्ज्या कोटिलम्बननाडिकाः |
महत्त्वात्प्राग्गतेरिन्दोर्दशान्तात्प्राक्समोऽंशुना ||४७||

प्राक्कपालेऽन्यथा पश्चात्तथास्याद्युक्तिरप्यतः |
लम्बनं पर्वतः शोध्यं प्राक्कपालेऽन्यथा परे ||४८||

असकृल्लंवनं यावद्भिः सिद्धं सकलं समम् |
रवीन्द्वोर्लम्बनं चेति हरिजं चेति भास्करः ||४९||

वारयामास शब्दाभ्यामन्ययोगेषु लम्बनम् |
अग्रस्तोऽर्को विमुक्तो वा दिवा नक्तं च कालयोः ||५०||

व्यक्षे क्षणत्रयं दृश्यः पापिभिः सत्तमा इव |
स्थिरीकृतं तद्धरिजं लम्बनं स्वाष्टमान्वितम् ||५१||

पितृभक्तिविहीनानामेवं वा सर्वलम्बनम् |
स्थिरीकृता दृग्गतिज्या सप्ताष्टाङ्कहतापि वा ||५२||

अल्पच्छेदाथवा छेद स्वाष्टमेन स्थिरीकृता |
यद्वोदयज्याप्रभवो विना बाहुज्यया मुने ||५३||

मेषलग्नान्तरक्षेत्रज्यातो वा त्र्येकतः परम् |
वर्गयोरुक्तदृक्क्षेप एषः मार्गः सदा न सत् ||५४||

क्वचित्सन्नपि तत्रैतन्न क्वचिद्वापि सन्किल |
दृक्क्षेपत्रिभजा चेत्स्यान्मध्यभुक्त्यन्तरस्य यः ||५५||

अर्कविध्वो: पञ्चदशे नतिर्वा त्रिकृतिर्मुने |
दृक्क्षेपसप्तत्यंशो वा वनतिर्ग्रहणं ततः ||५६||

नतिरल्पन्तरा वान्त्यमार्गाभ्यां न हि दोषदा |
दृश्यते द्वादशांशोऽपि स्वच्छत्वाद्ग्रह एव हि ||५७||

इन्दोर्लिप्तात्रयं वार्कस्योष्णत्वाद् ग्रस्तमत्र न |
ग्रहणं नामभेदो हि दुर्लेख्यमपि पुण्यदम् ||५८||

तेनान्तराल्पकग्रासो ग्राह्यं चेन्न समो यदि |
सर्वग्रासोऽपि तिग्मांशोः क्वचिद्देशान्तरे तु सः ||५९||

अर्केन्द्वन्तरसद्भावात्स्पर्शमात्रोऽपि नास्ति हि |
पर्वाधिपतिसङ्ख्यासु पातालग्रहणं च तत् ||६०||

स्नानादिषु तु न ग्राह्यं शुभेषु ग्रहयुद्धवत् |
ग्रहणं ग्रहयुद्धं वा तत्तदह्नि फलप्रदम् ||६१||

छन्नं ग्राह्याधिकं चेत्स्याद्विमर्दग्रहणं च तत् |
यावत्बिम्बैकदेशो वा तावदेव न दृश्यते ||६२||

विमर्दग्रहणं तावत्कालो वैमर्दिक: स्मृतः |
चन्द्रबिम्बाधिकं सुर्यबिम्बमध्ये न कर्वुरम् ||६३||

तत्रारात् कङ्कनाकारं कङ्कणग्रहणं मुने |
तत्र कङ्कणकालः स्यादसौ वैमर्दिकस्तु यः ||६४||

स्थितिकालो भवेत्तावद्यावत्तिष्ठत्युपप्लव: |
कर्णमानैक्यमानान्तरार्धे क्षेपो भुजः स्वक: ||६५||

आभ्यां पूर्वपराकोटिर्गत्यन्तरसमा यदि |
स्थित्यर्धं च विमर्दार्धे क्रमात्स्यादष्टनाडिका: ||६६||

कङ्कणार्धे विमर्दार्धं कङ्कणग्रहणे भवेत् |
ग्रासो मोक्षो विमर्दार्धे नोनयुक्त: सदैव सः ||६७||

निमीलनोन्मीलनाख्यं कङ्कणार्धेन तत्तथा |
मुहुर्मुहुः कृताः सर्वे स्फुटाः सन्तु तदा मुने ||६८||

असकृल्लम्बनं सूर्यग्रहणेऽन्यत्सकृत्तथा |
मध्यस्पर्शादन्तरं वा स्थित्यर्धादि स्फुटं स्वकम् ||६९||

स्थितादौ तु धनं वा स्यात्स्वमध्यहरिजान्तरम् |
मध्याधिकोने क्षितिजखमध्यदिशि लम्बने ||७०||

स्थित्यर्धादाबृणं तच्चेदन्यथा हरिजान्तरम् |
धनं कपालभेदे तु लम्बनैक्यं भवेन्मुने ||७१||

इत्थं स्फुटं वा स्थित्यर्धं विमर्दार्धं च नारद |
स्थित्यर्धं लम्बनं चापि युगपच्चासकृत्स्फुटम् ||७२||

अह्नोगत्यन्तरं कोटि: कुमध्येऽष्टममक्षजम् |
तदर्कग्रहणे मध्यस्थित्यर्धघ्नं स्फुटं मुने ||७३||

स्फुटस्थित्यर्धसम्भक्तं क्षेपो बाहुः श्रवस्तत: |
ग्रासं तात्कालिकं प्रोज्झ्य मानैक्यार्धात्ततोऽन्यथा ||७४||

इष्टग्रहणकालः स्यादग्रासे स्पर्शमोक्षयोः |
कालः स्फुटो ग्राह्यग्रास उन्मीलननिमीलने ||७५||

अतीर्थेऽक्षविधि: कल्प्यो मध्याह्ननतमूर्धग: |
याम्योत्तरं मुनिश्रेष्ठ लम्बनं तद्ग्रहान्तरम् ||७६||

नतोत्क्रमज्या क्षज्याघ्नी त्रिज्याप्ता क्रमकार्मुकम् |
वलनं तद्भवं प्रत्यक्कपाले दक्षिणं हि तत् ||७७||

उत्तराभिमुखो याति तस्मिन्प्रतिपदं ग्रहः |
प्राचीमध्यनतस्थानं याम्यप्रत्युद्गमादिति ||७८||

उत्तरं वलनं प्राक्स्याद्वेलावलनमेव तत् |
ग्राह्य क्रान्ति चतुर्विंशं मध्यं वलनमापनम् ||७९||

यद्वेलावलनं प्राच्या उत्तरोत्तरतो ग्रहः |
उदेति मकरादौ तत्प्राक्पश्चात्स्वर्णमत्र तत् ||८०||

अन्यदोदेति कर्क्यादावन्यदा यत्र तत्र तत् |
इति निष्पन्नवलनं पारमार्थिकमुच्यते ||८१||

तत्क्रमज्या त्रिभज्या चेद्गोधयो वलनाङ्गुलम् |
सप्तत्या साङ्गुलं वा स्यादत्यल्पं यत्तदन्तरम् ||८२||

नान्यजोत्क्रमजा कार्यं न तासोः सन्निभग्रहात् |
वेदाः सम्प्रवदन्ते च नतकालाय चापतः ||८३||

इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते पञ्चमोऽध्यायः

||षष्ठोऽध्यायः||

छेदकेन विना छेदाःसुस्फुटा उपरागयोः |
न ज्ञायन्ते यतस्तस्माच्छेदकज्ञानमुच्यते ||१||

समभुदिङ्मध्यबिन्दोःसप्तवर्गाङ्गुलेन च |
मानैक्यार्धेन वृत्तानां ग्राह्यार्धेन त्रयं लिखेत् ||२||

तन्मध्यमं समासाख्यं बहिष्ठं वलनाश्रयम् |
ग्राह्यमण्डलमध्यस्थं दिशःप्रागेव साधिताः ||३||

यत्प्राच्यां वलनम् देयम् तद्यथादिशमेव तु |
पश्चाद्यत्तद्विपर्यस्तम् वलनं प्राक्प्रसिद्धये ||४||

आद्यन्तमध्यवलनैस्त्रिभिरेवाखिलं भवेत् |
निमीलनोन्मीलनाभ्यां न किञ्चिदपि नारद ||५||

विक्षेपाग्रे यतश्चन्द्रः परस्मादनुसृत्य तत् |
प्राङ्मुखं मध्यवलनम् तद्विक्षेपैकता यदि ||६||

भेदे पश्चान्मुखं देयमिन्दोर्भानोर्विपर्ययात् |
सव्यापसव्यमार्गाभ्याम् तथा तन्न्यासदर्शनात् ||७||

तिस्रो रेखामध्यबिन्दुं प्रापयेद्वलनत्रयात् |
तत्समासयुतिभ्यां तु विक्षेपौ ग्रासमौक्षिकौ ||८||

वलनाभिमुखम् बिन्दोः स्वविक्षेपं च मध्यमम् |
विन्यस्य विलिखेच्चापम् विक्षेपत्रितयाग्रगम् ||९||

इष्टच्छन्नोनमानैक्यदलसम्मितयास्पदम् |
शलाकया मध्यबिन्दोः ज्ञात्वा चापं ततो लिखेत् ||१०||

ग्राहकार्धेन तद्बिम्बस्थानं चेत्स्पर्शमोक्षयोः |
निभीलनोन्मीलनयोर्विद्याद्ग्रहणमीप्सितम् ||११||

अध्यान्तत्वाद्विधो: सूर्यग्रहणं कृष्णमेव तु |
ध्वान्तम् छादकमिन्दोर्यद्विशेषेऽस्ति विधौ ततः ||१२||

धूम्रं कृष्णं क्रमात्कृष्णं कृष्णताम्रं विनिर्दिशेत् |
किञ्चिदूनाधिकै: पादै: छन्नं कपिलमेव तत् ||१३||

न देयं यस्य कस्यापि रहस्यं शास्त्रमुत्तमम् |
अर्थलुब्धाय मूर्खाय साहङ्काराय पापिने ||१४||

गुरुभक्तिविहीनाय पुत्रायापि वदेन्न हि |
एतद्देयं सुशिष्याय मुने वत्सरवासिने ||१५||

इति श्रीशाकल्यसंहितायां द्वितीयप्रश्ने
ब्रह्मसिद्धान्ते षष्ठोऽध्यायः

Transliteration

Chapter I

dhyānayogasamārūḍhaṁ brahmāṇaṁ trijagadgurum |
abhivādya sukhāsīnaṁ nāradaḥ paripṛcchati ||1||

deva deva jagannātha sarvajña kamalāsana |
jyotiṣāṁ caritaṁ jñānaṁ brūhi kālāśayaṁ mahat ||2||

adhītamakhilaṁ chandaḥ sthāṇurūpaṁ pratīyate |
aṅgairvinā yathaivāṁgī tasmādetatprasīda me ||3||

ityevamukto viśvātmā nāradena maharṣiṇā |
putreṇa dhīmatā prītyā vākyametadabhāṣata ||4||

sādhu sādhu mahābhāga yanmāṁ tvaṁ paripṛcchasi |
vistareṇ pravakṣyāmi tanme nigadataḥ śruṇu ||5||

nārāyaṇaḥ suraśreṣṭho vedākāreṇa vartate |
chandaḥ śāstraṁ tasya pādau kalpaḥ pāṇī mukhaṁs tathā ||6||

śabdaśāstraṁ śrotrayugmaṁ niruktaṁ ghrāṇameva ca |
śikṣāśāstraṁ jyoutiṣaṁ tu nayane ṣaṣṭhameva tu ||7||

etairaṅgairasāvaṅgī rājate vedavigrahaḥ |
pradhānamaṅgamevedamaṅgeṣveteṣu ṣṭsu ca ||8||

etacca mattaḥ śītāṁśoḥ pulastyāñca vivasvataḥ |
romakācca vasiṣṭhācca gargādapi bṛhaspateḥ ||9||

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aṣṭadhā nirgataṁ śāstraṁ svayaṁ paramadurlabham |
ete'pi kālādhīnāni jñānāni vidurīśvarāḥ ||10||

gatāgataṁ ciraṁ kāryaṁ kālastatprabhāvātyaye |
hetuḥ kāraṇakālo'sau sarvādhārastrivikramaḥ ||11||

tatkāryaṁ kālakalanaṁ vakṣyate nāradādhunā |
aṣṭādaśa nimeṣāstu kāṣṭhā triṁśat kalā ca tāḥ ||12||

tāsāṁ triṁśat kṣaṇaste'pi ṣaṇṇāḍīti praśasyate |
yadvā gurvakṣarāṇāṁ tu daśakaṁ prāṇa ucyate ||13||

ṣaḍbhiḥ prāṇairvināḍī tu tatṣaṣṭyā ghaṭikā tathā |
śvāsaḥ prāṇastu sarveṣāṁ tadayustena nirdiśet ||14||

nāḍīṣaṣṭyā hyahorātraṁ māsastatriṁśātā bhavet |
mānamārkṣamiti proktaiṁ sāvanādyamathocyate ||15||

udayādudayaṁ bhānorbhūdinaṁ mṛtyulokajam |
syāttenārkodayo māsastathāyaṁ sāvanaśca hi ||16||

bhāsvadviyogataścandro yāvataiti raviṁ punaḥ |
syāttāvānaindavo māsasthithīnāṁ triṁśatā ca saḥ ||17||

tatpūrvottarapakṣau tu svataḥ siddhau sitāsitau |
kṛttikādi dvandvagatātpūrṇendoḥ kārtikādayaḥ ||18||

tridhā māsā upāntyāntyā prathamāstu trayo'tra hi |
pitaraścandrabimbasthā agniṣvāttādayo ravim ||19||

uditaṁ kṛṣṇapakṣārdhe paśyantyanyatra cāstagam |
ahorātraṁ tat pitṛṇāṁ cāndro māsaḥ prakīrtyate ||20||

māsapakṣāvasāne tu taddivārātramadhyamau |
saṅkrāntyā sauramāsastu māsadvayamṛturbhavet ||21||

varṣa ṣaḍṛtavo divyamahorātraṁ ca tanmune |
kapitthākārabhūgolamadhyago meruparvataḥ ||22||

nānāratnacayo haima ubhayatra vinirgataḥ |
tasyopariṣṭānmanvindrāmarāstasthurmaharṣayaḥ ||23||

adhastādasurāstadvanmahābalaparākramāḥ |
graho meṣāyane prodayansañcarannudaguttaram ||24||

pūrayetprāgaharmadhyaṁ devānāmṛtubhistribhiḥ |
yāmyāyanādyaistrigraṛhairahnaḥ paścārdhameva saḥ ||25||

tathā tulādairdaityānāmapi saumyāyanādibhiḥ |
surāsurāṇāmanyonyamahorātraṁ viparyayāt ||26||

divārātrpramāṇaṁ ca bhānorbhagaṇapūraṇāt |
vikalānāṁ kalā ṣaṣṭhyā tatṣaṣṭhyā bhāga ucyate ||27||

tattriṁśatā bhavedrāśirbhagaṇo dvādaśaiva te |
tulādi ṣaḍaśītyaṁśaiḥ ṣaḍaśītimukhaṁ dinam ||28||

taccatuṣṭayameva syāddvisvabhāveṣu rāśiṣu |
ṣaḍviṁśe dhanuṣo bhāge dvāviṁśe'nimiṣasya ca ||29||

mithunāṣṭādaśe bhāge kanyāyāstu caturdaśe |
tataḥ śeṣāṇi kanyāyāṁ yānyahāni tu ṣoḍajña ||30||

kratubhistāni tulyāni pitṛṛṇāṁ dattabhakṣayam |
yatra kṣetre bhavedetatṣaḍaśītimukhaṁ dinam ||31||

ṣaḍaśītimukhaṁ nāma tasya kṣetrasya kīrtyate |
saumyayāmyāyane yat syāt kṣetraṁ tadayanābhidham ||32||

triśṛṅgadrermadhyadeśādupariṣṭādvivākaraḥ |
tulāmeṣāyane yāti viṣuvadviṣuvaṁ ca tat ||33||

carasthiradvisvabhāvaiḥ phalaiste ca mṛgādayaḥ |
śiśirādiguṇairvṛddhaiḥ punaśca śiśirādayaḥ ||34||

sthiraṁ viṣṇupadaṁ ceti tannāma sthirabhaṁ smṛtam |
meṣacaitrādimāsāstu madhvādyā iti kīrtitāḥ ||35||

kvacidete vasantādyā yajamānecchayā punaḥ |
vādayaḥ samparīdānvitādyāstu vatsarāḥ prabhavādayaḥ ||36||

pramāthī prathamaṁ varṣaṁ sauraṁ kalpasya sarvadā |
divyairahobhibrāhmairvā varṣasaṁjñā puroktavat ||37||

divyāvdānāṁ sahasrāṇi dvādaśaiva caturyugaṁ |
yugasya daśamo bhāgaścatustridvyekasaṅguṇaḥ ||38||

kramāt kṛtayugādīnāṁ ṣaṣṭhāṁśaḥ sandhayaḥ svakāḥ |
yugeṣu tatra vartete gatāgatayugasthitī ||39||

kṛtādīnāṁ vyavastheyaṁ dharmapāda vyavasthayā |
sandhyāsandhyāṁśasahitaṁ vijñeyaṁ taccaturyugam ||40||

caturyugāṇāṁ saikā syātsaptatirmanusañcaraḥ |
kṛtābdasaṅkhyā tasyānte sandhirdhātrījalaplavaḥ ||41||

manvantaravyavastheyaṁ prājāpatyamudāhṛtam |
kalpe sasandhayo jñeyā manavaste caturdaśa ||42||

kṛtapramāṇaḥ kalpādau sandhiḥ pañcadaśaḥ smṛtaḥ |
itthaṁ yugasahasreṇa bhutatārādimānakaḥ ||43||

saṁhārakārakaḥ kalpaḥ kathitastava nārada |
sahasrayugaparyantamaharyad brahmaṇo viduḥ ||44||

rātriṁ yugasahasrāntāṁ te'horātravido janāḥ |
yāvad brahmākhilaṁ viśvaṁ tāvattiṣṭhati tiṣṭhati ||45||

śatāyuḥ puruṣaḥ sarvaḥ svayā'horātrasaṅkhyayā |
graharkṣadevadaityādi pratikalpaṁ carācaram ||46||

kṛtādrivedairdivyābdaiḥ śatadhnaiḥ sṛjyate mayā |
jyāmiṇḍamadhye paridhikrameṇa labaṇārṇavaḥ ||47||

mekhalāvasthitastasyā devāsuravibhāgakṛt |
yojanānāṁ śataṁ triṁśadyutaṁ tasyāpi vistaraḥ ||48||

tanmadhye tulyabhāge tu svarṇaprākāratoraṇāḥ |
catasra etāḥ pūrvādyā nagaryo devanirmitāḥ ||49||

yamakoṭiśca laṅkā ca romakaṁ siddhapuryapi |
upariṣṭād vrajatyāsāṁ bhacakraṁ grahasaṁyutam ||50||

viśeṣād viṣuvatyarkastannāmnā viṣuvatprabhā |
puṣkaradvīpamadhyasthe mahāpuṣkarabhūruhe ||51||

tiṣṭhatā siddhapuryā tu grahāḥ saṁsthāpitā mayā |
kalpādau sṛṣṭikāle tatpurīṣveva tadādiṣu ||52||

madhyodayārdharātryastakāle vāraḥ prajāyate |
tadā paścānmukhaṁ sarvaṁ grahanakṣatratārakāḥ ||53||

sṛjantyagrāgrabhūpādeṣvasubhiḥ sāvanodbhavaiḥ |
grahanakṣatratārāṇāṁ samodgamanakāraṇāt ||54||

pūrvoktaṁ tu dinaṁ triṁśannāḍikaṁ naktamapyatha |
viṣuvatyudayasthānātprācyavā paścimottarāḥ ||55||

prādakṣiṇyena kakubhaścatasraśca vinirdiśet |
evamuktapurībhyo'yamuttaro merurāmaraḥ ||56||

āsuro dakṣiṇāḥ kāṣṭhāniyamo na tayoḥ samaḥ |
liptāsu cakratulyāsu dṛśyate sakalaṁ yadiḥ ||57||

viṣuvaddivase bhūsthe tāvatīne kuto diśaḥ |
iti paryaṭatāṁ yo yadbhāti yadyaduḍūnyapi ||58||

atītya tarasā yāti yatpratyakprāggatiśca sā |
tulyamevātikramaṇaṁ navatirvā svakakṣayā ||59||

ūrdhvaṁ tatparivartena pauṣṇānte bhagaṇaḥ smṛtaḥ |
sarvatrecchākalavadhe pramāṇāptaṁ ca tatphalam ||60||

jātyecchāmānasāmyaṁ doḥ koṭivargayuteḥ padam |
karṇo daśapadābhyasto viṣkambhātparidhirbhavet ||61||

hānivṛddhidhiyā mārgavyatyayādiṣṭamiṣṭajāt |
yuge syuḥ prāggaterbhānorjñasya śukrasya cātmaja ||62||

kujārkiguru śīghrāṇāṁ bhagaṇāḥ sūryavatsarāḥ |
indostarkāmarāgnyarthasaptaśailaśarāstathā ||63||

radebhatarkagonetranayanāni kujasya ca |
budhaśīghrasya vai ṣaṣṭikhādyagnyaṅkamunīndavaḥ ||64||

śūnyāśvinayanāmbhodhiṣaḍguṇā vākpatestathā |
kāvyaśīghrasya ṣaṭśailaguṇākṛtiviyannagāḥ ||65||

aṣṭatarkaśarartvabdhiśaśāṅkāḥ sūryajasya ca |
trinakhebhāṣṭavarṇāstu mandoccasya niśāpateḥ ||66||

vāmapātasya vasvagnidvidasrāgniyamā mune |
kaujātkalpe kramādindrakarā aṣṭāṣṭasāgarāḥ ||67||

kṛtātyaṣṭisriśūnyāṅkā nāsatyarturasāstathā |
prāggateḥ sūryamandasya saptakuñjarapāvakāḥ ||68||

kaujātkṛtanaravā nāgaṣaḍguṇāḥ khaviyannava |
śarapāvakabāṇāśca tathā navahutāśanāḥ ||69||

aṣṭāśvībhādrivikṛti dvayṣṭabāṇendavo yuge |
bhodayāḥ prāggaterete bhagaṇaistu vivarjitāḥ ||70||

pātānāṁ bhagaṇairyuktā svodayāḥ parikīrtitāḥ |
nakṣatrodayataḥ pūrvaṁ pratyaggāti rudeti hi ||71||

paścātprāggatiretasmādabhikalpodayā yuge |
arkonacandrabhagaṇāḥ śaśimāsāḥ prakīrtitāḥ ||72||

dinīkṛtāste tithayo bhūdinonāḥ kṣayakṣaṣāḥ |
arkendumāsaviśleṣo bhavetputrādhimāsakāḥ ||73||

atra cakrakalāścandrakakṣā pañcadaśāhatāḥ |
vyomakakṣā bhavedeṣā kalpendu bhagaṇāhatā ||74||

kakṣā grahāṇāṁ saiveha hṛtā caiva pṛthak pṛthak |
svakalpabhagaṇaiḥ kakṣāṣaṣṭighnaṁ bhramaṇaṁ rave ||75||

svakakṣāvyāsabhūvyāsa viśleṣārdhaṃ tu madhyamam |
sarveṣāṁ prāggatiḥ kalpyā bhūdinairvyomamaṇḍalam ||76||

ekasya bhūdinasyāsya kalpyā pratyaggatistviha |
chāyāśaṅku vyāsakoṭī karṇo'to viṣuvatprabhā ||77||

chāyā yā sā viṣuvatī svadeśe syāddinārdhajā |
śaṅkuḥ syādviṣuvatkarṇo yatra na kṣīyate tataḥ ||78||

vardhamāno mahīkarṇaṣ svārivarjo nirakṣakaḥ |
akṣākhyau dvau dhruvau meroruparisṭānnabhaḥ sthitau ||79||

bhūbhacakrāntaraṁ bhūmidhruvāntaramapi dhruvam |
samudre madhyakakṣāsyāḥ kṣitijasthau dhruvāviti ||80||

tatrasthāḥ paripaśyanti dakṣiṇottarayormune |
akṣonnaterabhāvātsa vyakṣadeśa iti smṛtaḥ ||81||

anyatrākṣocchrayo yāvatāvaccakrāvalambanam |
merorabhimukhaṁ yāturuparyupari dṛśyate ||82||

dhruvastatastataścakraṁ nīcairnīrcestu nārada |
nirakṣābhimukhaṁ yāturanyathā taddvayaṁ bhavet ||83||

akṣāṁśā navatirmerau vyakṣe lambāṁśakāstathā |
lambākṣau dakṣiṇau grāhyau gaṇiteṣu tathāpi ca ||84||

lambajībā tribhajyā cedvardhamānā mahīśravaḥ |
vardhamānaḥ khakhartvinduyojanāni kṣitestu saḥ ||85||

bhūkarṇānuguṇaṁ tasya jyāyā vṛddheradarśanāt |
bhūkarṇavṛddhyanuguṇaṁ kṣīyate'kṣo dino'dhikaḥ ||86||

tathāpyakṣo na navatestatkramajyāpi gṛhyate |
akṣādvilomagamanāllambākṣāvadhikonakau ||87||

akṣajyātrijyayoḥ śleṣoyadyakṣakṣaya ityatha |
lambo hi bhavatā tatra gṛhyate tarhi yatnataḥ ||88||

tatpṛcchānuguṇaṁ loke susiddhaṁ tannirākṛtam |
syātsusādhayitā sveṣṭaḥ svādhyāyastadupādhayaḥ ||89||

tasmātpañcasu siddhānteṣūktamārgo'vadhāryatām |
dhṛtaṁ madhūptaṁ viṣavanmadhunājyaṁ viṣaṁ tathā ||90||

saṁsargasyāviśeṣe'pi tathaitadanumīyate |
madhyāhne viṣuvatyarkastasyākṣāṁśā natāṁśakāḥ ||91||

tannatātpalabhā cātaḥ sākṣacchāyā prakīrtyate |
cakraliptārdhavargasya daśamaṁ karaṇīpadam ||92||

vyāsārdhaṁ taccaturviṁśo jyārdhapiṇḍa itīryate |
vṛttasya ṣaṇṇavatyaṁśodaṇḍvadyaḥ samaḥ sa tat ||93||

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prathamaṁ jyārdhamevaitadvargena karaṇīpadam |
trayoviṁśo jyārdhapiṇḍḥ parakhaṇḍāntaraṁ jyayoḥ ||94||

dvighneṣṭahīnā khaṇḍajyā yatrārdhenduyutā na cet |
khaṇḍe śatādhike vetra viyadvedayutā tu cet ||95||

khādrinetrakhakhaṇḍā syādeṣyakhaṇḍayutā satī |
svakhaṇḍarahitā jīvā svātpūrvajyā tu maurvikā ||96||

prāyodaśaiva santyāsāṁ madhyaikādaśa varjitāḥ |
hitvā kukhaṇḍamūlāni tatrānyāḥ syuryathoditam ||97||

yadvāsyasya bhājye jye tatra guṇaṣaṭcandrasaṁyute |
dvitīyabhāntyajāstistro nagagovahnisaṁyutāḥ ||98||

tatpañcamī khakhāntyādyā ceḻjyā prāgvattataḥ sphuṭā |
ityetau dvau ca sāmānyau mārgau nānāguṇairyutau ||99||

vikṛtyadhikacakravyāsārdhamārgasya kiñca yat |
ādyamārge tribhajyārdhaṁ prathamajyā na yadbhavet ||100||

karaṇīpadapādo na karaṇī mukhameva hi |
ekadvibhajyā dvādaśajyā karaṇījyāpadaṁ kila ||101||

evaṁ nasyādādyamārge tatsarvānuguṇaḥ sphuṭaḥ |
vargo nirūpyate proktā trijyā prāgvatkaraṇyapi ||102||

cakrasya ṣaṇṇavatyaṁśo viliptāṣrayako'kṣataḥ |
prathamajyārdhametatsyādvikṛtijyā puroktavat ||103||

dvighnasya khaṇḍahīnajyā navādhviniyutāṁ tyajet |
tadādhvidvitayaṁ vyomavahninetrayutaṁ kramāt ||104||

yadvātaḥ khaṇḍa saṁśuddhiliptā yojyā kramāñcatāḥ |
saptaviśvairnagāṣṭābhīrasaśailairnagādribhiḥ ||105||

atibhṛtyā vardhiśailairasāṁbhonidhibhistataḥ |
dvitīyabhānte yā jyāravyā yuganetrendusaṁyutāḥ ||106||

tatpañcamī sebhasūryā taccaturthyaṣṭaśailabhāk |
sendrā tatra tṛtīyādyā dvitīye dvādaśānvite ||107||

ādyabhāntyā khadṛgbhāgā viśvādristu sphuṭādhvani |
tatsaptamī khabhetyādyā tatṣaṣṭhī radavarjitā ||108||

tatpañcamī caturthī sā khātyaṣṭigognisaṁyutā |
tṛtīyā vikalā sātatphalaṁ bhūtithisaṁyutam ||109||

dvitīyā yatphalaṁ veda vikalādyamathoktavat |
susphuṭajyā vidhiścātrotkramajyākhaṇḍabhedanam ||110||

jyā tvābhāvānulomyena saṣaḍvargānyabhākṣabhā |
parakhaṇḍaphalaṁ proktaṁ svakhaṇḍātsvasvapūrvayā ||111||

iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte prathamo'dhyāyaḥ

Chapter II

ākarṣataḥ svasambandhādbhavatīti sphuṭasthitiḥ |
mandoccābhyāmarkacandrau yadā mandaphalaṁ mune ||1||

ākṛṣyete eva tasmānmandakarmaikametayoḥ |
catvāryānayane dvārau pareṣāṁ dve tu tatra hi ||2||

tatkarmaṇāṁ caturṇāṁ ca kramaḥ prāksūcito mune |
grahabhūkteḥ phalaṁ kāryaṁ grahavattadvilomage ||3||

phalavyaste kendrabhuktiryadi vā trijyayā hatā |
tatkarṇāptā svoccabhukterviśodhyā sā gatiḥ sphuṭā ||4||

grahoccabhuktiyogāttu hitvā kendragatiṁ sphuṭām |
śīghrocca bhuktiśeṣārdhaṁ grahakendragatiryataḥ ||5||

śīghroccabhuktirekāhe tadaikye yoktavadgatiḥ |
śīghrārdhabhuktau tādṛśāṁ phalādhāya grahasya tu ||6||

grahāpakṣepaṇaṁ cārdhaṁ karaṇaṁ tatprakīrtyate |
grahāṇāṁ bhuktirevāsminkendrabhuktiśca māndayoḥ ||7||

sphuṭakendragatistasmāt sphuṭabhuktirgrahasya ca |
phalārdhārdhaṁ tu mandārdhagrahebhuktiyutārdhitā ||8||

sā bhavedvidyamānatvātkendrabhuktirvidhostu sā |
svoccabhuktirbhavedyatsā prāguccendugatistataḥ ||9||

atha vā kendrabhuktiḥ sā trijyākarṇāntarāhatā |
karṇāptārdhākhye'rdhitā ca grahabhukterdhanaṁ tvṛṇam ||10||

karṇe trijyādhikone tu vyastaṁ mānde vidhīyate |
uccairnīcairgate sūrye uccairnīcairyayurgrahāḥ ||11||

kiñcittasmātphalaṁ bhānostadgatyā ca tadā natam |
grahabhuktihataṁ bhaktaṁ cakraliptābhirarkavat ||12||

arkabhuktivadapyevaṁ grahe kāryaṁ ca tadgatau |
madhyagraheṣu cocceṣu tadbhuktiṣu ca tatkṛte ||13||

ādāvevākhileṣvevaṁ kṛtaṁ yattaddhitaṁ matam |
svoccaiḥ svanīcaistābhyāṁ svādanyasyaitad dvayaṁ bhavet ||14||

anyasyaivānyadīyābhyāṁ nāto'rkasyaitadiṣyate |
kriyate yā durāśaṅkā grahasphuṭavidhiṁ prati ||15||

sāparaṁ hīyate putra sāṁprataṁ tatra tatphalam |
madhyasaṁjñā grahāḥ pañcaivārkendū neti madhyamau ||16||

yadi syāttithisaṁvṛddhi hraāsābhāvaḥ prasajyate |
tithayaḥ sāvanāhāni bhagaṇāḥ hrāsavṛddhitaḥ ||17||

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yadi syuradhimāso na rātryabhāvaḥ prasajyate |
śukrajñayoḥ karṣakau ca śīghrā taditarasya ca ||18||

vikṣepā na vikalpyante phalaheturna kalpanā |
arkendvorapi śīghrārdhamandārdhādiprakalpanā ||19||

niṣphalatvānnirastaiva mahāvāyau pradhāvati |
tirodhānena ṣaḍajādīnvādyāṁśa iva khecarān ||20||

nudati pravahaśceti mārgabhedādidaṁ na sat |
karmāṇi yāni catvāri grahasyaiveti tāni ca ||21||

śīghrārdhaṁ syācchīghraphalaṁ caturthe dviguṇaṁ tathā |
mandārdhaṁ syānmandaphalaṁ tṛtīyamiti nānyathā ||22||

kiñcoccābhyāṁ niruktābhyāmapakṛṣṭaḥ punastathā |
kalpyaṁ cetpunarapyevaṁ tathārkendū ca nārada ||23||

grahopari na śīghroccamiti ceduccatā'sya na |
trijyonaśīghrakarṇaśca sarvadā munisattama ||24||

nādhaḥ śīghrocca iti ced grahastarhyalpago'stu saḥ |
adhaḥ kakṣā kalpyate cetkakṣāsau tatra kasya vā ||25||

tūṣṇīṁ kakṣā kalpyate cetsarveṣāṁ tarhi kalpyatām |
niṣphalatvānna sarveṣāmiti cetkalpyatāṁ phalam ||26||

nirarthatvātkalpanāyā yathākāryaṁ tu kāraṇaṁ |
kalpyate cetkalpitaṁ tanmayaiva na tu kiṁ punaḥ ||27||

atīndriyārthavijñāne pramāṇaṁ śrutireva hi |
yathāśruti mayā dṛṣṭaṁ yattadevāvabudhyatām ||28||

madhyamāḥ sthāyinaḥ santi neti cenmadhyamānugāḥ |
grahāścatuṣkarmavanta iti yattannirākṛtam ||29||

madhyaśīghrārdhamandārdhaphalameti tadāśrayaiḥ |
upagrahaiścāpakṛṣṭā mandoccaiśca grahā yayuḥ ||30||

iti cenmandabhāge ca naivākasmādupagrahāḥ |
yujyante te prakṛṣṭāścedapakṛṣṭā grahāśca taiḥ ||31||

iti catvāri karmāṇi grahasyeva na tanmatam |
upagrahāpakarṣe'pi pūrvamevedamucyate ||32||

ato mandārdhaśīghrārdhā na santīti hi nocyate |
asatve"nyatarasyāpi grahayorardhasaṁjñayoḥ ||33||

ekāpakarṣaṇaṁ kalpyaṁ grahasyāpi tathā punaḥ |
upagrahā na santīti yadi brūyāccatuṣṭayam ||34||

karmaṇāṁ syādgrahasyaiva santi tasmādupagrahāḥ |
ardhākhyenāpakṛṣṭaścennoccairnīccairyathā tathā ||35||

upagraho'pakṛṣṭaḥ syātsagrahastena cediti |
naivamardhagrahasthānajñānameva tathocyate ||36||

svacchandagamanaṁ taddhi kiṁ tūccairuccanīcatā |
arghākhyastvapakṛṣṭaścedapakṛṣṭa upagrahaḥ ||37||

grahaścāpyapakṛṣṭaḥ syāttadabhāvānna tadbhavet |
vikṣepyau ca na ceddharmau pātābhyāṁ śukracandrajau ||38||

vikṣepyai stāṁ tathā kṣepaliptāścenna sphuṭāsvadik |
apakṛṣṭairgrahaiḥ sākaṁ karṣakā yānti yattataḥ ||39||

te'pakṛṣṭāḥ svamandoccaiḥ pātāstaiśca tataḥ phalam |
tṛtīyamapi pātānāṁ grahavanneti kalpyatām ||40||

tasmānmandārdhamandoccamadhye yāvadupagrahaḥ |
yāti yaddiśi tāvatyevāste taddiśi madhyamāt ||41||

svacchandagaḥ karṣakastu kṣepaścalanamanyathā |
śīghroccāveva śīghrākhyau budhaśukrau na cetarau ||42||

iti cettādṛguccābhyāṁ grahasthānaṁ ca budhyatām |
yāmyottaragatī yadvadutkramādbhāskarasya ca ||43||

tathaivānapakṛṣṭānāṁ gaterādhikyamalpatā |
grahākarṣakavadvastu kiṁ na cedityupagrahaiḥ ||44||

svacchandagamane teṣāṁ mandoccāḥ kalpitā vṛthā |
mṛṣāvādī ca vedaḥ syāttatsarvānarthakāraṇam ||45||

mandārdhādyo yaddiśi ca yāti tanmadhyamo grahaḥ |
yāvanti kalpe mandārdhā yo gacchetso'pyupagrahaḥ ||46||

sa nāsti yasya gamanaṁ kalpajaṁ gamanaṁ na ca |
mandasphuṭā dromaśe hi some ca kṣepasādhanam ||47||

kīrtitaṁ tatkarṣakāḥ syurna sambandhāntaraṁ kramāt |
sūryaromaśasomebhyo yathā labdhagrahā iha ||48||

kalpitāḥ syuḥ sanāmāno bhinnasaṁjñāstathaiva ca |
mandāpakṛṣṭairmandākhyā grahairdevā yayuḥ saha ||49||

vikṣipyante ca pātaistaiste grahā iti kalpyatām |
iti cetkarṣakāṇāṁ tu proktaṁ nāmāntaraṁ bhavet ||50||

tyaktaṁ śrutikṛtaṁ nāma naitadapyasti pauliśe |
grahaiḥ kṛtaṁ yattatpāte kṛte neti ca vartate ||51||

somaromaśayoḥ pātāḥ śodhyā mandebhya īritāḥ |
śukrajñapātayorvāmakramaṇaṁ sūrya kīrtitam ||52||

tṛtīye'sya na cediṣṭaṁ tattavāpyasti dūṣaṇam |
śrutyantaravirodhastu pauliśe'tra ca gamyate ||53||

tadvāsya gamanaṁ tāvannirṇītaṁ ca sahetukam |
upagrahanimittaṁ vā na tāvatprathamakramaḥ ||54||

yatheṣṭakalpanāpatterdvitīyaḥ kalpa eva cet |
pātamandoccamadhyena phalaṁ sādhyaṁ na tanmatam ||55||

kalpastṛtīyaśceduccairnāpakṛṣṭa upagrahaḥ |
aśveneva rathaṁ pātamākarṣati na vā sa tam ||56||

stambhacchāyā dīpavaccenna mandocco'tra kāraṇam |
parasparaṁ bhacakrārdhapātopagrahasañcaraḥ ||57||

vāmaṁ niṣkāraṇaṁ yātītīyaṁ vā kalpanā satī |
svoccādupagrahādvāpi nākasmāddhi tadiṣyate ||58||

sahetukaṁ kalpyamānaṁ kalpyate na tu hetukaiḥ |
mandoccairnāpakṛṣṭastu yāvadvrajati bhāskaraḥ ||59||

tenākṛṣṭā grahastāvatte tathopagrahairyayuḥ |
bhṛtyaistatkriyate karma svāminā kriyate hi yat ||60||

pratyakprāgbahirantarvā tadgraho'rkasamaṁ vrajet |
iti cennaitadiṣṭaṁ syādbhogādāvadhikaṁ nṛpaḥ ||61||

sevādāvadhikaṁ bhṛtyā vartante na hi tatsamāḥ |
yāvānyasyādhikāraḥ syāttāvattasya pravartanam ||62||

sarvacakrādhipaḥ sūrya iyadyāti svabhuktitaḥ |
iyadyātīti yuktiḥ syādrājānucaraklptitaḥ ||63||

śrutiryatra pramāṇaṁ syādyuktiḥ kā tatra nārada |
jijñāsoryuktiriṣṭāsti yadi śrutyanusāriṇī ||64||

śrutyukteṣṭatarā yuktirnānyadbādheta yachrutim |
kṛtvādau mandakarmānte kriyate śīghrakarma yat ||65||

tasmānmandāpakṛṣṭaḥ prāk śīghreṇāyo'pakṛṣyate |
kiñcitkiñcidvilambyaiva iti cedapakarṣati ||66||

naitadevaṁ yadevaṁ cedgatirnānāvidhānvaham |
bimbaṁ ca samamarkasya tadbadetadabhāvataḥ ||67||

nanu bimbālpatādhikyaṁ khamadhye kṣitije'nvaham |
iti tu kṣitije brahmāṇḍāṁśavo na hyadho bhuvaḥ ||68||

pūrṇa kṛṣṇāṁśavastasmād dṛśaḥ pratihate mahat |
bimbaṁ bhṛbhābhisaṁchannaṁ khatavarṇaṁ ca dṛśyate ||69||

asaṁmukhatvānmadhyātsa pārśvādyaṁ khakharatvataḥ |
stokastokena bhūraśmihrāse caṇḍāṁśudarśanāt ||70||

dṛṣṭipratihate bimbaṁ kṣīyamāṇamite gate |
ārātkhamadhye caṇḍāṁśuraśmiḥ prāgalbhyate bhuvaḥ ||71||

raśmyabhāvācca pādonaṁ kṣitijādiva dṛśyate |
tribhiścaturbhiḥ kṣitije khamadhye'tha kalāhṛtāḥ ||72||

aṅgulāni bhavantyasmādityuktaṁ hi maharṣibhiḥ |
bhūmikakṣācaturbhāge svāsthitasyātmanastu yaḥ ||73||

kṣitijastha khamadhyastha ityevāsau puroditaḥ |
tisraścatasrastā liptāstadānīmaṅguladvaye ||74||

dṛśyte mahadekena bimbamanyena vānyathā |
ekasmindivase tasmādvimbādhikyālpatā na hi ||75||

tricatuḥ karṇayogārdhaṁ sphuṭakarṇo'sya mastake |
grahaścaratyataḥ kiñcidvilambyākarṣaṇaṁ na hi ||76||

uccadvayānuguṇyena graho yadyapi sañcaret |
tathāpi yugapatkarmadvayaṁ na kriyate yataḥ ||77||

tathā nītāgrahāstadvaddṛśyante naiva vai tataḥ |
upadeśakramo'pyevaṁ sa ca karmadvayakramaḥ ||78||

yāvatā so'dhikaḥ karṇastāvatārdhena tādṛśī |
trijyātaḥ sphuṭakarṇo'pi nārthasiddheḥ savarjitaḥ ||79||

upagrahāṇāṁ yajjātakakṣā siddhirgrahasya tu |
sutarāṁ mandaśīghrākhye karmaṇī kathite kramāt ||80||

uccairnīcairvrajante vārkānurūpaṁ samaśravaḥ |
madhyakarṇastataḥ karṇāntaratvaṁ yāti tanmune ||81||

antarunnatavṛkṣāśca vanaprāntasthitā iva |
dūratvāccandrakakṣāyāṁ dṛśyante sakalāstathā ||82||

bhaumārkibudhajīvānāṁ triṁśadambhodhivardhitāḥ |
viṣkambhāścandrakakṣāyāṁ ṣaṣṭiḥ śukrasya kīrtitāḥ ||83||

trijyāghnāḥ sphuṭakarṇāptā viṣkambhāste sphuṭāḥ |
tithyāptā bimbaliptāḥ syuraṅgulāni puroktavat ||84||

kakṣāśca bhaganāmānaṁ vidhoricchetarasya tu |
viṣkambhaḥ phalamasyeti viṣkambhaḥ pāramāyikaḥ ||85||

tathārkasya svakakṣāyāṁ viṣkambhaḥ khakhapañcaṣaṭ |
ṣaṣṭiraṣṭāhatārājñastathā bimbasya nārada ||86||

nijamaṇḍalaviṣkambhaḥ svakakṣāyāṁ phalaṁ vidhoḥ |
kakṣecchāmānamanyā vā mānecchā bhagaṇau dvayoḥ ||87||

itīndumadhyakakṣāyāṁ vijñeyaṁ bimbayojanam |
kakṣā vā bhagaṇā mānamityevecchādhikena tu ||88||

arkendumaṇḍalavyāsau sphuṭabhuktihatau tayoḥ |
madhyabhuttyudhṛtau spaṣṭau prāgvalliptāstadaṅgulam ||89||

dūrasthatvāttu bimbasya saukṣmyaṁ sthaulyaṁ prakalpitam |
lokadṛṣṭyā yathādreḥ svasthāne nityaṁ samātmanaḥ ||90||

arkakakṣendukakṣāptā sūryābimbaśrutiryataḥ |
indubimbaśravāptāyā krośo nāvā na va tataḥ ||91||

arkendukakṣā vyāsārdhe tadviṣkambhāvavehi te |
tanmadhyabhuktiguṇite sphuṭabhuktyuddhṛte sphuṭe ||92||

bhānorbhārdhe mahīcchāyā mahatvānmaṇḍalasya tu |
arkasya bhūmyāḥ sūcyagramānaṁ śeṣamilārkayoḥ ||93||

asaṅkucitaśuddhārkakakṣāvyāsadalaṁ phalam |
bhūkarṇa icchāchāyāgraṁ tato liptāstadaṅgulam ||94||

arkendukakṣāvyāsārdhe sphuṭe saṅkucite kramāt |
mānecche phalamārke lāveṣaṁ projñya tataḥ phalam ||95||

bhūkarṇādindukakṣāyāṁ chāyāvyāsastadā tanam |
yuktyā kālāṅgulaṁ vakṣye yuktyantaramatisphuṭam ||96||

bhūcchāye lāgatasyātha taraṇibhramaṇe vidhoḥ |
sūcīmadhyamakakṣāyāṁ kiyatīti mahīśravaḥ ||97||

sphuṭendubhuktighno bhakto madhyamā ca samaṁ phalam |
sphuṭārkacandrakarṇāptaṁ phalamarkamṛgāṅkayoḥ ||98||

mānecche madhyakarṇāstu projñya sūcyāpi bhāśravaḥ |
tithyā kalāyāsantyevametadardhaṁ vidhoḥ śravaḥ ||99||

madhyamicchādhikālpārkabimbābhyāṁ tādṛśaṁ tvṛṇam |
madhyārkaśravaṇe māne tathā syāditi tanmatam ||100||

tathā sphuṭārkakakṣāyāṁ vyāsārdhenādhikena vā |
adhikālpamṛṇaṁ mānenādhikalpe'rka maṇḍle ||101||

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paridhyaṁśahato vimbavyāso bimbaśravo bhavet |
uccena samaṁ yena yo'pakṛṣyetsa tatsamaḥ ||102||

yo'tyalpaucco nīcālpaḥ svabahusvalpa eva ca |
tenāpakṛṣyate svarṇaṁ mahadalpaṁ bahu svataḥ ||103||

uccairnīcairgate svoccaparidhyaṁśāḥ svabhāvataḥ |
alpādhikā yathāśakti kṣepāḥ mātaistathedṛśaiḥ ||104||

syādetacca phalaṁ karṇe śaidhye'lpā gatiranyathā |
adhikālpādhikā bhuktiruñcairnīñcairgatasya hi ||105||

trijyādhikālpe yadi tu bahiścarati sa grahaḥ |
svataḥ śīghrānabhimukhaṁ māndaṁ tu kvacidasti hi ||106||

maivaṁ yadi syādevaivaṁ syātpūrvāparamārdhayoḥ |
uccairgrahastvṛṇadhanaṁ vā yadyetatphalaṁ kramāt ||107||

yadā syādvikalā bhuktistadā yātu bhūmaṇḍalam |
graham prāggatihīnaṁ vā prākpratyaggativad grahāt ||108||

sarvoccapātānpātīti brahmāṇḍaṁ vai tu nārada |
pratipādayituṁ śakyā vakratā na yataḥ param ||109||

prāggatirnāsti yannāsti kevalaṁ tu na kāraṇam |
śanimandātparaṁ cetko hetuḥ kheṭo'pyadarśanāt ||110||

vakratā cādhikagatāviva kalpyo yadi grahaḥ |
gatiranyānurūpā sā bhūyasīti na kīrtyate ||111||

uccairnīcairgatasyādhikālpakarṇena sūkṣmatā |
sthaulyaṁ bimbasya cāto hi prasajyate munīśvara ||112||

hānivṛddhigate naiva yuktiyuktaṁ yadīrite |
ubhayorakṣisiddhe te tanme nigadataḥ śruṇu ||113||

uccākhyaṁ projñya kendraṁ tadgatagamyāntaraṁ tayoḥ |
yadi kalpyeta doḥkoṭī tadā bāhuḥ prasajyate ||114||

gatādbhujajyā viṣame gamyāktoṭiḥ pade iti |
yugmabhāvādgataiṣyābhyāṁ koṭibāhū yujīti ca ||115||

liptāstatvayamairbhaktā labdhaṁjyāpiṇḍkā gatāḥ |
gatagamyāntarābhyastaṁ vibhajettatvalocanaiḥ ||116||

tadavāptaphalaṁ yojyaṁ jyāpiṇḍe gatasaṁjñake |
ityevaṁ naiva vicaransadā jyāpiṇḍaśaktitaḥ ||117||

gatajyābhāvatastvindoścaturthījyā sadā bhavet |
evaṁ saṁvartamānāyāṁ taccaturthī gatā hyapi ||118||

na tātkālikasidhyai syādvartamānā yathā svataḥ |
iṣṭanāḍīhatā kendragatiḥ ṣaṣṭyauddhṛtāpi sā ||119||

bāhukoṭī jyāntaraghnetatvanetraistayoḥ phale |
pratyahaṁ vardhamānatvācchīghrakendrasya vardhate ||120||

bāhurojapade yugme kṣīyate koṭiranyathā |
pratyahaṁ kṣīyamāṇatvānmandakendrasya vardhate ||121||

koṭirojapade yugme kṣīyate vāhuranyathā |
tadvattadgrahavaccāsya phalaṁ grahaphaloditam ||122||

dhanākhyamanyaddhīnākhyaṁ dhanākhyaṁ grahavadgatau |
ṛṇākhyamanyathā projñya bahubhuktiṁ gate phalāt ||123||

jyāntaraghnā gatiryadvā doḥkoṭijyātha dṛkkvacit |
vyaṁśatryaṁśādibhirmande tricandrāyairhatā hṛtā ||124||

śaidhye tribhajyayā tulyā dorjyā cet kṣīyate'nvaham |
vardhante sphuṭavṛttāṁśāstathā vyastāstu nānyathā ||125||

tadvyastaṁ jīvaśanyostu śaidhye yuktiśca saiva hi |
sphuṭavṛttāntarahate doḥkoṭijye grahasya tu ||126||

gatārdhaṁ sphuṭavṛttaghnaṁ bāhukoṭijyayordhanam |
vardhamāne paridhyaṁśe kṣīyamāṇe ṛṇaṁ mune ||127||

gatyarthā bāhukoṭijyā grahārthā vardhate yadi |
dhanātmikā kṣīyate cedṛṇarūpeti saiva ca ||128||

niścitya phalajānyonyaiḥ kṛtvā yogāntaraṁ muneḥ |
bhagaṇaṁśairbāhukoṭyoḥ phalaje tāṁ vibhajya ca ||129||

grahabhukterdoḥ phalajyā vargāntaramitīritā |
karṇadoḥ phalajāvargairnāḍikā yāvatā bhavet ||130||

gateḥ koṭiphalajyā tu dvidhā syāttāvatā hatā |
karṇayorbahuvṛddhau tu svalpāyāṁ gati kheṭayoḥ ||131||

grahadoḥ phalajā vargaṁ yāvatonādhikaṁ vrajet |
yāvadvargo gatiḥ karṇastāvatyeva na saṁśayaḥ ||132||

tāṁ tu vargāntarātkarṇo doḥ koṭijyāṁ viśodhayet |
kṣīyamāṇe vardhamāne tūbhābhyāṁ tadvaye dhanam ||133||

kuryādyathoktaniṣpannakarṇabāhū yathā tathā |
vardhate kṣīyate cāpi mṛgātkoṭiphalena ca ||134||

karkyādi kendre tadvyastaṁ calakarṇastathā kṛtaḥ |
karṇe kakṣāgate koṭiphalamaurvyāṁ mahāmune ||135||

chedo'sau dviguṇastena svacchedāsaphalena ca |
doḥ phalānuguṇaścendoḥ svakādūnādhiko bhavet ||136||

sthirīkṛtaphalenaiva karṇaḥ kalpyaḥ sphuṭaḥ kṛtaḥ |
gatyardhaṁ calakarṇe syāttrijyā doḥ phalajāvadhe ||137||

grahabāhuphalajyā tu karṇāntarahatottarā |
svamūlādhikakarṇena grahakarṇavivāriṇā ||138||

ūnādhikā guṇastādṛkphalaṁ yattacchidānyathā |
svakābhyāṁ vṛttakarṇābhyāṁ grahātsiddhādgrahaṁ mune ||139||

tatpūrvakālikaṁ hitvā bhuktausatyāṁ gateḥ phalam |
tādṛk syāditi saṁskāro vṛttātkarṇādihādhikaḥ ||140||

niṣpannarāśeḥ karṇena gatirdoḥ phalamaurvikā |
jyāṁ projjhyā tatvayamalairhatvātadvivaroddhṛtam ||141||

saṅkhyā tatvāśvisaṁvarge saṁyojya dhanurucyate |
iti kriyā yadā tatra tatvāśvibhyḥ phalaṁ laghu ||142||

yajjyākhaṇḍaphalaṁ yāvattāvattatvāśvisaṅguṇam |
tajjyākhaṇḍoddhṛtaṁ bhukteḥ phalaṁ liptādikaṁ sphuṭam ||143||

yathā grahaphalaṁ yatra tadbhuktau ca gateḥ phalam |
tathānyathā tvṛṇaphalaṁ vakrabhuktistvṛṇādhike ||144||

bhujajyā kṣīyamāṇatvādatyalpaṁ śravaṇasya ca |
parārdhādaumahadṛṇaṁ pūrvāhāduttare dine ||145||

ato vakrānuvakreti parapūrvārdhayoḥ kramāt |
pratyaggaterhānivṛddhī vakrotthā tvanvahaṁ gatau ||146||

mandamandārdhayoḥ karṇaḥ syācchedatvādavakratā |
ardhitatvātphalasyaiva śīghrārdhe munisattam ||147||

dūrasthitaḥ svaśīghroccādgrahaḥ śithilaraśmibhiḥ |
savyetarākṛṣṭatanurvakrabhuktirbhavediti ||148||

nākṛṣyante hi śīghrārdhādākṛṣyante grahā iti |
viśeṣo'stīti cennityaṁ tattadbhāvaprasaktitaḥ ||149||

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ardhitatvātphalasyaivamityuktaṁ kāraṇaṁ tviha |
iti cedvakrabhuktiśca kiṁ na syāttādṛśī sakhe ||150||

ato na raśmiśaithilyaṁ vāṅmātrā raśmayaḥ kila |
cumbakabhramakanyāyenoccābhimukhameva ca ||151||

svayaṁ yāti graho bhuktistatphalānuguṇā bhavet |
upacāraṁ sarvamanyanmukhyeyamiti hi sthitiḥ ||152||

śīghravṛttāṁśānurūpaṁ viprakarṣaḥ prakalpyate |
śīghroñcātsaptame bhaumaḥ śukro jheyastathāṣṭame ||153||

śanaiścarastu navame vakriṇaste tvavakriṇaḥ |
ṣaṣṭhe ca pañcame tadvaccaturthe munisattam ||154||

aṣṭauviṁśatirardhona gajāgnivyardha kheṣavaḥ |
tritarkāḥ satribhāgādrirasāṅkāḥ saṣaṭśatam ||155||

navāśā navasūryāśca vedendrāḥ śarabāṇabhūḥ |
khātyaṣṭiḥ khadhṛtirgo'tidhṛtirviśvāśvinastathā ||156||

vedākṛtirgo dvidasrāḥ kvabdhihastā yugārthadṛk |
khotkṛtistryaṁśahīnāgara sahastāḥ khādanti dṛk ||157||

khago'śvinaḥ khadantāḥ ṣaḍdantāḥ sailaguṇāgnayaḥ |
meṣādyaśvyādi madhyāṁśāḥ ṣaḍśonāḥ khaṣaḍguṇāḥ ||158||

dvitriṣaṭpañcavahnīndudvitripañcārthadṛkśarāḥ |
śarendubhūdvivahnitrigo'vdhivedatrivahnayaḥ ||159||

śarāḥśataṁ dvidviradāstārāsaṅkhyāḥ syuraśvibhāt |
punarvasoruttararkṣe dakṣiṇarkṣe ca nārada ||160||

prāṅmātramapi vāśvinyāṁ sahāyamupakāraṇe |
aśvayonikṣuraprakhyaṁ śakaṭaiṇa śironibham ||161||

māṇikyagṛhabāṇābhaṁ cakraprākārasannibham |
dviparyaṅkanibhaṁ hastamuktāvidrūmasannibham ||162||

toraṇaṁ valisaṅkāśaṁ kuṇḍalaṁ siṁhapucchavat |
gajakarṇākṛtiḥ karṇaḥ śṛṅgāṭakanibho'bhijit ||163||

aśvinyāmurajābhaṁ tu dve mūle hyanyadārthikam |
āṣāḍhadvitayaṁ caiva yogatārātha vakṣyate ||164||

uttarā dvibha somyānāṁ madhyamā tribhameva hi |
vrahmādityabhadaityānāṁ prācī hastasya vāyavī ||165||

sā paścimā taddvitīyā śraviṣṭhā yāśca paścimā |
pitṛpaūṣayamāgnīnāṁ śravaṇābhijitostathā ||166||

mūlārdrā sārdhasaptāṁśo svasthānātprāgavasthitā |
dṛśyate yasya tasyāsti na svapne'pi śivasmṛtiḥ ||167||

yatra yāvatsu vikṣiptāstārā aṁśeṣu vedhasā |
mayaiva tatra tāvanto vikṣepāṁśā upagrahāḥ ||168||

dvidevātṣaṭtrayaṁ sraṣṭustvaṣṭrārkā hi pracetasaḥ |
svakrānterdakṣiṇasthānāttadanyebhyastathottare ||169||

āśārkapañcabāṇāśā navaṣaṭ khādrikhāṁśumān |
viśveśahastasaptāgniradhyardhatrikṛtāṅkakāḥ ||170||

vyardhatarkāḥ śarāḥ ṣaṣṭistriṁśat ṣaṭtriṁśadeva hi |
adhyardhakṛtyutkṛtiḥ khaṁ vikṣepāṁśāḥ syuraśvibhāt ||171||

kṣepārdhāṁśo vāruṇasya chāyāyā bhinnamaṅkataḥ |
vikṣipto dakṣiṇe'śītyāmagastyo mithunāntagaḥ ||172||

mithunāṁśe mṛgavyādho viṁśe yāmye nabhārṇave |
hutabhug brahmahṛdayau vṛṣe dvāviṁśabhāgagau ||173||

aṣṭābhistriṁśatā caiva vikṣiptāvuttareṇa tau |
pūrvasyāṁ brahmahṛdayātpañcāṁśaistu prajāpatiḥ ||174||

saumye'ṣṭatriṁśadaṁśaistu nirdeśyaḥ sarvadā mune |
uttare'śairapāṁvatsaścitrāyāḥ pañcabhistathā ||175||

āpastato'dhikaḥ svalpaṁ ṣaḍbhiraṁśaistaduttare |
yadaivādau tadānyasmin jñāte tārāgaṇe'pi ca ||176||

phalābhāvānna taṁ sarvamutsahe kathitaṁ mune |
yugādau viṣṇutārāyāḥ ṛturbhādyaiḥ samāhitaḥ ||177||

prācyā trihastaiḥ pulahaḥ pulastyo'to daśāṁśakaiḥ |
atristatastribhirbhāgairaṅgirā hyaṣṭabhistataḥ ||178||

vasiṣṭhaḥ saptabhistasmānmarīcirdaśabhistataḥ |
pratyabdaṁ prāggatisteṣāmaṣṭau liptā munīśvara ||179||

bāṇārthā bhūśarāḥ khārthāḥ ṣaḍbāṇāḥ saptasāyakāḥ |
ṣaṣṭirnabhorasāsteṣāṁ vikṣepāṁśāḥ syuruttare ||180||

kvacitkvacidakasmātte bhagavannuttare carāḥ |
khakhanakṣatravarṣāṇi tiṣṭhanti munivallabhāḥ ||181||

kālāntareṇa tajjñānaṁ svayaṁ yuktimato bhavet |
karkyādisthā mṛgādisthāḥ sṛṣṭerudagavāṅmukhāḥ ||182||

pratyabdaṁ yānti yāmyodaggamane vihite'pi yat |
tatpaścāñcalitaṁ cakramupacāro'yamityapi ||183||

tattatpaścāllavakrāntiprasaṅgādadridṛglavāḥ |
tato'nyathātha pratyabdaṁ kiñcitkiñcidvrajantyapi ||184||

tattatprāgaśakakrāntiprasaṅge'pi nijāspadāt |
paścimāṁśakramaprāpteḥ prākcakraṁ calitaṁ na hi ||185||

yāvatsṛṣṭyādinirdiṣṭasthānaṁ tāvatprayānti te |
ādyaivaṁ caratāṁ teṣāmantarāṁśāstadāspadāt ||186||

tattaprāgaṁśakakrāntiprāpteḥ svātprāglavasya ca |
prākcakraṁ calitaṁ ceti nāradaivopacaryate ||187||

prāgaṁśakakramaprāpteḥ prākcakraṁ calitaṁ bhavet |
prākpaścāccalanāṁśonaḥ svāṁśaḥ syādbhāskarādiṣu ||188||

krāntikālāṁśalagnānāṁ lambanaṁ dyugataṁ dvayoḥ |
sphuṭārthamayanārthe ca pratyahaṁ hyudayāstayoḥ ||189||

yaddine yasya yā kakṣā tatra teṣāṁ pravṛttitaḥ |
ityetadekaṁ calanaṁ prāgyuge tāni ṣaṭśatam ||190||

yuktyāyanagrahastasmiṅstulādau prākcalaṁ bhavet |
yadvā tacchuddhacakre vā meṣādau prākcalaṁ bhavet ||191||

ayanāṁśastadbhujāṁśāstrighnāḥ santo daśoddhṛtāḥ |
prākpratyakcalanaṁ cakrasyaiveti manute tu yaḥ ||192||

calāṁśasaṁskṛtastasya graha eva sphuṭagrahaḥ |
anabhyupagamādetasyopacāraśca cediti ||193||

dorjyā trijyā krāntijīvā cetsaptāṅkaguṇendavaḥ |
cāpakrāntirudagyāmyā cakrapūrvāparārdhayoḥ ||194||

sā tulyabhinnadikkṣepayutonā syātsphuṭā ca dik |
evo bhayoradhikadiṅ nyāyo'yamitaratra ca ||195||

rakṣogaṇatvātpātānāmapasavyaṁ yayurgrahāḥ |
prākpaścārdhagataḥ pāto grahād bhrāmayati graham ||196||

yāmyottarāśābhimukhaṁ kendradorjyā ca pūrvavat |
krānteḥ pūrve vā parārdhe yāmyakṣepo yadeṣyati ||197||

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pātaṁ saṁśodhyāpakṛṣyātkendradorjyāṁ ca viddhi bhoḥ |
dorjyā tribhajyā caikāśītyaṁśakāḥ paramaṁ yayuḥ ||198||

vikṣipyate rāhuṇā tu dorjyā krāntilavāśrayā |
tannavāṁśaṁ dviguṇitaṁ jīvastriguṇamurvijaḥ ||199||

budhaśukrārkajāḥ pātairvikṣipyante caturguṇam |
daśaghnatrighanāṅkārkarasārkārkāhatasya ca ||200||

bimbasya pātabimbatvātkṣepastaddhanurucyate |
triguṇāstvaṁśakairbhaktāstrijyārdhaṁ bimbayojanam ||201||

dasrādīnāṁ sphuṭaṁ nāsti sphuṭaṁ tārāgrahasya tu |
indorapi samīpatvānnaivaṁ syādbimbayojanam ||202||

rūpasāmyātsamīpatvādanyeṣāṁ bhagaṇasya ca |
samānanyāyatāpattiḥ kakṣābhedānna sā satī ||203||

apakramāstvakṣepānte dṛśyante khecarā yataḥ |
krāntimetyapuraḥ kṣepaṁ paścādetīti cettataḥ ||204||

ubhayānuguṇaṁ śuddhakrāntyante khecase vrajet |
nānyathāpattirityevaṁ proktā śaṅkā nirāspadā ||205||

doḥ koṭyoriṣṭajīvonā trijyānyā kramamaurvikā |
cakrakrāntimahīkakṣāmānecchāphalamityataḥ ||206||

vyakṣāgrahasyādhasthānaṁ krāntidikkaṁ vinirdiśet |
tasmiṁścakraviśālārthaṁ krāntikoṭyutthamaurvikā ||207||

svāhorātrārdhakarṇaḥ syāddinavyāsadalaṁ mune |
svāhorātrārdhamityāryairucyate nāmabhistribhiḥ ||208||

krāntyaiti yāvattāvattu vyakṣādojapadotthayā |
tanmerumadhyāttāvanti syāccakrārdhasya tāvatī ||209||

yāvatī yugapatkrāntistāvatī rātrirucyate |
anyaddivātra tanmeruḥ paro meruritīritaḥ ||210||

merubhyāṁ bhūmikakṣāyāṁ bhāge pañcadaśe mune |
vilomenāyanānte tu surāsuravibhāgayoḥ ||211||

nāḍīṣaṣṭyā sakṛdaharnāḍīṣaṣṭyā sakṛnniśā |
tadantare martyaloke kṣayavṛddhī divāniśoḥ ||212||

tathaiva ghaṭikāṣaṣṭyā te yatsarvaṁ yathoditam |
dārubhirviṣuatkakṣā krāntikakṣā ubhe api ||213||

ādhārakakṣe kṣitijaṁ maṇḍlaṁ pañca vai samāḥ |
rāśyantakakṣāḥ ṣaṭtisra udaktisrastvapāgatiḥ ||214||

kṛtvā tadvaddinavyāsadalairbadhvā yathocitam |
ādhārakakṣayoryogo dhruvayoḥ sthānamatra tu ||215||

rathacakrabile merurdaṇḍadvīpādrisāgaraiḥ |
nadībhiḥ paṭṭanavanairbhūgolena yutena ca ||216||

krāntikakṣāścatuḥṣaṣṭistadāvṛttena sarvataḥ |
madhyonnataṁ prasāryāgre ubhayatra vinirgatam ||217||

yathā druvau dhruvasamau stambhayoḥ sthāpayed dṛḍham |
aṣṭabhirmadhyakakṣādyairdhruvadvayagatairapi ||218||

vibhajya golaṁ dvādaśadhā meṣādīnnirdiśetsamāḥ |
tulāmeṣāditaḥ karkimṛgādi ca lavadvayoḥ ||219||

tanmukhādhārakakṣāyāṁ yogakakṣāṁ praveśayet |
krāntisaṁjñā tiryagevaṁ tulāmeṣāditaḥ suta ||220||

svaparadhruvayoḥ kakṣā madhyasthā kṣitijābhidhā |
akṣāṁśamānopariṣṭādyojayedyantramuttamam ||221||

ācchādya śuklavasreṇa nirdiśyāṁśāṁśca nāḍikāḥ |
meṣonnatasthānatastu tacchuddhakrāntimastake ||222||

nataṁ viyaccaraṁ sthāpya kālayantraiśca kālavit |
sūryāddinagati sūtrairunnayedudayastulāt ||223||

kṣitijādudayaṁ lagnāttadvaśācca khamadhyagam |
astaṁ gacchaṁśca vijñeyaḥ sarvaṁ pratyakṣatāmiyāt ||224||

pañcācalī mahī merudhruvau kṣitijamaṇḍalam |
avaṭasthamadhobhāgaṁ kṣitijādatra kārayet ||225||

uparyadhogatā nāḍyaḥ kṣitijātsyuraharniśoḥ |
sākṣe cakrasya tiryatkvā(ktvā)dudayasyodaguttaram ||226||

kṣapā sañcarato'lpā syādanalpaṁ dinamātmaja |
anyadetasya saṁyātu laṅkā kṣitijamaṇḍalāt ||227||

ata ūrdhvaṁ prāptadṛṣṭyā kṣitijātādṛśātsvakāt |
evaṁ satyuttarakrāntau triṁśato'lpādhikaṁ dinam ||228||

pūrvāparāmarāṁśe tu yāmyakrāntau viparyayāt |
akṣacchāyā dvādaśa cenmeṣādikṣitijāntaram ||229||

krāntijyā laghukakṣāyāṁ tat kṣitijyeti cocyate |
taccāpārdhaṁ dinavyāsadalaṁ trijyeti kalpyatām ||230||

sā viśiṣṭā taccarajyā caraprāṇā hi taddhanuḥ |
nāḍyaḥ pañcadaśaitena dyukṣapārdhādisaṁskṛtāḥ ||231||

dinakṣaye taddviguṇe ṣaṣṭireva tayoryutiḥ |
kakṣāyāmadhikālpāyāṁ mahatyalpā ca nāḍikā ||232||

mahānto'lpāstathāṁśā yadvaiṣuvatyāṁ tato'dhikāḥ |
bhāntakakṣāsu ṣaṭsvalpāstokastokena nārada ||233||

tadevaivaṁ bhavedojapade kṣiptvādito'nyathā |
anojapadabheṣvevaṁ duḥsādhyatvācca kasyacit ||234||

yuktisiddhyaiva kakṣāṇāṁ kalpyaṁ vyāsadalaṁ samam |
iṣṭadyubhuktikarṇārdhamekadvitribhamaurvikāḥ ||235||

phalaṁ cāpānurūpaṁ tattatkakṣāsu prakalpitāḥ |
ahorātrārdhakarṇaḥ syāttasya tasya mitirbhavet ||236||

icchāyāmanyakakṣāyāṁ trijyā trijyādhikā na tat |
icchā kakṣā cāpakhaṇḍā meṣāllaṅkodayāsavaḥ ||237||

khāgāṣṭayo'rthago'ścaikāḥ śaravyaṅkahimāṁśavaḥ |
karkaṭānte vilomena tulāyāḥ ṣaṭ ca te muhuḥ ||238||

analpā rāśayo'nyonyaṁ tallagnādīdṛśā api |
madhyaprāntamahāvayumandavāyuvaśādgatiḥ ||239||

śīghramandā satīkheṭān darśayetsamasañcarān |
madhyāmadhyamahāsvalpamārgābhyāṁ bhrāmakaṁ samam ||240||

sarveṣāṁ citramastīti mā śaṅkāstu tadeva ca |
khecāriṇaḥ khagāḥ kheṭāḥ khecarāśca viyaccarāḥ ||241||

iti hi vyavahāro'yamṛṣīṇāṁ mahatāṁ mune |
pūrṇaṁ meṣādibhirgolaṁ cakraṁ syānna tu cenna tat ||242||

grahamaitrādivadbhavā meṣādyā hi prakīrtitāḥ |
vastuvṛttena meṣādyā grahamaitrāditā na hi ||243||

vyakṣāduttaratastattadudaguttarato natam |
pārśvayoḥ kṣitijaṁ vyakṣaṁ kṣitijāduttare dale ||244||

tathā dakṣiṇacakrārdhe dṛśyate hyanyathā mune |
tāvatpratīcyai kṣitijaṁ tāvattadubhayāspadam ||245||

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kalpyā nirakṣāḥ kṣitijaprakāraṁsthānatastataḥ |
uttarottarato'dho'dho mṛgaṣaṭkamudeti hi ||246||

niḥśeṣaṁ svodayasthānaṁ paścātsṛṣṭena gacchati |
ato mṛgādyāḥ ṣaṭ svasvacarakhaṇḍavivarjitāḥ ||247||

svodayāḥ karkaṭādyāstu dṛśyante ṣaṭ tato'nyathā |
tatkālakrāntikakṣāto rāśīnāṁ kṣitijātsvakāt ||248||

udayāstamayāveva svakāryeṇānyathā yataḥ |
lagnānayanavelāyāṁ saṁskāro'trāyanasya ca ||249||

iṣṭasya krāntikakṣāto yadanyattatra cāpi tat |
martyalokottarāvācyo rakṣabhā saptaviṁśatiḥ ||250||

tayormṛgādyāḥ karkādyā yugapatṣaṣṭidarśanāt |
ato devāsurāṁśe tu vyastā lagnadinakṣapāḥ ||251||

amrtyaloke gaṇitaṁ naitadevaṁ mahāmate |
yadrāśistho yatra dṛśyaste māsāstatra dṛśyakāḥ ||252||

tadrāśestadgrahaḥ prāṇāstatsthabhukteḥ katīttitaiḥ |
adhikatvaṁ tvahorātraṁ tārāhorātrato bhavet ||253||

nākṣatranāḍyastā nāḍyastāstu svarṇacaraṁ yadi |
kurvīta caraṇāḍīśca proktaṁ tanmānajaṁ phalam ||254||

icchā tattadahorātraṁ nākṣatraṁ mānamityapi |
ṣaṣṭiścaraṁtaṁ nakṣatraṁ saṁskuryāttādṛśe mune ||255||

svāhorātra caturbhāge nākṣatraṁ dyukṣapādalam |
sauranāḍyo bhuktisiddhāstattannāḍyo'nyathodbhavāḥ ||256||

grahadvayāntarā ṣaṣṭistannākṣatraṁ dināntaram |
bhavanti phalamānecchāstāścārkṣyonāḍikāḥ smṛtāḥ ||257||

nākṣatranāḍyaḥ kathane saurāstātkālikāgame |
chāyālagnāgame tattannāḍyo grāhyā iti sthitiḥ ||258||

anuktaṁ romaśendvarkairādyaistatte smṛtaṁ svataḥ
ityevaṁ kathitaṁ putrānyadbai śrṛ(śṛ)ṇu samāhitaḥ ||259||

iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte dvitīyo'dhyāyaḥ

Chapter III

tithyastriṁśadṛkṣāṇi saptaviṁśtireva hi |
tāvanto bhagaṇe yogāḥ karaṇāni nabhorasāḥ ||1||

arkonacandraliptābhyastithayaḥ karaṇāni ca |
prahasya bhāni sārkendoryogāḥ syurbhogabhājitāḥ ||2||

praveśanirgamau teṣāṁ tādṛk bhuktyā muhustathā |
tau kāryau bartamānānāṁ tattanmadhyasphuṭgrahaiḥ ||3||

māsādi karaṇaṁ hitvā kiṁstughnaṁ sthirasaṁjñitam |
tithyardharāśeḥ saptaiva vavādi carasaṁjñitam ||4||

māse'ṣṭakrtva ekaikaṁ vartate karaṇaṁ caram |
sthirāṇi trīṇi māsānte śakunaṁ tu catuṣpadam ||5||

nāgaṁ tadanu krṣṇāyāścaturdaśyāḥ parārdhataḥ |
pūrvāparārdhajā viṣṭirviṣṭireva divāniśoḥ ||6||

sā tyājyā tvanyathā bhadrā sarvakarmasu bhadradā |
pucchākhyā daśame vidyā api tadvacchubhāvahaḥ ||7||

sā krṣṇātyunnatasthūlahanugaṇḍasthalā mune |
ugradaṁṣṭrā dīrghnāsā vahninetrā mahodarā ||8||

kroḍī ca bhīkarākārā sarvāriṣṭakarī tadā |
lāṅgūlinī vahnilakṣamudgirantī tripājjagat ||9||

sarvaṁ vyāpnoti pāto'pi tadrūpastatktiyaḥ kramāt |
dvipādapuccha evāsau saṁjñābhedena vaidhṛtiḥ ||10||

saptadaśe saptaviṁśe yoge ca sa hi vartate |
kvacicca tasmātprabalaḥ kvacittasmātsudāruṇaḥ ||11||

calāṁśasaṁskṛtārkendvostadasaṁskṛtayostu vā |
bhinnaikāyanagatayoryutau bhārdhena maṇḍale ||12||

krāntyastulye kramātpāto vaidhṛtaśca sudāruṇaḥ |
viṣuvatkrāntisāmyaṁ dviryadā syurdvividhāstadā ||13||

dvitīyaḥ prabalaḥ pāto dvirbhavediti niścayaḥ |
krāntyābhicaratoreva bhāskarendvoḥ parasparam ||14||

tāvadevāsya pāto'yaṁ vyatipāto'yamityataḥ |
ayaṁ prasiddho'tastāvadevāsyāpi ca sambhavaḥ ||15||

parasparaṁ vānucaratorarkendvoḥ prabalodbhavaḥ |
syāttadarthoktaviṣuve calasaṁskṛtasambhave ||16||

arkendoḥ pathike krāntistadvidā tadvidhe gatī |
api grahasyeva kalpye prāggatiśceti vakratā ||17||

mandādhikonaśīghre syāttadyogo gatagamyajaḥ |
avakriṇordvayorevaṁ vakriṇostu viparyayāt ||18||

prākcaryātyadhike'tīto bhāvahīne tu vakriṇaḥ |
gatyantareṇa tadvakrādanulomavilomayoḥ ||19||

dinādi vakriṇyetasminbhuktiyogena nārada |
tātkālikau grahau tena cheddyamicchāmitirharaḥ ||20||

svabhuktau phalamiṣṭaṁ vā tau bhvetāṁ muhurmuhuḥ |
krāntidinādi gaṇayankrāntisāmyaṁ vicārayet ||21||

krāntiryadāpanītendoḥ śodhyā kṣepāttadāstu sā |
kalpaujayugmapadajā yugmaujaypadajeti hi ||22||

sūryakrāntyadhikonendoḥ sphuṭakrāntirgataiṣyajā |
pāta ojapadasthā cedvāmaṁ tvanyapadodbhavā ||23||

paramakrāntijīvāghnī krāntijyātrijyayā phalam |
taccāpāntaramardhaṁ vā śatālpaṁ śītagoḥ phalam ||24||

tatsaṁskṛtebhyaḥ krāntīte same yāvatpunaḥ punaḥ |
upakramopasaṁhāragrahāntarakalādikam ||25||

tadbhuktyā parame hīne bhāvī pāto gato'dhike |
pātaśca madhakālaśca krāntisāmyamapīti vā ||26||

catuḥśatī śatālpā vā tato'nalpārdhamatra vā |
krāntigatyantaraṁ ṣaṣṭirmānaikyārdhamiti phalam ||27||

icchāsthityardhanāḍyaḥ svamṛṇaṁ kāle ca madhyame |
nirgamaśca praveśaśca pātasyetthaṁ viśudhyatām ||28||

gatyoraikyaṁ cāntaraṁ vā gatyantaramitīritam |
na cetkrāntyantaraṁ cādau vāntaraikyaṁ na mānayoḥ ||29||

syādetatprathamapraśne tūṣṇīṁ gatyantaraṁ yataḥ |
kathitaṁ tatkrāntibhuktigataikyaṁ ca na saṁsthitiḥ ||30||

evaṁ cedgrahayormadhyaṁ mānaikyārdhaṁ bhavellaye |
syattadā samaliptau tau madhyakālau yadāpi ca ||31||

krāntirna kāraṇaṁ yasmāttasmādetanna sammatam |
upāyaḥ krāntisāmyārthaṁ kaścidatra nirupyate ||32||

digbhede'pīti dikkaulyametāvatkalpyameva ca |
prajvalajjvalanākāre kāleyāvatpatatyasau ||33||

tatra snānena dānena dattaśrāddhajapādibhiḥ |
yatprāptaṁ sumahacchreyastatkālajñānato'pi ca ||34||

aviśeṣeṇa sarvāṇi nakṣatrāṇi vratāni tu |
rātryardhavyāpinakṣatre kuryādvā tadupasthite ||35||

sarvatra yā yāḥ saṁnihitā nāḍyastāstāḥ supuṇyadāḥ |
tridhā vibhajya rātriṁ tāṁ madhāṁśe yanna tārakam ||36||

upoṣitavyaṁ yadyatra yenāstaṁ yāti bhāskaraḥ |
śroṇyā śraviṣṭhayā yuktā grāhyā taddvādaśīvrate ||37||

jyeṣṭhā śleṣārevatīnāṁ pādā antyā bhasandhayaḥ |
teṣāṁ ca tatpararkṣāṇāmantyā ādyāśca ṣoḍaśa ||38||

bhasandhayaśca ganḍāntaṁ sarvakarmasu varjitam |
yathaiva lagnaganḍāntaṁ nāsti jīve balānvite ||39||

tathaiva tithiganḍāntaṁ nāstīndau balaśālini |
pradoṣavyāpinī grāhyā tithirnaktavrateṣu ca ||40||

abhāve dviguṇacchāyāvyāpinyāṁ kāla idṛśe |
divā naktaṁ caredarvaāgvyāpinyāṁ vā tathā tataḥ ||41||

upavāsadine rātrau syānnaktaṁ harivāsare |
ekabhaktena naktena tathaivāyācitena ca ||42||

upavāsena dānena na nirdvādaśiko bhavet |
vrataṁ daivaṁ dvijaṁ coktaṁ na yāceta kutaścana ||43||

madhyāhnavyāpinī tadvadekabhuktavrataṁ vratī |
upavāsadine'pyevaṁ pūrvāhṇavyāpinī mune ||44||

dvirātravyāpinī yeṣṭā vrate sā tadupasthitā |
jyeṣṭhopavāse pūrvaviddhā sā grāhyā cāstagāminī ||45||

tadaikye paraviddhā tu kṣīyamāṇena tanmatam |
ojayugme tithiḥ pūrvā paraviddhā ca pakṣayoḥ ||46||

vratopavāsādau grāhyā vṛddhihrāsābakāraṇam |
pūjyā svalpāpi sarvatra yā tithirvṛddhigāminī ||47||

mahatyapi na sā pūjyā yā tithiḥ kṣayagāminī |
vratādau trimuhūrtāpi svīkāryā vṛddhigāminī ||48||

tatra vratādi kurvīta vṛddhihrāsāvakāraṇam |
yadā pakṣakṣayaṁ yāti tadā syādaparāhṇikī ||49||

udayāstagatā pūjyā tithirvṛddhikṣaye titheḥ |
vratasvīkaraṇasyaitaduktaṁ ślokacatuṣṭayam ||50||

gṛhītvodaṅmukhaṁ pātraṁ vāripūrṇamudaṅmukhaḥ |
upavāsaṁ tu gṛhṇīyādyadvā saṅkalpayedbudhaḥ ||51||

maitre muhūrtaṁ etaśca kāryṁ no ced vṛthā phalam |
āṣāḍhaśuklaikādaśyāṁ yāmyāyanadine'thavā ||52||

cāturmāsyavrataṁ sarvaṁ svīkāryaṁ bhuktimuktidam |
haviṣyabhojanaṁ snānaṁ satvamāhāralādhavam ||53||

brahmacaryamadhaḥśayyāṁ naktabhojī ṣaḍācaret |
divā nidrānṛtaṁ dyūtaṁ tāmbūlaṁ madyamāsavam ||54||

kāṁsyaṁ māṁsaṁ masūraṁ ca caṇakodravadūṣakam |
ekaṁ madhu parānnaṁ ca surā kṣaudraṁ ca maithunam ||55||

asakṛjjalapānaṁ ca lobhaṁ vitathabhāṣaṇam |
kṣāraṁ pratigrahaṁ tailaṁ tilapiṣṭamahaṁkṛtim ||56||

vyāyāmaṁ vyavasāyaṁ ca kāmaṁ krodhaṁ madaṁ tathā |
dambhaṁ mohaṁ ca mātsaryaṁ tilamungādibhakṣaṇam ||57||

punarbhojanamabhyaṅgaṁ ṣaṭtriṁśacca mahāmune |
upavāsadinātpūrvāparāhe ca vivarjayet ||58||

asakṛjjalapānaṁ vā kuryātpūrvāparāhṇayoḥ |
ekādaśyāṁ nirāhāraḥ sthitvāhani paretvaham ||59||

bhokṣyāmi puṇḍarīkākṣa śaraṇaṁ me bhavācyuta |
ajñānatimirāndhasya vratenānena keśava ||60||

prasīda sumukho nātha jñānadṛṣṭiprado bhava |
saṅkalpya pāraṇaṁ ceti mantrābhyāṁ kramaśo mune ||61||

ekādaśīṁ prati strīṇāṁ śūdrāṇāmapyayaṁ vidhiḥ |
trayodaśīṁ ca daśamīṁ kṛṣṇapratipadaṁ mune ||62||

rātridvayavyāpinīṁ tāṁ svīkuryātsatataṁ mune |
ghaṭikaikāpyamāvasyā syāccetpratipadiṣyate ||63||

saiva vratopavāsādau parabiddhā hi sottamā |
tṛtīyāṁ paurṇimāṁ tadvatpūrvaviddhāṁ munīśvara ||64||

imāstisraḥ pūrvaviddhā api vā tadasambhabe |
dvādaśī pūrvaviddhaiva sarvadā munisattama ||65||

vratādau pūrvaviddhaiva bhavetkṛṣṇacaturdaśī |
kṛṣṇāṣṭamī kṣīyamāṇe yadyetenānyathā mune ||66||

vratādau kṣīyamāṇastu paraviddho'sitesmaraḥ |
prāhyaḥ śuklo vadhamāna iti vā nānythaiva tu ||67||

śuklatṛtīyā vaiśākhe pūrvaviddhaiva sākṣayā |
vināyakacaturthī ca tathā bhādrapadāmalā ||68||

madhyāhne tvanatikrānte yadyevaṁ syānmunīśvara |
svīkuryādupabāse'pi tadvidhānāttaduttame ||69||

te cāparāhṇavyāpinyau paraviddhe suśobhane |
dine pūrvārdhagāminyau kalayāvasare ime ||70||

tayoḥ satyoścāparāhṇavyāpinyāvapi tena hi |
tṛtīyādyaṁ ṣaḍaṁśaṁ tu pūrvaṁ vyāpyaiva dūṣayet ||71||

aparāhṇasyorjaśuklacaturthī nāgasaṁjñitā |
paropavāsa evaṁ cenna cetpūrvaiva gṛhyate ||72||

nāsminvicārye hānivṛddhī caturthyanyā tu nedṛśī |
atyalpamativedhāya vopavāsāya cāpyalam ||73||

tadante pāraṇaṁ taccetpradoṣavyāpi tatra ca |
sarvamanyad vrataṁ kāmyaṁ nityamekādaśīvratam ||74||

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puṇyāṅganāṁ binā yonijātibhedo'pi nocyate |
yadaiva vā vrataṁ kuryājjīvedbhartaryupoṣya cet ||75||

patyurāyuḥ kṣayaṁ kṛtvā svayaṁ ca narakaṁ vrajet |
patyurā bhojanāt strīṇāṁ bhojanatyāga eva hi ||76||

brataṁ śruśrūṣaṇaṁ tasya tadājñāpālanaṁ caret |
kāmākāmakṛtaṁ pāpamārdraśuṣkendhanaṁ kramāt ||77||

bhasmasātkurute vahnirekādaśyudbhavo mune |
yāvantyaśnāti sikthāni mohādvā harivāsare ||78||

vyādhito vāpi tāvanti vrajetpāpāni nārada |
prāśayennavanītaṁ vā naikādaśyāṁ śiśūnapi ||79||

yogino'pi mahātmāno nāśnantyasyā vrate ratāḥ |
ekādaśyupavāsena mriyate yadi mānavaḥ ||80||

kṣudhārtaḥ śivasālokyaṁ gacchenniṣkalmaṣo mune |
vismṛtyaikādaśī mohāddvādaśī parataḥ sthitā ||81||

upoṣyā dvādaśī tatra yadīcchetparamaṁ padam |
śoke vā yadi vā mohe harṣe vā samupasthite ||82||

sūtake mṛtake vāpi na tyājyaṁ dvādaśīvratam |
sūtakānte hariṁ viprānbhojayedarcayetsvayam ||83||

evaṁ copavasedviṣṇuṁ viprāṁścānyāṁśca pūjayet |
kāmyavrateṣu sarveṣu sarvatra ca vidhistvayam ||84||

tathāpi gaṇayetkāmyaṁ na tathā kṛtameva vā |
asāmarthye śarīrasya kāmyavrata upasthite ||85||

putraṁ vā dharmapatnīṁ vā kārayenmunivallabha |
patnīvrataṁ patiḥ kuryādasāmarthye tayoḥ sutaḥ ||86||

anyathā vratabhaṅgena tvauṣadhaiścaiva sūtakaiḥ |
yaḥ kuryātputravittādikāmyaṁ ekādaśībratam ||87||

ā vratodyāpanāttasya nāmāni trīṇi nārada |
putravāndhanavānmuktaḥ paryāyāsteṣvanekaśaḥ ||88||

dinakṣaye'pi saṁkrāntyāṁ grahaṇe candrasūryayoḥ |
ekādaśyāṁ tu kṛṣṇāyāṁ śukrārkadivase gṛhī ||89||

na pāraṇaṁ nopavāsaṁ kuryātpāte ca manmate |
ekādaśīvratasyaiva lakṣayitvā yathocitam ||90||

nāmabhistribhiruktaiśca kathyate sakalavrate |
uktadoṣeṣu cānuktavedheṣu vratamācaret ||91||

vrataṁ tatpāraṇāhātprāktithisaṁkhyāni hanti ca |
teṣu naktaṁ haviṣyānnamanodanaphale tilāḥ ||92||

kṣīrānnādyaṁ pañcagavyaṁ prāṇāyāmatrayaṁ kramāt |
evaṁ jadaiva vā gacchedduttarottaramuttamam ||93||

vratabhaṅgo hi naivaṁ ced vrataṁ naika upasthite |
anyaṁ kurvīta dānārcā homairanyaṁ ca vartayet ||94||

brahmacārī vanasthaśca mumukṣuryatirityapi |
vārcyaḥ sarvāśramastho'pi kurvannityavrataṁ mune ||95||

na tasya santyuktadoṣā yattaṁ bhakṣaṁ ca nocitam |
paraviddhottamā kāryā nāradaikādaśī tithiḥ ||96||

pūrvaviddhāpi sā grāhyā parato dvādaśī na cet |
śuddhādhikā viddhasamā cottarānadhikā yadi ||97||

pūrvā puṇyā gṛhasthānāṁ yātīnāmuttarā smṛtā |
viddhādhikottarā hīnā vyavastheyaṁ yadiṣyate ||98||

uttarānuktarūpā sā sarveṣāmuttaraiva cet |
śuddhā hīnā śuddhasamā viddhahīnā ca nārada ||99||

sarveṣāmaviśeṣeṇa pūrvaiva phaladāyinī |
phālgunadvādaśī puṣyayuktā govindasaṁjñitā ||100||

śuklā godvādaśī tu māghe bhīmābhīdhā svayam |
āṣāḍhe śayanākhyā syātprabodhākhyā ca kārtike ||101||

ekābdadvādaśīpuṇyaṁ pañcaitā dadyurekaśaḥ |
pāraṇaṁ dvādaśīviddhitrayodaśyāṁ nihanti ca ||102||

dvādaśadvādaśīpuṇyaṁ parordhāyā prayacchati |
siṁhārke rohiṇīyuktā kṛṣṇā bhādrapadāṣṭamī ||103||

rātryardhapūrvāparagā jayantī kalayā'pi vā |
abhāve rohiṇīyuktā nabhaḥkṛṣṇāṣṭamī yadi ||104||

muhūrtamapi vā seṣṭā saivābhāve tithirmatā |
kāryā viddhāpi saptamyā rohiṇīsahitāṣṭamī ||105||

aviddhā kevalā sā cediti vedavido viduḥ |
madhyarātrigatā māghe śivarātri caturdaśī ||106||

kṛṣṇapakṣe jayantī ca nopekṣye vidite api |
narasya dviguṇāṁ chāyāmatikramya yadā raviḥ ||107||

tadā sauraṁ carennaktaṁ na naktaṁ niśi bhojanam |
dinadvaye'pyamāvāsyā madhyāhnavyāpinī yadi ||108||

daive pitrye vrate grāhyā kramātpūrvāparāpi ca |
amā dūṣyā bhūtaviddhā madhyāhnavyāpinī na cet ||109||

grāhyā mā bhūtaviddhāpi pūrvāhṇe pratipadyadi |
pūrvamadhyāparāhṇeṣu devamartyapitṛṛnyajet ||110||

dviguṇātmādhikacchāye caturthe prahare'dhamaḥ |
yaḥ śrāddhaṁ kurute yāti narakaṁ sa tadā dhruvam ||111||

ato'parāhṇavyāpinyāṁ pūrvasyāṁ tu tithikṣaye |
kurvīta pārvaṇaśrāddhaṁ sarvatithyā bratetare ||112||

dinadvaye'pi sā no cedaparāhṇe munīśvara |
sālpāpi paraviddheṣṭā kurute sāsti kiṁ tataḥ ||113||

śukralagraṁ śukravāraṁ tyajecchāddheṣu janmabham |
āmaśrāddhaṁ daivikaṁ tu pūrvāhṇe grahaṇe niśi ||114||

pūrvāhṇe lagnakāle vā vṛddhiśrāddhaṁ vidhīyate |
niśāpi putrotpatyā (ttyā)di nimittaṁ śrāddhamiṣyate ||115||

vinā prātarādinārdhādekoddiṣṭaṁ vidhīyate |
annena vā hiraṇyena śrāddhaṁ mādhyāhnikaṁ viduḥ ||116||

caturdaśyeva varjyā syātkāmye nitye ca paitṛke |
etayosthitivārarkṣamanyatsarvaṁ ca pūjyate ||117||

pratyabdaṁ pratimāsaṁ vā mṛtāhaḥśrāddhakarmasu |
sāyantanyuttarābhāve pūrvāsiddhā parāhṇikī ||118||

sāyantanīyā bhāve syātparaviddhaiva śasyate |
nityanaimittikaśrāddhādi cetarat ||119||

adhimāse na kartavyā sevādyadevatādiṣu |
nabhasya kanyakordhvārdhabhāgayoge'bhidhīyate ||120||

śrāddhaṁ tvaparapakṣākhyaṁ nabhasyordhvadale'nyathā |
mīne dhanuṣi siṁhe'rke na vratārabhma(mbha) ityapi ||121||

māghe māsi na siṁhejye ceti kecinna tanmatam |
ṛte'nnadānagrahaṇaṁ vrataṁ kāryaṁ manīṣibhiḥ ||122||

sūtake mṛtake vāpi kecidārtava eva ca |
punaḥ punaḥ śubhaḥ kālaḥ sūryagrahaṇasuvrate ||123||

somagrahaṇakṛtyeṣu ślāghyaḥ kālaḥ paraḥ paraḥ |
nādyādyāmatra yādarvāggrahaṇe candrasūryayoḥ ||124||

viśuddhamaṇḍalaṁ dṛṣṭvaivordhvaṁ vā praharatrayāt |
rātrau snānaṁ na kartavyaṁ dānahomabalikriyāḥ ||125||

pratiṣṭhājātakodvāhayajñagrahaṇavarjitam |
madhyandine parvasandhistataḥ pūrvamathāpi vā ||126||

yāgastaddivase kāryaḥ parataścetpare'hani |
sandhiścetsaṅgavādūrdhvaṁ prākparyāvartanādraveḥ ||127||

sā paurṇamāsī vijñeyā sadyaḥkālavidhau vidhiḥ |
yāgātpūrvadine kuryādanvādhānaṁ dvijottama ||128||

anvādhānaṁ tu saṅkalpaḥ prāṇāyāmapuraḥsaraḥ |
anvādhānaṁ pākahomaṁ nityahomādanantaram ||129||

kuryānnaimittikaṁ karmānantaraṁ nityakarmaṇaḥ |
parvaṇyaudayike kuryuḥ śrāvaṇaṁ taittirīyakāḥ ||130||

bahvṛcaḥ śravaṇe kuryuḥ sasyasaṁpattidarśane |
viśiṣṭaḥ śrāvaṇo māsaḥ svādhyāyānāmupakrame ||131||

taddarśopāttadarbhaistu kuryātkarmāṇi vatsaram |
ayane viṣuve caiva śayane bodhane hareḥ ||132||

anadhyāyaṁ prakurvīta manvādiṣu yugādiṣu |
kārtike navamī śuklā tṛtīyā mādhave tathā ||133||

māghe manvādayaḥ kṛṣṇe nabhasye ca yugādayaḥ |
aśvayuk śuklanavamī kārtike dvādaśī tathā ||134||

caitre tṛtīyā jyeṣṭasya paurṇimā dvādaśī śucau |
catasraḥ phālgune dvādaśyūrje kṛṣṇāṣṭamī mune ||135||

manvantarādayasteṣu teṣāmevodbhavaḥ kramāt |
nabhaḥ phālgunapauṣāṇāmamā caikādaśī sitā ||136||

vaiśākhajyaiṣṭhapauṣāṇāṁ paurṇimā phālgunorjayoḥ |
māghāmaladvādaśī ca nabhasyāmalacandrikā ||137||

śucistriṁśo'ṣṭamī kṛṣṇādvitīyāśvayuje'malā |
manvantarāntasteṣāmeṣvanadhyāyeṣu nirgamaḥ ||138||

yathā jñaptajano mantrī rājānaṁ pratigacchati |
tathā manvādayaḥ sarve vrahmāṇamupatasthire ||139||

tisro'ṣṭakā anadhyāyaḥ saptamyāyā munīśvara |
parvagādiṣu māseṣu viṣuvāyanasaṁyutāḥ ||140||

praśastā iti paścāśattithayaḥ pārvaṇe mune |
upakramācca tridinaṁ kṣapāḥ pañcadaśāpi ca ||141||

upakrameṇa paryantapauṣa utsarjanātparam |
rātrayaḥ śuklapakṣeṣu kṛṣṇapakṣeṣu kṛtsnaśaḥ ||142||

anadhyāyāstathānye te ye ca vṛddhapracoditāḥ |
tathā seyaṁ muhūrtāḍhyā yānadhyāyasya sāpi ca ||143||

aṅgādhyayana ityuktaḥ svādhyāyāḥ sakalā api |
adhikartavyamevāṅgamaṅgitvaikaprayojanāt ||144||

śucestadvyatirekeṇa tvaṅgitvābhāvasambhavāt |
pakṣādimadhyāntyopāntyā aṅgānāmaṅgināmapi ||145||

anadhyāyaḥ pradoṣaśca saṁdhyāstrirmadhyamā niśā |
trayodaśī caturthī ca saptamī kalayāpi vā ||146||

rātriṁ spṛśyati maunī syātpradoṣo yadi tatra saḥ |
rātrerdinacaturtho vā praharaḥ kathyate budhaiḥ ||147||

tāvāneva pradoṣaśca pūrvatryaṁśastu kaiścana |
ādyatryaṁśāntanāḍī vā caturthī tvitare mune ||148||

pradoṣaḥ pūrvarātryardhaṁ virāmaghaṭikāpi vā |
madhyandine pūrvasandhirityādiṣu na cintayet ||149||

dinakṣapāyuktadoṣaṁ ślokānāṁ triguṇā'ṣṭasu |
arkamānakalāstasya bhuktiścetṣaṣṭināḍikā ||150||

saṅkrāntikālastadvimbaṁ yāvat kṣetradvaye'pi saḥ |
bimbamadhyaṁ grahasyāste yatra tatra sthitaśca saḥ ||151||

tasminparāparaksetre grahe dvisthe yathocyate |
bhuktakṣetremabhuktarkṣaṁ na tathānyatra nārada ||152||

tithinakṣatrayogāderbimbamadhyaṁ prabodhakam |
śubhāśubhaṁkṛtastasmānnaiva cettadvṛthāphalam ||153||

saṅkrānteḥ prāgabhuktarkṣaṁ sārdhāḥ ṣoḍaśa nāḍikāḥ |
bhuktakṣetraṁ ca tāvatyaḥ paścāditi hi nāḍikāḥ ||154||

trayastriṁśatsaṅkramasya sarvakālasya nārada |
Yā yāḥ saṁnihitā nāḍyastāstāḥ puṇyatamā matāḥ ||155||

bhuktarkṣe vāpyabhuktarkṣe snānadānādi kārayet |
paryāptamubhayaṁ rātrāveva cettadathocyate ||156||

bhavanāntaṁ bimbamadhyaṁ rātryardhātprāgudeti cet |
Snānadānādi madhyāhnātkuryādūrdhvaṁ gate dine ||157||

rātryardhādupari kṣetraṁ yāti cedanyathāryamā |
ahnyāgāmini madhyāhnātpūrvaṁ snānādi karma yat ||158||

yadyardharātra eva syātsaṁpūrṇe ravisaṅkramaḥ |
Tadā dinadvayaṁ puṇyaṁ snānadānādi karmasu ||159||

bhuktakṣetramabhuktarkṣaṁ cobhayaṁ ceddivāsti vā |
yāmyāyanaṁ viṣṇupadaṁ cābhuktarkṣe'tipuṇyadam ||160||

ṣaḍaśītimukhaṁ codagayanaṁ bhuktaveśmani |
niṣuvatyubhayaṁ tulyaṁ sarvametattu nānyataḥ ||161||

calasaṁskṛtatigmāṁśoḥ saṅkramo yaḥ sa saṅkramaḥ |
nānyo'nyatra ca tat kṣetraṁ naiti tatkrāntikakṣayā ||162||

bhuktakṣetramabhuktarkṣaṁ vā vihāyāhni sambhavam |
vṛthānyatra kṛtaṁ karma bhasmanīva hutaṁ havi ||163||

tadabhāve tadāsanne kāle cāpi vṛthetarat |
krānteḥ pūrṇaphalaṁ tvardhaṁ praveśādubhayoḥ samam ||164||

kālasya nirṇyo hyetanmṛgakarkyoḥ kṣapādale |
Arkāha śuklasaptamyāṁ puṣyarkṣe cottarāyaṇe ||165||

saptamīvratamanvicchetsarvakāmārthasiddhaye |
aṣṭamīnavamīdvandve hyardhanārīśvaraṁ bratam ||166||

nabhasye rohiṇī ṣaṣṭhī vyatipāte yadīrite |
puṇyā kapilaṣaṣṭhīha dvādaśī vijayā harau ||167||

śroṇāmārka vyatīpāte divā pauṣī yadā bhavet |
ardhodayaṁ puṇyarāśerharatyardhamupekṣitam ||168||

yogarūpāḥ puṇyakālāstibhyādīnāṁ munīśvara |
kathyante tena yeṣvasti vedhadoṣa iti sthitiḥ ||169||

alaṁ muhūrtamātraṁ vā snānādibhyo hi yogajam |
rātrau divā pañcadaśo muhūrtaḥ kutapo'ṣṭamaḥ ||170||

maitrastṛtīyo'hnaḥ putra punnakṣatrāṇi rohiṇī |
aśvinī kṛttikā hasto maitraṁ puṣyaḥ punarvasuḥ ||171||

proṣṭhapaddvitayaṁ viṣṇuḥ kecitsaumyamiti sthitiḥ |
iti te kathitaṁ vatsānyacca vakṣyāmi tattvataḥ ||172||

iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte tṛtīyo'dhyāyaḥ

Chapter IV

avikṣepaḥ sphuṭakrānterudak kṣiptastataḥ puraḥ |
udeti paścādetyastaṁvā kṣiptastathānyathā ||1||

paścimasthaḥ prāgudeti paścātprākstho'sthameti hi |
anyathā cedanyathā dṛkkarma yatkalpitaṁ tathā ||2||

vikṣepastatphalaṁ syādyadyakṣbhā dvādaśāṅgulam |
khamadyagrahayormadhyaṁ nataṁ kṣitijakalpanā ||3||

tannatāttadinārthaṁ ca phalaṁ prāk siddhameva hi |
grahaṇādanyayoge ca kālabhā lagnasādhane ||4||

śṛṅgonnatyudayāsteṣu dṛkkarmādāvidaṁ smṛtam |
kramacāpotkramajyābhyāṁ krāntiḥ satrigrahasya ca ||5||

trijyā cenmadhyaṭṭṣṭānāṁ kṣepaliptāntare punaḥ |
dṛkkarmasthānataḥ prākstha iva paścāditi sthitaḥ ||6||

dṛśyakṣepaḥ krāntidiśobhedābhede yathā kramam |
tattanmerudigaṁśānāmalpaḥ syāddṛśyate tathā ||7||

skhalanaṁ madhyakakṣāyāmadhikaṁ svalpamanyagam |
tadardhamutkramajyaiṣā tādṛk khaṇḍairhi sānvitā ||8||

dvādaśījyā samaiḥ khaṇḍairuktamaṁ dhanuruttamam |
alpatvāt skhalanasyaivaṁ kramacāpaṁ smṛtaṁ tviha ||9||

tribhadānaṁ madhyamārge mahatskhalanasūcakam |
krāntikrāntyūnaparamaṁ krāntyostvevaṁ tadalpataḥ ||10||

dvitīyaṁ pāpadṛṣṭīnāṁ dṛkkarma munisattama |
dvitīyameva dṛkkarma necchantyuttamadṛṣṭayaḥ ||11||

śāstrīyavyavahāro hi laukikaṁ niṣprayojanam |
kecidanye'pi necchanti tāṭṭakpratyakṣakāraṇāt ||12||

khamadhyastho madhyalagramudayāt kṣitijodayaḥ |
astalagraṁ saṣaṅbhaṁ tātkālikaṁ kheṣṭakālikāt ||13||

gatāgataiṣyaṁ kālācca gataiṣyaṁ lagnamātmaja |
laṅkodayairmadhyalagnaṁ svamadhye kṣitijaṁ na hi ||14||

lagnagrahābhyāṁ kālaśca muhurmuhuriti sthitiḥ |
sūryātprākpaścimārdhasthe śuklakṛṣṇe prakalpayet ||15||

sūryāstakālikau sūryādgrahau kṛtvā saṣaḍgrahau |
tatastatkālalagnārthaṁ kṛṣṇe tvarke tu ṣaḍbhavān ||16||

arkāttadantaraprāṇairbhāskarāstamanātparam |
sthirīkṛtairudetyanyaḥ śukle kṛṣṇe'stamite hi ||17||

dinarātrigrahāḥ pūrvāparabhārdhodayāḥ svakāḥ |
āsannārkasya tadraśmicchanno mūḍha itīritaḥ ||18||

śukle prāguditaḥ prāṇātkālāṁśāḥ ṣaṣṭibhājitāḥ |
kṛṣṇe tu tau saṣaḍbhau tu bhāskarodayakālikau ||19||

kāryāḥ kālaāṁśakāstadvadanarkāste sakṛddvayoḥ |
sūryātpaścimato'tyantaṁ yātu yaḥ sakṣamaḥ sa tu ||20||

kṛṣṇe'stamudayaṁ śukle gacchantyanye'nyathā mune |
dvādaśātyaṣṭimanvīśadiktithiḥ śītagoḥ kramāt ||21||

astāṁśā dvādaśāṣṭau ca vakriṇorbudhaśukrayoḥ |
tathā mahattvādanayordūratvāditarasya ca ||22||

mūlatrayaṁ viśākhārdrā mitradasrā hi vahnayaḥ |
ḍṛśyante pañcadaśabhiḥ śeṣāṇyatyaṣṭibhāgakaiḥ ||23||

maghā catuṣkaṁ śravaṇadvayaṁ dhātā bhavāsavaiḥ |
punarvasvabhijiccātra mṛgavyādhaḥ prabhañjanaḥ ||24||

agastyo brahmahṛdayaṁ śakrāṁśairanalendubhiḥ |
mṛgaśīrṣaṁ ca bharaṇī puṣyastriḥ saptakāṁśakaiḥ ||25||

tatvādhikaḥ sa yasyodak kṣepāṁśā nāstago bhṛśam |
ebhyo'dhikonaiḥ kālāṁśaiḥ kramāḍṛśyā adarśanāḥ ||26||

tadantarā dinādiḥ syātkālagatyantaraikyajam |
tatkālāṁśodayaprāṇā svāṁśarāśikalāmitiḥ ||27||

phalecchayā tat kṣetrāṁśairdṛśyatvāddṛśyatāpi vā |
saiva vyekoditāstāṁśairdṛk siddhaṁ syāt kvacinmune ||28||

alpāyuṣāṁ pākhaṇḍināṁ gandharvanagarādivat |
khamadhyakṣitije doḥkoṭyāśrayairmaurvike tayoḥ ||29||

dṛgbhāśaṅkurmune chāyā vyavahāra itīryate |
trijyā bhavecchāyā yadi karṇo'tra koṭijā ||30||

lambajyāyāṁ koṭijīvāṁ paramāyāṁ tu sodbhavā |
trijyāyāṁ koṭijīvāyāṁ kiyatīti viśeṣatā ||31||

paridhiḥ viyatītyeva śaṅkucheda itīritaḥ |
khadinavyāsārdhakarṇau tau ca śaṅkau sa eva ca ||32||

kiyānsa tasmiṁstrijyāyāmunnatajyeti sādhitā |
trijyādhikonodagarvākcaramaurvyantyamaurvikā ||33||

madhyakṣitijamadhyajyā sā natajyonnatoditā |
tadutkramadhanuḥ prāṇā nataprāṇāḥ prabhāyate ||34||

byāsārdhe labdhajīvāyāṁ ca samā mune |
kalpyaḥ śaṅkustadā tatsatrijyaśceddvādaśāṅgulaḥ ||35||

chāyākarṇau vā dinārdhe krāntyakṣābhyāṁ bhujāṁśakaiḥ |
śṛṅgonnatyūna bimbārdhayuvā chāyā natāsubhiḥ ||36||

kṛṣṇe śukle'pi pakṣe prāginendvoścenna bhidyate |
tajjyonaṁ ca dinārdhāptaṁ nataghnaṁ cāpi tatkila ||37||

anuktaṁ yata evaitadanyapraśnacatuṣṭaye |
abimbakastu darśe'dhaḥ sthitaḥ sūryānna dṛśyate ||38||

paurṇimāyāṁ tadantaḥsthaiḥ sampūrṇaḥ sūryaraśmibhiḥ |
anyatra yāvānviprakarṣastāvacchuklaṁ vidhoevidhiḥ ||39||

candrādyatra tadāśāyāṁ śapto dakṣiṇataḥ śaśī |
aṅgādhyāyī śaunakasya merūvāsītyataḥ samam ||40||

hānivṛddhī yayau dakṣavareṇāsya tithiṁ prati |
kṣīyamāṇāṁ kalāṁ devā aśnantyekakalaṁ tathā ||41||

vardhayati kṣīyate'sau ya evaṁ veda na kvacit |
abindhanānāmanyeṣāṁ dūrasthatvādidaṁ na hi ||42||

yena darpaṇavatsvacchā jāyante teṣu cāṁśavaḥ |
lāñchanaṁ pratibimbaṁ gorgomatīndāvināṁśubhiḥ ||43||

candreṇa śauklyaṁ vānyeṣāṁ tadṛrśe'pyasti yattataḥ |
bimbaṁ sitāsite ṣaḍbhe vyarkendoravibhāvataḥ ||44||

ravīndumadhyakrāntijyā viṣuvatkarṇasaṅguṇā |
madhyāhnāñcandraśaṅkvāptā uttarā vāgvidhau raveḥ ||45||

ṛṇaṁ dhanaṁ cākṣabhāyāṁ bhujo'rkādindudiṅmukhaḥ |
yasyālpā jyā khamadhyenducchāyākarṇāhatā tathā ||46||

dvādaśaghnākṣajīvāyāḥ kalpanāyā raviṁ vidhum |
khamadhyādviṣuvatkakṣā madhyatojyāṁ śirasyapi ||47||

bhujāṅgulaṁ lavaṁ pātaḥ karṇo dvidaśakoṭijaḥ |
arkasaṁjñitadiṁmadhyādvāhuṁ śaṅkuṁ tathādiśam ||48||

prākpaścātṣaṁmukhīṁ śukle kṛṣṇe koṭi prasārya tat |
bāhukoṭyagrakaṁ karṇa koṭikarṇyuto vidhoḥ ||49||

bimbaṁ tadūrdhvamānena likhetkoṭyāśrayeṇa ca |
prāgrekhe yāmyarekhe ca tadantarmatsyamadhyage ||50||

karṇena tanmukhaṁ śuklaṁ kṛṣṇaṁ vā parabhāgataḥ |
datvā tadagrayāmyodaṅmadhyamatsyadvayasya ca ||51||

madhyasūtrayuteścāpaṁ vinduṁ trispṛglikhediha |
koṭayā sādhita yāmyodagrekhānte śṛṅgamunnatam ||52||

anekaguṇakacchedabhavāṁśāśchedasaṁmitān |
dvandvaśo nāśayedvāpavartayedicchayaiva tu ||53||

bāhusiddho hi yaśchedastadutpatau harā guṇāḥ |
guṇaguṇyaharā vyastaṁ vikṣepyā anyathā yadi ||54||

tāvatsvadeśalambajyā svabyāsārdhaṁ yathārthataḥ |
tāṁ trijyāṁ kalpayecchāyāṁ vyavahārasukhapradām ||55||

tathā krintijyādhikā satyagrajyeti prakīrtyate |
krāntijyā viṣuvatkarṇahatāgrajyāpi bhāskaraiḥ ||56||

sā cet trijyeṣṭabhākarṇastadā grāhyo'ṅgulādikā |
krāntijyā ceṣṭakarṇaghnā lambajyāptāṅgulādikā ||57||

svaśaṅkutulyakrāntijyāgrāṅgulaṁ viṣuvacchravaḥ |
ardhāṅgulaphalaṁ vāramadhyeṣu karṇamitīrite ||58||

rekhā prākpaścimāyāṁ sā samamaṇḍlamucyate |
sā vṛttamadhye'tyanyatvaṁ meruścedaṅguladvayam ||59||

udbhāgasthā prācyaparā yā rekhā samamaṇḍalāt |
unmaṇḍalaṁ tayormadhye sarvatra viṣuvatprabhā ||60||

viṣuvanmaṇḍalaṁ caiṣā chāyāgre viṣuvātra hi |
iṣṭacchāyāgraviṣuvanmadhyamagrārdhagaṁ mune ||61||

sā rekhonmaṇḍalādbhāgre sadetyagrātpratiṣṭhitā |
unmaḍ(ṇḍ)alādudakchāyā yāmyakrāntāvavāgudak ||62||

bhuja ityucyate madhyaṁ samamaṇḍalabhāgrayoḥ |
ato mādhyāhnikī chāyā nityaṁ mādhyāhniko bhujaḥ ||63||

yadā dinārdhodak krāntiḥ svarkṣcchāyā tadā na hi |
raveḥ śaṅkvagrasaṁsthatvādbhā yāstatpratidṛśyate ||64||

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yadodakkrāntirakṣonā tadodagudito grahaḥ |
udagastaṁ yathāvṛddhiḥ samamaṇḍalameti ca ||65||

krāntijyā viṣuvacchāyā yadi syādviṣuvacchravaḥ |
samamaṇḍalaśaṅkuḥ syācchāyākarṇau tu pūrvavat ||66||

akṣabhā dvādaśābhyastā lambākṣajyā vibhājitā |
samamaṇḍalaṁge sūrye karṇau krāntijyayā sakṛt ||67||

icchākarṇe'kṣabhādyātādagrayā vā śravaḥ sa tu |
samamaṇḍalaśṅkurvā trijyā tenārkatāḍitā ||68||

śaṅkuryāmyottarā trijyā kalpyārthaṁ tatkṛtestathā |
dikkoṭimadhyajyāvargaṁ tanmadhyaṁ sārdhabhaṁ yataḥ ||69||

pūrvāparāṁ koṭikṛtiṁ tadeva manutānmune |
dorjyākṣamā koṭikṛtyoḥ kalpyā trijyākṛtiryutiḥ ||70||

arkacchāyārkavajjñeyā yadā tāvattadā'grajā |
phalamityucyate tāvattadvyakṣakṣitijāntaram ||71||

trijyāvargārdhamadhyārdharāśirjyāvargameva tu |
agrajyāvargahīnaṁ tatkoṇārkodayamadhyagam ||72||

tatkalpatribhajāvargaṁ yadi śaṅkukṛtirbhavet |
koṭijyākṛtoreṣāṁ hi karaṇītyāhurāgamāḥ ||73||

phalavargo bāhuvargaḥ karṇaḥ śaṅkudvayodbhavaḥ |
sa koṇasthagraho vyakṣakṣitijāntara eva hi ||74||

sadṛkphalaḥ svasvaśaṅkuḥ svasvārdhaphalavārjitaḥ |
ūrdhvādhaḥsthaṁ svakaṁ vyakṣaṁ kṣitijādyadavāgudak ||75||

yāmyāyā vidiśoḥ śaṅkuḥ sa śaṅkordakṣiṇe ravau |
madhyacchāyāto bhujajyā saumyāto dakṣiṇottarā ||76||

yāmyato'kṣakrāntirasyā akṣajyā lambajā yadi |
caratyuttarayoḥ saumye prāgvatkoṇākṣabhāśrutiḥ ||77||

dvādaśākṣaprabhā krāntikṣetraṁ meṣādiko raviḥ |
karkyādau projjhya cakrārdhāttulādau bhārdhasaṁyutaḥ ||78||

mṛgādau projjhya bhagaṇātbāhurgamyādviyukpade |
calasaṁskṛtasūryonacchāyārke bhajite kramāt ||79||

prākpaścānmadhyarekhāto deśaḥ svīyastadantaram |
deśāntaraphalaṁ bhānoryuktyānyatsakalaṁ mune ||80||

chāyārkārkāntarāṁśāḥ syuścalāḥ svasvaminādike |
chāyārke tvṛṇamūne prākpaścāccakraṁ ca lambate ||81||

koṇacchāyākṛtidalātpadaṁ vā trijyayā hatam |
koṇātkarṇahṛtaṁ krānti jyātaścchāyāravistataḥ ||82||

krāntijyeṣṭhāgrāṅgulādvā bhākarṇābhyāṁ samādhvani |
bhujāṅgulaṁ bhujacchāyā karṇaḥ koṭistalābhidhaḥ ||83||

śaṅkupūrvāparā rekhā tathānyā madhyamatsyajā |
adbhiḥ samīkṛte sthāne kalpyamādvādaśāṅgulam ||84||

vyāsārdhāṅgulamutsedhaḥ ṣaḍaṁśavyāsameva vā |
chāyāmadhyaśalākābhyāṁ chāyāgrajñānadurbalaḥ ||85||

madhye tūnnataśikharaṁ nakhādri vyaṅgulocitam |
svāṅgulenaiva sarvatrātrāṅgulajñānakāraṇam ||86||

sūcyagreṇeṣṭakṛttasya protenāṅkitamadhyagam |
sthāpayetprāntatacchayāṁ śaṅkaryottadamadhyataḥ ||87||

chāyāgraṁ yatra bhūvṛtte pūrvāhṇe pratyageva tat |
madhyāttathāparāhṇe'rke diśi śaṅkuṁ nidhāya ca ||88||

prācīṁ nirdiśya bhāgreṇa vyastaṁ bāhuṁ prabhāgrataḥ |
koṭiṁ yathārhaṁ saṁprasārya doḥkoṭyeryogayugmagām ||89||

rekhāṁ prācyaparāṁ kuryādbhujājñāne phalaṁ yadi |
tatastayoryāmyage'rke vardhate bāhuruttaraḥ ||90||

prācītivai jāyate'rke tatastata udaggate |
tatastato dakṣiṇago bhujā prācyagnidiggatā ||91||

agrāntaraṁ tatprāgvindoryanmukho'rkastadācaret |
taddiṅmukhaṁ prasārya prāgbindusuddhaṁ hi nikṣipet ||92||

tatra pūrvāparā rekhā tanmadhyāddakṣiṇottarā |
samamaṇḍalametatsyānmatsyena munisattama ||93||

dvitryaṅgulādiko madhyacchāyāvṛttadalaṁ yadi |
agrājñānena caivaṁ syācchaṅkuścedunnataṁ kila ||94||

kālastu pañcanāḍyastanmadhyamastatvaliptikāḥ |
nābhyeti krāntirekāhe madhyā syādbhāḥkalāpi vā ||95||

ato'grāṅgulamekaṁ vā vyaṅgulaṁ na hi sidhyati |
diśaśca susphuṭā eva bhavanti munisatrama ||96||

caturasraṁ yāvadiṣṭaṁ tatkarṇārdhaśalākayā |
koṇaṁ vāpiśalākābhyāṁ tāvatībhyāṁ digantataḥ ||97||

yadā vistarasūtrāgradiśormadhyaṁ vidiśyapi |
nikṣipya caturastraṁ tu vaṁśe tu sthāpanādiṣu ||98||

satyunnate'rdhanāḍyūne durdaśā syātprabhā mune |
durdaśāyāṁ yathā chāyā vinyastasya yathādiśam ||99||

cāpamṛkṣatrayasyāgre chāyāmārge munīśvara |
jyāsaṅkhyā ceccaturviṁśatyā(tya)dhikā natasambhavā ||100||

tadādhikyakramajyā trijyānvitā hi natotkramā |
carakramajyā satrijyā bhavedantyā tataḥ suta ||101||

trijyādhikakramadhanuḥ satribhāsutayā dhanuḥ |
anyatra tūtkramajyābhirādhikyādubhayaṁ tathā ||102||

śaṅkostrijyāṁśāṅgulaistu vṛtte krāntyā yathoditam |
udayāstamanasthānaṁ madhyaṁ jñātvā natāṁśakaiḥ ||103||

taccāpadinanāḍyaṁśairdiṅmadhye na prabhāpadam |
vibhajya vā kālabodhaḥ kālakhaṇḍaṁ prakalpya vā ||104||

nidhāyaśṛṅge prākpaścācchaṅkormadhyāhnabhāgage |
koṭijyāṁśāṅgulotsedhaṁ madhyaṁ śaṅkoruparyapi ||105||

vrahmāṇḍamadhyaṁ sūcyagraṁ śaṅkvagraṁ nāḍikāṁśataḥ |
śaṅkvāgrācca prabhāmārgaspṛksūtraiḥ kālasādhanam ||106||

golārdhamadhye vyāsārdhayaṣṭyā vā kālavedanam |
krāntyā madhyanatena pratyagramatrāṅkanaṁ sukham ||107||

dhanurvedyaṁ vidhiṁ kalpaṁ natadiśyupamastakam |
dharārandhreṇa madhye prāptātapena ca madhyataḥ ||108||

lambasūtreṇa cakrasya kramāṅkairjñāyate kvacit |
samāṅkaiḥ kālavijñānaṁ māsaṁ pratyanupātataḥ ||109||

ceṣṭāvānpratināḍīnāṁ pakṣmaniśvāsato yadi |
kujo mayūro vā syātāṁ kiṁ tataḥ śālmatodbhavai ||110||

naraṁ kapiṁ mayūraṁ vā sthūlaveṇūdaraṁ mune |
karṇadaghnaṁ pūrṇajalaṁ pṛṣṭhacchidraṁ prakalpayet ||111||

nyastvā toye plavatkāṣṭhaṁ taṁ baddhvā vadanādbahiḥ |
tāvatyevāṅkanaṁ kālaścitreṇānena gamyate ||112||

gopyejjalaniḥ srāvaṁ madhye'kṣaṁ namanaṁ tathā |
lambasūtraṁ pṛcchamānaṁ ṣaṣṭyaṅkaṁ ca samāntaram ||113||

raktatantvā dinā yāvannāḍīṣaṣṭyantareti tat |
tato randhreṇa pṛṣṭāstān pūrayeñcopakajjalaiḥ ||114||

amale'mbhasi vā kuṇḍe palānāṁ daśabhiḥ kṛtam |
tāmrapātramadhacchidraṁ caturaṅgulamucyate ||115||

hemamāṣacatuṣkeṇa grāhyātrānanavistṛtau |
daśāṅgulakamutsedhe ṣaṣṭirmajjatyaharniśam ||116||

tatpātraṁ yādṛgapi vā yadyevaṁ tañca gṛhyatām |
kapālayantreṇānena kālo jñeyaḥ sphuṭena vā ||117||

devadāruḥ śivataruḥ khadiro raktacandanaḥ |
śaṅkvaryaṁ vaṁśanimbādyā grāhyā yajñīyabhūruhāḥ ||118||

evaṁ hastocchritaḥ śaṅkuradhohastanikhātagaḥ |
utsedhaścakṣuṣā kalpyo dvādaśāṅgulavāniti ||119||

paśyedyatra sthito yo'yaṁ tadagre darpaṇe mukham |
divā nirūpyau bhākarṇau nirūpyau cakṣuṣaḥ sukham ||120||

tādṛk śaṅkudvayaṁ grāhyaṁ yathā digbhramaṇasthitam |
grāhyāntarakṣepamadhyamāgamānāṁ vivecane ||121||

iti te kathitaṁ vipra tathānyattatvataḥ śṛṇu
iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte caturtho'dhyāyaḥ ||

Chapter V

samāgamo vā yuddhaṁ vā bhaumādīnāṁ parasparam |
no bhāvīti muniśreṣṭha candreṇaiva samāgamaḥ ||1||

samaliptau yadā syātāṁ dṛkkarmāṇau muhuḥ samau |
tadā tadantarakṣepe mānaikyārdhasame sati ||2||

anyonyasparśamānatvādullekhaṁ yuddhameva tat |
hīne bhedaṁ samucyate cāpasavyaṁ tathādhike ||3||

ārādaṁśārdhamaṁśūnāṁ vyāptirhi tu śaśīnayoḥ |
āvrahmāḍaṁ kapālaṁ tatsṛtyaṁśe tadgrahāntare ||4||

raśmisammīlanādaṁśuviruddhamadhikāṁśukāt |
samāgamaścetprabhavati tārābimbasamāgamaḥ ||5||

trijyāṁśāṅgulayaṣṭayagre tiryaṅmadhyāṁśakāṅgulam |
śalākāṁ sthāpayenmadhye daṇḍamūlaṁ ca paśyatā ||6||

abhedayoge dṛśyete dvau śalākāgrayoḥ khagau |
manaḥpūrtyai grahāṇāṁ cāpyevaṁ yogaṁ prasādhayet ||7||

vṛṣe'tyaṣṭayaṁśake yasya yāmyaḥ kṣepo'ṁśakadvayāt |
bhavedabhyadhiko bhindyādrohiṇyāḥ śakataṁ hi saḥ ||8||

nāṇureko'pasavye cennāpasavyaṁ tadiṣyate |
tathā samāgame'ṇuścedeko'sāvasamāgamaḥ ||9||

asthūlāvanaṇū dvau cedudakastho dakṣiṇāśritaḥ |
sthūlāṇu prathamapraśne'pītyevārdhatrayaṁ smṛtam ||10||

sāmye'pītyapiśabdena saumye'pīti hi kīrtitam |
taduddiṣṭāvimau śabdāvudakstho dakṣiṇāśritaḥ ||11||

adīptimānvivarṇaśca vepathū rūkṣadarśanaḥ |
durbalaścāpi yo'ṇuḥ sa sthūlastu svayamanyathā ||12||

jayī jitaśca sthūlo'ṇuryadvādṛṣṭāntavācakau |
imau śabdau vṛthā syātāmudaktho dakṣiṇāśritaḥ ||13||

tāvimāveva yāmyādi sthūlākhyatvaṁ vṛthoditam |
yāmye'pi yukta evoktasthānādi balamatra cet ||14||

anyatra naitadityājñāvaikṛtāttatsadīritam |
sthānādi balābhinnātra vyarthā naikāpi bhā smṛtā ||15||

praśnatraye'pyevānyasmin sthitau sūkṣmaphalaṁ smṛtam |
samāgame'pi savye vā svalpau dvāvapi vepathū ||16||

svotkaṭau vigrahau dvāvādīptau yadi samāgamau |
udakstho dakṣiṇastho vā bhārgavaḥ prāyaśo jayī ||17||

jagataḥ kalpanaiveyaṁ bhāvābhāvāya kevalam |
anyonyamatidūrasthāḥ kathaṁ yuddhaṁ prakurvate ||18||

chādako'thaḥ sthitaśchādya uparisthaḥ śaśī rave |
chādakaśchādikā rājño bhūcchāyā munisattam ||19||

yadyevaṁ pratiśuklāntaṁ syāddarśaṁ pratyupaplavaḥ |
sambhavādravi tulyendorbhūcchāyā tulyaśītagoḥ ||20||

chādakau rāhuketū stāmanyonyasyārdhacakragau |
evaṁ yadyuktadoṣo'pi neti cettad bruve mune ||21||

tathā cecchuklakṛṣṇāntāduparāgāstathānyadā |
na ced dvirindormāsaṁ pratyarkasya prativatsaram ||22||

yadyeka eva rāhuḥ syānna grāhyastasya bhārdhagaḥ |
ekaikaṁ grahaṇaṁ māsaṁ prativarṣaṁ pratīti ca ||23||

śaśyeṇa vaṭavalmīkalakṣe'ṅke bāliśaḥ phaṇī |
tadvalmīkasthito nātti kalpyo nārkagraho'sti cet ||24||

kiṁ na syādgrahaṇaṁ śaśvatkutastatra samaṁ sadā |
grahaṇāntarakālānāṁ vaiṣamye kiṁ nu kāraṇam ||25||

bahupralāpāstannoktāstasmādvedavirodhinaḥ |
nimittakāraṇaṁ rāhurdvayorevoparāgayoḥ ||26||

vikṣiptaḥ phaṇinā candraḥ sūryamācchādayediva |
meghaḥ svayaṁ vā bhūcchāyāṁ praviśed grahaṇaṁ bhavet ||27||

śīghragāmī śaśī sūryaṁ chāyā paścimato'pi vā |
prāgetyatītya tatpaścādgrahaṇaṁ bhāskarasya hi ||28||

prāṅmokṣaḥ śītagostu prāggrahaṇaṁ pratyageva hi |
brahmenduśakravitteśavaruṇāgniyamāḥ kramāt ||29||

phaṇī nabhagaṇaikyaghnadvimitagrahaṇādhiyāḥ |
samaliptau yadā chādyacchādakau tatra cedbhujaḥ ||30||

vikṣepajanako rāśyardhonaḥ somagrahastathā |
arkagraho'pyāśaṅkyeta vṛttyaṁśānnādhikaḥ sa tu ||31||

sarvatra somagrahaṇaṁ samameva hi dṛśyate |
ubhayorantarābhāvād bhūcchāyendośca sarvadā ||32||

grahāntaraṁ śaśikṣepastenoddeśya upaplavaḥ |
pūrvāparāntarābhāvādabhāvo lambanasya ca ||33||

parvapratipadoreva grāsamokṣau vidhormune |
na hi lambanahetuḥ syādeva yāmyottarāntaram ||34||

tasminsati tripādasthe'pyuparāgo'sti taddine |
tāvatkaḥ putra yāmyodaggatyā gatvā prasidhyati ||35||

tadantareṇāvanateḥ sambhavādbhāskaragrahe |
sendukṣepayutonā diktulyabhede grahāntaram ||36||

sābhākṣodaṁmadhyalagnakrānyoḥ sāmyena sambhavaḥ |
pūrvāparāntarābhāvānmadhyāhne māstu lambanam ||37||

astyanyadā tu pūrvāhṇe grāsamokṣau tu darśagau |
pratipadyaparāhṇe tu tathā sto vā tadā kvacit ||38||

arkendoratidūratvātsamīpatvādidaṁ bhavet |
dṛkkarmaṇaiva tatsiddherbhagrahasaṅgatau ||39||

lambanāvanatī na stāmapi satyantaradvaye |
iṣṭalambanamanyatra yadīṣṭe'vanatirbhavet ||40||

dṛkkarma ca tathā vipra pratyakṣaṁ ca na tattathā |
dṛkkarmaṇī dve ca kṛte vyarke bhāsati tādṛśe ||41||

vṛthā hyavanaterbhāvo'khaṇḍatvācca tathā tathā |
madhyajyā madhyalagnasya natajyā hardale'rkavata ||42||

carasaṁskṛtalagnajyā lanbajyā cedbhavatyapi |
antyakramajyodayajyā trijyā cenmadhyamaurvikā ||43||

koṭijīvodayajyā syādityūhyaṁ koṭijāsphuṭam |
madhyajyā karṇajā dorjyā dṛkkṣepo dakṣiṇottaraḥ ||44||

asya diṅmadhyajīvāni kujyā vikṣepavargayoḥ |
vikṣepo dṛggatirmūlaṁ śaṅkurityapi cocyate ||45||

natāṁśasphuṭadoḥ koṭijīve dṛkkṣepadṛggatīḥ |
chedaḥ śaṅkuhṛtaiḥ kujyākṛtiśchedasamā yadi ||46||

madhyalagnārkottha dorjyā koṭilambananāḍikāḥ |
mahattvātprāggaterindordaśāntātprākasamo'ṁśunā ||47||

prākkapāle'nyathā paścāttathāsyādyuktirapyataḥ |
lambanaṁ parvataḥ śodhyaṁ prākkapāle'nyathā pare ||48||

asakṛllambanaṁ yāvadviḥ siddhaṁ sakalaṁ samam |
ravīndvorlambanaṁ ceti harijaṁ ceti bhāskaraḥ ||49||

vārayāmāsa śabdābhyāmanyayogeṣu lambanam |
agrasto'rko vimukto vā divā naktaṁ ca kālayoḥ ||50||

vyakṣe kṣaṇatrayaṁ dṛśyaḥ pāpibhiḥ sattamā iva |
sthirīkṛtaṁ taddharijaṁ lambanaṁ svāṣṭamānvitam ||51||

pitṛbhaktivihīnānāmevaṁ vā sarvalambanam |
sthirīkṛtaṁ dṛggatijyā saptāṣṭāṅkahatāpi vā ||52||

alpacchedāthavā cheda svāṣṭamena sthirīkṛtā |
yadvodayajyāprabhavo vinā bāhujyayā mune ||53||

meṣalagnāntarakṣetrajyāto vā tryekataḥ param |
vargayoruktadṛkkṣepa eṣa mārgaḥ sadā na sat ||54||

kvacitsannapi tatraitanna kvacidvāpi sankila |
dṛkkṣepatribhajā cetsyānmadhyabhuktyantarasya yaḥ ||55||

arkavidhvoḥ paścadaśe natirvā trikṛtirmune |
dṛkkṣepasaptatyaṁśo vā vanatirgrahaṇaṁ tataḥ ||56||

natiralpāntarā vāntyamārgābhyāṁ na hi doṣadā |
dṛśyate dvādaśāṁśo'pi svacchatvādgraha eva hi ||57||

indorliptātrayaṁ vārkasyoṣṇatvād grastamatra na |
grahaṇaṁ nāmabhedo hi durlekhyamapi puṇyadam ||58||

tenāntarālpakagrāso grāhyaṁ cenna samo yadi |
sarvagrāso'pi tigmāṁśoḥ kvaciddeśāntare tu saḥ ||59||

arkendvantarasadbhāvātsparśamātro'pi nāsti hi |
parvādhipatisaṅkhyāsu pātālagrahaṇaṁ ca tat ||60||

snānādiṣu tu na grāhyaṁ śubheṣu grahayuddhavat |
grahaṇaṁ grahayuddhaṁ vā tattadahni phalapradam ||61||

channaṁ grāhyādhikaṁ cetsthādvimardagrahaṇaṁ ca tat |
yāvadbimbaikadeśo vā tāvadeva na dṛśyate ||62||

vimardagrahaṇaṁ tāvatkālo vaimardikaḥ smṛtaḥ |
candrabimbādhikaṁ sūryabimbamadhye na karvuram ||63||

tatrārāt kaṅkaṇākāraṁ kaṅkaṇagrahaṇaṁ mune |
tatra kaṅkaṇakālaḥ syādasau vaimardikastu yaḥ ||64||

sthitikālo bhavettāvadyāvattiṣṭhatyupaplavaḥ |
karṇamānaikyamānāntarārdhe kṣepo bhujaḥ svakaḥ ||65||

ābhyāṁ pūrvaparākoṭirgatyantarasamā yadi |
sthityardhaṁ ca vimardārdhe kramātsyādaṣṭanāḍikāḥ ||66||

kaṅkaṇārdhe vimardārdhaṁ kaṅkaṇagrahaṇe bhavet |
grāso mokṣo vimardārdhe nonayuktaḥ sadaiva saḥ ||67||

nimīlanonmīlanākyaṁ kaṅkaṇārdhena tattathā |
muhurmuhuḥ kṛtāḥ sarve sphuṁṭī santu tadā mune ||68||

asakṛllambanaṁ sūryagrahaṇe'nyatsakṛttathā |
madhyasparśādantaraṁ vā sthityardhādi sphuṭaṁ svakam ||69||

sthityādau tu dhanaṁ vā syātsvamadhyaharijāntaram |
madhyādhikone kṣitijakhamadhyadiśi lambane ||70||

sthityardhādāvṛṇaṁ taccedanyathā harijāntaram |
dhanaṁ kapālabhede tu lambanaikyaṁ bhavenmune ||71||

itthaṁ sphuṭaṁ vā sthityardhaṁ vimardārdhaṁ ca nārada |
sthityardhaṁ lambanaṁ cāpi yugapaccāsakṛtsphuṭam ||72||

ahnogatyantaraṁ koṭiḥ kumadhye'ṣṭamamakṣajam |
tadarkagrahaṇe madhyasthityardhaghnaṁ sphuṭaṁ mune ||73||

sphuṭasthityardhasambhaktaṁ kṣepo bāhuḥ śravastataḥ |
grāsaṁ tātkālikaṁ projjhya mānaikyārdhāttato'nyathā ||74||

iṣṭagrahaṇakālaḥ syādagrāse sparśamokṣayoḥ |
kālaḥ sphuṭo grāhyagrāsa unmīlananimīlane ||75||

atīrthe'kṣavidhiḥ kalpyo madhyāhnanatamūrdhagaḥ |
yāmyottaraṁ muniśreṣṭha lambanaṁ tadgrahāntaram ||76||

natotkramajyā kṣajyādhnī trijyāptā kramakārmukam |
valanaṁ tadbhavaṁ pratyakkapāle dakṣiṇaṁ hi tat ||77||

uttarābhimukho yāti tasminpratipadaṁ grahaḥ |
prācīmadhyanatasthānaṁ yāmyapratyudgamāditi ||78||

uttaraṁ valanaṁ prāksyādvelāvalanameva tat |
grāhya krānti caturviṁśaṁ madhyaṁ valanamāpanam ||79||

yadvelāvalanaṁ prācyā uttarottarato grahaḥ |
udeti makarādau tatprākpaścātsvarṇamatra tat ||80||

anyadodeti karkyādāvanyadā yatra tatra tat |
iti niṣpannavalanaṁ pāramārthikamucyate ||81||

tatkramajyā tribhajyā cedrodhayo valanāṅgulam |
saptatyā sāṅgulaṁ vā syādatyalpaṁ yattadantaram ||82||

nānyajotkramajā kāryaṁ na tāsoḥ satribhagrahāt |
vedāḥ sampravadante ca natakālāya cāpataḥ ||83||

iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte pañcamo'dhyāyaḥ

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Chapter VI

chedakena vinā chedāḥ susphuṭā uparāgayoḥ |
na jñāyante yatastasmācchedakajñānamucyate ||1||

samabhudiṅmadhyabindoḥ saptavargāṅgulena ca |
mānaikyārdhena vṛttānāṁ grāhyārdhena trayaṁ likhet ||2||

tanmadhyamaṁ samāsākhyaṁ bahiṣṭhaṁ valanāśrayam |
grāhyāmaṇḍalamadhyasthaṁ diśaḥ prāgeva sādhitāḥ ||3||

yatprācyāṁ valanaṁ deyaṁ tadyathādiśameva tu |
paścādyattadviparyastaṁ valanaṁ prākprasiddhaye ||4||

ādyantamadhyavalanaistribhirevākhilaṁ bhavet |
nimīlanonmīlanābhyāṁ na kiñcidapi nārada ||5||

vikṣepāgre yataścandraḥ parasmādanusṛtya tat |
prāṅmukhaṁ madhyavalanaṁ tadvikṣepaikatā yadi ||6||

bhede paścānmukhaṁ deyamindorbhānorviparyayāt |
savyāpasavyamārgābhyāṁ tathā tannyāsadarśanāt ||7||

tisro rekhāmadhyabinduṁ prāpayedvalanatrayāt |
tatsamāsayutibhyāṁ tu vikṣeoau grāsamaukṣikau ||8||

valanābhimukhaṁ bindoḥ svavikṣepaṁ ca madhyamam |
vinyasya vilikheñcāpaṁ vikṣepatritayāgragam ||9||

iṣṭacchannonamānaikyadalasammitayāspadam |
śalākayā madhyabindorjñātvā cāpaṁ tato likhet ||10||

grāhakārdhena tadvimbasthānaṁ cetsparśamokṣayoḥ |
nimīlanonmīlanayorvidyādgrahaṇamīpsitam ||11||

adhvāntatvādvidhoḥ sūryagrahaṇaṁ kṛṣṇameva tu |
dhvāntaṁ chādakamindoryadviśeṣo'sti vidhau tataḥ ||12||

dhūmraṁ kṛṣṇaṁ kramātkṛṣṇaṁ kṛṣṇatāmraṁ vinirdiśet |
kiñcidūnādhikaiḥ pādaiśchannaṁ kapilameva tat ||13||

na deyaṁ yasya kasyāpi rahasyaṁ śāstramuttamam
arthalubdhāya mūrkhāya sāhaṅkārāya pāpine ||14||

gurubhaktivihīnāya putrāyāpi vadenna hi
etaddeyaṁ suśiṣyāya mune vatsaravāsine ||15||

iti Śrī Śākalyasaṁhitāyāṁ dvitīyapraśne
Brahmasiddhānte ṣaṣṭho'dhyāyaḥ

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Translations and Notes with Critical Analysis

Brahmasiddhānta in Śākalyasaṁhitā is such a compilation where the author (Śākalya) puts its content not in a conventional manner. The contemporary astronomical knowledge is spread over the whole text. There are many verses which are not worthy to be included in astronomical text, as for example, many verses in third chapter are mismatched with astronomical text. According to S B Dikshit and D H Dhavale these are suitable for Saṁhitā not for Siddhānta. So, the focus here is to translate verses containing astronomical contents only. In the manuscripts no chapter division is shown. For this very reason translation and notes are not bound to follow the conventional chapter division. The definitions, formulations and astronomical contents of this text are, in most cases, same as in Sūryasiddhānta and other contemporary works. But in some cases Brahmasiddhānta in Śākalyasaṁhitā differs sharply. This text is not worthy for primary level students. This compilation considers that its readers have some basic knowledge of astronomy. According to this feature it can be assumed that the author mixes all contents in an unique manner. The editor tries to arrange contents in a conventional method and the respective verses are translated here.

Salutation:

I-V: 1 to 10

Nārada paid respect to and questioned Brahma the master of the universe, seated comfortably and absorbed in meditation. Oh! Supreme God, Lord of the universe, Omniscient, Seated on the lotus petals, narrates the knowledge regarding the eternal time as envisaged in the field of astronomy. You have studied all Vedas, appeared as the pillar

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of the universe, as a whole, without its parts become meaningless, have taken pity on me. Thus being requested by Nārada, the great sage, intelligent son, the Lord of the universe narrated these words with satisfaction.

Well, "O" holy person, listen to what I am going to narrate being asked by yourself.

Vishnu, the supreme, being among the gods, receives the form of the Vedas; where the texts of the Vedic hymns are considered as his feet, and the kalpa regarded as his two arms and face. The grammar is his two ears, the Nirukta is his nose, and the astronomical treatises are his eyes.

With these organs, that body, the arena of the Veda is constituted, among the organs the principal one is this. Such eight fold treatise, highly difficult to be obtained. The masters were aware about observation and knowledge about time.

Time Measurement (Kālakriyāpāda):

Time is invisible unity without beginning or end. The life-cycle, birth, existence and death, are eternal processes. Nobody can feel the strong force of time. From being ancient period to modern, time is one of the burning questions. From Āryabhat to Stephen Hawking, everybody spent his valuable time thinking about 'time'.

In Brahmasiddhānta, the concept of time is explained in different chapters. It is very interesting that in previous astronomical texts, like Suryasiddhānta, Somasiddhānta, Āryabhatiya, the time concept is explained in what manner, Brahmasiddhānta is not. This text describes time in more than one chapter. Comparing with other texts it is noticed that Brahmasiddhānta follows the Suryasiddhānta but not in every topic.

Brahma starts, "O" Nārada! Divisions and measurement of time, which are His effects (creations), are now being spoken.

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I-V: 12- 17

Kālakalana (multitude) is now going to be discussed: eighteen moments (nimeṣa), thirty kāsṭha, and one kalā.

18 nimeṣa = 1 kāsṭha

30 kāsṭha = 1 kalā

The thirtieth portion of kalā is kṣana and one tenth of the 'guruvakṣara' is called prāna. 1/10 guruvakṣara = 1 prāṇa

Six prāṇasconsititute one vināḍi and sixty vināḍi constitute one nāḍi (ghatikā). The prāṇa is the respiration of all things and it is considered as āyu (life)

Sixty nāḍis constitute one whole day and night. Such thirty days constitute a month. The time from one sunrise to the next is called aharātra. Sāvana means time required from one sunrise to the next. Then one lunar month comprises thirty tithi, where the first fifteen tithi happen to meet with bright moon (sita) and next fifteen tithi being afforded with the dark moon is called asita (krisna).

The interval of time between two consecutive conjunctions of the sun and the moon is called cāndramāsa (lunar month). The solar month starts at the end of the lunar month, six seasons a year.

Notes:

a) Civil:

The Sun rises each day little later depending on its one day's eastward motion. The arc traversed by the Sun in one day is the same fraction of sign in which the Sun is staying as an ascension equivalent of the arc. This ascension equivalent of the arc gives the time gained by the Sun over sidereal day in a civil (saura) day. A civil day is divided into 60 nāḍis, 60 nāḍi into 60 vināḍi, and 12 civil months constitute a civil year.

6 prāna = 1 vināḍi
60 vināḍi = 1 nāḍi (Ghaṭika)
60 nāḍi = 1 sidereal day

There is some difference between sidereal day and civil day;
1 civil day = 60 nāḍi
30 civil days = 1 month

In kālakriyā section of Āryabhatiya, similar divisions are found.
1 revolution = 12 signs
1 sign = 30 degrees (aṁsa)
1 degree (aṁsa) = 60 kalā
1 kalā = 60 vikalā
1 vikalā = 60 tatparas
30 degree = 1 rāśi
and 12 rāśi = 1 bhagana

In Brahmasiddhānta, there is no mention of civil nāḍi and sidereal nāḍi as the modern Surya Siddhānta

b) Sideral:
The time between two successive risings of a star is called sideral day and sixty nādi constitute a sidereal (nākṣatra) day and night.[1]

The moon gains 12degree over the Sun is called a tithi and for 12 degrees, it takes 720 minutes. The moon completes a synodic revolution in 30 tithi. This synodic period of the moon is called lunar month. One lunar month comprises thirty tithes, where fifteen tithes happen to meet with bright moon and next fifteen tithes being afforded with 'Krisna', dark.

If the difference between the longitudes of the Sun and moon in minutes be divided by 720, the quotient will give the elapsed tithi; the remaining will give the part of current tithi. The concept of synodic month is old. The length of the synodic and sidereal month can be compared like this.

Text	Synodic month (days)	Sidereal month (days)
Āryabhahatia	29.530582	27.321668
Brāhmasphuṭasiddhānta	29.530587	27.321668
Brahmasiddhānta	29.530587	27.331139

c) Solar:

Brahmasiddhānta says the solar month starts at the end of the lunar month which is known as divyomahārātra. It can be explained as a solar month begins when the sun enters a sign. It moves over 30 degree of a sign in 30 solar days and 12 such months make a year. Comparing other siddhāntas, measurement of a year is like this:

Pitāmahasiddhānta	365 days 21 ghati 25 pala
Brāhmasphuṭasiddhānta	365 days 15 ghati 30 pala 22 vipala 30 prativipala
Brahmasiddhānta (Śākalyasaṁhitā)	365 days 15 ghati 31 pala 31 vipala 24 prativipala

These data also prove that Pitāmahasiddhānta is older than other two.

Conversion with contemporary concept

1 vipala = 0.4 second
10 vipala = 1 prāna= 4 second
60 vipala = 1 pala = 24 second
2 pala = 1 kalā = 48 second
60 pala = 1 ghati = 24 minute
2 ghati = 1 muhurta = 48 minute
60 ghati = 1 day= 24 hour
30 muhuta = 1 day = 24 hour

Alternative term:
vināḍi = pala
nāḍi = ghati
kṣhana = muhurta
Day = sidereal day

d) Lunar:

Thirty lunar dates constitute a lunar month. In Indian calendar luni-solar concept is being used.

e) Saṁkrānti:

In Brahmasiddhānta third chapter devoted many verses in explaining the rituals, religious time etc. Saṁkrānti is defined in this chapter. The ingress of the sun from one sign to the next is called saṁkrānti. After 29 days (approx.) the sun enters the next sign and the period in which the centre disc of the sun crosses over the junction point of two signs is the duration of saṁkrānti.

Duration of saṁkrānti = sun's diameter × 60 / Sun's daily motion in nādi

III-V : 151 Saṁkrānti, when the disc of the sun just crosses the sign and enters the other. The duration of saṁkrānti can be determined.

I-V-26-27

The mutually opposed day and night of the gods (sura) and demons (asura) is time of gods, being measured by the completion of the suns revolution through rāśis.

Sixty seconds (vikalā) make a minute (Kalā), sixty of these a degree (bhaga), of thirty of the later is composed a sign, twelve of these are a bhagana (revolution)

I V: 26 explains the day and night of god and asura. Brahmasiddhānta describes mahāyuga, kalpa (I–V 36,37) etc. In paitāmahasiddhānta of Pancasiddhāntikā uses the epoch of 80 AD and five years Yuga system. 180,000 years Yuga system is found in early siddhāntas but in Brahmasiddhānta 4320000000 years yuga system is employed and 432 × 10^7 years span time is called kalpa.

1 kalpa = 14 manu

1 manu = 71 Yuga

1 Yuga = 432 × 10^4 Years

I-V: 38 describes that a Yuga has been sub-divided in four parts in the proportion 4:3:2:1 of which the last part is important in astronomy. The four parts are called satya, tretā, dwāpara and kaliyuga. The length of a kali Yuga is 432,000 mean solar years and the other three Yugas are in order four times three times and twice the length of the kali.

Thousand Yugas are considered as one day of Brahma.

Text

I-V:36 -42……. First year and the solar year are considered to be included in 'kalpa.'

Individual years of the gods or the demons consist of the 'divya' days. Twelve thousand divya years constitute a mahāyuga or four Yugas.

The tenth part of an age (Yuga), multiplied successively by four three, two and one gives the length of the golden and the other ages; in order, the sixth part of each belongs to its dawn and twilight. Coming ages are treated by the present age as quadrant of the whole span of time.

"Manvantara" means another large unit, constituted by 71 Yugas. At the end of each manvantara, there is twilight equal to the period of kṛetā Yuga

The period of manvantara = 71 × 43, 20,000 = 306720000 solar years;

Period of twilight = 1728000 solar years;

The four Yugas together is marked as manvantara

At the end of manvantara is said to be twilight which has the number of years of golden age, and which is a deluge, considering the fourteen sons of human and knowing the conjunction in kalpa there appears fourteen manus, when kalpas are combined with the sandhis.

So, the period of manu is,

= (71 × 4320000 + 1728000) years = 308,448,000 years.

14 manus adding with the dawn of 1728000 years give the span of golden age.

Now, in a Yuga,
Number of sidereal days = 1,582,237,828

Number of sidereal revolutions of the sun = 432×10^4

Multiplied by 12 we get the number of solar months. Lunar months in a yuga = 53,433,336

Then excess of lunar months over solar months = 53,433,336 – 51840000 = 1593336

These are called adhikamasa (intercalary month)[2]

Different modes of reckoning time:

Brahmasiddhānta explains in a few slokas, the mode of measuring time and it is also interesting that in Suryasiddhānta, this topic has been explained in fourteenth chapter. This chapter is titled as mānādhyāya in other astronomical tints. This is the peculiarities of Brahmasiddhānta of Śākalyasaṁhitā i.e. this book explains the astronomical topics where it is fitted.

In Indian system each type of calendar is to divide it in days, months and years of their respective length,[3] normally thirty days constitute a month and twelve months constitute a year. The basis of this division would have originally been the sun's complete revolution along with the zodiac consisting 360 degrees. The concept of days comes from the daily movement of the sun. The term 'dyu' used for the day and the interval between one rising to another came to be known as ahorātra. The concept of the month would have come from the appearance of the full moon and after gradual decreasing till it becomes invisible and also reach the full moon. The interval between these two full moon is called month. The cycle of brightness and gradual decreasing the appearance of the moon disc called kṛsnapakṣa and gradually increase of brightness of the moon disc is called śuklapakṣa. In the interval of two full moons sun rises nearly thirty times. So, the month consists of average thirty days. The concept of the year comes from the time around which the monsoons come. Indian astronomers like to calculate the beginning of the year from summer solstice. Since the year is divided on the basis of the observations of lunar and solar motions, so the luni-solar calendar was constructed and till today it is used. From Sūryasiddhānta systems of time reckoning become standardized. Solar, lunar, sidereal and civil are time reckoning for practical use. The time taken by the sun in travelling

one degree is called solar day. The use of solar days has been mentioned in determining ṣaḍāśītimukha. The measurements of the days and nights in the northern and southern hemispheres increase or decrease depend on the declination of the sun. According to Ārabhatiyaṁ the term ṣaḍāśītimukha is applied to the four divisions of the ecliptic each containing 86 degrees and the beginning to be made from the tulā sign. No scientific explanation is found of the 86 divisions of ecliptic.

To determine the points of solstices solar reckoning is important. The time at which the sun enters in the makara sign, the sun is said to be the northern progress or uttorāyana up to a period of six months. Similarly, at the time when the sun enters karkata sign it will be named as dakṣināyan or southern progress. The seasons are determined from these solstices.

Equinoxes are determined by the solar reckoning. The ecliptic cuts the celestial equator at two places and these points of intersection are known as equinoxes (viṣuva). The angular distance of these two equinoxes is 180 degree from each other and lie exactly opposite on the two ends of the same diameter. During the course of the revolution the sun comes on the celestial equator twice in a year, 21st March and 23rd September, known as Vernal and Autumnal equinoxes.

Text:

I-V: 28-34. The ṣaḍāśītimukha is at the end of the periods of light six days, in succession, there are four of them, occurring in the signs of double character (dvisvabhāva); namely, at the twenty six degrees of Sagittarians, at the twenty-second of Pisces, at the eighteenth degree of Gemini and at the fourteenth of Virgo.

From the later point, the sixteen days of Virgo which remain are suitable for sacrifice; anything given to the pitara (father) in them is inexhaustible.

the house, where a day consists of light six such faces is named after these faces.

In the midst of the zodiac, two solstices (ayana) and two equinoxes

(viṣuva) are situated upon the same diameter. When libra passes over to Aries, it behaves as equator. Between equinox and ayana, two entrances, from the moment of entrance, known as the feet of Vishnu.

Notes

The solar year is sidereal, not tropical; it commends whenever the sun enters the first sign of the sidereal Zodiac. The length of solar year and month is subject only to an infinitesimal variation, due to slow motion. The solar day is that time during which the sun traverses each successive degree of the ecliptic, with this true motion, the method by which solar day can be measured, is the sun is true longitude for that moment . Hence, it is not used practically. This portion of this text is almost similar to Suryasiddhānta the technical terms saṁkranti is explained earlier, it is the sun's entrance into a sign of the Zodiac. The auther uses the term Vishnu's feet for solstice or equinox. In Hindu mythology, Vishnu is the sun. The three steps of Vishnu are to recognize in the three signs intervening between each equinox and solstice.[4]

Introduction of Planetary Motion

The first chapter deals with introduction of planetary motion also. The planets impelled by the 'prabaha' move from east to west and this motion are reflected in the risings and settings of planets. At the same time, the asterism circle beats the planets towards east and for this reason, the planets move eastward in circular or bits around the earth (Geocentric)

I-V: 62–72 In a Yuga, the revolution of the sun, Mercury and Venus; and of the conjunction (sighra) of Mars, Saturn and Jupiter, moving eastward, are four million, three hundred and twenty thousand (4320000); of the moon, fifty seven million, seven hundred and fifty three thousand, three hundred and thirty six (57753336); of the mars, two million, two hundred and ninety six thousand, eight hundred and thirty two (2296832); of mercury's conjunction, seventeen million nine hundred and thirty seven thousand and sixty (17937060); of Jupiter, three hundred and sixty four thousand, two hundred and twenty

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(364220); of Venus conjunction, seven million twenty two thousand, three hundred and seventy six (7022376); of Saturn, one hundred and forty six thousand five hundred and sixty eight (146568).

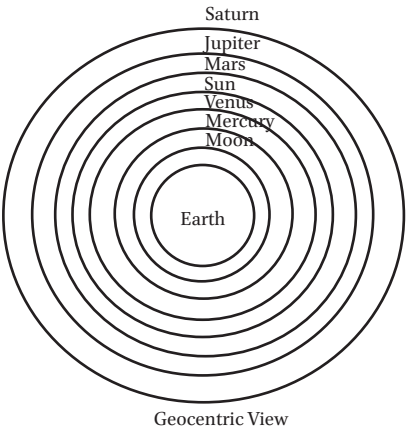

Fig. 1

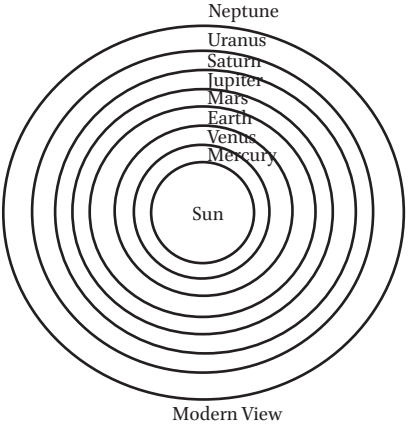

Fig. 2

(Courtesy: Suryasiddhanta: An Astro-Linguistic Study, Dr. Sudhi Kant Bhardwaj)

There revolution of the sun's apsis (manda), moving east-ward in a kalpa the number is three hundred and eighty seven, that of mars, two hundred and four, that of mercury three hundred and sixty eight; of Venus, five hundred and thirty five; of Saturn thirty nine, of Jupiter, nine hundred.

The number of rising of asterisms, diminished by the number of the revolutions of each planet, gives the number of the planets in an age.

As there is retrogression of a star before it's rising and it regains its earlier motion, on Yuga constitutes one adhikalpa (adhikalpadayāyuge).

Subtraction the number of apsis of the moon, from that of the sun is the number of lunar months in one Yuga; the residual of the subtraction of lunar day from the solar day is called the "tithi".

Notes: According to Brahmasiddhānta, the number of revolutions of the planets in a mahāyuga, are like this

Sun –	43,20,000
Moon –	5,77,53,336
Mars –	22,90,832

Mercury –	43,20,000
Venus –	43,20,000
Saturn –	1,46,568

These are similar to Suryasiddhānta. The beginning point of all the planets in their respective tracks is stated to be the Asvini nakṣatra and the ending point is the end of the Revati nakṣatra. The one complete circle of each planet is known as one bhagana of that planet.

The ecliptic is divided into 12 equal parts each measuring 300 called signs (rāśi), the first sign commencing from the vernal equinox. These signs are

Meṣa (Aries) commencing from vernal equinox
Vṛṣa (Taurus)
Mithuna (Gemini)
Karkaṭa (Cancer) commencing from summer solstice
Siṁha (Leo)
Kanyā (Virgo)
Tula (Libra) commencing from autumnal equinox
Vṛścika (Scorpio)
Dhanu (Sagittariaus)
Makara (Capricorn) commencing from winter solstice
Kumbha (Aquarius)
Mīna (Pisces)

The vernal equinox has been taken in the text at a point 10 minute east of the star zeta piscium, Revati; so we always refer to this point as initial point.

Latitude of the earth

In the half revolution beginning with Libra, excess and deficiency occur in the reverse order in two hemispheres. The method of determining them depends on latitude. Multiplying earth's Circumference by the sun's declination in degree and divides by the number of degrees in a circle, the result is in Yojanas. This is only a reduction of latitude from

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degree to yojana at a place from where the position of the sun is at zenith (Mid-day).

360 degree: Earth's circumference in yojanas = sun's declination in degrees :equivalent yojanas.
I-V: 91–103 At midday, when the sun is at Zenith, the arcs are in perpendicular position and the eighth part of the minutes of a sign is called the first sine (jyārdha) and the twenty thus dividing the jyāradhapinda in succession by the first and adding them, in each case. What is left after subtracting the quotients from the first, the result is twenty four jyārdhapinda. Palabhā or akṣabhā is used for the mid-day shadow on the gnomon cast on the north-west line at any given place.

Planetary Phenomenon (Grahaṇāni avasthānam)

This chapter deals with manda, śighra, ucca, nica, pāta etc. which are discussed in other astronomical treatises in spaṣṭādhikara chapter. The author tried to clear the causes of difference between a spaṣṭagraha and madhyagraha, what constitutes an upagraha. The diameter of the disc of a planet or its orbit is tried to determine. Polar longitudes of the asterisms are discussed. Brahmasiddhānta gives directly the degrees of longitude without divisional explanation. The symbols used to indicate different asterisms are described through slokās. Another feature of this text is to coordinate some stars and reference to the motion of saptarṣi. Golāyantra and some measuring methods are discussed in this chapter.

Copernicus published his heliocentric conception when he was about death, in 1543; before that the geocentric system and the Ptolemaic system of epicycles were popular in Europe. As in India, each planet was presumed to move on the circumference of a circle, called epicycle, while the centre of that circle revolved around the earth on a second circle called deferent. Kepler, with the help of Copernicus's book and observational data of Tyclo Brahe, gives three historic laws to explain the planetary motion. The Indian astronomers recognized by observation that the daily motions of the planets are not uniform. They realized that the motion of a planet becomes lowest (mandacca) when it is in farthest position from the earth.

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But not only Śākalya, other ancient Indian astronomers suggested the elliptic path of the planet. They conceptualized the fastest and slowest motion of planets, considering their orbit.

Causes of Planetary Motion

The main cause of planetary motion is the attractive force between the celestial objects. The constant orbital motion of a planet is disturbed by three factors-mandocca, pāta and śighrocca and so the orbital motion is not uniform.

Text

II- V: 1 to 6. The attractive forces act on the sun and the moon, amount by which a planet is, at any point in its revolution, drawn away from its mean place by the disturbing influence of mandocca. The planets, attached by the chords of air, with all sides (Sphuṭasthiti), multiplying the base- sine by the difference of the epicycles and divide by radius (trijyā), accordingly, this is less or greater than the odd, given the corrected epicycle, subtract the longitude of a planet from that of its apsis (mandocca), subtract it from that of its conjunction (śighra), the remainders is its Kendra.

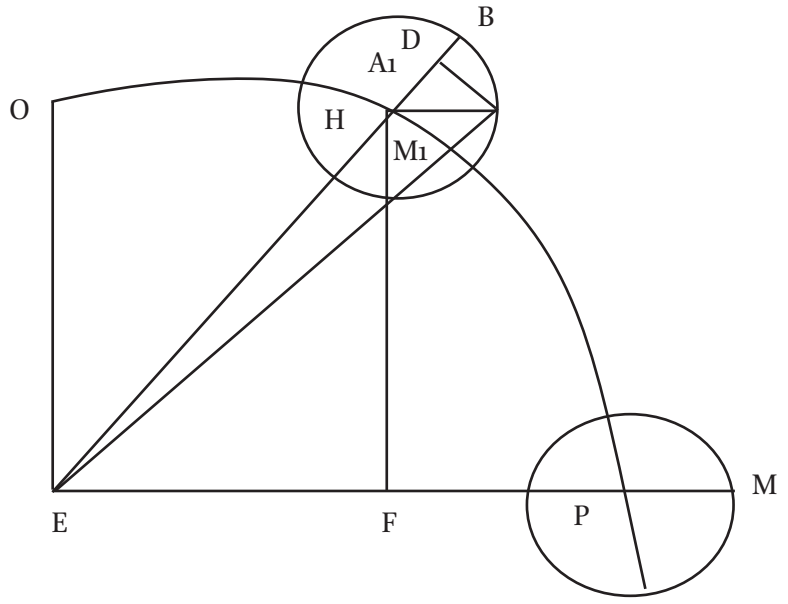

Fig. 3

(Courtesy Surya Siddhanta A K Chakrovarty)

a) Mandocca: Technically it is the apex of slowest motion, so it is apogee for the sun and moon, and aphelion for other five planets.

At this point, the speed of a planet is less, so it starts to gain speed from this point when it reaches perigee, the speed becomes maximum.

In fig. 3, P is the mandacco point on the orbit. A circle is drawn whose centre is P. This circle is called mandaparidhi (epicycle). The periphery of an epicycle is maximum at mandocca and reduces to minimum at O. The periphery of the epicycle at A_1 (sphuṭaparidhi) is shown.

Contraction from P to G = bhujajyā

Sines and cosines of Kendra are known as bhujyā and kotojyā respectively. If the Kendra is in odd quadrant (viṣamapāda), the sine of the travelled arc is known as bhujyā; but if the Kendra is in even quadrant (samapāda), then the sine of the arc to be travelled is bhujyā.

b) Pāta : The mean motion of the sun is effected by mandocca (node). This is the point where the orbit of a planet appears as crossing the ecliptic. There are two nodes opposite to each other. The point from where the planet's direction is turned north of the ecliptic known as ascending node (rāhu), and the point where the direction is turned south known as descending node (ketu). The position of the node goes on successively moving westward and makes a circle, known as the revolution of the node of a planet. This motion is very slow. The effect of the node on the planetary motion is to deflect the planet from the ecliptic north or south. When the node lies in the western half orbit i.e. when the distance of the node from the planet is more than 180 degree, it deflects the planet northward. This rule is applicable for Moon, Mars, Jupiter and Saturn. The deflection of Mercury and Venus is determined with respect to their conjunction.[5]

Trijyā: It is the short form of trirāśijyā. Angles are measured in ancient Indian system in rāśi. Arāśi consists of thirty degree. So, three rāśi consists of 90 degree. Trijyā is measured in terms of kalian Indian system.

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Sighrocca:

Sighrocco represents fastest motion. From ancient point of view (geocentric), the speed of a planet is fastest at conjunction. The revolution of a planet in a Yuga, are its sidereal revolutions in its heliocentric orbits. The old concept śighra karma explains the heliocentric direction is reduced to geocentric direction by an operation.

Verse three indicates that the equation of a planet's daily motion is to be calculated like the place of a planet in the process of mandacco.

II-V: 5 and 6
Subtract the longitude of a planet from that of its apsis (mandocca), subtract it from that of its conjunction (śighrocca), the remainder is its kendra.

The author tries to explain the correction of conjunction. The equation of motion of any given time is equal to the amount of acceleration or retardation effected during this time by the influence of apsis.

Referring the fig 4,

S, the sun in its orbit surrounding the earth (geocentric), a circle drawn with S as centre, this circle is called sighraparidhi. Let V. is the planet; both the planet and the conjunction move towards east.

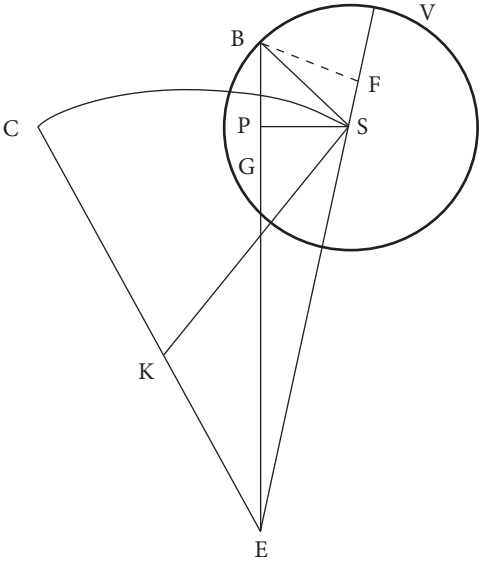

Fig. 4

Here BF = (BS X SK) / ES = Dophalā

SF = Kotiphalā

Sighraphala = (trijya x dophala) / kalakarna

It is very difficult to arrange sequentially due to repetition and different concepts of astronomy in this text, like: sighra ,manda, pāta etc. which are discussed in second chapter only in most of the texts. Brahmasiddhānta spreads over its concept in chapter 1, chapter 2 and chapter 5. The concept of eclipse, samāgama is explained in 5th and 6th chapter but, the knowledge of projection or grahanam are explained in chapter two.

Text

II-V: 7 to 12: The sun of the arc found by subtracting the place or the node from that of the planet being multiplied by the extreme latitude, and divided by the last hypotenuse, by radius, gives the vikṣepa (latitude). The equation of true planet's daily motion is to be calculated like the place or planet in the process of apsis multiply the trijyā corresponding to the tabular sine, the apogee and aphelion of the sun is determined. It is clear that the difference between the mean and true places of the sun indicates the difference between mean and true time, get equation of time.

The causes of the difference between ṣpasṭagraha (true planet) and madhyagraha (mean planet)

There are too many slokas are in chapter two which involved to explain the causes of the difference by graha-madhya and graha- spasta. The concept of upagraha is rare term in Indian astronomy. This term is used as a spirit directs the planet's motion

A wind mahāvayu impels the planets towards their own apsis (nata) being drawn away forward and backward, processed a varying motion. The concept of upagraha comes to explain the causes of motion also. Verse no. 36, 37, 38 are faulty in the sense; all manuscripts do not match these verses. One line in each verse is absent in three manuscripts.

II-V: 83-84 The diameters upon the moon's orbit of Mars, Saturn, Mercury and Jupiter are declared to be thirty, (increased) that of Venus is sixty. These, divided by the sun of radius and the hypotenuse , multiplied by two , and again multiplied by radius, are the respective ' Sphuta'.

The time when the sum of the longitudes of sun and moon comes to an integral multiple of $13^{\circ}20'$ is called Yoga. One of the Yoga is called vishkambha. Colebrooke noticed the use of 'Yoga' in India by different names. There are 27 (28) Yogas are not of stellar origin.

Determination of Sun's diameter

II-V:89–99. The diameter of sun's disk is six thousand five hundred yojonas and for moon's four hundred eighty.

These diameters (byāsa), each multiplied by the true motion and divided by mean motion, give the corrected (sphuta) diameter or if it multiplied by the moon's orbit (kakṣa), and divided by sun's orbit, the result will be the diameter upon the moon's orbit. Multiply the earth's diameter by the true daily motion of the moon. And divide by its mean motion, the result is the earth's divide by its mean motion, the result is the earth's diameter (corrected)

Notes: Mean motion: mean diameter: true motion at the time: true diameter at the time.

True diameter (Sun) = mean diameter (sun) x true motion (Sun) / mean motion (Sun)

True diameter (Moon) = mean diameter (moon) x true motion (moon) /Mean motion (moon)

Sun's diameter on moon's orbit:
SS'/MM' = ES/EM = radius of sun's radius of moon's orbit
Sun's true radius on moon's orbit = MM^1
= SS^1 x radius of moon's orbit/radius of Sun's orbit
Sun's true diameter on moon's orbit
= Sun's true diameter x orbit of moon/orbit of sun

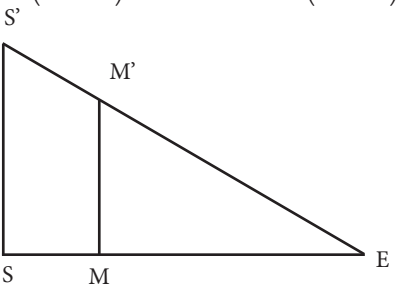

Fig. 5

Diameter of earth's shadow on moon's orbit

Reference to fig 6
Let E be the centre of the earth,
S, the sun
N, the mean moon
M, the actual position of the moon
SP the corrected radius, EF the radius of the arc

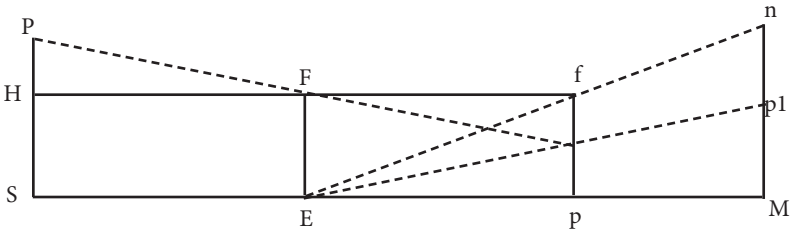

Fig. 6

(Courtesy Surya Siddhanta A K Chakrovarty)

The bhucchāyā Mp' is to be determined.
Using simple geometric method, diameter of earth's shadow at moon's orbit
= (True diameter of Sun – Diameter of earth) × diameter of the moon /mean diameter of the sun

Determination or polar longitudes (dhruba)

EL represents the equator
CL the ecliptic,
P & P' respective poles,
S the position of any given star
PS, the circle drawn through S,
'a' is the point on the ecliptic of which the distance from the Aries and from the star respectively and so given the longitude and latitude.
Let the path of a planet is ecliptic, the point of that circle which it is determined by the calculated longitude. In case of a fixed star its point of declination is that to which it is referred by a circle through that pole. From the verse the term dhruba comes from the

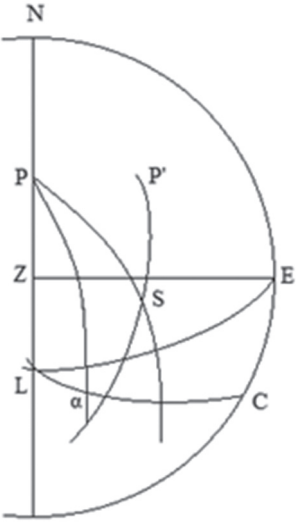

Fig. 7

constant dhrubaka. By which the poles of the heaven are designated and longitude of a star as referred to the ecliptic by a circle from that pole.

Different Asterism

The identification of the asterisms is founded upon the position of principal or junction stars, the figures by which the asterisms are distinctive, these have particular name. Colebrooke studied Śākalyasaṁhitā and found this description. Sir William Jones furnished a copy of drawing of the figures assigned to the asterisms. In ancient India, two different methods are shown for calculating time; one lunar tithi and two, rāśi. Ancient astronomers observed daily motion of the moon and after repeated observation they suggested that the direction of motion is to east to west. But due to motion of the sun and the moon, the heavenly bodies move eastwards daily. This movement is in regular interval. The moon moves from one asterism to another in 271/3 days. The sun revolves in 365 days 6 hours 9 minutes 9.5seconds. This path of the sun is called ecliptic. Astronomers calculated that the declination of the axis of the moon with ecliptic is negligible. So, they fixed 28 asterisms in 27 places. The star of maximum brightness was called yogatārā. Jyotiṣaratnamālā of SripatiBhatta illustrated from Aswini to all asterisms with number of stars.

The special feature of Brahmasiddhānta is that this text gives directly the degree of longitude, which is not present in any other astronomical text book at that time. Colebrooke, studied siddhantaśiromoni and commented on Brahmasiddhānta. The latitudes given in Brahmasiddhānta are almost same as siddhantaśiromoni as Colebrooke said.

II-V: 172 to 179. Agastya (campus) is situated 80 degrees is in south at the end of mithuna (Gemini) and Mṛgavyādha (lubdhaka) is situated in the twentieth degree of Gemini. Agni (hutabhuj), is in the 22nd degree of vṛṣa and its latitude is stated to be 8 degree north; situated 5 degree eastward from Bramahṛdaya isprajapati; it is the end of Vṛṣa (Taurus).

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Astronomical instrument concept:

Brahmasiddhānta covers yantravidyyā in its six chapter comparing Suryasiddhānta, as it gives the idea of astronomical instruments in thirteenth chapter.

II-V: 213 to 218
A wooden earth globe of desired size is made fixing in a globe of stellar sphere and then inserts a staff through the common centre of the two globes. Two hoops (Kakṣa) are to be fastened to the axis at right angles to one another so that they represent the equinoctial and the solstitial colures. Above the points of intersection and the supporting hooks are the two solstices and two equinoxes.

A hoop if placed obliquely from solstice to solstice, ecliptic is found. Along this path the sun moves, the moon and other planets, being drawn away from the ecliptic by their respective nodes, become visible at their respective latitudes. The Rsine which is between the meridians (Madhya) and Ksitijya is the day measure.

Coordinates of asterism: To compute the position of any star, dhrubaka and vikṣepa are used in there are termed as polar longitude and polar latitude respectively.

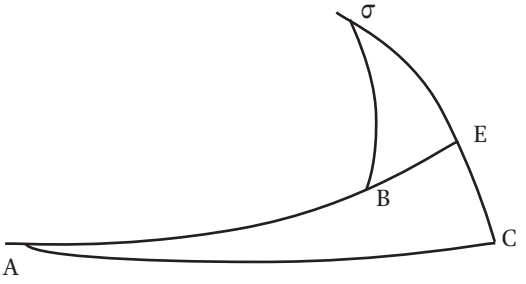

Fig. 8

Let, AB = Longitude λ of a star σ
σB = latitude β of σ
Angle σBE represented as B angle
Polar longitude AE (dhruvaka), polar latitude σE (vikṣepa); this coordinate system is used for stars only.
Sin β = Sin d Sin B

Sin (λ – l) = tanβ cotβ
Cot B = cos l tan ε
Burguess first computed λ, β from l, d for 35 stars[6].

For the planets, bhoga and vikṣepa are used as coordinates. The period of one revolution of a planet, considering an initial point, ahargana is computed. The position (bhoga) is reckoned as the mean longitude of the planet. Vikṣepa is measured from the ecliptic along a secondary to the equator drawn through the planet.

Computation of tithi and nakṣra(tithinakṣatradinirupana)

Measurement of tithi
Lunar tithi:
According to colebrooke, the use of Yogas is chiefly astrological; the occurrence of certain movable festival. The name of 27 Yogas are:

1	Vishkambha	10	Ganda	19	Parigha
2	Priti	11	Vṛddhi	20	Civa
3	Āyushmant	12	Dhruva	21	Siddha
4	Saubhāgya	13	Vyāghata	22	Sādhya
5	śovana	14	Harsana	23	Subha
6	Atiganda	15	Vajra	24	śukra
7	Sukarman	16	Siddhi	25	Brahman
8	Dhṛti	17	Vyātipata	26	Indra
9	Cūla	18	Variyan	27	Vaidhrti

The term 'Yoga' is applied as the 'Sun' of the increments in longitude of the sun and moon. It is absolutely on drive of astrologers, Colebrooke noticed 28 Yogas but what is 28th and what the effect that is not known. By the verse it can be well understood that it is the period of variable length, during which the joint motion in longitude of the sun and moon amounts to 13°20′. In the travelling time, festivals, the uses of this Yoga are shown.

If Yoga is to be determined: in a certain time, the amount of Yoga; the longitude of the moon at that time 11(rāśi), 17°39', that of the sun 8 (rāśi),

18°15'; their sum is 8 (rāśi); 5°54' is 14,474', Dividing by 800, We find that eighteen Yogas of the series are past and add nineteen parigha of which 354' are past and 446' to come.

III-V.1-2 The part of a lunar day seven hundred twenty if the longitude of planet be divided by portion of asterism. The result sits position of asterism. From the number of kalā (minutes) in the longitude of the moon be diminished by that of the sun, are found the lunar days, by dividing the difference by the portion of a lunar day.

III-V: 4 to 6. The karanas, namlysakuni, nāga, kisstughna are counted from the latter half of the fourteenth day of the dark half month.

Notes: Tithi is defined as the single part of lunar month. In a lunar month, moon will move 360 degree than the sun. Therefore, the single part of the 30 is 120 or 720 minute. This 12° is called a bhoga. To determine any tithi, the latitude of the moon be subtracted from latitude of the sun and divide by 720 minute. The quotient will give the present tithi.

Of the eleven karanas, four occur only once in lunar month while the other seven are repeated, each of the light times to find out the remainder of the month.

This adhyāya should not include in astronomical text, dikshit truely said that the content of this chapter should belong in saṁhitā. Ekādasi, Upavāsa, result of upavāsa, dāna etc. are the contents. So, in prepare an astronomical work it should be avoided. Verses (42, 43) explain:

Fasting and donation were the duty of a devotee. To brāhman, donation is the part of rituals.

Ekasdasi should be spent without water; also Fasting without water should be followed by a devotee.

What are the duty in trayadosi, dasami, pratipada etc. are discussed in the verse 49 of this chapter. Śākalya noticed some rituals which are common and followed by common people.

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Risings and setting of planets and stars

This fourth chapter starts from risings of inferior planets, (Mercury and Venus); perhaps the author started this chapter imagining Venus in the west. The visibility correction is also noticed in third verse of this chapter. The terms used for the helical settings and rising or the heavenly bodies are disappearance and return their visibility (asto and udaya). These udaya and asta depend on the arc of the ecliptic intercepted between the sun and the hour angle of the planet. According to Suryasiddhānta, dṛkkarma means akṣadṛkkarma; Brahmasiddhānta follows this interpretation. Brahmasiddhānta noticed not only incident but it gives explanation also. The correction of visibility is also another topic of discussion.

IV-V: 1 the inferior planets, (Mercury, Venus); set with the sun rises. When the longitude of planets is greater than the sun, go setting for the west. When it is less, rise in the east, so likewise inferior planets when retrograding.

Notes: The speed of planets if greater than the sun. Then sun sets first; those rise before sunrise. The speed of Mercury and Venus are sometimes fast, sometimes slow, when the motion is retrograde. Inferior planets rise helically in the east after conjunction and then they are retrograde. They attain gradually the maximum elongation in the east and after they revert to direct motion, their elongation gradually decrease. Then they set in the east and helically rise thereafter in the west. Their elongation attains a maximum value and then they begin to retrograde and gradually set in the west.

IV-V: 6 To Calculate the longitude of the Sun and of the planet – in the west and in the east, then the apparent longitude (dṛkkarmana) is to be calculated.

In Śākalyasaṁhita the detail of risings, settings of planets, asterisms etc. are other features. It is apparently difficult to isolate the verses in traditional method, as for example, in this chapter, the contents of uday-asta, phases of the moon, instructions for setting observatory etc. are included.

IV-V: 13 to 19. Multiplied by the sine of the colatitudes of any place and divided by radius, get the corrected circumference of the earth. Multiplying daily motion of a planet by the distance in longitude of any place, divide by the corrected circumference, the quotient subtract from the mean position of the planet as found, if the place be cast of the prime meridian, add it to the west, the result is the planet's mean position at a given place. The meridian line is imagined through Lanka and Sumeru. Multiply the mean daily motion of a planet by the number of hour angle and divide by sixty; day and night are explained in verse 19. The interval between two lagnas will give when divided by sixty, the degrees of time (Kālāṁsa), in the west, in respiration (prāṇa), of the interval between the two increased by six signs.

Notes

Determining eastern horizon for calculation of sunrise, the true longitudes and rates of motion of the sun and the planet are found, as the latitude of the planet. The language of the text indicates that the calculation is not full and it is surprising that conclusion is made correctly.

IV-V: 22 to 25

The degree of settings of Venus in the west and the rising in the east take place becomes of it greatness, at eight degrees; and the rising in the west. Owing to its inferior size, at ten degrees, the degree of setting for Saturn is fifteen, Maghā, Śrabaṇā, Punarvasu, Abhijit, Mṛgabhyadha, Agastya, Brahmahṛdaya, Mṛgasirsa, Varani rise and set at seventeen degree.

Notes: The statement of V24 and V25 are different from Sūryasiddhānta. In that text, Svāti, Agastya, Mṛgavyadha, Citrā, Jyesthā, Punarvasu, Abhijit, and Brahmahṛdaya rise and set at thirteen degree; whereas Hasta, Śravana, Phālguni, Sraviṣṭha, Rohini and Maghā at fourteen degree; Kṛttika, Anurādhā, Mula at fifteen degree and Bharani, Pushyā, and Mṛgasīrṣa at seventeen degree. But this text states all the stars set at seventeen degree. No doubt, Suryasiddhānta is more accurate than Brahmasiddhānta, but it may be assumed that for simple understanding

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the author may draw this conclusion. The categorizations of stars are due to its magnitude and brilliancy. The first class stars (above mentioned) are visible at a distance 13° from the sun and moon.

IV-V:26. the degree of visibility is, as a result of the corresponding degrees on the ecliptic. By means of them, likewise the time of visibility and invisibility may be ascertained.

How to determine the phases of the moon?

IV-V: 38 to states the phases of the moon.

After setting the sun, the moon rises, on purnima, the whole solar illumination is received. If phases of the moon are to be determined, then the kranti is to be measured correctly until the interval, in respirations, of the sun and moon is fixed, in the sukla, go to the setting after the sun. Of the declinations of the sun and moon, if their direction be the same, take the difference, or take the sun the corresponding sine is to be regarded as south or north, according to the direction of the moon from the sun. Multiply this by the hypotenuse of the moon's midday shadow when it is north, subtract it from the sine of latitude multiplied by twelve, when it is south.

IV-V: 78, 79 are almost same of the Sūryasiddhānta (Chapter III-19) indicates the correction of mandaphala. If commencing with cancer, Subtract from a half circle, if commencing with libra, add a half circle, if commencing with Capricorn, subtract from circle, the result in each case, is the true longitude (sphuta) of the sun at mid- day.

How to make kapalayantra?

The last portion of this chapter indicates how to make an astronomical instrument, kapalayantra, for the measurement of time. It consists of a copper vessel of hollow hemispherical shape with a hole at the bottom, set in a basin of clean water, it will sink 60 times in the interval of a day and night. If the instrument be set in operation at any instant of run rise. The ghatikā expired at any time is known from the number of times the vessel sinks. It is an accurate hemispherical instrument.

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According to Burgess, this instrument is noticed in Ain-I-Akbari. This traditional kapalayantra is to ten palas 'weight of copper, four angulas high, and of twice that width at the mouth.

The difference of verse from the Sūryasiddhānta is that in height; Sūryasiddhanta tells six angulas and Brahmasiddhanta instructs four angulas.

Verse 117 says, this yantra is helpful for determining time even at night.

Conjunction of planets, eclipses

V-V: 1 to 10. The stars, planets takes place with one another samāgama or yuddha, with the moon samāgama, when a fast moving planet has high longitude the samāgama (conjunction) has been past. Ullekha, bheda are the types of conjunctions. If the interval between the planets is small, and if the planet is inferior, then the encounter is called apasavya (transit). If the rays coming from one star create the shadow then the samāgama occurs. The diameter of the shadow multiplied by two and again multiplied by radius, are the best point of clear view. Having calculated the measure of day and night, likewise latitude, lagna can be determined.

Notes: To measure the exact time of conjunction it is needed to determine the position of two planets. This time before and after which the conjunction has taken place can be found by dividing the difference of the planets by the difference of daily motion.

Terms to be explained:

a) Samāgama : When the five planets are in conjunction with the moon, then they are said to have samāgama.
b) Astamāna : When the five planets are in conjunction with the sun, there they are said as astamāna.
c) Bheda: It is one type of conjunction.

It two planets come close together and one planet covers some part of another planet but both are vividly shown, then this type of conjunction is called bheda.

The types of conjunction discussed in the text are: i) Ullekha: If the planets are in contact, known as ullekha. ii) Yuddha: literary means conflict. When the discs of the planets remain apart but their rays coincide, then the phenomenon is called yuddha. iii) Bheda: discussed earlier. iv) apasavya: It is defined as the interval between the planets when too small and one of the planet is faint. v) Samāgama: though it is said that samāgama is closed to conjunction but If the planets are bright (not faint) and if the interval between the planets are greater than one degree, then the phenomenon is known as samāgama. When longitude of a planet is equal to that of the moon then it is called samāgama.

Time of conjunction

Let both the planets move with direct motion, such that the daily orbital speed of the first one is V and that of the speed is V^1 ($V > V^1$); longitudes of the planets are l, l^1 respectively ($l^1 > l$). If conjunction occurs after a time t, at a further distance x from l'

We get $vt = l^1 - l + x$

And $v^1t = x$

$vt = l^1 - l + vt$

$$t = \frac{l^1 - l}{v - v^1}$$

$$x = \frac{v'(l' - l)}{v - v'}$$

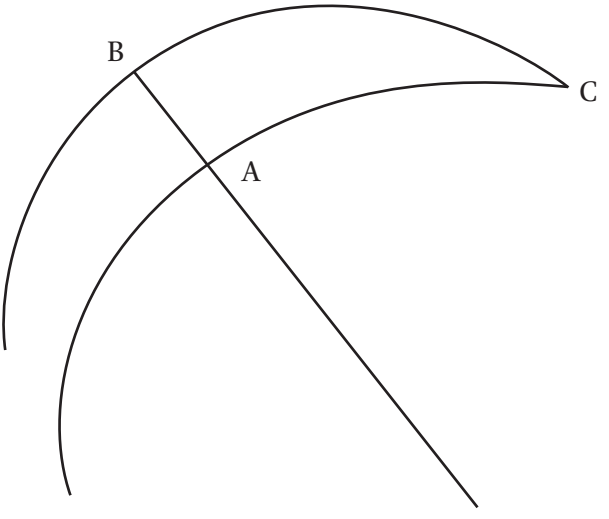

Fig. 9

Fig 9 shows, the conjunction of two planets. If c be the starting point of two planets and let A and B be the paths of the planets, from P, a circle through A is drawn on BC, then BC and CA will have the same angular valve from P. A and B are said to be in same longitude and in conjunction.

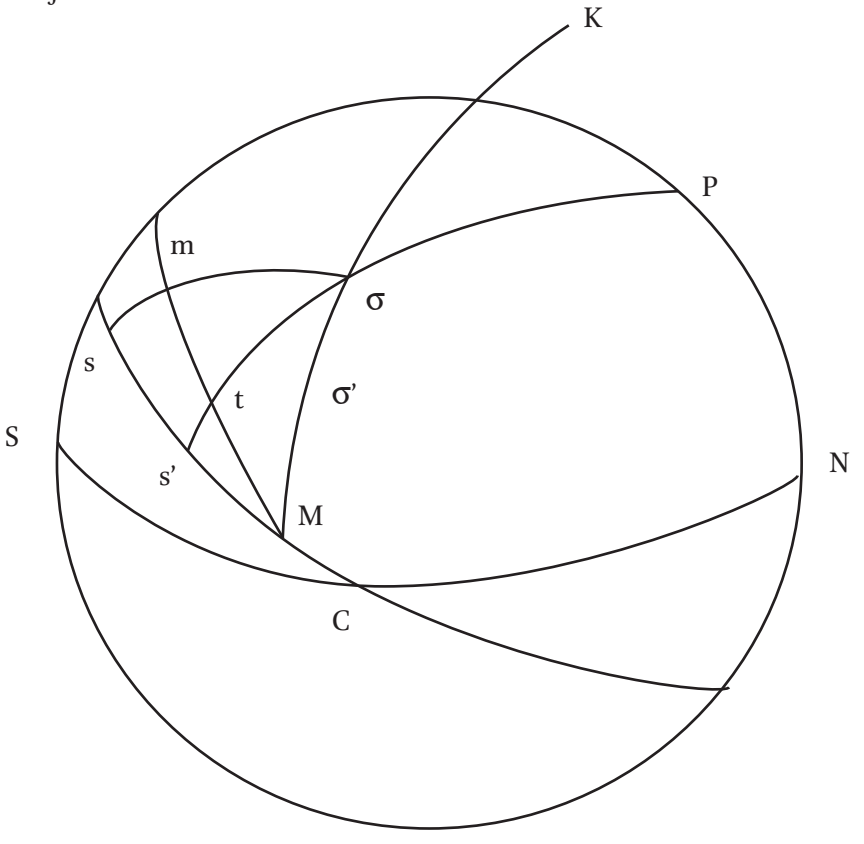

Fig. 10

Fig 10 shows the conjunction of two planets σand σ/, they lie in the latitude cisels Kσσ'where k is the pole of the ecliptic. Let the meeting point on the ecliptic is M, let C be the lagna, a great circle drawn through the north, south, and a body is called position circle of the body. Let the hour circle through σ meet the ecliptic at S' and a secondary to the prime vertical through σ meet the ecliptic at S. Computation of the point S is called dṛkkarma. This calculation is done in two steps. The first step, called ayanadṛkkarma, is the computation of the point S', the second step, called aksadṛkkarma, is the computation of S from S'. In

Indian astronomy, kṣepa is a word which deserves particular mention. This word is used in all astronomical treatises. Bina chatterjee, in her edited book khandakhādaka, explained that the meaning of this word has been given as an additive quantity. Throughout Sūryasiddhānta vikṣepa has been used to mean celestial latitude – kṣepa is synonymous with vikṣepa. Generally, in all Indian astronomical treatises, the use of vikṣepa, to mean celestial latitude, can be observed.

V-V: 11-17. If one star is colourless , situated to the south ,one situated in north and bright, the north star becomes win and prominent . If both are brilliant, and closes approach; then it is called conflict. It both are small and struck down, it is called 'kuta'. It is shown that Venus is generally won, whether situated to the north or to the south.

Notes: These slokas (verses) are comparable to the seventh chapter of Sūryasiddhānta. The special characteristics of this Brahmasiddhānta in respect of conjunction are elaboration. Sūryasiddhānta tells it in short form. It is also seen that this knowledge of conjunction is described in Gola portion of Āryabhatiya in very short.

V-V: 18 to 27

The moon is the eclipser of the sun, coming under the sun. The eastward moving moon enters the earth's shadow, and eclipse of moon starts. Grahaṇamāsa is detected in every year. The moon and other planets, from their point of declination, when half orbit behind the planet, the node comes it to deviate northward and vice versa.

Notes: Chādya : The eclipsed body is called chādya; chādaka; This term is used to denote the body which becomes the cause of eclipsing another body; i.e. in the lunar eclipse, the shadow of the earth is chadaka and in the solar eclipse, the moon is chādaka. The old concept of rahu and ketu is tested and the other has tried to explain in the new concept which is known by Āryabhat.

V-V: 28 to 36

The swift motion of the moon towards west, eclipse of the sun occurs. The middle of the eclipse is to be regarded as occurring at the turn clove of the lunar day, if from that time , the time of half duration be

subtracted. The moment of contact is found and if added the time of immersion and emergence is found. From half the sun of the eclipsed and eclipsing bodies subtract any given amount of obscuration. In the case of eclipse of the sun, the perpendicular is to be multiplied by the mean half-duration, and divided by the true half duration given the true perpendicular.

Notes: This portion has tried to explain the duration and the type of calculation the eclipse. At purnima tithi, the probable date of lunar eclipse can be calculated by the moon and line of intersection of the moon

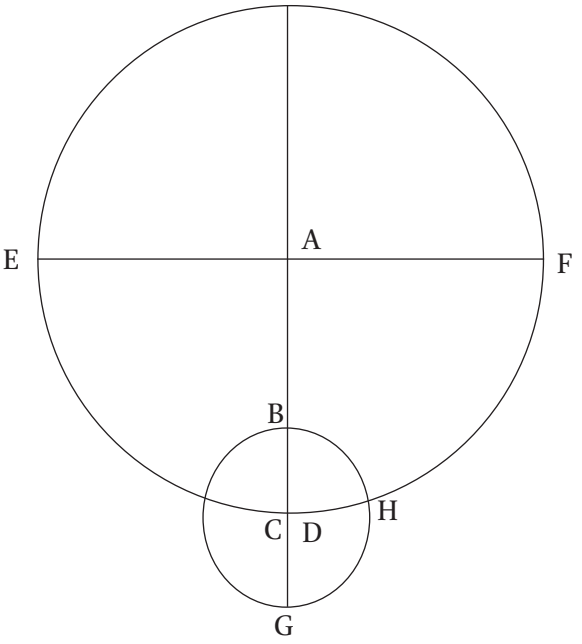

Fig. 11

EAF, the greater circle is seemed as earth's shadow A is the center, BGH the moon's orbit and O is the centre, B A is the moon's vikṣepa.

BC= AC+CB – BA

= ½(2.AC+2.DB) – BA

It BC is greater than diameter of the moon, and then the total eclipse occurs.

IV-V: 37 to 46

The instant of true position, or of apparent conjunction, in longitude, is to be taken as the middle of the eclipse. The correction of visibility of eclipse can be explained. Time of contact and the moment of separation, explanation of time of eclipse are found in these slokas. From half the duration of the eclipse at any given interval be subtracted and the remainder multiplied by the difference of daily motions of the sun and moon, divided by sixty, the result will be perpendicular (lambana). The contemporary concept if the middle of the eclipse, subtract the interval from the half duration on the side of separation, the result is the amount of remaining obscured. From the square of the remainder deduct the squares of the latitude at the time and taking square root of their difference. The result is the perpendicular, in an eclipse of the sun, to be multiplied by the true and divided by the mean, half duration and get the time of eclipse, time of obscuration (grāsa), multiplying R sine(natajyā) of the hour angle by the Rsine of the latitude and divide by the radius. The degree of deflection is found. This result can be found by the arc deducted Rcos of the hour angle (Kotijya) also.

Notes

The concept of eclipse is described is such a way that is known form older days. Āryabhata, Varāhamihira and Brahmagupta also, treat the eclipse in same manner.

V-V: 47 to 66

The detailing of eclipse is given in Brahmasiddhanta of Śākalya – By the 'divisor' divide the sine of the interval between the meridian ecliptic point and the sun's place (madlyalagna), the quotient is regarded as lambana (parallax in longitude) the sun and the moon. The moon's shadow covers the sun's disc when the perpendicular of the point moves eastward.

If the sine of dṛkkṣepa (Zenith distance) be multiplied by the difference of the mean motions of the sun and moon. Divided by fifteen times radius, the result will be the parallax. The parallax in latitude is the quotient resulting from dividing the of ecliptic Zenith distance by seventy. The parallax in latitude (nati) is to be regarded as south or north

according to the direction of madhyajyā. The calculation of eclipse of the sun is determined according to moon's sthiti, valana, etc. This sthityardha means mean (Madhya) sthidhārdha. With this calculate the half duration (sthiti), half total obscuration (vimārdha) in the like manner.

Notes

The parallax in longitude for the times of contact (grāsa) and of separation (mokṣya) is calculated and finds the difference between these and the parallax in longitude for the middle of the eclipse. If the parallax in longitude is the eastern hemisphere is greater than that of the middle. Then the difference of parallax in longitude is to be added to the half duration on the side of separation and if in the western hemisphere, it is to be subtracted. In this way, Nasada: spinta, sthityardha, vimadārdha are calculated. The time of eclipse, contact, grahaṇa and mokṣa is calculated in this way.

Having fixed point described from it, in the first place, with a radius of forty nine digits (aṅgula), a circle for the deflection, In case of lunar eclipse, the deflection for the contact can be drawn according to the direction. The author concluded this chapter indicating the contemporary knowledge lased description of the eclipse.

Computation of eclipses (lunar):

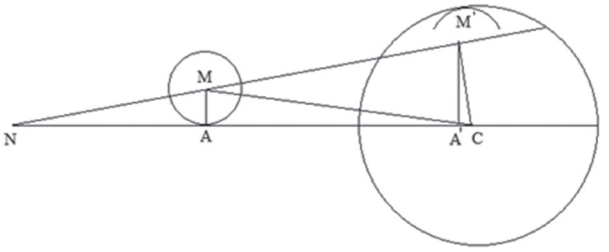

Fig. 12

Let N be the node when a total lunar eclipse occurs, NC be the ecliptic according to fig 12.

First contact occurs when the centre of the moon is at M and second at M'.

The time by which A reaches C, that is the half duration of eclipse, similarly when A' reaches C, time of half duration of totality are found.

CA , in time , CA x moon's daily gain over sun /60 nādis, that is the time interval between first contact and mid eclipse.

Projection of eclipses

VI-V: 1 - 2
That without knowledge of projection of eclipses, the precise differences of two eclipses are not under stood, is called doctrine of projection. In the plane surface, the midpoint describing from it in the first plane, with the radius of forty nine digits (aṅgula), three circles are drawn.

Notes

The term chedaka comes from the word split, it is used as divisor. The knowledge of projection is necessary to understand precisely the eclipsed portion of the disc. The projection is directed to be made upon, a plane surface of the earth where the midpoint is identified.

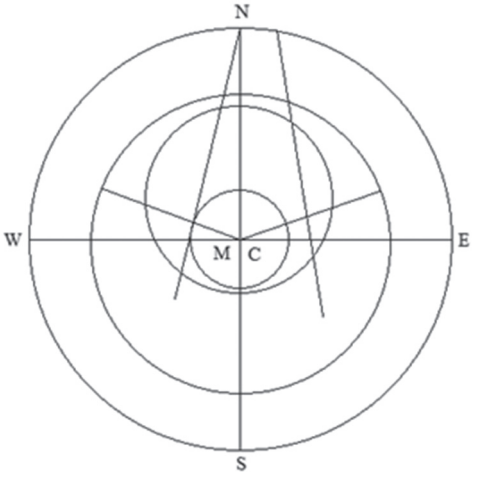

Fig. 13

Let M be the position of the moon. EW and NS are the circles of direction draw through M. The great circle is drawn through the north and south points of the horizon. This is the Indian method of illustrating a projection. A small circle is drawn parallel to the prime vertical. If the deflection for the contact is north, then it is laid off northward from E.

VI-V: 3 - 4

Among these three circles the largest is drawn for projecting the deflection. The mid-circle is drawn with the average radii of the two circles which is called average circle. The direction of deflection is laid off from east ward, when this direction and the latitude are in same direction, if the direction of detection is to be laid off westward (lunar eclipse) it will be in contradiction.

Notes

Among these circles, the small circle is parallel to the prime vertical. Assuming that the observer's position is in the north side and looking straight southward. The position of our latitude and he could compare the different phases of the eclipses. The mid-circle is drawn taking its outermost circle is for deflection. "Valana" means deflection. The problem is to identify those points. At what point eclipse beings and what point it ends. Valana gives the angle between the ecliptic and prime vertical.

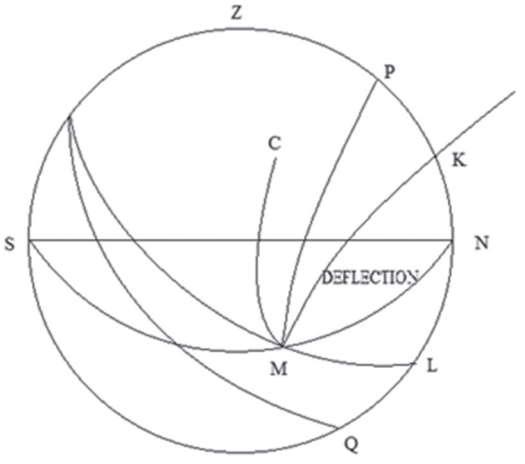

Fig. 14

Let M be the eclipsed body, the moon on the ecliptic, MC is drawn parallel to the prime vertical, KM is drawn secondary to the ecliptic YML where K is the pole of the ecliptic. The angle KMN is the deflection. This angle is measured by KMP (ayanavalana) and PMN (akṣavalana). The algebraic sum of these two parts depends on the position of K, the valana. If M be the vernal equinox, then its longitude is Zero and ayanavalana, the angle between the declination circle and latitude circle through M, is 24^0. If M be at solstice, then the longitude $\lambda = 90^0$ and ayanavalana is Zero. The angle PMN, Duration of the hour circle through M, from the position circle of M is equal to the day circle of M from a east–west circle. If the equator cuts the position circle, akṣalalana becomes the angle between the equator and a small circle parallel to the prime vertical. If M be on the horizon, then the position P on the circle of M is also the horizon and the cutting point is the east point.

VI-V: 5 - 6

From the end point (extremity) of either deflection draw a line to the mid-point (centre), which cuts the point of contact and separation. Listen, Nārada.

When the moon's shadow follows from the extremity of the projection, a line is drawn from to mid-point from eastward.

Notes

It is required to represent the deflection of the ecliptic; an east-west line is drawn on the part of greatest obscuration. The deflection (in this moment) is determined by a secondary to the ecliptic, drawn from north and south point.

In the lunar eclipse, if the direction of the deflection and the latitude is the same, the deflection should be marked on the eastern side of the north-south line. If the latitude is north, the defection should be marked east or west from the southern point. When it is south, the deflection should be marked from the northern portion is obscured.

VI-V: 7-8

If there are some differences, if the sun and the moon are in opposite direction, it is to be laid-off in case of lunar eclipse, in case of solar eclipse, the case is in contrary.

From the end point of the deflection, draw a line to the mid-point and upon the line of the middle lay off the latitude, in the direction of deflection.

Notes

When the latitude is north, the southern portion of the eclipsing body is obscured, and vice-versa. In the eclipse diagram, the centre of the eclipsing body is supposed to be on the agree gate circle, and for the mid-eclipse, the latitude of the moon, is to be marked, on the line joining the centre and the point of deflection.

The rule formed to mark the deflection from the northern or southern point corresponding to the opposite direction of the latitude. In such a situation, the centre of the eclipsing body lies or the western side of the N –S line of the eclipsed body.

In case of solar eclipse, the position is contrary.

VI-V: 9 - 10

In the direction of deflection the self-induced projected points may be noticed sequencing three projected lines in proceed.

With a line touching the midpoints describe an arc which should be measured by a stick equal to half of the radius of the eclipsing body.

Notes

If the direction of the latitude and the deflection is the same, the deflection has to be marked on the western side of either the northern or southern point. If it is opposite, the deflection has to be marked on the eastern side. From the point of latitude, a circle of radius half of the eclipsing body should be described.

So, the obscured portion is the portion of the eclipsing body cut by an arc of this circle.

VI-V: 11-12
With the radius equal to half the eclipsing body, draw a circle touching the path of immersion and emergence.

In solar eclipse, the place will be dark when the moon's placed obstacle (the light), darkness covers but brilliancy shown when is will emerge
Notes: According to Brahmasiddhānta in Śākalyasaṁhitā, a circle is drawn having radius equal to the length half of the eclipsing body should touch the path of immersion and emergence.

In case of solar eclipse, the plate will be dusk when the moon's plate obstacle. Darkness covers but brilliancy showed when it will emerge.

VI-V:13-15
The part obscuring is going dusky to black and more black, copper colour when its obscuration is total.

Notes: Colour of the eclipsed moon. The colour of the eclipsed moon depends upon the obscuration. When the eclipsed portion is less than half, its colour will be smoky, if it is more than half, colour is black, at the time of emergence, i.e. eclipse is total, then, its colour is dark copper.

Conclusion:

After detail examination of Brahmasiddhānta in Śākalyasaṁhitā it is concluded that this book was compiled not before 9th century CE and followed by Suryasiddhānta. It is compiled by Śākalya , which is proved at the end of each chapter. But it is considered to be apauruṣeya because this work is entitled by the name Brahma, the legacy as Suryasiddhānta, Paulisasiddhānta, etc. Āryabhata initiates the school of astronomy where the writer's name exists. This text does not belong to this school. It is an astronomical text covering almost all topics throughout the book which is now clear after translating and editing the manuscripts. Pt. Sankar Balakrishna Dikshit truly says that this book has some unique features which make this book important. At that time Śākalya

got the traditional knowledge from VedāngaJyotiṣa, Āryabhatia, Paitāmahasiddhānta, Brhāmasphuṭasiddhānta, etc. but he actually followed the Suryasiddhānta. Many verses are similar to this text.

The epicyclic theory is applied for measuring longitude but the application is not similar with Sūryasiddhānta. As for polar longitudes, according to Sūryasiddhānta, the longitude of Ārdrā is 73 degree 47 minute, but it measures 67 degree 20 minutes as given in this text. Ranganath accepted it. Śākalya'sBrahmasiddhānta has given the longitudes and latitudes of Saptarṣis, which were not found in any other works.

Another speciality about this book is, this work mentioned the number of stars in each nakṣatra, which is not found anywhere else.

Example:

Sl. No.	Name of stars	Varāhamihira	Śākalya'ssaṁhita
1	Aśvinī	3	2
2	Bharaṇī	3	3
3	Kṛttikā	6	6
4	Rohiṇi	5	5
5	Ārdrā	1	1
6	Punarvasu	5	2
7	Pusya	3	3
8	Aśleṣā	6	5
9	Maghā	5	5
10	Revati	32	32

The planetary phenomenon is discussed in the line of Suryasiddhānta. Spasṭādhikara chapter deals with manda, śīghra, ucca, nica, in Surya and other siddhāntas. The ascending node and descending node i.e. rāhu and ketu concepts are examined in Brahmasiddhānta in Śākalyasaṁhitā. Projection of eclipses is discussed in a separate chapter with importance. Śākalyasaṁhitā discusses the coordinate system and computes number of stars in asterisms.

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4. Similar to 1 , P-172
5. Similar to 3. P- 77

APPENDIX A:
Astronomical Technical Terms

adhikamāsa: A month gained by the lunar reckoning over the solar. An adhikamāsa or intercalary month is a Synodic month; an intercalation takes place when two lunar months begin in the same solar month.

Samkraṁaṇa.- Intercalary month. Kalpādhimāsa x completed solar days – residual adhimāsa = solar days × completed adhimāsa (bījagaṇitaṃ)

adhyaradhāśriccheda: Right-angled triangle

adhva: Distance of a place from the prime meridian

agaṇitacāra: An anonymous work containing a set of astronomical tables for determining without actual calculations the movements of the planets with reference to Mars, Mercury, Jupiter and Venus.

agrajyā: The Hindu sine of the arc of the horizon in between the rising point of the Sun and the east point.

akṣajyā: The term is used for the sine of the latitude

akṣa(*or*) *Pala*: Latitude (Terrestrial)

akṣa Dṛkkarma: The arc of the ecliptic between the point of intersection of the ecliptic with a secondary through the star to the prime vertical and the point of intersection of the ecliptic with the star's declination circle

akṣakarṇa: The hypotenuse of the gnomonic triangle when it's shadow is equal to what is called *aiṣuvat-chāyā*.

ākṣavalanam: The angle at the point of the star in between the declination circle of the star and a secondary to the prime vertical through the star.

antyā: The Hindu sine of an arc of the celestial equator corresponding to Hṛti. It is used to signify the point where the Sun rises, as projected on the equatorial arc. It also shows the measure of half-day length at given latitude.

antyakarṇa: to calculate the true place of a planet this term is īused for variable hypotenuse (śīghrakarna).

apakrama: used for the declination of the Sun

Asta: Setting or heliacal setting.

Ayanabindu: Solstice.

Āyana-Dṛkkarma: The arc of the ecliptic intercepted between its point of intersection with the star's declination circle and the secondary to the ecliptic through the star.

Ayanāṁśam: The arc of the ecliptic in between the vernal equinoctial point and the Hindu zero of the ecliptic i.e. the first point of the zodiacal sign called Aśvini.

Āyanavalanam: The angle at the point of a star, between its declination circle and the secondary to the ecliptic through the star.

Bārhaspatyamāna: The time taken by Jupiter to reside in a Rāśi, on the average, is called a jovian year. This falls short of a solar year.

Bhāga: A degree.

Cāpa: Arc.

Carajyā: The Hindu sine of the arc intercepted between the east point and the declination circle of a rising star or planet or the Sun.

Cāndra-māsa: The time between two consecutive full moons or New moons.

Chāyā or Bhā: Shadow cast by the gnomon.

Chāyābhuja: The projection of the shadow on the east-west line.

Chāyākraṇa or Bhākarṇa: The hypotenuse of the gnomonic triangle whose two sides are the gnomon and its shadow.

Chāyākoti: The perpendicular from the extremity of a shadow on the east-west line.

Dhruva: The star near the celestial pole or the celestial pole itself.

Dhruvaka: The celestial longitude.

Dhruva-protavṛttam: The declination circle.

Digjyā: The Hindu sine of the azimuth measured by the angle between the prime vertical and the vertical of a star or a planet.

Dorjyā or Bhujajyā: Hindu sine of celestial longitude.

Dṛgjyā: The Hindu sine of the Zenith distance.

Dṛg-lambana: Total parallax.

Dvāparayuga: Twice the period of a kaliyuga.

Dyujyā: The Hindu cosine of declination or the radius of the celestial equator to be R equal to 3438 units.

Dyujyā-vṛtta or Ahorātra-vṛtta: The diurnal circle of a star or a planet.

Ghaṭi or Nāḍi: An interval of time equal to 24.' (minutes)

Grahaṇa: Eclipse.

Hṛti or IṣṭaHṛti: The Hindu sine of the arc of the diurnal circle from a point of the same up to the plane of the horizon.

Kadamba: Pole of the ecliptic.

Kadamba-protavṛtta: A secondary to the ecliptic through a star or planet.

Kakṣamaṇḍala: The deferent of a planet or the circle with the earth as centre and radius equal to 3438 units.

Kalā: The Hindu sine in the diurnal circle corresponding to the Sūtra (given bellow).

Kalā or Liptā: A minute of angle.

Kaliyuga: The period consisting of 4,32,000 mean solar years.

Kalpa: Dvāparayuga is twice Kaliyuga; Tretāyuga thrice and Kṛta four times. All these put together constitute a Mahāyuga. 71 Mahāyugas make one Manvantara. 14 Manvantaras with what are called Sandhi periods on either side equal to a Kṛtayuga or thousand Mahayugas make a Kalpa.

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Kramajyā: Hindu sine of an angle.

Karṇa: Half of the duration of a tithi.

Karṇāgrajyā: The Hindu sine Agrājyā

Ketu: The diametrically opposite point of Rāhu. Rāhu also means the circular section of the earth's shadow at the moon.

Krānti-Vṛttam: Ecliptic.

Kṣitija: The Horizon at a place.

Lagna: The Rāśi which rises at any moment or the rising point of the ecliptic.

Lambana: Parallax in longitude.

Mahāyuga: The Sum of four yugas.

Manvantara: A period equal to 71 Mahāyugas.

Nakṣatra: A star. Also the time, this elapses as the longitude of the moon increases by 13.5 degrees starting from the zero point of Aśvinī

Nākṣatra-māsa: The time taken by the moon to go from Aśvinī again to Aśvinī.

Pāta: The point of time when the declinations of the sun and the moon are equal and of the same sign or the opposite sign. Also it means the point of intersection of two great circles.

Prācī: East point.

Prācyaparā: East-west line.

Rāhu: The point of intersection of the moon's path with the ecliptic (ascending point of the moon's path). Also it means the circular section of the earth's shadow at the moon.

Rāśi: An arc equal to 30 degree (on the ecliptic).

Śanku: Gnomon.

Śankucchāya: The shadow cast by the gnomon.

Saura-māsa: The time when the sun occupies one Rāśi.

Tithi: The time taken by the elongation of the moon to increase by 12 degree starting from zero.

Trijyā: The Hindu sine of three Rāśi's or 90 degree equal to R or 3438 units.

Udaya: Rising or heliacal rising.

Vighaṭī or Vināḍī: One sixtieth of a ghaṭī.

Vikṣepa: Celestial latitude.

Viṣuvatbindu: Equinoctial point.

Vṣuvat-Vṛtta: Celestial equator.

Vṛtta or Maṇḍala: A circle.

Yaṣṭi: R^2 -Āyanavalanajā^2. Yaṣti has another meaning namely the length of the perpendicular from a point on the diurnal circle on the plane parallel to the plane of the horizon through the point of intersection of the diurnal circle with the *unmaṇḍala*.

Yoga: The time which elapses when the sum of the longitudes of the sun and the moon to increase by $13^{0}10'3''$ starting from zero.

Yuti: Conjunction.

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Critical Apparatus

Chapter 1

1. i) B_1, योगासनारूढं
   ii) B_1, नो
   iii) B, पर्यपृच्छता (त ?)
2. i) Be D_1
   ii) D_1 An - श्रयं (for शयं)
   iii) B_1, विस्तरतो
3. i) B_1, स्थूल
   ii) B_2, सर्वं
   iii) B_1, यथावांगी
   iv) B_1, भोः
5. i) Ba, D_1
   a) B_1, प्राज्ञ
7. d) Ba, Be, D_1, B_1, - नयन
9. i) D_2, B_1, शा
10. i) B_1, विर्बभूवादौ
11. i) B_1, प्रत्ययस्य यः
13. i) D_2, B_1, त्रिषट्
15. Between these two lines Ba, Be, D_1 have मानमार्क्षमिति प्रोक्त सावनाद्यमथोच्यते।
    i) Be, D_1, B_1, दिवारात्रं
    ii) Be, उदयादोदयं
    iii) Be, D_1, मर्त्य
16. i) D_2, B_1, यैमसि
17. i) D_2, B_1, तत्पूर्वापर
18. i) Be, D_1, B_1, B_2 पञ्चमास्तु
19. i) B_1, पक्षादौ
    ii) D_2, B_1, वास्तकम्
20. i) B_1, र्तितः
    ii) B_1, - गौ (for मौ)
23. i) D_1, स्था असुरा
24. i) D_2, B_1, - मध्ये
    ii) Be, B_1, - राशिभिस्त्रिभिः
25. i) D_2, B_1, - रहः
28. i) B_1, - व
32. i) Be, B_1, - शृङ्गा
    ii) D2, B_1, - द्विचस्वत्वः
33. Ba - यान्तिग्रहा यद्विषुवश्चतत्
37. i) Ba, Be, D_1, - वर्षज्ञानं
39. i) Be, D_1, B_1, - युगपत्
40. i) B_1, - सन्धिसन्ध्यंश
    ii) B_1, - सम्भवः
48. i) B_1, - तद्विस्तारो योजनानां ससप्तति शतद्वयम्
49. i) Be, D_1, B_1, - टी च
50. i) B_1, - म
51. i) D_1, B_1, - स्थ
52. i) Ba, Be, D_1, - तदुपर्येव
53. i) Ba, - सृज्यन्ते खाम्रभूपद्विकासुभिः २१६००
55. i) Be - त्प्राच्यैवं पश्चिमादयः
58. i) B_1 - यद्भाग्रे भाति तु तान्ग्रहान्
63. i) Ba तर्काग्निरामार्थ - (५७७५३३६) wrong
73. i) B_1 युरधिमासकाः
74. i) Lines missing in Be, B_1

77. i) Be, D_1, B_1 - बाहुकोटी
79. i) D_1, B_1 - न्नस
81. After this verse S. has the line यावांश्चक्रोच्छ्रयस्तावत्खनमध्यादक्षलम्बनम्।
84. Ba - लम्बोना च
85. D_1 - भूकर्णोनुगुणः
96. Ba - ख
99. Be, D_1 - गुणौ यतः
100. Ba, Be, D_1 दलमेव
102. D_1, B_1 द्वि; B_1 नवकोटितः
103. Ba, Be, D_1 - स्मा
105. B_1 - शाभी-; D_1 - श्वाभि

Chapter 2

5. c) D_1, S. शीघ्रार्ध
12. Be, तनम्
13. D_2, B_1 - व
14. B_1 - यत्तदिदं
15. B_1 - गतिं
16. Be, B_1 - सा परिह्रियते
17. These lines are missing in Be, B_1
18. i) Be, B_1 - स्यादधि
    ii) कोश्चं
    iii) शीघ्रं
22. i) This line is missing in B_1
    ii) Ba, D_1 - मपि
23. Be, D_1, B_1 - प्रागुक्ताभ्या
25. Ba - गस्तु
31. Ba - ते
37. Ba - ख्येनो, This verse is missing in B_1
38. Line is missing in B_1
39. Ba - तौ
40. Ba - मन्दाद्यैः
42. D_1 - स्खलन
43. i) Ba - चैता
    ii) Be, B_1 - अकस्मात्
44. Ba - ग्रहे
45. i) Ba - गमनं
    ii) Ba - कथिता
46. Be, D_1 - यातीति
47. i) Be - सदास्ति कस्य
48. i) Be, B_1 - ध्रुवे
49. Ba - स्वनामादौ
51. D_2, B_1 - विवर्तते
52. i) Be, B_1 - सौम्य
    ii) B_1 - शुक्रेन्दु
53. B_1 - यार्धेन
55. B_1 - नार्धेन
56. i) D_1 - दुश्चेनापकृष्ट
    ii) Be, D_1, B_1 - रथः
    iii) B_1 - वामतः
57. D_1 - र्धे
59. i) Ba - कल्प
    ii) Be, D_1, B_1 - मन्दीश्चेनाप
60. Be, B_1 - तेनापकृष्टा
61. Ba - नृपाः
62. i) B_1 - यावत्त
    ii) Ba - सूर्यः
    iii) B_1 - कि
    iv) Ba - कि

67. Ba - शुद्धकर्मास्य
69. i) D_1, B_1 - र्महत्
ii) D_1, B_1 - भूरक्ष्मि
70. This line is missing in Be, B_1
72. B_1 - रश्मि
73. i) Ba - श्च
ii) Ba - स्वस्थित
74. D_1, B_1 - मङ्गुलं दूयोः
76. B_1 - लङ्घया
77. Be - निष्क्रियते
78. Be - यं
79. Ba - सिद्धविवर्जितः
81. i) B_1 - क्षम
ii) Ba, Be, D_1 - यन्मुने
82. Ba - अन्तरे वनतोवृक्षावन्तप्रान्तेस्थिता इव।
83. Ba, Be, D_1 - कीर्तिता
84. b) Ba - स्तत्स्फुटाः
85. Be, D_1, B_1 - कक्षा च
88. B_1 - त्यत्रेच्छाधिकैव तु
90. Ba - प्रकीर्तितिम्
92. D_1 - द्धते
94. B_1 - व्यक्षातदंशकम्
95. Ba - मानेच्छा
96. i) Be, B_1 - नतम्
ii) B_2 - युगान्तरमितिस्फुटम्
97. i) B_2 - तदानीम्
ii) B_1 - सा सूचिमध्य
98. i) Ba - स्फृटसूर्येन्दुभूक्तिघ्रो भक्तो मध्यमया कलम्
ii) Be, D_1, B_1 - भूकर्णशेषं
99. i) Be, B_1 - च्छा
ii) B_1 - विभाश्रवाः
iii) Ba - तिय्यः
100. i) B_1 - कल्पार्के ii) Ba - मानं
101. i) B_1 - व्यासार्धेनाल्पाधिकेन च
103. B_1 - स
104. Ba - अल्पाधिककला भूक्तिरूञ्चैर्नीञ्चैंतस्य हि।
106. This verse is missing in B_1
108. B_1 - ग्रहान्
109. Ba - पातान्वाऽतीत्य
110. D_1 - त्रा
113. Be, B_1 - अर्थ
116. i) Ba - स्ता
ii) Ba - भाज्यास्त
119. B_1, ना, Ba - सिद्धि
122. D_1, B_1 - कोटि
123. i) D_1 - तेः
ii) वक्रभूमि
124. B_1 - र्ध, D_1, B_1 - ह्क्करैः
125. B_1 - शीघ्रैः
128. i) Ba - ग्रहवत्
ii) Ba, D_1 - द्रुण
129. D_1, - ज्ये
131. B_1, - तुल्यायां
132. i) Ba - वर्गो
ii) Ba, - र्गे
136. I) D_1, - छेद्या
ii) B_1, - विधः
137. D_1, B_1 - चलकर्ण
138. i) Ba - हृता तथा
ii) D_1 - स्वर्णमूनाधिके कर्णे
iii) B_1 - स्वर्णमूलाधिके कर्णे
iv) B_1 - कर्णाद्विचारता
139. Ba, Be - ऊनाधिक
142. i) Be, D_1, B_1 - ज्यं
ii) Be, D_1, B_1 - क्रिये D_1, यथा

143. i) D_1, वर्गफलं
ii) Ba. - भवेत्
144. B_1 - णेऽधिके
145. B_1 - स्या
149. Ba - प्रशक्तिवत्
151. Ba - द
152. Ba - द्युत्य
157. B_1 - श्च
158. Ba - मध्याख्याः
162. Ba, D_1, B_1 - दीपमौक्तिक
163. B_1 - तोरणाभं तज्यं तालनिभं शय्यनिभे उभे
165. Ba, D_1, B_1 - सौ
171. B_1 - संस्कृत
181. B_1 - भार्गवादुत्तरे
182. Ba - मृगान्तस्था
185. Ba - हितम्
186. i) Ba, Be, D_1, - प्रभान्ति
188. i) Ba, D_1, - प्रागंशक्रममप्राप्तेः
195. i) Be, D_1, B_1, तुल्या
ii) Ba, Be - मात्रोऽयमितरसस्य
207. Ba - विन्द्याद्ग्रहधन
209. Be, B_1 - द्रव्य
210. S. यावता B_1 युक्पदक्रान्ति
211. Ba, D_1 मेरूं
212. d) Ba, Be, D_1, B_1, क्कचिद्वृद्धिः
214. Ba, चक्रकैः
216. Ba, पत्तनपुरै
218. B_1 - र्धै
222. D_1 - मेषात्ततत्स्थानतस्तु
224. B_1 - यत्ज्ञेयं
225. B_1 - कल्पयेत्
227. B_1 - थे
228. Be, D1 - अध B_1 - गात्मकात्
235. B_1 - द्धैश्च
240. Ba, श्रयान्
243. Ba, वन्न हि
245. Ba, D_1 त्यै
247. B_1 - पृष्ठेन
251. Ba, ष्यस्तलग्नाहिनं क्षपा।
252. Ba, - ष्ट
253. Ba, - कलीकृतेः
255. Ba, - तत्र नाक्षत्रं

Chapter 3

4. D_2, B_1 - संस्थितम् Be, B_1 - संस्थितम्
8. Ba, Be, D_1 गण्डा
10. i) Ba, Be, D_1 पुमान्
ii) Ba, Be, D_1 वैधृतः
12. B_1 - भ
13. Ba, Be, D_1 - क्रान्त्येस्तौल्ये
16. i) Ba, वा चरतो
ii) Ba, Be - र्धो
17. i) D_1, B_1 - कौ
ii) B_1 - ति
19. i) Ba, परागत्या
ii) B_1 - नो
iii) B_1 - तन्मध्या
20. a) D_1 - धिकत्री - D_1, B_1 - मितेर्हरः
21. Ba, - क्रान्तेः, D_1 - क्रान्ति
22. Ba, D_1 - स्फुटक्रान्तिर्गतैष्यजा
23. Ba, - शोध्य क्षेपात्तदा तु सा
24. B_1, - ज्ययोन,

26. Ba, - मथापि
28. Ba, Be, D_1 - विबुध्याताम्
30. Be, D_1 - सन्त्विति
31. Be, B_1 - ले
36. Be, - यत्र
39. Ba, - न्ते
40. Ba, - नास्ति दौर्बल्यशालिनी
41. B_1 - ईदृशः
42. Ba, - भुक्तेन
43. Ba. - चैव द्विजे, B_1 - प्रोक्ता Ba, - व्रतं ततः
45. Ba, - द्यु, Ba, Be, D_1 - ज्येष्ठा D_2, B_1 - येष्टो-, B_1 - सिद्धा
46. B_1, - ओजा युग्मा
47. Ba, - हानी च कारण्
49. B_1, - कुर्वन्ति
53. Ba, - त्य, B_1 - म
54. Ba, - भोज्यं
55. Ba, - चणकं कोद्रवं तथा Ba. - पूगं B_1 - सुधा
56. B_1, - क्षौरं
59. Ba, - चैव परेऽह्नि
62. Ba. D_1, - शी, Ba, - भी, d) Ba, - दा
66. Ba, - माणा
67. Ba, - शुक्ले
68. Ba, - दे
71. Ba, - न्योश्चापि
75. Ba, - यदा नारी
77. Ba, D_1, - तस्याः
81. Ba, - षं Ba, - शीं
82. Ba, Be - वर्षे
84. Ba, - विधिनोपवसे
85. Ba, - शरीरश्चेत् Ba. - मुपस्थितम्
86. Ba, - पुत्रेण धर्मपत्न्या
90. B_1, - मन्मथे
91. Ba, Be, D_1, - सफलं व्रती
94. Ba. - चेदव्रतं
98. Ba, D_1, Ba - वृद्धा
103. Ba, Be - परार्धायां
104. B_1 - जयन्ति
105. a) Ba. - श्रेष्ठा
106. a) Ba. - अभावे
107. D_1, B_1. - कृष्णे पञ्च
110. b) Ba. मध्याह्ने
111. b) Ba. नरः
112. d) Ba. Be. तिथ्यां, Be. - रथे
113. d) Ba. Be. कुरूते, Ba. - स्वस्तिकं
114. a) Ba. Be. शुक्राद्यं शुक्रवारं च, D_1. शुक्राद्यंशं शुक्रवारं
118. d) Ba. पूर्वविद्धा
120. a) Ba. कर्तव्यं
b) सेवाद्यं
c) Ba. कन्यको
123. i) Ba. Be. D_1. पूर्वः पूर्वः
ii) Ba. Be. D_1. सूतके
124. Ba. कालेषु
127. B_1. मादूर्ध्व
133. B_1. कृता
136. Ba. फाल्गुनयोः षण्णमेका
140. Be. B_1. पवर्गा
141. Ba. पक्षाः
143. B_1. सापादद्विमुहूर्ताभ्यां
148. Ba. आद्यास्त्रिंशांशनाडयञ्च
150. B_1. - क्षयाद्युक्तदोषान्
168. Ba. - ह्यमा

Chapter 4

4. Ba. - भेदे तथैव हि

10. B_1. - त्रिभेदानां

16. Ba. Be. B_1. - सपड्गृहौ
Ba. - सपड्भकात्

20. Ba. - यातुर्यः

23. Ba. D_1 - मूला

26. Ba. - कांशा

27. Ba. D_1 - प्राणा

28. B_1. - छायाफलं

32. B_1. - चार्कशङ्कौ
B_1. - लम्बयाग्राड्गुलाधिका

40. Ba. - समो दक्षिणतः

41. Ba. - क्षीयमाणकला

44. Ba. - व्यर्केन्दोरर्क

45. B_1. - मध्याह्नचन्द्र

46. B_1. - भ्यां

48. Ba. - भुजा अपि लयं यान्ति B_1. - यथा

54. B_1. - हरो

58. Ba. - वा Ba. - कर्णोन्मितीतरौ

62. B_1. - वा च्युदक्

63. Ba. - की द्विज

64. Ba. B_1. - स्वाक्षच्छाया

67. B_1. - स्ते

68. Ba. - छायाकर्णावक्षभायां
तदाग्रावधजः स तु।

69. Ba. - दो कोटि, B_1. - वर्ज्यं

72. Ba. - रात्रि

74. Ba. Be. D1. - पल

75. B_1. - अवाक्फलविवर्जितः

78. Ba. - गो

87. B_1. - वृत्त
Be. B_1. - प्रान्ते
Be. D_1. - प्राग्रतश्छाया
B_1. - मध्यमः

88. B_1. - र्क Ba. - पिधाय

90. D_1. - कलं

91. Ba. - ति वै Ba. - ग्र प्र भा Ba. - ग्र

95. Ba. - पञ्चीना Ba. - मध्य Ba. - मध्याद्धा कलयापि वा

96. Ba. Be. - द्वयड्गुलं Ba. - देशा

98. Ba. B_1. - यद्वा B_1. - चतुरस्त्रे B_1. - करोतु

99. B_1. - दुर्दशनाया छायायां

102. Ba. - एवमुक्तं समासतः
B_1. - क्ये शो

103. B_1. - कार्या यथादिशम्

104. D_1. - त्रिभज्यया Ba. - काल

107. Ba. - षष्टया

108. i) Ba. - विधिः कल्पो
ii) Ba. - श्यु
iii) Ba. - धरारन्ध्रे मध्यामानं
iv) Ba. - प्रोतयेक

110. a) Ba. - चेष्टानु, चेष्टान्वा

113. B_1. - छिन्न

114. Ba. Be. D_1. - निरन्ध्रे Ba. - ह्यष्टास्त्रान्

Chapter 5

3. Ba. - भेदः
4. Ba. - तत्स्वत्र्यंशे
5. Ba. - विर्रूद्धो यद्धिमांशुमान्
6. Be. D_1. - दण्डं सूक्ष्म
11. B_1. - याम्ये B_1. - साम्ये B_1. - तददुष्टा
13. Ba. D_1. - न पीडितञ्च
15. B_1. - केनापि
21. Ba. - ब्रुहन्
22. B_1. - न न
24. Ba. - भत्ति
26. Ba. Be. D_1. - स्ते नोक्ता
29. Ba. Be. D_1. - विघ्रेश
30. Ba. - क्याद्धि निमित्त
35. Ba. - स्थो Ba. Be. D_1. - तावत्कालस्तु
37. Ba. Be. D_1, - क्षा Ba. Be. D_1. - लग्ने
39. Ba. Be, D_1. - मध्यग्रहणसङ्गतौ
41. Ba. - ततस्तथा
45. Ba. - अन्यस्य दिङ्मध्यजीवा द्युज्या
46. Ba. - ह्वति
49. D_1. - द्विरूद्धं
52. B_1. - भक्ति
54. B_1. - त
55. Ba. - च
57. Ba. - स स्वच्छा
58. Ba. - नतिरत्र न
59. B_1. - नेतरत्सकलग्रासो
64. Ba. - तत्रैतत्
66. Ba. - अन्या
70. Ba. Be. D_1. - त्खमध्य
73. B_1, Ba. Be. D_1. - मध्ये B_1. - ध्ने
77. Ba. - द्युज्याग्री D_1, - लम्बनं
79. Ba. - प्राच्यां वेला
    Ba. ग्राह्यं,
    Ba. D_1, - चलनसाधनम्
83. Ba. कालापवादतः

Chapter 6

3. b) Ba. - वहिष्कं
   c) D_1, - ग्राह्यं
6. Ba. - दविसृज्य
    Be. D_1 दनुसृज्य
10. B_1, - च्छि