Indian J. Innovations Dev., Vol. 1, No. 4 (Apr 2012) ISSN 2277 - 5390

Meticulous and meritorious meteorology enshrined in the *Brihat Samhita* – A comparative case study over four Indian regions situated in diverse climatic zones

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Abstract

The *Brihat Samhita* is the *magnum opus* of *Varaaha Mihira*, comprising about 4000 verses (*slokams*). Among these, 27 predictions were chosen for the present study, which were sub-divided into Movement of Venus, *Raahu's* course, Predictions based on planetary conjunctions, Prediction for the Sun's entry into *Aardra* star, Predictions based on the directions of clouds and winds and Predictions based on lunar conjunctions. These predictions were compared with the on-site real-time recorded values of meteorological parameters like rainfall, wind velocity, wind direction, cloud direction, etc. over four Indian regions, *viz*. Tirupati, Ajmer, Shillong and Port Blair, situated in diverse climatic zones of the country. The period of study was from 1992- 1993 to 2002 – 2003, using the data provided by the India Meteorological Department (IMD). Despite being compiled and formulated about 1500 years prior to contemporary times, these predictions maintained a healthy success rate in significant number of instances. During some episodes, they were spot – on with the forecast as the actual measured parameters reflected the same trend. Tirupati and Ajmer were found to comply more with the predictions than Shillong and Port Blair, though in some cases, the latter two exhibited a relatively better association compared with the former duo. Overall, the rate of correspondence was above 50%. Many a time, it was around 55% - 57%, barring a few cases where there was complete or almost complete correlation with the documented data, where correlation stretched from as high as 80% to 100%. Furthermore, intensive investigation – oriented studies need to be initiated in this direction, while the government and other scientific establishments need to encourage the students and researchers by providing appropriate incentives and facilitating Research & Development on this front.

***Key words*:** Brihat Samhita; Varaaha Mihira; Lunar Mansion; Asterism; Nakshatram; Conjunction; Aadhaka; Drona; Kartari/Kaarti; Raahu; Vaayu Dhaaranas; Climatic Zones.

Introduction

Ever since the dawn of human civilization, India has been the quintessence of multi-faceted knowledge. The early Vedic period Indians were ardent observers and worshippers of nature. Some of their principal deities were *Indra* (King of Gods), *Varuna* (Rain-God), *Agni* (Fire-God), *Surya* (Sun-God), *Vaayu* (Wind-God), etc., who are the personifications of the basic and life-sustaining elemental entities of the mother nature. In due course of time, this weather observation developed into a full-fledged science and by latter Vedic period, our ancestors were capable of predicting several meteorological phenomena based on both theoretical and observational methods. The Hindu Almanac *Panchangam,* which has ever since (from about 5000 years) been a part and parcel of day-to-day life of Indians, contains theoretical and empirical predictions pertaining to various aspects based on centuries of meticulous study.

On the other hand, there are some treatises like *Brihat Samhita* of *Varaaha Mihira*, *Artha Shaastra* of *Chanakya*, etc. which encompass a blend of both theoretical and observational principles. Especially the encyclopedic treatises like the *Brihat Samhita* embrace the science of meteorology in a praiseworthy approach. The meteorological formulations in the *Brihat Samhita* are based on planetary conjunctions, transits, *nakshatram* (star)

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influences, omens from animals, birds, etc., prognostics from flowers and creepers and other portents such as earth quakes, glow at the horizon, meteors, halos, etc., which were believed to be the envoys of rain and weather changes. So, it can be effectively surmised that our ancestors had construed and put forth these theories after centuries of meticulous and intricate observations, which might have involved both instrumental and spiritual-insight observations that draw from a variety of religious traditions. (Roncoli *et al,* 2001). The India Meteorological Department (IMD) has been giving rainfall prediction based on 8 parameters using Power Regression Model, which are listed below: (Varshneya *et al.*, 2010)

1. Arabian Sea Surface Temperature (January + February)
2. Eurasian Snow Cover (December of Previous Year)
3. North-West Europe Mean Temperature (January)
4. Nino-3 SST (July + August+ September of the previous year)
5. South Indian Ocean SST Index (March)
6. East Asia Pressure (February + March)
7. Europe Pressure Gradient (January)
8. 50 h Pa Wind Pattern (January + February)

Further, multifarious astrological methods and rainfall prediction techniques have been discussed elaborately by Bhat *et al* (2005) and Varshneya and Vaidya (2002). The *Yaagas* or Sacrificial rituals were considered to bring about beneficial rainfall, right from the Vedic Period.

Varaaha Mihira starts the chapter on 'Pregnancy of Clouds' in the *Brihat Samhita*, with a sloka that reads thus: *"As food forms the very life of living beings, and as that food is dependent on monsoon, a devoted investigation of the monsoon is of utmost importance"*(*Garbha Lakshanam*, Chapter XXI, *Slokam* 1).

The Holy *Bhagavad Geetha* also proclaims the same theory in the following manner:

"Annaat bhavanti bhootaani
Parjanyadanna sambhavaha
Yagnyaat bhavati Parjanyo
Yagnyaha karma samudbhavam"
[The *Bhagavad Geetha*, Ch. III (*Karmayogam*), *Slokam* 14]

This means 'Creatures (*bhutaani*) are born (*bhavanti*) from food (*Annam*); Food originates (*Sambhavaha*) by rain (*Parjanya*); Rain originates (*bhavati*) through *Yagnyam*; *Yagnyam* can be instigated and initiated only through activity/work (*Karma*)'. In case of *Parjanya Yaagas* (Vedic sacrifices performed for rain; *Parjanya* in Sanskrit means 'Rain'), the overall success rate was about 80% (Kale *et al.,* 2005). Based on a paper presented by Varshneya *et al.* (2010) at the 'Second World Congress on Vedic Sciences' held at Banaras Hindu University (BHU), Varanasi, India in February 2007, the same have reported a fascinating fact that in the summer of 1950, when Dr, Babu Rajendra Prasad visited "*Panchmadhi*" in Madhya Pradesh, a primary school teacher presented his research paper on "*Dwaadasa* (Twelve) *Jyotirlingams*" (The twelve places in India where Lord *Siva*, The Merger/Destroyer

Table 1. The Twelve *Jyotirlingams* and their locations in India. To this list of 12 *Jyotirlingams*, the *Amarnath lingam* (ice-formation) located in the state of *Jammu* & *Kashmir* is often included in place of the *Omkareshwar lingam* in *Madhya Pradesh*

***Jyotirlangam* Name**	**State**	**Location**
1. Somnaath	Gujarat	Prabhaas Pattan, Saurashtra
2. Mallikaarjuna	Andhra Pradesh	Sreesailam, Kurnool District
3. Mahaakaaleswara	Madhya Pradesh	Mahaakaal, Ujjain
4. Omkaareswara	Madhya Pradesh	An island in River Narmada, Omkareswar
5. Kedaarnaath	Uttarakhand	Kedarnath
6. *Bheema Sankara*	Maharashtra	Bheema Sankar
7. Kaasi Viswanaatha	Uttar Pradesh	Varanasi (Benaras)
8. Tryambakeswara	Maharashtra	Tryambakeswar near Nasik, the place from where River Godavari originates
9. Baidyanaath	Jhaarkhand	Santhaal Paraganaas Division
10.Naageswara	Gujarat	Daaruka Vana, Dwaaraka
11.Raameswara	Tamilnadu	Rameswaram
12.Ghrishneswara	Maharashtra	Near Ellora caves, Aurangaabad District

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among The *Hindu* Trinity, is worshipped as a *Jyotirlingam*; 'a pillar of light or fire', revered by the *Hindus* to be extremely auspicious, as Lord *Siva* appeared as a *Jyotirlingam* on the night of the *Arudra Nakshatram* (Star)).

In this research paper, he convincingly sustained his findings that the twelve *Jyotirlingams* (Table 1) are originally "Holy Fire Places", which are supposed to be the centers that attract and accelerate the monsoon cycle in *"Bharat Khand"* (the Indian Sub-Continent). India, Pakistan, East Africa, Madagascar, West Indies, South America, Bangladesh, Thailand, Myanmar, Philippines, Sri Lanka and North Australia get rains from this monsoon. Hence, late and weak monsoon occurrence very badly affects these regions. This has been published in a booklet, by *Shri Yogiraj Ved Vignan Ashram*, *Kasarvadi, Barshi, Maharashtra*, India; 88 pp. (Varshneya *et al,* 2010).

Moreover, there is a considerable anecdotal description in ancient literature to believe that the monsoon phenomenon was well known in India since early Vedic Period (c.4000-3000 BC). In ancient texts, there lies some information about some techniques of rainfall measurement. But, the major shortfall here is the non-availability of any recorded outcomes of those measurements (Iyengar, 2004), which creates a yawning void between the age-old heritage and the contemporary competence. Various methods of indigenous rain forecasting, including *Panchangam* predictions, folk lore, portents, prognostics, etc. have been studied in *Visakhapatnam*, *Ranga Reddy* and *Anantapur* regions of Andhra Pradesh (Ravi Shankar *et al*, 2008)

Hence, to overcome this discrepancy, efforts need to be directed towards abridging the cavity between the sacrosanct indigenous ancient wisdom and the modern sophisticated technological prudential prowess. Therefore, in the present study, an attempt has been made to compare the meritorious meteorological principles enshrined in the *Brihat Samhita* with the meticulous modern-day recorded observations provided by the India Meteorological Department (IMD) for a period of ten years (1993-2003) over four Indian regions; *Tirupati*, *Ajmer*, *Shillong* and *Port Blair*, situated in different geographical and climatological zones of the country.

Materials and Methods

Varaaha Mihira and Brihat Samhita

Varaaha Mihira (505 A.D -587 A.D.) was a multi-faceted doyen Indian Scientist, Mathematician, Poet, Astronomer and an Astrologer of rare merits. He was believed to be among the *Nava Ratnas* (The Nine Gems; *Nava* means 'nine' and *Ratnam* stands for 'gem', signifying the nine eminent scholars) in the court of the legendary king *Vikramaaditya* of *Ujjain* in Madhya Pradesh, who is thought be the *Gupta* emperor *Chandra Gupta* II, bearing the titles of '*Vikramaaditya*' and '*Bhoja*'. The *Navaratnas* are: Kalidaasa, Betala Bhatta, Varaaha Mihira, Dhanvantari, Amarasimha, Vararuchi, Bhaktamara stotra, Shanku and Ghatakarpura. Sometimes, the names of Arya Bhatta and Kshapanaka are also included in other versions. Sun God was the tutelary deity of *Varaaha Mihira*'s family and ancestors. The very word '*Mihira*' is one of the various names attributed to the Sun and *Varaaha* points to one of the ten incarnations (*Avataaras*) of Lord *Vishnu*; that of a wild boar (*Varaaha*). In *Brihat Samhita*, we find that *Varaaha Mihira* starts some chapters with an invocation addressed to Lord *Vishnu* or Lord *Naarayana*. Some scholars say that '*Varaaha'* is the greatest award of the Magadha Empire, the emblem of which is *Varaaha* (Wild Boar). Most of the astrologers put forward a tale that Mihira had predicted the death of King Vikramaaditya's son at the hands of a wild boar. But, despite extensive security measures, the prince was killed while playing in the garden when he fell on an idol of Varaaha (Wild Boar has two sharp protruding teeth on both sides of its mouth). From then, everyone started calling him 'Varaaha' Mihira. His father's name '*Aaditya Daasa*' also points to the conclusion that *Varaaha Mihira's* ancestors were staunch worshippers of the Sun (In Sanskrit, *Aaditya* means 'Sun' as he is said to be

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the son of *Aditi,* the mother of Devas (Gods) and *Daasa* means a 'Servant'). The birth place of *Varaaha Mihira* is a village named *Kaapitthaka*, which is identified with the present *Kaayatha* or *Samkaasya* at a distance of about 12 mile (19.3 km) from *Avanti*, the present day *Ujjain* in Madhya Pradesh.

The *Brihat Samhita* is the encyclopedic *magnum opus* of *Varaaha Mihira* that has won many an accolade from all quarters of the globe in all times since its conception. Al Beruni (973 A.D -1048 A.D.), an Islamist scholar from Central Asia who was commissioned by the *Mahmud of Ghazni* to prepare a comprehensive document on India, was all praise for *Varaaha Mihira's Brihat Samhita* in his monumental composition '*Kitab fi tahqiq ma li'l-hind*', simply called '*Ta'riqh al-hind*'. Many western scholars like Dr. Kern, Monier Williams and others have extensively studied and commented on this outstanding treatise.

Table 2. Chapters related to meteorology in the *Brihat Samhita* and total number of verses (*Slokams*) contained in each of them

Subject of the Chapter	Chapter number	Number of *Slokams* (Verses)
The Sun's transit	3	39
The Moon's transit	4	32
Rahu's course	5	98
Transit of Mars	6	13
Mercury's transit	7	20
Jupiter's course	8	53
Course of Venus	9	45
Saturn's transit	10	21
On Comets	11	62
Canopus (*Agastya*)	12	22
Planetary Rulership	16	42
Planetary Wars	17	27
Conjunctions of Moon	18	8
Planetary years-Effects	19	22
Pregnancy of Clouds	21	37
Retention of Embryo	22	8
Rainfall	23	10
Moon-*Rohini* Conjunction	24	36
Moon-*Swaati* Conjunction	25	6
Moon-*Uttaraashaadha* Conjunction	26	15
The Wind Cycle	27	9
Signs of Immediate Rain	28	24
Prognostics from Flowers and Creepers	29	14
Indications at dawn and twilight	30	33
Glow at the Horizon	31	5
Signs of Meteors	33	30
Characteristics of Halos	34	23
Signs of Rainbows	35	8
Signs of Aerial City	36	5
Mock Suns	37	3
Indications of Haze	38	8
Symptoms of Hurricane	39	5
Growth of Crops	40	14

The word *Brihat* in Sanskrit means 'Colossal' and '*Samhita'* is synonymous to 'A Divine Collection of Knowledge'. The first segment of the *Vedas* which consists of the collection of sacred divine devotional hymns is known as *'Samhita'*. Hence, *Brihat Samhita* can undoubtedly be identified as 'An Encyclopedic Colossal Compilation of Divine Knowledge'. *Varaaha Mihira* uses similes of extraordinary poetic worth like that of *Kalidaasa*, *Vyaasa*, *Bhaasa, Homer,* etc. and is also a 'metrical genius', employing some rare and fabulous meters for his verses (Raama Krishna Bhat, 1981).

Other works of *Varaaha Mihira* include the majestic master piece '*Pancha-Siddhantika'*, known as 'the treatise of the five astronomical canons', (namely, *Surya Siddhanta, Vasishtha Siddhanta, Pulisa Siddhanta, Romaka Siddhanta* and *Brahma Siddhanta)*, *Brihat Jaatakam* (a major land-mark treatise on Hindu astrology and horoscopy, followed extensively till date), *Laghu Jaatakam*, *Yoga Yaatra*, *Vivaha Patala*, *Yakshyeshvamedhiya yaatra* etc. *Varaaha Mihira's* son *Pruthuyashasa* also contributed to the field of Astrology by his magnificent work "*Horaa Saaraha*", a famous treatise on Horoscopy. The subjects dealt with, in the *Brihat Samhita* can be broadly categorized under the following heads: (Raama Krishna Bhat, 1981),

1. Astronomy
2. Geography
3. Calendar
4. Meteorology
5. Flora
6. Portents
7. Agriculture and Economics
8. Politics

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9. Physiognomy
10. Engineering
11. Botany
12. Industries
13. Zoology
14. Erotics
15. Gemology
16. Hygiene
17. Auguries
18. Stellar lore

The *Varaaha Mihira'*s *Brihat Samhita*, Part One, with English translation, exhaustive notes and literary comments by Professor Raama Krishna Bhat, a well-known Sanskrit scholar, teacher, poet and astrologer who retired in 1974 as the Head of Sanskrit Department, Hindu College, Delhi University, was followed for the present study (Prof. RK Bhat passed away in 1990). This was first published by *Motilal Banarsidass Publishers* Private Limited, Delhi in 1981 with six periodical reprints, the latest being in 2010. The English translations of the original Sanskrit verses by Prof. Bhat in the above edition have been extensively used as-it-is at several places in the present article. In total, there are about 106 *Adhyayams* (chapters) in *Brihat Samhita* with around 4000 *slokams* (verses). With a glance at these sections, one can easily infer that the *Brihat Samhita* is a 'scientific treatise with a social face', as all of these prove to be of highly beneficial applications in our day-to-day life. Among these, there are certain chapters that can be useful for meteorological studies as shown in Table 2.

Lunar Mansion and Asterism

***Lunar Mansion*:** The position of the moon in its orbit around the earth varies depending upon the relative orbital position of the earth. Each of these particular segments where the moon is stationed with respect to the 27 fixed stars is known as a *lunar mansion*. The *nakshatra* system of Indian astrology, the *manzils* of Arabic astrology, etc. are some of the illustrative examples of the astrological applications of lunar mansion system.

***Asterism**:* It is a common place observation that the stars visible and recognized in the night sky appear to be arranged in a superfluity of patterns. The stars in a particular pattern may be an integral part of a known constellation or comprise the stars from different constellations. Each of such patterns is called an *Asterism*. From this it can be implied that the stars which are supposed to be the part of a specific asterism may not be physically or directly related to one another. Hence, the study of asterisms can be very beneficial for sky-watchers to track the positions and movement of stars.

A total of 797 verses spread over 33 chapters of the *Brihat Samhita* provide information on weather episodes, to some extent or the other (Table 2). But, since they include omens, prognostics, signs, indications like haze, mock Suns, glow at the horizon, symptoms from the formation of aerial cities in the sky, false fires in the quarters and other portents, some of which are nebulously qualitative and require decades of observation and precise documentation, we cannot consider all of those for our comparative study. The following predictions have been selected from a plethora of the like, enshrined in the *Brihat Samhita* for comparison with modern data:

When it comes to astro-meteorology, Venus has been conferred a pivotal position as its transits, conjunctions, etc. profusely influence the weather phenomena, especially rainfall. Obviously, in the *Brihat Samhita*, the chapter on 'Course of Venus' (*Shukra Chaaraha*, chapter IX, where the nomenclature *Shukra* stands for 'Venus' and *'chaara*' means 'movement/transit/course' in Sanskrit) houses many valuable predictions. Some of the definitive and quantitative scientific weather predictions in the *Brihat Samhita*, which have been considered for this present incumbent study, are enlisted as follows:

Predictions based on Venus (The *Brihat Samhita*, Chapter IX, *Shukra Chaaraha*)

1. There will be low rainfall when Venus is situated in *Makha* star and its four counterparts

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in the West. (*Makha, Poorva Phalguni, Uttara Phalguni, Hasta* and *Chitra*)
2. There will be less rain when Venus is situated in *Swaati* star and it's two counterparts in the East. (*Swaati, Visakha* and *Anuraadha*)
3. There will be good rainfall when Venus is situated in *Makha* star and its four counterparts in the East *(Makha, Poorva Phalguni, Uttara Phalguni, Hasta* and *Chitra*)
4. There will be copious rain when Venus is situated in *Swaati* star and it's two counterparts in the West (*Swaati, Visakha* and *Anuraadha*)
5. It was also predicted that with Venus rising or setting on 8th, 14th or the 15th day (*Amaavaasya*) of the dark fortnight, the earth will be submerged in floods, i.e.; there may be heavy rains, severe cyclones in the sea or even a tsunami, that trigger flash floods, inundating the entire region.
6. When Saturn is in advance of Venus, it causes vitiation of wind and sparse rainfall conditions prevail.
7. Should Mars march ahead of Venus, then there will be prevalent famine and drought.
8. When Jupiter is ahead of Venus, there will be plenty of hail stone rains. The autumnal crops will flourish as a result of some satisfactory rainfall.
9. When Mercury, while rising or setting, is situated in advance of Venus, there will be plentiful rainfall and abundant summer-crop yield.
10. When Jupiter and Venus are aligned in the *Sama Saptakam* mode (Venus and Jupiter are situated in 7th house from each other on a mutual 1-7 axis), there will be very scarce or even no rain at all. (This was propounded by *Bhattotpala*, a tenth century scholarly astrologer, author and an erudite critic whose first and the most authentic commentaries on the *Brihat Samhita* and the *Brihat Jaatakam* of *Varaaha Mihira* are held in great reverence even today. He also authored a great question-answer type text on horary astrology named '*Prasnajnaanam',* where *prasna* means 'question' and *jnaanam* means 'knowledge'. Therefore, the name of this very work means 'acquiring knowledge through questioning').

Predictions based on *Raahu*'s Course, i.e. Eclipses (The *Brihat Samhita*, Chapter III, *Raahu Chaaraha*)

1. If a solar or a lunar eclipse occurs in the month of *Kaarthika*, there will be happiness and prosperity to all, except to Kings, ministers and their followers.
2. If an eclipse takes place in the month of *Maargaseersha*, it will lead to good rains.
3. If the eclipse happens in the month of *Pousha*, there will be scanty rainfall and famine.
4. An eclipse falling in the month of *Maagha* will result in good rains and joy to the farmers.
5. An eclipse in the month of *Phaalguna* will prove harmful to people implying that there would be scanty rainfall.
6. There will be erratic rainfall in the year when an eclipse falls in the month of *Chaitra*
7. Good Rains and subsequent bountiful food grains can be expected when the eclipse takes place in the month of *Vaisaakha*.
8. An eclipse in the month of *Jyeshtha* would prove inauspicious and would destroy rains and crops.
9. There will be uneven distribution of rains when an eclipse occurs in the month of *Aashaadha*.
10. There will be happiness, prosperity and plenty of food grains (except in autumn) when there is an eclipse in the month of *Sraavana.*
11. There will be plenty of food in the land i.e. good rainfall at a time when the eclipse happens in the month of *Bhaadrapada.*
12. An eclipse in the month of *Aaswayuja/Aaswina* witnesses plenty of rain, food and happiness.

Predictions based on Planetary Conjunctions

1. There will be rain during the period of the conjunction of Mercury and Venus
2. The conjunction of Mercury and Jupiter augurs rainfall
3. Copious rainfall occurs when Jupiter is conjoined with Venus.

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4. The conjunction of Mars and Saturn will not prove beneficial for rainfall

Varaaha Mihira clearly states six types of planetary combinations/conjunctions in the *Brihat Samhita*, as follows: *Samvarta* (Concourse), *Samaagama* (Gathering), *Sammoha* (Tarnishing), *Samaaja* (Meeting), *Sannipaata* (Encounter), *Kosa* (Fellowship) (The *Brihat Samhita*, Chapter XX, *Graha Srungaatakaadhyayaha*, *sloka* 5). Besides, the effects of each of these fore stated conjunctions have also been discussed by him.

Prediction for Sun's entry into *Aardra* Star (The *Brihat Samhita*, Chapter XXVIII, *Sadyovarshanaadhyayaha*, *sloka* 20)

The Sun's entry in *Aardra* star usually befalls towards the end of the third week of May and his stay in this star for 13-14 days till the end of the first week of June, experiences ample rainfall undoubtedly. This period marks the onset of South-West monsoons and it is believed that the Sun's entrance into *Aardra* star triggers the circulation of the Monsoon winds. The word *Aardra* itself, in Sanskrit, means 'Wet or dampened one', which projects the fact that this star is associated with rainfall.

Predictions based on Direction of Clouds and Winds

1. If the clouds rise in the East, there will be good crops (i.e. beneficial rainfall, as Lord *Indra* is the ruler of this direction).
2. If the clouds originate in the South- East, there will be outbreak of fires (i.e., heat wave prevails). South- East is called *Aagneyam* in Sanskrit for which Lord *Agni* (Fire-God) is the potentate.
3. If the clouds occur in the South, crops will decay for want of rain. (Lord *Yama,* the God of Death reigns over this direction)
4. Partial growth of crops can be predicted when clouds appear in the South-West (Lord *Niruti* is the king of this direction and monsoon winds blow from South-West during June-September)
5. If clouds seem to be developing in the West, then, this portends copious rainfall (Lord *Varuna*, the Rain-God, is the ruler of this direction)
6. If the clouds are observed sprouting in the North-East, then, there will be bumper crop yield.
   Lord *Eeshaana*, one of the five forms of Lord *Siva*, is the ruler of this direction. The other four forms of Lord *Siva* are *Sadyojaata*, *Vaamadeva*, *Tatpurusha* and *Aghoranaatha*. In the divine hymn *Vishnu Sahasra naamam*, there is a *slokam* (verse) that goes like this: "*Eeshaanaha Praanadaha Praano….*" Here, the Almighty has been given the name "*Eeshaana*" and He is also attributed the quality "*Praanada*", which means 'the bestower of life'. In Sanskrit, *Praana* means 'life' and *da* means 'to give'. It can be observed that there will be substantial rainfall during October-November in India when the monsoon winds blow from the North-East accompanied by the formation of low pressure circulations (depressions) in seas, e.g. Bay of Bengal. Since rains are the sole source of water, which is the most vital life-sustaining entity, the fore stated description is very apt.
7. Sporadic rainfall with stormy weather is most likely when we see the build-up of clouds in the North-West (Lord *Vaayu*, the Wind-God is the liege of this direction)
8. When the clouds evolve from the North, very fine and abundant rainfall may be anticipated (Lord *Kubera*, the God of Wealth and Prosperity, is the presiding deity of this direction)

(The same predictions apply for the winds originating from the corresponding directions, as specified above).

(***For points 1-8 mentioned above, please refer BS, Chapter XXIV, Rohini Yogaadhyaayaha, slokas 23 and 24***)

9. Clouds formed in the East will pour down rain in the West and vice versa. The same holds good for other pairs of

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quarters/directions (North-South; North-East and South-West; North-West and South-East) (BS, XXI, *Garbha Lakshanam*, *slokam* 13)

10. The winds also follow the same trend mentioned above, i.e. the direction of wind at the time of cloud formation is reversed at the time of rainfall (East-West, North-South, etc.) (*BS*, XXI, 13)
11. If, on the day of the full moon (*Poornima*) in *Aashaadha* month, when the moon is conjoined with the asterism *Uttaraashaadha*, if an easterly wind blows, then, the earth is enriched with splendid vernal and autumnal crops. The sky is covered with groups of dark clouds.

    Poorvaashaadha star, the twentieth star among the 27 *nakshatrams*, is also known by the names *Jalam*, *Toyam*, *Aapaha*, etc., all of which in Sanskrit mean 'water', implying rain. This star is also known by the name *Ambu Deva nakshatram*, where *Ambu* also stands for 'water', signifying rain. This star is said to be presided by Venus, who is believed to be beneficial for rainfall. Sometimes, this star is represented by the symbol of a hand-held fan. This may be associated with the cooling (relieving from heat) effect of the star *Poorvaashaadha*.

    Uttaraashaadha star, the twenty-first star among the 27 *nakshatrams*, is known by the name *Viswedeva nakshatram*, as this is presided by a class of Gods known as *Viswe Deva*s, who are supposed to be ten in number. In the *Vedas*, they are addressed to be the 'bestowers of awards and preservers of mankind'. Traditionally, they are assigned the kingship of the *praavrut kaalam* (rainy season). Their names are: *Vasu*, *Satya, Kratu, Daksha, Kaala, Kaama, Dhriti*, Kuru, *Pururava* and *Maadrava*. In some versions, two others are added *viz*. *Rochaka* or *Lochana* and *Dhuri* or *Dhwani*. Sun is the planetary ruler of this asterism of *Uttaraashaadha.*

    Hence, from the above, it is quite consequential that our ancestors insisted that the pregnancy of clouds should be calculated in the month of *Maargaseersha* from the day when the moon occupies the asterism *Poorvaashaadha*, followed by *Uttaraashaadha* and other lunar mansions/asterisms (stars).
12. When the wind blows from the South-East on the same full moon day as mentioned above, heat wave intensifies.
13. When the howling South wind is observed on *Poornima* day of *Aashaadha* month, clouds will shower very miserly rainfall
14. If on the same day, the South-West wind blows ceaselessly, it causes famine and drought in the region.
15. When there is a westerly breeze on the full moon day of *Aashaadha*, the earth is endowed with rich crops.
16. If a North-West wind blows incessantly on this full moon day, there would be all-round growth of splendid crops and torrents of rain.
17. The clouds will flood the Earth with water when a Northerly breeze blows on this full moon day in the month of *Aashaadha*.
18. If the cool North-East wind blows on the full moon day of *Aashaadha* month, especially at the time of Sunset, the earth is filled with plenteous water and the region would be rich in crops.
19. If, after the full moon in the month of *Aashaadha*, there is rain on the 4th lunar day of the dark fortnight (*Krishna Paksham*) in the asterism of *Poorvaabhaadra*, then, that particular rainy season would prove beneficial, otherwise, it would not emerge to be promising. (The commentator *Bhattotpala* describes this verse as *Anaarsha* i.e. an interpolated one. However, some editions include this verse at the end of chapter XXVII, *Vaatachakra*) (For points 11-19, see *BS*, Chapter XXVI, *Aashaadhee Yogaadhyaayaha*, *slokas* 13, 14 and 15).
20.

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Predictions based on Lunar Conjunctions

1. The symptoms of pregnancy of clouds are to be detected when the Moon passes through the asterism *Poorvaashaadha*, beginning from the first day of the bright fortnight of the month of *Maargaseersha*. The foetus formed during the Moon's stay in a particular constellation starting from *Poorvaashaadha*, will be released after 195 Solar days when the Moon again passes through the same asterism as per the laws of his revolution. The days of *Garbha Dhaarana* (Pregnancy; In Sanskrit, *Garbham* stands for 'Pregnancy' and *Dhaarana* means 'to have or possess') start from the first day of the bright fortnight (*Shukla Paksham*) of *Margaseersha* month i.e., the month when the moon occupies the lunar mansion of *Mrigasira nakshatram* (star) on the day of the full Moon (*Poornima*).

   (One of the most unique aspects of ancient Indian meteorology is 'the pregnancy of clouds'. Modern atmospheric science opines that the clouds are entirely formed only during the times of rainfall and the process of their build-up starts on the very day when there would be rainfall based on the endemic weather factors, i.e. the clouds that yield rain on a given day are formed during that particular day itself. But, the *Brihat Samhita* clearly states that clouds too have a gestation period like the humans, lasting for 195 days. During this period, the cloud develops from the stage of an embryo, where it is retained by favourable winds and then transforms into a fetus, which acquires its ultimate form as a full-fledged cloud at the end of the 195-day period. During this period, if any unfavourable, disparaging and reproachful phenomena like affliction by malefic planets like Mars, Saturn, etc., comets, meteors, excessive rainfall at the formation of fetuses and others (elaborated in the *Brihat Samhita* lucidly) are encountered by the embryo, then, there would be miscarriage of foetuses consequently, i.e. there would be no proper rainfall during the ensuing rainy season or monsoon).
2. If there be excessive rain at the time of formation of foetuses without any apparent cause, this would lead to the destruction of fetuses. Should the amount of rainfall exceed $1/8^{th}$ of a Drona (0.8 cm or 8mm. of rainfall of the modern rain gauge), there would be miscarriage of the foetus.
3. The four days commencing from the 8^{th} lunar day of the bright fortnight of *Jyeshtha* month are sustained by winds. These days are called *Vaayu dhaaranas*. It will prove beneficial if they are accompanied by soft and auspicious breezes from north, north-east and east (For points 1-3, see XXI, *Garbha Lakshanam*, *slokas* 6, 7, 30 and 34).
4. In the bright fortnight of *Jyeshtha* month, if it rains in the four lunar mansions beginning with *Swati*, the four months commencing from *Sraavana* would be retainers of rain in order i.e. if there is rain in the star *Swati*, there would be no rain in the month of *Sraavana*. If there is rain in the star *Visaakha*, no rain in *Bhaadrapada* month; if there is rain in the star *Anuraadha*, no rain in *Aaswayuja* month and if there is rain in the star *Jyeshtha*, then, there will be no rain in the month of *Kaarthika* (For points 4-5, see XXII, *Garbha Dhaaranaadhyaayaha*, *slokas* 1 and 2).
5. In whichever stars (stars with which the Moon is conjoined) there is rain at the beginning, there will generally be rain once again in the days ruled by the same stars during the rainy season. If there is no rain in any of the asterisms starting from *Poorvaashaadha* at the time of delivering rain, then, there would be very less or no rain in the season.
   a) If there happens to be rainfall in the asterisms of *Hasta, Purvaashaadha, Mrigasira, Chitra, Revati* and *Dhanishtha*, the total rainfall in the rainy season would be 16 *Dronas.*
   b) If it rains under the asterisms *Shatabhishak*, *Jyeshtha* and *Swaati*, the rainfall amounts to 4 *Dronas*.

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c) If it happens in the asterism *Krittika*, it will be 10 *Dronas*.
d) 14 *Dronas* of rainfall is can be expected during the season if it rains under the stars *Sravana, Makha, Anuraadha, Bharani* and *Moola*.
e) If it rains in *Poorva Phalguni*, then, the total rainfall would be 25 *Dronas*.
f) One could predict 20 *Dronas* of rainfall if it rains in *Punarvasu* star.
g) If it rains in the stars *Visaakha* and *Uttaraashaadha*, then, this would yield 20 *Dronas* of rainfall in the season.
h) If it rains in *Aaslesha* star, then, the total seasonal rainfall would be around 13 *Dronas*.
i) A rainfall of 25 *Dronas* can be predicted if it showers under the stars *Uttaraabhaadra*, *Uttara Phalguni* and *Rohini*.
j) When the rainfall occurs in *Purvaabhaadra* and *Pushya* stars, then, the total precipitation would be equal to 15 *Dronas* in quantity.
k) In *Aswini* star, a rainfall would indicate a total rainfall of 12 *Dronas* during the monsoon season.
l) If it happens to rain on the day reigned by *Aardra* star, then, the aggregate precipitation during the season may be placed at about 18 *Dronas*. (One *Drona* = 6.4 cm. of modern rain gauge), (For points 6-8, see XXIII, *Pravarshanaadhyaayaha*, *slokas* 3, 5, 6, 7, 8 and 9).

Some qualitative, observation - oriented and miscellaneous, yet, interesting and invaluable predictions & bits of information pertaining to meteorology encompassed in the *Brihat Samhita* (Not considered for the present study)

1. An amazing mention of the comets called *Taamasakeelakas* (Dark Shafts; the word *taamasa* means 'dark' and *keelaka* means 'a shaft or a flare (of fire, etc.)), which are said to be the offsprings of *Raahu* can be found in the *Brihat Samhita*. (*Raahu* is a shadow-planet in astrology known as a *chhaya graham*, where *chhaya* means 'shadow' and *graham* means 'planet'. *Varaaha Mihira* very scientifically describes *Raahu* to be the northern or ascending lunar node). They are 33 in number and are observed on the discs of the Sun and the Moon. These dark shafts appearing on solar orbit might be the prototypes of the modern day solar flares and sunspots (Raama Krishna Bhat, 1981).

Further, *Varaaha Mihira* also declares that the appearance of these *Taamasakeelaka*s has the following effects: the water turns turbid, the sky is filled with dust, disastrous storms break out, trees and creepers show abnormal features contrary to seasons, animals and birds get heated by the Sun, appearance of flares in the quarters (directions), thunderbolts, earth quakes, languished people migrate to other places due to famine and drought, etc. In addition to this, despite the appearance of rain-bearing clouds in the sky, they will not pour down adequate rain on the Earth. In some places, rivers are rendered very slender and crops sparse. All these prevalent conditions deteriorate the living standards of the already-famished people of those regions. However, it is also to be borne in the mind that the above effects are to be prophesied only when these shafts appear during times, other than the ecliptic periods of the luminaries (The Sun and the Moon). III, *Aaditya Chaaraha Slokas* 7 to 16 (*Aaditya* stands for 'Sun', as He is said to be the son of *Aditi*, the Mother of Gods, according to the *Hindu* scriptures).

Recent observations also seem to approve very well with these age-old predictions in the *Brihat Samhita*, as they reveal that the 'Sun Spots' appear dark because these regions are at relatively lower temperatures compared to their surrounding areas. Hence, they appear black against a background of the adjacent areas which are relatively hotter. They are termed 'comets' because these flares rush towards the

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earth like the comets and influence the geo-magnetic field of the earth, disrupt communications and bring about a lot of drastic and abrupt changes in climate and temperatures by way of unusual *El-Nino* and *La-Nino* occurrences, vagaries in the circulation of monsoon winds, the *westerlies*, tropical jets, equatorial electro jets, *Doldrums*, *Chinooks* etc. These changes in the solar atmosphere may also cause disturbances and re-adjustments of the Earth's tectonic plates, thereby eliciting tsunamis, earth quakes and volcanic eruptions. An in-depth analytical study of the impact of solar flares and sun-spot cycle on earth and human beings is a 'burning' topic generating immense attention.

The Sun was observed unleashing two humongous X-Class Solar flares from the giant active sunspot AR 1429 on March 6, 2012.

A massive Coronal Mass Ejection (CME)/Solar flare of M 8.7 Class was observed on January 23, 2012, which is considered to be the largest since 2005, could affect the GPS systems and other communications.

In addition to the above instances, recently, similar giant 'Sun-Spot' activities were observed by the National Aeronautics and Space Administration (NASA) through its Solar Dynamics Observatory (SDO) on November 3, 2011, June 7, 2011, April 12 – 13, 2010 and March 30, 2010.

Furthermore, Scientists anticipate 2012 to be one of the most impactful years for solar storms, Surges of highly energetic charged particles are most likely to fatally disrupt satellites and power grids because, these coronal mass ejections streak out through the interplanetary medium, swaying lethally over any planets, satellites or spacecrafts that obstruct their pathway.

2. The transit of Mars through the stars *Rohini, Sravana, Moola, Uttaraashaadha, Uttarabhaadrapada, Uttaraphalguni* and *Jyeshtha* would destroy the formation of clouds (VI, *Bhouma Chaaraha*, *sloka* 11).
3. If after the termination of an eclipse, there should arise a dust storm in the place within Seven days, it will cause famine, i.e. due to insufficient rains and resultant poor crop-yield (V, *Raahu Chaaraha*, 92).
4. It is a known astronomical fact that Jupiter takes around 12 Earth Years to complete one revolution around the Sun. As on Earth, if we consider one sidereal period of Jupiter to be one Jupiter year, then, that is equivalent to 12 sidereal revolutions of the Earth or Earth Years. Hence, 5 complete revolutions i.e., 5 Jupiter Years would constitute the entire cycle of 60 Earth Years. This is known as *Jovian* (related to Jupiter) system, which is known as *Baarhaspatya varsha maanam* in Sanskrit (Since, Jupiter is called *Brihaspati* or *Guru* in Sanskrit).This cycle of Jupiter is divided into 12 *yugas* (five-year periods).

   Generally, in the first year (*Samvatsaram*) of all the 12 *yugas*, rainfall will be evenly distributed during the rainy season which is spread over the months of *Sraavana*, *Bhaadrapada*, *Aaswayuja* and *Kaarthika*. In the second year (*Parivatsaram*), there will initially be good rainfall and a gradual decline thereafter. During the third year (*Idaavatsaram*), there will be plenty of rainfall throughout the season. In the fourth year (*Anuvatsaram*), the rainfall will occur at the end of the season. The final year (*Idvatsaram*) witnesses scanty rainfall (VIII, *Brihaspati Chaaraha*, 23 and 25).
5. If the mock sun (Sun's illusionary reflection due to certain types of clouds like *Cirrostratus*, *Altostratus*, etc. and ice crystals in the atmosphere. Halos around the Sun and the Moon are also a consequence of these clouds. This phenomenon portends good rainfall during the day or in the coming days, according to modern meteorology as well) be situated to the north of the Sun, there would be good rain. If it is situated to the south of the Sun, then, it would indicate a thunder storm with a strong wind. If it is observed on both sides of the Sun, then, there would be floods in the region (III, *Aaditya Chaaraha*, 37). Hence, a scrupulous

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study of the mock suns may prove to be of significance in disaster management.

6. According to Sage *Paraasara*, the presence of Venus in the eastern horizon during monsoon is said to be not so favourable for rainfall, but, is beneficial to crops and grass (IX, *Shukra Chaaraha*, Page 113).
7. If Venus appears ash-grey and coarse in the sky, then, not a drop of water will fall from the sky (IX, 44).
8. When Venus rises or sets while travelling through the nine stars beginning with *Bharani* (*Bharani, Krittika, Rohini, Mrigasira, Aardra, Punarvasu, Pushyami, Aslesha and Makha*), there will be good rainfall in the season (IX, 8).
9. When Venus is situated in *'Bha' chatushtaya* stars (the four stars beginning with *Bharani; Bharani, Krittika, Rohini* and *Mrigasira*), then, there will be plenty of rainfall and food (IX, 10).
10. When Venus is situated in the stars *Aardra, Punarvasu, Pushya and Aaslesha*, good rains with luxuriant crops can be observed (IX, 12).
11. If Venus is in *Jyeshtha*, *Moola*, *Poorvaashaadha*, *Uttaraashaadha* and *Sravana*, then, people will suffer from hunger with no rainfall and crops (IX, 18 and 19).
12. If Venus is in *Dhanishtha*, *Shatabhishak*, *Purvaabhaadrapada*, *Uttarabhaadrapada*, *Revathi* and *Aswini*, there will be abundant crops with good rainfall (IX, 20).
13. If Venus becomes visible before the Sun sets, he will create panic. If it is seen throughout the day, famine occurs (IX, 23).
14. The following are the results predicted for the course of Venus through different stars:
    a) *Krittika*- Rivers submerge coastal areas and cause floods.
    b) *Mrigasira*- Destroys crops
    c) *Aardra*- Exceedingly heavy rains
    d) *Pushya*- Good Rains
    e) *Makha*- Copious rains
    f) *Poorva Phalguni*- Abundant rains
    g) *Uttara Phalguni*- Good rains
    h) *Hasta*- Drought
    i) *Chitra*- Good rainfall
    j) *Swati*- Good rainfall
    k) *Visaakha*- Beneficial rainfall
    l) *Anuraadha*, *Jyeshtha* and *Moola*- Drought
    m)*Poorvaashaadha*- Less rain
    n) *Shatabhishak* and *Poorvabhaadrapada*- Good Rains (IX, 24 to 35)
15. When Jupiter and Venus are situated in the Western and Eastern horizons, being at the same time in opposition (180^0 apart), there will be no rain at all (IX, 37).
16. The auspicious symptoms at the time of conception of clouds during various months are given as follows:
    a) *Maargaseersha* and *Pousha*: A red glow at the horizon at dawn and sunset, clouds with halos, not much cold in *Maargaseersha* and not too thick frost in *Pousha*.
    b) *Maagha*: A strong wind, the Sun and the Moon dim by mist, bitter cold and the Sun is accompanied by clouds during rising or setting.
    c) *Phaalguna*: A rough and violent storm, glossy floating banks of clouds, an incomplete halo around the Sun or the Moon and the Sun in red or russet colour.
    d) *Chaitra*: Wind, Clouds, Rain and Halos
    e) *Vaisaakha*: Clouds, Wind, Rain, Lightning and Thunder (XXI, *Garbha Lakshanam*, 19 to 22).
17. The clouds that resemble pearls and silver, or blue lily and possess the colour of collyrium with the shapes of aquatic animals (fish, crocodile, etc.), possess abundant water (XXI, 23).
18. Those clouds that are scorched by the fierce rays of the Sun and fanned by gentle breezes during their embryonic stages will cause torrential rains at the time of delivery. (These conditions can be observed during the summer when *Cumulonimbus* clouds pour down heavily towards the afternoon time, when the temperature is at its peak), (XXI, 24).
19. A foetus that is formed when the Moon is situated in any of the five lunar mansions, viz. *Poorvaashaadha, Uttaraashaadha,*

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Poorvabhaadrapada, Uttarabhadrapada and *Rohini*, in any season will yield copious rains (XXI, 28).

20. A cloud embryo that is formed when the Moon occupies *Shatabhishak*, *Aaslesha*, *Aardra*, *Swaati* or *Maagha* proves beneficial and rains for many days (XXI, 29).
21. *Varaaha Mihira* uses a great simile to introduce the concept of hail as thus: "Just as the milk of a cow grows thick and hard if kept for too long, even so does the water in the clouds (atmosphere) retained beyond its time" (i.e. without raining), (XXI, 36).
22. The days of retention of cloud embryos will prove efficacious, if they are accompanied by lightning, water-drops, dust-storm and the luminaries hidden by clouds. If there be beautiful flashes of lightning in east, north and north-east, very good growth of crops can be predicted. If there be rain with dust-storm, pleasant cries of birds and if the luminaries (Sun and Moon) are surrounded by glossy, unbroken halos, then also, then, there would be good rain sustaining bounteous crop yield. Further, if the clouds are lustrous, collected together and moving in a clockwise direction, there would be heavy rains tending to the growth of all varieties of crops (XXII, 4-8).
23. When the Moon is in conjunction with *Rohini*, seeds of all varieties of food grains are to be immersed in a vessel containing water. It has to be sensibly and judiciously observed that which of those seeds and that too, what percentage of them have sprouted. Only those grains will flourish during the year and none else and also to the extent and proportion indicated by the percentage of sprouting grains (XXIV, *Rohini Yogaadhyaayaha*, 11).

    Actually, this is quite an amazing and a fascinating prediction. The farmers and the government need to implement this as a pilot-project for several years and after cautious observation of the outcomes, they can take this up on a large scale, if found encouraging. This would in turn, avert unnecessary expenditure, effort and other undesired ramifications of cultivating an unfavourable crop during the year that would incur heavy losses to the farming community. This, in turn, would prove a burden to the government in disbursing compensation, thereby prompting hefty budgetary allocations for this purpose, which could otherwise be channelized towards numerous welfare schemes.
24. There are some extensive aesthetic, exotic and highly poetic descriptions of clouds in the *Brihat Samhita* would remind the readers of the modern cloud types distinguished by the scientists *Abercromby* and *Hildebrandsson* in 1887, some of which are stated below:
    a) The sky in some places is covered with large banks of black and white clouds (*Altocumulus* clouds, in which one part of the cloud is usually darker than another).
    In other places, there are white clouds (*Cirrocumulus* clouds, which are small, rounded and white puffs that occur individually).

    In some other places, there are dark clouds in the form of huge serpents whose bellies and backs alone are visible in their coils and whose tongues are represented by the flashes of lightning in the clouds (*Cumulus congestus* clouds, the top of which is often in the form of rounded towers and assume the shape of a cauliflower, which denotes the extent of rising air. These may also be *Lenticular* clouds in the form of lens that form near the mountains due to the waves caused by moist air crossing a mountain barrier, that often resembles a 'Coiled Snake' or a 'Flying Saucer' (Unidentified Flying Object (UFO)).

    It looks as though the sky were adorned with clouds which are as white as the interior of lotus-blossoms, whose fringes are tinged by the rays of the rising Sun. These clouds may be dark like bees, yellow like saffron and also appear in red, white

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and many other colours (*Cirrocumulus*/*Altocumulus* clouds).

b) The sky looks as if it were studded with dark clouds and beautified with dashing streaks of lightning and the rainbow. This looks like a forest on fire, which teems with herds of elephants and bisons. (*Altocumulus*/*Stratocumulus* clouds)

c) The sky is crowned with clouds that resemble the mass of boulders of a collyrium mountain and by those clouds which possess a luster that even annuls the brilliant luster of snow, pearls, conch-shells and the rays of the Moon. (May be *Nacreous* clouds, generally called 'mother-of-pearl' clouds and may also be interpreted to be '*Noctilucent'* clouds ('luminous night clouds') that can be best viewed at high latitudes especially as we approach the Polar Regions).

d) The sky is covered with dark clouds in the form of elephants whose golden trappings are marked by the lightning originating from them (clouds). The flying cranes represent the tusks of these elephant-like clouds and the rain showered by them represents the nectar or *ichor* (an ethereal fluid flowing in the veins of Gods in the place of blood, as per the Greek Mythology). Further, moving cloud fringes are similar to elephant trunks and the multi-coloured rain bows stand for the majestic banners (of the Gods) held aloft. (This description can be suitably attributed to *Cumulonimbus* clouds)

e) When the sky shines with a crimson glow at twilight, the clusters of clouds appear like dark lily flowers and the entire cloud array with the beautiful radiant back ground appears like Lord *Krishna* clad in his yellow silken garment. (This description coincides with *Stratocumulus* clouds, as they frequently appear near sunset).

f) If the clouds hang low at the horizon having spread throughout the firmament and if the deep and distinct peal of thunder be heard followed by the cries of peacocks, *Chaataka* birds (These are birds that are said to be always waiting for rain and are believed to quench their thirst by raindrops during times of rainfall. Their jubilant cries are said to be a definitive prognostic of an imminent rain) and frogs, then, one could predict a torrential downpour on the Earth (May be *Stratocumulus*, as they appear low at horizon and even *Nimbostratus*, which is a low-lying cloud layer associated with continuous light to moderate showers).

g) If the sky be covered with banks of clouds concurring with the above descriptions for a period of one to three days, then, there would be abundant food and plenty of water (Rainfall) in the land.

h) On the contrary, if the clouds be rough and small, tossed about by the wind and have the shapes of camels, crows, dead bodies, monkeys, etc. and be silent (without any clangor of thunder), then, there would be neither prosperity nor rain in the land. (Corresponds mostly to *Cirro* form clouds)

i) If the day sky is cloudless and shines with the scorching rays of the Sun and the night sky appears with bright stars (cloudless), looking like a lake with lily blossoms, then, there would be plentiful rain.(Because, this facilitates good convection and effective mixing in the atmospheric layers) (XXIV, 13-22).

25. The following, according to *Varaaha Mihira*, are the signs of immediate rain:

a) Sun's intense heat accompanied by dazzling brilliance and his appearance like molten gold as well as his beryl-like luster, when he is situated at the zenith.

b) Tasteless water, the sky with the colour of cow's eyes (white) and crow's eggs (blue), salt becoming moist, subdued wind, repeated croaking of frogs and excessive tumbling of fishes ashore.

c) Accumulation of rust on iron and bronze vessels with the smell of raw meat or fish due to high moisture content in the air.

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d) When a second Moon (Moon's illusionary reflection due to the presence of some sub-visible *cirro* form and *alto* form clouds) shines in the sky.
e) If peals of thunder are heard at night time and blood-red streaks of lightning at day time accompanied by a cool breeze from the east, then, there will soon be rain.
(It is a commonplace observation for most of us that streaks of lightning appear in various colours like white, creamy, red, blue, violet, etc. This colouration may have various causative factors like, the type of cloud, its size, its distance from the earth's surface, the energy packed in it, the cloud temperature and the like)
f) If the clouds at dawn or twilight possess the same colour as peacocks, parrots, blue-jays or *Chaataka* birds or have the lustre of roses and red lotuses, resembling the shape of waves, hills, crocodiles, tortoises, fish, etc. and are piled up in many layers, they will give immediate rain.
g) If a rainbow appears at the time of sunrise or sunset along with a cross bar of clouds, a mock Sun, a straight fragmentary rainbow, flashes of lightning and haloes around the Sun and the Moon, copious rainfall can be predicted before long.
h) If glow worms are seen at night near the clouds, there would be rain very soon, flooding all the fields.
i) Despite persistent rains for the past few days, if jackals howl in the evening, it is certain that there will not be a drop of rain, even though the sky remains overcast for about one week at a stretch (XXVIII, *Sadyo Varshanaadhyaayaha*, 3, 4,5,11,12,14,16, 23 and 24).

26. If a blue cloud with its top resembling curds, being situated at the zenith of the sky, screens the Sun, then, this type of cloud is called *Abhrataru* ('A Cloud Tree'; In Sanskrit, *Abhra* means 'the one that bears water(i.e. a Cloud)' and *Taru* means 'a tree'). If the clouds are tinged yellow, having a dense bottom, they would produce copious rains. (Here, the descriptions relate to *Cumulus Congestus* type clouds with cauliflower-head like tops and sometimes, they may appear yellow due to refraction of the incident Sun's light by the cloud droplets) (XXX, *Sandhyaa Lakshanaadhyaayaha*, 18).
27. A twilight sky which has the lustre of blue lily, beryl or lotus-filaments, which is free from strong winds and which is brightened by the Sun's rays, produces rain the same day (XXX, 20).
28. If the Sun be screened on the right side by clouds that are white or white-fringed, there would be rain. The same result would ensue, if he be screened likewise by clouds which resemble bushes of *Andropogon* grass (*Andropogon gerardii*, commonly known as *beard grass, big bluestem grass, broomsedge*, etc. This is the official state grass of the *Illinois* state in USA) and which arise in a direction not seared by Sun's heat. (These two may be *Cumulus* cloud variants at different stages of development), (XXX, 24).
29. If there be mock suns touching the Sun on both sides, there would be abundant rain. If these mock suns surround the Sun on all the four sides, not a drop of rain would fall from the sky (XXX, 26).
30. The rays of the Sun and the Moon turned into a circle by the wind and reflected in the sky with sparse clouds, become halos possessed of different colours and shapes. (Here, *Varaaha Mihira* states the mechanism behind halo formation in a nut shell), (XXXIV, *Parivesha Lakshanaadhyaayaha*, 1).
31. When the halo resembles the peacock's neck in colour, there will be heavy rains (XXXIV, 6).
32. When a thick and glossy halo during a particular season is covered with razor-like clouds, there will be rainfall on the same day. A yellow halo accompanied by the fierce rays of the Sun would also produce rain instantly (XXXIV, 7).
33. The multi-coloured rays of the Sun, being dispersed by the wind in a cloudy sky, are seen

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in the form of a bow which is called the Rainbow (*Indradhanus* in Sanskrit stands for 'the bow of Indra' as the word *dhanus* means 'a bow'). This shows that by *Varaaha Mihira*'s time (505 AD), the knowledge was prevalent in India that the Sun's rays comprise the spectrum of seven colours, i.e. *VIBGYOR*, which have been described in ancient Indian texts, right from the Vedas, as the 'Seven Horses of the Sun God' figuratively. This was later proposed by Sir Isaac Newton nearly after 11 centuries since *Varaaha Mihira*, in the 17th Century (XXXV, *Indraayudha Lakshanaadhyaayaha*, 1).

34. If a rainbow is unbroken, bright, glossy, thick, vividly multi-coloured and touching the earth at both its extremities with a 'double' appearance (two rainbows formed adjacent to each other), this phenomenon would culminate in the occurrence of favourable rains (XXXV, 3).
35. A rainbow seen in the middle of water leads to drought. If it is spotted on land, it results in the destruction of crops (XXXV, 5).
36. A rainbow seen in the east when there is literally no rain will produce rain and similarly, when it is seen in the east, when there are rains, there will be no rain. But, however, the flourish of a rainbow in the west always signposts rainfall (XXXV, 6).
37. An aerial city (*Gandharva Nagaram* in Sanskrit; the word *Gandharva* represents mythological celestial beings, who are believed to possess exceptional expertise in singing and *Nagaram* is synonymous to 'a city') of pale white colour causes the fall of thunderbolts and storms (XXXVI, *Gandharva Nagara Lakshanaadhyaayaha*, 4).

    An aerial city (*Gandharva Nagaram*) is an elegant description by our ancient seers, of a spectacular atmospheric episode, wherein the clouds, shaped by the rising air drafts undergo various patterns of arrangements resembling a magnificent aerial city constructed with clouds.

    Here, one can effortlessly infer that the clouds that constitute such aerial cities are *altocumulus* and *cumuli*form clouds. Some *altocumulus* clouds are known as "*Castellanus*" clouds because they are like 'little castles' of a city in appearance, which coincides with the above description. Moreover, *cumulus* clouds exhibit pronounced vertical development. Small and unregimented *cumulus* clouds known as *cumulus humilis*, gradually develop into more complex *cumulus congestus*, which are towering *cumulus* clouds, which initially look 'pale white', 'creamy' or 'curdy' in colour. If these clouds continue to develop vertically, then, they transform into gigantic *cumulonimbus* clouds that occur as isolated individual clouds or even as an integral entity of a 'wall of such clouds'. These *cumulonimbus* clouds are associated with severe thunderstorms, gale winds and hail.

    When *Varaaha Mihira* asserts in the above prediction that an aerial city of pale white colour causes thunderbolts and storms, it should be understood that he was speaking of a similar phenomenon discussed here above.
38. The Sages have declared that the effects of the indications portended by haze would be realised completely, only in seasons other than winter (This is because, in winter, the weather itself normally remains hazy owing to snow, fog, moisture or humidity in air and incomplete dispersion of smoke and pollutants due to improper mixing, owing to the formation of an inversion layer in the atmosphere) (XXXVIII, *Rajo Lakshanaadhyaayaha*, 8).
39. When a gust of wind struck by another gust in the sky reaches the earth and dashes against it, then, that impact generates a portentous thunder. (Here, the author *Varaaha Mihira* symbolically states that the sound of a thunder is produced by the extremely rapid cycles of compression and rarefaction of air molecules adjacent to its epicenter in the parent cloud generating a thunderbolt. This impact is passed on to the neighbouring air molecules as a (longitudinal) sound wave till it reaches the Earth and our ears. (XXXIX, *Nirdhaata Lakshanaadhyaayaha*, 1).

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40. When Saturn passes through the seven stars commencing from the star *Krittika* (i.e. *Krittika*, *Rohini*, *Mrigasira*, *Aardra*, *Punarvasu*, *Pushyami* and *Aaslesha*) and becomes retrograde in its motion, then, there will be an impending dreadful and a long-drawn famine in the region (XLVII, *Mayura Chitrakam*, 13).

    In the annals of ancient Indian astrology, planets are classified as malefic and benefic based on the effects produced by them, as given below:

    a) **Malefic Planets:** Sun, Mars, Saturn, Waning Moon (*Ksheena Chandra*), *Raahu*, Mercury in the company of other malefic planets and *Ketu* situated in fixed and common zodiac constellations.
    b) **Benefic Planets:** Venus, Full/Waxing Moon (*Poorna Chandra*), Mercury in the company of other benefic planers, Jupiter and *Ketu* in movable zodiac constellations.

    The zodiac constellations are divided into 3 categories as shown below:

    a) **Movable:** *Mesha* (*Aries*), *Karkaataka* (*Cancer*), *Thula* (*Libra*) and *Makara* (*Capricorn*)
    b) **Fixed :** *Vrishabha (Taurus), Simha (Leo), Vrishchika (Scorpio)* and *Kumbha (Aquarius)*
    c) **Common/Mutable/Flexible:** *Mithuna (Gemini), Kanya (Virgo), Dhanush (Sagittarius)* and *Meena (Pisces)*

    This 'Common' class of zodiac constellations are said to exhibit both types of tendencies, i.e. movable and fixed, and hence, known as '*Dwi Swabhaava Raasis'* ('Constellations with fixed or dual behaviour'; In Sanskrit, *Dwi* means 'dual', *Swabhaava* stands for 'nature or behaviour' and *raasi* means a 'constellation')

41. There will be famine as long as the course of Jupiter and that of Saturn lie through the end of the zodiac signs *Mesha* (*Aries*) and *Vruschika* (*Scorpio*) and through the middle of the signs *Vrushabha* (*Taurus*) and *Simha* (*Leo*) (XLVII, Page 402).
42. a). The *Brihat Samhita* puts forth a very interesting proposition that the cloud foetuses formed in the bright fortnight will be released (i.e. occurrence of rainfall) in the dark fortnight and those formed in the dark fortnight, rain in the bright fortnight.

    b). The foetuses formed during the daytime, will yield rain at night and those formed in the night, deliver rain during the day.

    c). those foetuses that are formed at the dawn, rain in the evening and the ones that are formed in the evening, produce rain at the dawn (XXI, *Garbha Lakshanam*, 8).
43. a). The foetuses of clouds formed in the bright fortnight of the months *Maargaseersha* and *Pousha* are of little consequence. Those formed in the dark fortnight of the month *Pousha,* would be delivered in the bright fortnight of the month *Sraavana*.

    b). those clouds that are formed in the bright half of *Maagha,* would yield rain in the dark half of *Sraavana*.

    c). for clouds formed in the dark half of *Maagha*, the period of delivery is the bright half of *Bhaadrapada.*

    d). those formed in the bright half of *Phaalguna,* would have their delivery in the dark half of *Bhaadrapada*.

    e). the clouds formed in dark half of *Phaalguna,* would yield rain in the bright half of *Aaswayuja.*

    f). Clouds formed in the bright half of *Chaitra* would rain in the dark half of *Aaswayuja.*

    g). the cloud foetuses that are generated during the dark fortnight of the month *Chaitra* (dark fort night of *Vaisaakha* as per the convention in Northern India) would be delivered during the bright fortnight of the month *Kaarthika* (XXI, 9-12).
44. When a planet (Mars, Mercury, Jupiter, Venus or Saturn) and a star are encircled by the halo round the Moon, there will be rain within three days from the day of the appearance of this

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particular halo (XXXIV, *Parivesha Lakshanaadhyaayaha*, 11).

45. If Saturn is encircled by a halo around the Moon, it destroys base corn and trees, causes stormy rains and badly affects agriculturists. Mercury inside the halo bequeaths good rains. Venus enveloped by a lunar halo makes food very expensive, i.e. it causes famine. *Ketu* (the descending or southern lunar node) inside the halo creates hunger and mortality (XXXIV, 12-15). Professor *Raama Krishna Bhat* opines that if there is a halo around the Moon and if the longitudes of *Raahu* or *Ketu* are almost the same same as that of the Moon, then, it can be said that the particular planet in contention between the two (Rahu (or) Ketu), is encircled in the Moon's halo.
46. If there are three planets enclosed in a halo around the Sun or the Moon, then, this causes famine and drought (XXXIV, 16).

    All these predictions enlisted above, may appear to be mere qualitative suppositions. But, there lie several thousands of years of keen observation and adept analysis behind them. The fact that *Varaaha Mihira* admits many a time in his *Brihat Samhita* very humbly and obediently that he had just tried to compile and interpret the statements of his predecessors, points towards this decisive conclusion. Hence, sincere and ace efforts have to be put in, to achieve a feasible fusion of hereditary ancient prowess and contemporary state-of-the-art sophistication to derive and arrive at an efficacious system that caters to all the requirements and challenges encountered in the arena of meteorological studies and research.
47. The cloud fetuses formed during the Moon's conjunction with the stars *Poorvaashaadha, Uttaraashaadha, Poorvabhaadrapada, Uttarabhaadrapada, Rohini, Shatabhishak, Aaslesha, Aardra, Swaati* or *Makha* during the months of *Maargaseersha, Pousha, Maagha, Phaalguna, Chaitra* and *Vaisaakha*, will yield rain for 8, 6, 16, 24, 20 and 3 days respectively, after 195 days (XXI, *Garbha Lakshanam*, *slokam* 30).
48. Should there be rain in the lunar mansions beginning with *Poorvaashaadha* after the full moon in the month of *Jyeshtha*, the quantity of rainfall during the rainy season can be judged based on the rainfall during this period. The quantity of rainfall should be gauged on the day ruled by any of the rain-producing asterisms (headed by *Poorvaashaadha* star), when there is rain for the first time, through the amount of rain by which the earth is cleared of dust, or drops of water are made to appear on the tips of blades of grass. Hence, the star in which the initial rainfall occurs during the season is pivotal to determine the prospect of rainfall over the entire season.

    In whichever stars there is rain at the beginning, there will be rain again under the days ruled by the same asterisms (stars) during the rainy season in a year (XXIII, *Pravarshanaadhyaayaha, slokam* 1, 3, 5).

Measurement of Rainfall

The Rainfall in *Brihat Samhita* is calculated and given in terms of an ancient term *Drona*, which literally means 'a pot'.

According to Sage *Paraasara*, who is the author the famous treatise *'Krishi Paraasara'* (here, *krishi* stands for agriculture and in this work, various valuable meteorological predictions and calculations have been incorporated. *Varaaha Mihira* in his *Brihat Samhita* and even its masterful commentator *Bhattotpala*, extensively quote the verses from *Paraasara*), one *Drona* equals in quatity to 200 *Palas*, i.e. mathematically,

1 *Drona* = 200 *Palas*

Since, $1/4^{th}$ of a *Drona* = 1 *Aadhaka*, hence,

I *Drona* = 4 *Aadhakas* and therefore, 1 *Aadhaka* = 200/4 *Palas* = 50 *Palas*

Further, *Paraasara* also states that *Aadhaka* is the capacity of a circular vessel whose diameter is 20 *Angulams* and depth (height) is 8 *Angulams* (A hollow cylinder with a base and open at the top). Here, in ancient times, the length of the finger (mainly thumb) of a medium-sized man was

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considered to be an *Angulam*, as the Sanskrit word itself means 'a finger'.

The modern mensuration treats an *Angulam* as being approximately equal to an inch, considering its value to be just more than $3/4^{th}$ of an inch. Sometimes, an *Angulam* is treated equivalent to 1-3/8 inch (11/8 inch or 1.375 inch).

Paraasara also states that an *Aadhaka* is equal to a volume of 17600/7 cubic *Angulams*.

So,

1 *Aadhaka* = 17600 ÷7 = 2514.28 cubic *Angulams*

Again, *Paraasara* states that an *Aadhaka* is the volume of rain water collected in a circular vessel with diameter 20 *Angulams* and height 8 *Angulams*

We know that the volume of a cylinder is given by the formula $\pi r^2 h$, where,

R= radius of the cylinder = 20/2 *Angulams* = 10 *Angulams* and h = height of the cylinder = 8 *Angulams*

Therefore, Volume = πr^2 (Area of the circular base) x h (height) = 3.1416 x $(10)^2$ x 8 = 2513.28 cubic *Angulams*, which is almost equal to 17600/7 cubic *Angulams*, i.e. 2514.28 cubic *Angulams*. This quantity is equal to one *Aadhaka.*

Varaaha Mihira also categorically states that the quantity of rainfall should be determined with the help of a gauge whose diameter is one cubit. He also declares that when this vessel contains 50 *Palas* of rain water, it will measure one *Aadhaka* (*Brihat Samhita*, Ch. XXIII, *Pravarshanaadhyayaha, Slokam* 2).

One cubit is generally taken to be around 27 inches that is equivalent to 19.6 *Angulams* (taking one *Angulam* = 1.375 inch). If we substitute this value in the formula $\pi r^2 h$, where the radius (r) in this case is about 9.8 *Angulams*, as against *Paraasara's* 10 *Angulams*, then, from this, we have,

Volume = πr^2 h = 3.1416 x 9.8 x 9.8 x 8 = 2413.75 cubic *Angulams*

So, from these, we can easily perceive the striking correlation between *Varaaha Mihira's* and *Paraasara's* calculations in terms of the volume of an *Aadhaka* of rain water.

But, it was found that this volume of rain water (*Aadhaka*) is equal in weight to 11 *OZ Avoir* (Tripathi, 1969).

Normally, 1 *OZ Avoir* = 28.35 gram (approx.)

Hence, 11 OZ Avoir = 28.35 x 11 = 311.85 gram

Therefore, the weight of one *Aadhaka* of rain water = 311.85 gram

We know that in case of water, 1 gram = 1 cubic centimeter, i.e. the weight of one cubic centimeter volume of water is one gram or the volume occupied by one gram water is one cubic centimeter.

In other words, the density of water is represented as $1g/cm^3$ or 1000 kg/m^3. From all these, it can be said that the volume occupied by one *Aadhaka* of rain water is 311.85 cc. Now, the area of a standard modern rain gauge = 200 cm^2.

Hence, volume of 1cm. of rain water (calibrated height scale in the rain gauge) collected in this rain gauge is given by:

Volume = Area x Height = 200 cm^2 x 1 cm = 200 cm^3

Here, in our case, the volume of rain water collected is 311.85 cm^3, which is equal to one *Aadhaka*. Our current task is to derive the equivalent calibrated height in a standard rain gauge of area 200 cm^2.

311.85 cm^3 = 200 cm^2 x Amount of rain water collected (height in cm.)

From this, we get,

Amount of rain water collected (or) the rain gauge reading equivalent to one *Aadhaka* of rainfall = 311.85 ÷ 200 = 1.559 cm

Hence, one *Aadhaka* of rainfall= 1.559 or 1.6 cm, i.e. 16 mm. of rainfall. Since, we have earlier seen that One *Drona* = 4 *Aadhakas*, it can be thus concluded that:

One *Drona* = 4 *Aadhakas* = 4 x 1.6 cm. = 6.4 cm. or 64 mm. of rainfall of the modern rain gauge.

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Such type of conversion was earlier attempted by T.M. Srinivasan, who stated that one *Drona* was nearly equal to 5.1 cm. of rainfall (Srinivasan, 1976). But, this conversion factor was found to be 6.4 cm, as derived above, by a meteorologist H.V. Balkundi (Balkundi, 1999). Hence, the values derived above, shall be entertained in interpreting and analysing the results of the present study.

The Calendar System

Preparation of the Vedic calendar for various ceremonies and of rituals necessitated the study of heavenly bodies and of their movements, and this led to the advancement of astronomical science in India (Prasad, 1980). Hence, it can be apparently mentioned that all these texts like the *Brihat Samhita* and others, which are replete with meritorious gen, have been prepared to identify and assign auspicious times for the performance of various rituals and sacrifices (*Yagnyams*).

In the *Brihat Samhita*, the author *Varaaha Mihira* suggests that the days are to be counted as per the civil or solar calendar. But, the days are identified based on the lunar asterism i.e. the star with which the moon is conjoined during that time. The months are designated depending upon the star with which the Moon's conjunction takes place on the day of *Poornima* (Full Moon).

Traditionally, in India, there have been two systems followed. In the ancient system, the year started with the month of *Maargaseersha*, i.e. during the winter/autumnal season (*Sisira rutu*). In another system that has become popular afterwards, the year starts in the vernal month of *Chaitra,* during the spring time. *Maargaseersha* is considered extremely auspicious by *Hindus* and it represents a transition from the gloomy melancholy of autumn to the mellifluous melody of spring. *Chaitra* has a very congenial climate with a fresh lease of mellowing greenery and floral exquisiteness that appeal to all the people, which also marks a transition from soothing spring to simmering summer.

Moreover, Lord *Krishna* proclaims in The *Bhagavad Geetha* thus: "*Maasanaam Maargaseershoham Rutuunaam Kusumaakaraha*" (The *Bhagavad Geetha*, Chapter X, *Vibhuti Yogaha*, *sloka* 35). This verse means "Among all the months, I am *Margaseersha* and among the seasons, I am the spring (*Vasanta*/*Kusumakara*)". The very word *Maargaseersha* means 'being ahead or at the obverse of the path'. In Sanskrit, *Maargam* means 'path' and *Seersham* stands for 'head', 'top portion' or 'beginning'. Hence, this *Maargaseersha* month is regarded as the beginning of the year, leading the entire annual chronological transit and in the other system, the year starts with the month *Chaitra*, standing as a testimony to the spirit of the fore stated *slokam* in the *Bhagavad Geetha*.

The *Geetha Jayanti* (birthdate of The *Bhagavad Geetha)* is observed on the *Ekaadasi* (11th day) of the *Shukla Paksham* (bright fortnight) of the month of *Maargaseersha* as per the *Hindu* Almanac *Panchangam*. It is believed to be the day on which the Holy Scripture was revealed to the world by *Sanjaya*. (*Sanjaya* is a character in the *Maha Bhaarata*. He is *Dhritarashtra's* (father of the 100 *Kauravas*) advisor and also his charioteer. *Sanjaya* attained the gift of seeing events at a distance which was granted to him by the sage *Vyaasa*, the author of the *Maha Bhaarata*. *Sanjaya* narrates to *Dhritarshtra* the action in the climactic battle of *Kurukshetra*, including the *Bhagavad Geetha*. Hence, in the *Bhagavad Geetha*, verses often start with the Sanskrit words "*Sanjaya uvaacha*:" ("*Sanjaya* said :"). The entire *Bhagavad Geetha* is a recital of *Sanjaya* to *Dhritaraashtra* of the conversation between Lord *Krishna* and *Arjuna* in the epic *Maha Bhaarata*)

In South India, the '*Ama*' *anta* system is followed, i.e. the month begins with the bright fortnight (*Shukla Paksham*) and ends with the 15th (last) lunar day of the dark fortnight (*Krishna* paksham), i.e. *Amaavaasya.* In northern India, the '*Poornima' anta* system is followed (*Anta* in Sanskrit means 'to end'). The month begins with the dark fortnight and ends with the 15th (last) lunar day of the bright fortnight, i.e. *Poornima*. For instance, the year in South India begins with the

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bright fortnight of the month of *Chaitra*, followed by the dark fortnight of *Chaitra*. But, as per the convention in North India, after the bright fortnight of *Chaitra*, the following dark fortnight would be treated as the dark fortnight of *Vaisaakha*, instead of acknowledging it to be the dark fortnight of *Chaitra*.

Hence, a plausible solution to resolve this incongruity is to follow the *Gregorian* calendar dates corresponding to the lunar conjunctions cited in the *Brihat Samhita*.

Places Chosen for the Study

Tirupati

Tirupati is the abode of the richest shrine in the world; that of Lord *Venkateswara* situated in *Chittoor* district of *Andhra Pradesh* state in India, at an average altitude of 182.9 metres above sea level at 13.39^0N latitude and 79.25^0E longitude**.** This is a semi-arid region with prevalent continental type of climate. This temple city is an internationally renowned, spiritual, educational and a buzzing commercial centre surrounded by industrial and agricultural environs.

Tirupati is an integral part of the Rayalaseema region of Andhra Pradesh, which basically has a rocky terrain that abounds in hills and hillocks. Tirupati is surrounded by the *Seshaachalam* hill ranges and other discrete hummocks. (*Sesha* stands for the Great Serpent *Aadi Sesha* on which Lord Vishnu reposes and *Achalam* means 'the immovable', say, a hill, etc., as '*chalam'* in Sanskrit means 'to move'. Hence, '*A – Chalam'* conveys a negative sense, i.e. immovable, generally ascribed to a hill. These *Seshaachalam* hill ranges are said to be the form of Lord *Aadi Sesha*). The word *Tirupati* means 'The Lord of *Lakshmi'*, as in Tamil *Tiru* is the equivalent of *Sri* in Sanskrit signifying Goddess *Lakshmi* and *Pati* means 'Husband or Lord'. Lord *Venkateswara* is hence believed to be the form of Lord *Vishnu*, the husband of Goddess *Lakshmi*, after whom this temple city had been named so.

Broadly, in a year, Tirupati has three distinct seasons: Summer (March-May), Monsoon (July-September), and winter (November-January). February, June and October months are considered to be transition periods with relatively stable weather conditions with sunny days. Geographically, since Tirupati is in proximity to the coastal regions of *Nellore* and *Chennai*, this region receives prominent amounts of rainfall whenever there are cyclonic formations in the Bay of Bengal, off the coast of Chennai and coastal

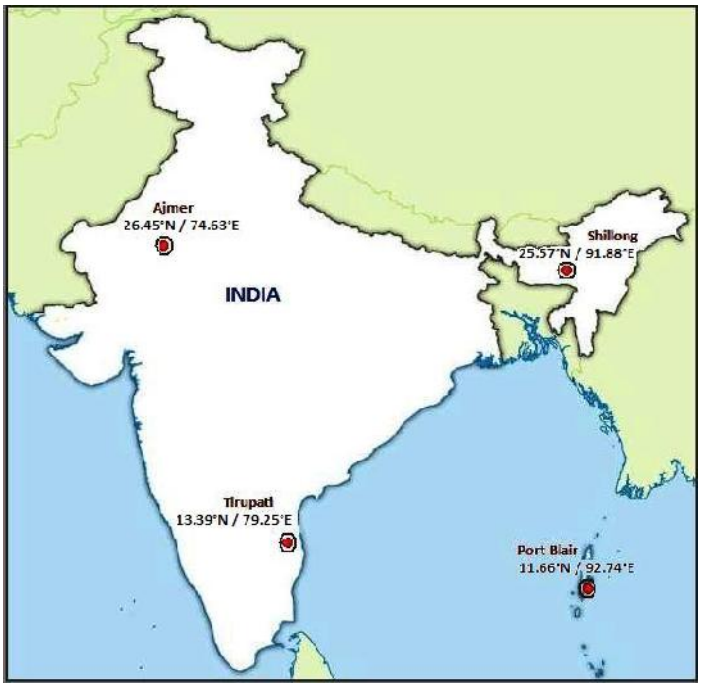

Fig.1. Map showing the location of the four regions chosen for the study

Nellore. Due to this, along with the South-West monsoon, the North-East monsoon (October-December) also brings copious rains to this region. The average annual rainfall of the Tirupati region is around 900 mm. The geographical location of the places chosen for the study has been represented in Fig.1.

Ajmer

Ajmer is a city situated in the state of Rajasthan in India at 26.45^0 N latitude and 74.63^0 E longitude. This place was once known by the name '*Ajayameru'*, meaning 'the invincible *Meru*'. (*Ajaya* or *Ajeya* in Sanskrit means 'the

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invincinble'. In Hindu mythology, *Meru* or *Sumeru* is a golden mountain that is believed to be situated at the centre of the universe and is said to be the axis of the world. It is also supposed to be the abode of Gods). Since this was founded by the *Rajput* chieftain *Ajayapal Chauhan*, he gave this nomenclature to the city after his own name. It is a very popular Islamic pilgrimage centre with the famous *Dargah* (a *Sufi* shrine built over the grave of a revered religious personality) of *Quaja Moinuddin Chisti*, a *Sufi* Saint, which draws people from all over the world.

Temperature is very high in summers and very low in winters. Ajmer has an extreme climate with high climatic variations between the seasons because of its proximity to the *Thar* Desert. Average maximum summer temperature stands at around 38°C and the mean minimum temperature is about 27^{o} C. There is not much of rain in Ajmer even during the monsoons. Ajmer receives 400-500 mm. of precipitation in the rainy season. Hence, Ajmer has a typical desert type of climate throughout the year.

Shillong

Shillong is the capital of *Meghalaya*, one of the 'seven sister' states (North-Eastern states) in India and is the primary homeland of the *Khasi* tribe. The word *Meghalaya* itself means a 'temple or abode of clouds', as in Sanskrit, *Megham* means 'a cloud' and *Aalayam* stands for 'a temple or abode' and moreover, it rains extensively and heavily in Meghalaya, especially in places like *Cherrapunji* (11, 177 mm. of average annual rainfall) and *Mawsynram* (11, 873 mm. of average annual rainfall). The region receives rainfall from both North-East and South-West monsoons as it is situated on the wind-ward side of the *Khasi* hills, which results in even more precipitation due to the phenomenon of 'orographic uplift'. The name *Shillong* originated from "*Leishyllong*", a God who is believed to live on the *Shillong* peak, overlooking the city.

It is the headquarters of the East *Khasi* Hills district and is situated at an average altitude of 4,908 feet (1,496 m) above sea level. The highest point is the *Shillong Peak* situated at 6,449 feet (1,966 m).It is said that the rolling hills around the region reminded the European settlers of *Scotland*. Hence, *Shillong* is also known as 'Scotland of the East'. Since the climate of *Shillong* was cooler than that of the tropical India, it remained the capital of undivided *Assam* until the creation of the new state of *Meghalaya* on 21 January 1972. Then, Shillong became the capital of *Meghalaya* and *Assam* shifted its capital to *Dispur* in *Guwahati* district.

Shillong is located at 25.57°N latitude and 91.88°E longitude. It is positioned on the *Shillong* Plateau, the only principal protruding structure in the entire northern and north-eastern Indian mainland. The city lies at the centre of the plateau and is surrounded by hills, three of which are revered in *Khasi* tradition: *Lum Sohpetbneng*, *Lum Diengiei* and *Lum Shillong*. *Shillong* experiences autumn during the months of September to November and winter reigns from November to March and then, the onset of summer takes place from April to June. Summers in *Shillong* are pleasant and pollution-free with the average temperatures varying from 12° C to 25^{o} C. During winters, the mean temperature varies from 4° C to 12^{o} C. The monsoons arrive in June and it rains almost until the end of August. The average annual rainfall of *Shillong* is placed at about 4,931 mm.

Our author *Varaaha Mihira* also emphatically affirms time and again in *Brihat Samhita* that north-east winds, north-east clouds and north-east direction, on the whole, are exceedingly conducive for copious rainfall in India.

Shillong is located at a distance of 55 km. from *Mawsynram*, the world's wettest place that holds the record for maximum rainfall. Due to its latitude and high elevation Shillong has mild summers and chilly winters, featuring a subtropical highland climate as per *Koppen's climatic classification*. The monsoons arrive in June and it rains almost until the end of August.

(In 1920, *Vladimir Peter Koppen* developed a simple classification system to categorise climates

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based on precipitation and temperature. This *Koppen*'s classification system makes an admirable reference for the purpose of easily conveying different types of climates and related details even to lay men).

Port Blair

Port Blair is the capital of the Indian union territory of *Andaman* and *Nicobar* Islands, which are situated quite far away in the *Bay of Bengal* to the East- South- East of the Indian mainland territory. *Port Blair* is the largest town and a municipal council in the *Andaman* district of the Andaman Islands. It lies on the east coast of the South *Andaman* Island and is the main entry point to the islands. Port Blair is situated at 11.66^0 N and 92.74^0 E.

Port Blair is the headquarters for the Indian district of South *Andaman* and is the local administrative sub-division as well. It serves as a major base for the Indian Navy and the Indian Coast Guard. It is also the headquarters of the Tri Services Command. The place had been named *Port Blair* in the year 1789, to honour Lieutenant *Archibald Blair* of the British East India Company.

Port Blair has a tropical monsoon climate, with a little variation in average temperatures and receives large amounts of precipitation throughout the year. All months except January, February and March receive substantial rainfall. The mean annual temperatures range from 22.5^0 C to 32.5^0 C. Likewise, the mean annual precipitation is substantially high and is observed to be around 3,035 mm.

Thus, the foremost and prime aim of this study is to validate and correlate the invaluable meteorological predictions enshrined in the *Brihat Samhita vis-à-vis* the actual real-time adroit observations over the four regions specified above, that are situated in diverse climatological and geographical zones of India. This has been done by using the daily station-wise surface data over these regions, provided by the National Data Centre (NDC), India Meteorological Department (IMD), Pune, for the period 1993-2003 (*For the years after 2003, there are some sizable data gaps in IMD data, concerning one or more of the above mentioned stations*).

Results and Discussions

Here, in this section of the article, an attempt has been made to compare and assess the degree of validation of the predictions in *Brihat Samhita* with the actual recorded observations over the four Indian stations, viz., Tirupati, Ajmer, Shillong and Port Blair. Among these, many of the tabulations are self-explanatory and in case of the rest, appropriate discussions and analysis have been furnished so as to enable the readers to get hold of a comprehensive picture of the scenario in contention.

I. There will be low rainfall when Venus is situated in Makha star and its four counterparts in the West (Makha, Poorva
II. Phalguni, Uttara Phalguni, Hasta and Chitra), (Table 3).

I. There will be less rain when Venus is situated in Swaati star and it's two counterparts in the East (Swaati, Visaakha and Anuraadha), (Table 4).

II. There will be good rainfall when Venus is situated in Makha star and its four counterparts in the East (Makha, Poorva Phalguni, Uttara Phalguni, Hasta and Chitra), (Table 5).

III. There will be copious rain when Venus is situated in Swaati star and it's two counterparts in the West (Swaati, Visaakha and Anuraadha), (Table 6). From Tables 3-6, it is evident that while the predictions stood significantly corroborated for significant number of episodes. But, at the same time, there were also instances during which there was low to very rainfall when copious rainfall was predicted and *vice versa*.

IV. It was also predicted that with Venus rising or setting on 8^{th}, 14^{th} or the 15^{th} day (Amaavaasya) of the dark fortnight, there may be good rainfall in the region.

In the case of this prediction, interestingly, during many instances, there was no rainfall

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before and after the period specified in Table 7. It rained promptly during this specific period in majority of the instances. Barring a few cases where there was no rainfall or very negligible rainfall (below 1 mm.), the 3-day period of occurrence of the above astrological phenomenon experienced good rainfall as per the prediction. The absence of rain during the preceding and the following days raises its significance remarkably.

Table 3. Rainfall when Venus is situated in *Makha* star and its four counterparts in the West

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
August 3- Sept.25, 1992	122.4	71.4	227.4	759.6
June 26- September 8, 1994	337.5	391.8	423.8	1620.3
August 22- Oct.11, 1995	110.8	190.4	513.1	747.7
August 4 – September 12, 1997	111.0	340.3	442.5	636.4

Table 4. Rainfall when Venus is situated in *Swaati* star and its two counterparts in the East

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
Sept. 25- Oct.28, 1992	118.8	4.8	325.7	228.3
Sept. 8 – Oct. 31, 1994	255.3	19.8	296.4	572.3
Oct.11 – Nov.12, 1995	263.6	0.2	113.8	465.2
Sept.11 – Oct. 18, 1997	176.6	159.7	221.5	379.1
Nov.27, 1998 to Jan. 6, 1999	223.9	0.8	0.0	37.8

Table 5. Rainfall when Venus is situated in *Makha* star and its four counterparts in the East

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer rainfall (mm)	Shillong rainfall (mm)	Port Blair rainfall (mm)
Aug. 18 – Nov. 9, 1993	790.8	117.1	428.7	910.3
Aug. 30 – Sept. 2, 1995	3.8	1.0	2.9	16.7
Sept. 28 – Nov. 24, 1996	447.7	0.2	379.8	779
Aug. 23 – Nov. 9, 1998	660.6	326.6	821.7	1047.8
Sept. 27 – Dec. 1, 1999	411	36.6	430.2	550.7

Table 6. Rainfall when Venus is situated in *Swaati* star and its two counterparts in the West

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port- Blair Rainfall (mm)
Nov. 9 – Dec. 11, 1993	384.8	1.0	10.8	212.8
Nov. 4, 1994 to Jan. 17, 1995	392.1	6.1	44.5	165.9
Nov. 23 – Dec. 26, 1996	547.7	0.0	No Data	258.9
Nov. 14 – Nov. 26, 1998	1.4	0.0	81.8	128.8

Table 7. Rainfall when Venus rises or sets on 8th, 14th or the 15th day of the dark fortnight

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port- Blair Rainfall (mm)
July 25 – 27, 1995	No Data	84.8	16.5	122.0
September 23-25, 1995	0.0	0.0	52.0	13.9
June 14 - 16, 1996	254.0	4.4	6.3	69.4
April 29 – May 1, 1997	0.0	23.2	32.2	5.6
August 10 - 12, 1999	0.1	0.6	33.8	1.7
November 3 - 5, 2002	23.6	0.0	No Data	8.7

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Table 8. Rainfall When Saturn is in advance of Venus

Time of Occurrence during the period of Study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port-Blair Rainfall (mm)
Mar. 25 – Apr. 14, 1995	2.2	0.6	9.2	5.0
Nov. 23, 1995 – Feb. 2, 1996	48.0	0.0	24.3	143.5
May 13 – 29, 1998	0.0	0.0	75.1	332.4
Mar. 18 – 20, 1999	0.0	0.0	0.0	0.0
May 19, 2000	0.0	0.0	8.4	24.9
June 16 – July 13, 2001	27.4	155.1	No Data	236.1

Table 9. Rainfall when Mars marches ahead of Venus

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
April 22 – June 22, 1997	87.0	162.3	446.8	385.4
June 6 – August 4, 1998	106.3	226.6	645.1	934.3
March 21 – August 21, 1999	164.1	317.5 (156.1 mm on a single day on July 31, 1999)	1706.2	1537
June 13 – June 21, 2000	0.6	11.7	121.7	47.3
March 18 – May 10, 2002	0.0	0.0	No Data	102.1

Table 10. Rainfall when Jupiter is ahead of Venus

Time of Occurrence during the period of study	Tirupati Rainfall (mm)	Ajmer rainfall (mm)	Shillong Rainfall (mm)	Port- Blair Rainfall (mm)
Oct. 12 – Dec. 24, 1997	766.1	30.7	65.6	384.8
Mar. 28 – Apr. 22, 1998	0.0	6.8	199.6	0.0
May 10 – 19, 2000	1.4	15.8	83.1	258.4
July 15 – August 6, 2001	47.1	86.6	No Data	257.6
May 10 – June 5, 2002	129.6	18.8	No Data	530.9

Table 11. Rainfall when Mercury is situated in advance of Venus

Period of Occurrence	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
Apr. 18 – May 16, 1993	0.4	0.0	338.1	62.3
July 15 – Aug. 30, 1993	211.8	115.3	346.2	608.2
Dec. 25, 1993 to Jan. 1, 1994	0.0	0.0	0.0	8.0
Oct. 22 – Dec. 15, 1994	399.9	1.1	30.1	172.8
Mar. 25 – April 15, 1995	2.2	0.6	25.2	14.0
June 5 – 19, 1995	45.0	0.0	537.8	545.1
July 22 – 28, 1995	No Data	176.6	30.9	125.9
Aug. 27 – Sept. 29, 1995	69.3	172.4	451.5	488.7
Oct. 31 – Nov. 29, 1998	327.8	0.5	87.5	251.1
Nov. 17, 1999 to Jan. 16, 2000	243.3	0.0	3.8	223.3
June 22 – July 2, 2000	65.1	10.0	309.6	154.8
April 10 – 19, 2001	59.9	0.0	No Data	0.0
Oct. 14 – Dec. 5, 2001	435.2	4.8	No Data	340.6
Jan. 15 – Jan. 29, 2002	1.0	0.0	No Data	0.0
June 5 – July 4, 2002	88.9	499.3	No Data	316.4
Nov. 5 – 15, 2002	125.1	0.0	No Data	187.9
Jan. 11 – Mar. 23, 2003	32.6	42.4	No Data	0.3

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Table 12. Rainfall When Jupiter and Venus are aligned in the Sama Saptakam mode

Time of Occurrence during the Period of Study	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
Mar. 24 – May 30, 1993	117.5	10.6	510.6	277.5
June 5 – June 30, 1995	140.8	57.7	630.5	718.0
May 3 – June 4, 1996	12.4	13.9	159.1	229.3
July 30 – Aug. 29, 1996	218.0	209.8	267.8	437.6
June 23 – July 15, 1997	37.1	17.7	505.4	535.5
Sept. 11 – 25, 1998	35.6	135.8	154.1	226.3
Dec. 1 – 26, 1999	41.2	0.0	3.0	193.2
Oct. 13 – Nov. 7, 2000	31.5	0.0	178	136.9
Dec. 20 – Jan. 14, 2002	0.0	16.2	No Data	78.6
Feb. 25 – March 23, 2003	32.6	0.0	No Data	0.0

Table 13. Rainfall during the time of eclipses in various months

October 24, 1995	*Kaarthikam*	Plenty of food and happiness, i.e. good rainfall	280.7 (13.0 mm of rainfall on October 24)	0.2 (No rainfall on October 24)	36.3 (Insufficient Data with gaps)	427.4 (No rainfall on October 24)
February 26, 1998	*Phaalgunam*	Harmful to crops i.e. no adequate rainfall	0.0	10.5 (No rainfall on February 26)	26.7 (0.2mm of rainfall on February 26)	0.0
June 21, 2001	*Vaisaakham*	There would be good crops in the land, i.e. satisfactory rainfall	30.5 (0.6 mm. of rainfall on June 21)	108.8 (No rainfall on June 21)	No Data	358.7 (No rainfall on June 21)
December 14, 2001	*Maargaseersham*	Leads to some good rainfall	143.9 (No rainfall on December 14)	0.0	No Data	79.2 (6.3 mm. of rainfall on December 14)
June 10, 2002	*Jyeshtham*	Crops will be harmed; there may be some spells of rainfall, adversely affecting the crops	100.2 (No rainfall on June 10)	472.8 (412.3 mm of rainfall on the day of eclipse itself)	No Data	479.4 (6.3 mm. of rainfall from June 10^{th} - 11^{th})
December 4, 2002	*Maargaseersham*	Leads to some good rainfall	73.6 (No rainfall on December 4)	0.0	No Data	182.7 (35.7 mm. of rainfall on December 4)

Table 14. Rainfall during the conjunction of Mercury and Venus

Date of Actual occurrence during the period of study	Tirupati Rainfall during the period of conjunction (mm)	Ajmer Rainfall during the period of conjunction (mm)	Shillong Rainfall during the period of conjunction (mm)	Port Blair Rainfall during the period of conjunction (mm)
April 18 – 19, 1993	38.6	8.6	85.6	0.8
November 14, 1993	234.4	1.0	9.8	69.9
December 27, 1993	38.9	0.0	No Data	8.0
February 16, 1994	5.4	0.0	No Data	0.0
November 14, 1994	100.9	0.0	5.1 (Insufficient data with gaps)	0.0
June 19, 1995	45.0	41.6	419.7	217.1
July 22, 1995	No Data	136.5	50.0	216.0
September 29, 1995	2.5	1.9	72.6	37.9

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Table 14. Rainfall during the conjunction of Mercury and Venus (**Continued…**)

Date of Actual occurrence during the period of study	Date of Actual occurrence during the period of study	Date of Actual occurrence during the period of study	Date of Actual occurrence during the period of study	Date of Actual occurrence during the period of study
June 23, 1996	11.9	154.7	234.3	485.6
January 13, 1997	120.4	0.0	7.0	0.0
April 23, 1997	3.2	0.0	100.1	1.0
February 17, 1998	0.0	0.0	1.5	0.0
August 27, 1998	60.7	107.6	269.7	46.3
September 13, 1998	13.8	77.3	117.8	155.1
November 29, 1998	10.5	0.0	77.6	13.2
March 17, 2000	0.0	3.8	16.1	0.0
April 28, 2000	10.7	1.6	99.4	180.6
July 2, 2000	48.0	22.0	82.0	213.7
April 10, 2001	56.9	0.0	No Data	0.0
October 30, 2001	18.8	0.0	No Data	102.1
November 3, 2001	63.6	0.0	No Data	25.1
January 26, 2002	1.0	0.0	No Data	0.0
November 4, 2002	51.2	0.0	No Data	210.9

Table 15. Rainfall during the conjunction of Mercury and Jupiter

Date of Actual Occurrence	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port- Blair Rainfall (mm)
August 26, 1993	82.4	0.2	82.8	125.5
November 28, 1994	1.0	0.0	17.8	150.5
December 8, 1995	0.0	0.0	No Data	5.3
February 13, 1997	0.0	0.0	0.2	0.0
March 25, 1998	0.0	0.1	90.0	0.0
May 3, 1999	9.5	0.0	105.3	98.3
May 9, 2000	8.6	35.9	30.5	183.7
May 17, 2001	7.6	0.0	No Data	380.8
June 19, 2001	5.3	0.0	No Data	37.3
July 13, 2001	57.4	48.9	No Data	98.9
July 24, 2002	42.5	26.0	No Data	103.0

Table 16. Rainfall when Jupiter is conjoined with Venus

Date of Actual Occurrence	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
November 8, 1993	292.6	0.0	15.5	0.0
September 29, 1994	18.2	0.0	73.9	24.5
February 6, 1997	0.0	0.0	4.0	0.0
April 24, 1998	6.4	15.2	123.5	0.0
February 25, 1999	0.0	0.0	0.6	0.0
May 18, 2000	2.4	7.8	167.1	258.0
August 6, 2001	19.4	86.4	No Data	199.3 (87.2 mm. on August 6)
June 5, 2002	37.8	431.1	No Data	196.2

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Table 17. Rainfall during the conjunction of Mars and Saturn

Date of Actual Occurrence	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port- Blair Rainfall (mm)
March 22, 1996	0.0	0.0	0.1	0.0
April 3, 1999	0.0	0.0	1.2	10.5
May 5, 2002	0.0	0.0	No Data	1.2

Table 18. *Aardra Kartari* time rainfall during the period of study

Aardra Kartari Period	Tirupati Rainfall (mm)	Ajmer Rainfall (mm)	Shillong Rainfall (mm)	Port Blair Rainfall (mm)
June 21 – July 5, 1993	33.0	56.4	385.4	162.3
June 22 – July 6, 1994	130.0	88.5	105.7	265.4
June 22 – July 6, 1995	129.4	57.7	258.9	204.8
June 21 – July 5, 1996	16.6	136.4	376.7	544.6
June 21 – July 5, 1997	15.1	16.6	239.0	267.4
June 22 – July 6, 1998	82.3	125.3	34.3	358.7
June 22 – July 6, 1999	34.8	13.9	213.2	43.5
June 21 – July 5, 2000	96.1	22.0	370.3	220.6
June 21 – July 5, 2001	4.6	108.8	No Data	196.2
June 22 – July 6, 2002	10.2	60.0	No Data	63.7

Table 19. Tirupati rainfall as perceived from the perspective of *Aashaadha Poornima* wind effect

Date of occurrence of *Aashaadha Poornima*	Observed Wind Direction over Tirupati Region	Predicted Effect	Tirupati rainfall during the season (mm)
July 15, 1992	South-West	Famine and drought in the region	346.6
July 5, 1993	West	Earth is endowed with rich crops with copious rainfall	1023.3
July 23, 1994	South-West	Famine and drought	682.9
July 13, 1995	No Data	-	475.5
July 30, 1996	No Data	-	800.3
July 20, 1997	West – North- West	Splendid crops with good rainfall	606.6
July 9, 1998	South-West	Famine and drought	678.4
July 28, 1999	West	Earth is endowed with rich crops	433.9
July 16, 2000	West	Earth is endowed with rich crops	346.3
July 6, 2001	West-North-West	Splendid crops with good rainfall	854.4
July 25, 2002	South – South-East	Sparse rainfall with intensive heat-wave conditions	537.4

Table 20. Ajmer rainfall as perceived from the perspective of *Aashaadha Poornima* wind effect

Aashaadha Poornima Date	Observed Wind Direction over Ajmer Region	Predicted Effect	Ajmer rainfall during the season (mm)
July 15, 1992	South	Very Sparse Rainfall	No Data
July 5, 1993	West	Earth is endowed with rich crops	170.1
July 23, 1994	South- West	Famine and drought in the region	189.9
July 13, 1995	North- East	Plenteous rain with rich crop yield	640.1
July 30, 1996	West	Earth is endowed with rich crops	325.5
July 20, 1997	South- West	Famine and drought in the region	488.4
July 9, 1998	South – West	Famine and drought in the region	213.0
July 28, 1999	South – West	Famine and drought in the region	66.5
July 16, 2000	South – West	Famine and drought in the region	31.3
July 6, 2001	South – West	Famine and drought in the region	176.9
July 25, 2002	South – West	Famine and drought in the region	100.0

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Table 21. Shillong rainfall as perceived from the perspective of Aashaadha Poornima wind effect

***Aashaadha Poornima* Date**	**Observed Wind Direction over Shillong**	**Predicted Effect**	**Shillong rainfall during the season (mm)**
July 15, 1992	Calm	-	614.3
July 5, 1993	South – West	Famine and drought in the region	511.5
July 23, 1994	South – East	Sparse rainfall with intensive heat-wave conditions	474.5
July 13, 1995	South – South - West	May be sparse rainfall conditions	861.7
July 30, 1996	North – East	Plenteous rain with rich crop yield	658.2
July 20, 1997	North – West	Splendid crops with torrents of rain	703.2
July 9, 1998	South – West	Famine and drought in the region	998.7
July 28, 1999	South – West	Famine and drought in the region	837.3
July 16, 2000	South – East	Sparse rainfall with intensive heat-wave conditions	840.0
July 6, 2001	Calm	-	No Data

Table 22. Port Blair rainfall as perceived from the perspective of *Aashaadha Poornima* wind effect

***Aashaadha Poornima* Date**	**Observed Wind Direction over Port Blair**	**Predicted Effect**	**Port- Blair rainfall (mm)**
July 15, 1992	South – West	Famine and drought in the region	1206.7
July 5, 1993	West – South –West	May be copious rains owing to the predominant influence of the West direction	1553.2
July 23, 1994	West	Earth is endowed with rich crops	1332.9
July 13, 1995	South – South - West	May be sparse rainfall conditions	1388.9
July 30, 1996	West – South – West	May be copious rains owing to the predominant influence of the West direction	1631.7
July 20, 1997	South – West	Famine and drought in the region	1272.8
July 9, 1998	South – West	Famine and drought in the region	1162.3
July 28, 1999	South – West	Famine and drought in the region	1179.6
July 16, 2000	West – South – West	May be copious rains owing to the predominant influence of the West direction	1199.5
July 6, 2001	West	Earth is endowed with rich crops	1329.7
July 25, 2002	West – North –West	Splendid crops with good rainfall	997.0

Table 23. Tirupati rainfall from the perspective of Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*

Date of the Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*	**Tirupati Rainfall on the day (mm)**	**Tirupati Rainfall during the season (mm)**
July 19, 1992	0.0	346.6
July 9, 1993	10.8	1023.3
July 27, 1994	2.7	682.9
July 17, 1995	No Data	475.5
August 3, 1996	0.0	800.3
July 24, 1997	5.7	606.6
July 13, 1998	3.2	678.4
August 1, 1999	0.0	433.9
July 20, 2000	0.0	346.3
July 10, 2001	0.6	854.4
July 29, 2002	13.4	537.4

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Table 24. Ajmer rainfall from the perspective of Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*

Date of the Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*	**Ajmer Rainfall on the day (mm)**	**Ajmer Rainfall during the season (mm)**
July 19, 1992	No Data	No Data
July 9, 1993	54.1	170.1
July 27, 1994	3.5	189.9
July 17, 1995	0.6	640.1
August 3, 1996	0.0	325.5
July 24, 1997	0.4	488.4
July 13, 1998	0.0	213.0
August 1, 1999	24.5	66.5
July 20, 2000	0.0	31.3
July 10, 2001	0.0	176.9
July 29, 2002	0.0	100.0

Table 25. Shillong rainfall from the perspective of Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*

Date of the Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*	**Shillong Rainfall on the day (mm)**	**Shillong Rainfall during the season (mm)**
July 19, 1992	8.2	614.3
July 9, 1993	1.9	511.5
July 27, 1994	3.4	474.5
July 17, 1995	0.1	861.7
August 3, 1996	No Data	658.2
July 24, 1997	16.2	703.2
July 13, 1998	17.9	998.7
August 1, 1999	7.4	837.3
July 20, 2000	0.2	840.0
July 10, 2001	No Data	No Data
July 29, 2002	No Data	No Data

Table 26. Port Blair rainfall from the perspective of Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*

Date of the Lunar Conjunction with *Poorvaabhaadra* after *Aashaadha Poornima*	**Port Blair Rainfall on the day (mm)**	**Port Blair Rainfall during the season (mm)**
July 19, 1992	3.2	1206.7
July 9, 1993	2.8	1553.2
July 27, 1994	0.7	1332.9
July 17, 1995	7.4	1388.9
August 3, 1996	5.3	1631.7
July 24, 1997	5.9	1272.8
July 13, 1998	1.5	1162.3
August 1, 1999	25.5	1179.6
July 20, 2000	0.0	1199.5
July 10, 2001	0.2	1329.7
July 29, 2002	0.1	997.0

Table 27. Rainfall under various cloud directions in Ajmer

AJMER	**CLOUD DIRECTION**							
	NE	**E**	**SE**	**S**	**SW**	**W**	**NW**	**N**
1992	47.8	21.6	0	0	0	0.1	0	0
1993	0	0	54.9	0	96.7	0	0	0
1994	0.8	0	20.3	22.1	29.3	73.8	0	0
1995	0	0	0	34.5	89.2	56.1	0	16.1
1996	0	0	0	19.3	171.6	53.7	0	0
1997	0	0	0	183.6	38.3	0	0	0
1998	0	0	0	0	0	14.7	0	0
1999	0	0	0	0	6.2	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	18.3	31.9	0
2002	0	0	0	0	0	0	0	0

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Table 28. Rainfall under various cloud directions in Tirupati

TIRUPATI	CLOUD DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	285	16.6	64.2	81.8	94.4	72.9	9.5	95.2
1993	695	11.7	5.4	42	336.6	211.7	70	41.8
1994	337.8	44.8	54.8	74.4	437.4	50.2	27.2	60.4
1995	200.6	3.8	4.8	44	83.2	8.8	62.2	0
1996	343.9	0	0	0	12.7	298.7	104.2	111.3
1997	452.3	0	0	0	0	0	23.6	108.7
1998	262	0	0	6.9	4.4	0	0	100.7
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0

Table 29. Rainfall under various cloud directions in Shillong

SHILLONG	CLOUD DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	19.9	0	0
1994	0	0	0	0	0	0	3.3	0
1995	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0.3	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	--	--	--	--	--	--	--	--

Table 30. Rainfall under various cloud directions in Port Blair

PORT BLAIR	CLOUD DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	2.5	0	0	110.8	125.9	2.8	3.2	3
1993	0	58.2	0.8	0	1168.9	19.9	0	0
1994	5.2	55.4	27.2	51.9	497.6	947.8	67.7	0
1995	5.9	49.6	107.5	215.7	664.2	136.5	26.6	7.2
1996	41.4	256.6	134.7	72.7	1353.1	361.4	0	0
1997	20.3	42.7	90.9	18.2	2048.8	145.9	0	0
1998	7.5	76.9	41.8	136.8	1149.2	150.2	7.6	22.7
1999	135.6	244.6	44.2	63.5	1096.9	401.4	19.3	0
2000	33.3	52.2	39.5	1.6	511.9	478.9	2.2	9.8
2001	54.5	102.8	19.3	20.1	1199.2	320.3	22.6	32.5
2002	39.3	220.4	71.3	34.7	766	773.2	0	0

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Table 31. Rainfall under various wind directions in Ajmer

AJMER	WIND DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	61.2	0	0	0	5.8	0.1	4	0.8
1993	7.2	4.7	24.6	50.4	219.3	136.2	6.7	47.8
1994	78.3	6	84.7	27.4	162.8	15	48.4	3.1
1995	2.4	0	0	73	337.5	104.5	43.5	56.1
1996	10.4	21.2	0	115	248.3	153.1	5.5	3.1
1997	94.5	0	22.8	239.3	193.8	59.7	0.3	116.4
1998	31.8	7.6	9.9	62.9	89.3	40.2	13.3	94.8
1999	8	0	0	20	219.5	15.6	2.6	41.8
2000	0	0	0	16.5	182.9	31	3.6	0
2001	0	0	0	0	177.9	37.8	0.2	31.9
2002	1	0	0	2.6	179.5	467.6	35.4	13.2

Table 32. Rainfall under various wind directions in Tirupati

TIRUPATI	WIND DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	148	0	61.4	33.2	71.8	12.5	9.4	53.3
1993	354.5	11.7	12.6	123.6	159.6	14.4	56	0
1994	146.6	7.6	15	72.3	142.3	32	50.6	96.6
1995	298.2	7.2	4.8	43.6	49.4	78.5	12.9	38.4
1996	327.1	5.7	0	0	25.8	301	58.2	118
1997	269.2	80.9	14.9	40.5	62	17	25.7	42.3
1998	307.7	53.1	6	36	56.2	0	127.7	4.2
1999	134.5	22.8	34.7	45	3.5	14.7	36.6	5.1
2000	145.5	15.1	6.3	3.6	71.4	85.2	36.4	15.1
2001	199.2	137.5	11.2	0	137.5	24.2	100.3	118.9
2002	121.9	42.1	3.4	0.2	34.4	45.6	111.9	73.3

Table 33. Rainfall under various wind directions in Shillong

SHILLONG	WIND DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	0	0	117.5	92	479.2	173.8	19.4	8.5
1993	3.1	19	53.5	236.2	718.9	356.6	162.7	32.3
1994	30.1	3.9	120.4	216.6	234.1	442.5	131.1	15.9
1995	25.5	75.4	102.8	204.4	709.3	210.6	244	70.5
1996	2.2	26.1	65.7	88.2	440.1	124	288.3	12
1997	6	46.8	118.2	236.1	365.5	283.3	157.9	4.4
1998	49.9	12.7	78.5	84.5	664.9	319.6	118.5	89
1999	10	3.2	35.6	87.4	803.5	142	95.6	1.5
2000	calm	calm	186.8	29.9	777.3	203.5	79.3	14.9

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Table 34. Rainfall under various wind directions in Port Blair

PORT BLAIR	WIND DIRECTION							
	NE	E	SE	S	SW	W	NW	N
1992	3.3	56.8	156.6	85.7	1648.2	29	154.3	0
1993	130.6	58.1	17.6	0.7	1130.3	296.5	118.1	1.2
1994	18.5	135.2	27.5	111.4	235.3	995	580.7	0.6
1995	111.7	60.9	85.1	150.6	1462.3	155.9	12	29.2
1996	211.6	113.2	107.1	59.6	878.4	391.9	62.2	0
1997	16.4	95.6	37.4	107.6	1256.4	235.1	1.5	4.2
1998	0	94.5	23.4	152.2	1027	492.1	55.1	22.7
1999	7.5	209.2	2.5	108.5	510.5	527.4	9.7	37.5
2000	106.3	5	1.2	11.3	393	452.3	258	0
2001	7.4	100	85.2	104.7	816	533.6	46.6	0
2002	54.1	184.8	71.9	74.9	463.4	668.1	53	1.3

Table 35. Table showing initial day of rainfall after the first cloud foetus completes its complete gestation period of 195 days

195-day gestation period of the initial cloud foetus as per the *Brihat Samhita*	Initial day of seasonal rainfall in Tirupati (mm)	Initial day of seasonal rainfall in Ajmer (mm)	Initial day of seasonal rainfall in Shillong (mm)	Initial day of seasonal rainfall in Port Blair (mm)
Nov. 27, 1992 – June 9, 1993	July 2	June 15	Consistently raining from April	May 11
Dec. 16, 1993 – June 28, 1994	June 30	June 24	Consistently raining from April	April 28
Dec. 5, 1994 – June 18, 1995	June 15	June 22	Consistently raining from April	May 8
Nov. 25, 1995 – June 6, 1996	June 10	June 12	Consistently raining from May	April 20
Dec. 13, 1996 – June 26, 1997	June 4	May 1	Consistently raining from April	May 16
Dec. 3, 1997 – June 16, 1998	Insufficient Data	June 7	Consistently raining from April	May 10
Nov. 22, 1998 – June 4, 1999	May 24	June 12	May 5	Consistently raining from April
Dec. 10, 1999 – June 22, 2000	May 25	July 1	Consistently raining from April 10	April 25
Nov. 28, 2000 – June 10, 2001	June 3	June 26	No Data	April 30
Dec. 17, 2001 – June 29, 2002	June 4	June 10	No Data	May 10

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Table 36. Dates when rainfall exceeded 8 mm. over Tirupati and its consequential rainfall after the specified period

Period of Generation of Cloud Foetuses	Day when Rainfall Exceeded 8mm over Tirupati	Rainfall (mm)	Rainfall after the Period of Cloud Foetus Formation (mm)
Nov. 27 1992 - Apr. 21, 1993	Feb 21	35	4.4
	Mar 2	20	0
	Apr 15	38.6	0
Dec 16, 1993 - May 10, 1994	Dec 21	8.5	0
	Dec 22	28.4	25.4
	May 4	13.6	0
Dec. 6, 1994 - Apr. 29, 1995	Dec 20	68	No Data
	Dec 21	16.9	No Data
	Dec 22	14.6	No Data
	Jan 8	11.2	No Data
	Jan 16	16.6	No Data
	Jan 17	49.2	No Data
	Jan 18	10.5	0
	Feb 19	38.4	0
Nov. 25, 1995 - April 17, 1996	Rainfall less than 8mm		
Dec. 13, 1996 - May 6, 1997	Dec 13	110.7	0
	Dec 14	62.9	6.8
	Dec 15	45.1	0
	Jan 8	50.9	0
	Jan 9	59.4	1.4
	Jan 11	8.6	0
	Apr 4	18.6	0
	Apr 5	42.5	17.2
	May 6	22.6	40.9
Dec. 3, 1997 - Apr. 26, 1998	Dec 5	10.8	No Data
	Dec 6	33.9	No Data
	Dec 7	41.9	No Data
	Dec 10	10.9	No Data
	Dec 12	11.4	No Data
Nov. 22, 1998 - May 16, 1999	Dec 1	9.8	1
	Dec 10	63.2	0
	Dec 11	24.8	0
	Dec 12	103.8	0
	Dec 13	20.5	0
	May 4	9.5	0
	May 11	12.4	24.4
	May 13	23	0.5
Dec. 10, 1999 - May 4, 2000	Dec 22	24.4	12.4
	Dec 23	16.3	12.8
	Feb 21	9.8	0
	Feb 26	9.7	0
Nov. 28, 2000 - April 23, 2001	Nov 29	14.4	5.4
	Nov 30	65.9	3
	Dec 2	14.1	0.5
	Dec 4	24.5	0
	Dec 30	34.8	21
	Dec 31	51.6	15
	Apr 13	21.6	14.3
	Apr 14	23.4	0
	Apr 15	9.9	1.3
Dec. 17, 2001 - May 12, 2002	Dec 21	22.1	0
	Dec 22	49.7	0
	Dec 26	46.6	0

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Table 37. Dates when rainfall exceeded 8 mm. over Ajmer and its consequential rainfall after the specified period

Period of Generation of Cloud Foetuses	Day when Rainfall Exceeded 8mm over Ajmer	Rainfall (mm)	Rainfall after the Period of Cloud Foetus Formation (mm)
Nov. 27 1992 - Apr. 21, 1993	Rainfall less than 8mm	--	--
Dec 16, 1993 - May 10, 1994	Jan 11	8.3	3.8
Dec. 6, 1994 - Apr. 29, 1995	Feb 14	11.1	35.2
Nov. 25, 1995 - April 17, 1996	Rainfall less than 8mm		
Dec. 13, 1996 - May 6, 1997	May 1	23.2	0
	May 3	12.5	0
	May 4	14.3	0
	May 5	20	0
Dec. 3, 1997 - Apr. 26, 1998	Rainfall less than 8mm	--	--
Nov. 22, 1998 - May 16, 1999	Rainfall less than 8mm	--	--
Dec. 10, 1999 - May 4, 2000	Rainfall less than 8mm	--	--
Nov. 28, 2000 - April 23, 2001	Rainfall less than 8mm	--	--
Dec. 17, 2001 - May 12, 2002	Feb 11	14.4	0

V. When Saturn is in advance of Venus, it causes vitiation of wind and sparse rainfall conditions prevail

One can readily infer from Table 8 above that this particular prediction stands thoroughly validated even more so because Shillong and Port Blair experience consistent as well as copious rains during the lion's share of the year. Keeping in view this consideration, the above predicted stands authenticated to a great extent.

VI. Should Mars march ahead of Venus, then there will be prevalent famine and drought

Tirupati and Ajmer comply noticeably to the predictions, while Shillong experienced copious rainfall during almost all instances, except in 2000. Port Blair witnessed good rainfall during 1998 and 1999 and moderate rainfall in 1997. The years 2000 and 2002 received less rainfall, making Port Blair a 'Mixed Bag' as far as this particular prediction is concerned (Table 9).

VII. When Jupiter is ahead of Venus, there will be plenty of hail stone rains. The autumnal crops will flourish as a result of some satisfactory rainfall.

In this case, Tirupati received very good rainfall during 1997 (766.1 mm) and moderate rain of 129.6 mm in 2002. The other 3 instances saw low rainfall. The rainfall in Ajmer was predominantly on the lower side throughout, except during 2001 (86.6 mm). The rainfall in Shillong was under par during this period. But, Port Blair had normal spells of rain as per its standards with one exception during 1998, where there was not even a drop of rainfall in the region. On the whole, there was low to normal rainfall in the four regions (Table 10).

VIII. When Mercury, while rising or setting, is situated in advance of Venus, there will be plentiful rainfall and abundant summer-crop yield.

Pertaining to this prediction, over Tirupati, in 11 out of 17 instances, there was considerable rainfall during the periods specified in Table 11. Likewise, 6 out of 11 instances (no data available during other 6 periods) in Shillong seem to coincide with the prediction. Port Blair was qualitatively placed beside Tirupati with almost 12 predictions in agreement with the forecast. Ajmer was reluctant to conform to the prediction, with only 5 of 17 episodes correlating themselves with the spirit of this prediction.

IX. When Jupiter and Venus are aligned in the Sama Saptakam mode (Venus and Jupiter are situated in 7^{th} house from each other on a

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mutual 1-7 axis), there will be very scarce rainfall.

During the mutual 1-7 alignment of Jupiter and Venus, there are only 3 out of 10 instances in Tirupati that differed strikingly with the prediction, with 7 of them in significant agreement. In Ajmer, as many as 8 instances out of 10 coincided with the forecast. Out of 8 valid episodes in Shillong, only one was in healthy association with the prediction, i.e. during 1999. In case of Port Blair, only 2002 and 2003 are positively concomitant with the prediction. Therefore, it is quite obvious from Table 12 that Titupati and Ajmer fared very well with this prediction as against Shillong and Port Blair.

X. Now, we compare the predictions pertaining to effect of solar eclipses (*Raahu's* course) with real-time recorded data. The year starts from the month of *Kaarthika* or *Maargaseersha*, as explained earlier under 'The Calendar System'. Here, we consider the total rainfall during the month in which the eclipse has occurred, going by the predictions made on the same lines. Most of the recorded rainfall values during eclipses accorded with the predicted effects during the respective months of occurrence (Table 13).

XI. There will be rain during the period of the conjunction of Mercury and Venus

Here**,** the total rainfall during the day of conjunction and during some days prior and after the conjunction has been considered, as the influence of a conjunction starts a few days before the real conjunction and lasts till some days after the actual conjunction occurs.

On the whole, among the 92 instances of Mercury - Venus conjunction, there was no rainfall during 21 instances. Besides, there were 8 instances of non-availability of data and one instance of insufficient data (Table 14). Hence, it can be concluded that 62 instances experienced rainfall and 30 of them stood invalid for reasons specified above. It is noteworthy that during many instances it rained exactly during this period of conjunction when there was no rain during the preceding and the following days.

XII. The conjunction of Mercury and Jupiter augurs rainfall

From Table 15, out of the 44 instances, during 11 instances, there was no rainfall at all, while there were 5 episodes of absence of records. Hence, 28 occurrences were accompanied by rainfall.

XIII. Rainfall occurs when Jupiter is conjoined with Venus.

On the consummate, when Jupiter is conjoined with Venus, 10 cases out of 32 went without any rainfall. There was no data for the years 2001 and 2002 over Shillong. In total, 20 events witnessed rainfall under this phenomenon during the period of study (Table 16).

XIV. The conjunction of Mars and Saturn will not prove beneficial for rainfall

This prediction was excellently effective during the period of study, as is predominantly palpable from Table 17. All the instances over all the four stations recorded very scarce rainfall, with Tirupati and Ajmer perfectly abiding by the prediction.

XV. The Sun's entry in Aardra star usually befalls towards the end of the third week of May and his stay in this star for 13-14 days till the end of the first week of June, experiences copious rainfall undoubtedly.

This period is called '*Aardra Kartari or Aardra Kaarti*'. Generally, this period marks the initial active phase of South – West

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monsoons during a year. Further, it was observed that even during the adjacent days, both before and after this *Aardra Kartari* period, significant quantity of rainfall was recorded. This may be due to the pre- and post-influences of the Sun's entry in to *Aardra* star during the specified period. Moreover, in many cases, a considerable relative surge in the amount of rainfall was also perceived when this period of *Aardra Kartari* draws nearer and also during this two-week period of *Aardra Kartari*, compared to the values recorded during the other days prior to and after this time. Hence, this is a remarkable prediction that has been consistently proved to be valid for almost all the episodes over all the four stations in consideration (Table 18).

XVI. If, on the day of the full moon (*Poornima*) in *Aashaadha* month, when the moon is conjoined with the asterism *Uttaraashaadha*, there are some predictions based on the direction of wind prevalent on this day. The results of the comparison over the four regions are tabulated as follows: (Tables 19-22). It has been categorically mentioned in the *Brihat Samhita* that based on direction of the wind that blows during the evening before sunset on *Aashaadha Poornima* under the asterism *Uttaraashaadha*, these predictions for the season are to be framed. Hence, the wind direction at 1200 hr UTC (1730 IST) has been considered apt for the purpose of appraisal of this prediction during the period of study.

The treatise recognises the period from the bright half of the month *Sraavana* to bright half of the month *Kaarthika* to be the rainy season during a year. This covers both South-West and North-East monsoonal periods as it spans from about July to November approximately. Though the pregnancy of clouds starts from the bright half of *Maargaseersha* and the delivery of rainfall is expected to begin from the bright fortnight of the month *Jyeshtha*, *Varaaha Mihira* categorically states that the cloud foetuses formed during the bright fortnights of *Margaseersha* and *Pousha* are of little consequence in terms of their rainfall and hence can be ignored. That is the reason why the bright half of the month *Sraavana* is taken to be the introductory phase of the year's rainy season. From the above tables, one can easily compare the observed wind direction and the consequence predicted in the *Brihat Samhita* with the calculated rainfall as per the instructions instituted by *Varaaha Mihira* in his titanic treatise, indicated above.

XVII. If, after the full moon in the month of Aashaadha, there is rain on the 4th lunar day of the dark fortnight (Krishna Paksham) in the asterism of Poorvaabhaadra, then, that particular rainy season would prove beneficial, otherwise, it would not emerge to be promising.

Since these time periods are given based on *nakshatram* scale and since such a lunar conjunction with a particular star does not comply with our modern calendar dates and our contemporary 24-hour time scale, Moon's stay in a lunar mansion may often prevail for even 2 days of the Gregorian calendar.

It has been clearly demonstrated from the Tables 23–26 that there is nothing much to evaluate this prediction over Shillong and Port Blair as it duly rained on the day during the entire period of study and the rainfall was seemingly good and beneficial (Tables 25 and 26). In Ajmer, during the years 1996, 1998, 2000, 2001 and 2002, there was no rainfall on this particular day and one can easily find that the seasonal rainfall too was relatively on the lower side compared to other years (Table 24). In Tirupati, there was no rain during this day in the years 1992, 1996, 1999 and 2000. It can be inferred from Table 23 that except during 1996, all the remaining years experienced relatively lower rainfall during the period of study. Here also, Ajmer showed the highest

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association with the prediction, followed closely by Tirupati.

XVIII. The total rainfall during a year under clouds rising in various directions and winds originating from different quarters of the skyline has been tabulated in order to gauge the cogency of the predictions.

In Ajmer, predominant quantity of rainfall occurred when the clouds have risen in the South – West. This was followed by South and West (Table 27). This result is very significant because Ajmer is an extremely arid region with very little rainfall during a year. As per the *Brihat Samhita*, the clouds rising in south are said to cause very sparse rainfall and those in the South-West cause partial yet satisfactory rainfall. So, this gels very well with the fact that Ajmer is a region confronted with serious scarcity of rainfall.

In Tirupati, the highest quantity of rainfall occurred when the clouds originated in the North – East, followed by South- West, West, North and North- West (Table 28). The clouds in North, North-East and West are said to cause copious rains and those in the North – West result in stormy weather. The clouds from South – West cause moderate rainfall. Hence, healthy correlation can be observed between predictions about the effect of cloud directions on rainfall and the actual quantity of rainfall measured over Tirupati during the study period.

No specific direction could be ascertained to the clouds over Shillong during the period of study as the sky remains over cast for most of the year in the region, raining incessantly (Table 29).

The location of Port Blair in mid-sea implies that it gets immensely influenced by the monsoon winds, especially South – West monsoons and the formation low-pressure regions (depressions) in the Bay of Bengal. Table 30 reflects the same proposition as the rainfall under the South- Western clouds is predominantly and strikingly high when compared to other directions. This was followed by the western and eastern clouds, which resulted in considerably substantial down-pour in the region. The rainfall predictions based on cloud directions, turned out to be functioning significantly well for all the regions chosen for the present study (Tables 27 – 30). This has been illustrated in Fig. 2.

XIX. The Brihat Samhita clarifies categorically that the wind directions and their consequent rainfall also follow the same pattern of predictions as in the case of cloud directions and ensuing rainfall.

From Tables 31 and 32, it is crystal clear that Tirupati and Ajmer followed the same trends pertaining to rainfall with regard to both cloud and wind directions. The directions under which rainfall occurred are exactly in the same sequence as observed with respect to cloud directions (Tables 27 and 28). However, no specific direction could be assigned to clouds over Shillong. But when it comes to winds, copious rainfall was recorded when the winds were blowing from South – West, followed by West, South and North – West (Table 33). When it comes to Port Blair, it rained profusely when the clouds stemmed from South – West, West and East. When it comes to winds, the most rain-bearing directions were South – West, West, East, North – West, South, North – East and South – East (Table 34).

Hence, the predictions pertaining to quantity of rainfall under various cloud and wind directions stand validated quite convincingly over the four stations during the period of study. It is also highly worthy of mention that there is remarkable equivalence of trends in amounts of rainfall under cloud and wind directions. The rainfall under winds originating

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from various quarters has been depicted in Fig. 3.

XX. The symptoms of pregnancy of clouds are to be detected when the Moon passes through the asterism Poorvaashaadha, beginning from the first day of the bright fortnight of the month of Maargaseersha. The foetus formed during the Moon's stay in a particular constellation starting from Poorvaashaadha, will be released after 195 Solar days when the Moon again passes through the same asterism as per the laws of his revolution.

The rainy season in India generally begins from the last week of May or from the first week of June. April and May (especially and predominantly May) often experience torrents of convective rainfall with thunderstorms on summer afternoons. Table 35 shows the initial day of rainfall when the first cloud foetus completes its gestation period of 195 days, as envisaged by the *Brihat Samhita*. From the table, it is apparent that Tirupati and Ajmer were well within proximity of the predicted dates of rainfall, while Shillong and Port Blair differed entirely.

XXI. If there be excessive rain at the time of formation of foetuses without any apparent cause, this would lead to the destruction of foetuses. Should the amount of rainfall exceed 1/8th of a Drona (0.8 cm. or 8 mm. of rainfall of the modern rain gauge), there would be miscarriage of the foetus.

The following are the times of cloud foetus formation/generation during the period of study based on the information provided in the *Brihat Samhita*:

a) 1992 – 1993 : November 27 – April 21
b) 1993-1994: December 16 – May 10
c) 1994 – 1995: December 6 – April 29
d) 1995 – 1996: November 25 – April 17
e) 1996- 1997: December 13 – May 6
f) 1997 – 1998: December 3 – April 26
g) 1998 – 1999: November 22 – May 16
h) 1999 – 2000: December 10 – May 4
i) 2000 – 2001: November 28 – April 23
j) 2001 – 2002: December 17 – May 12

In Tirupati, there were 52 cases to be considered for verifying this aspect. Of these, there was no data during 11 instances. Out of the remaining 41 occurrences when rainfall exceeded 8 mm. during the indicated period, 23 resulted in no rainfall (0.0 mm) after the specified period represented in table 36, thus, showing a sound positive association with the prediction (Table 36).

In Ajmer, there were 13 instances to be taken into consideration during the period of study, out of which, 6 episodes experienced rainfall less than 8 mm. and thus could be eliminated. 5 out of the remaining 7 such occasions resulted in zero rainfall, endorsing the prediction emphatically (Table 37).

Of the 78 cases in Shillong, 8 occurrences could be discarded on grounds of non-availability of data and its inadequacy. Among the enduring 70 instances, 40 completely complied with the prediction, bearing no rainfall during the time of delivering rain (Table 38). Finally in Port Blair, this prediction proved efficacious with regard to 32 out of the total 76 occasions, where there was no rainfall during the rainy season (Table 39).

Other than the instances during which the rainfall was zero or almost zero, there were considerable number of other episodes where the rainfall was very low and insignificant, as perceived from Tables 36-39. Hence, this prediction pertaining to the miscarriage of foetusus when the rainfall exceeds 8 mm. during the period of cloud foetus generation can be tagged as a substantially potential one.

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Table 38. Dates when rainfall exceeded 8 mm. over Shillong and its consequential rainfall after the specified period

Period of Generation of Cloud Foetuses	Day when Rainfall Exceeded 8mm over Shillong	Rainfall (mm)	Rainfall after the Period of Cloud Foetus Formation (mm)
Nov. 27 1992 - Apr. 21, 1993	Jan 9	28.8	14.7
	Jan 10	12	No Data
	Feb 18	9.8	1
	Mar 2	9.2	3
	Mar 27	23.1	3
	Apr 10	16.1	No Data
	Apr 15	37.2	No Data
	Apr 21	19	0
Dec 16, 1993 - May 10, 1994	Jan 16	9.8	3.2
	Jan 17	9.8	2.1
	Feb 3	14.6	0.1
	Mar 26	13.5	29.5
	Mar 27	25.6	1.8
	Mar 28	52.4	6.7
	Mar 30	9.1	15.3
	Apr 5	13.1	No Data
	May 2	13.2	3.8
Dec. 6, 1994 - Apr. 29, 1995	Jan 18	9	16
	Feb 16	13	1.6
	Apr 16	16	No Data
	Apr 18	12	No Data
	Apr 27	12.2	No Data
Nov. 25, 1995 - April 17, 1996	Jan 2	10.5	7.2
	Jan 17	11.8	71.1
	Mar 7	12.7	3.1
	Mar 8	21.3	10.8
Dec. 13, 1996 - May 6, 1997	Mar 26	34.5	0
	Mar 30	14.8	2
	Apr 1	35	0
	Apr 2	23.9	0
	Apr 3	13.5	2.9
	Apr 7	8.8	0.4
	Apr 11	23.2	0
	Apr 17	19.6	0
	Apr 21	19.8	0
	Apr 22	15.6	0
	Apr 23	45.6	0
	Apr 24	10.6	0
	Apr 30	31.8	1.4
	May 2	30	0
Dec. 3, 1997 - Apr. 26, 1998	Mar 7	16	57
	Mar 24	20.8	0
	Mar 25	34.8	0
	Mar 30	11.6	0.4
	Mar 31	16.2	4.2
	Apr 6	42	7.4
	Apr 7	31	6.7
	Apr 18	25.7	0
	Apr 20	10.6	1.1
	Apr 21	18.2	0.4
	Apr 22	11.6	0.5
	Apr 23	10	0
	Apr 26	29.5	0
Nov. 22, 1998 - May 16, 1999	Nov 23	29.4	47.3
	Nov 24	45.2	24.3
	Apr 7	8.2	55.2
	Apr 8	8.2	35.1
	May 5	32.3	0.3
	May 6	47.3	0.3
	May 7	24.3	0
	May 9	27.3	0.2
	May 11	30.5	0
	May 13	8.6	0
	May 14	36.6	0
	May 15	30.2	0
Dec. 10, 1999 - May 4, 2000	Mar 14	8.8	0.2
	Mar 30	17	0
	Apr 12	12	0
	Apr 15	17.6	0
	Apr 17	33.4	105

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	Apr 18	10.9	0
	Apr 21	29.5	0
	Apr 23	10	0
	Apr 24	9.8	0
	Apr 29	10.8	0
	May 2	22	0
	May 3	21.1	0
Nov. 28, 2000 - April 23, 2001	Insufficient Data	--	--

Table 39. Dates when rainfall exceeded 8 mm. over Port Blair and its consequential rainfall after the specified period

Period of Generation of Cloud Foetuses	Day when Rainfall Exceeded 8mm over Port Blair	Rainfall (mm)	Rainfall after the Period of Cloud Foetus Formation (mm)
Nov. 27 1992 - Apr. 21, 1993	Mar 11	30	6.2
Dec 16, 1993 - May 10, 1994	Mar 22	27.2	1
	Apr 28	13.1	0
	Apr 29	27.2	0
	Apr 30	111.4	0
	May 1	50.3	0
	May 3	25.1	0
	May 8	51.9	0
	May 9	16.5	0
Dec. 6, 1994 - Apr. 29, 1995	Mar 30	10	77.2
Nov. 25, 1995 - April 17, 1996	Nov 26	10.3	0
	Jan 12	93.3	0.8
Dec. 13, 1996 - May 6, 1997	Apr 8	8.1	0.3
	May 4	18.2	31.8
Dec. 3, 1997 - Apr. 26, 1998	Dec 3	19.3	1.6
	Dec 4	9.8	26.5
	Dec 10	9.5	2.9
	Jan 25	20	32.1
Nov. 22, 1998 - May 16, 1999	Dec 5	11.1	0.4
	Dec 25	16	18.5
	Jan 13	19	0
	Jan 15	8.3	2.7
	Jan 17	53.5	42.6
	Jan 31	11.2	0.8
	Feb 2	21.6	25.7
	Feb 5	8.6	21.2
	Feb 6	9.9	5.9
	Mar 28	22.8	0
	Apr 2	8.6	0.5
	Apr 12	8.1	0
	Apr 14	12.2	45.8
	Apr 18	24.4	10.3
	Apr 22	41.5	15.2
	Apr 23	10.2	0.1
	Apr 24	18.5	14.6
	Apr 25	27.4	7.9
	Apr 26	40.4	9.9
	Apr 27	8.5	7.6
	Apr 29	72.9	0
	May 3	9.1	0
	May 13	12.1	2.8
	May 14	34.2	3.7
	May 15	11.3	10.4
	May 16	36.3	0
Dec. 10, 1999 - May 4, 2000	Dec 20	10	7.6
	Jan 27	10.8	100.9
	Jan 28	20.7	20.3
	Feb 19	37.5	19.6
	Feb 20	14.4	4
	Feb 21	27.1	15.7
	Mar 26	18	3.3
	Mar 27	96.1	34.9
	Mar 28	56.9	5.6
	Mar 29	28.3	49.9

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	Apr 14	23	11.4
	Apr 27	61.2	0
	Apr 28	59.9	0
	Apr 29	16	0
	Apr 30	25.4	0
	May 3	11.3	0
Nov. 28, 2000 - April 23, 2001	Nov 28	21.9	37.1
	Dec 12	11.8	7.6
	Dec 13	24	9.6
	Dec 22	32.5	40.9
	Jan 7	14.3	0.3
	Jan 9	42.9	0.8
	Jan 10	48.4	0
	Jan 17	11.6	0.3
	Mar 12	9.8	0.7
	Mar 23	57.4	1.7
	Mar 24	33.1	1.8
	Mar 26	10.5	0
Dec. 17, 2001 - May 12, 2002	Apr 28	61.5	93.3
	Apr 30	15.7	37.2
	May 10	16.5	0
	May 12	8.8	11.6

Table 40. Tirupati seasonal Rainfall from the perspective of *Vaayu Dhaarana* Days

Year	Period of time during the year	Wind Velocity over Tirupati (kmph)	Wind Direction over Tirupati	Total Seasonal Rainfall in Tirupati (mm)
1992	June 9 – 12	10, 10-18, 16, 10-14	NNE, NE, NE, SSW	346.6
1993	May 29 – June 1	16 – 22, 10 – 12, 12 – 14, 12 – 18	WNW, WNW, WNW, NW	1023.3
1994	June 17 – 20	18, 16 – 22, 22, 16 – 22	SW, W, SW, W	682.9
1995	June 6 – 9	14, 14, 14, 12 – 14	WNW, W,W, WNW	475.5
1996	May 25 – 28	8 – 12, 8 – 10, 10, 12	E, SE, W, WSW	800.3
1997	June 13 – 16	6 – 10, 12 – 26, 18 – 30, 8 – 14	NNW, S, S, SW	606.6
1998	June 2 – 5	No Data	No Data	678.4
1999	June 21 – 24	18 – 30, 14 – 26, 18 – 30, 22-24	W, W, W, WNW	433.9
2000	June 10 – 13	18, 18, 18 – 24, 12 – 18	WSW, WNW, NNW, NNW	346.3
2001	May 31 – June 3	12 – 28, 6 – 12, 10 – 14, 6 – 10	WNW, WNW, NNE, SE	854.4
2002	June 18 – 21	10, Calm, Calm, 2 – 14	SE, Calm, Calm, WNW	537.4

Table 41. Ajmer seasonal Rainfall from the perspective of *Vaayu Dhaarana* Days

Year	Period of time during the year	Wind Velocity over Ajmer (kmph)	Wind Direction over Ajmer	Total Seasonal Rainfall in Ajmer (mm)
1992	June 9 – 12	No Data	No Data	No Data
1993	May 29 – June 1	2 -12, 10, 4 – 6, 2	W, SW, S, NE	170.1
1994	June 17 – 20	6 – 10, 8 – 12, 8 – 16, 10 - 12	SW, W, W, W	189.9
1995	June 6 – 9	6 – 12, 8 – 14, 8 – 14, 8 - 18	SW, W, W, W	640.1
1996	May 25 – 28	Calm, 4, 4 – 6, 8 – 10	Calm, N, SW, SW	325.5
1997	June 13 – 16	2 – 4, Calm, 2, 4 – 14	N, Calm, W, W	488.4
1998	June 2 – 5	6 – 8, 6 – 8, 2 – 8, 8 - 12	W, W, W, W	213.0
1999	June 21 – 24	4, 4 – 12, 6 – 8, 4 – 6	NW, SW, W, W	66.5
2000	June 10 – 13	4 – 8, 4 – 6, 4, 4 – 8	SW, W, SW, W	31.3
2001	May 31 – June 3	4 – 8, 4 – 8, 4, 6 – 8	SW, SW, SW, W	176.9
2002	June 18 – 21	4 – 10, 6 – 8, 2 – 4, 4	W, W, SW, SW	100.0

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Table 42. Shillong seasonal Rainfall from the perspective of *Vaayu Dhaarana* Days

Year	Period of time during the year	Wind Velocity over Shillong (kmph)	Wind Direction over Shillong	Total Seasonal Rainfall in Shillong (mm)
1992	June 9 – 12	Calm, 4, 4, 4 – 12	Calm, NE, SW, SW	614.3
1993	May 29 – June 1	2 – 6, 10, 4, 4	E, SE, N, N	511.5
1994	June 17 – 20	6, 2 – 4, 2, 2	SW, E, NE, W	474.5
1995	June 6 – 9	Calm, 2, 2, 2 – 4	Calm, WNW, NW, N	861.7
1996	May 25 – 28	6, 4, 4 – 10, 8 – 16	NW, NW, WSW, WSW	658.2
1997	June 13 – 16	6, 4 – 6, 2, 4 – 10	SW, SW, W, SSW	703.2
1998	June 2 – 5	2 – 8, 4 – 6, 8, 8 – 12	SW, SW, SW, SW	998.7
1999	June 21 – 24	2 – 4, 2, Calm, 2 – 4	NE, SW, Calm, SW	837.3
2000	June 10 – 13	2 – 4, Calm, Calm, 4	SW, Calm, Calm, WSW	840.0
2001	May 31 – June 3	1, Calm, Calm, Calm	NW, Calm, Calm, Calm	No Data

Table 43. Port Blair seasonal Rainfall from the perspective of *Vaayu Dhaarana* Days

Year	Period of time during the year	Wind Velocity over Port Blair (kmph)	Wind Direction over Port Blair	Total Seasonal Rainfall in Port Blair (mm)
1992	June 9 – 12	4 – 8, 4, 4 – 6, 2 – 6	SW, SW, SW, W	1206.7
1993	May 29 – June 1	22, 30 – 34, 16 – 18, 10 – 16	SW, SW, SW, WSW	1553.2
1994	June 17 – 20	26 – 28, 20 – 28, 22 – 30, 20 – 28	W, W, W, W	1332.9
1995	June 6 – 9	8 – 10, 12 – 20, 22 – 30, 20 – 22	SW, WSW, SW, WNW	1388.9
1996	May 25 – 28	12 – 14, 10 – 14, 12 – 20, 10 – 20	WSW, SW, WSW, WSW	1631.7
1997	June 13 – 16	4 – 6, 2, 6, 10	S, ENE, NW, WNW	1272.8
1998	June 2 – 5	4, 4 – 6, 12, 6	SW, SW, W, SSE	1162.3
1999	June 21 – 24	20 – 22, 14 – 30, 14 – 20, 12 – 18	SW, SW, WSW, WSW	1179.6
2000	June 10 – 13	14, 12 – 14, 24 – 30, 16 – 24	SW, WSW, WSW, SW	1199.5
2001	May 31 – June 3	6 – 20, 6 – 10, 6 – 10, 6 – 8	SSW, SW, S, SSW	1329.7
2002	June 18 – 21	12, 14 – 16, 12 – 20, 18 – 22	WSW, WSW, SW, SW	997.0

Table 44. Validity of the prediction pertaining to retention of rain over Tirupati during the period of study

Year	Period during the year	Rainfall in Tirupati with *nakshatram*	Whether any rainfall in *Sraavanam*	Whether any rainfall in *Bhaadrapadam*	Whether any rainfall in *Aaswayujam*	Whether any rainfall in *Kaarthikam*
1992	June 13 – 16	No Rain	No	No	No	No
1993	June 2 – 5	On June 4th under *Anuraadha*	No	No	No rainfall during 22 days of the month; Less rain during the remaining 8 days	No
1994	June 21 – 24	No Rain	No	No	No	No
1995	June 10 – 13	No Rain	Insufficient Data	No	No	No
1996	May 29 – June 1	No Rain	No	No	No	No
1997	June 17 – 20	On June 19th under *Anuraadha*	No	No	No rainfall during 22 days of the month	No
1998	June 6 – 9	No Data	-	-	-	-
1999	June 25 – 28	No Rain	No	No	No	No
2000	June 14 – 17	No Rain	No	No	No	No
2001	June 4 – 7	On June 5th under *Visaakha*	No	No Rainfall for 25 days; other days experienced nominal rainfall		
2002	June 22 – 25	On June 23rd under *Visaakha* and on June 25th under *Jyeshtha*	No	No Rainfall for 22 days	No	Rainfall for 17 days during the month

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Table 45. Validity of the prediction pertaining to retention of rain over Ajmer during the period of study

Year	Period during the year	Rainfall in Ajmer with *nakshatram*	Whether any rainfall in *Sraavanam*	Whether any rainfall in *Bhaadrapadam*	Whether any rainfall in *Aaswayujam*	Whether any rainfall in *Kaarthikam*
1992	June 13 – 16	No Data	No	No	No	No
1993	June 2 – 5	No Rain	No	No	No	No
1994	June 21 – 24	On June 24th under *Jyeshtha*	No	No	No	No significant rainfall during the month
1995	June 10 – 13	No Rain	No	No	No	No
1996	May 29 – June 1	No Rain	No	No	No	No
1997	June 17 – 20	No Rain	No	No	No	No
1998	June 6 – 9	On June 7th under *Visaakha*, on June 8th under *Anuraadha* and on June 9th under *Jyeshtha*	No	Only 5 days of rainfall during the month	Only 8 days of rainfall during the month	Only 2 days of rainfall during the month
1999	June 25 – 28	No Rain	No	No	No	No
2000	June 14 – 17	No Rain	No	No	No	No
2001	June 4 – 7	No Rain	No	No	No	No
2002	June 22 – 25	No Rain	No	No	No	No

Table 46. Validity of the prediction pertaining to retention of rain over Shillong during the period of study

Year	Period during the year	Rainfall in Shillong with *nakshatram*	Whether any rainfall in *Sraavanam*	Whether any rainfall in *Bhaadrapadam*	Whether any rainfall in *Aaswayujam*	Whether any rainfall in *Kaarthikam*
1992	June 13 – 16	Rainfall on all four days	Yes	Yes	Yes	Yes. But, no rainfall for 19 days at a stretch from Oct.24 to Nov.11
1993	June 2 – 5	Rainfall on all four days	Yes	Yes	Yes	Insufficient Data
1994	June 21 – 24	Insufficient Data	-	-	-	-
1995	June 10 – 13	Rainfall on all four days	Yes	Yes	Yes	Yes
1996	May 29 – June 1	Rainfall on all four days	Yes	Yes	Yes	Insufficient Data
1997	June 17 – 20	Rainfall on all four days	Yes	Yes	Yes	Only 7 days of sparse rainfall during the month
1998	June 6 – 9	Rainfall on June 6th , 7th and 9th under *Swaati*, *Visaakha* and *Jyeshtha*	Yes	Yes	Yes	Yes
1999	June 25 – 28	Rainfall on all four days	Yes	Yes	Yes	5 – 6 days of rainfall
2000	June 14 – 17	Rainfall on June 14th , 15th and 16th under *Swaati*, *Visaakha* and *Anuraadha*	Yes	Yes	Yes	5 days of significant rainfall during the month

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Table 47. Validity of the prediction pertaining to retention of rain over Port Blair during the period of study

Year	Period during the year	Rainfall in Port Blair with *nakshatram*	Whether any rainfall in *Sraavanam*	Whether any rainfall in *Bhaadrapadam*	Whether any rainfall in *Aaswayujam*	Whether any rainfall in *Kaarthikam*
1992	June 13 – 16	Rainfall on all four days	Yes	Yes	Yes	Yes
1993	June 2 – 5	Rainfall on June 2nd , 4th under *Swaati* and *Anuraadha* respectively	Yes	Yes	Yes	Yes
1994	June 21 – 24	Rainfall on June 23rd , 24th under *Anuraadha* and *Jyeshtha* respectively	Yes	Yes	Yes	Only two days of sparse rainfall during the month
1995	June 10 – 13	Rainfall on 10th , 11th and 13th under *Swaati*, *Visaakha* and *Jyeshtha*	Yes	Yes	Yes	Yes
1996	May 29 – June 1	Rainfall on May 30th and June 1st under *Visaakha* and *Jyeshtha*	Yes	Yes	Yes	Yes
1997	June 17 – 20	Rainfall on 19th under *Anuraadha*	Yes	Yes	Yes	Yes
1998	June 6 – 9	No significant rainfall; 1.2 mm of rain on 7th under *Visaakha*; other days, it was far less than 1mm.	Yes	Yes	Yes	Yes
1999	June 25 – 28	No Rain	Yes	Yes	Yes	Yes
2000	June 14 – 17	Rainfall on 14th , 15th , 16th under *Swaati*, *Visaakha* and *Anuraadha*	Yes	Yes	Yes	Yes
2001	June 4 – 7	Rainfall on 5th , 6th , 7th under *Visaakha*, *Anuraadha* and *Jyeshtha*	Yes	Yes	Yes	Yes
2002	June 22 – 25	Rainfall on 23rd , 24th under *Visaakha* and *Anuraadha*	Yes	Yes	Yes	Yes

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Table 48. *Nakshatrams* of initial phase of rainfall and evaluation of predicted precipitation with actual measured rainfall over Tirupati

Year	Dates of Rainfall during the first 27 days of the initial month of rainfall over Tirupati (>= 1mm.)	*Nakshatrams* under which rainfall occurred respectively	Predicted Rainfall (*Drona*)	Predicted Rainfall (mm)	Actual Rainfall (mm)
1992	Jun 21, Jul 3,7,13	*Dhanishtha, Pushya, Uttara Phalguni, Jyeshtha*	16	1024	346.6
1993	Jun 8,14,15, Jul 2,3	*Uttaraashaadha, Revati, Aswini, Jyeshtha, Moola*	20	1280	1023.3
1994	Jun 26,30, Jul 3,5,6,7,9,10,11,14,17	*Poorvaashaadha, Shatabhishak, Revati, Krittika, Rohini, Mrigasira, Punarvasu, Pushya, Aaslesha, Uttara Phalguni, Swaati*	16	1024	682.9
1995	Jun 15,16,20,24,25,26,27,28,29, Jul-No data	*Poorvaashaadha, Uttaraashaadha, Poorvaabhaadra, Bharani, Krittika, Rohini, Mrigasira, Aardra, Punarvasu*	16	1024	475.5
1996	Jun 12,13,14,15,16,23,26	*Bharani, Krittika, Rohini, Mrigasira, Aardra, Hasta, Visaakha*	14	896	800.3
1997	Jun 27, Jul 1,5,10,11,18	*Poorvaabhaadra, Bharani, Aardra, Poorva Phalguni, Uttara Phalguni, Moola*	15	960	606.6
1998	Jun-No data, Jul 1,2,6	*Hasta, Chitra, Jyeshtha*	16	1024	678.4
1999	Jul 2,6,8,10,13,14,18,20,23	*Sravana, Uttaraabhaadra, Aswini, Krittika, Aardra, Punarvasu, Poorva Phalguni, Hasta, Visaakha*	14	896	433.9
2000	Jun 22,23,28,29, Jul 3,4,5,6,7,9	*Dhanishtha, Shatabhishak, Bharani, Krittika, Punarvasu, Pushya, Aaslesha, Makha, Poorva Phalguni, Hasta*	16	1024	346.3
2001	Jun 9,11,12,13,16, Jul 2,3,4	*Poorvaashaadha, Sravana, Dhanishtha, Shatabhishak, Revati, Visaakha, Anuraadha, Jyeshtha*	16	1024	854.4
2002	Jul 12,22,23	*Pushya, Jyeshtha, Moola*	15	960	537.4

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Table 49. Nakshatrams of initial phase of rainfall and evaluation of predicted precipitation with actual measured rainfall over Ajmer

Year	Dates of Rainfall during the first 27 days of the initial month of rainfall over Ajmer (>= 1mm.)	*Nakshatrams* under which rainfall occurred	Predicted Rainfall (*Drona*)	Predicted Rainfall (mm)	Actual Rainfall (mm)
1992	No Data for 1992	No Data	No Data	No Data	No Data
1993	Jun 15,20,26,27,28	*Aswini, Aardra, Uttara Phalguni, Hasta, Chitra*	12	768	170.1
1994	Jul 1,2,3,4,9,14,16,18,20,22,25,26	*Poorvaabhaadra, Uttaraabhaadra, Revati, Aswini, Aardra, Poorva Phalguni, Hasta, Swaati, Anuraadha, Moola, Sravana, Dhanishtha*	15	960	189.9
1995	Jun 22,30, Jul 11	*Revati, Pushya, Moola*	16	1024	640.1
1996	Jun 16,17,18,19,20,22,23	*Aardra, Punarvasu, Pushya, Aaslesha, Makha, Uttara Phalguni, Hasta*	18	1152	325.5
1997	Jun 29,30, Jul 8,12	*Revati, Aswini, Aaslesha, Hasta*	16	1024	488.4
1998	Jun 11,17, Jul 1,2,3,4,5,6	*Poorvaashaadha, Uttaraabhaadra, Hasta, Chitra, Swaati, Visaakha, Anuraadha, Jyeshtha*	16	1024	213.0
1999	Jul 8,9,16,17,18,20,21,22,23	*Aswini, Bharani, Aaslesha, Makha, Poorva Phalguni, Hasta, Chitra, Swaati, Visaakha*	12	768	66.5
2000	Jul 1,3,4,12,13,14,15	*Mrigasira, Punarvasu, Pushya, Visaakha, Anuraadha, Jyeshtha, Moola*	16	1024	31.3
2001	Jun 26,27,29, Jul 2,3,4,5	*Makha, Poorva Phalguni, Hasta, Visaakha, Anuraadha, Jyeshtha, Moola*	14	896	176.9
2002	Jun 27,29,30, Jul 18,20	*Poorvaashaadha, Sravana, Dhanishtha, Chitra, Visaakha*	16	1024	100.0

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Table 50. *Nakshatrams* of initial phase of rainfall and evaluation of predicted precipitation with actual measured rainfall over Shillong

Year	Dates of Rainfall during the first 27 days of the initial month of rainfall over Shillong (>= 1mm.)	*Nakshatrams* under which rainfall occurred	Predicted Rainfall (*Drona*)	Predicted Rainfall (mm)	Actual Rainfall (mm)
1992	Jun18,19,24,25,26,27,28,29, Jul 1,2,3,4,5,6,7,8,9,10,11,12,13	Excluding *Sravana, Dhanishtha, Shatabhishak, Poorvaabhaadra, Mrigasira, Moola*	16	1024	614.3
1993	Jun 7,8,9,10,11,12,13,17,18,19,20,21,22,24,25,26,27,30, Jul 1,2,3	Excluding *Revati, Aswini, Bharani, Aaslesha, Chitra, Swaati*	16	1024	511.5
1994	Jun 26,27,28,29, Jul 1,2,3,5,6,8,9,12,18,21,22	*Poorvaashaadha, Uttaraashaadha, Sravana, Dhanishtha, Purvaabhaadra, Uttaraabhaadra, Revati, Bharani, Krittika, Mrigasira Aardra, Aaslesha, Swaati, Jyeshtha, Moola*	16	1024	474.5
1995	Jun 15,16,17,18,19,20,21,22,23,24,25,30, Jul 2,3,4,5,6,7,8,10,11	Excluding *Rohini, Mrigasira, Aardra, Punarvasu, Aaslesha, Anuraadha*	16	1024	861.7
1996	Jun 3,4,5,7,9,11,12,13,14,16,19,20,21,22,23,24,25,26,27,28,29	Excluding *Dhanishtha, Poorvaabhaadra, Revati, Mrigasira, Punarvasu, Pushya*	16	1024	658.2
1997	Jun 23,25,27,28,29,30, Jul 1,3,4,8,9,10,11,12,13,14,15,16,17	Excluding *Poorvaashaadha, Sravana, Shatabhishak, Krittika, Aardra, Punarvasu, Pushya, Moola*	20	1280	703.2
1998	Jun 14,15,18,19,20,22,23,27,28, Jul 2,3,5,6,7	*Dhanishtha, Shatabhishak, Revati, Aswini, Bharani, Rohini, Mrigasira, Aaslesha, Makha, Chitra, Swaati, Anuraadha, Jyeshtha, Moola*	16	1024	998.7
1999	Jun 30, Jul 1,2,4,5,9,10,11,12,13,14,15,16,18,19,20,21,24	Excluding *Dhanishtha, Uttaraabhaadra, Revati, Aswini, Makha, Swaati, Visaakha, Jyeshtha, Moola*	16	1024	837.3
2000	Jun 19,21,22,23,24,26,28,29, Jul 1,3,4,5,7,8,9,10,13,14	Excluding *Uttaraashaadha, Uttaraabhaadra, Aswini, Rohini, Aardra, Makha, Swaati, Visaakha, Moola*	16	1024	840.0
2001	No Data	-	-	-	No Data
2002	No Data	-	-	-	No Data

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Table 51. *Nakshatrams* of initial phase of rainfall and evaluation of predicted precipitation with actual measured rainfall over Port Blair

Year	Dates of Rainfall during the first 27 days the initial month of rainfall over Port Blair (>= 1mm.)	*Nakshatrams* under which rainfall occurred	Predicted Rainfall (*Drona*)	Predicted Rainfall (mm)	Actual Rainfall (mm)
1992	Jun 18,19,20,21,22,23,24,27,28,29,30, Jul 2,3,5,10,11,12,14	Excluding *Revati, Aswini, Aardra, Aaslesha, Poorva Phalguni, Uttara Phalguni, Hasta, Chitra, Jyeshtha*	16	1024	1206.7
1993	Jun 7,8,9,10,11,12,13,14,15,16,25,26,30, Jul 1,2,3	*Poorvaashaadha, Uttaraashaadha, Sravana, Dhanishtha, Shatabhishak, Poorvaabhaadra, Uttaraabhaadra, Revati, Aswini, Bharani, Poorva Phalguni, Uttara Phalguni, Visaakha, Anuradha, Jyeshtha, Moola*	16	1024	1553.2
1994	Jun 29,30, Jul 1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18,19,20, 21,22	Excluding *Poorvaashaadha, Uttaraashaadha, Sravana, Aaslesha*	16	1024	1332.9
1995	Jun 15,18,19,20,21,22,23,24,25,26,27,28,29, Jul 1,2,3,4,5,6,7,8,9,10,11	Excluding *Uttaraashaadha, Sravana, Pushya*	16	1024	1388.9
1996	Jun 6,7,9,10,11,12,13,14,15,16,18, 19,20,21,22,23,24,25,26,27,28,29	Excluding *Poorvaashaadha, Uttaraashaadha, Sravana, Poorvaabhaadra, Punarvasu*	16	1024	1631.7
1997	Jun 23,24,25,26,27,28,29,30, Jul 1,2,3,4,5,6,8,9,10,11,12,13,14,15,16,17,18	Excluding *Poorvaashaadha* and *Pushya*	20	1280	1272.8
1998	Jun 11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30, Jul 1,2,4,6,7	Excluding *Anuraadha* and *Swaati*	16	1024	1162.3
1999	Jul 2,3,4,5,8,9,10,11,12,13,14,15,17,19,20,21,22,23,25,26	Excluding *Poorvaashaadha, Uttaraashaadha, Uttaraabhaadra, Revati, Aaslesha, Poorva Phalguni, Anuraadha*	14	896	1179.6
2000	Jun 19,20,22,23,24,25,26,27,28,29,30, Jul 1,2,3,4,5,6,7,8,9,10,11,12,13,14	Excluding *Sravana* and *Moola*	16	1024	1199.5
2001	Jun 9,10,11,12,13,15,17,20,22,23,24,25,26, Jul 1,2,3,4,5	Excluding *Poorvaabhaadra, Revati, Bharani, Krittika, Mrigasira, Poorva Phalguni, Uttara Phalguni, Hasta, Chitra*	16	1024	1329.7
2002	Jun 27,29,30, Jul 2,3,4,5,6,8,9,14,15,16,17,18,22,23	Excluding *Uttaraashaadha, Shatabhishak, Krittika, Aardra, Punarvasu, Pushya, Aaslesha, Swaati, Visaakha, Anuraadha*	16	1024	997.0

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Table 52. Cloud directions over Tirupati during the period of cloud foetus formation and during the rainy season

Year	Observed Cloud Directions During Cloud Foetus Formation Period over Tirupati	Tirupati Cloud Directions During Rainy Season
1992–1993	SW, N, SE,S, NE, E	SW,NW,W,S,NE,N,E
1993-1994	SW,N, SE,S, NE, NW, E	N,E,S,W,NE,NW,SW
1994–1995	SW,N, SE,S, NE, E	N,E,S,W,NE,NW,SW
1995–1996	No specific Direction can be ascertained	NW,W,SW,N,NE,S,E
1996-1997	NE,N,NW,SW	NE,N, E,NW,SW
1997–1998	SW,N, NE,E	S, NE
1998–1999	NE	No specific direction could be ascertained
1999–2000	No specific direction could be ascertained	No specific direction could be ascertained
2000-2001	No specific direction could be ascertained	No specific direction could be ascertained
2001–2002	No specific direction could be ascertained	N

Table 53. Cloud directions over Ajmer during the period of cloud foetus formation and during the rainy season

Year	Observed Cloud Directions During Cloud Foetus Formation Period over Ajmer	Ajmer Cloud Directions During Rainy Season
1992–1993	NW, W, SW	S,W,NE,SE,SW,NW
1993-1994	S	N,E,S,W,NE,SE,SW,NW
1994–1995	No specific direction could be ascertained	SW,W,N,NE,S,E
1995–1996	No specific direction could be ascertained	N,E,S,W,SE,SW
1996-1997	W	N,E,S,W,NE,SW,NW
1997–1998	NW	W,SW,E,NW
1998–1999	No specific direction could be ascertained	W,SW
1999–2000	No specific direction could be ascertained	SW,W
2000-2001	No specific direction could be ascertained	W,NW,SW
2001–2002	No specific direction could be ascertained	SE

Table 54. Cloud directions over Shillong during the period of cloud foetus formation and during the rainy season

Year	Observed Cloud Directions During Cloud Foetus Formation Period over Shillong	Shillong Cloud Directions During Rainy Season
1992–1993	W	No specific direction could be ascertained
1993-1994	No specific direction could be ascertained	No specific direction could be ascertained
1994–1995	No specific direction could be ascertained	No specific direction could be ascertained
1995–1996	No specific direction could be ascertained	No specific direction could be ascertained
1996-1997	NE	No specific direction could be ascertained
1997–1998	No specific direction could be ascertained	No specific direction could be ascertained
1998–1999	No specific direction could be ascertained	No specific direction could be ascertained
1999–2000	NE	No specific direction could be ascertained
2000-2001	No specific direction could be ascertained	No specific direction could be ascertained
2001–2002	Insufficient Data	No Data

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Table 55. Cloud directions over Port Blair during the period of cloud foetus formation and during the rainy season

Year	Observed Cloud Directions During Cloud Foetus Formation Period over Port Blair	Port Blair Cloud Directions During Rainy Season
1992–1993	N,E,S,NE,SE,SW,W	E,S,W,SW
1993-1994	E,S,W, NE,SE,SW	N,E,S,W,NE,SW
1994–1995	N,E,S,NE	N,E,S,W,NE,SE,SW
1995–1996	E,NE	E,S,W,SW,SE,NE,NW
1996-1997	N,E,S,W,NE,SE	W,SW,SE,S,NE,E
1997–1998	N,E,NE,SE,W,S,SW,NW	N,E,S,W,NW,SE,SW
1998–1999	N,E,W,S,SE,NE,NW,SW	W,SW,E,SE,S,NE,NW
1999–2000	N,E,W,S,NW,NE,SE	W,SW,NE,S,SE,E
2000-2001	N,E,W,S,NE,NW,SE	E,S,W,SW,SE,NE
2001–2002	NE,E,SE	SW,W,S,E,NE,SE

Table 56. Wind directions over Tirupati during the period of cloud foetus formation and during the rainy season

Year	Wind Direction During Cloud Foetus Formation Period over Tirupati	Wind Direction During Rainy Season over Tirupati
1992–1993	NNE,NE,SSW,S,SSE,N,SW,W,ENE	SW,SSW,WSW,WNW,W,NW,NE,NNE
1993-1994	NE,SSW,NNE,SW,ESE,S,ENE,SSE,WSW	SW,SSW,WSW,NE,NNE,S,W,NW,SSE
1994–1995	NE,NNE,SSW,SW,E,SSE,SE,ESE,N	NW,NE,SW,SSW,W,WNW,S,NNE,WSW
1995–1996	NE,E,SW,ENE,SSW,S,W,ESE,NNE,SSE	NW,SW,NE,W,N,NNW,NNE,S,SSW,ENE
1996-1997	NE,SSW,SW,ENE,S,WSW,E,W	SW,W,E,SSW,NNW,WSW,NNE,NE,S
1997–1998	SW,NE,ENE,SSW,S,NNE,W,E,WSW	SSW,SW,NW,NNW,S,WSW,W,NNE,NE
1998–1999	NE,ENE,SSW,NNE,SW,E,S,NNW	W,SW,WSW,NNW,NW,WNW,NE,ENE
1999–2000	ENE,NE,SW,SSW,E,NNE,SE,WSW	W,SW,NW,NNW,SSW,WSW,NE,E,WNW
2000-2001	ENE,NE,SSW,SW,W,E,S,WSW	W,SW,WNW,NW,NNW,WSW,SSW,NE
2001–2002	NE,SSW,ENE,SW,E,S,SE,WSW	W,SW,WSW,NNW,NW,WNW,SSW,NE

Table 57. Wind directions over Ajmer during the period of cloud foetus formation and during the rainy season

Year	Wind Direction During Cloud Foetus Formation Period over Ajmer	Wind Direction During Rainy Season over Ajmer
1992–1993	SW,N,NE,S,W,NW,SE	SW,W,N,NW,NE,SE,E,S,WSW
1993-1994	SW,N,NE,S,W,NW,SE,E,SSE	SW,W,NE,N,NW,S,SE,E
1994–1995	SW,N,W,NE,SE,S,NW,WNW	SW,W,NE,N,NW,S,SE,E,WNW
1995–1996	N,SW,NE,S,W,SE,E,NW,WSW	SW,W,N,NE,NW,S,E,SE
1996-1997	SW,N,S,NE,W,SE,NW,E,ESE	SW,W,N,NE,S,NW,WSW
1997–1998	N,SW,S,W,NE,SE,NW,E,WSW,SSE	SW,N,W,NE,NW,S,SE,E
1998–1999	N,SW,W,S,NE,SE,NW	SW,W,N,NW,S,NE,E,SE,WNW
1999–2000	SW,W,N,S,NE,NW,WSW,E,SE	SW,W,NW,N,NE,S,E,SE
2000-2001	SW,N,W,S,NW,NE,E,SE	SW,W,N,NW,NE,SE
2001–2002	SW,W,N,S,NW,NE,E,SE,WSW	SW,W,N,NW,SE,NE,S,E,WSW

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Table 58. Wind directions over Shillong during the period of cloud foetus formation and during the rainy season

Year	Wind Direction During Cloud Foetus Formation Period over Shillong	Wind Direction During Rainy Season over Shillong
1992–1993	W,SW,NW,SE,NE,E,S,NNE	SW,NW,W,SE,S,N,NE,E
1993-1994	SW,W,NW,SE,N,E,NE,S	SE,SW,NW,W,S,N,E,NE
1994–1995	W,SW,NW,E,N,SE,S,WSW	SW,E,W,S,NW,SE,N,NE
1995–1996	W,SW,NW,E,N,NE,SE,S	SW,S,SE,NW,W,N,E,WSW
1996-1997	SW,NW,W,E,N,SE,S,NE	SW,SE,NW,E,S,W,NE,N
1997–1998	SW,W,NW,SE,E,NNW,N,S	SW,W,NW,NNW,NE,SE,N,E
1998–1999	SW,N,NW,W,SE,E,NNW,NE,WSW	SW,W,NW,N,NE,SE,S,WNW,E
1999–2000	SW,W,NW,E,N,S,WSW	SW,W,SE,E,NW,S
2000-2001	SW,W,NW,WNW,E,SE,WSW,NE	SW,SE,NW,E,S,NE,N,WSW
2001–2002	Insufficient Data	Insufficient Data

Table 59. Wind directions over Port Blair during the period of cloud foetus formation and during the rainy season

Year	Wind Direction During Cloud Foetus Formation Period over Port Blair	Wind Direction During Rainy Season over Port Blair
1992–1993	NE,E,NW,N,SW,NNE,W,SE	SW,WSW,W,NW,S,SSW,E,N,SE
1993-1994	E,NE,ENE,SE,NW,ESE,WSW,NNE,NNW	W,WSW,E,NW,SW,WNW,NE,ENE
1994–1995	NE,NNE,N,E,ENE,NW,SE,NNW	SW,WSW,SSW,W,S,E,NE,SE,ESE
1995–1996	NE,ENE,NNE,E,N,NNW,ESE,W,NW	SW,WSW,W,SSW,S,WNW,SSE,SE,NW
1996-1997	NE,ENE,E,NNE,W,N,NW,NNW	SW,W,WSW,E,NE,SE,SSW,ENE
1997–1998	NE,E,ENE,NNE,ESE,NW,W,SW	SW,W,WSW,S,SE,WNW,NW,E
1998–1999	E,ENE,NE,W,SW,WNW,ESE,NNW	SW,WSW,W,NW,WNW,SE,E,NNW
1999–2000	NE,ENE,E,NNE,ESE,NW,NNW,N,S	W,WSW,SW,NW,WNW,E,NE,SE,ESE
2000-2001	NE,ENE,E,NNE,W,NW,N	W,SW,WSW,WNW,SSW,S,NW,ESE
2001–2002	NE,E,ENE,W,NNE	W,WSW,SW,E,WNW,SE,S,NE, SSW

XXII. The four days commencing from the 8th lunar day of the bright fortnight of Jyeshtha month are sustained by winds. These days are called Vaayu dhaaranas. It will prove beneficial if they are accompanied by soft and auspicious breezes from north, north-east and east.

In the *Brihat Samhita*, it has been stated that westerly winds also result in copious rainfall in the regions. This particular period specified in the prediction starts just around the time when the gestation period of cloud foetuses is complete and they are ready to deliver the initial rains of the season. Tables 40-43 give a lucid illustration of the wind velocities, prevalent wind directions and total seasonal rainfall during the respective years over the four stations during the period of study.

XXIII. In the bright fortnight of Jyeshtha month, if it rains in the four lunar mansions beginning with Swati, the four months commencing from Sraavana would be retainers of rain in order i.e. if there is rain in the star Swati, there would be no rain in the month of Sraavana. If there is rain in the star Visaakha, no rain in Bhaadrapada month; if there is rain in the star Anuraadha, no rain in Aaswayuja month and if there is rain in the star

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Jyeshtha, then, there will be no rain in the month of Kaarthika.

An attempt has been made to assess the rationality of the prediction over the four regions during the bright fortnight of *Jyeshtha*. It is directed by *Varaaha Mihira* that the days ruled by lunar mansions *Swaati, Visaakha, Anuraadha* and *Jyeshtha* should be taken into consideration. Generally, a lunar month is named after the star with which the moon is conjoined with on the day of the full moon (*Poornima*). So, in our present discussion, in *Jyeshtha* month, during the full moon or the fifteenth day of the bright fortnight (*Shukla Paksham*), the Moon is in conjunction with the star *Jyeshtha*. Hence, a conclusion can be drawn out of this, that the days referred to here are the last four days i.e., *Dwaadasi*, *Trayodasi*, *Chaturdasi* and *Poornima* (12^{th} , 13^{th} , 14^{th} and the 15^{th} days respectively) of the bright fortnight of the *Jyeshtha* month when the lunar conjunction takes place with the *nakshatrams Swaati*, *Visaakha*, *Anuraadha* and *Jyeshtha* respectively. Tables 44 – 47 represent this very concept by verifying whether there was any rainfall during the months of retention (mentioned in the prediction) over the four regions during the study period.

XXV

a). *If there happens to be rainfall in the asterisms of Hasta, Purvaashaadha, Mrigasira,*

Chitra, Revati and Dhanishtha, the total rainfall in the rainy season would be 16 Dronas.

b). If it rains under the asterisms Shatabhishak, Jyeshtha and Swaati, the rainfall amounts to 4 Dronas.
c). If it happens in the asterism Krittika, it will be 10 Dronas.
d). 14 Dronas of rainfall is can be expected during the season if it rains under the stars Sravana, Makha, Anuraadha, Bharani and Moola.
e). If it rains in Poorva Phalguni, then, the total rainfall would be 25 Dronas.
f). One could predict 20 Dronas of rainfall if it rains in Punarvasu star.
g). If it rains in the stars Visaakha and Uttaraashaadha, then, this would yield 20 Dronas of rainfall in the season.
h). If it rains in Aaslesha star, then, the total seasonal rainfall would be around 13 Dronas.
i). A rainfall of 25 Dronas can be predicted if it showers under the stars Uttaraabhaadra, Uttara Phalguni and Rohini.
j). When the rainfall occurs in Purvaabhaadra and Pushya stars, then, the total precipitation would be equal to 15 Dronas in quantity.
k). In Aswini star, a rainfall would indicate a total rainfall of 12 Dronas during the monsoon season.
l). If it happens to rain on the day reigned by Aardra star, then, the aggregate precipitation during the season may be placed at about 18 Dronas.

Hence, the first 27-28 days of the initial period of rainfall during a year have been considered as they envelope a single cycle of the days ruled by all the 27 asterisms. The period after the full moon in the month of *Jyeshtha*, beginning on the day ruled by *Poorvaashaadha*, has been considered for this purpose i.e. to judge the quantity of rainfall during the season, as specified by *Varaaha Mihira* (Chapter XXIII, *Pravarshanaadhyaayaha, Slokam* 1).

The star groupings specified in the above prediction may not comply with the actual patterns of rain-bearing stars during the given period. Hence, in case of total difference with the groupings in the prediction, an ambiguity arises as to which particular star/star grouping has to be considered for weighing the prediction against the modern data. Here, again the *Brihat Samhita* comes to our rescue by stating thus categorically:

"Should there be rain in the lunar mansions beginning with Poorvaashaadha after the full moon in the month of Jyeshtha, the quantity of rainfall during the rainy season can be judged based on the rainfall during this period.

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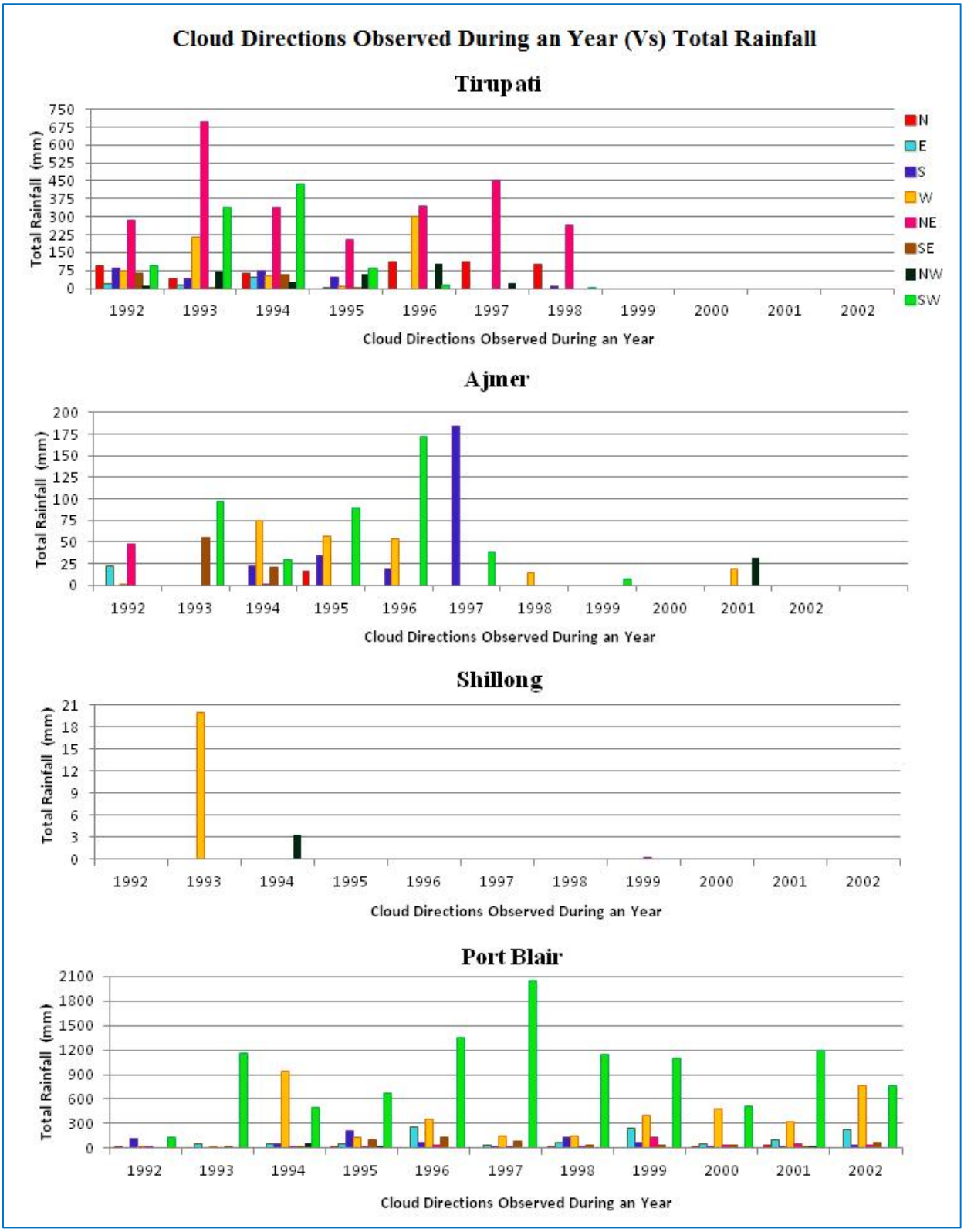

Fig.2. Cloud Direction versus Rainfall over the four regions during the period of

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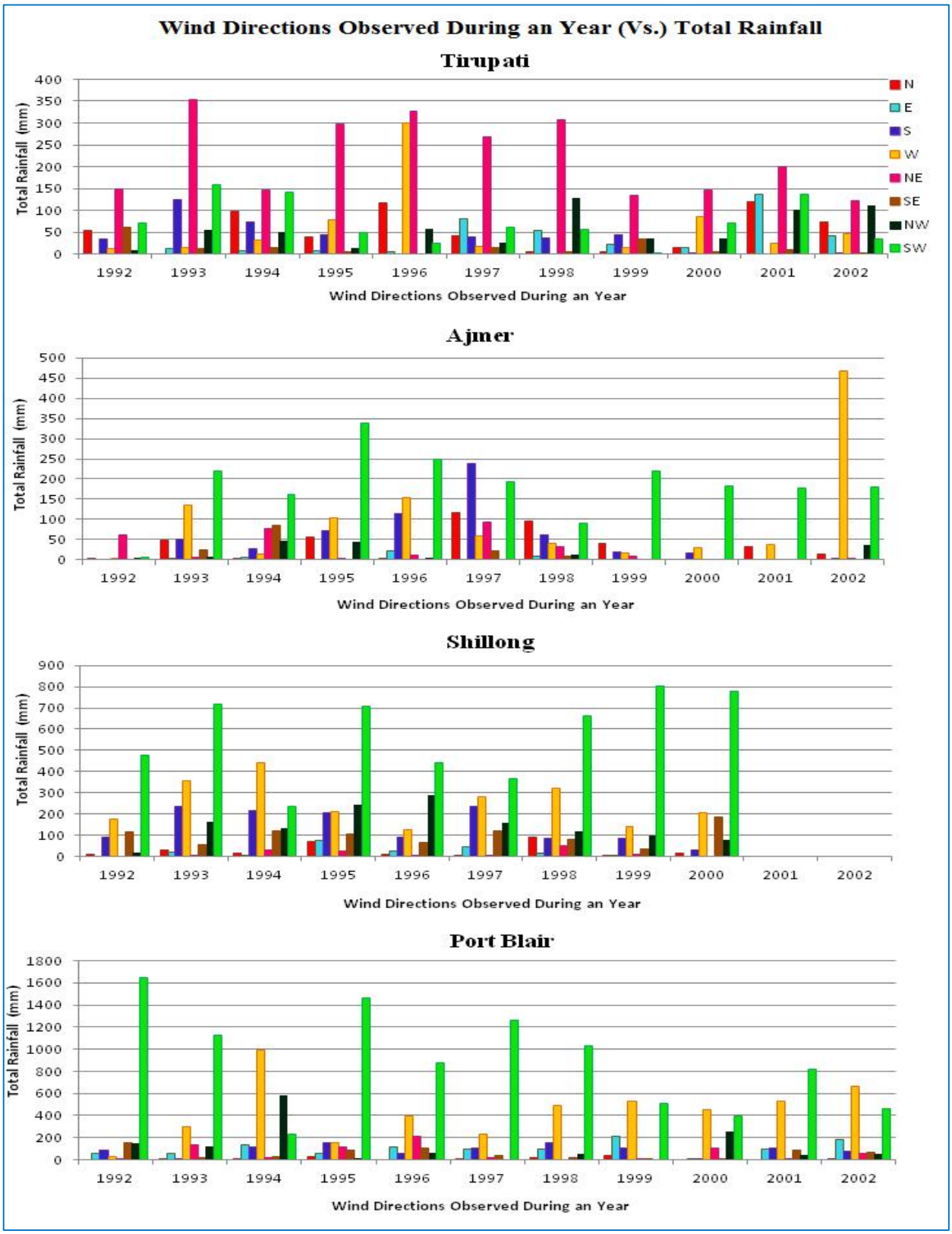

Fig.3. Wind direction versus rainfall over the four regions during the period of study

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Fig.4. Predicted Rainfall versus actual Rainfall based on the nakshatram of initial

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The quantity of rainfall should be gauged on the day ruled by any of the rain-producing asterisms (headed by Poorvaashaadha star), when there is rain for the first time, through the amount of rain by which the earth is cleared of dust, or drops of water are made to appear on the tips of blades of grass" (Chapter XXIII, *Pravarshanaadhyaayaha, slokam* 1).

Hence, it can be asserted unequivocally that the star in which the initial rainfall occurs during the season is pivotal to determine the prospect of rainfall over the entire season. *Varaaha Mihira* also assists us by stating the physical criteria, based on which the initial day of rainfall is to be identified (earth is cleared of dust and drops of rain made to appear on the tips of blades of grass). Hence, bearing this in contention, we have considered only those days when the rainfall was greater than or equal to 1 mm. Consequently, it follows that the first instance, after the Full Moon in the month of *Jyeshtha*, counted from the day ruled by the asterism *Poorvaashaadha*, in which the rainfall is greater than or equal to 1 mm. during the period (27 - 28 days) is taken to be the initial day of rainfall and the asterism prevalent over that particular day has been considered for the purpose of comparison.

Tables 48-51 portray the days of initial phase of rainfall during the season in a given year along with the *nakshatrams* under which the precipitation occurred. This is accompanied by a comparison of the actual tangible rainfall with the envisioned rainfall value, going by the *Brihat Samhita*. (One *Drona* of Rainfall = 6.4 cm.). From the tables, it is quite clear that the predicted rainfall values are within some considerable vicinity of the measured rainfall values over Shillong, Port Blair and even Tirupati, with maximum proximity observed over Port Blair. However, in case of Ajmer, there are yawning gaps between the two sets of values during the period of study (Tables 48 – 51). These trends have been portrayed graphically in Fig. 4.

In Tirupati, Ajmer and Shillong, the predicted rainfall values were greater than the recorded rainfall values, while in Port Blair, this was reciprocated, i.e. the recorded rainfall values were greater than the predicted precipitation quantities.

XXVI. The direction of clouds at the time of cloud foetus formation is reversed at the time of their delivery during the rainy season. Clouds formed in the East will pour down rain in the West and vice versa. The same holds good for other pairs of quarters/directions (North-South; North-East and South-West; North-West and South-East) (BS, XXI, Garbha Lakshanam, slokam 13)

The cloud directions over Tirupati during the period of rainy season were significantly opposite to the directions observed during the period of formation of cloud fetuses in 1992-1993, 1993-1994, 1994-1995 and to some extent in 1997-1998 (Table 52). In Ajmer, during 1992-1993, 1993-1994, 1996-1997 and 1997-1998, the directions were found to be reversed during both the fore stated periods of time (Table 53). Since there was no perceptible data available over Shillong during the period of study, no solid comparisons could be sketched out regarding this prediction (Table 54). Most of the instances over Port Blair coincided with the prediction as in majority of the episodes, mutually opposite cloud directions were observed during the course of the both the periods (Table 55). Hence, this prediction seems to be in vigorous terms with the real-time observations, as seen from the comparison.

XXVII. ***The winds also follow the same trend mentioned above, i.e. the direction of wind at the time of cloud formation is reversed at the time of rainfall (East-West, North-South, etc.)*** (***BS***, **XXI**, ***Garbha Lakshanam***, ***slokam*** **13**)

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The observed wind directions over all the four stations during the period of study have been tabulated in Tables 56–59. From these, we can deduce without any substantial degree of difficulty that, the wind directions observed during the period of cloud foetus formation over all the stations in deliberation, were promptly reversed during the period of delivering rain in a given year during the period of study. Hence, this particular prediction can also be appended to the list of highly effectual predictions of the *Brihat Samhita*.

Overall, the rate of correspondence of the predictions of *Brihat Samhita* with the on-site recorded values was generally above 50%. Many a time, it was around 55% - 57%, barring a few cases where there was complete or almost complete correlation with the documented data, where the rate of relation ranged from as high as 80% to a comprehensive 100%.

Conclusion

In the present work, after meticulous scrutiny, a total of 797 verses spread over 33 chapters are identified to be in some way or the other related to meteorology at least in the remotest of the terms. Out of these, about 75 predictions are designated to be included in this article, of which, 48 are categorized to be placed under qualitative predictions and the rest 27 of them are picked up to carry out the current comparative study.

The predictions are categorized under the 6 sub-heads *viz*. Predictions based on Venus, Predictions based on *Raahu's* course (pertaining to eclipses), Predictions based on planetary conjunctions, Prediction for the Sun's entry into *Aardra* star, Predictions based on the directions of clouds and winds and lastly, predictions based on lunar conjunctions. All the results have been tabulated elaborately and graphical illustrations have been provided duly wherever necessary.

The concept of cloud pregnancy and subsequent delivery of rain after the 195 days of cloud foetus gestation is a unique and quintessential feature of the *Brihat Samhita*. Expert astrologers were often able to predict the onset, circulation and withdrawal of monsoons, about famines, droughts and other disasters, when the modern measurements as well as modeling techniques failed to do so. Prediction of rainfall trends has somehow managed to brow-beat all the advances in modern meteorology from time to time.

Most of the predictions stand validated during majority of the instances. A further study by employing most sophisticated astronomical apparatus to assess the efficacy of the astrology-based predictions would pave way for the creation of a comprehensive, reliable and a completely accountable prediction system that could be readily counted upon even at times of crises.

The inimitable virtuous trait of *Varaaha Mihira* is that he exhibits great scientific temper and does not blindly support some prevalent antiquated notions. He seeks to explain them on solid scientific grounds using sound rational platform. For example, about the age-old belief that a eclipse is caused by *Raahu*, has been treated by *Varaaha Mihira* in the following manner:

"In case Raahu has a body and moves in the zodiac possessing only the head and a circular shape, how is it that he seizes the luminaries who are separated from him by 180^0, when his own movement is fixed and uniform? If, on the other hand, his motion is not fixed, how is it that his exact position is determined by calculation? If he is to be identified only by his tail and face, why should he not seize the luminaries (Sun and Moon) at other intervals, instead of only when 180^0 apart? If this Raahu who is a big serpent in appearance, actually seizes the Sun or the Moon with his tail or mouth, why should he not obstruct half of the zodiac that lies between his head and tail? If there be two Raahus, when the moon is eclipsed by one Raahu, then, the Sun who is 180^0 away from the Moon should also be eclipsed by the other Raahu whose rate of motion is also equal to that of Raahu.

At a lunar eclipse, the moon enters the shadow of the earth and at a solar eclipse; Moon enters the Sun's disc. That is the reason why the lunar eclipse

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does not begin at the western limb, nor the solar one at the eastern limb. In this manner, the ancient seers who were endowed with divine insight have explained the causes of eclipses. Hence, the scientific fact is that Raahu is not at all the cause of eclipses. An eclipse can by no means be ascertained through omens and other indications because portents such as fall of meteors and earth tremors occur at other times as well" (The *Brihat Samhita*, Chapter V, *Raahu Chaaraha*, *slokams* 4, 5, 6, 7, 8, 13 and 14).

From this, it is predominantly evident that despite his reverence and veneration for ancient religious traditions, *Varaaha Mihira* is vehemently reluctant to let certain proprietary scientific facts to be diluted with widespread beliefs and notions and even attempts to seal this lacuna with some plausible, balanced and coherent postulations. He also urges the readers to understand the scientific symbolism embedded in such stories. Moreover, *Varaha Mihira*, inspite of his ingenious, nifty and crafty contributions, very humbly admits and acknowledges that he has presented nothing novel and creative and all this knowledge had been inherited from the innovations of the ancient seers and sages. Hence, indubitably, *Varaha Mihira* can be certified as a 'champion campaigner', in whom the sacrosanct ancient Indian wisdom and noble traditions are vested and manifested adeptly and comprehensively. *Varaaha Mihira* in the concluding chapter remarks thus: ***"I have lifted out the moon of science by churning the ocean of knowledge with the Mandhara of my intellect so that, under the moonlight, people may have correct vision. I have not left out the findings of the ancient Acharyas in this book of mine. May, good people go through my work as well as that of the ancient Acharyas. A good man magnifies the virtue inspite of there being defects, whereas a bad man magnifies defects, ignoring the merits. It is desirable to invite criticism from a bad person as much; as the gold of Kaavya (classic) gets purified by putting it into the fire of a bad man's intellect. Hence, by all means, even a bad man must be invited to see this book. A scholar is invited to look into this work impartially so that he may know what defects there have accrued by this work being handled by different persons, different scribes as well as by being transmitted by rote. Also, I might have myswelf been at fault or might have omitted certain portions. With a mind rendered pure by the Grace of the Sun-God, the rishis of yore and my own teachers, I have codified and compiled this Science. May, my salutations be to the Acharyas of the yore!"***

Given this scenario, it is highly unfortunate that many western orientalists still believe and propagate a misguided theory that Indians had borrowed everything from Ancient Greeks or *Yavanas*, especially *Hindu* Astrology. Even some western scholars have voiced their concern against this proposition saying that the *'Indians were the teachers rather than learners'*. They have all founded their argument on the pseudo pedestal of *Varaaha Mihira's* statement that "the *Yavanas* are to be honoured like the sages".

This particular bogey of imposed Greek influence on Indian intellectual heritage has been permanently put to rest by *Swami Vivekananda's* fortified and resilient arguments thus:

"There may be, it is true, some similarity between the Greek and Indian terms in astronomy and so forth, but, the westerners have ignored the direct Sanskrit etymology and sought for some far-fetched etymology from the Greek. That such shallow and biased learning has been manifested by many orientalists in the West is deplorable. From a single Sanskrit sloka that reads, 'The Yavanas are Mlecchas (foreigners); in them, this science is established; therefore, even they deserve worship like Rishis (Sages)……', in the west, they have gone so far as to declare that all Indian sciences are but echoes of the Greek; whereas a true reading of the sloka may show that the Mleccha disciples of the Aryans are herein praised in order to encourage them to a further study of the Aryan Sciences…….".

This was seen by several eminent scholars across the globe, as an irrefutable tactic employed by *The Occident* (Western World) to showcase,

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project and establish Greece as an obverse promoter of the West, to counteract the justified and genuine dominance of *The Orient*, especially India, in the arena of the origin and evolution of multifarious divisions and sub-divisions of various arts and sciences. We know that, during the recent contemporary times, this spot-light shifted quite perceivably towards Africa and Central Asia.

Sometimes, when we observe rain-bearing clouds gathering in the sky, it may not actually rain and those clouds may disperse within no time, giving way to a clear sky. During some other instances, rain droplets may actually start falling from the clouds and one can even view them with naked eye. But, astonishingly, these showers won't reach the earth's surface at all. They get evaporated in mid-air and their trail in the atmosphere can be recognized effortlessly. Such rain is known as '*Virga'*. Modern atmospheric science may enlist the immediate visible reasons for such a phenomenon to occur. But, treatises like *Brihat Samhita* assert that such phenomena are caused due to the miscarriage of cloud foetuses, the reasons for which have been mentioned and elaborately explained.

Hence, the speedy need of the hour is to study the treatises like The *Brihat Samhita* of *Varaaha Mihira*, The *Artha Shaastra* of *Kautilya* and other such texts, wherein meteorology has been given due weightage and put those invaluable and meritorious predictions enshrined in them, to test. In the case of *Brihat Samhita*, the author *Varaaha Mihira* lived in and around *Ujjain* in Madhya Pradesh state of India. Hence, there is a fair bit of probability that he might have observed the climate of *Ujjain* and its surroundings while compiling his *magnum opus*. Ujjain is a land-locked territory in central India with typical tropical climate. Hence, the predictions of the *Brihat Samhita* are found to be more validated over Tirupati and Ajmer, which possess climatic conditions that resemble those of *Ujjain* to a considerable extent, though Ajmer has a typical desert-type climate. Shillong's climate can be classified as sub-tropical high land climate and that of Port Blair is immensely impacted by the sea surrounding it. Hence, evidently, in some cases, the predictions were not found so efficient over these two regions.

But, overall, at a bird's eye view, we can straightforwardly arrive at a definitive conclusion that an all-inclusive study and research over the *Brihat Samhita* will definitely throw some light on certain shrouded mysteries concerning meteorology, that have been puzzling the meteorologists for many a decade. Moreover, *Brihat Samhita* was compiled some fifteen centuries earlier. Climatic conditions, especially temperatures, have undergone tremendous changes since then. Pollution has increased manifold and man has left no stone unturned in degrading the nature's sensitive ecological balance. Therefore, it would be too much of an anticipation to expect these predictions to exhibit the same efficacy that they were expected to do, some 1500 years ago. Indiscriminate anthropogenic activity and the subsequent environmental deterioration is the principal culprit here. But, despite all these adverse odds against them, the predictions of the *Brihat Samhita* managed to score a healthy 55% - 57%, barring a few cases where there was complete or almost complete correlation with the documented data, where the rate of relation ranged from as high as 80% to a comprehensive 100%.

Furthermore, intensive investigation – oriented studies need to be initiated in this direction, while the government and other scientific establishments need to encourage the students and researchers by providing appropriate incentives and facilitating Research & Development on this front.

Before assessing the effectiveness of such treatises, the immediate mission of mankind is to put in their pledged and full-fledged ace efforts to bring the already - depreciating atmospheric environment back on track, because the entire star and planetary effects and other phenomena are rendered void by the predominant anthropogenic haphazard pollution and toxification. Then alone, can they design and formulate any scientific tools and prediction models that can be totally relied upon, without any second thought. When this noble

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manoeuvre is accomplished, then alone, man can fully harvest the fruits of treatises like the *Brihat Samhita* and hand over a clean, pure, unadulterated living environment to his posterity. It is also his pristine and destined duty to preserve such eternal and imperishable treasures like the *Brihat* Samhita and other such perpetual scriptures because it is our ordained provident duty to sustain this quintessential torch of primordial wisdom as its worthy custodians, so that our future generations can proudly inherit them from us as a cherished lineage and use these precious jades as potential tools to decrypt and decipher the 'Ever Green' codes and masterly modes of the Mother Nature.

Acknowledgement

My first and foremost salutations to the Almighty Lord *Venkateswara* and to my Parents as well for bestowing upon me the essential strength and endurance to carry out this study. I am equally obliged to the Sun-God *(Aaditya),* to all the planets of the planetary system and to the 27 *nakshatrams* for benevolently instigating the divine driving force (*Prachodaka Sakti*) required for this extensive work. I feel greatly indebted to the sacred lineage of Scholarly Saints, especially *Varaaha Mihira,* who have invested their entire whole and soul to present us with ever-treasurable treatises like the *Brihat Samhita* and others. My grateful obeisance to Professor *Raama Krishna Bhat* (late) for bringing out an exquisitely erudite and a reader-friendly translation of the *Brihat Samhita* with some exhaustive literary comments. I take this golden opportunity to convey my profound gratitude to *Sri Varun Jain* of *Motilal Banarsidass* Publishers Private Limited (MLBD), New Delhi, for their initiative in providing me the treatise within a short notice of one month, despite the volume being rendered out of print at that point of time. My heartfelt thankfulness to National Data Centre, India Meteorological Department (IMD), Pune, for the supply of the requested meteorological data vital for carrying out this study. Last but not the least; I express my profound gratefulness and appreciation to Ms. *Haripriya Chinthapally*, USA for her undaunted, able and invaluable support as well as meritorious cooperation in statistical data programming and in formatting the article.

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