

PLANETS IN THE VEDIC LITERATURE

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A deeper examination of Vedic literature reveals a profound tradition of astronomical observation that was previously overlooked, because it is hidden in religious symbolism, not clearly stated in rational terms.

1. Vedic literature reflects a clear tradition of astronomical observation through the 27 or 28 Nakṣatras (constellations of the Moon), along with other astronomical data, including various solstice and equinox positions of great antiquity.
2. Notice of the Nakṣatras, which are often very dim groups of stars, requires notice of the planets, which are brighter even than the brightest stars.
3. The planets are primarily mentioned as a group of five or seven (including the Sun and the Moon) or as 33 or 34 along with 27 or 28 Nakṣatras and the Sun as wives of the Moon.
4. The Vedic ritual was based on union with the Sun, Moon, stars and planets and thereby required an ongoing observation of their positions.
5. The Vedic Gods and seers have astronomical correlations relative to the stars and planets.
6. The Planets can be seen as forms of Soma cups.
7. The Planets can be seen as forms of Agni, particularly the Planet Mars.
8. Evidence for observation of the Planets appears in Vedic literature through numbers that resemble those of the sidereal and synodic periods of planets, particularly the numbers used in the building of the fire altar, as well as the hymn totals of the different books of the *Ṛg Veda*.

INTRODUCTION

The Vedic literature, the most ancient literature of India, including the Brāhmaṇas and early Upaniṣads, contains no listing of the five planets by name. The *Vedāṅga Jyotiṣa*, the earliest Vedic astronomical text, mentions the Sun, Moon and constellations (*Nakṣatra*) but not the planets. The first clear reference to the planets by name is found in the epic, the *Mahābhārata* (Udyoga Parva 143.8-11, Bhīṣma

Parva 2.32; 3.11-18, 27-28), which is generally dated around the second century BC (though much of its material is regarded as several centuries or more older). For this reason some scholars have proposed that the Vedic people were not aware of the planets and knowledge of them came from an outside source, possibly as late as the Greeks after the time of Alexander (300 BC).

There is, however, much evidence to show that the Vedic people did know of the planets, but that existing Vedic literature, being non-astronomical in nature only referred to them indirectly and symbolically, and generally as a group among the other heavenly bodies. The *Vedāṅga Jyotiṣa* being concerned with a calendar depending upon Sun and Moon positions relative to the *Nakṣatras* did not need to consider the planets and hence does not mention them.

The Vedas contain a system of astronomy dividing the zodiac into 27 or 28 lunar constellations (*Nakṣatras*). The full listing of *Nakṣatras* occurs as early as the Yajur Veda (*Taittirīya Saṃhitā* IV.4.10), and *Atharva Veda* (XIX.7), while several *Nakṣatras* and the term *Nakṣatra* itself occur several times in the oldest Vedic text, the *Ṛg Veda*. The Brāhmaṇas describe positions of the new, full, or half moon in these *Nakṣatras*, including as beginning the year (for example *Kauṣītiki Brāhmaṇa* IV.4-12; V.1-2).

It should be noted that the *Nakṣatra* system is a highly practical and scientific division of the zodiac, because it provides a different constellation for the Moon to occupy every day. Thereby it allows for precise observation of the Moon's position relative to the stars. Once it is determined what *Nakṣatra* the Moon occupies, the *Nakṣatras* for the remainder of the month will follow in sequence.

The number of *Nakṣatras* being either 27 or 28 is a reflection of the fact that the Moon traverses the zodiac in 27.3 days. To keep the sequence in order a twenty-eighth *Nakṣatra* has to be inserted periodically. This is like the lunar months being 12 or 13 as there are 12.3 lunar months in a year, necessitating the insertion of an occasional intercalary month.

We will not go into the controversial issue of the dating of Vedic texts. The most conservative estimates place them in the pre-Buddhist era from the *Ṛg Veda* to the Brāhmaṇas about 1500-700 BC. The most liberal estimates, including those done in light of recent archaeological evidence of the Sarasvatī river in India, pushes the earlier texts before 1900 BC, when the Sarasvatī river which they prominently mention ceased to exist as a perennial stream. This agrees with the astronomy of the texts also. The Brāhmaṇas place the Kṛttikās (Pleiades in Taurus) in the eastern direction (*Śatapatha Brāhmaṇa* II.1.2.3), the direction of the vernal equinox. The *Atharva Veda* (XIX.7.2) places the solstice (*ayana*) in Maghā (Leo). Such data reflects a period of around 2500-2000 BC. For information on this subject one can examine my book *Gods, Sages and Kings: Vedic Secrets of Ancient Civilization*. ¹The point of this particular article is to show that there was a Hindu

knowledge of the planets back into the Vedic era.

NAKṢATRA OBSERVATION NECESSITATES NOTICE OF THE PLANETS

The *Nakṣatras* often consist of relatively faint stars, third magnitude and dimmer, which are hardly noticeable compared to the brightness of the planets. It is totally illogical to believe that a culture could notice so precisely these dim fixed stars along with the Moon's position within them and not notice the planets which are much brighter than any of the *Nakṣatras*. That the Vedic people knew of the *Nakṣatras* but not the planets would be like stating that a culture knew of the planets but not the Moon. Hence the very existence of the *Nakṣatra* system suggests that the planets were known to the Vedic people.

In fact since a number of the *Nakṣatras* are made up of dim stars it is difficult to note the Moon's position relative to them clearly. The brighter Moon causes several *Nakṣatras* to become almost invisible. In this regard an observation of the planets helps greatly and would be discovered quickly as an additional aid in observation. Jupiter stays in a *Nakṣatra* for over five months, and Saturn for over a year. When one of these bright planets is located in a dim *Nakṣatra*, the *Nakṣatra* can be easily observed through the particular planet located there. The position of the planet could be clearly noted on a moonless night, and then the Moon's conjunction with it would provide an accurate delineation of the Moon's position in it.

The planets follow the same zodiacal band as the Moon and thereby appear as its companions. Judging the Moon's position with the help of the planets on this band is much easier. A number of even brighter *Nakṣatras* (like Svāti or Arcturus) are far removed from the ecliptic and do not provide a precise determination for the Moon's position in the zodiac. Therefore, observation of the *Nakṣatras* would require noting of the planets, particularly the outer planets Mars, Jupiter and Saturn which stay distant from the Sun for long periods of time, to provide clarity in determining *Nakṣatra* positions.

THE TERM NAKṢATRA ORIGINALLY INCLUDED THE PLANETS

There is evidence that the term *Nakṣatra* originally included the planets, along with the Sun and Moon. *Nakṣatra* probably originally meant star or heavenly body, which would naturally include the planets. We should note that all cultures originally included the planets among the stars and discriminated between fixed and moving stars, the latter being the planets. We would expect the same inclusion in the earlier phase of Vedic astronomy.

In the *Mahābhārata* (I.66.16-16) and *Purāṇas* the *Nakṣatras* are considered to be the daughters of the creator Dakṣa, who were given as wives to the Moon, of which Rohiṇi was the favourite. The Moon as the moving force was considered to be masculine, and the *Nakṣatras* as the places through which he travelled were

regarded as feminine.

However, in the *Yajur Veda (Taittirīya Samhitā II.3.5.1)* the daughters of Prajāpati (another name for the creator Dakṣa) are said to be 33, not 27. They are also given in marriage to the Moon, of which again Rohiṇī is the most favourite. Who were these 33?

It is unlikely that these were 33 constellations, because such a division of the zodiac makes no sense. The division by 27 provides the Moon with a different constellation every day. A division by 33 would cause insurmountable difficulties to calculate, particularly for calendrical purposes, which was the main use of the *Nakṣatras*. If the 33 included extrazodiacal constellations there is no explanation as to how the Moon could unite with them as it would never pass through them. Hence we can rule out the 33 being constellations.

There are 33 Gods in Vedic literature which are said to be the 8 Vasus, 11 Rudras, 12 Ādityas (Suns) and 2 Aśvins. This could not have been the group of 33, as the Vasus and Rudras relate to phenomenon of the earth and atmosphere, not the heavens, and are not considered to be wives of the Moon.

Meanwhile we note that in the *Ṛg Veda (VII.86.1; X.88.13)* the term *Nakṣatra* is used for the Sun. This means that it could have been used for other heavenly bodies like the planets. Elsewhere in the *Ṛg Veda* there are 34 lights of a common nature of which the most important is the Sun.

Vast is that secret name and all-reaching, through which you generated what has been and what will be. The five beloved ones have entered into its original born beloved light.

He filled the two firmaments and the middle region, the five Gods by the seasons seven by seven. With thirty-four lights of common nature and diverse laws his light spreads in many ways. *Ṛg Veda X.55.2-3*.

The 34 must be the 27 *Nakṣatras*, Sun and Moon and five planets. The five Gods may also be the five planets.

The sacrificial horse, identified with the Sun (*Ṛg Veda I.163.2*), is divided into 34 parts (*Ṛg Veda I.162.18*), which are divided according to the seasons (*Ṛg Veda I.162.19*). As the horse sacrifice (*aśvamedha*) is one of the most important Vedic rituals, it appears that the planets were included in this symbolism. In fact we note that the *Nakṣatras* are said to be the form (*rūpa*) of the sacrificial horse and the year is said to be his soul (*Yajur Veda, Taittirīya Samhitā VII.5.25; Bṛhadāranyaka Upaniṣad I.1*). The planets, therefore, must have been among these 34 parts of the horse which is all the *Nakṣatras*, including the Sun.

Therefore, the 33 wives of the Moon are the 27 *Nakṣatras*, the Sun and the five planets and the Moon himself is the thirty-fourth. Affirming this we note that there is an entire hymn in the *Ṛg Veda* (X.85), which also occurs in the *Atharva Veda* (XIV.1), describing the marriage of the Moon God with the Sun Goddess, which apparently occurs at the winter solstice. Just as the Sun and the constellations were regarded as wives of the Moon, so must have been the planets.

The Moon is the fastest moving of the heavenly bodies. In this regard it could be looked upon as the male who activates or fertilizes the other heavenly bodies it comes in contact with, including the Sun and planets which move slower than it does. The *Ṛg Veda* (I.105.10) also speaks of the five bulls that dwell in heaven, which are probably the five planets. As the Moon by moving through the *Nakṣatras* activates them, so must the other planets. To call the planets bulls (*ukṣa*) suggests this impregnating action. If this action of the planets was known, it must have been watched and calculated.

There are also said to be seven horses of the Sun (*Ṛg Veda* I.164.2). These seven probably included the Sun, Moon and five planets, as the horse has been identified as having the form of the *Nakṣatras*.

THE VEDIC RITUAL AS GAINING THE HEAVENLY BODIES

The heavenly bodies were important to the Vedic religion, in fact central to it. The *Taittirīya Brāhmaṇa* I.V.2 states:

Those who sacrifice here attain (*nakṣate*) heaven beyond. This is the nature of the *Nakṣatras* (*nakṣatrānām nakṣatratvam*).

The idea is that by the sacrifice one goes to the heavenly bodies and their resident deities. The very term *Nakṣatra* means what is obtained by sacrifice.

A similar verse occurs in the *Ṛg Veda* (X.22.10), which speaks of “the secret of the peoples of the seers who have the power of the *Nakṣatras* (*guhā yadī kavīnām viśāṃ nakṣatraśavasām*).” Yet more clearly the *Ṛg Veda* states:

Like a dark horse ornamented with pearls, our fathers (the seers) made the *Nakṣatras*. They placed the darkness in the night and the light within the day. Bṛhaspati broke open the rock and found the rays (cows). *Ṛg Veda* X.68.11.

Not only do the seers gain the stars, the original seers, the Vedic fathers, were regarded as creators of the stars. How could they fail to include the planets among them, the brightest of the stars? Their leader in fact here is Bṛhaspati, whose planetary role as Jupiter would make perfect sense here. Jupiter is the planet that is most regular in its movements, its brightness and its closeness to the ecliptic. Hence it would quite likely be regarded as a prototype for cosmic law.

Meanwhile, the Upaniṣads contain paths that lead to the Sun and the Moon (*Chāndogya* V.10). This again related the goal of Vedic knowledge to the reaching of various heavenly bodies, the foremost of which is the Sun. The *Taittirīya Āraṇyaka* I.11.49 states:

The seven seers and Atri, all the Atris and Agastya, dwell with the *Nakṣatras* giving blessings.

The seven seers are identified with the stars of the Big Dipper also called the Bears, *Rkṣas*, by the Vedic people. Agastya as the eighth is the star Canopus. However other stars and the planets have been identified with the *Rṣis*.

These ideas reflect connections between the stars and karma, such as became the basis for astrology. In this regard the *Mahābhārata* states (*Udyoga Parva* 29.15), “the *Nakṣatras* beyond shine by karma.”

The two main *Rṣi* families in the *Ṛg Veda* are the Aṅgirasas, of which Bṛhaspati is the foremost, and the Bhṛgu of which Kavi, Uśanas or Śukra is the most important. Bṛhaspati is the Hindu name of Jupiter and Śukra of Venus in later Hindu astronomy. Bṛhaspati as the priest of the Gods corresponds well with the role traditionally given to Jupiter. Śukra as the priest of the demons as well as the Gods agrees with the role of Venus. In fact one Bhṛgu seer is called *Vena* (note *Ṛg Veda* X.123), perhaps the ancient Vedic equivalent of the Roman Venus.

While some scholars have argued that the planetary identity of these seers came later, it is difficult to believe that the Vedic people could so faithfully and logically note the *Nakṣatras*, noting where the Moon resided every day, and failed to note Venus and Jupiter which are much brighter than any star! These are the two stars that are most like seers and have ever inspired human beings to greater visions.

In this regard Vedic astronomy employs a 60 year cycle based upon 5 X 12 years, with 12 years being the period of Jupiter’s orbit around the Sun. Such a 60 year cycle is found among the Chinese, who also have 28 lunar constellations and call the seven stars of the Big Dipper the seven seers, just as in the Vedic tradition. These traditions are not found in Greek or Babylonian astronomy. Such a *Nakṣatra* related Jupiter calendar would naturally suggest a knowledge of Jupiter along with that system.

In traditional Hindu astrology each planet is related to a particular Vedic seer family, as well as to certain deities. In this regard Indra, the greatest of the Vedic Gods, is associated with the planet Jupiter. This is quite impelling in that Roman Jupiter or Dyaus Pitar as the giver of the rains is clearly the Roman equivalent of Vedic Indra.

Yet while the ancients named the planets after their Gods, this does not mean that the Gods and their activities only referred to the planets. We cannot accept all the mythology of the Greco-Roman Gods as planetary in nature, even for deities like Jupiter or Mars who had planetary correspondences. Similarly Vedic Gods like Bṛhaspati or Indra stood for much more than one particular planet. The point is that we cannot exclude the planets from their symbolism.

PLANETARY MYTHOLOGY

The Hindu names of the planets and their mythology is uniquely Hindu, which is another reason why one cannot easily attribute knowledge of them to a foreign influence. Hindu mythology of the planets is given in terms of Vedic and Hindu Gods like Viṣṇu, who is the deity of Mercury, and Śiva, whose son, Skanda, relates to the planet Mars, Bṛhaspati and Jupiter, Śukra and Venus, Yama and Saturn.

Most interestingly the two main families of Vedic seers, are the Aṅgirasas and the Bṛḡus, with Jupiter (Bṛhaspati) and Venus (Śukra) who are their main leaders. These two groups often struggled. The Bṛḡus as the gurus of the Daityas or demons, and the Aṅgirasas as the gurus of the Gods become involved in the famous war between the Devas and Asuras (demons). This began when Bṛhaspati's (Jupiter's) wife Tārā (meaning the stars), was abducted by Soma (the Moon). This led to a war in heaven. Śukra (Venus) aligned himself with the Moon and the demons. Rudra (apparently Mars) aligned himself with Jupiter and the Gods. Tārā gave birth to Budha (Mercury) who is accepted as a son by both Jupiter and the Moon, though he was actually the son of the Moon.

This story contains an astronomical riddle. Jupiter is the brightest star in the night sky, and as such rules over the other stars. When the Moon appears however, it steals the light of the stars or metaphorically speaking takes away Jupiter's wife. Venus, which can never get far from the Sun, appears only in the morning or evening sky, not in the dark of night when Jupiter reigns supreme. Hence Venus is allied with the Moon. Mars similarly is allied with Jupiter as a night star. Mercury appears like a night star, lacking the brilliance of Venus, but is found only close to the Sun in the twilight hours, thus allying itself with Venus and the Moon.

This story is furthermore related to the original Vedic kings and ancestor figures. Vedic lineages start with Manu, the Vedic original man, who is said to be the son of the Sun. He has a daughter named Iḷā (which also means speech). She marries Budha (Mercury, the planet of speech), the son of the Moon (Soma), which was during the time of the war between the Gods and Demons. This starts the lunar dynasty of kings which was the main dynasty that ruled ancient India.

We should also note that Manu has a twin brother named Yama, who became the God of death, and was also the son of the Sun. In Hindu mythology Saturn is also a son of the Sun and the God of death.

This battle between the Moon and Jupiter suggests that the Vedic people not only noticed the *Nakṣatra* of the Moon but also that of Jupiter. Jupiter stays in a *Nakṣatra* around 160 days, meaning that it covers two *Nakṣatras* in the *Nakṣatra* year of 324 (12 X 27) days. The Jupiter calendar as mentioned in later astronomical texts was an imitation of the Moon (*Sūrya Siddhānta* XIV.17).

THE PLANETS AS GRAHA OR SOMA CUPS

The *Atharva Veda* contains clear references to the planets and the nodes of the Moon in a hymn that relates to various astronomical and meteorological phenomena. For the planets it uses the term *graha*, which is the classical Sanskrit term for them.

May the earthly and atmospheric powers be peaceful to us. May the planets that move in Heaven (*divicarā grahāḥ*) give us peace. May the planets (*grahāḥ*) and the Moon give us peace. May the Sun and Rāhu give us peace. *Atharva Veda* XIX.6.7, 10.

This hymn not only mentions the planets but also Rāhu or the north node of the Moon, which suggests a knowledge of eclipses and possibly the ability to predict them. Another name for Rāhu, Svarbhānu appears in *Ṛg Veda* (V.40). Yet another hymn from the *Ṛg Veda* (X.72.9), while speaking of the seven sons of Aditi or Adityas, whom I would identify with the Sun and Moon and five planets, adds an eighth called Mārtaṇḍa or the mortal egg, which is responsible for birth and death. This eighth sun which is imperfectly born or mortal, I would also identify with Rāhu. The eclipses of the Sun reflects the births and deaths of creatures, as each time the Sun is eclipsed it dies and is reborn.

The term for planet, *graha*, is very interesting, because it is a ritualistic Vedic term for the cups of Soma that can be offered to the different Gods. The Soma cup is well known to be the Moon which is filled during the waxing half and emptied during the waning half.

The wise sages with their words fashion the one being, the eagle, in various ways. Sustaining the meters in the rituals, they measure twelvefold the cups of Soma (*grahāntasomasya mimate dvādaśa*). *Ṛg Veda* X.114.5.

The twelve *grahas* are obviously the twelve moons of the year. The planets, like the Moon, also have their motions whereby they wax and wane. This is most true of the planets which are inferior to the earth's orbit, namely Venus and Mercury. Venus most noticeably fills with light as it moves from the Sun and loses that light as it falls back into the Sun and disappears. Yet Mars also goes through significant fluctuations of brightness during its synodic period. Undoubtedly, the term *graha* for planet arose from this observation of the fluctuations in planetary light like the Moon. The term *graha*, thereby, suggests an observation of the waxing and waning of the brightness of the planets through their synodic periods.

The term *graha* for planet indicates that the planets may have been an integral part of rituals wherein different cups or *grahas* were offered to the God (who himself is Heaven or the Sun). The planets may have been considered to be different types of Soma cups.

Two Some cups are particularly interesting. One is Śukra said to relate to the Sun and Manthin related to the Moon (*Śatapatha Brāhmaṇa* IV.2.1.2). Śukra as a name for Venus may be meant here, as the brightest star it could be related to the Sun. Manthin could be Mercury who is the son of the Moon in Vedic astrology.

The *Ṛg Veda* (IX.114.3) speaks of seven suns (*Ādityas*) relative to the seven directions, which may be the Sun, Moon and five planets. They are related to the seasons, which in India are six with the seventh being the Sun as the year (*samvatsara*). In classical Vedic astrology the six seasons of spring, summer, rains, autumn, the cold and the frosty seasons are ruled by Venus, Mars, Moon, Mercury, Jupiter and Saturn. This may reflect an earlier Vedic view. The six seasonal Soma cups (*rtu graha*) may have had planetary correspondences.

PLANETS AND AGNI

The planets would also be likely to be regarded as forms of Agni or the Vedic sacred fire. The reason is that when fire rituals were done at night, the stars would be imagined to be like sparks from the fire and Agni rules all forms of light.

In Hindu mythology since the *Mahābhārata* (*Vana Parva* 223-233) the deity ruling Mars, Skanda, the son of Śiva, is said to take birth through Agni. Skanda is born in the same Kṛttikā *Nakṣatra* ruled by Agni (which rulership is first mentioned in the *Atharva Veda* XIX.7 and *Yajur Veda Taittirīya Saṃhitā* IV.4.10), and *Atharva Veda* (XIX.7) listings of the *Nakṣatras*. Skanda has six mothers as the (Kṛttikā) Pleiades and the seventh which is Umā (Pārvatī). Agni in the *Ṛg Veda* is also said to have been conceived by seven mothers or seven voices (*Ṛg Veda* III.1.6).

Agni has several forms. In his universal form he is the Sun, Vaiśvānara Agni. Yet he also has the form of a child (*Kumāra*), which is related not only to Skanda but to Rudra. This child form of Agni appears to be related to the night and to the Earth. In Hindu thought, Mars is considered to be the son of the Earth, and Agni is enkindled in the Earth altar (Vedi). Earth corresponds to the night as Heaven is with the day. Hence Agni the child may be the same as Mars-Skanda, the warrior-child.

Those practicing fire rituals at night and noting the *Nakṣatras* would be impelled to identify Agni with Mars. Mars is the red and fiery planet. It also undergoes significant changes in its brightness through its synodic period.

Mars in Hindu thought is also associated with agriculture as *Kṣetrapati* or the

Lord of the field (*R̥g Veda* IV.57.2, which verse is used for the worship of Mars in later rituals). Perhaps Mars moving through the sky was thought to imitate the ploughing of the Earth. Vedic agriculture began with the burning of the land by fire. Hence Agni also relates to agriculture. Agni in his child form emerges from the field, preparing his weapons (*R̥g Veda* V.2.2-3).

PLANETARY PERIODS

There are two types of planetary periods, synodic and sidereal. The synodic period measures the period between the two brightest appearances of the planet was probably the most important of the two. This fluctuation of brightness is most in evidence relative to Mercury (116 days) and Venus (584 days), the inferior planets. Yet Mars as a superior planet has a noticeable synodic period (780 days). The synodic periods of Jupiter and Saturn are much less noticeable in their fluctuations and not much longer than a year (399 days and 378 days). As Mercury is always close to the Sun and difficult to observe one would expect that the synodic periods of Venus and Mars would have been more likely to have been noted.

The sidereal periods of Mercury is (88 days) and Venus (225 days). Of these periods those of the superior planets, particularly Jupiter and Saturn would be more evident measures of time because of their greater length (4333 days and 10,760 days, which approximate 4320 and 10,800). The period of Mars is 687 days. The number 432 (*R̥g Veda* IV.58.1) and its various multiples is common in Vedic lore, so is the number 108 and 10,800 (*Śatapatha Brāhmaṇa* X.4.2.25). The importance of these numbers may reflect at least in part an approximation of the periods of these planets (though this is not explicitly stated anywhere).

The Vedic fire altar (*Śatapatha Brāhmaṇa* X.4.3.13) is enclosed by three layers of bricks² for the three worlds of Earth, Atmosphere and Heaven, consisting of 21, 78 and 261 for a total of 360. 78, the atmospheric number, is 1/10 of the synodic period of Mars (780 days). 261, the heavenly number (which would include the stars), is 1/3 of the synodic period of Mars plus one.

That numbers for Mars would appear in the Vedic fire altar makes sense owing the later Hindu identification of Mars and Agni, the Vedic fire. The synodic period would be more important as it measures the fluctuations of Mars between its dimmest and brightest appearances, mimicking the enkindling nad blazing up of the fire altar.

Such correspondences with Mars, however, need not exclude other correspondences to various calendrical or astronomical considerations that can also be found in these numbers. The Vedic sages would have created as many sides and comprehensive a symbology as possible in the Vedic attempt to recreate the entire universe in the ritual.

THE ṚG VEDIC ASTRONOMICAL CODE OF SUBHASH KAK

Subhash Kak has shown that the numbers of the hymn totals in the different books of the *Ṛg Veda* contains much astronomical information including the *Nakṣatra* year (324 days), the lunar year (354 days), the distance between the Sun and the earth (108 solar diameters) and both the synodic and sidereal periods of the planets.³ Such numbers were encrypted in various combinations that are beyond any mere chance occurrence. The information in this article gives additional information to support that the Vedic people observed the planets.

CONCLUSIONS

In the early Vedic period the planets were included among the *Nakṣatras* or stars as the 34 lights or 33 wives of the Moon. About the time of the *Yajur Veda* the term *Nakṣatra* became more limited in meaning to the fixed star systems along the zodiac 27 or 28 in number. At this time the planets became differentiated as Soma cups (*graha*), and a more defined mythology of the planets gradually emerged including Vedic deities and Vedic seers, yet with probable antecedents going back to the *Ṛg Veda*.

Astronomy in the Vedic period to the time of the Brāhmaṇas included noting the position of the Moon (and Sun) in the 28 *Nakṣatras*, noting solstice points, as the Vedic ritual year began with the winter solstice (note *Kauṣītakī Brāhmaṇa* XIX.3).

It also involved a calculation of the phases of the Moon and the lunar days or *Tithis* (a 30 fold division of the lunar month of 29.5 days). In addition, it must have noted the movements of the planets, particularly the Moon's conjunction with them. Such combinations (lunar *yogas*) are well explained in classical Vedic astrology which has no real counterpart among the Greeks.

The Vedic ritualists saw union with the heavenly bodies as the goal of their practice. This could include merging into the Sun, the Moon, the *Nakṣatras* or other stars (like the stars of the Big Dipper or Canopus). It must have, therefore, included the planets as well. The Vedic seer families of the Aṅgirasas and Bhṛḡus associated themselves with the planets Jupiter and Venus as these were the two brightest planets. There may have been longer Vedic calendars based upon these planets, like the 60 year cycle of Jupiter. The Vedic kings traced their descent from the Sun and Moon apparently with symbolic connections with Mercury, and with Jupiter and Venus as relating to their priestly guides, the Aṅgirasas and Bhṛḡus. Hence there are strong astronomical considerations throughout the Vedas suggesting an early and independent tradition of astronomical observation, including the planets. This matter requires further exploration, which necessitates giving up the idea that there is no real astronomy or mathematics in the Vedas, which now appears as no more than a prejudice of Eurocentric thinking.

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NOTES

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