Antiquity of the vedic calendar

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Abstract. Taking guidance from Vedāṅga Jyotis, it is found that in ancient India the sacrificial year started near the winter solstice. As the position of the winter solstice retrogrades by 1° in about 71 years due to the phenomenon of precession, references to the solar and lunar positions at the beginning of the year in the Vedic literature allow one to trace the antiquity of the various Vedic epochs backwards up to about 7000 BC.

Key words: vedic calendar, shift of winter solstice

1. Introduction

The present Indian pañchangas are based on the siddhāntic principles. They start the year from Mesādi, the first point of the Hindu zodiac, which is 180° in opposition to the Chaitrā nakṣatra i.e. α Virginis (M. N. Saha and N. C. Lahiri, 1955). It represents the vernal equinox of 285 AD. This year beginning was a radical departure from the earlier practice of starting the year either at the winter solstice or at the autumnal equinox. It is clear from Vedāṅga Jyotis (S. B. Dixit 1968), which was composed for the sacrificial purposes, that the samvatsarasatrasa, i.e., the yearly sacrifice, was started at the winter solstice. This is further corroborated through Aitareya Brāhmaṇa 18.18 and 18.22, where it is stated that on the viśuvadin which occurred in the middle of the year long sacrifice, the sun reached its maximum altitude on the summer solstice day. One the other hand, the autumnal equinox started the civil year as is evident from the statements like "Jīvena Śardahāsatam" i.e. let us live for 100 autumns.

Now, the Vedāṅga Jyotis is the oldest extant astronomical text of Hindu astronomy, may the world astronomy, as it is dated about 1300 BC (see below). Not only does it contain the elements of the calendar that existed before the advent of the Siddhāntas of the 5th and 6th century AD, but it also represents the culmination of the efforts in that direction made in the earlier times. Hence it incorporates the main features of the calendars that existed prior to itself. They are mainly three:

1. The division of the year into two halves known as Uttarāyana, the northward march of the sun,
and Dakṣināṇaya, the southward march of the sun; 2. Starting of the year at the beginning of Uttaraṇaya i.e. at the winter solstics; and 3. Introduction of an intercalary month (adhikamāsa) for the adjustment between the adopted and the true length of the year.

Uttaraṇaya and Dakṣināṇaya represent the most natural divisions of the year based on the observations of the position of the rising and setting sun on the horizon, and its midday altitude by means of a gnomon. Further, the beginning of Uttaraṇaya is the most convenient time of the year for the Indian conditions, because the weather is clear for observations as opposed to any other time of the year. Hence the above features must have been the cornerstone of the Indian calendar from the remotest antiquity. They can help us in tracing backwards the changes in the Hindu calendar. We shall start this quest from the Vedāṅga Jyotiś period itself.

2. Vedāṅga Jyotiś period

It is expressly stated in the Vedāṅga Jyotiś (Yājus Jyotiś verse 6) that the winter solstice occurred when the sun and the moon came together in the Dhanṣṭhā nakṣatra. Everyone agrees that it refers to the conjunction of the sun with β Delphini for which λ (1990) = 316°. Since λ = 270° at the winter solstice, there has been a precession of 46° since the time of Vedāṅga Jyotiś. Taking a mean rate of precession of 50°.2 per year we get a epoch of about 1300 BC for the Vedāṅga Jyotiś calendar. At that time the lunisolar calendar year was started on Māgha S1 (the first day of the bright half of the lunar month of Māgha), and the intercalary month was introduced in such a way that the summer solstice occurred in the months of Srāvaṇa, and winter solstice in the month of Māgha, both being amānta (new moon ending) months. The correspondence of the seasons with the months was Māgha-Phālgūn-Śiśir ṛtu, Chaitra-Vaiśākhā = Vasanta ṛtu, Jyeṣṭha-Āśādha = Grīmśa ṛtu, Srāvaṇa- Bhādrapada = Varṣā ṛtu, Aśvin-Kārtik = Śarad ṛtu, and Mārgaśīrṣa-Pauṣa = Hemanta ṛtu. So the civil year would have started in the amānta Kārtik month.

3. Kṛttikādi nakṣatras

The Vedic literature (Taitiriya Brāhmaṇa 1.5.1 and Atharvaveda 19.7) gives the list of 28 nakṣatras starting from Kṛttikā and ending with Bharaṇi, which are identified by the author (Abhyankar 1991). It also refers to the nakṣatras from Kṛttikā to Viśākhā as Deva i.e. northern nakṣatras and those from Anuradhā to Bharaṇi as Yama i.e. southern nakṣatras. From this it is clear that the vernal equinox was at Kṛttikā (η Tauri), which has λ (1990) = 60°. At that time the winter solstice was opposite to Maghā (α Leonis), which has λ (1990) = 150°. Thus the winter solstice has λ (1990) = 330°; so the precession comes out to be 60° giving an epoch of about 2300 BC. At that time the winter solstice was marked by the full moon at Maghā. Hence the year was started on Maghā Paurnimā, so the winter solstice would occur in the Paurnimānta (full moon ending) month of Phalgun. Kṛttikādi list of nakṣatras tells us that the civil year started at the autumnal equinox on Kārtika Paurnimā (full moon).
4. Epoch of mahāsivarātri

The night of K 13 (13th day of the dark half of the month) of every lunar month is called śivarātri for the following reason. After the whole night Jāgaraṇa (vigil) of śivarātri in the dawn of K 14 (14th day of the dark half of the month) we have the last visibility of the moon in that amānta (new moon ending) lunar month. At that time we see the crescent moon rising in the east, which is followed by the rising sun. So the sun of that morning represents the god Shiva with the crescent moon over his forehead. As this spectacle can be observed only in the dawn after śivarātri, the appellation śivarātri is the most appropriate for that night.

Having understood the significance of the śivarātri of every lunar month, it becomes clear that Mahāśivarātri must represent the longest śivarātri of the year, which would be naturally closest to the winter solstice. As the amānta Magha K 14, or paurnimānta (full moon ending) Phālgun K 14, is called Mahāśivarātri, the sacrificial year would have been starting on Phālgun S 1 during that epoch when the Mahāśivarātrī festival was initiated. At that epoch the sun would be in Śatabhīṣag naksatra at winter solstice and the vernal equinox would be at Rohini (α Tauri), which has λ (1990) = 70°. It gives a precession of 70° and an epoch of about 3000 BC. This epoch is represented in the Mohenjodaro Seal No. 420 as explained by the author (Abhyankar 1993b).

It may be mentioned that at the time the Holi festival which falls on Phālgun S 15 (Paurnimā) occurred in winter. This stands to reason because a large common bonfire would be a natural method of protecting oneself from cold: It may be also noted that yule log festival of the Europeans, which is similar to Holi, is celebrated at Christmas near the winter solstice. Holi may also represent the beginning of the samvatsarasatras, the yearly sacrifice.

5. Mrgaśīra period

As noted by us (Abhyankar 1993b), in order to understand the lingum erectus position of the central figure in Mohenjodaro Seal No. 420 we have to refer to a purānic story which is itself based on a Rgvedic tale. According to Rgveda 10.65.5 to 9, Prajāpati was enamoured by his daughter. When she took the form of a she-deer, Prajāpati went after her in the form of a he-deer. Seeing this heinous crime, Rudra killed him by shooting an arrow. This story is depicted in the sky with Mrga(Orion) as Prajāpati, Rohini (Aldebaran) as his daughter, and Vyādha (Sirius) as Rudra. The three stars in the Orion's belt represent the Rudra's arrow. This story is actually an allegory to the sliding back of the vernal equinox from Mrgaśīra (λ Orionis) to Rohini (Aldebaran), or the autumnal equinox from the month of Mrgaśīra to the month of Kārtik. This brings us to an earlier epoch discovered by B.G. Tilak (1893).

Tilak has called attention to the statement in Śatapatha Brāhmaṇa 6.2.2.18 and Gopatha Brāhmaṇa 1.19 like Phālguni Poornamāsi (Phālguni fullmoon) is the month of the samvatsara i.e. the year. They indicate an epoch in which the winter solstice occurred when the sun was
opposite to Uttarā Phālguni (β Leonis) with \( \lambda \) (1990) = 351°. It gives a precession of 81° and an epoch of about 3800 BC. At that time the autumnal equinox occurred in the month of Mārgaśīrṣa. Since autumn is the best time of the year in India and the autumnal full moons are the most beautiful full moons, Mārgaśīrṣa has been called the best māsa i.e. the month of Bhagavatgitā 10.35.

6. Aditi era

Just as Rohini is considered to be the daughter of Prajāpati - Brahmā, similarly Dakṣa - Prajāpatiś is consider to be the son of Aditi, the mother of Devas (gods) and Daityas (opponents of the gods). As Aditi is the deity of the Punarvasu nakṣatra, this relation points to s sliding back of the vernal equinox from Punarvasu (β Geminorum) to Mārgaśīrṣa (λ Orionis). That earlier epoch is referred in the Taitiriya Saṃhitā 7.4.8, according to which one should get consecrated for the yearly sacrifice on the Chaitri Paurṇima (full moon near α Virginis), because it is the month of the samvatsara i.e. the year. Thus the winter solstice occurred when the sun was opposite to Chitrā (α Virginis), which has \( \lambda \) (1990) = 204°. It gives a precession of 114° and an epoch of about 6000 BC. It may be noted that Punarvasu is 90° behind Chitrā, so it represents the vernal equinox of that time. As Punarvasu was then at the boundary of the northern and southern halves of the ecliptics, it separated Devayāna, the path of the gods, from Pitṛyāna, the path of the names who were earlier identified with Daityas. That is why Aditi, the deity of Punarvasu, was called the mother of both the Devas and the Daityas.

7. Aśvinī era

Now we come to the earliest epoch of the Vedas when the year was started at the winter solstice with the heliacal rising of the Aśvinī nakṣatra, i.e. α and β Arietis, which represent the Vedic deities Aśvinikumars or Nāsatyas. We can infer this from several Rgvedic hymns. They are mainly of two kinds (K. D. Abhyankar 1993a):

1. In about a dozen hymns it is stated that Nāsatyas come and claim their share of sacrificial offerings at the dawn or daybreak.

2. Several hymns describe the many healing powers of the Aśvinikumārśor Nāsatyas such as restoration of youthfulness, removal of blindness, lameness and other handicaps, healing of injuries, giving strength, lengthening of life, etc. According to Muir (see R.T.H. Griffith, 1976), they refer to certain physical phenomenon with which Aśvinikumars are supposed to be connected. We have identified this phenomenon as the heliacal rising of the Aśvinī nakṣatra at the winter solstice after which the sun, who had become weak in winter, starts getting strong again. There are also a few quotations in Rgveda which indicate that Aśvinikumars represented the farthest, i.e. the southernmost point of the sun's travel.

It is this importance of Aśvinikumars which has provided for them 53 hymns in the Rgveda,
which are next only to Indira (the sun) with 251 hymns, Agni (fire) with 193 hymns and Soma (the moon) with 113 hymns. As $\lambda(1990) = 36^\circ$ and $38^\circ$ for $\alpha$ and $\beta$ Arietis, we get a precession of $126^\circ$ to $128^\circ$ and an epoch of about 700 BC.

8. Continuation of the tradition.

Table 1 (See Abhyankar, 1994) traces the changes in the beginning of the sacrificial year as required by the observed changes in the positions of the winter solstice on the ecliptic from the most ancient times. We have already noted that the year beginning was shifted from the winter solstice to the vernal equinox during the siddhantic period. However, the older memory about the importance of the winter solstice is preserved in the festival of Makarasankrânti, which coincided with the winter solstice in 285 AD. But its astronomical significance is now lost, because it occurs about 24 days after the winter solstice at the present time. Similarly the year is now started about 24 days after the vernal equinox due to precession. This clearly shows the need of introducing a radical calendar reform in the Indian panchanga in consonance with its ancient tradition.

Table 1. Changes in the Vedic year beginning from antiquity.

<table>
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<tr>
<th>Epoch</th>
<th>Upper Naksatra of winter solstice</th>
<th>Sacrificial year</th>
<th>Lower Naksatra of vernal equinox</th>
<th>Civil year</th>
<th>Notes</th>
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<td>7000 BC</td>
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<td>Vîśâkha S 1</td>
<td>Pusya (δ Cnc)</td>
<td>Māgha S 1</td>
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<tr>
<td>6000 BC</td>
<td>Opposite Chitřā (α Vir + 180°)</td>
<td>Chaitra S 15</td>
<td>Punarvasu (β Gem)</td>
<td>Pauṣa S 15</td>
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<tr>
<td>5000 BC</td>
<td>Uttarā Bhâdrapadâ (α Peg)</td>
<td>Chaitra S 1</td>
<td>Ārdrâ (α Gem)</td>
<td>Pauṣa S 1</td>
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<tr>
<td>3800 BC</td>
<td>Opposite Uttar Phalguni (β Leo + 180°)</td>
<td>Phalgun S 15</td>
<td>Mrgaśirṣa (λ Ori)</td>
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<tr>
<td>3000 BC</td>
<td>Satabhisa (α PsA)</td>
<td>Phalgun S 1</td>
<td>Rohini (α Tau)</td>
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<tr>
<td>2300 BC</td>
<td>Old Dhanisthâ end (€ Peg)</td>
<td>Magha S 15</td>
<td>Kṛttikā (η Tau)</td>
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<td>1300 BC</td>
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<td>Aśvinî (β Ari)</td>
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<td>2000 AD</td>
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<td>Phalgun S 15</td>
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<td>2450 AD</td>
<td>Mula (λ sco) Dhanursankrânti</td>
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<td>Meenâdì Phalgun S 1</td>
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References

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