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# HISTORICAL NOTES

## Some Comments on Kelkar Committee's Proposed All India Calendar

S. K. Chatterjee[1] has given a detailed historical account of Indian calendar reform since independence, and has presented the salient features of Kelkar Committee's recommendations in this respect. I do not know whether I would be considered competent to comment on this subject. But I venture to do so as I am a modern astronomer who is interested in ancient Indian Vedic and Siddhantic astronomies. They have bequeathed to us the current *nirayaṇa* (sidereal) luni-solar calendar (*pañcāṅga*) which is prevalent in all parts of India and is used by even the lowest strata of Indian society.

Firstly, the Vedic calendar was tropical i.e. season based, which is clear from the statement, *ṛtavaḥ samvatsaraḥ*, i.e. the seasons make the year. Secondly, it was based on fixed sidereal *nakṣatras* which are a unique contribution of Indian astronomer-priests. However the seasons move backward with respect to *nakṣatras* at the rate of one *nakṣatra* in about 1000 years due to the phenomenon of *ayanacalana* or precession of equinoxes. In ancient times the year was started at winter solstice at the beginning of *uttarāyana* and *śiśir-ṛtu*. At one time winter solstice coincided with *Caitri paurṇimā*. But as the seasons moved backward among the *nakṣatras* the ancients changed the year beginning first from *Caitri paurṇimā* to *Phālguṇī paurṇimā* and later to *Māghī paurṇimā* prior to *Vedāṅga Jyotiṣa*. *Vedāṅga Jyotiṣa* itself starts the year from *Māgha Śukla Pratipada*.

Siddhantic astronomers headed by *Āryabhaṭa* and *Varāhamihira* changed the beginning of the year from winter solstice to *vasanta sampat* or vernal equinox of 285 AD opposite to Citra (*Alpha Virginis*). Further they made the year sidereal, which is the time required by the Sun to return to that point on the ecliptic. The length of the sidereal year is 365.256363 days which is about 20 minutes longer than the tropical year whose length is 365.242198 days.

Consequently the religious and social functions shift with respect to seasons by about 1 day in 71 years. That is why *Makarasaṅkrānti*, which used to occur on December 22 and represented beginning of *uttarāyana* in 285 AD now occurs on January 14 or 15, 24 days after *uttarāyana*.

Following the ancients one could have corrected this shift of *vasanta sampat* and *uttarāyana* by changing the year beginning by one *pakṣa* in about 1100 years. For example, one could have changed the year beginning from *Caitra śukla pratipada* to *Phālguṇi paurṇimā* around 1400 AD and then to *Phālguṇa śukla pratipada* in 2500 AD. And all the festivals could have been shifted accordingly. But this is not possible now because the sidereal tradition is permanently fixed in the minds of Indian people. That is why they did not accept the *Rāṣtrīya pañcāṅga* recommendation by the Saha committee for two reasons: it is a replica of the tropical Gregorian calendar with no specific advantage and it was divorced from the ancient *nakṣatra* system. However we need to standardize the siddhantic *pañcāṅga* on the basis of scientific principles and make it uniform for all India use. Kelkar Committee recommendations achieved this to a great extent. But I would like to make a few comments.

(1) As the Gregorian calendar is tropical while the proposed calendar is sidereal, there cannot be permanent correspondence between them as shown in Annexure 1[1]. There are 300 – 9 = 291 leap years during the period of 1200 years in the Grogorian calendar. On the other hand, there will be 300 + 8 = 308 leap years during the same period in the sidereal calendar. Thus there will be 17 extra leap days in 1200 years or 1 leap day in 71 years in the sidereal calendar. This will separate the dates of the two calendars by 1 day in 71 years. Therefore it is clear that it is not advisable to tie the sidereal calendar with the Gregorian calendar as shown in Annexure 1.

(2) The dates of *Phālguṇa* in the leap year shown in the lower table on page 533[1] will hold good only if the leap year in the Gregorian calendar coincides with the leap year in the sidereal calendar. But according to point 10 in Appendix A[1] on page 529 it is seen that they differ by one year. For example, Kali Year 5104, which is a leap year, covers the period 14 April 2002 to 13 April 2003 in the Gregorian calendar[2]. But 2003 AD is not a leap year, so there will be a mismatch of dates between the two calendars for one year and not 15 days. This also goes against the tie up between them.

(3) Entry of the Sun into *Meṣa rāśi* heralds Caitra in South India while it is the beginning of Vaiśākha in North India. Therefore it is not advisable to use Caitra, Vaiśākha for the solar months. To avoid ambiguity it is better to name the solar months as Meṣa, Vṛṣabha etc and restrict the names Caitra, Vaiśākha etc for lunar months only. The current practice of naming the lunar months according to specific *Rāśi saṅkrāntis* should continue as it is a fool-proof method of synchronizing the lunar and sidereal calendars. It is this system which has spread to all parts of India and, as pointed out earlier, reached the lowest strata of Indian society. As the Indian solar calendar is based on *Rāśis* it is logical to name the solar months in the proposed calendar by *Rāśis* and not *nakṣatras*. This has the advantage that it will remove a common confusion among people between the *Rāśis*, which are fixed constellations, and Signs (Aeries etc.) which move with the vernal equinox. For example, people do not know that the Sun enters *Meṣa rāśi* on 14 April at present while it enters *Aeris sign* always on March 21. This difference clearly brings out the unscientific nature of astrology based on either of the two horoscopic systems.

(4) In the case of the lunar calendar (*pañcāṅga*) for use all over India *tithis*, *nakṣatras* etc should be given for the Greenwitch of India viz. Ujjain, and Central as well State governments should declare holidays according to this calendar. *Dharmācāryas* should modify their rules so that festivals are celebrated on the same day all over India. Tables should be provided to convert times for various places in the country.

(5) The National *Pañcāṅga* should provide following additional information; (i) *Kaliahargaṇa* at the beginning of the year; (ii) *Krāntis* (Declinations) of the Sun and the moon on all days, (iii) Cardinal days viz. *Vasantamadhya* ($\lambda = 0^\circ$ around 21 March), *Dakṣiṇāyana* or *Varṣārambha* ($\lambda = 90^\circ$ around June 22), *Śāradamadhya* ($\lambda = 180^\circ$ around Sept. 23), and *Uttarāyana* or *Śiśirāmbha* ($\lambda = 270^\circ$ around December 22)

Knowledgeable persons are invited to give their opinion about these matters.

## References

1. S. K. Chatterjee, "Uniform All India Nirayaṇa Solar Calendar", IJHS, 39.4 (2004) 519-534.

2. According to convention, there is no Zero Year between AD and BC. Then the calculation goes like this

| | |
|---|---|
| Kali 1 | 18 Feb 3102 BC to 17 Feb 3101 BC |
| Kali 3101 | 17 March 2 BC to 16 March 1 BC |
| Kali 3102 | 17 March 1 BC to 16 March 1 AD |
| Kali 3104 | 17 March 2 AD to 16 March 3 AD |
| Kali 5104 | 14 April 2002 AD to 13 April 2003 AD |

On the other hand if we count Zero and negative AD's we have

| | |
|---|---|
| Kali 1 | 18 Feb -3101 BC to 17 Feb -3100 BC |
| Kali 3101 | 17 March -1AD to 16 March 0 AD |
| Kali 3102 | 17 March 0 AD to 16 March 1 AD |
| Kali 3104 | 17 March 2 AD to 16 March 3 AD |
| Kali 5104 | 14 April 2002 AD to 13 April 2003 AD |

Both calculations give the same result in agreement with *Date Pañcāṇga.*

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**Observations on the paper by Commodore S K Chatterjee, Delhi, dated 8 April 2005**

The confusion that has arisen is perhaps due to the fact that Kali era years are counted on the basis of completed or expried years and not of current years as the Gregorian calendar does. The start or commencement of Kali era year which is midnight 17-18 Feb 3102 BC was '0' year. So the start of 1 year Kali was midnight 17-18 Feb 3101 BC. In this process start of 3101 Kali is 1 BC. This means by adding 3101 to the era of Gregorian calendar AD year, one can arrive at the corresponding (expired) year of Kali Era.

For a, BC year, Kali year equivalent is obtained by subtracting it from 3102 and not 3101. Therefore:

| | | | | |
|---|---|---|---|---|
| 0 | Kali year | ..... | started from midnight | 17/18 Feb 3102 BC |
| 1 | Kali year | ..... | started from midnight | 17/18 Feb 3101 BC |
| 3101 | Kali year | ..... | started from midnight | 12/13 Mar 1 BC |
| 3102 | Kali year | ..... | started from midnight | 13/14 Mar 1 AD |
| 5102 | Kali year | ..... | started from midnight | 14 Apr. 2001 AD |

**Remarks by K D Abhyankar, Hyderabad, dated 17 April 2005**

All eras like Christian era, Śaka era, Hijri era, etc. start from year 1. There is no zero year in them. Zero can only be a point of time for commencement of the era. It cannot be the ordinal number of any year. Kali era is no exception to this convention. So Kali 1 or Kaliśaka 1 starts on 18 Feb 3102 BC. I am sorry to say that those who call start of Kali 0 are confused and mistaken.

Elapsed year cannot be used to identify the ordinal number of the year in an era. It will be absurd to say that Jan 1, 2005 is the first day of the elapsed year 2004. Again it will be absurd to say that Caitra S1 and Śaka 1927 on 9.4.2005 is the first day of the elapsed Śaka year 1926. Similarly it is absurd to say that 18 Feb 3101 BC is the first day of the elapsed Kali 1.

Confusion has arisen due to ill conceived introduction of zero and negative AD's in the computation. But once introduced one has to be consistent when applying it to Kali era. 0 AD is the year before the birth of Christ. Similarly Kali 0 will be year before the commencement of Kali era on 18th Feb 3102 BC i.e. from 18 Feb 3103 BC to 17 Feb 3102 BC. Shri Pilai has inadvertently called 18 Feb 3102 BC to 17 Feb 3101 BC as Kali 0. Unfortunately, this error is carried over by Saha and Lahiri in Table 27 on page 258 of the *Report of the Calendar Reform Committee*. It is the Kali year 5056 which start in April 1954 and not the Kali year 5055 which has already elapsed. The absurdity of identifying *Gata Kali* year with the following year is already pointed out.

**Remarks by Vachaspati Upadhyaya, President, Association of Indian Universities, New Delhi, dated June 9, 2005**

As per tradition and according to the references available in the texts of Varāhamihira and Āryabhaṭa, Kali era 3102 BC was one year less. In view of this the first year of the Kali era according to the Gregorian Calender was 3101 BC. On the basis of this, Vaiśākha 2005, the first day, according to Kali era will be 5106.