Traditional Indian Calendar — living and changing

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Traditional Indian calendar consists of five elements (*pañcāṅga*), namely, *tithi*, *nakṣatra*, *karaṇa*, *yoga*, and *vāra*. We do not know exactly when these five elements, as a set, became an essential part of the Indian civil calendar. The concept of *tithi* (lunar day) is very old. The date of rituals and festivals, since the Vedic period, were prescribed in the lunar date as expressed by the ordinal number in a half month (*pakṣa*) such as *caturthī* (fourth), *aṣṭamī* (eighth), and *ekādaśī* (eleventh). The vow (*vrata*) was performed according to the lunar date, such as fasting in the eleventh lunar day. This is the reason why the science of calendar making (*jyotiṣa*) was regarded as one of the six auxiliary branches of the Vedic learning. The *nakṣatra* system is also as old as *tithi*. The origin of the concept of *karaṇa*, a time unit of a half of *tithi*, might have been as old. The introduction of weekday (*vāra*) and *yoga*, on the other hand, seems to belong to the later period. The oldest Sanskrit text which refers to the weekday order is the *Yavanajātaka* of Sphujidhvaja belonging to the mid-third century AD. The oldest Indian inscription which gives a date with a week-day is that of Thursday, 21 July, AD. 484. The *yoga* was not very well defined at the time of Āryabhaṭa (b. AD. 476) who defines only the *vyatīpāta*, when the sum of the longitude of the sun and moon is 180 or 360 degrees (ABh.3.4).

The concept of omitted day (*kṣayadina* or *ūnarātra*) and intercalary month (*adhimāsa*) is as old as the luni-solar system of Indian calendar itself. But the two concepts exactly opposite to them, namely, additional day (*adhidina*) and omitted month (*kṣayamāsa*) belong to the later period. As long as we use the mean longitude of the sun and moon in the computation of the conjunction (or new moon) and the opposition (or full moon), we have no chance of getting *adhidina* and *kṣayamāsa*. This is evident since the average length of civil days (sunrise to sunrise) is longer than the mean *tithi*, and the average length of lunar months is shorter than that of solar month. It was only after the development of astronomy, especially in the computation of the true longitude of the sun and moon, that the possibility of *adhidina* and *kṣayamāsa* was recognized and incorporated in the calendar. The occurrence of omitted days and additional days is the main reason of the variety of traditional Indian calendars. It is interesting to know that some *pañcāṅga* today are almost identical with the calendar produced by my computer program which is based on the *Sūryasiddhānta*.

I will report the present situation of the traditional Indian calendar from my two recent experiences: (1) attending the *National Conference on Panchanga Ganitham* organized by the Hindu Dharma Acharya Sabha in December 2010 and (2) my visit to Kathmandu and Varanasi in 2011.