

COMETARY OBSERVATIONS IN ANCIENT INDIA*

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EXTENDED ABSTRACT

Comets are fascinating, awe inspiring celestial objects. Their infrequent appearance adds to the mystery surrounding their growth, shape and colour. Starting with Rigveda, comet observations have been described in a personified fashion dramatizing the episode. Later Purāṇa literature recounts some of these as ancient mythology. However, Bṛhat-samhita of Varāha-mihira (5-6 Cent.A.D) and Adbhuta-sāgara of Ballāḷa-sena (11-12 Cent. A.D) present more scientific approaches by classifying comets and listing their features. Rāja-taraṅgiṇī (12-16 Cent. A.D) from Kashmir and chronicles of the Moghul period provide historical information on the years in which comets appeared in the sky. This talk presents a panoramic view of the topic in reverse chronological order.

18th-12th Centuries

A severe earthquake occurred in February 1705 in Gujarat. A few days later there was widespread rainfall of red colour. At the same time a comet appeared and was visible for 15 days. This was taken to presage the death of Aurangzeb (Moghul India by Manucci, v.IV). Jehangir, was a naturalist and has left a comet record for October 1618. It is recorded that in the year 1621 a heavy iron meteorite fell in a village field. This was dug out and sent to the king, who made out of it two swords, a knife and a dagger. The court chronicle of Akbar mentions that a comet was observed in November 1577 while Akbar was camping in Punjab (Akbar Nāma, ch. XL). The book also lists three other comets, observed during 1433, 1400 and 1263-64 A.D. Rāja-taraṅgiṇī, the Sanskrit classic that provides the history of the kings of Kashmir, describes three comets. The first was in 1533 after the Mughals invaded Kashmir. In the modern catalogues, this perhaps refers to 1533/M1 that was visible in June 1533. Before this in 1531, when Kacha Chakrapati was moving his army a comet was observed. This could be identified with Halley's comet, which appeared in August 1531. A tragedy is associated with a comet that appeared towards the end of the reign of Zain-ul-Abidin, who died in 1470. This comet (1468 A.D.?) with a long tail

was seen in the north, for a period of two months. There was widespread unrest in the country with influx of refugees into Kashmir and the town of Suyyapura (modern Sopore) was burnt.

Ancient Period

Prior to 12th century no historical records are known for observed comets. Jayadeva (1101-1173 A.D.) the famous poet, in his *gita-govinda*, alludes to a comet (*dhūmaketuriva kimapi karālam*). We may speculate that he might have witnessed a past appearance of Halley's comet in 1145 A.D. This situation appears anomalous, since 2nd-12th Cent A.D. were the heydays of Siddhantic Astronomy when many celestial observations were carried out. However, books such as Bṛhat-samhita (BS), Adbhuta-sāgara (AS) and Nārada Samhita, which represent compilations of prevailing general knowledge, contain chapters on comets and also separately on meteorites. Varāha-mihira in BS is categorical that comets are unpredictable and beyond mathematics. Also, he frankly states that he is presenting only what his predecessors Garga, Parāśara and others have written. The other two books belonging to later dates are similar in recounting previous authorities on the subject. However, AS provides much more information than given in BS. Parāśara's treatise is in prose, which is unusual and hence considered an ancient style in Sanskrit composition. Some of the names of comets recorded by these authors coincide with names of celestial deities Aṅgiras, Ka, Tvaṣṭa, Viśvarūpa, Triśira, Triśikha, who first appear in Rigveda. Thus, the matter contained in these books, particularly the tradition of Vṛddha-Garga, Garga and Parāśara seems to have come down from hoary antiquity, more ancient than 500 B.C. The word *ketu*, (meaning flag or comet) is widely used in Rigveda. The above books name the comets indicating their distinctive property with the prefix being *ketu*. Thus *Dhūma-ketu*, stands for smoky-comet, a word which is currently used in all Indian languages, to indicate comets in general. Comet *Śveta-ketu* appears once in 100 years. This may be seen with another comet by name Ka,

*Lecture delivered at the monthly meeting of the Geological Society of India at Bangalore on 23th February, 2005

appearing in the west like a yoke. *Raśmi-ketu* appears in Pleiades and causes devastation in the country. *Dhruva-ketu* leads to change in climate. *Cala-ketu* appears once in 1500 years in the west, with a crest tipped south. It moves north with increasing length to touch the Pole Star, U. Major, Vega and turns back to set in the southern sky. It brings famine and diseases in Central India. *Añgiras* is a comet seen on the solar orb like a human being seated in a chariot. *Kabandha* is a comet appearing like a truncated human body. *Brahma-daṇḍa* is a rod like comet, with three colours and three heads. *Kaṇika* appears like a clump of bamboos. There are also a few short period comets such as *Agni-ketu* seen once in three-and-half years in the direction of star Jyeṣṭhā (Antares). In the Jain tradition, it is recorded that during the death of Mahāvīra in 526 B.C. a comet (*graha*) called *ḥsudrāma*, resembling a heap of ashes, appeared in the asterism U-Phalgunī

Epic and Purāṇa Literature

Whereas the above books are matter of fact, descriptive and objective, Mahābhārata (MB), Rāmāyaṇa and Purāṇas dramatize appearance of comets. Nevertheless, one can easily make out the cometary origin of heavenly events, like the birth of Kārtikeya in the star cluster of Kṛttikā (Pleiades) and his descent on earth as Skanda. This is best described in MB in four places, and leaves one in no doubt that the narrative is about the appearance of a celestial object in Pleiades followed by widespread impact events experienced on earth. Purāṇic literature is massive by any standards and to discriminate physical events from imaginations is not easy. However, one remarkable feature of all Purāṇas is the narration of celestial disturbances involving bright and dark objects, the latter eventually falling on earth to go underground. MB describes two comets directly as having appeared during the War. However, what is interesting is the appearance of a comet during the last days of Krishna. *Adi-parvan* and *mausala-parvan* of MB refer to this as *Brahma-daṇḍa*, whereas, *Skānda-purāṇa* (7-237.24) unambiguously, calls this *sammā rjinī-mahā-ketuḥ* (broomstick-great-comet). The strange birth of *musala* (Pounding rod) due to which Yādavas fought among themselves, should have been a folkloric euphemism for the ominous comet. This was associated with sea waves that inundated the coastal city of Dvārakā.

Comets in Vedas

The celestial birth of Kārtikeya of Purāṇas has a parallel in Rigveda (RV 1.141, 9.86, 10.5) in the birth of Agni (Fire) to the Seven Sisters, who are identified with the star group Kṛttikā in Śatapatha Brāhmaṇa. Agni is called Dhūma-ketu

(Smoke-banner) but this could imply a comet whenever Agni is celestial. The hymns RV 1.162, 1.163, read like an eye witness account of a celestial object: 'moving fast...in the sky like a line of swans...gold horned, metal footed.' The simile of the celestial Horse or Fire moving like a line of birds in V-formation appears again at RV 3.8, which could be the split tail of a comet. Indra is a prominent deity who fights Ahi-Vṛtra the dragon. This is a widespread myth in ancient Indian literature. Even though Indra cannot be identified unequivocally as a comet, his celestial nature is clear. He is said to have pressed down the wheel of Sun and crushed Ushas (Dawn) the daughter of sky. Ushas, fled from her ruined chariot, which lay broken to pieces in River Vipāśa (RV 4.28-30). From Yajurveda (T.S.Br. 1.5.7) we learn that seers in ancient times feared that they may not see Sun rise again and in fact they won the dawn by the *citrāvasu* hymn. This read along with RV 1.35, where Sun is described as covered with dark dust, but getting cleared later, makes one wonder whether this was due to cometary dust. RV has also many references to objects falling from the sky (1.172, 8.55, 10.68). Atharvaṇa Veda (19.9) has a prayer for peace to the quaking earth hit by meteorites and to Death called *dhūma-ketu*. All these give the impression that, during some epoch of the Vedic period, people might have experienced spectacular meteoritic activity coinciding with the appearance of one or more great comets.

Conclusion

It would appear that comets were more frequent in the visible sky in ancient times, than they are now. This could have been the reason for Vedic lore coming down from 4th millennium B.C. to have enriched Indian mythology with celestial happenings inducing earthquakes and distress on ground also. It is interesting to note that Indus valley seals show Swastika figures, which perhaps symbolize comets, as indicated in the Chinese comet atlas (c 168 BC). Another seal of an animal with three heads, perhaps a comet glyph, reminds us of Vedic *triśiras*. Yet another seal shows a row of seven sisters, with a human figure bowing to a youthful divine person. Could this be the birth of Kumāra in Pleiades, with Agni being shown as a goat in Vedic parlance? In any case, certain celestial events have influenced Indian

