How to interpret astronomical references in Vedic texts?

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The exchange in EJVS 5, 2 (December 1999) between B. N. Achar and Michael Witzel on the subject of Vedic astronomy raises interesting points on both sides, and is conducted with admirable courtesy and attention to the texts. Achar again repeats the arguments (originally put forth by S. B. Dikshit) in favor of an astrochronological dating of the *Śatapatha Brāhmaṇa* (ŚB) to around 3000 BCE, and describes the use of modern "planetarium" software for easier inspection of celestial appearances at different dates and places. Witzel again repeats the criticisms of these arguments frequently made since Dikshit's time (particularly, in recent years, by David Pingree), and adds some suggestions on the linguistic evidence as well as some ideas for partially reconciling the opposing viewpoints.

The central question, now as ever, is how to interpret astronomical references in Vedic texts: particularly, in the case discussed here, whether the ŚB states that the "*kṛttikā*s" (Pleiades) have, in effect, a declination of zero and therefore refers to observations made approximately 5000 years ago, when the position of the earth's axis due to precession put the Pleiades as seen from the earth on the celestial equator. There is simply no way to decide this question incontrovertibly from the textual evidence without making an assumption one way or the other about the intended meaning of the Sanskrit terms. If the expression translated as, e.g., "do not depart from the east" was really intended to mean "rise exactly at the accurately determined east point," that is, on the celestial equator, then the Dikshit/Achar chronology is the most probable interpretation. If, on the other hand (as I believe), its significance was less astronomically rigorous, then that interpretation is unlikely.

Achar accepts the hypothesis of greater astronomical exactitude, and suggests an interpretation of an accompanying passage about the "*saptarṣis*" (Big Dipper) that is consistent with it. Unlike some defenders of this hypothesis, he has

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carefully read and understood the arguments of its opponents, particularly Pingree. But I think Achar has neglected Pingree's discussions of the parallels with early first-millennium BCE Mesopotamian astral sciences (particularly omens), which lie at the heart of the hypothesis of Mesopotamian-Indian transmissions that provides an alternative explanation of the ŚB's statements.

Witzel (also without explicitly noting possible Mesopotamian connections) focuses primarily on the advantages of a looser interpretation of "rising in the east": it permits a chronology that fits better, historically and linguistically, with what we know of the ŚB. It is, in addition, perfectly consistent with everything else we know for certain about the practices of Vedic astronomy—which, unfortunately, is hardly anything at all. Witzel also suggests a possible combination of the two hypotheses, according to which the statement about the Pleiades in the east, like the name "Bear" for the "*saptarṣi*s", could be a survival from an earlier era preserved in the ŚB without disrupting his chronology for the work itself. While this irenic proposal is not in itself unreasonable, I don't think either side will be truly convinced by its implication that a concern for precise astronomical determinations existed among the Indo-Europeans of the late fourth millennium, but had been lost except for a few vestigia by the late Vedic period.

In my view, the chief disadvantage of Achar's hypothesis is the absence of unambiguous and detailed attestations of an astronomy sufficiently developed to give rise to the precision he postulates. Where is the explicitly *quantitative* astronomy his conclusions appear to assume, where are the units of measurement, the standardized reference systems, the observational records, the descriptions of observational practices, the refinements of calendrical computation? If one reads all the astronomical references in Vedic texts "loosely", that is, without requiring them to conform to precise technical meanings, they form a consistent and reasonable (though sketchy) picture of a minimal astronomy concerned mostly with the regulation of a simple luni-solar liturgical calendar, and taking note of other celestial features such as

constellations and eclipses without attempting any predictive mathematical schemes concerning them—a picture very like the one we have of late second-millennium Mesopotamian or early first-millennium Greek astronomy. It does not challenge in any way the conservative chronology for the Vedic period maintained by most Indologists on the basis of linguistic and archaeological evidence.

The problem is, of course, that we have such a scanty textual record from this period that it is impossible to exclude all alternative interpretations beyond dispute. If the astronomical references are translated under the assumption that they reflect a highly developed astronomical system of great antiquity, they can support that assumption too. The best we can hope for is that disputants on both sides will continue to develop and explain their own reconstructions without mischaracterizing those of their opponents, and with the realization that the choice of one hypothesis over the other is ultimately determined by one's own assumptions about the probable nature of Vedic astronomy.