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THE FOLLOWERS OF THE STARS: ON THE EARLY SOURCES AND HISTORICAL DEVELOPMENT OF INDIAN ASTROLOGY

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*This article sets itself a goal to explore the early historical development of the traditional astrological sciences (*jyotiṣaśāstra, jyotiṣavidyā*) in India, tracing its relationship to the astrology developed in Mesopotamia and in the Hellenistic period by the Greeks, as well as discussing some of its amplifications in South Asia, and the direct intercourse between India and the Arabs. Some attention is paid to the transformation and re-interpretation of foreign astral and divinatory sciences in India. The primarily sources of the present study are the early Sanskrit texts (mainly those of Sphujidhvaja's and Varāhamihira's), and the study itself is grounded on the critical analysis of contemporary discussions carried on by D. Pingree, O. Neugebauer, P. V. Kane, A. M. Shastri, and others scholars in the field.*

> "To deny to Babylon, to Egypt, and to India, their part in the development of science and scientific thinking is to defy the testimony of the ancients, supported by the discoveries of the modern authorities. The efforts, which have been made to ascribe to Greek influence the science of Egypt, of later Babylon, of India, and that of the Arabs, do not to the glory that was Greece. [...] Without serious questioning we may assume that a fundamental part of the science of Babylon and Egypt and India, developed during the times which we think of as Greek, was indigenous science."
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> *Lynn Thorndike*[1]

> "There existed, therefore, a more or less common understanding of astronomy and astrology in those regions of the world where Latin, Greek, Syriac, Pahlāvi and Sanskrit were used, though each culture had its particular idiosyncrasies and its special areas of sophistication".
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> *D. Pingree*[2]

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[1] Lynn Thorndike, *A History of Magic and Experimental Science,* vol. I–VIII, London, Macmillan, 1923–1958, vol. I, p. 31.

[2] D. Pingree, "The Indian and Pseudo-Indian passages in Greek and Latin Astronomical and Astrological Texts", *Viator: Medieval and Renaissance Studies*, vol. 7, 1976, p. 142.

Astrological texts bear testimony to the profound and illustrious culture of Indian divination traditions in ancient times. That is, because astrology in one form or another provided a common ground for the encounter of meteorology and architecture, medicine and jewellery-making, iconology and town-planning, agriculture and historiography. India, owing to her preeminent geographical position, had always been a meeting place of many nations and cultures. This enabled her from the very beginning to play an important role in the transmission and diffusion of ideas. To a historian of civilization, astrology is not only one of the significant phenomena of the ancient world's culture but a very helpful tool for the investigation of the transmission of ideas. The purpose of this study is the investigation of Indian astrology in the crucial period from about 500 B.C. to 1000 A.C. in order to obtain a more comprehensive and more plausible picture of ancient Indian astrological history than had previously been presented. The emphasis is placed on the ascertainment of socio-religious dynamics that brought about the change in conceptual basis of ancient Indian astrology during this period, which saw the transition from Vedic *Vedāṅga Jyotiṣa*, anchored in a magic-religious ideology to practical applied astrology *Phalita Jyotiṣa*. The methodology requires a historical and philological investigation of a variety of Indian and non-Indian sources and study itself is based on the analysis of contemporary discussions carried on by D. Pingree, O. Neugebauer, P. V. Kane, A. M. Shastri, and others scholars in this field.

We know equally little about the origin of astrology and astronomy and the relative influence of these two disciplines upon one another is largely a matter of conjuncture. Our attempt here is to explore the development of classical astrology (*jyotiṣaśāstra*) in India, tracing its relationship to the astrology developed in Mesopotamia and in the Hellenistic period by the Greeks, as well as discussing some of its amplification in the South Asia, and direct intercourse between India and the Arabs.[3] Knowledge of the processes by which Brahmanism integrated elements of Hellenistic astrology into its religious doctrines and practices not only helps to deepen the understanding of Indian astrological history, but also sheds abundant light on the social and cultural history of Hinduism through the centuries.

Origins of Astral Divinatory Practices: Mesopotamia and Greece

The reading of celestial omens was a relatively late development within the Mesopotamian sciences of omens, following after extispicy, oneiromancy, teratology, and physiognomy, and

[3] For a more contemporary approach to the history of astrology in general, a reader may refer to the following books: *Astrology, Science and Society: Historical Essays*, ed. by Patrick Curry, Woodbridge, Boydell Press, 1987; Patrick Curry, *Propecy and Power: Astrology in Early Modern England*, Collins & Brown, 1989; Patrick Curry, *A Confusion of Prophets: Victorian and Edwardian Astrology*, Collins & Brown, 1992; S. J. Tester, *A History of Western Astrology*, Woodbridge, Boydell Press, 1987; Tamsyn S. Barton, *Power and Knowledge. Astrology, Physiognomics, and Medicine under the Roman Empire*, Ann Arbor: The University of Michigan Press, 1994; Peter Whitfield, *Astrology. A History*, The British Library, 2001.

more or less contemporaneous with animal and plant omens. The events in the heavens, in the sky and even on the earth were supposed to intimate the thoughts of the gods and to convey indications about impeding happenings. By celestial omens the gods, without being asked any question, voluntary communicated to the king their intentions by altering the normal appearance and behaviour of the stars and planets, which serve as the physical manifestations of the divine powers in the world of men.[4] The events announced by omens were not considered inevitable by the Babylonians and Assyrians. The message of the gods always allowed one to prevent the imminent evil by appropriate actions and behavior. The rites to avert such evil were called *nam-bur-bi*. This is a Sumerian word, taken over into Akkadian as *namburbu*, has a meaning "its (i.e., the announced evil's) loosening".[5] Among the numerous *namburbis* there are also some especially concerning evil omens coming from the celestial events, and eclipses were among the most dangerous omens.

According to Rochberg-Halton, the earlier history of celestial omens in Mesopotamia is hard to delineate, such omens were probably observed in late Sumerian times, in the late 3rd millennium B.C., though no Sumerian tablets with such contents are as yet available and nothing is know about Sumerian astronomy. From the last half of the 2nd millennium B.C., the principle collection of celestial omens in Akkadian was the series of probably over seventy Tablets entitled *Enūma Anu Enlil*. These tablets comprise omens derived from the moon, the sun, weather phenomena, the stars and planets, however it seems to have evolved from the observation of eclipses, both lunar and solar ones.

The oldest fragments of tablets from the Old Babylonian Period itself dealing with the appearance of the sky and the Moon on certain numbered days in a lunar month belong to the first half of the 2nd millennium.[6] And from the third quarter of the 2nd millennium we have a greater variety of omens, but not a significantly greater number of texts. Historically are interesting two texts called *mul. apin*, of which earliest preserved copies are dated around 700 B.C. They contain summary of the knowledge of their time and are concerned mostly with the fixed stars, the planets, the Moon, the seasons and related topics. Around this time we meet

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[4] See: David Pingree, *From Astral Omens to Astrology, From Babylon to Bīkāner*, Roma, Instituto Italiano per L'Africa e L'Oriente, 1997, p. 11. My debt to modern scholarship in the field is considerable. In present research I relied throughout on David Pingree's findings, however differently organized and emphasized. His fundamental works have much cleared up interconnections between the ancient Near East and adjacent cultures to the East and the West, and the routes they followed in Greek and Arabic language transmissions. In the immense project called *Census of the Exact Sciences in Sanskrit*, D. Pingree provided a preliminary explanation and organization of the vast of Sanskrit and Sanskrit influenced literature devoted to astronomy, mathematics, astrology and divination together with brief bibliographical information concerning the treatises and their authors. Without this unique encyclopedia any serious attempt in the field of traditional Indian astrosciences would be rather impossible. See *Census of the Exact Sciences in Sanskrit*, Series A, Philadelphia, American Philosophical Society, 1970–1994, vols. I–V.

[5] H. Hunger and D. Pingree, *Astral Sciences in Mesopotamia*, Leiden-Boston-Koln, Brill, 1999, p. 6.

[6] F. Rochberg-Halton, *Aspects of Babylonian Celestial Divination: The Lunar Eclipse Tablets of Enūma Anu Enlil*, Horn, Archiv fur Orientforschung, 1988; also see: E. Reiner, "Fortune-Telling in Mesopotamia", *JNES*, 19, 1960, p. 28.

with systematic observational reports of astronomers.[7] The documents concerning astrology in Mesopotamia belong to the Seleucid period. A letter written by the priest of Assur, Akkullanu, to Assurbanipal in 657 B.C. shows that in c. 1100 B.C. the Babylonian king employed observers who reported to him on celestial phenomena.[8] At the end of the 5th century B.C., the earliest examples of what has been called Babylonian horoscopes are attested. We have less than ten horoscopes from cuneiform tablets, and still fewer texts concern astrological doctrines as they are known to us in such enormous amounts from Greek sources.

Sufficient indications exist that at least in the 3rd century B.C. in Asia Minor something was known about Mesopotamian birth omens. By the 1st century B.C. horoscopes begin to appear in Greek and to be mentioned in Latin literature. The earliest datable example is for a nativity on 21 January 72 B.C.[9] In Egypt the earliest horoscopes, Demotic or Greek, are from the reign of Augustus. The earliest astrological doctrines belong to the same period. The rapid spread and enormous development of astrological doctrine during the first Roman imperial period is paralleled in the spread of Christianity, Mithraism, and related creeds.

The astrology which is known to us from the Assyrian period is quite different from the Hellenistic personal astrology. The predictions concern like the king and the country as a whole and are based on observed astronomical appearances, not on computation and not on the moment of birth. The science of planetary astrology was developed in, most probably, the late 2nd or early 1st century B.C. as a means to predict, draw up from horoscopic themata the moment of an individual's birth (or conception), the fate of the native, and depend upon the computed position of the seven celestial bodies and of the zodiacal signs in their relation to the given horizon. This form of astrology, called genethlialogy, is rooted in Aristotelian physics and Hellenistic astronomy, but also borrowed much from Mesopotamia and some elements from Egypt as well as developing many theories of its own.[10] The adaptation of this form of astrology to determine the best time for initiating actions is termed catarchic astrology. All these types of astrology depend on the notion that the planets in their eternal rotations

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[7] Ulla Koch-Westenhalz, *Mesopotamian Astrology. An Introduction to Babylonian and Assyrian Celestial Divination*, University of Copenhagen, 1995, p. 15.

[8] S. Parpola, *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal*, vol. 2, Helsinki, State Archives of Assyria, 1993, p. 76–78.

[9] O. Neugebauer, H. van Hoessen, *Greek Horoscopes*, Philadelphia, 1959, p. 76.

[10] The most significant scholarly treatments of the Hellenistic astrology are: A. Bouche-Leclercq, *L'astrologie grecque*, Paris, 1899; F. Cumont, *Astrology and Religion among the Greeks and Romans*, London, 1912 (Reprint. New York, 1960); F. Cumont, *L'Egypte des Astrologues*, Brussels, 1937; F. H. Cramer, *Astrology in Roman Law and Politics*, Philadelphia, 1954; R. Eisler, *The Royal Art of Astrology*, London, 1946; W. & H. G. Gundel, *Astrologumena: die Astrologishe Literatur in der Antike und ihre Geschichte*, Wiesbaden, 1966; David Pingree, *From Astral Omens to Astrology, From Babylon to Bīkāner*, Roma, Instituto Italiano per L'Africa e L'Oriente, 1997 (Chapter 2, "Origins of the Greek Astrology"); Jack Lindsay, *The Origins of Astrology*, Frederick Muller, 1971.

about the earth, transmit motion to the four elements and to the assemblages of elements, animate and inanimate in the sublunar world. As Neugebauer states it clearly:

> "The main structure of the astrological theory is undoubtedly Hellenistic. [...] Though it is quite possible that the original impetus for horoscopic astrology came from Babylonia as a new development from the old astronomical omens, it seems to me, that its actual development must be considered as an important component of Hellenistic science."[11]

The closest Babylonian parallels to Greek astrology are the so-called 'horoscopes', which record planetary positions and other data at the time of a native's birth and, sometimes, computed conception, and the texts which inform the diviner about the interpretation of these omens. The astronomy of Mesopotamian omen-literature was purely descriptive, and all concern the nation as a whole, or the king and royal princess. None of those omens that reached our times is concerned with the fate of individual men. Description of omens clearly presuppose that there is some relationship between what happens in the sky and what happens on the earth, though they do not suggest that the relationship is one of cause and effect.

From the seventh century onwards an exact observation becomes increasingly important, and still later arithmetical computation plays a part in this sort of proto-astrology. The names of the constellations, including those, which lie along the ecliptic, are frequently used, but there is no sign of the zodiac as such. Many of the names were taken over by the Greeks, and the combined Greco-Babylonian description of the heavens was later given the name *sphaera graecanica*, to distinguish it from the *spaera barbarica*, the non-Greek and usually Egyptian description. Alongside these omens there are a few which give predictions about a child according to the month of birth, but these may be derived from list of lucky and unlucky months rather than from any astronomical data.

After the conquest of Alexander the Great, the Egypt of the Ptolemies was part of the Greek world, and Alexandria became and remained for centuries the intellectual capital of the ancient world. Nevertheless, the ancient Egypt produced no astrology of its own. The Greeks themselves believed that their astronomy was derived from the east, from Babylonia, and that astrology was brought into Greece by the 'Chaldaean' Berosus. Four books of Ptolemey's *Tetrabiblos* became for centuries the most influential textbook of astrology in the West.[12] He himself was an Alexandrian Greek of the mid-second century A.D., and Alexandria was the home of Greek astrology. As Franz Cumont has made it clear, the new cities and academies of the Hellenistic world spurred the fusion of Zoroastrian, Babylonian, Jewish, Syrian, and Greek currents, and astrology came to function as nothing less than a universal and syncretistic religious perspective that underlay or influenced all the religions of late antiquity. Astrology appealed to the educated Greeks precisely because they were rational, and because it was a rational system, or could be made to look like one. Its acceptance as a learned and

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[11] O. Neugebauer, *The Exact Sciences in Antiquity*, New York, Dover, 1969, p. 164.

[12] *Tetrabiblos of Ptolomey*, edited and translated by F. E. Robbins, Cambridge, Mass., 1940.

scientific study was the common, if not the normal, attitude to it, and it is not an accident that the greatest of the Greek astronomer (Hipparchus, Ptolemy) were also astrologers. In that sense George Sarton has justly pointed:

> "One might almost claim that Greek astrology was the fruit of Greek rationalism. At any rate, it received some kind of justification from the notion of cosmos, a cosmos which is so well arranged that no part is independent of the other parts and the whole."[13]

Early Astrological Beliefs in Vedic India

But let's take a look now at India.[14] The history of astrological beliefs in India goes back to a hoary antiquity. The Vedic civilization exhibits belief in the prognostications and omens.[15] Omens (*adbhuta, utpāta, nimitta*) have always been regarded by Indians, as well as by others, as a means of knowing the future. Prognostications were based in very early Vedic times on the *nakṣatras* either of birth or on *nakṣatras* deemed auspicious or inauspicious. To regard the time when the Moon conjoins with a particular *nakṣatra* as propitious or unpropitious for performing certain acts was an ancient custom in India. Eventually a separate science developed that used this notion of auspicious and inauspicious time-units, in combination with omens and astrological *yogas*, to establish the correct time for initiating various kinds of actions. This is the science of *muhūrta* corresponding to Hellenistic catarchic (horary) astrology.[16] In Indian treatises on catarchic astrology great importance is given to deciding the time for performing the religious sacraments *saṁskāras* and other ritual acts, and this aspect

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[13] George Sarton, *A History of Science: Hellenistic Science and Culture in the Last Three Centuries B.C.*, Cambridge, Massachusetts and London, 1959, p. 165. A similar position is expressed by O. Neugebauer: "Compared with the background of religion, magic and mysticism, the fundamental doctrines of astrology are pure science" (O. Neugebauer, *The Exact Sciences in Antiquity*, New York, Dover, 1969, p. 171).

[14] P. V. Kane in his study, the *History of Dharmaśāstra* divides the history of astrological and astronomical literature in Sanskrit into three slightly overlapping periods. According to him, the first period is that of the Vedic *Saṁhitās* and the *Brāhmaṇas* from the mists of antiquity to about 800 B.C. The second period is represented by the *Vedāṅga Jyotiṣa*, the *Śrauta, Gṛhya* and *Dharma sūtras, Manu, Yājñavalkya* and *Garga smṛtis*, Jaina works like *Sūryaprajñapti* and ended about the 3rd century A.D. The third period begins at the commencement of the Christian era and is represented by the works called *Siddhānta* and gave rise to the works of Aryabhaṭa (born 476 A.D.), of Varāhamihira (born about 475 to 550 A.D.), Brahmagupta (born in 598 A.D.) and so on. (P. V. Kane, *History of Dharmaśāstra*, Poona, Bhandarkar Oriental Research Institute, 1994, vol. V, Part 1, p. 484.) However, it is clear that he totally ignored the evident influence which astrological methods of Greeks and Arabs made on Indian astrosciences. See for instance, Alex Wayman, "Four Periods in the History of Indian Astrology", *Proceedings of the 26th International Congress of Orientalists*, Poona, 1969, vol. III, pp. 146–148.

[15] V. R. Pandit, "Omens and Portents in Vedic Literature", Proceedings of the All-India Oriental Conference, Nagpur Session, *Journal of the University of Bombay*, 1946, XXVI, Part II, p. 76.

[16] D. Pingree, *Jyotiḥśāstra: Astral and Mathematical Literature*, (A History of Indian Literature), vol. 6, fasc. 4, ed. by Jan Gonda, Wiesbaden: Otto Harrassowitz, 1981, p. 101.

of *muhūrta* strongly influenced, many treatises of *dharmaśāstras* which are entirely or partially devoted to this kind of prediction.

Traditionally *jyotiṣa,* according to the medieval Indian astrological treatises, was originally promulgated by the eighteen sages: Brahmācārya, Vasiṣṭa, Atri, Manu, Paulastya, Romasa, Marici, Angiras, Vyāsa, Nārada, Śaunaka, Bhṛgu, Cyavana, Yavana, Garga, Kaśyapa, Parāsara and Sūrya. The *Vedāṅga Jyotiṣa* is a general name by which one generally refers to the treatises called the *Ṛgveda-jyotiṣa* (RJ), the *Yajurveda-jyotiṣa* (YJ) and the *Atharvaveda-jyotiṣa* (AJ). The former two are ascribed to Lagadha, while the last one is anonymous. The *Vedāṅga Jyotiṣa* is traditionally known to be one of the six auxiliary sciences (*aṅgas*) of the Vedas and its purpose was to provide Vedic priests with a means of computing the times for which the performances of sacrifices are prescribed, primarily new and full moons. In the following verse the purpose of the *Vedāṅga Jyotiṣa* is clearly stated:

> "The Vedas arouse for the purpose of use in sacrifices; sacrifices are enjoined according to the order of times; therefore he who knows *Jyotiṣa* which is the science lay in down the proper times knows sacrifices. Just as a tuft of hair stands on the head of peacocks or a jewel in the heads of cobras, so astronomical calculations (*gaṇita*) stand at the head of all the sciences that are spoken of as *Vedāṅgas.*"[17]

After quoting the verse given above in his commentary on *Bṛhajjātaka* Bhaṭṭotpala says:

> "Now, how it is proved that astrology is Vedāṅga? It is Vedāṅga because auspicious times are described in terms of lunar and solar eclipses, sun's entry into a sign of the zodiac, [calculations] of *vyatipāta, gajacchāya, tithi,* etc; because specific times are prescribed for the sacrifices, and because times are laid down for various other activities described in the Śrutis, smṛtis and Purāṇas."

It means that, according to Bhaṭṭotpala, astrology (*phālita jyotiṣa*) depends strongly on astronomy (*gaṇita jyotiṣa*). In the *Pāṇinīya Śikṣā* the science of the movements of heavenly bodies is said to be the eye of the Veda. (*Śikṣā,* 41–42) It shows that the words *jyotiṣa* and *gaṇita* are used as synonyms in the *Vedāṅga Jyotiṣa.* From amongst these three, it is only the RJ that is the current text memorized for the Vedic recitation by the traditional Vedic reciters (*vedapāthin*), while the YJ and the AJ are the less known two, and hardly ever recited in the Vedic circles.[18] The YJ is a sort of enlarged and revised version of the RJ, both of which are ascribed to Lagadha, whose disciple Śuci seems to have composed or corrected and preserved

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[17] *vedā hi yajñārthamabhipravṛttaḥ kālā anupurvyā vihitāśca yajñāḥ, tasmādidam kālāvidhānaśāstram ye jyotiṣam veda sa veda yajñān* – *Ṛgveda Jyotiṣa,* 35, *Yajurveda Jyotiṣa,* 3.

[18] See: *Issues in Vedic Astronomy and Astrology: Proceedings of colloquim on Vedic Astronomy and Astrology September, 1989 at Nagpur,* eds. H. Pandya, S. Dikshit, M. N. Kansara, New Delhi: Rashtriya Veda Vidya Pratishthan, 1992, p. 273.

the knowledge codified by this celebrated teacher, sometimes between 1000 to 500 B. C.[19] The RJ consists of 36 verses, the YJ – of 43 verses and the AJ – of 162 verses divided into 14 chapters. *Yajur*-recention names no author, but has *bhāṣya*, or a commentary by one Somakāra. While the RJ and the AJ have some variations in the readings, both of them have about thirty verses in common.[20] It is the YJ that has generally been used by modern scholars too, as it, in two of its additional verses, attempts to adjust the older system of the RJ to the familiar terms of medieval Indian astronomy.

We have no clue for ascertaining whether there were any works more ancient than the *Vedāṅga Jyotiṣa* and the *Saṁhitās* of Garga and others. None of these are available at present. The first *Saṁhitā* branch dealed with the movement of planets in the zodiac and their mutual conflicts, etc., the consideration of benefic or malefic effects of meteors, comets, eclipses and omens on the world. The second branch is devoted to the selection or consideration of auspicious moments for starting on a journey, the celebration of a marriage, etc. Varāhamihira's works show that in his time both branches enjoyed equal importance, but from *Śripati's* time (around 1050 A.D.), the first part began to lose its importance and from about 1500 A.D., the second part gained so much importance that only the chapter on *muhūrta* began to pass to the fore the third branch.[21]

References to named stars or constellations are extremely rare in the earliest levels of Vedic literature, written before 1000 B.C. Vedas and Brāhmaṇas provide us with some elements of observational astronomy. For marking the sideral positions of the Sun and the Moon, ancient Indians divide the ecliptic circle in 27 or 28 (depending on the particular list) divisions *nakṣatras* or constellations associated with the Moon's course through the sky, and this tradition seems to have been subject to Babylonian influence. The earliest text, *Taittūriya saṁhitā* (IV.4.10. 1–3) gives the names of twenty-seven *nakṣatras* in sequence and of the presiding deity of each; this information with further mythological references is found also in two passages of the *Taittūriya brāhmaṇa* (I. 5 and III. 1. 4–5). The other early lists of *nakṣatras* are those of the *Atharvaveda* (XIX. 7, 2–5) *Kāṭhaka saṁhitā* (XXXIX.13) and

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[19] The common points in astronomy and cosmography discussed by W. Kirfel include Vedic evidence, but can be explained as reminiscences from the Indus culture. However, according to P. V. Kane, they at least do not prove any direct contact between Vedic India and Mesopotamia. See: Willibald Kirfel, *Die Kosmographie der Inder*, Bonn–Leipzig, 1920, p. 28.

[20] *Vedanga Jyotisa*, ed. with corrected readings and interpretations in his commentary, by Himmatram M. Yajnik (Jani), Vedhashala, Ahmedabad, 1985. A detailed comparative table of corresponding verses has been provided by Shankar Balakrishna Dikshit in his celebrated work on Indian Astronomy *Bhāratiya Jyotiṣā* (2nd printing, Poona, 1931; Hindi trans., Publication Bureau, U.P., Prayag, 1957. English translation of part 1, *History of Astronomy during the Vedic and Vedanga period*, tr. by R. V. Vaidya, Delhi, 1969). By the way, Dikshit held that the scientific system of Indian astronomy is essentially independent and rests only on Indian observations.

[21] This can be confirmed from the titles and the subjects matter of the following works: *Muhūrta Tattva, Muhūrta Mārtaṇḍa, Muhūrta Cintāmaṇi, Muhūrta Cuḍāmaṇi, Muhūrta Dīpika, Muhūrta Gaṇapati,* and others.

Maitrāyaṇī saṁhitā (II. 13, 20). The *nakṣatras* are named after a prominent star or asterism in the respective portion of the Zodiac, but these names differ in the various lists.[22] In this list, which is always headed by the Kṛttikās (the Pleiades) in the East, each *nakṣatra* is associated with a ruling deity, gotra, food and number of *muhūrtas* in the unequal-space *nakṣatra* system. What is important is that almost all of the Indian names of *nakṣatras* are significant or have ancient legends connected with them:

Taittīriya saṁhitā	*Atharvaveda*	Meaning	Deity (according to RJ. 25-26, and YJ. 36.40)
1. Kṛttikās (pl.)	*Kṛttikās* (pl.)	cutters (?) knife (?)	Agni
2. Rohiṇī	*Rohiṇī*	ruddy	Prajāpati
3. Mṛgaśirṣa	*Mṛgaśiras*	deer's head	Soma
4. Ārdrā	*Ārdrā*	moist, wet	Rudra
5. Punarvasū (dual)	*Punarvasū* (dual)	two that are good again	Aditi
6. Tiṣya	*Puṣya*	auspicious, nourishing	Bṛhaspati
7. *Āśreṣās* (pl.)	*Āśleṣās*	entwiners	Sarpāḥ
8. Maghās (pl.)	*Maghās*	mighty ones	Pitaraḥ
9. Phalgunyau (dual)	*Phalgunyau* (dual)	---	Bhaga
10. Phalgunyau (dual)	---	---	Aryaman
11. Hasta	*Hasta*	hand	Savitṛ
12. Citrā	*Citrā*	brilliant	Tvaṣṭṛ
13. Svātī	*Svāti*	sword	Vāyu
14. Viśākhe (dual)	*Viśākhe* (dual)	two with spreading branches	Indrāgni
15. Anurādhā	*Anurādhā*	success	Mitra
16. Rohiṇī	*Jyeṣthā*	ruddy, eldest	Indra
17. Vicṛtau (dual)	*Mūla*	two releasers, root	Indra
18. Aṣāḍhās (pl.)	*Pūrvā Aṣāḍhās* (pl.)	unsubdued	Āpaḥ
19. Aṣāḍhās (pl.)	*Uttarā Aṣāḍhās* (pl.)	unsubdued	Viśvedevāḥ
20. --	*Abhijit*	conquering	---
21. Śroṇā	*Śravaṇa*	lame, ear	Viṣṇu
22. Śraviṣṭhā	*Śraviṣṭhās* (pl.)	most famous	Vasava
23. Śatabhiṣaj	*Śatabhiṣaj*	having 100 physicians	---
24. Proṣṭhapadās (pl.)	*Proṣṭhapadā*	having ox feet	Aja Ekapād
25. Proṣṭhapadās (pl.)	*Proṣṭhapadā*	having ox feet	Ahirbudhnya
26. Revatī	*Revatī*	wealthy	Pūṣa
27. Aśvayujau (dual)	*Aśvayujau* (dual)	two horsemen	Aśvinau
28. Apabharaṇis (pl.)	*Bharaṇyas* (pl.)	bearers	Yama

[22] A more detailed comparative table of *nakṣatras* is given by P.V.Kane in his *History of Dharmaśāstra*, Poona, Bhandarkar Oriental Research Institute, 1994, vol. V, Part 1, p. 501–504.

However, it does not appear that in these early times any rules had been arrived at about the influence of planets in certain *nakṣatras* or about horoscopes with planets in *nakṣatras* or *rāśis,* or in certain 'houses' (*bhāvas*). Prognostications in those days were confined mainly to *nakṣatras,* days and natural phenomena, bodily marks and from the sight, flight or cries of birds and other animals (*śākunas*).[23] As a part of divination Indians had for long predicted the characteristics of a native on the basis of the *nakṣatra* occupied by the Moon at his birth. The result of the dependence on ideas of lucky and unlucky days and *nakṣatras* was that some people began to make observations and deduce conclusion and a lore called *nakṣatra-vidyā* arose.

For example, in the *Chāndogya Upaniṣad* (VII. 1.2.4), *daiva* and *nakṣatra-vidyā*, meaning the knowledge of the *utpātas* or natural disturbances and *jyautiṣa* respectively, are included in the list of the sciences studied by Nārada. Pāṇini refers to the belief in divination from bodily signs and to fortune-telling by soothsayers, while the inclusion in the *Ṛgayanādigana* of *utpāta, sāṁvatsara, muhūrta* and *nimitta* as subjects of study indicates the study of astrology and omens in his days.[24] After analyzing the main early Indian astronomical texts on the identification of the coordinates of star (*yogatārā*), Pingree comes to the conclusion that the Indians did not observe the positions of the stars and planets with accuracy. The idea that the star-coordinates, like the polar coordinate system itself and so much else of the astronomy of medieval India, came from Greece seems more plausible to him.[25] But concerning the question of the units of time, there are famous verses in this connection in *Ṛgveda*:

> "The wheel of *ṛta* has twelve spokes; it revolves round the heavens; it does never wear out. O Agni, in this (wheel) seven hundred and twenty sons in pairs abide. Some say that the father (Sun) who sends down water has five feet and twelve forms and remains endowed with fullness in the disant half of heavens while others say that he, all-seeing, is placed in a lower (place) that has seven wheels and six spokes; all the worlds abide in the revolving wheel and five spokes; on wheel and twelve rims (of the wheel) and three naves – who is there that knew these (thoroughly)? In that (wheel, i.e. year) are placed together three hundred and sixty very unstable nails."[26]

In these passages a riddle is passed by sages in a very metaphorical and mystic language about a year divided into three, five or six seasons, twelve months, 360 days and 720 days and nights. It is possible also to hold that the wheel of *ṛta* means the zodiacal belt divided into twelve parts (*dvādaśāra*).

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[23] Various references to an ominous bird (*śākunas*) are found in the Ṛgveda (II. 42–43 and X. 165) and in the Atharvaveda (VI. 27–29 and VII.64). But the earliest attempts to list and classify omens and to provide their ritual countermeasures (*śānti*) occur in the *Kauśikasūtra* of Atharvaveda (XIII. 93–136). See: A. Weber, "Zwei Vedishe Texte über Omina und Portenta", *Abhandlungen der Akademie der Wissenschaften zu Berlin,* 1858, pp. 313–413.

[24] See: V. S. Agrawala, *India as known to Pāṇini*, Lucknow, 1953.

[25] See D. Pingree "On the Identification of the Yogatārās of the Indian nakṣatras", *Journal for the History of Astronomy*, 1989, vol. 20, Part 2, pp. 114–115.

[26] *Ṛgveda,* I. 164, 11–13 and 48.

Hardly anything can be said about the astrological significance of planets in the ancient Vedic literature. The study of planets appears in late astronomical-astrological works and the Vedas do not mention them. Unlike the Babylonians, the ancient Indians were not particularly interested in the study of stars as such and in the preparation of star catalogues. They were primarily interested in the study of the motions of the sun and the moon with a view to developing a workable calendar.[27] Yet it is impossible to deny the knowledge of the planets to the Vedic Indians, even if we have to agree that the cult of the worship of planet that we find well developed in the Purāṇic texts had not yet arisen in Vedic times. At least Bṛhaspati (Jupiter) and Uṣas (Venus) appear to be clearly meant in some Vedic verses. (RV. IV.50.4; X.123.1; X.123.5; At. XX. 88. 4) There are also many verses mentioning in an enigmatic form the main seven planets as "seven priests" (*sapta viprāḥ*), "five oxen" (*adhvaryubhiḥ pañcabhiḥ*), "five gods" (*pañcadevām*) and so on. (RV. III.7.7; III.31.5; IV.2.15; VI.22.2; X.55.3.) "The mighty five (gods) are seen in the middle of the vast expanse of the sky" (RV, I.105.10). It may be interfered that 'mighty five' (*pañcekṣane*) could be the five planets. Jupiter as Bṛhaspati is mentioned in *Taittīriya Brāhmaṇa* (2.8.2), *Ṛgveda Saṁhitā* (IV.50.4), *Atharvaveda Saṁhitā* (20.88.4). As the "Star of Planets" (*osadhitārakā*) Venus is mentioned in an early Buddhist text, the *Majjhima Nikāya* (M.N. 2.3.7.).[28] *Chāndogya* and *Maitrāyaṇī Upaniṣads* mention Śani (Saturn), Rāhu (ascending node of the Moon), and Ketu (descending node of the Moon).[29] The earliest literary references to Mangala (Mars, named also as Aṅgāraka and Bhauma) are also in the late portions of *Mahābhārata* and *Rāmāyana*.[30] The very remarkable feature of the Indian Epics is that while they put forward dozens of times the positions of the Sun, the Moon and planets in reference to *nakṣatras*, not a single passage gives the position of the planets in relation to *rāśis*, the signs of the Zodiac, or weekday.[31]

Assimilation of the Greco-Roman Traditions

From the time of Indo-European dispersal in the 4th and 3rd millennium, no contact of great significance could have taken place between Greeks and Indians before Alexander's penetration into Bactria. There are reports by writers of the Hellenistic and Roman periods that Greeks had visited India in much earlier times; Plutarch in his *Lives* reports that legendary Lycurgus of Sparta visited India (*Lycurgus*, 6). In fact, Plutarch, Diodoros Sikeliotes (known as Siculu) and Diogenes Laertius manage between them to send just about every Greek sage into the East, including Pythagoras and Democritus, but notably not

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[27] D. M. Bose, S. N. Sen, V. Subbarayappa (eds.), *A Concise History of Science in India*, New Delhi, Indian National Science Academy, 1971, p. 66.

[28] *Majjhima Nikāya*, ed. R. Chalmers (Pali Texts Society), vol. II, London, 1998, pp. 14, 34; cf. Buddhaghoṣa's *"Papañcasūdanī"*, ed. I. B. Horner, *PTS*, pt. 3, London, 1937, p. 274.

[29] *Chāndogya Upaniṣad*, VIII. 13; *Maitrāyaṇī Upanisad*, VII. 6.

[30] S. Sörensen, *An Index to the Names in the Mahābhārata*, Delhi: Motilal Banadrsidass, 1963, p. 38, 126.

[31] P. V. Kane's, *History of Dharmaśāstra*, Poona, Bhandarkar Oriental Research Institute, 1994, vol. V, Part 1, p. 532.

Socrates and Aristotle. Even if such journeys did take place, these sages are more likely to have brought back with them philosophical rather than scientific ideas.[32] And it is much likely that iconographic material would have reached Greece through merchants or through conscripted Indian soldiers in the Persian armies in the 6th (in Ionia in the eastern Aegean) and early 5th centuries (mainland Greece).[33]

In the 5th and early 4th century B.C. much of Mesopotamian omen literature, perhaps from Aramaic versions[34], was translated into an Indian language, and these translations, though undoubtedly considerably altered to fit with Indian intellectual traditions and with Indian society which the diviners had to serve, form the basis of the rich Sanskrit and Prakrit literatures on terrestrial and celestial omens. Thus the Babylonian astral sciences, in a form that they had reached in the Achaemenid period, became the foundations of Indian *jyotiḥśāstra*. According to Pingree, even the mathematical astronomy of the *Vedāṅga Jyotiṣa* heavily depends on Mesopotamian science of the Achaemenid period and cannot be dated earlier than 400 B.C.

> "It is my suggestion that some knowledge reached India, along with the specific astronomical material in the fifth or fourth century B.C. through Iranian intermediaries, whose influence is probably discernible in the year-length selected by Lagadha for the *Jyotiṣavedāṅga* [...]. Iranian influence in the early fifth century was sufficient strong to make possible the safe completion of Scylax's exploratory voyage down the Indus and Takṣaśila, in the region where Pāṇini seems to have worked, was certainly a city where cross-cultural contacts were frequent. And it is arguable that the enormous and often-studied Iranian influence discerned in Maurian polity, architecture, sculpture, epigraphy, and the like in the third century B.C. was an inheritance from the pre-Mauryan Nandas' rather than from the post-Alexandrian Greeks' adaptations of Achaemenid forms. And parallel to the suggested Mesopotamian-Iranian influence on Indian mathematical astronomy is the influence of the same cultural complex on Indian omens, which first are mentioned in the Upaniṣads and Buddhist canonical texts of the pre-Mauryan period, though the oldest codifications of these omens available to us were compiled in the early centuries A.D. I believe, to see the origins of mathematical astronomy in India as just one element in a general transmission of Mesopotamian-Iranian cultural forms to northen India during the two centuries that antedated Alexsander's conquest of the Achaemenid empire."[35]

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[32] Nicholas Kazanas, "Archaic Greece and the Veda", *Annals of the Bhandarkar Oriental Research Institute*, vol. LXXXII., 2001, p. 1–42.

[33] Possible contacts between Greece and India from most ancient to Roman times have been extensively examined by J. W. Sedlar, *India and the Greek World. A study in the Transmission of Culture*, Totowa, New Jersey: Rowan and Littlefield, 1980; and Klaus Karttunen, *India and the Hellenistic World* (Studia Orientalia 83), Helsinki, 1997.

[34] David Pingree, *From Astral Omens to Astrology, From Babylon to Bīkāner*, Roma, Instituto Italiano per L'Africa e L'Oriente, 1997, p. 33.

[35] D. Pingree, "The Mesopotamian Origin of Early Indian Mathematical Astronomy", *Journal for the History of Astronomy*, 1973, vol. 4, Part. 1, p. 9–10. See also D. Pingree, "The Recovery of Early Greek Astronomy from India", *Journal for the History of Astronomy*, 1976, vol. 7, Part 2, p. 109–123; and

The history of the traditional zodiacal and planetary symbols is virtually unknown. The general outline of the development of the idea of the zodiac is summed up by Rupert Gleadow: "The zodiac grew up, and must have grown up, as a device for measuring time. Only later did it come to be used for divination, and later still for the analysis of character."[36] Since Assyriologists began to reveal the astronomical knowledge in the valley of the Euphrates, the Babylonian origin of the Zodiac has been taken for granted by almost all scholars.[37] The Zodiac of 12 times 30 degrees as a reference system for solar and planetary motion was in use at the end of the prehistory of Babylonian astronomy which extends from about 1800 B.C. to about 500 B.C.[38] The word 'Zodiac' itself is derived from a Greek word *zodion* meaning 'little animals' and means literally 'a circle of animals'. The zodiacal signs are referred to already by Plato, though named and described first by Eudoxus.[39] By the Persian period (538–331 B.C.) all the zodiacal constellations were considered in Mesopotamia to represent virtually the same figures as they do in Greek tradition.[40] The expression 'signs of the Zodiac' may be used in two senses, in one sense as the 12 groups of constellations which are found sown in the vicinity of the ecliptic (the path of the Sun) irregular in position, unequal in extent and in brightness; in another sense the twelve equal artificial divisions of the belt in the sky each extending 30 degrees of longitude. The picture signs are already mentioned in part in a Hettite text of the 13th century B.C. As Bruno Meissner points out, the most ancient text of Babylonian observation belonging to the 37th year of Nabuchadnezzar (567 B.C.) knows only the figures or pictures of the constellations, while the twelve equal divisions of the belt occurs first of all in a text of the reign of Darius II (about 418 B.C.).[41] The zodiacal signs themselves, of course, where developed as a convenient measuring device for the longitudes of the planets.

In the Hellenistic period the Greeco-Babylonian iconography of the signs became known to all areas dominated by Greek dynasties, but some regional peculiarities developed which persisted for many centuries. It is quite possible, that planetary astrology was introduced into India from Greece in conjunction with astronomy as it was essential to possess some means of determining planetary positions in order to be able to cast horoscopes. The form of planetary

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disscusion on this subject between B. L. van der Warden and D. Pingree, "Two Treatises in Indian Astronomy", *Journal for the History of Astronomy*, 1980, vol. 11, Part. 1, p. 50–63. In his article "Venus Omens in India and Babylon" (*Language, Literature, and History (Festschrift Erica Reiner)*), New Haven, 1987, pp. 293–315) D. Pingree gave a detailed comparison of an Indian text on Venus omens from about the 1st century A.D. with possible Babylonian predecessors.

[36] Rupert Gleadow, *The Origin of the Zodiac*, London, 1968, p. 206. See also B. L. van der Waerden, "History of the Zodiac", *Archiv fur Orientforshung*, 13, 1953–54, pp. 216–230.

[37] For instance, see: A. Bouche-Leclercq, *L'astrologie grecque*, Bruxelles, 1963, p. 53.

[38] O. Neugebauer, *The Exact Sciences in Antiquity*, New York, Dover, 1969, p. 98.

[39] Plato, *Phaedrus* 246e–247c; F. Lassere, *Die Fragmente des Eudoxos von Knidos*, Berlin, 1966, pp. 38–67.

[40] See: W. Hartner, "The Earliest History of the Constellations in the Near East and the Motif of the Lion-Bull Combat", *Journal of Near East Eastern Studies*, 24, 1965, pp. 1–16; and B. L. van der Waerden, "Babylonian Astronomy II. The Thirthy-six Stars", *Journal of Near East Eastern Studies*, 8, 1949, pp. 6–26.

[41] Bruno Meissner, *Babylonien und Assyrien*, Heilderberg, C. Winter, 1925, vol. II, p. 406.

astrology originally transmitted represented Greek adaptations of the Babylonian astronomy of the Seleucid period; this was supplemented by other elements of early Greek astronomy, especially elements associated with Hipparchus (140 B.C.).[42] In the Seleucid period the standard arrangement of planets in cuneiform texts was: Jupiter-Venus-Mercury-Saturn-Mars, and the reason for this arrangement is unknown. An ordinary arrangement in Greek horoscopes is: Sun-Moon-Saturn-Jupiter-Mars-Venus-Mercury. Professor O. Neugebauer thinks that Hindu arrangement of planets is obviously Greek in origin for the following two reasons: it is based on the arrangement according to distance from the earth and also on a division of days into 24 hours. The ruler of the first hour is then considered to be the ruler of the day and thus one obtains for seven consecutive days the following rulers: Sun-Moon-Mars-Mercury-Jupiter-Venus-Saturn, which is still our sequence of the days of the week and also the arrangement of the planets in Hindu astronomy. Such arrangement is not Babylonian but Hellenistic and ultimately of Egyptian origin.[43] It was also elsewhere suggested that the teaching that every planet has its exaltation i. e. the strongest pitch of its might and influence when in a particular sign as well as the concept of benefic and malefic planets also goes back to ancient Babylonia.[44]

With the spread of Buddhism under Aśoka to the north-west India, the confrontation with Greco-Roman astrology begins with the break-up of the Mauryan empire. P. V. Kane stresses, that India's contacts with Mesopotamia became very close after Alexander's invasion of India about 325 B.C. and in the 3rd century B.C. To him probably appears that Indians, who had already the *nakṣatra* astrology, saw the signs of the Zodiac on Babylonian monuments and boundary stones and adapted them to their own astrological purposes just about the time when the Greeks derived their inspiration for individual astrology from Babylonians. However, both O. Neugebauer and D. Pingree are tempting to assume the way through the Greek and Persian civilization of the Sasanian period rather than through a direct contact between India and Mesopotamia:

> "Much seems to point toward astrology as a real carrier of astronomical knowledge – specifically, astrology in a form which has definitely gone through the Hellenistic medium. This is confirmed by the use in loan words of Greek terminology and by explicit references in the Hindu sources to the Greek (or Byzantines) as their authorities for the science of astronomy."[45]

But let's take a look at the earliest Sanskrit astrological text. The main Sanskrit text that has preserved for us what remains of Greeco-Babylonian planetary astrology in India is the

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[42] D. Pingree, "The Recovery of Early Greek Astronomy from India", *Journal for the History of Astronomy* 7, 1979, pp. 111–115.

[43] O. Neugebauer, *The Exact Sciences in Antiquity*, New York, Dover, 1969, pp. 162–163.

[44] F. Rochberg-Halton, "Elements of the Babylonian Contribution to Hellenistic Astrology", *Journal of the American Oriental Society*, 108, 1988, pp. 51–56; F. Rochberg-Halton, "Benefic and Malefic Planets in Babyonian Astrology", *A Scientific Humanist. Studies in Memory of Abraham Sachs, Philadelphia*, 1988, pp. 23–328.

[45] O. Neugebauer, *op. cit.*, p. 160

Yavanajātaka (*'The Horoscopy of the Greeks'*) of Sphujidhvaja composed perhaps around 270 A.D. The Greek origin of this treatise is reflected by its title, and its Babylonian character – of its planetary theory. From the concluding three verses of *Yavanajātaka* we are informed that it is a versified version of a prose translation of a Greek text, with a high degree of probability from Egypt, Alexandria, made by one Yavaneśvara, in the year 149/150 A.D. probably at the court of the Western Kṣatrapa Rudradāman in Ujjayinī. The prose translation of Yavaneśvara was evidently deemed an unsuitable vehicle for the transmission of śāstraic knowledge, therefore Sphujidhvaja undertook to versify the work. Sphujidhvaja himself was an Indianized Greek and his name may be a compound of Greek and Indian vocables and regarded as equivalent to the Sanskrit Śukradhvaja.

The great work was made by David Pingree in establishing of text, transcription, translation and writing the commentary on it. The conclusions of his work are unassailable: "the greater part of the *Yavanajātaka* was directly transmitted (with some necessary adjustments) from Roman Egypt to Western India, and this text is one of the principle sources for the long tradition of horoscopic astrology in India."[46] P. V. Kane does attach due importance to the fact that a vast literature in Sanskrit has perished beyond recovery, as it is admitted was the case in Greece after Ptolemy composed his *Almagest*, and that what we now have is a mere fraction of what once existed. But the *Yavanajātaka* is the earliest surviving Sanskrit text concerned with *horāskandha*, and together with another, lost translation of a Greek text on astrology known to Satya, constitutes the basis of all later Indian developments in horoscopy before the injection of Islamic theories through translations from Persian into Sanskrit of *tājika* works in the 13th and the following centuries. A large number of later commentators and compilers have preserved verses of the *Yavanajātaka,* and other astrologers – Mīnarājā, Kalyāṇavarman, Govindasvāmin, Utpala, Viṣṇuśarman, Kamalākara and Nṛsiṁha – have depended directly on Sphujidhvaja. There exist other horoscopic treatises in Sanskrit that are attributed to Yavanas. D. Pingree mentiones more than sixteen identified works, but they all seem to be posterior to the *Yavanajātaka.* The most important of these texts is *Vṛddhayavanajātaka,* a long treatise in 71 chapters written in Western India by Mīnarājā, a Yavanādhirājā of the early fourth century.[47]

Probably Yavaneśvara and Sphujidhvaja, who gives himself the title of *rājā*, both were "the lord of the Greeks", that is to say, men exercising some sort of authority over Greeks settled in the domains of the Western Kṣatrapas in those areas of India later known as Gujarat, Mālwā and Rajasthan. According to Klaus Karttunen,

> "The word [*yavanas*] was used in both of the Bactrian Greeks living in the Northwest of India, and those living in the Hellenistic West, and even, as in Tamil literature, of the merchants sailing to the

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[46] *Yavanajātaka of Sphujidhvaja*, vol. I–II, edited, translated and commented by D. Pingree, Harvard University Press, 1978, vol. I, pp. v–vi.

[47] *Vṛddhayavanajātaka of Mīnarājā*, ed. by D. Pingree, vol. I–II, Gaekwad Oriental Series, Baroda, 1976.

harbours of South India. Later, when there were no more real Yavanas in the neighbourhood, the name was used for all westerners, especially for Arabs."[48]

We have ample evidence that Greeks settled in India, composed inscriptions in Sanskrit and wrote extensive works on astrology in Sanskrit.[49] The Yavanas appear to have had some sort of political organization within the state, of which Yavaneśvara, Rājā Sphujidhvaja, and Mīnarājā the Yavanadhirājā, Yavanācārya were all leaders. As the evidence of these early Yavana scholars seems to be concentrated in Gujarat, it seems plausible to think of the commercial relations of the early centuries A.D. as their origin. But what extraordinary privileges these Greek settlers and merchants may have enjoyed in the kingdom of the Western Kṣatrapas is not known. It is clear from the *Yavanajātaka* that despite their superior station, they tended to accept either Buddhism or Brahmanism, because throughout the text the values of the casta system are constantly stressed and the Greek planetary deities are given Brahmanical equivalents.[50] An early work on divination, the *Gargasaṁhitā*, written probably in the first century B.C. or A.D., contains an important section called the *Yugapurāṇa*, which includes an interesting, but also problematic, reference to Indo-Greek history.[51]

The prime indisputable evidence that the *Yavanajātaka* is indeed influenced by Greek astrology is the presence in it of a large number of technical terms that are, as it was proved by Pingree, simply transliterations of their Greek equivalents. It was perhaps Sphujidhvaja who being himself an indianized Greek further indianized the text introducing the chapter on reincarnation; the list of minerals, plants and animals which is influenced by the Āyurvedic material medica; the section on military astrology and other elements of Indian culture. The original Greek system was further modified so that the predictions fit the social and economic expectations of people born in India, and:

"Indian astrologers after Sphujidhvaja considerably developed genethlialogy (*jātaka*) by emphasizing some aspects at the expense of others or by creating new and more complex technigues

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[48] Klaus Karttunen, *India and the Hellenistic World* (Studia Orientalia 83), Helsinki, 1997, p. 316. See also D. Pingree, "Sanskrit Evidence for the Presence of Arabs, Jews, and Persians in Western India: ca. 700–1300", *Journal of the Oriental Institute*, Baroda.

[49] See: A. Bouche-Leclercq, *L'astrologie grecque*, Bruxelles, 1963, p. xix.

[50] *Yavanajātaka*, 77. 1.

[51] Garga appears to be somewhat mythical personage, and according to Kern he is a meteoric phenomenon and his name originally denotes 'thunder', 'lightning', as a derivative from 'garja'. (BS, Introduction, p. 30) In a few verses of Garga cited by Utpala on BS I.5, it is stated that Garga studied Jyotiṣa Vedaṇga from the Self-Born who created if for use in sacrifices and then from Garga other sages received it and wrote work thereon. The fact of about 430 verses of Garga being quoted by Utpala in his gloss on BS and about 60 verses on BJ indicates that Garga wrote an important work on Horāśāstra. See: K. P. Jayaswal, "Historical Data in the Garga-Saṁhitā and the Brahmin Empire", *Journal of the Bihar and Orissa Research Society*, 14, 1928, pp. 397-421; K. P. Jayaswal, "The Paris Manuscript of the Garga-Saṁhitā", *Journal of the Bihar and Orissa Research Society*, 15, 1929, pp. 129–13; D. Pingree, *Census of the Exact Sciences in Sanskrit*, Philadelphia, 1970–1994, vols. I–V, A2, 116a–117b; A3, 29b; A4, 78a; A5, 78b.

of interpreting horoscopes; but basically all of *jātakas* before the introduction of *tājika* texts in the thirteenth century, and even most *jātakas* after that, can be traced back to the *Yavanajātaka*."[52]

It seems that an Indian zodiac has not existed before Yavaneśvara.[53] Sphujidhvaja's zodiac is the common Hellenistic one with certain features indicating an Egyptian origin. The most common terms of zodiacal signs (*rāśis*) that were used in early Indian astrological texts are as follows:

Greek terms	*Parāśara* (IV.3–24)	*Bṛhajjātaka* (I.8), *Horāsāra* (I.25)	*Sārāvalī* (III.7)
Kriós	meṣa	kriya	kriya
Taũros	vṛṣa	tāvuru	tāvuri
Dídymoi	mithuna	jituma	jutuma
Karkínos	karka	kulīra	kulīra
Léôn	siṃha	leya	leya
Parthénos	kumārikā	pāthona	pāthona
Zygón	tulā	jūka	jūka
Scorpíos	vṛścika	kaurpi	kaurpika
Toxotês	dhanu	taukṣika	taukṣa
Aigókerôs	makara	ākokera	ākokera
Hydrochóos	kumbha	hṛdroga	hṛdayaroga
Ichtŷs	mīna	ittha	antya

Subject matter, methodology, and *termini technici*, all indicate that the *Yavanajātaka* is indeed an offshoot of Hellenistic astrology, though it is true that the nature of the predictions has been extensively modified to suit a Hindu audience. Many of the Śaiva elements in the descriptions of planets, decans and horās can be found in the Greco-Egyptian material.

"So it may fairly be concluded that the figures described in the *Yavanajātaka* are, for the most part, based on illustrations which adorned the Greek manuscript utilized by Yavaneśvara, but that their interpretation has been colored by an attempt to understand them in Hindu, especially Śaiva, terms. But it must be added that they have also been subject to additions reflecting social conditions in Western India in the second, third and fourth centuries A.D."[54]

It seems that among the other things, Sphujidhvaja was the first to use a symbol for zero (*bindu*) in the decimal place-value system in his *Yavanajātaka* (79, 6 and 7), though, of course,

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[52] D. Pingree, *Jyotiḥśāstra: Astral and Mathematical Literature*, A History of Indian Literature, vol. 6, fasc. 4, ed. by Jan Gonda, Wiesbaden: Otto Harrassowitz, 1981, p. 81.

[53] P. V. Kane, "The Problem of the Introduction of Rāśis in Indian Astronomy and Astrology", *Bharatīya Vidyā* IX, 1948, pp. 310–315.

[54] D. Pingree, "The Indian Iconography of the Decans and Horās", *Journal of the Warburg and Courtauld Institutes* 26, 1963, pp. 251–252.

a dot or a circle had been used previously by both Babylonians and Greeks in the sexagesimal place-value system to represent a place with no other number in it. Āryabhaṭa (5th century A.D.) invented a different way of expressing numerals, in which the consonants of the Sanskrit alphabet are used to indicate the number and the vowels their place (up to eighteen).

It is in Sphujidhvaja's work that interrogational astrology (*praśna)* was introduced to India from the Hellenistic world. Interrogational astrology was developed in India in the 2nd and 3rd centuries A.D. on the basis of Greek catarchic astrology, and historical astrology in Sasanian Iran in perhaps the 5th or 6th century A.D. on the basis of continuous forms of Greek genethlialogy (*jātaka*). In catarchic astrology the *jyotiṣī* determines for his client the moment (*muhūrta*) at which it is most propitious for him to undertake a specific act. In interrogational astrology (*praśna*) he responds to a query about some aspect of the client's life on the basis of the horoscope of the moment of the query. The amount of detail in *praśna* texts was enlarged in the poem *Vidvajjanavallabha* written by the Paramāra Bhojarāja of Dhārā in the first half of the eleventh century.[55]

The Concept of Astrology in the Texts of Varāhamihira

One of the greatest Jyotiṣa writers of ancient India indeed was Varāhamihira and his fairly numerous writings on the subject truly depict the exuberant life, spirit and culture of the Gupta age, justifiably treated as the classical age of early Indian history. The combination of astronomical-astrological erudition coupled with his keen observation and literary talent made his works supplant most of the earlier writings on the subject. As Ajay Mitra Shastri has remarked:

> "He is among the writers on *jyotiṣā* what Pāṇini is among *vaiyākaraṇas*, Manu among *dharmaśāstrakāras*, Kauṭilya among writers on political science and Bhārata among dramaturgists."[56]

Varāhamihira, the son of Ādityadāsa ("slave of the Sun") was a Maga Brāhmaṇa – that is, descendent of one of those Persian Zoroastrians who entered India toward the begining of the Christian era. We learn from the penultimate verse of Varāhamihiras *Bṛhajjātaka* (XXVIII, 9) that he was a native of Avantī or Western Mālwā and resided in the village called Kāpitthaka. His date is delimined by his use of Lātadeva's epoch, 505 A.D., in the *Pañcasiddhāntikā* and by the fact that Brahmagupta was familiar with his work when he wrote the *Brāhmasphuta siddhānta* in A.D. 628.[57] It has further been suggested that he was

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[55] *The Vidvajjanavallabha of Bhojarāja*, ed. by D. Pingree, Baroda, 1970.

[56] A. M. Shastri, *India as seen in the Bṛhatsaṁhitā of Varāhamihira*, Delhi, Motilal Banarsidass Publisher, 1969, p. 1; and its review by D. Pingree: "Review of *India as seen in The Brhasamhita of Varāhamihira*, by Ajay Mitra Shastri", *Journal of the American Oriental Society*, vol. 94, no 4,1974, pp. 487–488.

[57] See: The *Pañcasiddhāntikā of Varāhamihira*, ed. and trans. by O. Neugebauer and D. Pingree, Parts I–II, Kobenhavn, 1970–1971, Part. I, p. 7.

connected with the Aulikara court at Dāsapura (modern Mandasor), and in particular with Yaśodharman who is known to have been ruling in Samvat 589 = A.D. 532, though, according to D. Pingree, no definitive assertion can be made with regard to this hypotesis.[58]

As a Maga Brāhmaṇa, Varāhamihira was subject not only to Greek influence, but to Iranian. The Magas were the Sun-worshiping Magi priests who were originally inhabitants of Medea which came to be included in the Achaemenid empire after Cyrus 1st conquest. Thereafter they gradually spread over the whole of the Achmaemenian world, particularly Iran. Some of them found a foothold in Zoroastrianism at some time in the fifth century B.C. They appear to have entered India when it passed on to the Achaemenids in the sixth-fifth century B.C. and the second wave in the wake of Scytho-Parthian invasion in the second-first century B.C.[59] The second wave appears to have been a much more powerful and probably played an important role in the transformation of the Sun-cult in India, which explains their association in Indian tradition with Śāka or Śaka dvīpa. The next wave came after the invasion of Islam in the first half of the seventh century A.D. That the immigration of the Magi priest in India has to be dated fairly early is evidenced by the mention by Ptolemy (mid-second century A.D.) of the presence of the Brāhmaṇised Magas (*brakhmanai magoi*) as far south as parts of Mount Bettigo.[60] Not by chance, commenting the verse of *Bṛhat Saṁhitā* Bhaṭṭotpala the Magas describes as a class of Brāhmaṇas who were the priests of the sun.[61]

The story of migration of the Magi priests of ancient Iran at some early date is found, in the shape of an elaborate legend, in the *Bhaviṣya Purāṇa* (Brāhma-parva, 127–149). According to most scholars Śakadvipa, from where the eighteen families of a Maga-Brāhmaṇa priests came to Jambudvīpa (India), has been after the Śakas or the ancient Scythians and its geographical position was the same as that of ancient Śakasthāna or modern Seistan in Iran.[62] After the fall of the Maurya empire the north-western region of India fell an easy prey to foreign invaders. These consisted chiefly of the Yavanas (the Greeks), the Śakas (The Scythians), and the Pahlavas (the Parthians). In spite of their foreign origin, these invaders gradually succeded in settling down in this country as permanent inhabitants and in the course of time acquired a place in the contemporary Indian society. The Magas were probably responsible for popularizing the anthropomorphic representation of the Sun-god,

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[58] D. Pingree "The Empires of Rudradāman and Yaśodharman: Evidence from Two Astrological Geographies", *Journal of American Oriental Society* 79, 1959, pp. 267–270.

[59] This important theory about an early origin of Sun cult has been clearly proposed by Srivastava. See: V. C. Srivastava, "Advent of Magas or Iranian Priests in India", *Foreigners in Ancient India and Sarasvati in Art and Literature*, ed. by D. C. Sircar, Calcutta, 1970, pp. 73–79; and his "Antiquity of Magas in Ancient India", *Proceedings of Indian History Congress*, 1969, pp. 86–94.

[60] J. W. McCrindle, *Ancient India as described by Ptolemy*, ed. by S. N. Majumdar Shastri, Calcutta, 1927, p. 170.

[61] *saviturādityasya magān magabrāhmaṇān* – B.S.60.19.

[62] D. K. Biswas, "The Maga Ancestry of Varāhamihira", *Indian Historical Quarterly*, 25, 1949, p. 179.

who was earlier worshipped in the symbolic form, and the emergence of the Saura sect.[63] The opening verse of the *Horaṣaṭpañcāśikā*, astrological work by Prthuyaśas, the son of Varāhamihira, also shows that the latter like his father, was a devotee of the Sun.

The fact that the Magas were Iranian magi priests was known even as late as the first half of the eleventh century A.D. when al-Bīrūnī wrote: "There are some Magians up to the present time in India where they are called Maga."[64] According to A. M. Shastri, the Magas are referred to in numerous inscriptions and literature up to the twelfth century A.D.

> "The *Maga-vyakti* of Kṛṣṇadāsa Miśra gives a detailed account of the Maga priests. They are still present in various parts of North India including Bihar and Uttar Pradesh where they are called *Śākadvīpin* Brāhmaṇas, Bengal where they are known as *Graha-vipras*, evidently due to their interest in astrology and lore of planets [...]."[65]

The influence of Varāhamihira's Iranian ancestors, which perhaps reached him through his father and teacher Ādityadāsa, is found mentioned in *Pañcasiddhāntikā* (I. 23–25). His own name-ending Mihira being a sanskritised form of Mihr, which itself is corrupted form Mithra, the Iranian Sun-god, his obtaining the boon from the Sun, his obeisance to the Sun in the beginning of all his works, except the *Vivāhapaṭala* (which opens with an invocation to Kāma, the Indian god of love) and his devoting a comparatively larger number of verses to the description of Sūrya icons (BS. LVII. 46–52), all indicate that the Sun was his family deity. As his commentator Bhaṭṭotpala tell us, he himself was regarded even as an incarnation of the Sun who descended to this world in the Kali age in order to rescue *Jyotiḥ śāstra* from wholesale destruction.[66] The name Varāhamihira is also highly significant in this connection inasmuch as it leaves no doubt that even though the Magi priests were throroughly Indianised and absorbed in the Brāhmaṇical fold enjoying the status of the Brāhmaṇas, the highest class in the Brāhmaṇical social order, their Iranian origins were not altogether forgotten.

Varāhamihira was an encyclopaedic writer and naturally he refers to a host of earlier or contemporary authors not only on astronomy and astrology but also on various other subjects. From the point of a study of the history of astrological ideas in India, it is important that Varāhamihira's main source for his knowledge of Hellenistic genethialogy, aside from *Yavanajātaka*, was the lost poem of Satya.[67] For that reason Bhaṭṭotpala persistently styled him as 'the writer on entire *jyotiḥśāstra*" (*jyotiḥśāstra saṅgraha kṛt*).

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[63] V. C. Srivastava, *Sun Worship in Ancient India*, Allahabad, 1972, pp. 200, 252–253. The first reference to the Sauras, a special sect of devotees who worshipped the Sun, is found in the *Mahābhārata* (7:82:16.) For detailed analysis of the evolution of the Saura sect see R. G. Bhandakar, *Vaiṣṇavasim, Śaivism and Minor Religious Systems*, Strassburg: Karl J. Tübner, 1913, pp. 151–155.

[64] E. Sachau, *Alberuni's India*, vol. II, London, 1910, vol. I, p. 21.

[65] Ajay Mitra Shastri, *Varāhamihira and his times*, Jodhpur, Kusumanjali Prakashan, 1991, p. 12.

[66] *Bṛhatsaṁhitā with Bhaṭṭotpala,s commentary*, ed. By Sudhakara Dvivedi, Varanasi, 1895–1897, vol. II, I. 2.

[67] Satya is quoted by Bhaṭṭotpala in his commentary on *Bṛhajjātaka*, I.12 "*tathā ca satyaḥ*". P. V. Kane has brought together the names of all the predecessors of Varāhamihira and gave extensive references in his

Varāhamihira states that the science of Jyotiṣa is divisible into three departments (*skandas*); the first branch called Tantra, or Gaṇita, deals with the determination by mathematical calculation of the heavenly bodies; the second known as Horā treats the horoscopy or the casting of the horoscope; and the last is natural astrology called Aṅgaviniścaya or Śākhā and that the treatment of the whole course of Jyotiṣa is named Saṁhita. The reasons, why the third branch was called Śākhā is not satisfactorily explained.[68] Horā again had three sub-sections, viz *jātaka* or *janma* – that is judicial astrology, predictions from the situations of the zodiacal signs and planets at a person's birth; *yātrā* or *yātrika* – that deals with prognostications on starting on a journey or on a king's marching against an enemy derived from the *tithi*, *nakṣatra*, the week-day and *muhūrta*, the moon's position, dreams, cries of birds; and *vivāha* – examining the horoscopes of the parties to a marriage.

A clear-cut distinction between these three branches of jyotiṣa cannot be drawn. He tells us that a real astrologer is one who 'knows both text and meaning of the works on mathematical astronomy, natural astrology, and horoscopy (*graha gaṇita horā saṁhit ārthavett eti*)'. It is said in another place that only a person fully accomplished in natural astrology can be an efficient diviner (*saṁhitā pāragaś ca daiva cintako bhavati*). Varāhamihira said a famous sentence about a high position of astrologer in society:

> "The twice-born one who knows this entire [science] both in word and in meaning, should be the first to eat at an ancestors ceremony (*śrāddha*), an honoured purifier of the row of guest. For although the Greeks are barbarians, they have brought this science to perfection and so are honored as sages; how much more [honorable], then is an astrologer who is a twice born! [...However,] he who assumes the role of astrologer without knowing the science should be known as a wretched defiler of the row, a mere gazer at the stars."[69]

Moreover, as already Weber has remarked, Varāhamihira uses as many as thirthy-four Sanskritised Greek words as technical astrological terms[70], and among his authorities on

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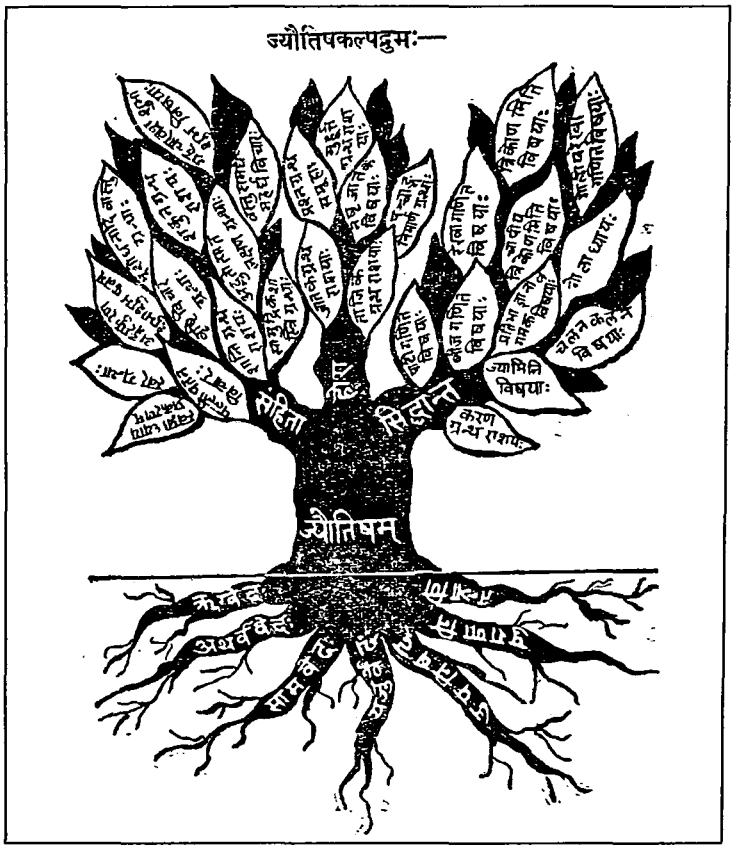
works. See P. V. Kane, "Varāhamihira and Utpala", *Journal of the Bombay Branch of the Royal Asiatic Society*, 1948–1949, vols. 24–25, pp. 1–31.

[68] According to P. V. Kane, it was so called probably because it had to deal with numerous circumstances, such as the fruits of the simple and retrograde movements, the conjunctions and oppositions of planets, haloes, meteors, earthquakes, lore about the movements and cries of birds, and so on. See: P. V. Kane, *History of Dharmaśāstra*, Poona, Bhandarkar Oriental Research Institute, 1994, vol. V, Part 1, p. 479.

[69] *granthataś cārthaś caitat kṛtsnaṃ jānāti yo dvijaḥ /*
agrabhuk sa bhavec chrāddhe pūjitaḥ paṅktipāvanaḥ //
mlecchā hi yavanās teṣu samyak śāstram idaṁ sthitam /
ṛṣivat te 'pi pūjyante kiṁ punar daivavid dvijaḥ //
[...]
aviditvaiva yaḥ śāstraṃ daivajñatvaṃ prapadyate /
sa paṅktidūṣakaḥ pāpo jñeyo nakṣatrasūcakaḥ // -- *Bṛhatsaṁhitā* II.31–32, 34

[70] The Sanskritised loan-words from Greek astrology are: *kriya, tāvuri, jituma, leya, pāthena, dyūka or jūka, kauryya, taukṣika, ākokera, hṛdroga, ittham, heli, himna, harā, jyo, koṇa, asphujit, hora, kendra, dreṣkāṇa or drekkāṇa, liptā, anophā, sunaphā, durudhara, kemadruma, veśi, āpoklima, pānapharā, hibuka, jāmitra, meṣūraṇa, dyūnam, dyutam, riṅpha, kulīra* and *trikoṇa*, cf. A. Weber *History of Indian*

Jātaka is one Yavana.[71] By the time of Varāhamihira even learned men had forgotten the Greek origin of the word *horā*. In some cases the name Yavana occurs in plural, indicating that the references are not to a Yavana author, but to Greek authors in general or a school of the Yavanas. These evidences merely indicate Indians' acquaintance with Greek astronomy and astrology and at best an exchange between the two.



Jyotiṣakalpadruma: the traditional representation of the magical tree of *Jyotiṣa* with its Vedic, Tantric and Purāṇic roots, three main branches (*saṃhitā, horā, siddhānta*) and all leaves-subjects (*viṣayā, granthā*). From: *The Jātaka Pārijāta of Srī Daivajña Vaidyanātha*, edited with the Sudhāsālinī Sanskrit Commentary by Sri Kapilesvara Chaudhary, Banaras, 1953.

Literature, 2nd ed., London, 1882, pp. 254–255. Kern in his introduction to edition *Bṛhatsaṁhitā*, (Calcutta, 1865, pp. 28–29) excludes *kendra* and *kulīra* from the list and addes one new word, viz., *harija*. Pingree finds some more Greek terms: *āra* (Mars), *meṇyaiva* (lunar), *karki* (cancer), D. Pingree, *From Astral Omens to Astrology, From Babylon to Bīkāner*, Roma, Instituto Italiano per L'Africa e L'Oriente, 1997, p. 34–38.

[71] *Bṛhajjātaka*, VII.1, XI.1, XXI.3, XXVII.19–21.

Varāhamihira holds a unique position in the history of astronomical and astrological literature in India. He was a prolific author in the three traditional *skandhas* (branches) of *jyotiḥśāstra* which reflects the amalgamation of Indo-Iranian traditions in socio-religious spheres. On gaṇita he composed only the *Pañcasiddhāntikā*; on horā he wrote the *Bṛhajjātaka* and the *Laghujātaka*; and on saṁhitā the *Bṛhatsaṁhitā* and the *Samāsasaṁhitā*. He also composed three works on military astrology – the *Bṛhadyātrā*, the *Tikanikāyātrā*, and the *Yogayātrā* as well as a *Vivāhapaṭala* on the astrology of marriages. Military astrology (*yātrā*) is based on a combination of omens with catarchic astrology. Several other works have been attributed to him, but their authenticity is doubtful.[72] Of the relative chronology of the works of Varāhamihira some notion may be derived from his cross-referencess. In *Bṛhajjātaka* (XXVIII. 4–6) he seems to indicate that his karaṇa, the *Pañcasiddhāntikā*, as well as treatises on interrogations, on military astrology, on omens (*saṁhitā*), and on the time of marriage had already been written. Varāhamihira in *Bṛhatsaṁhitā* (II) states that there are five *siddhāntikā*s, which he urges an astrologer to study: the Pauliśa, the Romaka, the Vasiṣṭa, the Sūrya and the Paitāmaha. Moreover, *Pañcasiddhāntikā* (I.22) seems to refer to the fact that he had not yet composed his books on *horā*, which include the *Bṛhajjātaka*. The *Bṛhajjātaka*, then, was written after the *Pañcasiddhāntikā*. Furthermore, *Bṛhatsaṁhitā* (II) lists the subjects to be covered by a work on horoscopy, but this is not a table of contents to either the *Bṛhajjātaka* or the *Laghujātaka*. According to Pingree, the *Pañcasiddhāntikā* and *Bṛhatsaṁhitā* were composed simultaneously towards the beginning of his writing career, the *Bṛhajjātaka* towards its end, and at least one work on military astrology and the *Vivāhapaṭala* in between.[73]

Bṛhajjātaka of Varāhamihira itself became the model for much of the subsequent Sanskrit literature on *jātaka*, and remains the most authoritative text-book on the subject today. *Horāśāstra*, or astrology, includes, according to Varāhamihira the following topics: the strength or weakness of Zodiacal signs (*rāśi*), half-signs (*horā*), third parts (*dreṣkāṇa*), ninth parts (*navāmśaka*), twelfth parts and degrees; determination of various kinds of power of the seven planets due to the direction, the place occupied, the moment and the orientation; the temperaments (*prakṛti*), bodily elements (*dhātu*), substances (*dravya*), caste (*jāti*), and the sphere of activity, etc. belonging to the department of each planet; conception, time of birth, prognostication of prodigious accessories, instant death of the child, span of life, destiny and intervening changes of it, the most favourable combinations of planetary positions as may exist in theory (*aṣṭakavarga*), the constellations in which kings are born (*rājayoga*), the lunar constellations (*candrayoga*), the constellations formed by only two planets and so on, the

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[72] For a detailed account of the Varāhamihira's works, manuscripts and translations, see: D. Pingree *Census of the Exact Sciences in Sanskrit*, American Philosophical Society, Philadelphia, 1994, Series A, vol. 5, pp. 563–595.

[73] *The Pañcasiddhāntikā of Varahamihira*, ed. and transl. by O. Neugebauer and D. Pingree, Parts I–II, Kobenhavn, 1970–1971, Part. I, p. 8.

celestial constellations, etc. and the effects of all these; descent and character, the planetary aspects (*avalokana*), manner of death (*niryāṇa-gati*), state in a former birth and after death (*anūka*), good and bad symptoms at the time of queries, the calculations of lucky periods for nuptial and other ceremonies.[74]

In Varāhamihira's *Bṛhajjātaka* the twelve *rāśis* starting from Meṣa are already identified respectively with the following limbs of the Kālapuruṣa, the head (Meṣa), mouth (Vṛṣabha), chest, heart, stomach, waist, the abdomen, the private parts, the pair of thighs, the pair of knees, the two shanks, the two feet. Varāhamihira adds that the words *rāśi, kṣetra, gṛha, ṛkṣa, bha* and *bhavana* are used as synonyms in *Jātaka*. (*Bṛhajjātaka,* I. 4) In the BJ both the Lagna and Moon position are important in this natal astrology, the Sun's position to a much lesser extent.

A very popular extensive work on *jātaka* entiteled *Horāsāra*, which is traditionally attributed to Varāhamihira's son, Pṛthuyaśas, is known in South India.[75] However, the author has borrowed verses from Kalyāṇavarman and so this text must have been written after 850 A.D. That is the reason, why Pingree refers to him as pseudo-Pṛthuyaśas. Mantreśvara (fl. c. 1550?) in his *Phaladīpikā (adhyaya XXIV)*[76] and Viṣṇuśarman quotes some verses from *Horāsāra*, the oldest manuscript of which is dated 1583 A.D. It seems that Pṛthuyaśas introduced a *daśā,* or a system of "life-periods", that is quite different from the one in the YJ and BJ. This new system has set years for the planets, including Rāhu and Ketu – not recognised as planets by Varāhamihira – and omits Lagna.

At some time after 600 and before 700 A.D. the *pūrvakhaṇḍa* was written whicht was to become known as the *Bṛhat Pārāśara Horā Śāstra* ascribed to the sage Parāśara,[77] who was deeply indebted to the *Bṛhajjātaka,* has borrowed two verses from Sphujidhvaja (YJ I. 59–60), and was extensively used by Kalyāṇavarman. Parāśara also puts forth serious requirements to an astrologer:

> "Expert in calculations, taking pains in the science of grammar, versed in logic and intelligent, studying and reflecting on the branches of judicial astrology, skilled in argumentation and refutation,

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[74] For detailed description of *Bṛhatsaṁhitās* content see: Ajay Mitra Shastri, *Varāhamihira and his times,* Jodhpur, Kusumanjali Prakashan, 1991.

[75] *Horāsāra of Pṛthuyaśas*, edited with an English translation by V. Subrahmanya Sastri and M. R. Bhat, Bangalore, 1949.

[76] *Phaladīpikā by Mantreśvara*, Sanskrit text, English translation, notes and commentary, by Dr. G. S. Kapoor, New Delhi, Ranjan Publication, 1996.

[77] *Bṛhat Pārāśara Horā Śāstra*, English translation, commentary, annotation and Sanskrit editing by R. Santhanam, New Delhi, Ranjan Publication, vol. I–II. 1992. Traditionally, *Parāśara* is held as the most ancient Indian astronomer and is refered several times by Varāhamihira (BJ VII.1; XII.2). BS VII.8 mentions him as having declared seven kinds of motions of Mercury and names his work *Parāśara-tantra* to which Utpala refers also (III.1; XXXII.26). Al-Bīrūnī also referes to the Saṁhitā of Parāśara and it appears that it contained some legendary matters, viz., stories about the war of gods and demons, origin of planets, etc. Utpala profusely cites prose passages and verses from *Parāśara-Saṁhitā.* From the occurrence of *Āryā* verses, Kern concludes that *Parāśara-Saṁhitā* is of later origin than the *Garga-Saṁhitā,* (BS Preface, p. 33).

conversant with time and place, controlling his senses: such an astrologer will no doubt predict truly."[78]

The second part (*uttarakhaṇḍa*) of *Bṛhat Pārāśara Horā* refers to the first as already existing and was commented on by Govindasvāmin (fl. c. 850), and probably can be dated in c. 650–750. Despite the questionability of the authenticity of some parts of the *pūrvakhaṇḍa*, the *Bṛhat Pārāśara Horā Śāstra* itself represents some notable developments in the long process by which the original Hellenistic astrology that was transmitted to India in the second century, was made increasingly complex as to generate predictions more closely approximating reality.[79] Perhaps from the 12th century Indian astrology became dominated by the so-called Nirayāna system of calculations based on the immovable zodiac that is represented in *Bṛhat Pārāśara Horā Śāstra.*

Another famous astrologer was Kalyāṇavarman (7th century A.D.) who enjoyed a high reputation as an astrological writer and the importance attached to his only known work, the *Sārāvalī*[80] is evident from the fact that a commentator of the eminence Bhaṭṭotpala (9th century A.D.) has profusely quoted from it in his commentaries on Varāhamihira's *Bṛhatsaṁhitā* and *Bṛhajjātaka.* Bhaṭṭotpala's relation with the Kalyāṇavarman's *Sārāvalī* has been generally known to go only to the extent of his quoting largely from it, as a work of undisputed authority, in his commentary *Jagaccandrikā* on Varāhamihira's *Bṛhajjātaka* and other works. Sudhakara Dvivedi opines that the *Sārāvalī* was composed in the age of Brahmagupta, i.e. about 628 A.C.[81] S. B. Dikshit is inclined, but possible not with much justification, to identify Kalyāṇavarman with Vittesvara, who is stated by Al-Bīrūnī to have composed the *Karaṇasāra* about 900 A.C. The gross view, generally accepted and warranted by hitherto known external evidence, is that Kalyāṇavarman flourished some after 505 A.C., the date of Varāhamihira, who is mentioned in *Sārāvalī* (I.2; XXXIX.9), and before 966 A.C., the date of Bhaṭṭotpala, who quotes profusely the *Sārāvalī.*[82] Kalyāṇavarman certainly lived later than the *pūrvakhaṇḍa*, the *Bṛhat Pārāśara Horā Śāstra* and is quoted by Govindasvāmin.

The details regarding Kalyāṇavarman are found in the *Sārāvalī* (I.5–6, and LIV.10). From these verses we can only gather that he was a renowned, pious, liberal and learned king of a region named Vyāghrapadī with his capital at the town called Devagrāmapura and that he

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[78] *gaṇiteṣu pravīṇo 'tha śabdaśāstre kṛtaśramaḥ /*
nyāyavid buddhimān horāshandhaśravaṇasammataḥ //
ūhāpohapaṭur deśakālavit saṃyatendriyaḥ /
evaṃbhūtas tu daivajño 'saṃśayaṃ satyam ādiśet // – BPHS, 28.39–40.

[79] D. Pingree, *Jyotiḥśāstra: Astral and Mathematical Literature*, A History of Indian Literature, vol. VI, Wiesbaden, 1981, p. 87.

[80] *Sārāvalī of Kalyāṇavarman,* edited by Subramanya Sastry with an English translation, NSP: Bombay, 1928.

[81] See Dvivedi Sudhakara, *Gaṇakataraṅgiṇī*, Benares, 1933, pp. 13–16.

[82] P. K. Gode, "Date of Sārāvalī of Kalyāṇavarman – Between A.D. 550 and 966", *Annals of Bhandarkar Oriental Research Institute* 16, 1934–35, pp. 147–148.

wrote the *Sārāvalī* on the lines of his predccessors for the use of the students in astrology. Among a host of authors and works Kalyāṇavarman mentiones not only Varāhamihira, the biggest number of these allusions go to Yavanas, mentioned variously as Yavana, Yavanarendra, Yavanapati, Yavanādhirāja, Yavanarāja, Yavanavṛddha, Yavanādhipati, Yavanendra, Pūrva Yavanendra, Vṛddha Yavanācārya, etc, and a Yavanendradarśana, too, has been mentioned. From an important verse "*yathā matam brahmapūrvāṇām*" (*Sārāvalī,* XI.2), giving an allusion to Brahmagupta himself, S. L. Katre concludes that Kalyāṇavarman's exact data may be fixed somewhere about 650 A.C.[83]

Intercourse between India and the Arabs

The works of Greek authors such as Dorotheus of Sidon (first century A.D.) and Vettius Valens of Antioch (2nd A.D.) had been translated into Pahlavī in the 3rd century and developed in new ways by Sasanian astrologers. The Pahlavī texts that informed most of the early 'Abbāsid astrologers were rooted not only in translations from the Greek, but as well from Sanskrit'.[84] Portion of Indian literature and sciences reached the Arabs either through direct translations from original Sanskrit texts with the help of Indian scholars or indirectly through Persia. From the Indians the Sassanians derived the interrogational (*praśna)* branch of astrology, the techniques of military astrology. Combining the Dorothean idea of anniversary horoscopes with the Indian theories of vast *yugas*, the Sassanians invented historical astrology, which foretells the fates of nations, prophets, dynasties and individual kings.

When the province of Sindh came under the direct rule of Khalif Mansur (753–774 A. D.), there began, for a short duration, a direct intercourse between India and the Arabs, and embassies from Sindh paid regular visits to Baghdad; these included scholars who brought with them Sanskrit texts including the *Brāhmasphuṭa-siddhānta* (*Sindhind*) and the *Khaṇḍakhādyaka* (*Arkand*) of the famous Indian astronomer Brahmagupta which were translated into Arabic. These works for the first time introduced the Arabs to astronomy even before Ptolemy's system. Under Hārūn (786–808 A.D.) another influx of Indian learning took place, and Sanskrit texts on medicine, pharmacology, toxicology, philosophy, astrology and other subjects were translated into Arabic, while in later times these activities continued on a limited scale.[85]

Among Persians and Arabs both interrogational and catarchic astrology were popular and the latter transmitted their versions of these astrological techniques to the Byzantines through a series of translations.[86] One of the most important transmitters of a knowledge of Indian

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[83] S. L. Katre, "Kalyāṇavarman's Sārāvalī: Fresh Light on its Date", *Indian Culture*, vol. XI, N.1, 1944–1945, p. 9.

[84] D. Pingree, *From Astral Omens to Astrology, From Babylon to Bīkāner,* Roma, Instituto Italiano per L'Africa e L'Oriente, 1997, p. 63.

[85] See E. S. Kennedy, *Astronomy and Astrology in the Medieval Islamic World,* Aldershot, Ashgate, 1998.

[86] D. Pingree, "Classical and Byzantine Astrology in Sassanian Persia", *Dumbarton Oaks Paper* 43, 1989, pp. 227–239.

astrology to the Arabs was Abū Ma'shar, (787–886), who had some direct contact with India. He was an early representative of Hellenistic and Iranian astrology among the Arabs. Abu Ma'shar was born in Balkh (now in Afghanistan) and spent most of his active life as an astrologer and astronomer in Baghdād. He utilized a Persian translation made in 542 A.D. of the *Spharea Barbarica* of Teucrus and his writings were translated into Latin, Greek, and Hebrew. His treatise, *Kitāb al-madkhal al-kabīr* contains Indian material and is, in fact, one of the principle conduits for the transmission of genuine Indian astrological doctrines to the West. The iconography of decans (*drekāṇas*) and *horās* as described by Abū Ma'shar had a considerable impact on astrological illustrations in the West. It has long been recognized that his descriptions are derived trough a Sasanian intermediary from Varāhamihira's *Bṛhajjātaka.* It has been recently demonstrated that Varāhamihira's descriptions are a mixture of those of the decans and horās in *Yavanajātaka* of Sphujidhvaja, and that these later are misinterpretations (influenced by Śaivite iconography) of the Greco-Egyptian pictures in a Greek manuscript translated into Sanskrit by Yavaneśvara in A.D. 149/150.[87]

None of the contemporary Persian works on the history of astrology in Iran during the Sasanian period (226–652) written in Pahlavī language have been preserved in their original form. Sasanian astrology was syncretistic – a blend of concepts and methods derived not only from Iran's indigenous traditions, but also from these of their neighbourns, and especially of India and the Hellenistic world. This later influence was felt both directly through Greek and indirectly through Syriac. The first two Sasanian emperors – Ardhashīr I (226–240) and Shāpūr I (240–270) – were dedicated to the expansion of the Iranian intellectual tradition and supported the translations of Sanskrit books into Pahlavī.

Indian astrological ideas were spread to Sasanian Iran mainly through the translation of Buddhist texts, which were made in Eastern provinces of the empire. The part of *Divyāvadāna*, so called *Sārdūlakarṇāvadāna* (by the way, translated into Chinese in 148 A.D.) contains a summary of the Babylonia-influenced astronomy and astrology, which was current in India between 500 B.C. and 100 A.D. Another text was *Mahāmāyūrīmañjari*, and from such sources as these the Iranian references to the nakṣatras, to Rāhu (who is called *Gocihr*) and to Shadow tables are probably derived.

The Islamic astrologers of the early Abbasid period quote many Persian authors, like Teucrus, Buzurjmihr and al-Andarzghar, who had used Indian sources and calculated in Indian manner horoscope for the birth of the highest type of *mahāpuruṣa* in which all the planets are in their exaltations.[88] Furthermore, a number of Indian astrologers visited Baghdad in the Abbāsid period. The most notable of these was Kanaka, who served Harūn al Rashīdi, he is perhaps identical with the homonymous astrologer cited by Kalyāṇavarman in his

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[87] D. Pingree, "The Indian Iconography of the Decans and Horās", *Journal of the Warburg and Courtauld Institutes* 26, 1963, pp. 223–254.

[88] D. Pingree, "Indian Influence on Sasanian and Early Islamic Astronomy and Astrology", *Journal of Oriental Research*, Madras, 34–35, 1964–1966, p. 123.

Sārāvalī. The Arabs attributed to him writings on the *numūdār* – that is, on the method of ascertaining a factitious ascendant of the nativity, on the nativities, on the conjunctions of the planets. As Pingree has remarked, Kanaka's (*Kankah al-Hindī*) name became a favorite symbol used by intellectuals of the Islamic tradition to indicate the partial dependence of some of their sciences upon Sanskrit sources. But in general, Muslim astrologers cited simply 'the Indians' (*al-Hind*), without particular names of authors. Some Muslim astrologers used electional astrology of Indian origin, which consists in deducing the fitting moment for action from the place which the moon then occupies in one of the 28 lunar mansions (*manāzil*).

Al-Bīrūnī, who visited India and composed his account known as *Kitāb-ul-Hind* in the first half of eleventh century A.D., is all admiration for Varāhamihira and speaks of him as an excellent astronomer who clearly spoke out the truth. From al-Bīrūnī's account we get valuable information on the question of Varāhamihira's period as well as his works. Having translated several astrological and astronomical Sanskrit texts into Arabic around 1030 A.D. (*Bṛhatsaṁhitā* and *Laghujātaka* of Varāhamihira, *Brāhmasphuṭa-siddhānta* and *Puliśa-siddhānta* of Brahmagupta), he regrets that others did not follow Varāhamihira's example and passes strictures on Brahmagupta's (6^{th}–7^{th} centuries A.D.) lack of sincerity and his support to imposture.[89] Al-Bīrūnī had so great admiration for him that even when he found some wrong notion in his writings, he was so much obsessed by the excellence, truthfulness and supremacy of Varāhamihira that he supposed some esoteric meaning concealed behind it which he was unable to follow. (II. 117)

Among the Muslims the technical name of astrology is *'ilm* (or *ṣinā'at*) *aḥkām an-nujūm* – 'science (or art) of the decrees of the stars'; *'ilm al-aḥkām* – 'science of the decrees'. Another name is *an-najāmah* (*nijāmah*) or *'ilm* (*sinā'at*) *an-nujūm*, 'science of the stars'. *'ilm at-tanjīm*, mean astronomy as well as astrology, and they also mean both of these sciences taken together. Avicenna, Muḥammad al-Akfānī as Sahāwī, al-Ghazāli, Ibn Arabī, Ḥājjī Ḥalīfah, and other considered astrology as one of the seven (or nine) *furū* – 'secondary branches' of the natural sciences, placing it beside alchemy, medicine, physiognomy, interpretation of dreams, etc.[90] Al-Kindī, this 'philosopher of the Arabs', regarded astrology as an integral part of philosophy (*ḥikmah, falsafah*), he seeks its basis not only in the mathematical, but in the physical and metaphysical doctrines as well. About the middle of the 9^{th} century we have already several small astrological works of Al-Kindī formed expressly on Indian astrological models.[91] But at the same time, Averroes, Ibn Ḥazm, al-Ghazāli, Ibn

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[89] E. Sachau, *Alberuni's India*, London, 1910, vol. I, p. 366; vol. II, p. 227.

[90] See for instance, Burckhart Titus, *Clé spirituele de l'astrologie musulmane d'après Mohyiddīn Ibn Arabī*, Arche, 1974; Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines: Conceptions of Nature and Methods Used for its Study by the Ikhwan al-Safa', al-Biruni, and Ibn Sina*, Albany: State University of New York Press, 1993; David A. King, *Astronomy in the service of Islam*, Aldershot: Variorum, 1993.

[91] See Carlo Alfonso Nallino, "Sun, Moon, and Stars (Muhammadan)", *Encyclopedia of Religions and Ethics*, ed. by J. Hastings, vol. XII, 1921, pp. 88–89.

Qayyim al-Jauziyyah, al-Fārābī and others, under the increasing influence of Aristotelian philosophy and dogmatic theology, contended against astrology, as having no scientific foundations and contradicting the religious doctrine.

Although medieval Arabic astrology and astronomy began with the translation of Indian, Iranian and Greeks works, its history after the early ninth century may be said to be a history of the interpretation and improvement of the Ptolemaic theory.[92] The influence of Arabic Ptolemaic theory upon Indian astronomy and astrology can be traced back to Muñjāla in the tenth century, who wrote two works – *Bṛhanmānasa* and *Laghumānasa*, which are referred to by al-Bīrūnī in his *Indica*.[93]

Aby Warburg has showed that those odd Egyptian deities, that illustrate the decans and horās, at some time before the sixth century of our era had made the long voyage to India, thence they had traveled to Islamic lands; and so finally, through the doctrines of Abū Ma'shar's astrology, they returned to Byzantium and the West. Even the famous astrological paintings in the decoration at the Palazzo della Ragione (Salone) in Padua (1306 A.D.), and in the Salone dei Mesi of the Palazzo Schifanoia in Ferrara, made in the second half of the 15th century, are influenced by the doctrines of Abū Ma'shar's astrology.[94] What is also important there is that Indian asterisms (*nakṣatras*) appear in Abū Ma'shar, and their source is found in the astrological writings of Varāhamihira. Astrological tables of Al-Khwarizmi, who belonged to the period of scientific activity of Islam originated under the Abbāsid Khalifate in Baghdad (9th century), also show a curious mixture of Hindu and Greek astrological and astronomical methods.[95]

After centuries of development of astrology in India, *jātaka* was joined by a new form of genethlialogy entiteled *tājika,* which reveals that Hindus and Muslims shared common intellectual interests. Since the early eight century, the Arabs and Persians who encroached on the Western coast of India (present Gujarāt) were called *Tājikas*. The word *tājika* is derived from the Pahlavī *Tāzīg*, a term which the Iranians applied to the Arabs; it in turn is derived from the name of the Arab tribe *Ṭayyi'* and came to signify any foreigner from the West without greater specifity. As the name for a branch of genethlialogy the term *tājika* refers to Indian adaptations of Arabic/Persian astrology, which was itself a combination of elements from Greek, Syriac, Sasanian, and Indian science. The most noteworthy and popular book on *tājika* is the *Tājikanīlakaṇṭhī* composed by Nīlakaṇṭha at Kāśī in 1587. This work is divided into two sections, which are often presented separately: the *saṇjñātantra* – on general *tājika,* and the *varṣatantra* – on anniversary horoscopes or, as it is called today, returns of planets (*varṣaphala, hāyana*).[96] The *Tājikanīlakaṇṭhī* has spread the knowledge of *tājika* throughout

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[92] *Arabic Astronomy in Sanskrit. Al-Birjandi on Tadhkira II, Chapter 11 and its Sanskrit Translation,* edited, commented and translated by T. Kusuba and D. Pingree, Leiden, Brill, 2002, p. 4.

[93] E. Sachau, *op.cit.*, vol. I, p. 157.

[94] See Aby Warburg, "Italienische Kunst und internationale Astrologie im Palazzo Schifanoia zu Ferrara", *Gesammelte Schriften*, Bande II, 1932, pp. 459–482, 617–644.

[95] D. Pingree, "Astronomy and Astrology in India and Iran", *Isis* 54, 1963, pp. 229–246.

[96] See *Śrīnīlakaṇṭhadaivajñaviracita Tājikanīlakaṇṭhī*, 2nd ed. by M. Jha, Banaras, 1950.

all of India, and made it one of the most common systems of genethlialogy in use in the subcontinent in the 17th and 18th centuries.

Conclusions

By way of conclusion, with some generalization it can be said that horoscopy astrology in India, being itself not indigenous science but a local adaptation and development of Mesopotamian, Greco-Babylonian, and Greek texts, has passed through a complicated process of transformation and hinduization. Indian divinatory tradition was able to absorb contrasting and diverging options. Thus, while the various passages from the *Yavanajātaka* were of crucial importance and continued to be reused in many subsequent texts, they obviously were unsatisfactory in fulfilling the needs of the Indians' religious needs and eventually had to be modified in order to become more culturally viable. At an early stage of the development of Indian astrological and divinatory practices, parts of Indian tradition had influenced Sasanian and Syriac science before the rise of Islam. When Sanskrit texts on medicine, pharmacology, toxicology, philosophy, astrology and other subjects were translated into Arabic, they made tremendous impact on the development of the later Islamic astrology. It is quite evident that Indians' understanding of foreign scientific systems and their elaborations thereof led to theories and methods which differ drastically from their Babylonian, Greek, and Islamic counterparts, but that nevertheless do not obscure their ultimate origins. The origin and development of the Indian astrological and divinatory systems reveals a complex interaction of numerous cultural components, both foreign and indigenous. In traditional Indian context astrology occupied a far more central position in any plausible map of ancient bodies of knowledge than one could anticipate from a modern perspective. Therefore history and sources of Indian astrology and divination should be studied in its fullest social and intellectual contexts as far as practically possible.

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ŠVIESULIŲ SEKĖJAI:
ANKSTYVIEJI INDŲ ASTROLOGIJOS ŠALTINIAI IR ISTORINĖ JOS RAIDA

Audrius Beinorius

S a n t r a u k a

Kaip sudedamoji indų kultūrinio konteksto dalis, astrologija yra itin svarbi kultūrinės ir istorinės civilizacijų raidos požiūriu, nes atskleidžia daug socialinės, religinės, kultūrinės gyvensenos aspektų. Remdamasis išlikusiais klasikiniais sanskrito šaltiniais ir įvairia šiuolaikine kritine, istoriografine medžiaga bei pasitelkęs istorinį, deskriptyvųjį ir tekstinį semantinį metodus, autorius glaustai apžvelgia istorinius indų klasikinės astrologijos (*jyotiṣa śāstra, jyotiṣa vidyā*) raidos vingius, nuo Vedų civilizacijai būdingo tikėjimo ateities pranašavimu iš įvairių ženklų iki pirmųjų klasikinių astrologinių traktatų. Dėl išskirtinės geografinės padėties Indija slenkant amžiams buvo įvairų tautų ir kultūrų sąveikos židinys. Straipsnyje atskleidžiama Mesopotamijos ir helenistinių astrologinių metodų įtaka ankstyviesiems indų astrologams Sphudžidhvadžai (II a.), Varahamihirai (V a.) ir Kaljanavarmanui (VII a.). Glaustai apžvelgiama ir arabų astrologinė tradicija, kuri formavosi veikiama helenistinės bei indų astrologijų. Per šią tradiciją viduramžiais kai kurie indų astrologų tekstai tapo žinomi ir Europoje. Savo ruožtu iš arabų pasaulio viduramžiais Indiją pasiekė savita arabų / persų astrologinė sistema (*tājika*), suderinanti įvairius graikų, sirų, sasanidų ir indų astrologinius elementus. Daroma išvada, jog ankstyvieji indų astrologijos tekstai byloja apie sudėtingus helenistinės astrologijos adaptacijos ir jos hinduizacijos procesus bei liudija astrologijos vaidmenį vykstant įdėjų perdavai ir difuzijai. Pabrėžiama, jog senųjų civilizacijų istorijos tyrinėtojams astrologija yra ne tik reikšmingas senosios kultūros paveldo sandas, bet ir itin svarbi tradicinių žinių perdavimo ir jų asimiliacijos pažinimo priemonė.

Įteikta 2003 m. gruodžio 8 d.