

The Harappan Question¹

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Abstract

One of the major problems of interpretation of early Indian history has been the inconsistencies between the Harappan (Indus Valley) civilisation and the Rigvedic literature. Problems arise from the fact that the Harappan Civilisation was at its peak around second millennium BC (Allchin and Allchin, 1989 page 131). The period of creation of the Rigveda has also been put around 4000 to 2000 BC, though the writing down of the text has been dated to a much later period around 2000 BC or later. The Rigvedic literature and its subsequent developments have also been in the Indian subcontinent. There has therefore been a strong temptation to connect the Harappans to the Vedic Civilisation. However, there are several problems with this association, most graphically portrayed in the 'horse problem' (Thapar, 2003). Horses are integral to most Rigvedic ritualistic customs while they are absent in the Harappan sites. There are several other problems also. We re-visit this controversy in the light of some recent developments and suggest that the Harappans belonged to the ancient Homo sapiens who separated from the humans migrating from Africa as early as sixty thousand years ago and travelled along the coast of the Arabian Sea (Wells, 2003). This group lost touch with the group that migrated to the Mediterranean and evolved independently of them. We suggest that it was this group that set up the Harappan civilisation. We suggest that the group that went to the Mediterranean eventually moved east at the end of the Ice ages and passing through northern Iraq, Iran and Afghanistan entered India (the Indo – Iranians) where they met the earlier migrants who had come along the seas. They met at the Harappan sites sometime around two and a half thousand years BC. We base this suggestion on new data on the genetic make up of aboriginal Indian tribes (Thangaraj et al., 2002) and other studies of human migration, dating of separation of languages (Gray and Atkinson, 2003) and broad based studies of prehistoric human evolution (Mithen, 2003) as well as other evidence about the appearance of horses in Asia, etc. We propose that the Vedas were composed by the Indo Iranian but they included upon the learning of the Harappans and this mix of knowledge is also visible in the Vedic literature, especially in the astronomical information in the literature.

Introduction

The Harappan or Indus (Sindhu) Valley question has been central to many debates about the origin of the Indian people. The oldest major Upper Palaeolithic cultures seen in Indian subcontinent developed in the Indus Valley. It is also called Harappan civilisation. The civilisation itself has its roots as old as

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6000 BC but it flourished between 2500 and 1900 BC. However, human settlements as old as 45,000 BC have been excavated in India (for a summary of evidence see Allchin and Allchin, 1989 page 33 and references therein). These excavations have shown their development to be intellectually similar but technologically different from that of the similar cultures in the Mediterranean region (for a more recent summary see Mithen, 2003 page 396). The Indus Valley civilisation was clearly very well developed and in later periods, it is known to have traded with other civilisations and cultures as far away as southern Europe. This civilisation essentially disappears without trace sometime around 2000 to 1900 BC. This civilisation has been associated with the legendary river Sarasvati which is said to have changed course in 2000 BC (Allchin, 1995 page 12). Recent studies by Kalyanaraman (2004, vol 1 page 3) have shown that the references to the river definitely refer to a flowing mass of water and are not a spiritual or mythical concept.

Conversely, the most extensive literature of the Indian past has been the Vedic and post – Vedic literature. Extensive studies of this literature have shown that it was at least completely indigenised by the settlers of the Indian subcontinent even if their origin may or may not have been in the Indian subcontinent. The time and the apparently geographical coincidence of these two major landmarks of human civilisation in the western part of the Indian subcontinent have tempted many historians to claim that they are the same civilisation (see e.g. Feuerstein, Kak and Frawley, 1995, page 116).

However, this interpretation has run into several serious difficulties. (See e.g. Witzel and Farmer, 2000, Thapar, 2000) The most discussed amongst these is the absence of horses in the Harappan civilisation, while they hold a central position in the Vedic literature.

The Harappan script or absence of it has also been another source of conflict. About 3500 seals of Harappan civilisation have been found with word-like markings on them (for a collection of the seals and their analysis see Mahadevan, 1976, Joshi and Parpola, 1987; Shah and Parpola, 1991). The longest piece of Harappan 'writing' is 27 characters long. Naranan and Balasubramanyan (1992) have extensively analysed language structures and their work clearly shows that the kind of structure seen in Harappan seals is not consistent with any language structure. Possehl (1996) has extensively reviewed of all proposed models for interpretation of the Harappan script and shown that none of them are satisfactory. Farmer, Sproat and Witzel (2003) have reviewed all the related current arguments about Harappan writing and conclude that the Harappan writing is not a script There are other larger and smaller discrepancies between what Vedic literature describes about the life of the Vedic people, which seems to be essentially pastoral, while the Harappans clearly lived in cities (see e.g. Ratnagar, 2001). Witzel (2001) has analysed the evidence put forward to suggest that the Indo Iranians were migrants *from* Harappa and Indian Subcontinent rather than *to* the Indian subcontinent from Iran and shown that the arguments are not tenable.

The last few years have seen a spate of new literature and re-interpretation of the old literature which gives a consistent picture. In light of this,

we discuss a possible scenario about what may have happened in the western part of the Indian subcontinent around 2000 BC.

Some recent results

The Homo Sapiens, originating in Africa began their long migration across the world sometime around 100,000 BC (Roper, 2004, Mitten 2003, page 3). They first left Africa through what we now call Ethiopia and moved to Saudi Arabia. From here, one group seems to have migrated further north around 60,000 to 40,000 BC, while another group followed the Arabian Sea, travelled all the way across the Indian coast line, eventually to reach China, Japan and Australia.

This is borne out by studies of prehistoric human settlements in India and East Asia that they date back to 60,000 BC. This group seems to have travelled along the Indian Ocean coastline, from Africa, Red sea, Arabian Sea, Bay of Bengal and then proceeded along the Indian Ocean to China, Japan and Australia (Roper, 2004, see also, Wells, 2003). Equally strong is the evidence that one group of Homo Sapiens went north from Africa and Saudi Arabia and settled in Babylonia and then travelled via northern Iraq and Iran to India. It therefore seems that the migration to India has been through two major paths.

This has been conclusively established by the work of the Centre for Cellular and Molecular Biology, Hyderabad (Thangaraj et al., 2002) which has done extensive studies of the genetic make up of the aboriginal tribes in Andaman and concludes that they separated out from other populations about 60,000 years ago. Their work is based on the genetic make up of the Andaman tribes which indicate a separation from the Indo-European tribes around 50,000 to 100,000 years ago and spread rapidly to East Asia. Wells (2003) has further analysed the genetic data and shown that the Dravidians seem to have come around 30,000 BC. Therefore there seem to have been more than one events of group migration into the Indian subcontinent.

The tribes that went north settled around the Mediterranean Sea near present day Turkey and Israel (Mithen, 2003, page20). They split into two around 12,000 to 10,000 BC, one going West and eventually reaching Europe and America while another group travelling through north and central parts of West Asia, created a major cultural development in Mesopotamia starting around 11,000 BC. They then moved through Mehrgarh around 8,000 to 5,000 BC on to Afghanistan and then entered the Indian subcontinent through northern Indus valley around 3,000 BC (Roper, 2004; see also Mithen 2003, page 407).

Independent archaeological studies within the south Asian region and Sri Lanka, near Muchchatla Chintamanu Gavi and several other locations, Palaeolithic sites dating between 34,000 BC to 20,000 BC have been found (Sahni et al., 1990, Kennedy, 2000, Chakrabarti, 1999, Misra, 1989, Datta 2000), all indicating a fairly established human population in the Indian subcontinent well before the influx of humans from Central Asia.

Another interesting set of new data now gives details about the rate and manner of de-glaciation in the world after the Last Glacial Maxima (LGM) around

18,000 BC. The LGM began about 1,20,000 BCE. Temperature of the Earth came close to the present values around 10,000 BC. Before LGM, there was a small 2,000 year long thawing of the weather around 11,000 BC (Mithen, 2003, page 12, Lal, 2004). During the LGM, glaciers covered Central Asia and practically the whole of Europe. This must have seriously hampered the movement of humans further north and those who travelled, had to alternate between nomadic and semi nomadic settled life styles (Mithen, 2003, page 20). Towards the end of the LGM, around 13,000 BC, 9,000 BC and 6600 BC, the earth experienced major changes in sea levels that have been noticed across the globe. There have been suggestions that soon after the glacial melting some of the water must have swept across the deserts of West Asia, making them habitable and opening a path of travel across the now arid west Asia and Iran to eventually come to India (Roper, 2004).

Detailed analysis of separation of various languages have shown that the South Asian languages separated from the Indo-European ones around 5,000 BC and the South Asian languages within themselves bifurcated around 2,500 BC while languages such as the Kashmiri separated out as late as 1,000 BC (Gray and Atkinson, 2003). The extensive analysis based on modern associative techniques is quite robust and highly reliable (Searls, 2003). This analysis clearly shows that while the human migration out of Africa began more than 60,000 years ago, until 5,000 years ago the tribes used to intermingle and interact. However, Gray and Atkinson (2003) have not analysed the southern Indian languages which do not seem to fit into a simple analytical pattern.

Another issue of importance is the horses. Horses originated in the North American continent where they became extinct about 20,000 years ago but had managed to travel to Asia via Alaska by then. However, the earliest reports of horses (Anthony and Brown, 1991, see also Levine, 2004 for a complete summary) suggest that the domestication happened around the third millennium BC in central Asia. By this time both the Mesopotamia and Mahrgarh were well past their prime (Mitten, 2003, pages 80, 417).

The last point of discussion is the astronomical observations in ancient India. It is interesting that the ancient Indians seem to have concentrated on *Lunar* observation creating *Nakshatras* to the exclusion of Zodiacal signs which seem to have been added later (see e.g. Sewel and Dikshit, 1986). The emphasis on *Nakshatras* and directional stars is an example of a civilisation keeping track of days and directions in the sea. In fact, the first astronomical records dating back to 15,000 BC in France also note lunar phases (Ephemeris, 2004) as the first recording of ephemeris by humans. The Zodiacal signs of solar movement of the sky seem to be much later additions to Indian astronomy.

A possible scenario

We therefore propose a scenario that can reconcile the various observational ambiguities and produce a consistent picture of the sequence of evolution in the western part of the Indian subcontinent during pre-historic periods.

We know that the Homo sapiens who came out of Africa separated into two (or more) groups of human race. One group travelled north to the Mediterranean Sea. The other group continued to travel east along the sea coast. This separation occurred as early as 60,000 BC (see e.g. Mithen, 2003 page 3, Roper, 2004, Wells, 2003) see figure 1 for the routes out of Africa.

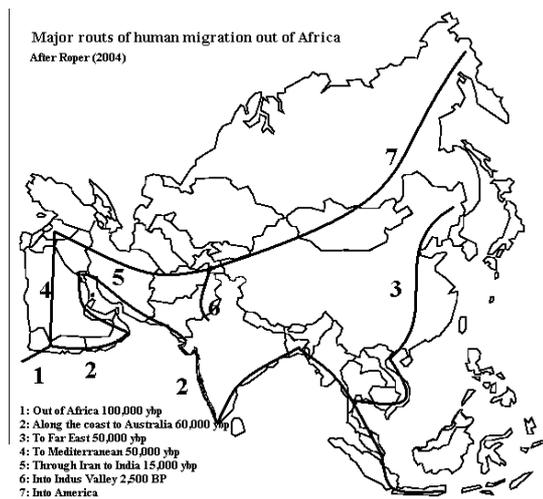


Figure 1: Figure 1: Major routes taken by humans out of Africa around 100,000 BC (after Roper, 2004, see also Wells, 2003)

We suggest that with a large desert separating the second group from their northerly neighbours, they would be out of contact with the West Asian group who settled down closer to Mediterranean Sea near the present day Israel and Turkey. The northerners, finding the paths further north blocked by the Glaciers, remained at or around the Mediterranean Sea exploring these regions. These groups became mobile only at the end of the Last Glacial Maximum (LGM) around 20,000 BC when they began to expand into Europe and into the Central Asian regions (Mithen, 2003, page 20). It is here that they seem to have first encountered the horses around 4th millennium BC (Levine, 2004).

However the group that travelled along the sea would not have been hampered by the cold weather of LGM and made a quick progress, reaching as far away as Australia and Japan where Palaeolithic sites as old as 30,000 years BC have been found (see e.g. Hooker, 2005). Since the areas they covered were warm, hospitable and rich in food, such tribes would have multiplied fast and explored large land masses in quick succession. At the same time, they would also get divided into smaller groups which would settle along the most comfortable environments. One such environment would be the Indus basin.

There is very strong evidence of this to be the case. Allchin and Allchin (1989, page 33) have extensively summarised the work of Indian archaeologists over the last several decades and given a comprehensive scenario about the life style in the India – Pakistan region (Indian Subcontinent) from the Stone Age onwards. Several interesting conclusions arise from this compilation. It is clear that the human presence in the Indian subcontinent date back to at least 35,000 years (Basu et al. 2003). The earliest remains of human activity can be found

from 45,000 to 17,000 BC, during the Stone Age period. Some remains of human activity can also be found all over the Indus, Narmada, Godavari and Krishna. The lithic period activities till 10,000 BC can be found largely in the Narmada and Krishna Basin. Thereafter when the weather seems to have settled into the present day pattern, a large number of sites are in the far western region, further west of Indus going all the way to the upper tributaries of Indus in Afghanistan. Around 10,000 BC, another group of sites can also be seen in the Krishna basin as well as at Mahágará and Chirand near Allahabad.

It is therefore clear that practically from circa 45,000 BC onwards, human activity extended as far south as the Teri region near Kanyakumari to as far north as Sanghao in Afghanistan. In the east, sites have been found as far as Béṛn river sites in Bihar to as far west as Jarruk in the Indus river basin. Sites like those in Pawagarh in Gujarat seem to have been habited all through the Stone Age to early and late Palaeolithic period till about 10,000 BC. There is also some evidence of interaction between these groups and homogenisation of knowledge (Allchin and Allchin, 1989, page 63). This itself is clearly indicative of a fairly advanced community with thousands of years of experience that is capable of domestication of animals and plants and evolve the technologies and norms required for the same.

However, toward the end of this period around 10,000 BC, there seems to have been a drastic reduction of the inhabited sites in the subcontinent and most of the sites after this period seem to be concentrated in the Indus – Sarasvati Basin. Allchin and Allchin (1989, page 23) have attributed this shifting of population to the changing weather patterns in the subcontinent as deduced from the various sea beds in Pushkar and Béṛn river basins. Often these sites have multiple layers of development indicating repeated visits over long periods rather than continuous settlements. This again indicates both knowledge of geography, habit of frequent travel and intermixing of tribes and communication between various settlements. It has also been noted that while the developments in the Indian Subcontinent parallel to those in the Eastern Europe, the subtle differences in techniques and choice of material indicates that there was no communication with Europe but the subcontinent itself was fairly well interconnected, exchanging knowledge and intermingling. This is also corroborated in Mitten (2003) (page 396). All this gives a fairly comprehensive picture of the scenario in the Indian subcontinent indicating that there was vibrant human settlement in the subcontinent from 45,000 or earlier and that it was fairly homogenous.

It has been argued in the literature (see e.g. McNair, 2004) that the human migration to north and east began much earlier around 50,000 to 75,000 BC. However, studies (Loube, 2000) show the long term temperature of the earth has remained low for the past 1,20,000 years, indicating that the frozen temperatures of the north and central Europe and Asia must have persisted since then preventing further migration of humans except along sea coasts as discussed here.

Possehl (1996, Page 59) has discussed the suggestion that the Elamite language which was spoken in southern Iran whose written material has been

found bears a great similarity to the Harappan script indicating that the two cultures were in close interaction with each other, further indicating the close relation between the coastal regions.

Recently, Jamkhedkar (2005) has extensively analysed the relation between Zénd Avestā and Rigveda. In his review, he has quoted Keith (1926) and several other scholars. He has noted the conclusion of Keith (1926) that the knowledge of the Indo-Aryans about the constellations (*nakshatras*) might have been borrowed from some other superior culture and the interpretation itself of the passage from the Rigveda was based on a misunderstanding. Jamkhedkar (2005) suggests that even a casual glance at the list of the sixteen countries, including the holy Airiyānā Vaejo, makes it clear that at the time of the composition of the Avestā, memory of the undivided Indo-Iranian (i.e. modern Iranians and Indo-Aryans) community and their habitat was fresh in the mind of the composer. All this and other dating of the Iranian region indicates that the two South Asian and Iranian cultures separated well after 9,000 BC but well before 1,500 BC, and the most probable dates are around 2,500 BC (see also Witzel, 2001).

The sea levels around the world have recorded three major events of rapid sea level rises in 13,000, 10,000 and 7,000 BC coinciding with major glacial melting phases (Ephemeris, 2004, Barnhardt, et al., 1995, Kelley and Dickson, 2004). These sea level changes would have forced the residents of the river delta of Indus to move farther north with their belongings and the most natural path would have been along the riverbed, going upstream until the weather becomes cold and inhospitable towards the starting of the Himalayan mountain ranges. These developments, essentially spurred by the Great Floods, would have been in the time frames of the oldest possible proposed dates of the Harappan civilisations.

Meanwhile, the cultures that settled down in the Mediterranean basin would have found themselves locked due to the desert in the east and ice glaciers in the north. They would have begun their journey only at the end of the LGM around 13,000 BC. There is extensive evidence that during their enforced localisation, the cultures had developed truly complex structures (Mitten, 2003 page 8) including multiple small dwellings making a community indicating the existence of family structure. There is significant evidence that over the period of 15,000 BC till 10,000 BC and later, these tribes often travelled long distances but returned periodically for various interactions (Mitten, 2003, page 8). These tribes of Mesolithic period are known to have had family units, in-house burial of the dead and re-visits over long periods, indicating a fairly sophisticated stage of evolution. By 11,000 BC they seem to have moved all the way to central regions of West Asia setting up mega settlements as in Mesopotamia around 11,000 BC which flourished till 6,000 BC.

As one moves further east along the central Asian and Afghan regions, the period of development of human settlements become later and later and the settlements in Afghanistan and Baluchistan are as late as 3000 BC (Mitten, 2003 page 407). However, given that the Harappan settlements were already very sophisticated by this period, a group of travelling nomads could hardly have

set up such a complex architecture within a few generations. Hence it seems that the arguments of dating itself indicate that the Harappan civilisation could not have been set up by the humans travelling from Central Asia. In addition, the structure and evolution of the Harappan civilisation is apparently so different that it seems to have little in common with Mesopotamian civilisations. The understanding of geometry and sophistication of the Harappan settlements also indicate a civilisation that had gone through several generations of developments that could hardly be the work of a nomadic tribe settling in (Ratnagar, 2001).

There is a lot of very strong evidence brought out from the work of Tilak (1893) and others (see e.g. Kak, 2000) indicating that the Vedic literature is the work of essentially highly sophisticated but otherwise nomadic people who had done extensive studies of the movement of the Sun, its effects on the weather and had elaborate mythologies on various aspects of human life.

Horse was central to the sacrificial Vedic religious rituals. In all major work of the Vedic people, horse was used extensively as a symbol representing all aspects of creation and the animal had made a deep impact on the Vedic people (see e.g. Kak, 2002, page 4). However, the horse itself does not make its appearance in Asian human life till about 3,000 BC (Levine 2004). Hence it again seems that the horse was an animal of the nomadic cultures travelling into South Asia from the north-west between 3,000 and 2,000 BC. This also explains why the early Harappan people were not familiar with the horse or the other human groups from Central Asia.

The question then remains whether the Harappan people were an independent civilisation that perished without ever coming in contact with the Vedic people coming in from the west and that Harappan civilisation disappeared in a discontinuous manner around 1700 BC. However, it is also well established that the Harappan civilisation was not destroyed either in war or natural calamities, nor are there indications of sudden migration (see e.g. Thapar, 2003), though there have been suggestions that the civilisation was critically dependant on Sarasvati river which dried out around 1900 BC (Kak, 2001) forcing the Harappans to leave the area.

It seems more logical that post 2000 BC, the Harappans merged with the migrants of Central Asia and then drifted farther east into the Gangetic plains when Sarasvati dried up. They must have had a good knowledge of the Ganges basin since human settlements have been seen there from stone ages (Allchin and Allchin 1989, page 3). It is therefore more logical to assume that the Harappan people and the Vedic people merged into a single human group. Since the language of this group was predominantly the Vedic language or a mixture of Vedic and Harappan, the continuity of literature does not express this integration satisfactorily.

However, it is the astronomical evidence that is most striking in several ways and we analyse some of this evidence below. Filliozat (1962) has done an extensive analysis of available astronomical data from the Vedic literature and Avesta. He has compared the names of various stars and zodiacs as well as the

equinox periods to derive the dates of the relevant literature and his conclusions are similar to those derived from other dates.

The path of the Sun and the Moon in the sky are slightly different. Hence there are two ways of designing the astronomical constellation. One is to take the stars around the path of the Sun and divide them into 12 patterns of 12 months corresponding to the 12 months of the Sun's passage around the Earth. This is called the Zodiacal signs. The second one is to take the stars that fall on the Moon's path and divide this into 27 parts corresponding to the 27 days in which the Moon completes one rotation around the earth. These are called Lunar mansions or *Nakshatras*.

The Zodiacs are believed to be Babylonian in origin. Objects associated with the Sun's zodiacal signs are Aries: Ram, Taurus: Bull, Gemini: Twins, Cancer: Crab, Leo: Lion, Virgo: feminine form (virgin), Libra: Scale, Scorpio: Scorpion, Sagittarius: a half human half animal archer, Capricorn: a goat like animal, Aquarius: Water bearer, Pisces: two fish. Of these, the ram, bull, crab, lion, Capricorn are all animals of jungle environment that were present in the entire Asian region. Twins, the feminine form, and water bearer are of human origin. Crab and fish are related to water. Scorpion is an insect that flourishes in arid environment. Scale (Libra) is the only object of human construct. In ancient times when the Sun passed through Libra, as it crossed the Celestial Equator, it marked the autumnal equinox in the year 1190 B.C., the time of equal day and night (then about Sept 22) for the Babylonians. On that date, the day and night are of equal length, making for a perfectly balanced day. By the time of the ancient Greeks, about 1500 years later that association had been lost (see Wright, 2005). Hence all zodiacal signs except Libra are associated with animals that would have been typical of hunter gatherer environment found across the Asian and European regions and could have been designed by any Palaeolithic or Mesolithic culture. The absence of the much loved horse of later Indo – Europeans, and the uniformity of constellations across Europe and (South) Asia indicates that the constellations were designed before 3000 BC.

Nakshatras are of Indian origin and such extensive structures of Nakshatras are found only in India. The Harappans, living along the coast and enjoying more moderate weather would have used the night sky and astronomy more to date the period rather than read it for predicting weather. They would have therefore concentrated on the Moon's position in the night sky, working out the Lunar mansions (*Nakshatras*) with great accuracy rather than concentrate on the Sun. We analyse this problem below.

The study of *Nakshatras* is unique to the Indian civilisation. Most other civilisations have turned to the Sun, making it the focus of their study. Even the most cursory look at the night sky would indicate that Moon is an excellent calendar keeper over short periods of few days to weeks. The period of Moon's rotation is 29.53 days from full moon to full moon and 12 lunar months make 354 days. Hence the lunar calendar becomes out of synchronisation with weather over long terms, with each lunar year short by 11 days. This would not be noticeable over few years in regions of moderate weather but would be quite conspicuous in northern latitudes. Hence any civilisation that is looking to the

sky to understand (or predict) the weather would concentrate on the Sun. But a civilisation living along the coast and navigating would concentrate on the Moon and a few directional stars for navigation. Hence we suggest that not only are *Nakṣatras* of Indian origin but are the Harappan contribution to the Indian learning added into the common knowledge around second millennium BC, while the Western nomadic people, had extensive knowledge of the Zodiacs that had in fact been homogenised with that of other tribes before the separation of these groups between 5000 to 2000 BC.

One more important feature of the *Nakṣatras* had been a part of original design of the night sky, each would have been given its own constellation. However, as it stands today, *Nakshatras* are spread over several constellations. We therefore suggest that the importance of these groups was noted much later, when the original designs could no longer be redone since they had been agreed upon by humans spread over a large area.

Hence, *Nakṣatras* remained parts of several zodiacal signs and are not classified as separate constellations (see table 1). It indicates that *Nakshatras* were later added as additional information into the Vedic learning but, at the same time, not considered important enough to require re-designating of constellations. In fact the *Nakṣatra Śataraḥ* which falls between constellations could easily have been assigned a separate identity but the fact that this was not done is another indicator that the system was adopted as a parallel interpretation of sky by different kinds of thinkers.

Hence we suggest that the most likely scenario was that the constellations and zodiacs were designed by cultures that needed to keep a good track of the sun, the northerners. When they eventually met the Harappans in the Sindhu valley, they found this interesting concept of *Nakṣatras* and adopted them without undertaking any major revision of the constellations. Absence of horses in the sky also indicates that the constellations were probably designed before 3000 BC. However, even while incorporating the *Nakṣatras* in the astronomical recording, they still had an option of re-naming them and this was used in a different manner. In particular, there is only one specific animal (Ashvini, the Horse) in the *Nakshatras* while all the other symbols are more appropriate to general well being, a very distinctive style from the style of naming the zodiacs (Bhujle and Vahia, 2005). This also indicates its distinct origin.

Table 1: Nakshatras and their corresponding Zodiacs and Constellation

No	Nakshatra	Meaning	Zodiacal sign	Constellation
1	Āṣvini	Female Horse rider	Aries	
2	Bharani	One which nourishes	Aries	
3	Kṛttikā	Hide of an animal	Taurus	
4	Rohiṇi	Red	Taurus	
5	Mṛgashīras	Head of an big animal		Orion
6	Ārdrā	Wet	Gemini	
7	Punarvasu	Wealth	Gemini	
8	Puṣya	To feed	Cancer	
9	Āśleṣā	One who is near to		Hydra
10	Maghā	Bountiful	Leo	
11	Purvāṣṭhī		Leo	
12	Uttarāṣṭhī		Leo	
13	Hastā	Palm		Corvus
14	Citrā	Bright	Virgo	
15	Svātī	Sun's outcast wife		Bootes
16	Viśākhā	One with many branches	Libra	
17	Anurādhā	One who delights	Scorpio	
18	Jyēsthā	Senior	Scorpio	
19	Mūlā	Origin – root	Scorpio	
20	Purvāśādhā		Sagittarius	
21	Uttarāśādhā		Sagittarius	
22	Śrāvāṇā	Ear		Aquila
23	Dhanyā	Wealthy		Delphinus
24	Shatābhīrā	Many stars		?
25	Purvābhādrapadā	Auspicious feet		Pegasus
26	Uttarābhādrapadā	Auspicious feet		Pegasus
27	Revatī	Full of wealth	Pisces	

In this connection we refer to the work of Frawley (1993, page 147) and Feuerstein et al. (2001, page 229). They have argued that the extensive astronomical data especially referring to the sun's location at equinoxes are dated to a period well before 3000 BC and based on this; they argue that the dates of Indo – Europeans into India should be advanced or even more radically consider that the Indo Iranians went from India. However, this suggestion has been severely criticised (Witzel, 2001) on the ground that all other evidence points against such a drastic revision of pre-history in the Indian subcontinent. We suggest that the present suggestion reconciles both the data consistently by suggesting that the basic astronomical knowledge was taken by the Vedic people from the Harappan people whose knowledge predates the arrival of the Indo – Europeans into the subcontinent.

In this connection, we also point out that as far as astronomical observations are concerned, there are some truly intricate observations about planetary movement that occurred only in 9,300 and 5,200 BC that seems to have been recorded in the Vedic literature. In particular, Mahajani et al., (2005) have shown that there is a record of movement of Mars through the head of Taurus in the literature. The last passage of Mars occurred in 5284 BC and prior

to that in 9860BC, 9828 BC, 9371 BC and 9339 BC. These periods coincide with the major rises in the sea level which would not have been noticed by the inland civilisations while they would clearly have made a great impact on the sea side civilisation. We suggest that this is also an indication of exchange of knowledge between the two cultures and their merging.

Conclusion

We suggest that the Harappan civilisation predates the arrival of Aryans from the west into the Indian subcontinent and that the Harappan civilisation was created by the groups of humans who left the original migrants from Africa 60,000 years ago and travelled along the coast. We further suggest that this civilisation merged with the Central Asian cultures around 2000 BC in the Harappan region. We show that there is a fair amount of circumstantial evidence to this effect.

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