

Catastrophes During Rigved

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Abstract: Rigved is a voluminous document of about ten thousand verses in its ten chapters. It is a treasure of past information brought into the present through tradition of memorization. In the earlier interpretation of Rigved during past two centuries its span of time was regarded invariably as very small – barely 700 years between 100 and 700 B.C. Discovery of material evidence of artifacts during the last decade suggests the commencement of Rigved period around 24500 years ago in Rajasthan and its termination in Gujarat is no earlier than 4000 years ago. Detailed study and a revision of the parameter of astronomical analysis fix the period of Rigved between 24.5 Ka and 3.5 Ka. It is a geological period of 21000 years in the Upper Paleolithic and Holocene.

Western translations of Rigved during the British Raj are hurried, faulty and unacceptable for any scientific work including interpretation of past river systems. After a constrained and rigorously refined translation of twenty verses of Rigved it is established that a succession of six river systems of varying duration covers the Vedic period of 21000 years in Northwestern India and Pakistan. A salient break is seen in the nomenclature pattern of river systems at 8.5 Ka, which divides the Vedic period into Lower and Upper.

Catastrophes and calamities related to tectonics, sea level changes and climatic vicissitudes have induced a thinning and swell in Vedic population due to case-effect relationship. It has been possible to infer them through astronomical events and geological parameters of the Western Indian Shelf. Some of the events, like a prayer for destruction of Das tribe, figures even in the verses of Rigved. Most severe among the Rigvedic calamities was a combination of aridity and a modest rise of sea level around 4 Ka. It brought to an end the trade through Sindhu River in its lower reaches. People survived the episode without any long distance migration. The trading cities, however, disappeared.

INTRODUCTION

Rigved is most extensive and voluminous among the four Veds, which form the treasure of ancient knowledge in India. It comprises of ten chapters (mandals) and nearly 10000 verses. In a commonly held opinion chapters 2 to 7 cover an older period in Rigved while chapters 1, 8, 9 and 10 were composed later (Dwivedi, 1982). Composition and pattern of hymns in chapters 1 and 8 is similar and these could be nearly contemporary. Chapters 9 and 10 may be even younger, it is believed.

In a view prevailing during the last century, hymns of Rigved were believed to represent a very short duration of time. Scholars like Macdonell and Keith (1912), the authors of 'Vedic Index', believed that the Vedic period is

very short — restricted merely to a duration of 700 years. Their Vedic land or the home of the 'Indo-Aryans of the earliest period' lay between 28°N and 35°N and 70°E to 78°E. The period commences with 1200 BC and closes around 500 BC. Radhakrishna (1999) has increased the duration to six thousand years between 4Ka and 10 Ka lately. The author, however, has already reported a Perigordian carving of Vedic deity Dyaavaaprihvee from Jaisalmer with sun, moon and asterism marks (Fig.1). It has been dated precisely as 24.4 Ka on astronomical evidence (Jagadishomrityunjay, 1997, fig. 7.14-15, box7.1). There is also a Harappan find fitting with the 'solar movement house' of Rigved (RIK.10.75.1) at locality Dholavira in Kachchh (Fig.2). The artifact is described by the author elsewhere



Fig.1. Dyaavaaprithivee (Heaven and Earth) Pillars of Basanbir. [The female figure of Earth has a circles each to her left and right side of head (A and B). In her standard pose of reference (looking north), the large circle of sun is to the left and the small circle of moon to her right. The timing of reference is evening of a full moon when sun is setting in west as the moon rose in east on equinox day when midday shadow of Dyaus pillar touched the feet of Prithivee (line). ***The equipment is a testimony of Vedic principle for defining the New Year on Vernal equinox.*** (After Jagadishomrityunjay, 2003)].



Fig.2. Sualings (sun indicators) in the Solar Movement Temple of Dholavira. [The Sualings or Sivlings (Suan + ling = sun + indicator) are a pair of lathe finished objects, oriented north - south in a large room. The room had a high roof with a hole. On the summer solstice a beam of sun from roof fell on pillar S and shadow of its rim on point P. On winter solstice the beam was on the top of pillar N (After Jagadishomrityunjay, 2003)].

(Jagadishomrityunjay, 2003). The Harappan establishment of Dholavira dates back to 4.2 – 4.5 Ka as per the literature at the excavation site (1999). It is a date when the *kaarū* or 'keeper' of the solar movement house describes River Sindhu in Chapter-10 of the highest Rigved (RIK.10.75.1: Jagadishomrityunjay, 2003, Box 1, item 18). The upper limit of Vedic culture is, however, is still younger. It could be fixed better considering the intrinsic evidence of profusely mentioned war chariots in Rigved. They appear first in prehistory around 3.6 Ka (Reader's Digest, 1983, p. 118). Accordingly, the upper boundary of Rigved is younger than 3.6 Ka. Vedic period is traditionally treated as older than Puran period. Purans begin with Mahaabhaarat War/ Coronation of Pareekshit around 3.4 Ka in view of time-lapse between Pareekshit and Nand (Bhargava, 1956). Upper limit of Vedic period is, accordingly, fixed at 3.5 Ka.

It is now established that the Vedic period covers a geological duration of 21000 years, covering human activity, perils and migrations

during Upper Paleolithic and Epipaleolithic. Northwestern India and Pakistan constituted once a vital segment of widespread Vedic land between 3.5 Ka and 25 Ka. The Rigvedic cult flourished mainly in this region. Six River Systems have appeared and disappeared during the Vedic period. Their nomenclature and dating has been done to establish a standard frame of chronostratigraphic units for correlation of geological and cultural events during the Vedic period (Jagadishomrityunjay, 2003).

The Vedic period has witnessed strong tectonic activity, sea level changes and shifts of major rivers and their tributaries in the Rigved country. The catastrophic events and calamities during Rigved relate mainly to tectonic activity, earthquakes, rise and fall of sea levels and extremes in climatic change. These have drastically affected the human population during the Upper Paleolithic and Holocene. Often, there have been large migrations after the catastrophic events and new tribes were established when the harshness of catastrophe was over.

The paper brings out and discusses main catastrophes during the Rigved period. They are associated essentially with the boundary events of the Vedic River Systems. The dates mentioned in the paper, unless otherwise specified, are in Calendar Year B.P.

VEDIC RIVER SYSTEMS

The learned Indians have been chanting Veds since ages for the power of mantras. Fascination of western pundits for the Veds was to serve an altogether different purpose when their study, translation and interpretation commenced in the nineteenth century of Europe. They were keen to learn about the people, land and culture of the Vedic tribes. It was for understanding the Vedic men, their living conditions, traditions and history in the shortest possible time. In general, the western translations of Veds during British Era are hurried, lax and, often, incorrect or garbled. Their application for any reconstruction of past lands, rivers or cultural-frames is bound to introduce serious errors of far-reaching consequences. Unless the errors and lacunae are rectified rigorously, credibility of inferences from Western translations will remain far from perfection and reality. Several errors of the Western translations are pointed out by Avasthi (1953) in context of the past rivers and geography. Translation of Veds is a complex topic (Sharma, 1977) and in the past works relating to paleogeography and channel courses there are serious lapses on account of: a) faulty translation, b) allocation of very short duration to Vedic period, and, c) unconstrained correlation of Vedic channels with the present ones.

In the reconstruction of succession of Vedic rivers systems and catastrophes, there are three areas of prime attention — composition of the channel systems, their chronological position and, the paleogeographic disposition of tributaries. In a scientific approach, the author has first attempted to fix the chronicle of Vedic events through refinement in the astronomical dating of Rigved, Panini Grammar and other works (Jagadishomrityunjay, 2003).

Physical proof and their dates have been taken into account for the Rigvedic deities Dyavaaprihivēe at Basanbir near Jaisalmer in Rajasthan and the 'solar movement house' at Dholavira in Khadir Island of Kachchh. Lastly, words specifying time, like the 'spun Sarasvatee' or the 'tied-foed-horses' in the similes of Rigved have been used for the dating of the Vedic past.

For a standard reference in chronostratigraphy, the 'original descriptions' of the main channels and their tributaries have been designated after a scrutiny of Rigved. Verses of Rigved were examined for coherent and elaborate descriptions of main channels and their tributaries. The bards of the past used them for their movements to reach to different parts of the Vedic land. They have sung the descriptions of rivers accurately, it appears. Later prayers of the same channels as goddesses can be eliminated from the geographic channels with the help of original descriptions, this way. The main channel and its supporting tributaries were designated as *river system* if they compared to the present lay out of Indus and its contributories. There are only 20 stanzas in chapters 3, 5, 6, 8 and 10 of Rigved that fulfill criteria for erecting a river system. These were translated by the author himself invoking traditional Panini Grammar for descriptions of rivers (Jagadishomrityunjay, Box 1, items 3-22).

The Type Descriptions in Rigved cover over fifty-five names of rivers, which belong to six river systems (Fig.3). One of these belongs to Chapter 5 and two were sung by the bards during Chapter 6 of older Rigved. One description each falls in Chapters 3, 8 and 10 of the younger Rigved (Fig.3, inset). The channel system established in this way is an informal chronostratigraphic unit denoting successive time levels all over the Vedic land. Informally, the Vedic period may be treated as a series equivalent unit and its two divisions — Lower and Upper — as stages. The river systems are equivalent to substages. Definition and description of the stratigraphic units are given elsewhere (Jagadishomrityunjay, 2003). Order of superposition, duration and number

BRIHAN-MARUT (I)	BRIHAT-SARASV- ATEE (II)	BRIHAT-PUREE- SHAANI (III)	BRIHCH- CHHUT- UDREE (IV)	BRIHAD- ASH- VINA (V)	BRIHAT SINDHU (VI)	RIVER SYSTEMS		RIVERS	
0:4	3:3	4:5	3:4	0:8	1:19	Maa.: Fest. Names	Vedic names	Modern names	Rigved O.D.
						Anitabha	1	-	5.53.9
						Dlv	2	-	5.53.8
						Krumu	3	Narmada	5.53.9
						Kubha	4	-	5.53.9
						Marut	5	-	5.53.8
						Pureshinee	6	-	5.53.9
						Rasa	7	Jhelum	5.53.9
						Sarayu	8	-	5.53.9
						Antariksham	9	-	5.53.8
						Sindhu	10	Sindhu	5.53.9
						Aj	11	-	6.61.11
						Aapeprusha	12	Sindhu	6.61.11
						Paarthisvaanee	13	-	6.61.11
						Uru	14	Beas	6.61.11
						Sarasvatee	15	Jhe-chen	6.61.4
						Angirasvat	16	Indus	6.49.11
						Chitrayu	17	Beas	6.49.7
						Kanya	18	Ganga	6.49.7
						Marut	19	Jhe-Che	6.49.11
						Nar	20	- Nara	6.49.11
						Paaveeravee	21	Degh	6.49.7
						Pureshaani	22	Sutlej	6.49.6
						Veerpatnee	23	-	6.49.7
						Payas	24	Beas	3.33.1
						Shutudree	25	Sutlej	3.33.1
						Subhaga	26	Jhelum	3.33.3
						Vipash	27	Ravi	3.33.3
						Vipast	28	Yamuna	3.33.1
						Urvi	29	Chenab	3.33.3
						Ashvina	30	Jhelum	8.26.19
						Dhiya	31	Degh	8.26.19
						Shubhra	32	-	8.26.19
						Shveta	33	Ravi/Swat	8.26.18
						Shveta Varoo	34	Kabul	8.26.18
						Sukeerti	35	Chenab	9.26.19
						Vaana	36	Beas	8.26.19
						Arjekooya	37	-	10.75.5
						Asiktee	38	-	10.75.5
						Ganga	39	Jhel-Che	10.75.5
						Gomattee	40	-	10.75.5
						Mehatnu	41	Mahi	10.75.6
						Marudvridha	42	-	10.75.5
						Parushnee	43	-	10.75.5
						Sachata	44	-	10.75.5
						Sarasvati	45	Beas	10.75.5
						Shroosuhoe	46	-	10.75.5
						Sursartu	47	Sohan	10.75.5
						Shvetee	48	Swat	10.75.5
						Varun	49	Boian	10.75.2
						Vitasta	50	-	10.75.5
						Yamuna	51	Ravi- Degh	10.75.5

COMMENCEMENT OF
SYSTEMATIC RIVER
DESCRIPTIONS (25 Ka)

MAJOR SHIFT IN
NOMENCLATURE
PATTERN

APPEARANCE OF NEW
GRAMMAR

CULTURAL
LANGUAGE
BREAKS

RIG VED
MANDALS

Fig.3. Succession of Vedic River Systems.

of channels in each river system are as under:

6. Brihatsindhu System 3.5 Ka – 6 Ka 22 Channels
5. Brihadashvina System 6 Ka – 8.5 Ka 9 Channels
4. Brihachchhutudree System 8.5 Ka — 11.5 Ka 7 Channels
3. Brihatpureeshaani System 11.5 Ka – 14.5 Ka 9 Channels

2. Brihatsarasvatee System 14.5 Ka — 20 Ka 7 Channels
1. Brihanmarut System 20 Ka – 25 Ka 9 Channels

The longest trunk channel and maximum number tributaries constitute Brihatsindhu System, which extended physically from Afghanistan to Gujarat between 4 and 6 Ka (Fig.4). The termination of the system is also

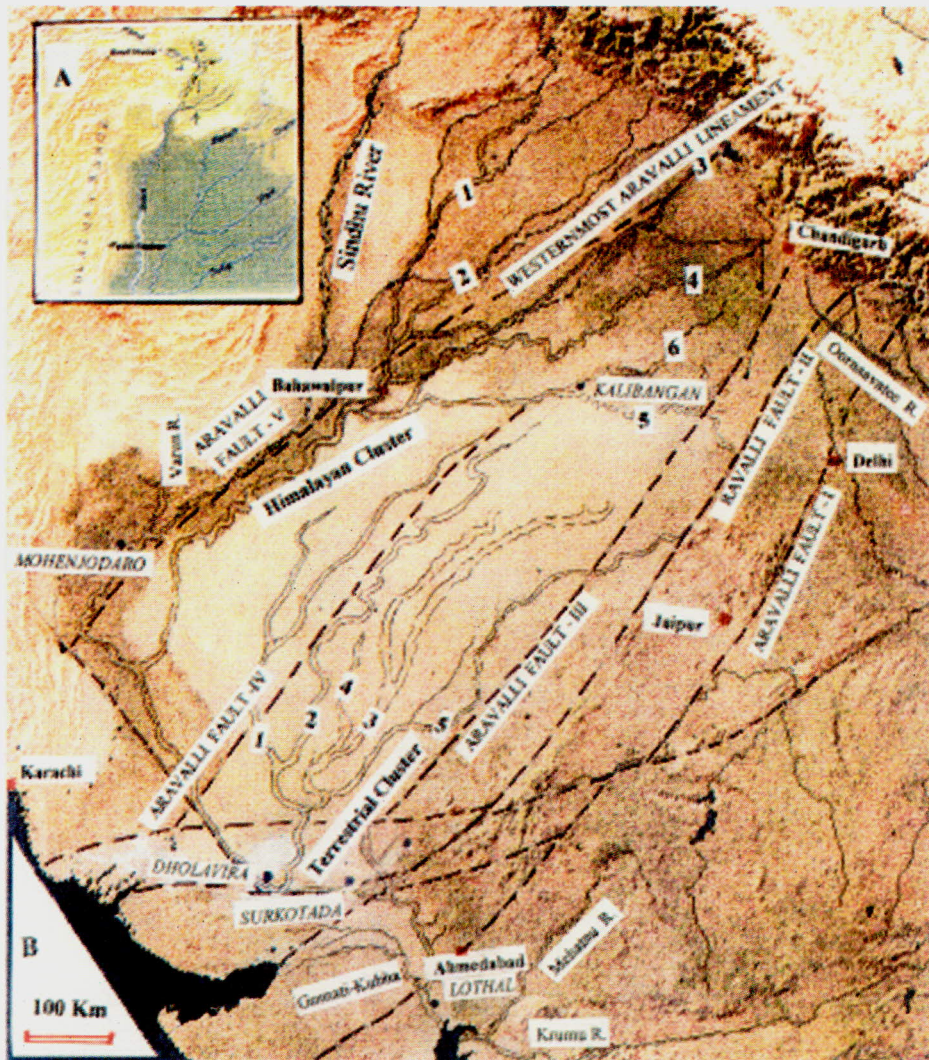


Fig.4. Sindhu River System. [A: Initial three rivers of Upland – 1 Sindhu, 2 Rasa, 3 Shvatee, 4 Susartu; B: Other Rivers *Himalayan Cluster*: 1 Ganga (pair), 2 Yamuna (pair), 3 Sarasvati, 4 Shutu-dree, 5 Sachata, 6 Parushnee. *Terrestrial Cluster*: 1 Marudvridha (pair), 2 Asiktee, 3 Arjikeeya (pair), 4 Vitasta, 5 Shreesuhee. (After Jagadishomrityunjay, 2003)].

through a worst combination of catastrophes during the Holocene because the Harappan civilization reaches to the lowest ebb just within 200 years of the event. There is evidence of other similar and severe calamities that were witnessed by the Vedic people during other river systems as well. Human response to such catastrophic events is, at times, evident even in the verses of Rigved.

SWELL AND THINNING OF POPULATIONS

Astronomy, Grammar, Similes and Disasters

Astronomy has been invoked in past for dating the events in Veds as well as Panini Grammar (Agrawal, 1955: Dixit, 1969) The dates arrived this way are, however, very young. They hardly exceed 3.5 Ka and remain younger than the artifact evidence of Vedic culture at Dholavira by a thousand years. Jagadishomrityunjay (1997) explained this disparity and suggested that it was arising out of a revision in the *Nakshatr Jyotish* (asterism astronomy) of India in 285 A.D.

On the day of vernal equinox of 285 AD (22 March) when the revision of the Indian

calendar was done, hour of reference was sunrise on the day (Lahiri, 1984). At that moment, Spica (Chitra) was setting in the west as a morning star, just opposite the conjunct sun-moon rising in east on a new moon day. The first day of the first month of the New Year was Chaitr 1. The month was named after Asterism Chitra just opposing to sun and moon. As evident from Shatapath Brahman (6.2.2.18) and Panini grammar, the defining parameters of the Vedic new year were just opposite to the one adopted by astrologers on 22.3.285 AD. Vedic Chaitr fell on a date when sun was conjunct with Spica at the time of sunset and full moon of the month was rising in the east 13000 years before 285 A.D. After introducing the necessary correction in the astronomical data, the events mentioned in the Veds and Panini Grammar were revised by Jagadishomrityunjay (1997). He adds some additional dates to them later in a tabulation of salient dates of Vedic past (Jagadishomrityunjay, 2003). The table below, summarizing the events and brings out short periods of knowledge building by a swell in population of Vedic bards, grammarians and astrologers. The swells are separated by their near absence in the intervening periods.

Table 1. Temporal Distribution of Astronomical acumen of Vedic Bards

Prayer of Paired Ashvinees (RIK.1.157.1)	3.5 Ka)	
Sookt 19.7 of ATH.	4.3 Ka)	Low astronomical potential
Solar Movement house of Dholavira	4.2 – 4.5 Ka)	
<i>Upper Gap in Description</i>		<i>People of lower intellect Wars for territory?</i>	
Year commencing with Purva Phaalguni (SPB.6.2.2.18)	11.6 Ka)	
Year commencing with Uttara Phaalguni (SPB. 6.2.2.18)	12.5 Ka)	High astronomical potential
Year commencing with Chaitriki (AST. 4.2.20)	14.7 Ka)	
<i>Lower Gap in Description</i>		<i>Simple grammar by migrants after LGM</i>	
Induction of Swati as a Nakshatra (Spica-Arcturus separation ~ 12° 52')	20.3 Ka)	Commencement
Year commencing with Sravistha (AST.4.3.34)	22.8 Ka)	of Vedic
Beginning of Asterism marking at Basanbir	24.5 Ka)	astronomy

Stress of a Catastrophe?

During the '*Upper Gap in Description*' between 5.1 and 11.6 Ka, the Brihachchhutudree River System covers the time-span of 11.5 Ka to 8.5 Ka. In the early days of the system, the seven tributaries of Brihachchhutudree System formed the seven channels of the Saptasindhu or seven Sindhu Rivers. Their final stream was Sindhu that drained into the sea. During the transgression acme of 10 Ka on the Western Indian Shelf, the setup was truncated in Sindh west of Chor (25°30'N: 71°48'E). The then sea level rose by 110m above the lowstand of 11.5 Ka and the entire Western Indian Shelf — 150 kilometers wide off the Kachchh–Saurashtra segment — was inundated. Even substantial land of Gujarat was submerged under the sea. Total inundated land of Gujarat-Sindh region during the transgression is estimated over a hundred thousand kilometers. The displaced population, at half the rate of the West Coast density of 1930s (Field, 1946), was almost 40 million. There was a big exodus moving towards the uplands of semiarid southern Rajasthan for respite.

The Saptasindhu period is restricted etymologically between 11.5 and 10 Ka. It was a time when people were catching the horses, tied them in ropes and dragged the animal to an enclosure as a food item. The animal formed 'tied food-horses' for Saptasindhu dwellers between 11.5 Ka and 10 Ka (RIK. 5.57.3, Jagadishomrityunjay, 2003). Horses were hunted and eaten the same way in France during the Magdalenian period before their domestication. At this period dwellers of Saptasindhu country were named as Aryans by their easterly neighbors Vyashvas of Rajasthan. In a composition, the latter were praying "The one laughing at Rikshaads or liberating us from the Aryas of Saptasindhu, O Vinrimn! Bend upon for killing the Dasas too." (Jagadishomrityunjay, 2003, Box 1, item 1). At this period, Dasas were moving north in the 10 Ka catastrophe mentioned above. They were settling in southern Rajasthan adjacent to Gujarat and naming localities

like Dasapa (25°10.5'N:72°15'E) or Dasuri (25°17'N:73°33.6'E). Their large population turned a direct competitor for the tied-food-animals hunted by Vyashva tribe alone earlier. The Vedic prayer was possibly in direct response to the catastrophe of 10 Ka.

Shiver-driven brains from North?

The three astronomical dates between the *Upper* and *Lower Gaps in Description* relate to best intellectual potential of Vedic men during the Brihatpureeshaani System. Their grammar is typical and advanced compared to the people of older river systems. For deriving a feminine river name from neuter Pureesham*(water), they do not simply modify the word as Pureeshinee as done earlier during Marut System. Instead, they converted the neuter word first into a masculine form Pureeshat*, comparable to their other words for river names like Angirasvat* or Marut*; and, then give a feminine form Pureeshaani. Even their adjective *jinvatam* for river Pureeshaani involves a complex grammatical exercise, deviating slightly from the Panini Grammar (*jīn*: respectable old + *u* for definite + *tam* as superlative). The people had built a complex stone-implement observatory at village Wandh in Kachchh, which used 160 divisions in a circle for demarcation (Fig.5). The date of the observatory, through its own intrinsic evidence, is fixed around 11600 years before present (Jagadishomrityunjay, 1997). The period between 11.6Ka and 14.5 Ka, thus, displays the most fertile brain of the Paleolithic men on the Indian soil. [*Connnotes consonant termination].

The astronomical dates of the Brihatpureeshaani System form the best fitting points on a sharply declining Global temperature curve at the close of Paleolithic, which was followed by an equally steep rise after 11.6 Ka (Fig.6). A telltale of the whole episode suggests entry of the Purreeshaani people in India from another Vedic land. They migrated to India from colder latitudes of north when there was a rapid and sever decline of global temperature. They went back to their

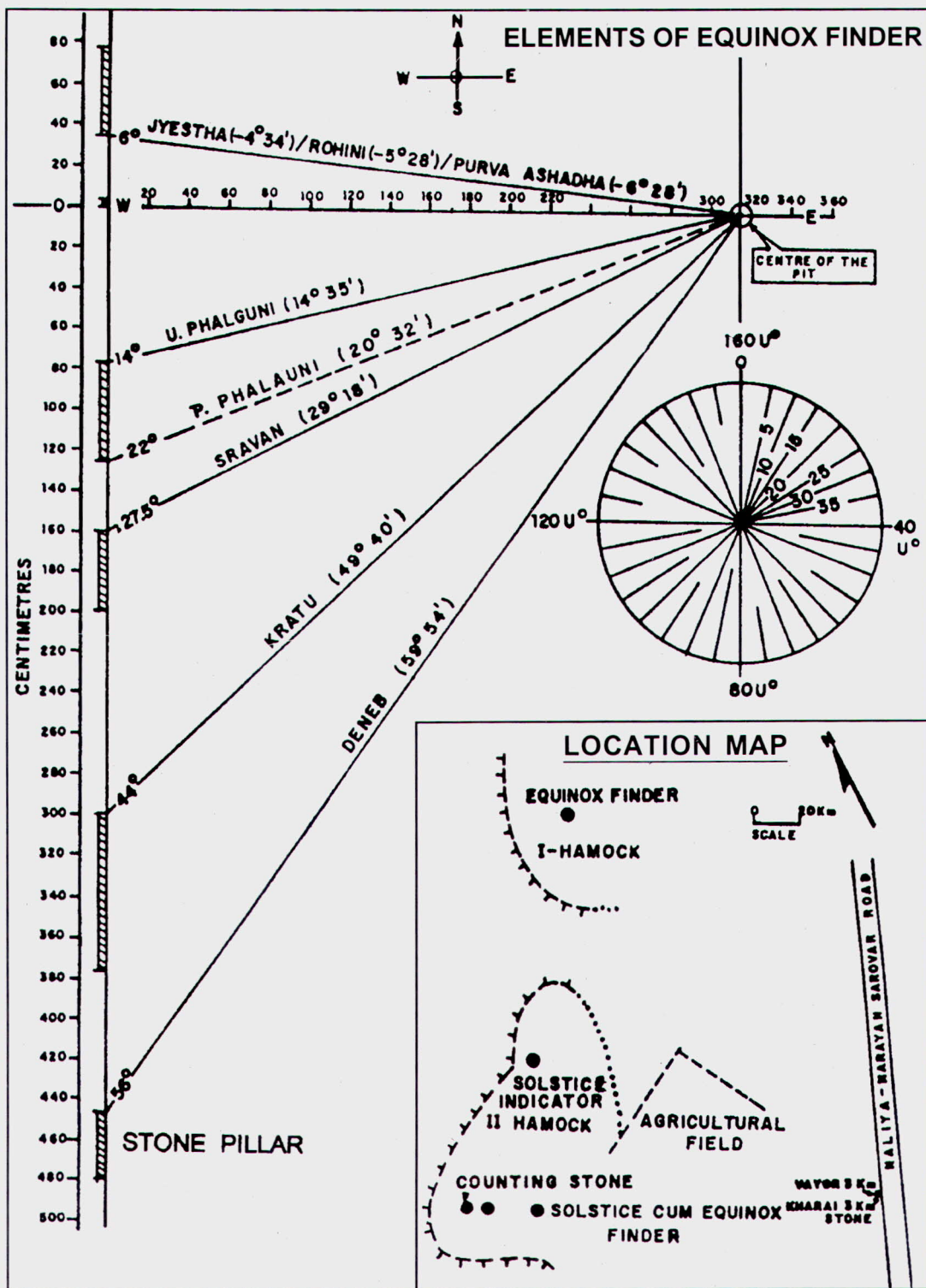


Fig.5. Paleolithic astronomical observatory site of Wandh and elements of Equinox finder. (After Jagadishomrityunjay, 1997).

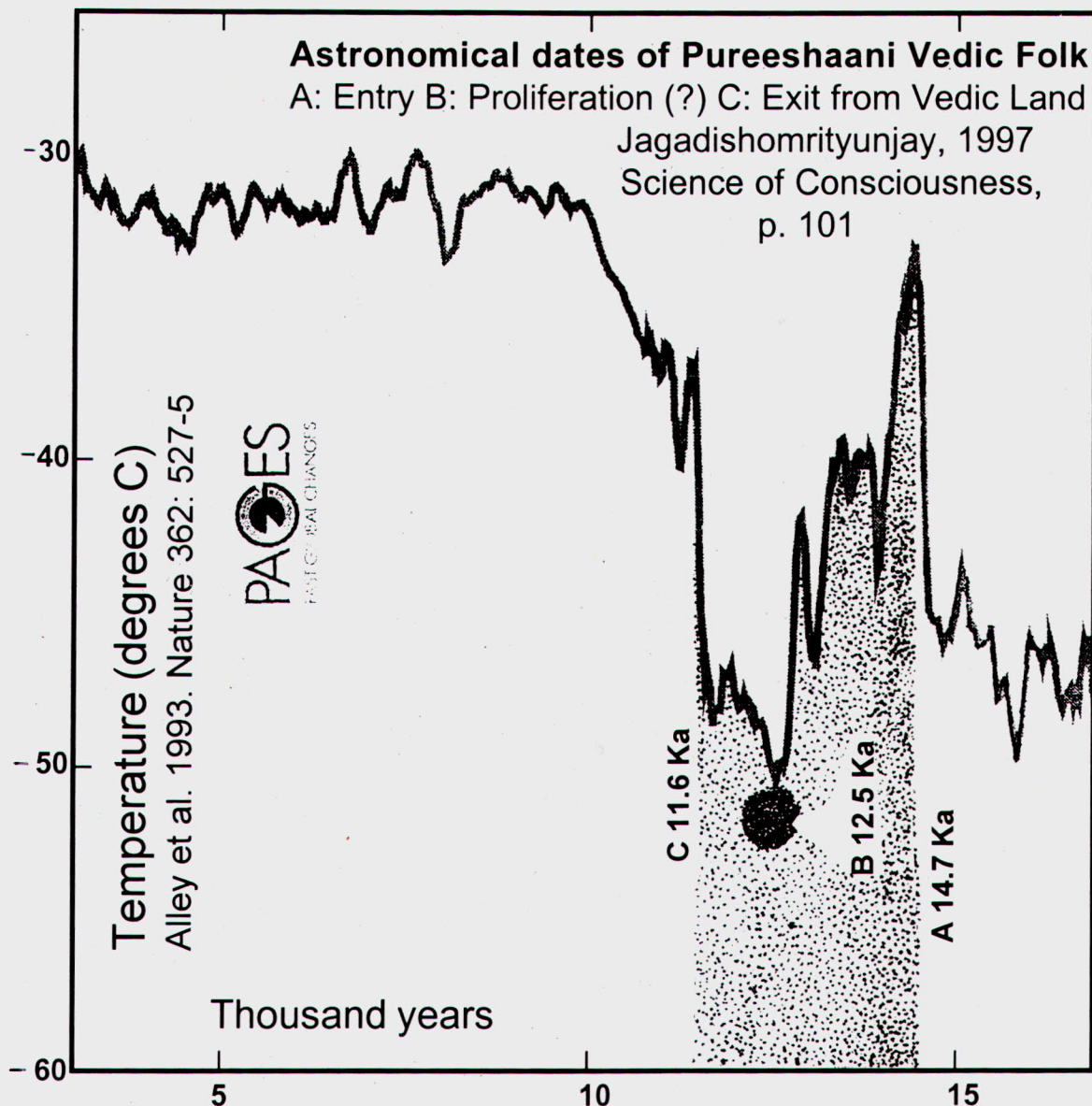


Fig.6. Paleolithic astronomical dates on global temperature curve.

homeland (around Caspian?), merely after 3000 years when Kachchh – Rajasthan became ovens after 11Ka. Fall of global temperature brought the brains to India in an exodus once. Rise of temperature sent these men out the country, just like the feathered flocks migrate away every summer to Russia.

There is no physical evidence for the northward migration the Paleolithic

astronomers of Vedic land. It is possible that most of them succumbed to rising temperatures either directly or due to diseases like cholera, common to the tropics till Mid-twentieth century. Their departure, nevertheless, draws a curtain over a sturdy cultural regime of Vedic people surviving successfully over 13000 years between 24.5 Ka and 11.5 Ka. Among the departing Vedic

men, there was a balanced approach in the gender of the river names. Male to female names of their rivers have a ratio of $\sim 1:1$. In the succeeding period between 11.6 and 3.5Ka, even River Sindhu has been compared to a cow (RIK. 3.33.3; Jagadishomrityunjay, 2003, Box 1, item 15) and all the names of rivers are feminine. Masculine nomenclature of rivers touches a naught. The cultural break of 11.5 Ka divides the Vedic period in to two: Lower and Upper. Patriarchy dwindles and matriarchy emerges as the dominant cult on the datum plane between the Lower and Upper Vedic periods.

Culturally Different Newcomers

The Holocene rise of temperature and ensuing cultural change from patriarchy to matriarchy at the Lower Vedic/ Upper Vedic boundary reflects emergence of a dominating new population. The change was related to a movement of people in response of heat, which was increasing progressively towards lower

latitudes. The expected movement, accordingly, was from peninsular India towards north. It was accelerated by displaced Dasas from Gujarat. A flux of dark skinned, dark haired people filled the void in the Vedic land after most of the earlier inhabitants either moved to north or succumbed to the tropical heat. The northward moving flux of men from warmer south India and elsewhere continued, seemingly, up to 40°N . In a wall painting of Catal Hoyuk in Turkey, dating back to calendar age 8.5 Ka to 10 Ka (^{14}C date 8.8 Ka to 7.5 Ka), hunters are seen attacking their prey (Jagadishomrityunjay, 1997, p. 81). The ratio between the white and black hunters is 3:7 (Fig.7).

Catal Hoyuk was a society of dominantly black people of matriarchal cult during the early days of town culture in the human species. Their primary deity was a Mother Goddess. Reflection of this cult is seen in Manusmriti wherein the initial verses were composed during Brihadashvina System (8.5 Ka – 6 Ka). A verse in the book says, "Teacher is ten times more respectable than a tutor, father a hundred time

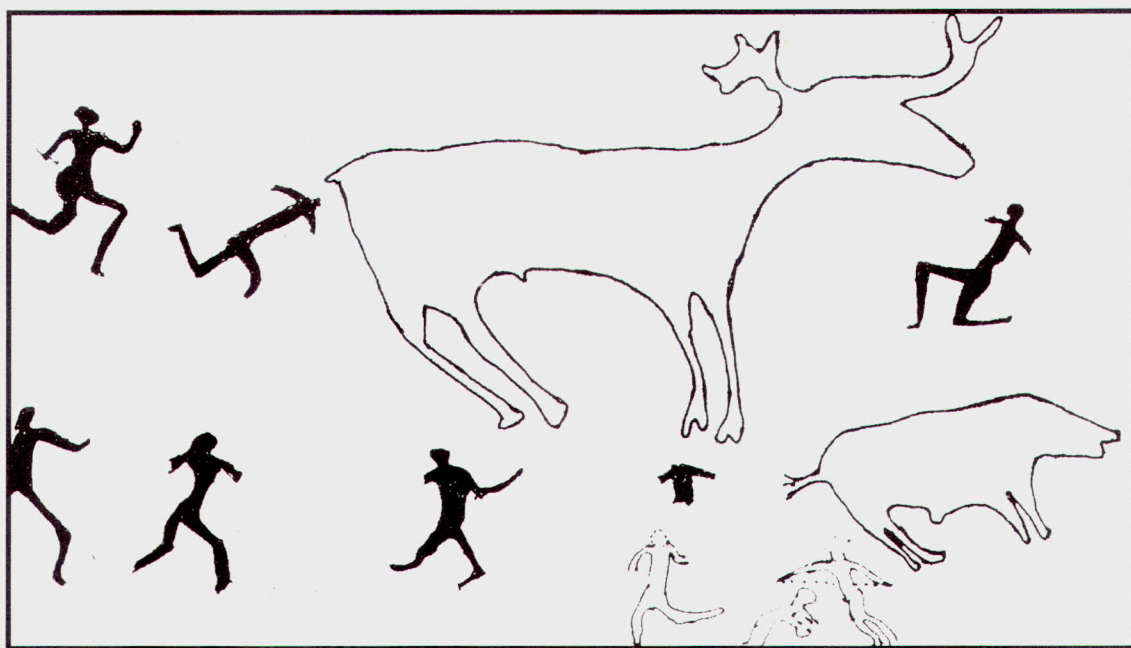


Fig.7. Early Holocene Hunters of Catal Hoyuk. [The painting has used ochre and charcoal as paints. White men are ochre painted and charcoal used for blacks. (Traced from a colored photograph in Jagadishomrityunjay, 1997)].

of teacher but mother is a thousand time more respectable than father" (MS.2.145). Comparison of Indus with mother during Brihachchhutudree System in the preceding page also demonstrates the impact of this philosophy.

The major break at the boundary of the Lower and Upper Vedic period relates to emergence of the Smriti culture and *Smaart Cult* in India. Manu may be considered as the originator of this revolution. He was preaching, "Desire driven are the actions of the Vedic ritual people (for Heavenly abode); (Contrarily), the determined renouncing men of penance are Smriti-followers" (MS. 2.2^{II STANZA} + 2.3^{II STANZA}). He created a great revolution around 11.5 Ka, which ultimately lead to Vedant or Upanishad trait during the Upper Vedic period. Human beings learnt after 8.5 Ka, in a new evolution, that life is not only for food gathering, eating and dying in hope of a heaven. It is also for spiritual growth through renunciation and discovering that soul is eternal and we get born again and again. A new human mindset appeared on this date under the scorching sun of South India. It spread all over the Vedic land along with the northward moving matriarchy.

The longest Population Void

The *Lower Gap in Description* spans between 20.3 Ka and 14.7 Ka (Table 1). The first date is so close to ~ 20 Ka LGM that the movement of the people can be correlated well with to the coldest phase of last glaciation. The expected exodus was towards warm southerly latitudes of India. The gap in the astronomical dates, however, is rather too long – extending much after the chill of Last Glaciation was over around 18 Ka. Cultural evidence in a simile of the trunk channel of River Sarasvatee, nevertheless, suggests that the same people who migrated away to south during LGM were back shortly after the cold days were over. Their language was simple. River Aantariksh, a tributary of Marut before 20 Ka, retained its name as channel of Sarasvatee after they were back and renamed the other contributories of the preceding Marut.

It is possible to fix the date of their date of resettling by a simile of Sarasvatee.

Ropes and threads are uncared objects today. During the Upper Paleolithic, however, the multiple yarn-rope was a great invention and used as a respectable simile. That is why the Vedic bard sang, "Spun is our Sarasvatee" (RIK. 6. 61. 7; Jagadishomrityunjay, 2003, Box 1, item 6). Sarasvatee was a channel spun by the yarn of its tributaries. Invention of multiple-yarn-rope was during the Magdalenian (20 Ka – 10Ka). One of such ropes is illustrated in a Paleolithic drawing depicting head of a horse (Rousset, 1978). Oldest spun ropes were possibly invented for tying and dragging bulky animals of prey. Soon they were refined and slender ropes found common use in the bows and drills. Korovkin (1985) gives the date of latter ropes as 13 Ka for bows etc, based on earlier dating by ¹⁴C, which could be revised down to 15.5 Ka Calendar Year. The Vedic simile, therefore, gives a date of about 16 Ka or slightly older when the hymn of Sarasvatee describes the magnificent river as spun by its tributaries.

Evidence from the simile of River Sarasvatee proves useful in fixing the longest duration of a thinned Vedic habitation in the Rigvedic land of Northwestern India after a wholesale migration at the LGM. It was 4000 years or marginally less.

DISASTER OF 4 Ka TRANSGRESSION

During the Upper Paleolithic and Holocene there have been some major sea level changes in Northwestern India (Nigam et al., 1992; Hashimi et al., 1995; Jagadishomrityunjay, 1997). The changes, related mainly to regional tectonics of the Western Indian Shelf, have triggered regional rise and fall of sea levels on the West Coast. There were corresponding shifts of shorelines in Sindh-Gujarat. The Western Shelf had a lowstand around 14.5 ¹⁴C Year B. P. when sea level was about 100m lower. Subsequently, it stood close to the present level around ¹⁴C 10 Ka (Nigam et al. 1992). There is also a second minor rise in sea level during the upper Holocene when littoral concretes were deposited up to 6m above the

sea level on the Western Coast of India (Hashimi et al. 1995). Gulf of Cambay, Rann of Kachchh and adjacent Sindh province of Pakistan logged a similar rise of sea level between 6 and 10 m. The highstand spans between 1.7 and 4.3 ^{14}C Ka (~ 1.1 to 4.1 Cal. Yr. B.P.). The lower boundary of the event coincides with an arid phase in the Middle East between 4.2 and 3.6 Ka (Cullen et al., 2000) and Northwestern Indian Subcontinent (Rand et al. 1999). The Arid phase has brought 'the 4.2 Ka Termination of the Indus Valley civilization', it is believed (Staubwasser et al., 2003).

Although aridity was a prime contributor to the disappearance of Harappan trading centers Like Harappa, Kalibangan and a large number of townships in Pujab-Rajasthan plains (Mahadevan, 1977, Fig.1), Sindh and Gujarat were affected more drastically by 4Ka transgression. After the 4Ka rise of Sea level and accompanying tectonics, a marshy, muddy and salty Great Rann of Kachchh appeared. The long course of Indus, joining Mohenjodaro with Lothal through Dholavira and Surkotada, came to an end. The Rann severed the Trade Channel as Indus found a new opening to the sea near Lakhpat on the western tip of Kachchh. The Harappan township of Khadir Island, i.e., Dholavira ran short of drinking water. There was an effort to manage water shortage for some time though harvesting, but the drought was too severe and proved unmanageable. Condition of Surkotda was no better than Dholvira. Stagnation of Sundhu north of Lothal and emergence of Sabarmati drainage in associated tectonic activity finished Lothal as a city of trade. Thus came to an end the trade towns in the lower reaches of Sindhu in a cause and effect relationship of 4 Ka Transgression. In Gujarat, a post-4Ka population survives but trade centers disappearing at this level sank below the debris of their own glory.

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Abbreviations (Traditional Sanskrit Literature)

AST: Ashtaadyaayi of Paanini

- Ashtaadyaayi Bhaashy Prathamaavritti: Jijnaasu, B. — Part 1 (1979), 748p., Part 2 (1974), 577p., Part 3, (1977), 666p., Ramlal Kapoor Trust, Sonapat.

ATH: Atharvaved Samhita

- I - Atharvaved Bhaasha Bhaashy: (1974), Dayanand Sansthan, Ved Mandir, Delhi- 110036.
- II - Atharvaved: Sharma, S. (Ed.) — Part 1 (1986) 542p., Part 2 (1982) pp. 543-1080, Sanskriti Sansthan, Ved Nagar, Bareilly-243 003.

MS: Manusmriti

- Manusmriti: Sharma, R. (with Hin.Trans.). (1925), 554p., Sanatan Dharm Press, Moradabad.

RIK: Rigved Samhita

- I - Rigved Bhaasha Bhaashy: (1975), 527p., Dayanand Sansthan, Ved Mandir, Delhi- 110036.
- II - Rigved: Sharma, S. (Ed.). (1965), 1436p., Sanskriti Sansthan, Ved Nagar, Bareilly-243003.

SPB: Shatapathabrahman

- Shatapathabrahmanam*, (1989), 1529p. Bharatiy Vidya Prakashan, Bangalow Road, Delhi -110007.