

CHAPTER-6

Vedic Land, People and Migrations

Abstract

Evidence about *vedic* population and their home, as culled from *veds*, suggests them to be a Indo-Mediterranean population spread between Greece and western India extending in the north upto southern Commonwealth of Independent States. The prevalent view taking Aryan as synonymous with *vedic* men is erroneous since *Arya Gotra* refers to a small segment of *vedic* people in Rajasthan now known as Marwari. Even the migration theory of 'Aryans' from a cradle in Russia, merely a few thousand years ago, is a myth. These people are far more older than Babylonians and Indus valley civilization (4-5 Ka). They flourished in Gujarat-Sindh-Rajasthan Region between eleven and twenty six thousand years ago. *Vedic* hymns are their creation. These are, however, heavily altered and corrupted due to later additions. Nevertheless, geographic descriptions in *veds* help to reconstruct the paleogeography of the Sindhu Land as described precisely in the hymns. The earlier reconstructions of the *vedic* land on the lines of Mc-donell and Keith (1912) are in error and do not exactly confirm to *vedic* descriptions because most of the land-segment described in *veds* as a part of Sindhu country is now submerged in the Arabian Sea.

Precise knowledge about *vedic* paleogeography requires an accurate dating of the *vedic* period. This is possible through the recorded position of asterisms in *veds* during those days and the real position of the same asterisms today on account of slow precession of equinoxes at a rate of 72 years per degree and invocation of rules of grammar in *Astadhyayi*. Precise dating was not done earlier and the ages, so calculated, turn out to be too young. The correction introduced here is corroborated by the position of a fast moving asterism *Swati* (Arcturus) and nearly stable *Chitra* (Spica). The movement of the *Swati* suggests that the *vedic* asterism system dates back to nearly twenty thousand years. On critical evidence duration of *vedic* period is fixed between 26 Ka and 11 Ka with two prominent phases of activity. One around 23 ± 3 Ka and other about 13 ± 2 Ka.

It is possible now to gauge the rise and fall of Arabian Sea level in the Sindh-Gujarat country during the last fifty thousand years besides pointing out the exact locales of deltas of rivers during the *vedic* period. The first invokes the Landsat imageries in the infrared band and the second a precise survey of the sea bottom off the coasts of Kachchh-Saurashtra in connection with oil exploration. The Landsat imageries also reveal the changes in the channel courses during the recent geological past covering the last twenty six thousand years. Integration of these data brings out that the periods 23 ± 3 Ka and 13 ± 2 Ka were the days of unusual sea-level fall in Kachchh-Saurashtra region, about 125 to 105 meters below the present day shore-line and the then coast line lay far to the west. Even the courses of rivers were different. The integrated data-set suggests two distinct periods of settlements in the history of the *vedic* people. The first one was in **Plains of Sindhu** around 23 ± 3 Ka; and, the second included a larger region designated as **Yajniodesh or Worshippers' land** about 13 ± 2 Ka.

The study of paleo-deltas and their likely sequences in time helps in the reconstruction of the *vedic* paleogeography and establishes the existence of :

1. **Sindhu River System:** There was a single river system in Sindh-Rajasthan-Saurashtra region around 23 ± 3 Ka draining in the Arabian Sea opposite Saurashtra.

2. **Saraswati-Drishdwati-Indh River System:** A three river system came out of this single system around 13 ± 2 Ka when a less effective Western Drainage of Indh lay near to the present mouths of Indus while the major Saraswati drainage was again in the earlier area.

The plains of Sindhu during the first phase of *vedic* settlement lay between the offshore of Saurashtra and Hyderabad in Pakistan. In this land, three clusters of seven rivers each joined a mighty river Sindhu. The first one was Saraswati, the second Sarayu and the third Vaxini. During the later *vedic* period around 18 Ka, the rise of sea level and tectonic activity destroyed the Sindhu River system and most of the land was inundated. When the upper *vedic* settlements of Manusmriti-Shatpath Brahman come into existence around 13 ± 2 Ka there was no Sindhu. Instead there were other rivers and a vast land between Turkey (*Aryavart*) and Gujarat (*Panchal*), as it figures in Manusmriti.

At the close of the *vedic* period there were major changes again due to sea level rise around 10 Ka accompanied by tectonic activity in the Himalayan Region. Water arteries of Rajasthan dried up and climate of the land moved towards humidity triggering forestation. These together brought a major migration of people from Western India around 10 Ka. A large population of the *vedic* people moved to the Middle East, mainly because of sea level rise in Sindh-Saurashtra region and heavy rains spreading the forest-cover at a very fast rate in the *Vindhya-atavi* area or the Indus valley forest.

Introduction

Gleaning through the passages of *veds* gives interesting information about the land and geography of the bards composing the hymns. There are hymns describing croaking of frogs at the commencement of annual monsoon rain [RIK: 7.103.1-10] as also there are verses which narrate that the bears around the polar star hanging high up in the sky perennially [though becoming invisible in the day due to sun, like the moon during the day, RIK: 1.24.10]. This phenomenon is common to the northern latitudes beyond 50°N . Accordingly, the *vedic rishis* were as much aware of the polar lands as the tropics of India. Equally significant in this context are the presence of *vedic* god *Dyaus* in Greece as *Zeus*, discovery of names like *Mitra* and *Varun* in the documents of Bohaz-koi in Turkey (Ghosh, 1971) and occurrence of *brahman's* sacred girdle in Kirkuk, dating back to around 6 Ka, now kept in Iraq Museum, Baghdad (seen by the author in 1976). These artifacts and words are very vital in detailing the east-west extent of the *vedic* land between western India and easterly Mediterranean Coast and extending to the north around Black Sea.

In the long history of Sanskrit, some words like *Heli* [=Ga→Ha+Ili= men of Ila] provide a clue to the age of the *vedic* men. *Ili* is synonymous with gods. Etymologically it may relate to Dwellers of River Ilam of Iran. These were the people erecting Bab-il (= gate of gods in Arabic) or Babylon and settled further west in Greece as a Hellenic tribe. They were also responsible for establishing townships (=pur=par=bar) like Bareili in two locales of Indo-Gangetic plains ($26^\circ 8'\text{N}$; $81^\circ 9'\text{E}$ and $28^\circ 15'\text{N}$; $79^\circ 13'\text{E}$) and one in Madhya Pradesh ($23^\circ 0'\text{N}$; $78^\circ 14'\text{E}$). These people, the inventors of the Indus script, have taken the script far to the east upto Hazaribagh in Bihar (Fig.6.1). Ili or Heli is not a *vedic* name (Macdonell and Keith, 1912) but relates to enemies of *asurs* (=god) in mythology as referred in the famous Sanskrit grammar treatise of Patanjali (2 Ka). This non-*vedic* word, accordingly, relates to the rise of the men of Ila and their expansion as builders of Bab-il around 4 Ka. The sacred girdle of Kirkuk (6 Ka) antedates them. In view of this historical fact the *vedic* population and literature are certainly pre-Babylonian and pre-Susa (Readers Digest Editors, 1983). It depicts a land and people older than 5 Ka, contrary to a confusing general belief of linking the Harappan people with *vedic* men (Majumdar, 1971).

As the author was told by Dr.Solak A. Darmono (1976), a paleontologist in the Iraqi National Oil Company, the Yezidi tribe of this land—mainly in hills of Kurdistan—is a Satan worshipper. Satan's current image as a man bearing horn and tail figures in the Harappan seals (Fig.6.2) where other horned figures are also available. Associated with this population of Indus as well as Babylon are exotic single horned animals that were treated by the then men as lucky (Fig. 6.2). The two people are also basically Indo-Mediterranean

type of caucasoid stock morphologically (Fig.6.2). The word Yezidi is a variant of Yajati denoting worshipper in Sanskrit. The prime deity of Yezidi or Heli people seems to be Satan and they were followers of animal-worship cult. These are not *vedic* people in strict sense, since none of the figured unicorn animals finds its description in the *vedic* verses. Babylonians and Harappans, with exotic animal illustrations on walls and seals (Fig.6.2) are seemingly far separated in time and culture from the *vedic* men of rituals and worshipping of the river, fire and other gods. Animals in the *vedic* literature are mostly normal, not exotic. The cited relevance of *Heli* [PAT :Ahn.1] and archeological material establishes that *veds* are far more older than the rise of Ilam population around 5 Ka. This observation invalidates many stories and reconstructions relating to *vedic* men younger than 6 Ka including several reaching as early as 5 Ka (Majumdar, 1971).

Reconstruction of the *vedic* land is possible in the Pakistan-Western Indian region considering the Upper Paleolithic rise and fall of sea levels and transgression of sea on the land, changing course of major rivers in the Landsat imageries and bathymetry of sea-bed. A rough chronology of the *vedic* events as indicated through various approaches e.g., astronomy, oceanography and climatology is also possible, though there is a considerable scope of refining it.

During the commencement of cold climate with the main Wurm glaciation (Fig.4.5) active and evolving human minds of different tribes reached Rajasthan-Gujarat country from Mediterranean-Black-Caspian-Aral Sea terrain, due to the southerly shift of colder climate (Fig.5.1). Interaction of knowledge ensued among them besides their learning of something new from the pre-existing population in the region.

The people, who were inhabiting the Sindhu country originally and then joined by the men from different areas of Irano-Mediterranean Region communicated with one another and through their interaction emerged the *vedic* knowledge, culture and way of life. The paleogeography of the land where the *vedic* culture appeared, spread and flourished, is discussed in chapter. Shifting of people and migrations in the

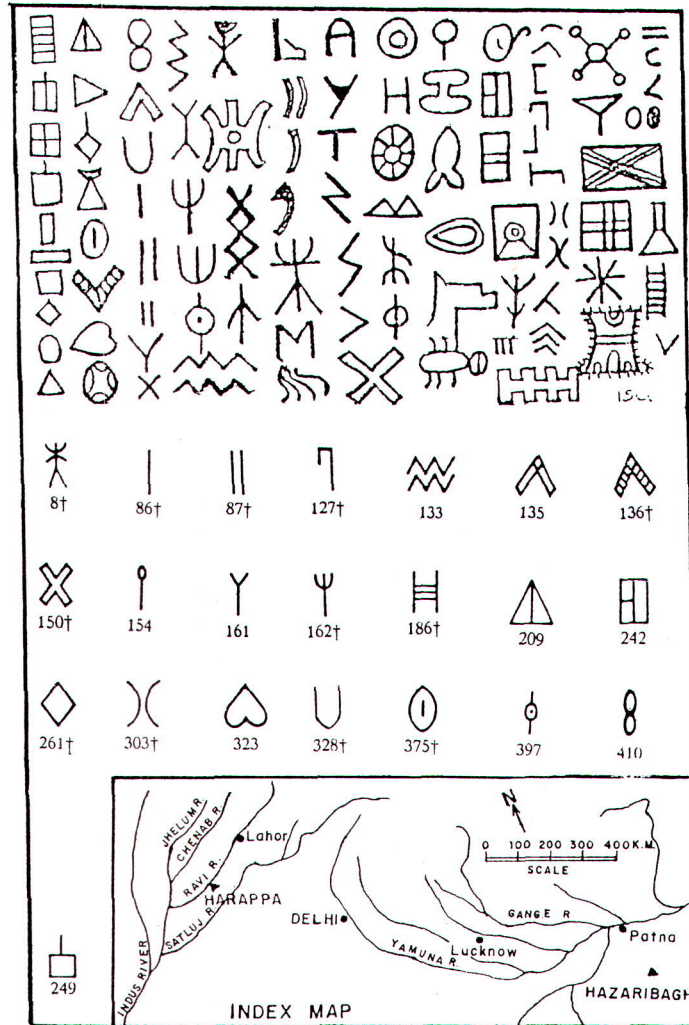
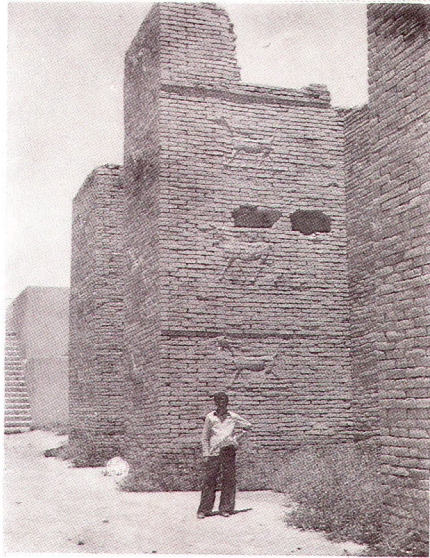


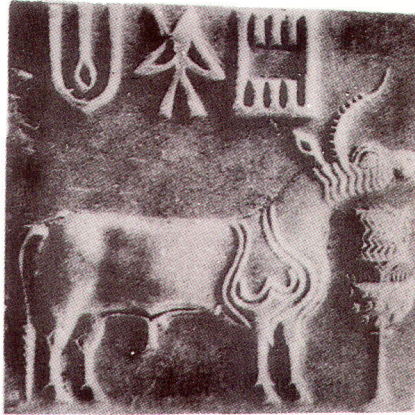
Fig. 6.1 : Indus valley script of Hazaribagh (above) with some comparable forms from Harappa-Mohinjodaro part of Pakistan standardized by Mahadevan (1977)



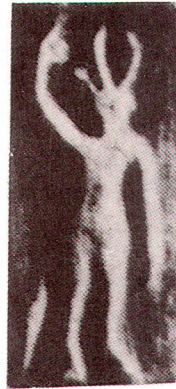
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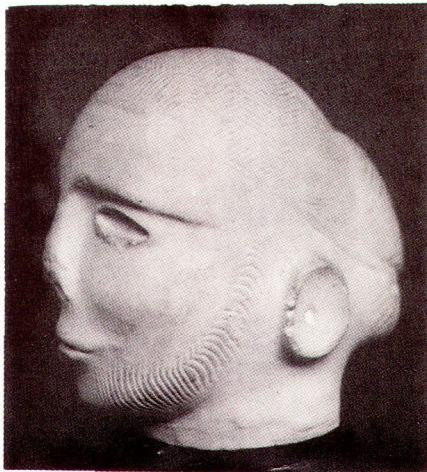
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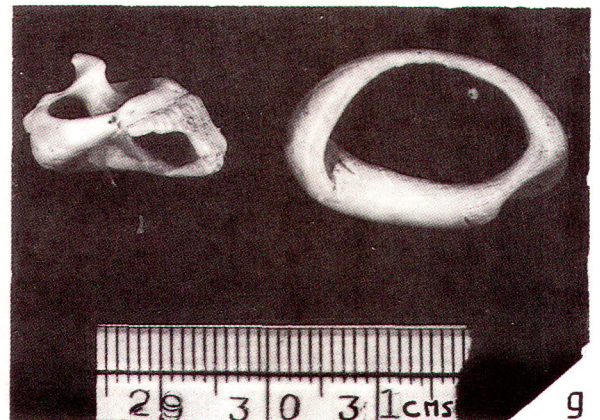
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Fig. 6.2 : Relationship between Babylonian and Harappan populations. *The two peoples were worshippers of exotic animal and a horned tailed deity—Satan; a- wall of a Babylonian house with exotic animals made of bricks; b- one of these animals; c- A Harappan exotic animal on a seal ;d- Satan on a Harappan seal; e & f - front and side view of a Harappan male statue ;g- beads of a shell-necklace from Muldwarka on the southern coast of Saurashtra, reminiscent of Mahabharat (?) culture.*

Indo-Mediterranean Region have been routine phenomena. Some important occasions of migration are discussed in the pages to follow.

Myth of Aryan Migration

One of the significant developments related to *veds*, *vedic* land and people has been identification of closeness between the *vedic* language Sanskrit and others like Latin, Greek or Persian and, then, a theoretical conjecture about the oneness of these people and their migration to India where *veds* still survive. The word Aryan somehow got intimately related to *vedic* people. It appeared first as a language group, "Utterly incapable to race" in the view of Max Muller (Ghosh 1971). However, a definite racial or clan concept is apparent when it was conceived that "South Russia, more than any other region can claim to be regarded as the cradle land of *Aryans* (Indo-Europeans)" (Ghosh, 1971).

Aryans, many believe, migrated from Russian cradle to India and the common story as built by Naqvi (1975 p. 22,23) is "It is thought that the early *Aryans* were nomads and they used to graze their animals in the pastures, fed themselves on milk and other accessories. They, however, cultivated some patches of grounds here and there to grow their food. When the grass was eaten up by the animals, they just advanced a few hundred yards or so in search of a better pasture and drinking facilities. They, however, did not start any quest of any foreign land or for any other exploratory reasons. Slowly and gradually they marched on and on till they came to the Indo-Gangetic plains and found the region fertile for their crops and full of vegetation for their animals. [They were good dreamers too to have seen a beautiful land across the passes between Afghanistan and Pakistan! - author's remark]. They were satisfied with their life in the Punjab region and slowly migrated towards the Gangetic plains but they did not go far to the east or to the south as we do not find their influences in those regions even today. In the *vedic* literature we do not find any mention of Vindhya-chal or Satpura, Narmada and Godavari and as such it is more than certain that they did not try to penetrate in the south". To quote him further "There is again a dispute among the historians about the date of their arrival in India. Different thinkers have given this period between 1000 BC to 5000 BC. In this connection it would be well to quote Winternitz who says, "Some lay down the year 1000 BC as the earliest limit for *Rigvedic* hymns while others consider them to have originated between 3000 BC to 2500 BC. The date of the authorship of the *Rigved* must also be taken to be the date of the arrival of the *Aryans* in the country and as such it can also be somewhere between 3000 BC to 1000 BC."

Arya, as a word, figures in *Rigved* with both short as also long *a*, i.e., *Arya* and *Aarya*. In the former sense it denotes a *Vaishya*, e.g., in the usage of *Arya-Patni* or wife of a *Vaishya* vide usage *Aryah-swami-vaishyayoh*, [AST: 3:1.103, RIK: 7.6.5]. Long *arya* (= *aarya*) is quite often synonymous with short *Arya*. However, it has mostly been forcibly construed by the western thinkers as a synonym of *vedic* people who migrated to India (from Russia) in spite of caution by Max Muller.

In *Prakrit*, or base language of Sanskrit, word for *Arya* is *Ajj*; and, obviously, *Arya* is transformed in Sanskrit from *Ajj* in two steps: first by substitution of first *j* by *r* [AST:8.2.6] to form *Arj*, i.e., in the format of *Yajurvedic* pronunciation, to denote the dweller of the River *Arjiki* [RIK: 10.7.5] and then substitution of *j* by *y*, as in Japan→Yaban (Arabic), to form *Arya*. *Ajj* is merely a stressed *Aj* [AST:8.4.46] of *Rigved* [RIK:7.8.19]. Thus, *vedic Arya* has also its too close variant *Arj* and *Aj*. *Arj* figures in *Arjiki* as a river name associated with river *Vis* [= *Vis-tas-ta*; RIK: 10.75.5]. *Arj-Vis* is thus a natural singular clan or the dwellers of *Arjiki* and *Vistasta* drainage system. Together these people were called *Aj* or *Ajj* in the initial phase; and then addressed themselves as *Arya* (or *aarya*) with evolution of these later words. *Ajj* continues in *Prakrit* as such. The origination dates of *Aj* and *Arya* work out around 31 and 18 Ka respectively, considering transformation of *Sekhpein* to Serpent. *Arjiki* is identifiable with *Aj-mer(u)* or *Aj* range now harbouring the city of Ajmer on its northern extension. In *Yajurved*, the *Vis* (*Vistasta*) country whose dwellers *Vaishyas* or *Arya* were, figured as the one nurtured by *Vis*, *Saraswati*, *Bharati* and *Marut* rivers [YAJ:20.19]. Among these *Saraswati* and *Marut* are traceable while the course of river *Bharati* is largely covered under the sands of Rajasthan, as discussed later.

In their northern limits word *Ajj* and its transformations are seen in the Black Sea region, e.g., Azean Sea, Azov Sea, Azerba (=Ajjaba→Ajerba=Azerbaijan) or Aral Sea (Ajjal→Aral). The northern limit of Aryan people is accordingly Black Sea country. This geographic limit, as noted earlier, is also reflected in the composition of hymn in *Rigved*.

A stone inscription from Kachchh museum, Bhuj, proves very rewarding in context with the word *Arya*. This inscription, in *brahmi* script is engraved on a stone found near Daulatpar and dates back to 254 *Saka* (323 AD). It states that Abhir King Iswardeo granted a piece of land to *Dutiswamy* of *Arya gotra*. *Arya* accordingly proves to be not the entire *vedic* population but merely a sub-clan among the *vaishya* people of the *vedic* age. The sub-clan that was higher and designated itself as *swami* among *Vaishyas* alone constituted *Arya*. The usage *Aryah-swami vaishyayoh* suggests *Arya* to be a word of address for the *swamies* or masters and elevated (pious) among the dwellers of *Vis* country. Accordingly, all the theories relating to an *Aryan* cradle and their migrations prove to be baseless. The word *arya* denotes merely a pious or elevated *Marwari* man of Rajasthan, specially those settled in Barmer (Wadi-Mera) and the areas around. Their northern limit, however, lies in Black Sea country.

A *gotra* covers usually all three *varns* or cast—the *brahman*, and equivalents, *kshatriyas* and *vaishyas*. *Dutiswamy*, an *Arya* in *Vaishya gotra*, was a *brahman* by *varn* as he had been given a donation by the King. This analysis proves the error of the west in synonymising the word *arya* with *vedic*.

Causes of Migration

Those who made theory of Aryan migrations were contemplating a territorial occupation by a winning clan, defeating the local inhabitant or conjecturing that the migration of *aryans* was in search for greener pastures while leaving the grazed ones behind. A population was conceived as moving because grass-lands were being grazed (and grass never grows after grazing!) without visualizing that the thick vegetation cover has existed in India between townships as late as last century when there was no ecological pressure for migration relatable to grass-lands being grazed away by the cattle.

Major causes of human migration in the tropics relate to draught, rainlessness and flooding of coastal land due to rise of sea level. Recently, in one of the draughts in Gujarat during seventies, Kachchhi people were seen migrating from Kachchh to Madhya Pradesh at the bank of Narmada in search of water. It was for nearly 1000 kilometres. They moved back after the rains returned.

Territorial occupation and wars commenced only during the last ten or twelve thousand years. Prior to this date, movements of population, if on large scale, were triggered by ecological stresses only. The causes of migrations, relatable to *vedic* community during the Upper Paleolithic, fall under categories of ecological stresses. Major migrations of the human population during the last 100000 years relate mainly to the glacial events. People moved towards the equator during stadial or cooling periods and northwards during inter-stades. It has not been conceived cogently in the past because these migrations were projected merely within a few thousand years of historical past when wars had become common among the human beings.

Alterations in the *Vedic* Text

Vedic language is continuing till date in a fossil state. *Veds* were composed initially for prayers and rituals, and although alteration in the text were made with addition of new stanzas in the hymns, their language and style of composition remained unchanged.

In the version of *veds* available now, several verses of *Rigved* and *Atharvved* contain large segments devoted to war stories and wars even though the ultimate motive is a prayer or a ritual. Apparently most of these segments were inserted much later and the development relates to a period when wars and winning over enemies of different lands became a common trait due to colonialism on account of religion. A trend of



Fig. 6.3 :A prehistoric painting of Bhimbaitthaka in Raisen District of Madhya Pradesh showing the use of animals in the wars. Fighters hurled club (pointed) from bullock backs and used spears while riding over the horses. As the name of the painted cave Bhim-baitthaka suggests it depicts a period related to Mahabharat (around 7 Ka) and belongs to that date.

organised wars was set around 10 Ka by Ram and is seen to continue till date through Mahabharat (7 Ka) when men deployed animals in the battles for the first time (Fig. 6.3).

There are passages in *veds* indicating use of war chariots and horses and the warring populations that were occupying extensive areas in the Middle East. Such wars related dates are 4 Ka or younger and stories were generated and inserted in *vedic* hymns to condition the minds of people for promoting warriors engaged in expansion of religious communities. They also impress that victories come through *vedic* rituals and gods. Beliefs and traditions of such religious wars have been typical of the Middle East till very late in the history (Mian, 1968).

Later alteration and corruption of the original *vedic* hymns is sometimes immense. A good deal of original compositions are even lost and it is hard now to take out and exclude all that has been inserted from time to time. Restoration of lost hymns is impossible. But it is no uniqueness to *veds*, we find that most Sanskrit works including Mahabharat, Ramayan or Manusmriti have substantial addition of verses later. It is equally true for Sanskrit grammar book Astadhyayi and other older works like the Old Testament. However, a good thing about later insertions is that they do not touch the originally composed stanzas, much due to religious sentiments of the later authors. Preservation of these original stanzas is of immense relevance in the reconstruction of paleogeography on the basis of *veds*.

Errors in Earlier Reconstructions of Paleogeography

Mc-donell and Keith (1912) have provided a map of *vedic* settlements in their classic work—Vedic Index of Names and Subjects. They state “In order that the reader may be enabled to visualize in a general way the territory known to and occupied by the *Vedic* tribes, I have prefixed to the first volume a map of *Vedic* India. Here the home of the Indo-Aryans of the earliest period—that of the *Rigved*—is the territory drained by the Indus river system, lying between 70° and 78° eastern longitude, and corresponding roughly to the North West Frontier Province and the Punjab of the present day. The eastern limit was probably the Yamuna, though the Ganges was already known.

The identification of many of the *vedic* rivers with those of modern India is certain but even here the exact channels in which they flowed in ancient times is doubtful.” Macdonell and Keith, however, could not visualize that nomenclature of rivers and places are often planted. For example, the original name for the modern Ganga River seems to be Kankhal (River Kan) on which township of Kankhal figures in the Meghdoot (53) as being on the bank of River Kanya and Kan-pur is a name continuing till date. The clan of *brahmans* on this river bank was *Kan-oudiy* transformed now to *Kannaujiy*. *Rigvedic* name of the channel *Kanya* figures as “*Paaviravi Kanya Chitrayuh Saraswati Veer Patni*” or “Watery Ravi, beautiful Kanya and bold-fat-wife Saraswati” [RIK: 6.49.10]. Ravi and Kanya were the western and the eastern tributaries of river Saraswati from the Himalaya during the early *vedic* period as figuring in the paleogeographic re-construction (Fig.6.4). The post-*Rigvedic* name Ganga has been planted very lately on the river Kan after the township of Kanpur had come to exist. It is certainly post Harappan i.e., less than 4 Ka when Magan Land [=Mai Gan(ga)] figures in the Mesopotamian transactions (Asthana, 1979). Caution, therefore, has to be applied before arriving at geographic locales related to the *vedic* names of the far antiquity. As late as the Harappan Period (4Ka) Mai-Gan land referred to Sindh-Rajasthan around Chor.

Macdonell and Keith have put all possible efforts to fix the names of the places and river systems, coast lines and hills of India only with reference to existing features. Similar are the approaches of Bhargava (1956), Majumdar (1971, map 2) and later workers. The first considers *vedic* age around 4.2 Ka when he reconstructs the land. The latter does not specify any date. A common feature of these and other similar reconstructions of paleogeography is a belief that *vedic* paleogeography relates only to a few thousand years in the past; and the river Sindhu, the main cultural centre of the *vedic* people, is nothing but the present day Indus in Pakistan. Both these assumptions have been used as the basis for tying up the names of tributaries of Sindhu as depicted in *Rigved*. Serious contradictions are observed when an attempt of reconstructions is made on such erroneous convictions.

Rivers were the routes or paths of migration to far and distant lands for the knowledgeable *vedic* people. They travelled by boat through the main streams in plains and proceeded through hilly or dry river beds on foot while moving to distant lands. Use of dinghy boats like the Andamanese goes back to 55 Ka or more. In such boats these people could reach from the foothills of Jammu to the present mouths of Indus in just two months, logging details of all the streams enroute. We can expect, accordingly, the past descriptions of *Rigvedic* rivers to be very accurate. Examining the description of the *vedic* rivers closely, one discovers that *vedic* Sindhu is not exactly what has been conceived by Mc-donell and Keith or Bhargava. Sindhu of the original description was firstly a channel with three cluster of rivers as evident from “*pra sap tredha hi chakramu*” [RIK:10.75.1] or ‘forcefully moved by seven rivers thrice’. Apparently, in each cluster of three there was one main river and six others were large tributaries-draining in to the trunk of clusters. None of the cited reconstructions fulfils this requirement. The three trunk-rivers figure in another prayer where the “*tri-sapt swasa nadyah*” or the tri-seven- river-sisters is prayed as Saraswati, Sarayu and Vakshinithe last being the estuarine one where waves of Sindhu get liberated [RIK :10.64.9]. Even the three clusters of Sindhu figure vividly when the composer states “Varun reached your way to promote your movement, O! Sindhu, from whose waters you become copiously affluent; travelling from mountain to plains, with the man (Varun) hereafter, you occupy the plain land [RIK :10.75.2]”. Expression Varun as male and Sindhu as

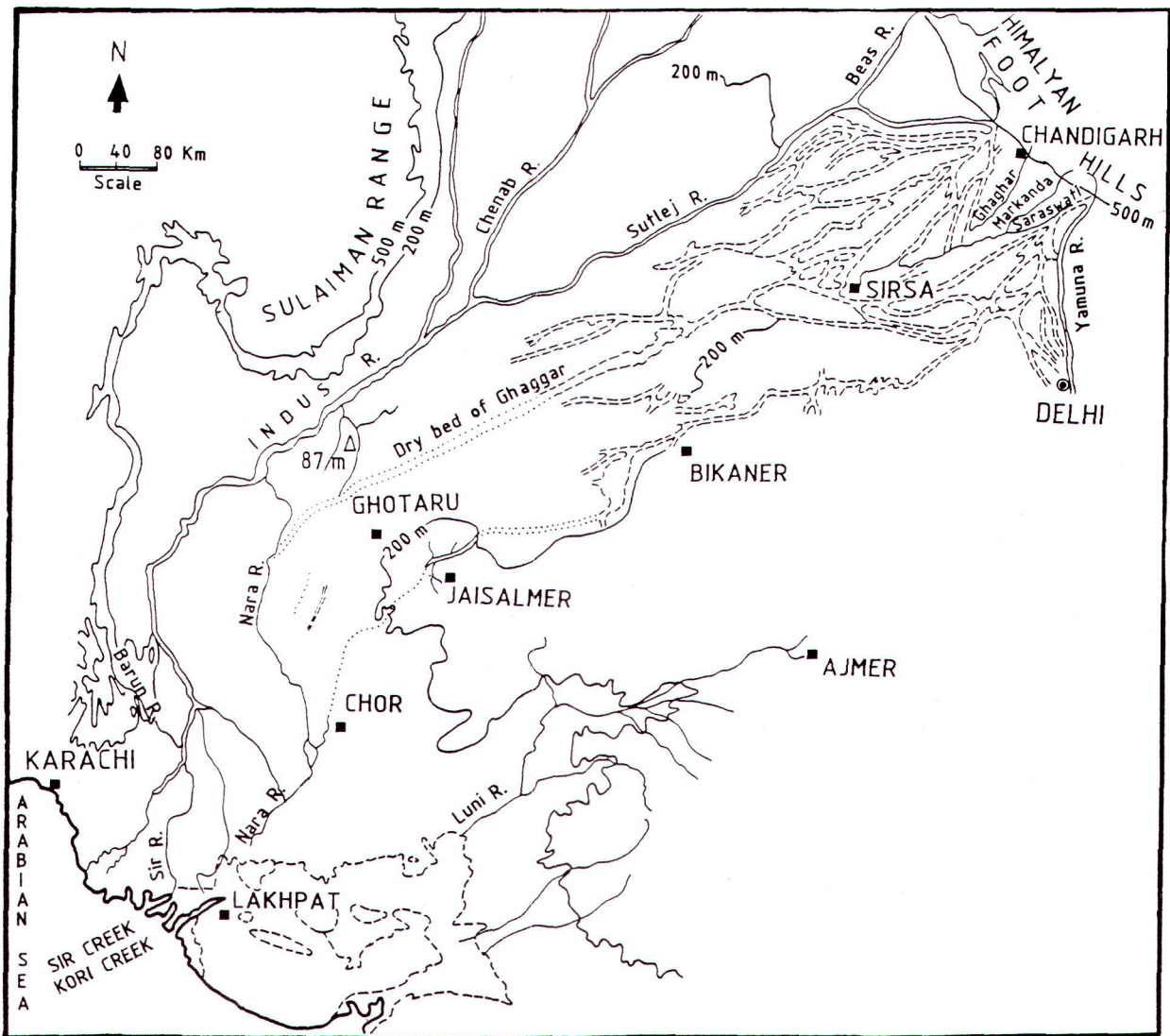


Fig. 6.4 : Abandoned and current river courses of North western India.

female also suggests that till the confluence of Varun, Sindhu was no more a major river and its discharge less than Varun. And, as the bard continues he enumerates two of the three clusters of the six rivers each: as (i) Ganga, Yamuna, Saraswati, Sutudri, Sachta and Parushni; and (ii) Asikti, Marutvridha, Vis-tas-ta (in some texts Vitasta), Arjiki, Shrisuhi and Sushoma [RIK :10.75.6]. The first among these constitutes the cluster of Saraswati—at times referred to Saraswati *Saptaswasa* [RIK: 6.61.10] or the seven sistered Saraswati. The second trunk river is Sarayu. For the third or last cluster of six rivers the stanza distinguishes that firstly Tristama joined Sindhu along with other three: Susartu, Rasa and Shweti; and, a second nearby system of rivers where Kubha was joined by Mehatna making six rivers in the last cluster too. The expression for the Mehatna, however, is Gomati-Kramu-Mehatna suggesting a cluster of three together in the head water region constituting a single Mehatna when it joined the southerly trunk-river Vaxini.

To the above eighteen rivers, now if we add, two trunk-rivers Sarayu and Vakshini it makes a perfect cluster of twenty rivers of Sindhu. The trunk river of the first cluster was Saraswati making the total of 21. River Varun joined Sindhu as soon as it reached the plains prior to the joining of Saraswati.

Varun of *Vedic* Land is decidedly Baran River of today which joins Indus (*Indh=Indra*) the moment the latter descends to the foothill region of Suleiman Range in Pakistan. This makes one fact certain, none of the remaining rivers or tributaries of Indus north of Varun-Indus confluence can be considered as the branches of *vedic* Sindhu. Strangely, however, the paleogeographic reconstruction, south of the Indra-Varun, confluence or Indus-Baran confluence of today, is seriously constrained because there is hardly any significant river-tract left after this point. Arabian Sea lies within 180 kilometres of this junction and the cited description of *Rigvedic* rivers remains unseen as mouths of Indus bifurcate and trifurcate within eighty kilometres of this junction. Lots of confusion was created due to this unexplained factor of paleogeography among the minds of past investigators. It is no wonder that Mc-donell and Keith show *Kramu* and *Kubha* right in the hilly part of Indus in Afghanistan and the same is repeated by Bhargava. **These reconstructions are nowhere close to the *vedic* descriptions and are grossly erroneous due to the lack of the concept of channel-routes during the period of *Rigved*.**

Lost Lands and Rivers

An obvious conclusion from the comparison of modern river systems and *Rigvedic* geography is that the two do not fit with each other since Indus delta lies too close to the confluence of Indus and Baran. The land-segments about which *vedic* people have talked is no more seen in the form when Sindhu was flowing like a fat-lady, slowly [RIK: 10.75.7]. There is no trace of the three clusters of Sindhu relatable to Saraswati, the river of copious water, the lake bearing Sarayu and the estuarine Vakshini when Sindhu joined the sea. From *Rigvedic* inter-relationship of rivers and comparison of modern rivers associated with Indus, it is obvious that: a) the first, second and third clusters of rivers must lay to the east and south of the Indus-Baran confluence of Pakistan in a country covered by Sindh-Rajasthan-Kachchh and Saurashtra; b) a good part of this drainage might have been destroyed due to neo-tectonic changes in this region; and, c) a considerable part of the *vedic* Sindhu system may now be submerged on the broad shallow shelf of Kachchh-Saurashtra region. Obviously, unless the evidence on these three possibilities is examined, our search for *vedic* Sindhu is not truly scientific. These three aspects nevertheless, need another vital information. It is the substance of chronology or dates around which *vedic* verses were composed. Rajasthan-Sindh land of today is a vast desert, but the *vedic* descriptions do not dwell upon such features. Accordingly we must visualize activities of men in this part of Western India when it was greener and forested—long long ago during the geological past.

Time of *Vedic* Geography

The dates of rivers during *vedic* paleogeography could be fixed precisely by referring to *gyotish* or astronomy in *veds* and *vedangs*. It provides a fair idea of *vedic* chronology from the precession of equinoctical position of sun with reference to star or asterisms mentioned in *veds*. Also since these dates fall in the Upper Paleolithic, when dates of marine transgressions and climatic changes of Indian west coast are precisely known, exact time of geographic features related to the *vedic* descriptions could be suggested.

Astronomy

Dates of *vedic* composition have been arrived during past through astronomical and mathematical statements in the *vedic* literature (Dwivedi, 1982). A fixed number and sequence of *nakshatras* or asterisms in the zodiac is the basis for all these astronomical dating related to the *vedic* period. Attention is being given once again to this topic with more refined results.

The rising sun crosses a *nakshatra*, asterism or star group on a specific date in a year and repeats its position after a sidereal year of Nirayan system exactly in 365 days, 6 hours, 9 minutes and 9 seconds. In

contrast to this the rising sun repeats its position after 365 days 5 hours, 48 minutes, 45 seconds in a tropical year between the successive vernal equinoxes or first point of Aries. The equinoctial position of the sun at the first point of Aries thus makes a slow westward shift with reference to the fixed zodiac of *vedic nakshatras*, almost one degree for every seventy two years. Due to this precession of equinoxes the tropical or *sayan* longitudes of all celestial bodies are gradually increasing by this amount. A complete circle in the process is reached after about 26000 years when the relationship of the sun and a specific *nakshatra* is nearly identical once again on the first point of Aries barring the shifting of *nakshatra* due to its own motion in galaxy (Fig. 6.5). Asterisms in the standard count have been 28. Of these *Abhijit* is now suppressed so that the figure is 27 (Fig.6.6).

That the equinoctial point keeps slowly moving backwards with reference to fixed zodiac of 'non moving' asterisms and the *sayan* or tropical longitudes of all celestial bodies are gradually increasing by 50 seconds per year is known since ages. The two systems of year marking have been adjusted by the Indian astronomers in the past with reference to each other. The last correction of the Indian *Nirayan* system has been carried out in 285 AD when the **Tropical and Sidereal longitudes of sun lay with reference to *Chitra* (Spika) at 180° to mark the beginning of the month of *Chaitra***. The first point of Aries was opposed to *Chitra* asterism on this date of new moon on March 22, 285 AD. From this date to the equinox of the March, 21, 1995 the shift in the longitude of the sun is 23°47'36" (Lahiri, 1995). These adjustments in the slow shift of equinoctial points in the two systems make an invaluable tool to date the astronomical events connected

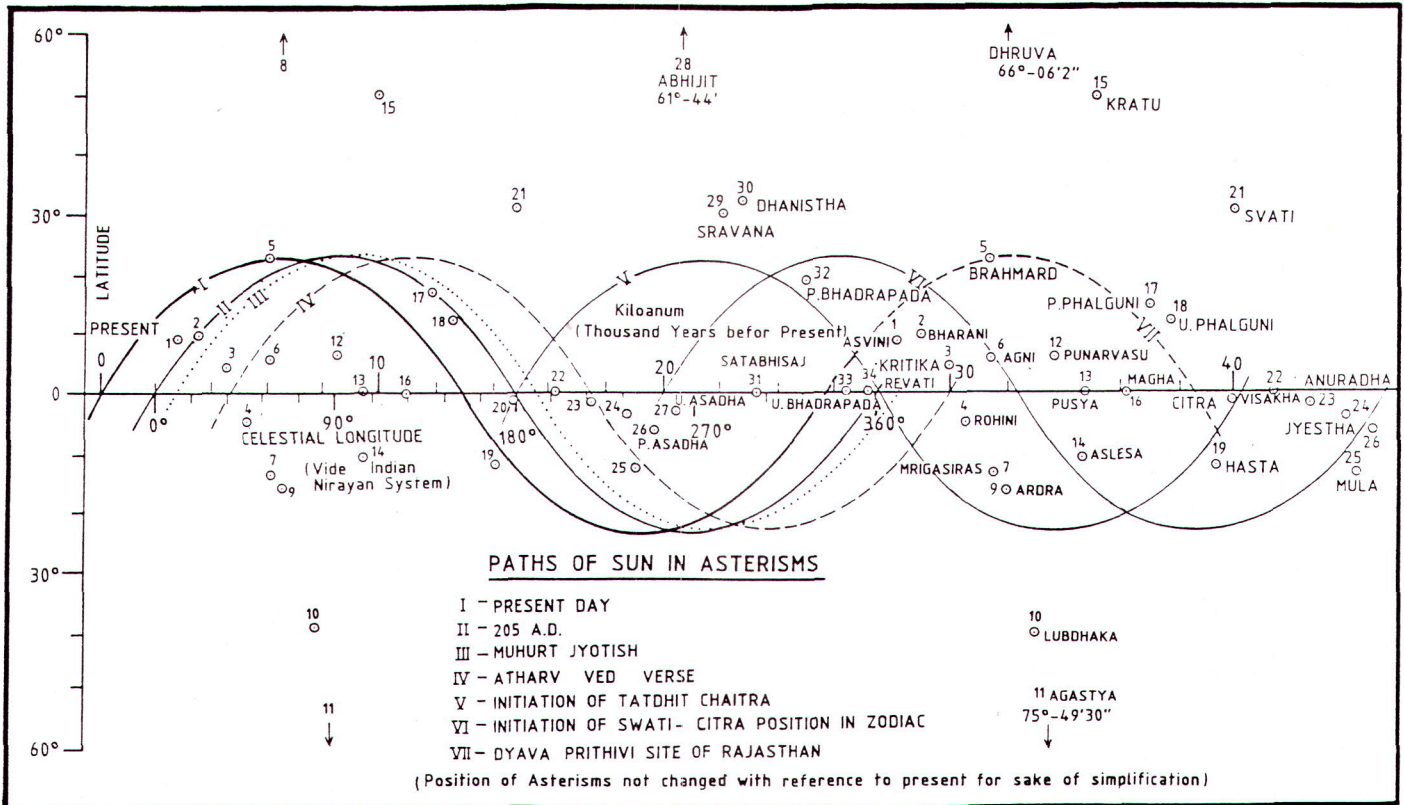


Fig. 6.5 : Path of sun in the asterisms during Upper Paleolithic and Quaternary. The vernal equinox has been gradually moving backwards in time during the last 25 thousand years since the stars were named (Position VII). Some important events in this shift are recorded in vedic and astronomical literature.

with *vedic* literature and variously calculated earlier by Tilak and others (Bhargava, 1956).

In all the above computations, however, the essence of starting the degree of *Chitra* as conceived by the *vedic* people has somehow slipped by the authors due to lack of grammatical appreciation of names of months and other events. They arrived, therefore, at dates that are far too younger than what they really were because of their assumption that in those times (of *vedang*) the sun and moon conjuncted on the winter solstice day (Dixit, 1969, p.86). Colebrooke, taking this conjunction at the beginning point of *Dhanistha* put the event in 1108 BC while Dixit (1969) citing that the verses should clearly be taken to mean that *Uttarayan* commenced when the sun and moon came nearer the cluster of 4 or 5 visible stars gives a date of 1400 BC. It has to be clearly understood here, however, that *Uttarayan* has its first *praktit* (Gujarat) expression as *uttran* meaning sun to the north, on the winter solstices day; and, the point of reference has shifted in the *vedic* period to equinoctical position since the Perigordian observatory of Basanbir about twenty five thousand years ago (Chapter-7). Typically, the word *Uttran* is pre-*vedic*. Hence the reference of northerly sun or *uttarayan* with the winter solstice is obscure. Reference point here is only the vernal equinox in the sense of *vedic* works (Chapter-7).

In 285 AD when relative position of sun in the month of *Chaitra* and asterism counting by *Asvini* was taken for reference, *Chitra* lay at 180° away in the reference point (Fig. 6.7). It is clear that the astronomers introduced a correction in the asterisms-

related-month-system of India violating the ancient rules of grammar for the designation of equinoctical month. If we go by grammar, a month completes with "*Sasmin Purnamasiti*", [AST: 4.20] . i.e., "It is the full-moon of *her* (a feminine *nakshatra*) marking the completion of a lunar month ". The rule has been missed in taking conjunction of sun and moon on the first point of Aries in 285 AD while defining *Chaitra*. It has also gone into later computations of Colebrooke, Dixit and others. Vide this rule of grammar, however, *Chitra* can only be the month when sun lies in *Chitra* Asterism, after the equinoctical day of spring and the month completes with *tithi* of full-moon or *Poornmasi*. The rule of *Poornmasi* is exemplified well in the Griottian or Upper Perigordian motif of Basanbir in Rajasthan portraying *sun* and moon on either side of *Prithivi* (earth) with *Dyaus* or God of heavens standing nearby controlling their movement (Chapter-7). The two together make *Dyavaprithivi* of *vedic* literature [RIK: 3.25.1, 3, ATH 2.12.1]. Vide the rule of grammar and motif of the Upper Perigordian, the sun in the figure had to be in conjunction with an asterism and moon in opposition when a month related to *Phalguni* or *Chitra* (both feminine star) has to complete and the next month begins. Here *Sasmin* (*her*) is very significant because their full-moon days besides being named as *Chaitri* and *Phalguni* as usual, are also declinable as *Chaitriki* and *Phalguniki* as privileged names [AST:

Sl.No.	Nakshtra	No. of stars
1	Asvini	3
2	Bharani	3
3	Krittika	6
4	Rohini	5
5	Mrigasiras	3
6	Ardra	1
7	Punarrasu	4
8	Pusya	3
9	Aslesa	5
10	Magha	5
11	Purva Phalguni	2
12	Uttara Phalguni	2
13	Hasta	5
14	Citra	1
15	Swati	1
16	Visakha	4
17	Anuradha	4
18	Jyestha	3
19	Mulala	11
20	Purva Asadha	2
21	Uttara Asadha	2
22	Abhijit	3
23	Sravana	3
24	Dhanistha	4
25	Satabhisaj	100
26	Purva Bhadrapada	2
27	Uttara Bhadrapada	2
28	Revti	32

Fig. 6.6 : Asterisms listed in *Muhurat Chintamani*, a conventional book of Indian astrology.

4.2.22]. In Shatpath Brahman, relevance of *Phalguniki* as a year marking full moon is obvious (6.2.2.18) and the same could be applied also to *Chatrikiki* or the one related to asterism *Chitra*. It was this date when asterism counting started with *Chitra* and the natural longitude of star on the Vernal Equinox was $0^{\circ}0'$ during *vedic* days. *Chitra* on this date was in conjunction with sun, but lay in near opposition of moon. Accordingly, on the vernal equinox in 285 AD, when the precession of equinoxes had brought it in opposition to *Chitra*, 180° apart from original position of *vedic* times, 13000 years had already lapsed since the initial setting of *Chitra*-sun relationship of the *vedic* equinox. With reference to 1995 it is 14710 years ago when original *Chaitriki* full-moon was marked.

This again, is not the ultimate date of the beginning for Indian astronomy and *vedic* literature. It was a date of major revision in astronomy when *Chitra* was taken as the star for vernal equinox (Fig.6.7). The *vedic* astronomers had decided on this date that vernal equinox longitude of sun on this date was zero. Subsequently when Shatpath Brahman takes preferentially the *Uttara Phalguni* as the marking star for the vernal equinox the date of composing the text works out around as 12.5 Ka [SAT:6.2.2.18]. This essentially is the date in the Tattariya Brahman [TAT:1.1.2.8] also. The text of Shatpath Brahman also makes it abundantly clear that their calendar commenced with the first night of the year rather than the first day of the waning moon. The verse translates, the full moon of *Phalgun* marks the first night of *samvatsar* (year); if marked by *uttra phalguni* it is good, but *purva phalguni* also marks quite commonly". This first night of *vedic samvatsar* marks the Holi festival in India now. In the later years of Shatpath Brahman, this date was 11.6 Ka.

In a further analysis of *vedic* astronomy two key statements are also important. Firstly, in the Indian *Jyotish* three *Uttara nakshatras*, i.e., *Uttara Phalguni*, *Uttara Ashadha* and *Uttara Bhadrapad* and Polar star are fixed as direction and longitude indicators in heavens and sun is taken as the fixed point for reference of asterisms [MUH:NAK.2]. The second statement relates to grammar which says that the month of *Ashadh* otherwise denotes the word *Asah* that has changed to *Asadh* [AST: 8.3.56]. Etymologically it denotes "makes one to tolerate (cold) upto this". Apparently *Asadh*, of such a situation was the month of winter solstice in the tropical system of *veds* where two months with 'SAH' component are seen—*Sahas* and *Sahasya*. New year begins after *Sahasya* (22 Nov.-22 Dec.) subsequent to which the month of heat—*Tapas*—sets in. Accordingly, 'Sah' in 'Sadh' refers to *Sahasya*. The other two fixed asterisms, nearly opposite to each other, marked autumnal and vernal equinoxes when *Uttara Ashadha* ($8S 18^{\circ}31'$) denoted winter solstice. Position of *Uttara Bhadrapad*, ($11S 15^{\circ}17'$), 87° away from *Uttara Asadh* and that of the latter 90° with reference to *Purva Phalguni* ($4S17^{\circ}27'$) is very relevant since the vernal equinox was marked by *Purva Phalguni* denoting the beginning of year in the asterism based *vedic* literature during Shatpath Brahman. By this period, however, when *Purva Phalguni* marked year beginning in Shatpath Brahman, *Uttara Asadh* was no more a winter marker. About 90° away from *Purva Phalguni*, the *Uttara Ashadha* was then at summer solstice—a rainy season marker in Kachchh. At this date, a star about 180° away from *Purva Phalguni* was marking autumnal equinox while winter solstice was marked by the one opposite to *Uttara Ashadha*. *Parri passu*, it was the *Uttara Bhadrapad* that marked the vernal equinoxes and the year beginning and *Uttara Phalguni* marked autumnal beginning and equinox when *Uttara Ashadha* defined winter solstice. It is a date 13000 years older than the Holi night of Shatpath Brahman, i.e., between 25.5 Ka and 24.6 Ka. Even the etymology of *Phalguni* (*Pa+laghun*=sun reducing) suggest so and confirms this observation.

During the *vedic* chronology of *nakshatras*, however, there has also been a time when spring or vernal equinox was marked coinciding with *Shravistha* now taken as *Dhanistha*. This view follows Agarwal (1955) in analysing one of the aphorisms of Astadhyayi [AST: 4.3.34]. This date works out around 22.8 Ka.

That the beginning of *vedic* calendar goes back beyond 20 Ka. has specific support even endemically in the asterism based astronomy. The two out of the twenty eight *nakshatras*, *Swati* and *Chitra* are presently occupying almost the same longitudinal position (Fig.6.7) but *Swati* ($6S 0^{\circ}22'36''$) is now posed to overtake *Chitra* ($5 S 29^{\circ}59'04''$). When the *nakshatra* zodiac would have been erected and asterisms named, the two stars should have been around at a distance of $12^{\circ} 51'26''$ in light of 28 *nakshatras* in the original zodiac

(Fig. 6.6). The *Swati*, however, has a fast annual motion of 2.29 seconds towards galaxy centre in Sagittarius (Fig. 6.8) as compared to almost 1 minute in 1800 years for *Chitra*. Calculated by these data the present day position of *Chitra* and *Swati* falls around 20.3 Ka. This date, is not very far from one indicated by *Sravistha*

STAR	Indian Name	Mag.	Nirayana Longitude				Latitude			Right Ascension			Declination		
			s	°	'	"	°	'	"	h	m	s	°	'	"
β Arietis	<i>Asvini</i>	2.72	0	10	06	47	+ 8	29	14	1	54	25.1	+20	47	19
α Arietis	...	2.23	0	13	48	19	+ 9	57	54	2	06	56.8	+23	26	37
41 Arietis	<i>Bharani</i>	3.68	0	24	20	47	+10	26	58	2	49	44.9	+27	14	39
Algol 1	...	2.7v	1	2	18	39	+22	25	42	3	07	54.4	+40	56	26
Alcyone 2	<i>Krittika</i>	2.96	1	6	08	07	+ 4	03	02	3	47	14.8	+24	05	35
Aldebaran 3	<i>Rohini</i>	1.06	1	15	55	56	- 5	28	03	4	35	41.4	+16	30	05
Rigel 4	...	0.34	1	22	58	21	-31	07	24	5	14	20.7	- 8	12	21
Bellatrix 5	...	1.70	1	27	05	22	-16	49	00	5	24	55.0	+ 6	20	47
Capella 6	<i>Brahmahriday</i>	0.21	1	28	00	03	+22	51	52	5	16	23.6	+45	59	39
β Tauri	<i>Agni</i>	1.78	1	28	43	05	+ 5	23	05	5	26	02.3	+28	36	16
ε Orionis	...	1.75	1	29	36	24	-24	30	25	5	36	00.1	- 1	12	15
λ Orionis	<i>Mrigasiras</i>	3.66	1	29	50	59	-13	22	12	5	34	55.0	+ 9	55	54
Polaris	<i>Dhruva</i>	2.1v	2	4	42	39	+66	06	03	2	27	25.7	+89	14	47
Betelgeuse 7	<i>Ardra</i>	0.6v	2	4	53	51	-16	01	39	5	54	57.3	+ 7	24	24
Sirius 8	<i>Lubdhaka</i>	-1.58	2	20	13	31	-39	36	16	6	44	58.3	-16	42	37
Canopus 9	<i>Agastya</i>	-0.86	2	21	06	17	-75	49	28	6	23	51.8	-52	41	36
Castor 10	...	1.99	2	26	23	02	+10	05	44	7	34	20.7	+31	53	51
Pollux 11	<i>Punarvasu</i>	1.21	2	29	21	33	+ 6	41	02	7	45	04.3	+28	02	10
Procyon 12	...	0.48	3	1	55	45	-16	01	08	7	39	05.6	+ 5	14	08
δ Cancri	<i>Pusya</i>	4.17	3	14	51	54	+0	04	37	8	44	27.5	+18	10	09
ε Hydrae	<i>Aslesa</i>	3.48	3	18	29	18	-11	06	16	8	46	33.9	+ 6	26	01
α Cancri	...	4.27	3	19	47	05	- 5	04	51	8	58	16.1	+11	52	24
Dubhe 13	<i>Kratu</i>	1.95	3	21	20	25	+49	40	48	11	03	29.0	+61	46	21
Regulus 14	<i>Magha</i>	1.34	4	5	58	21	+ 0	27	53	10	08	9.5	+11	59	13
δ Leonis	<i>P.Phalguni</i>	2.58	4	17	27	33	+14	20	00	11	13	53.8	+20	32	44
Denebola 15	<i>U.Phalguni</i>	2.23	4	27	45	39	+12	16	01	11	48	51.4	+14	35	40
δ Corvi	<i>Ilasta</i>	3.11	5	19	35	42	-12	11	46	12	29	39.4	-16	29	36
Spica 16	<i>Citra</i>	1.21	5	29	59	04	- 2	03	15	13	24	58.9	-11	08	26
Arcturus 17	<i>Svati</i>	0.24	6	0	22	36	+30	44	20	14	15	28.7	+19	12	11
α Libra	<i>Visakha</i>	2.90	6	21	13	32	+ 0	20	01	14	50	39.4	-16	01	31
β Centauri	...	0.86	6	29	56	08	-44	08	13	14	03	32.3	-60	21	14
α Centauri	...	0.06	7	5	37	40	-42	35	40	14	39	19.4	-60	49	09
δ Scorpii	<i>Anuradha</i>	2.54	7	8	42	51	- 1	59	08	16	00	05.8	-22	36	38
Antares 18	<i>Jyestha</i>	1.2v	7	15	54	18	- 4	34	10	16	29	09.7	-26	25	24
λ Scorpii	<i>Mula</i>	1.71	8	0	43	43	-13	47	16	17	33	20.2	-37	06	04
δ Sagittarii	<i>P.Asadha</i>	2.84	8	10	43	26	- 6	28	18	18	20	44.3	-29	19	49
ε Sagittarii	...	1.95	8	11	13	18	-11	03	04	18	23	54.4	-34	23	13
δ Sagittarii	<i>U.Asadha</i>	2.14	8	18	31	41	- 3	26	56	18	55	01.1	-25	18	07
Vega 19	<i>Abhijit</i>	0.14	8	21	27	31	+61	43	59	18	36	48.2	+ 8	46	47
Altair 20	<i>Sravana</i>	0.89	9	7	55	07	+29	18	13	19	50	35.3	+ 8	51	27
β Capricorni	...	3.25	9	10	11	25	+ 4	35	21	20	20	47.2	-14	47	39
β Delphini	<i>Dhanistha</i>	3.72	9	22	29	04	+31	55	07	20	37	21.7	+14	34	52
α Delphini	...	3.86	9	23	31	25	+33	01	22	20	39	27.1	+15	53	52
Fomalhaut 21	...	1.29	10	10	00	10	-21	08	06	22	57	25.8	-29	38	35
Deneb22	...	1.33	10	11	28	22	+59	54	23	20	41	17.7	+45	15	57
λ Aquarii	<i>Satabhisaj</i>	3.84	10	17	43	08	- 0	23	11	22	52	24.3	- 7	36	03
Achemar 23	...	0.60	10	21	27	13	-59	22	41	1	37	33.9	-57	15	25
Markab 24	<i>P.Bhadrapada</i>	2.57	10	29	37	43	+19	24	22	23	04	33.7	+15	11	01
β Pegasi	...	2.6v	11	5	31	02	+31	08	26	23	03	34.8	+28	03	39
γ Pegasi	<i>U.Bhadrapada</i>	2.87	11	15	17	57	+12	36	00	0	13	01.8	+15	09	41
α Andromeda	...	2.15	11	20	27	06	+25	40	50	0	08	10.8	+29	04	06
ζ Piscium	<i>Revati</i>	5.57	11	26	01	13	- 0	12	48	1	13	31.3	+ 7	33	15

1. β Persei	7. α Orionis	13. α Ursae Majoris	19. α Lyrae
2. η Tauri	8. α Canis Majoris	14. α Leonis	20. α Aquilae.
3. α Tauri	9. α Carinae.	15. β Leonis	21. α Piscis Austrini.
4. β Orionis	10. α Gemminorum	16. α Virginis	22. α Cygni.
5. γ Orionis	11. β Gemminorum	17. α Bootis	23. α Eridani
6. α Aurigae	12. α Canis Minoris	18. α Scorpii	24. α Pegasi.

Fig. 6.7 : Asterisms and their longitudes commonly used in the Nirayan system of Indian ephemeris on Ist January, 1966 (Lahiri, 1996).

as zero point of count considering the motion of *Swati* as uniform in the geocentric perspective, however.

The astronomical event sequence above suggests that the main period of the initial *vedic* verse and literature building was atleast around 25.5 Ka and possibly extended far back considering the time for evolution of astronomy. The beginning of *Nirayan* equinoctial system is now physically linkable with a Paleolithic astronomical apparatus datable to Gravettian (23.5 to 26 Ka) or Upper Perigordian. This equipment demonstrates the marking of vernal equinox with *Purv* and *Uttar Bhadrpad*. It is a demonstrable date when the *vedic* people, already well settled in Rajasthan-Sindh country, had gained proficiency in astronomy and composed the initial hymns of *Rigved* (Chapter-7).

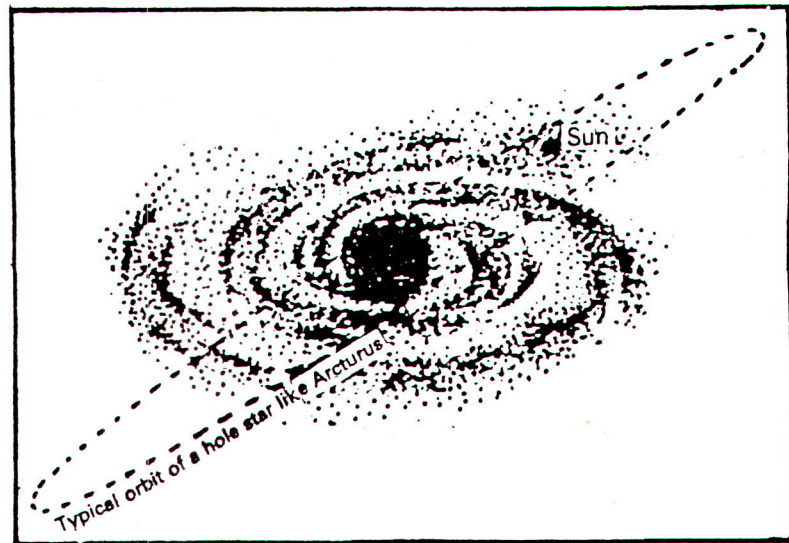


Fig. 6.8 : Orbit of *Swati* exemplified.

The asterism based calendar of *vedic* dates has apparently been actively debated for the tie up of *vedic* solar months and asterisms for equinoctial reference of zero count with *Chitra* a star very close to celestial equator. Asterism *Phalguni* is also equally in picture. The solar transit duration of *Chitra* and *Phalguni* lies between 11.5 Ka to 15 Ka approximately in view of the astronomical as well as grammatical data. This corresponds to major regression of the Arabian Sea around 14.5 Ka- 11.5 Ka.

The other major activity of *vedic* men was the initiation of asterism chart and a tie up with the tropical *nirayan* system. At the close of this time, star *Swati* (Arcturus) was one of the suitable asterisms. Seemingly this is probably the terminal date of asterism based tie up of tropical months of Early *vedic* culture in Rajasthan around 20 Ka (Chapter-7). The early *vedic* culture seems to have flourished well between 26 and 20 Ka. Accordingly, the first major activity of the *vedic* period lies between these two dates. *Sravan* seems to be one of the reference stars in *Astadyayi* that may be related to vernal equinox. It has followed the *Shravista* based new year 22.8 Ka and initial tie up between tropical and *nirayan* systems in astrology (25.5 Ka). This was again a period of major regression on the west coast of India.

In the light of the astronomical deductions above, the *vedic* period has two prominent dates bounding their activity between 26 Ka and 11 Ka. This duration of nearly fifteen thousand years is again divisible into two potential segments 26 Ka to 20 Ka (Lower) and 15 Ka to 11 Ka (Upper). There is also a period of low activity in between and probably the people were destabilised and were adjusting with the steep-sea level rise of 18 Ka intervening the two phases of activity. It is the Middle *Vedic* period.

Sea Level Changes

During each glacial or stadial event of Pleistocene the polar icecaps have expanded, locking oceanic waters within and lowering the global sea level. The interglacial or warmer phases during these major glacial periods on the contrary had higher sea levels or high stands. In the Huon Peninsula, New Guinea, a reliable history of sea level change has been established upto 140 Ka (Frakes, 1979). Seven major highstands are observed here with a periodicity of about 20 Ka. The first of these lies between 5 Ka/9 Ka, the second at 29 Ka and the third at 41 Ka (Fig.6.9). The sea level changes during the past - 18 Ka period are discussed in detail by Morner (1975) who emphasises two sharp rises in sea level. The first, about 30 m at 15 Ka and the

second about 20 m at 8.5 Ka. A detailed record from coral reefs in the offshore of Barbados shows changes associated with the last climatic shift and two intervals of quick sea level rise are 14 to 12.5 Ka and 10.5 to 10 Ka (Fairbanks, 1989).

Studies on the offshore of Western Indian shelf have established that there was a marked low stand around 14.5 Ka when the sea level drop is logged at 105 m below the present MSL. Again the sea level rose comparatively fast and reached above the present level around 10 Ka, through two pulses at 13 Ka and 11.5 Ka (Nigam, et al., 1992). Foraminifer record from the Recent sediments off the Bombay coast suggests a

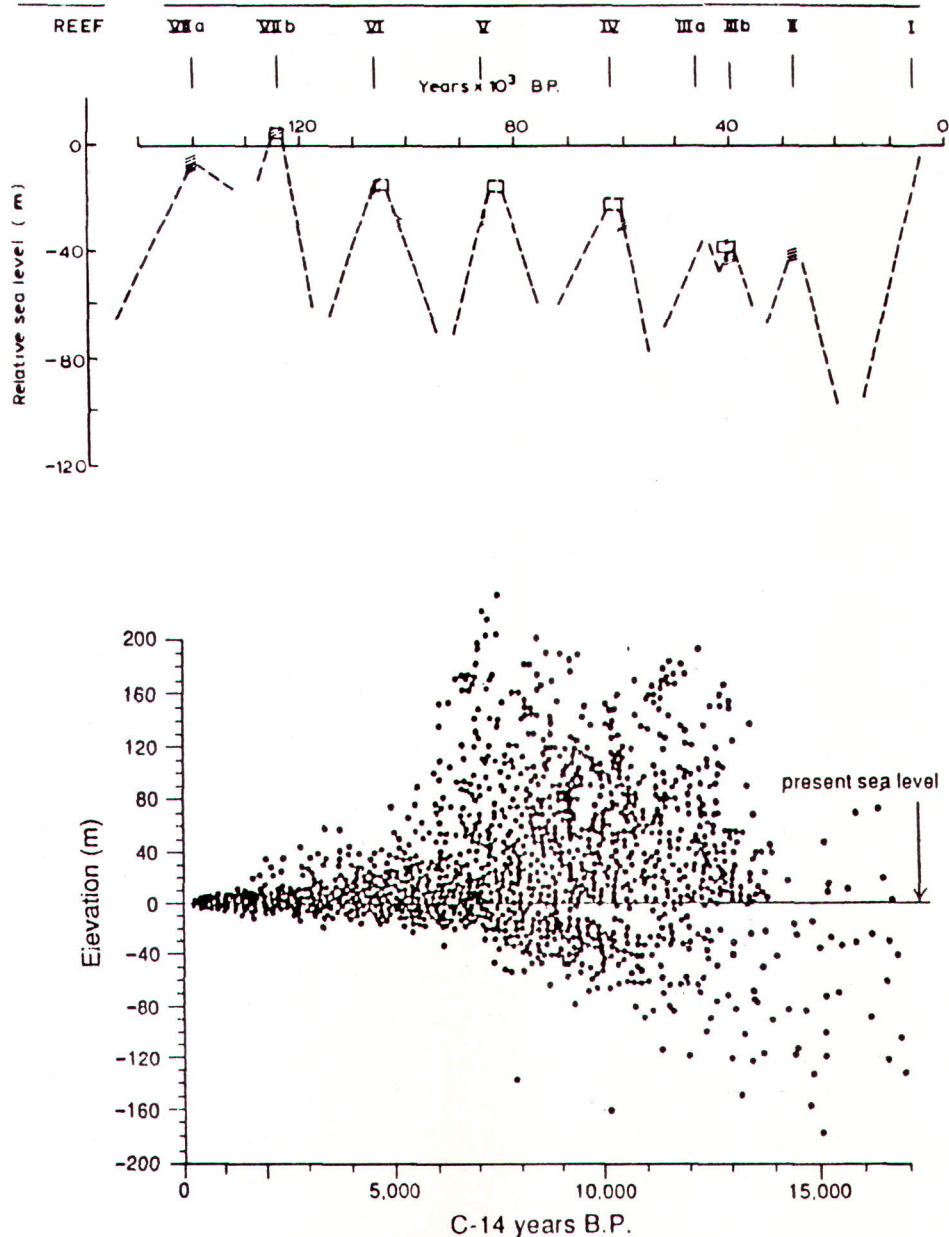


Fig. 6.9 : Changes of sea-levels in Huon Peninsula during the last fifty thousand years and their comparison with the scatter of sea level changes during the last seventeen thousand years.

prominent fall of sea level, nearly 30-40m between 7-7.5 Ka. Correlation of these dates with the temperature changes and global sea-level changes suggests that this fall may be about 20m less than the maximum fall of sea-level during the glaciation maximum (20 Ka) although recent data on the concept of eustatic sea-level changes are quite disturbing for correlation of global sea level changes during Pleistocene (Fig.6.9;Stanely, 1995).

In the Landsat imageries of the coastal Sindh-Gujarat region, coherent tonal boundaries of different dark regions around the mouths of Indus River and the Gulf of Cambay area are readily identifiable in the infrared band. These boundaries, five in number, suggest the past-shore lines of the Holocene and Upper Pleistocene. These are numbered I to V (Fig.6.10). In the Indus plains and Rajasthan, one of these is totally covered with sand dunes, the second is partly covered while the other three are seen well (Fig.6.11). The dune building activity of Rajasthan, commencing atleast around 40 Ka is focused mainly around 14 Ka (Chawla et al., 1992). Accordingly the shoreline I which is farthest in Saurashtra and wholly dune covered in Rajasthan is much older than the shore line II which is slightly older than 14.5 Ka. With reference to the global highstand correlation, shorelines I, II and III fit well with the transgression maxima of 41 Ka, 29 Ka and 18 Ka. Among the two younger shore lines not covered by the sand dune activity, the shore line IV is tied up with rapid post-glacial sea level rise and stability around 10 Ka. The fifth shoreline, depicting the most recent rise of sea level during the Holocene was responsible for development of Harappan ports like Dholavira or Lakhpat in Kachchh and Lothal in the Cambay Gulf area. It is placed around 4.5 Ka. This was the last rise of sea level, whereafter a fall has been continuing.

The five shore lines of the Indus area are slightly obscure in the rocky country of the Kachchh-Saurashtra around little Rann of Kachchh and also covered and obscure in the alluvial belt of Gujarat. However, in the region of Saurashtra, west of the Gulf of Cambay, these shore lines and relatable terraces are fairly well recognizable between Cambay and Bhavnagar on the space photograph by Rakesh Sharma (Fig.6.10). Their transfer on a topographic map provides the mean height of the paleo-sea levels, with reference to the present sea level (Fig.6.12). The sea level rise accordingly was:

Shorelines	V	IV	III	II	I
Date	4.5Ka	10 Ka	18 Ka	29 Ka	41Ka
Rise above sea level	10±1m	11± 1m	13±1m	20± 1m	24± 1m

The last among these transgressive shorelines, used for harbour building facilities at Lothal and Dholavira during the Harappan civilization has left Lothal docks now dry, 25 kilometres away from the present— port of Cambay. Dholavira also succumbed due to land locking of the Khadir Island in the Rann of Kachchh because the Great Rann of Kachchh has dried up due to fall of sea level by 10 meters. In both the cases, termination of navigation facilities has destroyed the ports and the trading cities.

The five transgressive events discussed above between 41 Ka and 15 Ka were intervened by three regression maxima that could be placed around the highest cooling of Wurm III Glacial (20 Ka) , the last major cooling episode of the Wurm IV Glacial (14.5 Ka) and the level of the submerged city off Dwarka and submerged forests off Bombay. The last has been taken at 7 Ka in the light of degradation maximum of coral reefs between 9 and 6 Ka in Kachchh-Saurashtra (Fig. 6.13) and foraminiferal record in the Recent sediments off Bombay.

Sea Level Changes and Activity of *Vedic* Men

In the above survey of sea level changes of the western coastal region of India one comes across two periods of large scale fall of sea-levels (Fig.6.14). These are between 26 Ka to 20 Ka and then around 15 to 11 Ka. Incidentally these are also the dates of maximum activity in astronomical knowledge expressed in the



Fig. 6.10 : Late Pleistocene-Holocene shore lines of Saurashtra, adjacent to Gulf of Cambay.

vedic literature besides the occurrence of astronomical sites on the then Indian soil. We find active monitoring of asterisms during these two periods (Chapter-7). Earlier and later to this date such activities are not prominent although the astronomical computations have continued in the Indian knowledge system. The inter-relationship between transgressive events and astronomy during *veds* suggest that *vedic* settlements commencing around 26 Ka flourished well till 20 Ka in Rajasthan-Kachchh tract. Then people receded from

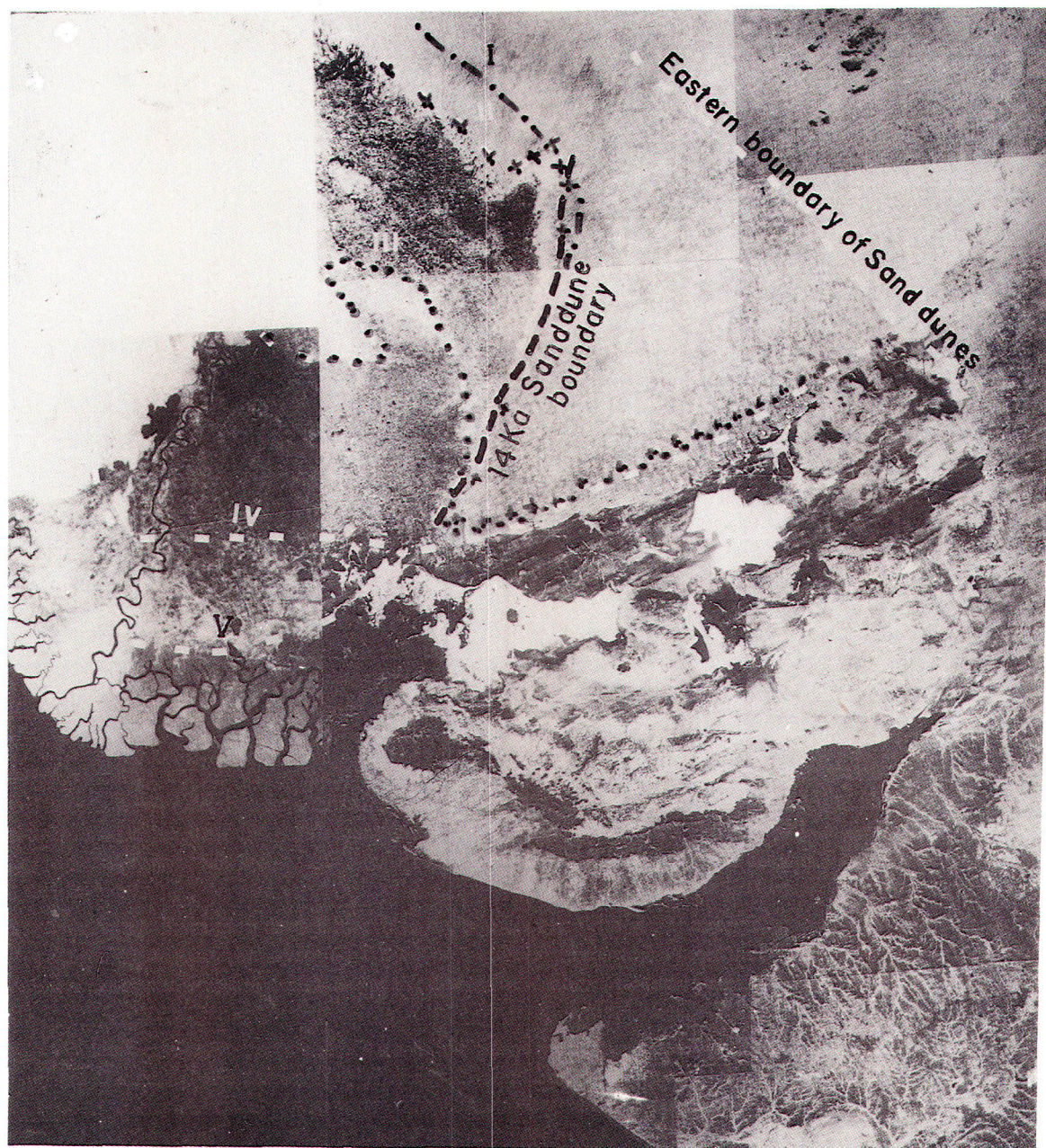


Fig. 6.11: Late Pleistocene-Holocene shore lines of Sindh-Kachchh region. Among the five shore-lines, I is obscured by dunes while II is partially covered; shore lines III, IV and V are clear.

this area, atleast temporarily. Subsequently, they become active again in the second regression of 15 Ka to 11 Ka. Thus, the *vedic* age, as already noted, is divisible into three units : Lower (26-20 Ka), Middle (20-15 Ka) and Upper (15-11 Ka). No active astronomical development is seen in *vedic* material after 11 Ka till composition of a later verses of *Atharvved* around 4.3 Ka [ATH: 19.1.7].

Seemingly after the primary composition of *veds* upto 11 Ka, most of the people moved away from this *vedic* land of Sindh-Gujarat in the wake of transgression at Pleistocene-Holocene boundary. This movement was to the far and wide lands between south India, north eastern India and Europe. This period was also coupled with very high rain fall when river Vis with three tributaries—Bharati, Saraswati and Marut—drained in the then Gulf of Rajasthan. Valleys of

comparatively drier Afganistan-Iran-Iraq-Turkey harboured a large chunk of population uprooted from Gujarat-Rajasthan-Sindh land. Loss of Saraswati drainage system from Rajasthan also added to the cause of exodus and a good number of the *vedic* people seem to have moved to western Asia upto Turkey with their gods and worships by 10 Ka. Even names like Bharati (Eu-Bharati→Euphrates) and Saraswati (Sar-Sar-wati→Tharthrwadi) and Drishadwati (=Tidris→Tigris) were planted on the streams of western Asia (Fig. 6.15). One of their leaders was a *Brahma* (=experiencer of *Brahm*), entered in Bible as Abraham (Al-Brahm). *Vasta* or the Goddess (River) *Vas* reached far to the west in Italy as *Vesta*. *Sarpah* (Snake) reached to Romania in the same wave as *Serpe*.

Coast Lines and Deltas

The plains of Sindh and Gujarat are very low and a sizable part of these was flooded during the rise of the sea level in the Middle and Upper Paleolithic. These have continued with similar flat topography toward sea to form a broad shallow shelf off the coast of Kachchh and Saurashtra. As a result, the present 100 m subsea contour (isobath) represented an approximate coast line during the sea level falls of 14.5 and 20 Ka. An additional area of fifty thousand square kilometres was added to Kachchh and Saurashtra during these periods (Fig.6.13). Defining paleorivers and drainage of lower *vedic* times, on this broad shelf is not difficult considering it to be the main tract of Sindhu River in view of *Rigvedic* description. Manusmriti and *Yajurved*

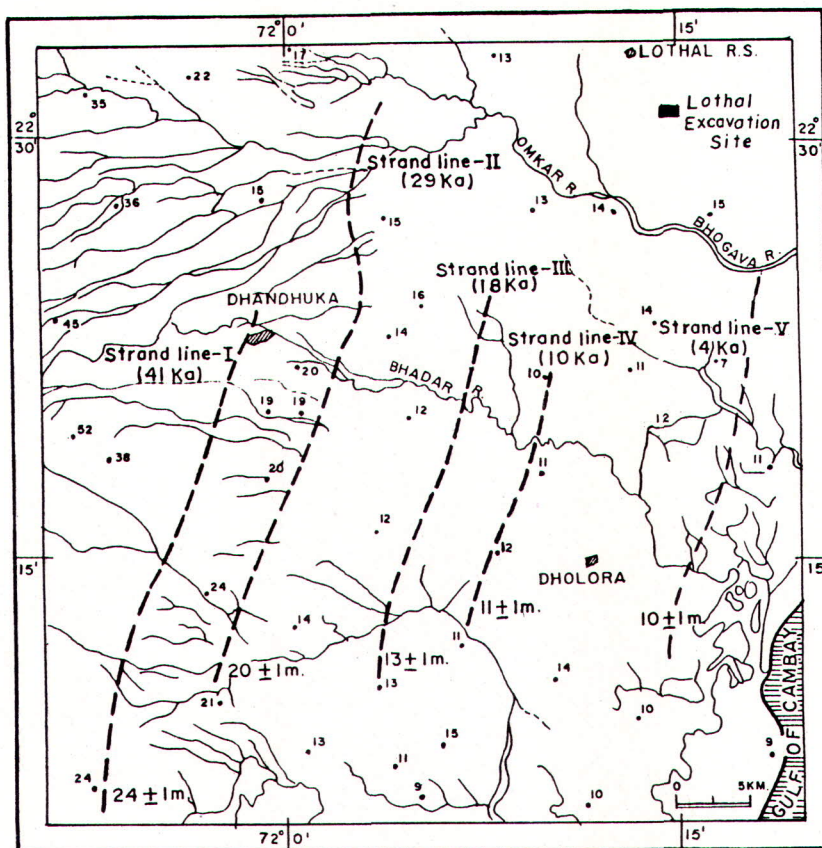


Fig. 6.12 : Average elevation of highstands of sea in the eastern Saurashtra, adjacent to the Gulf of Cambay during the last fifty thousand years.

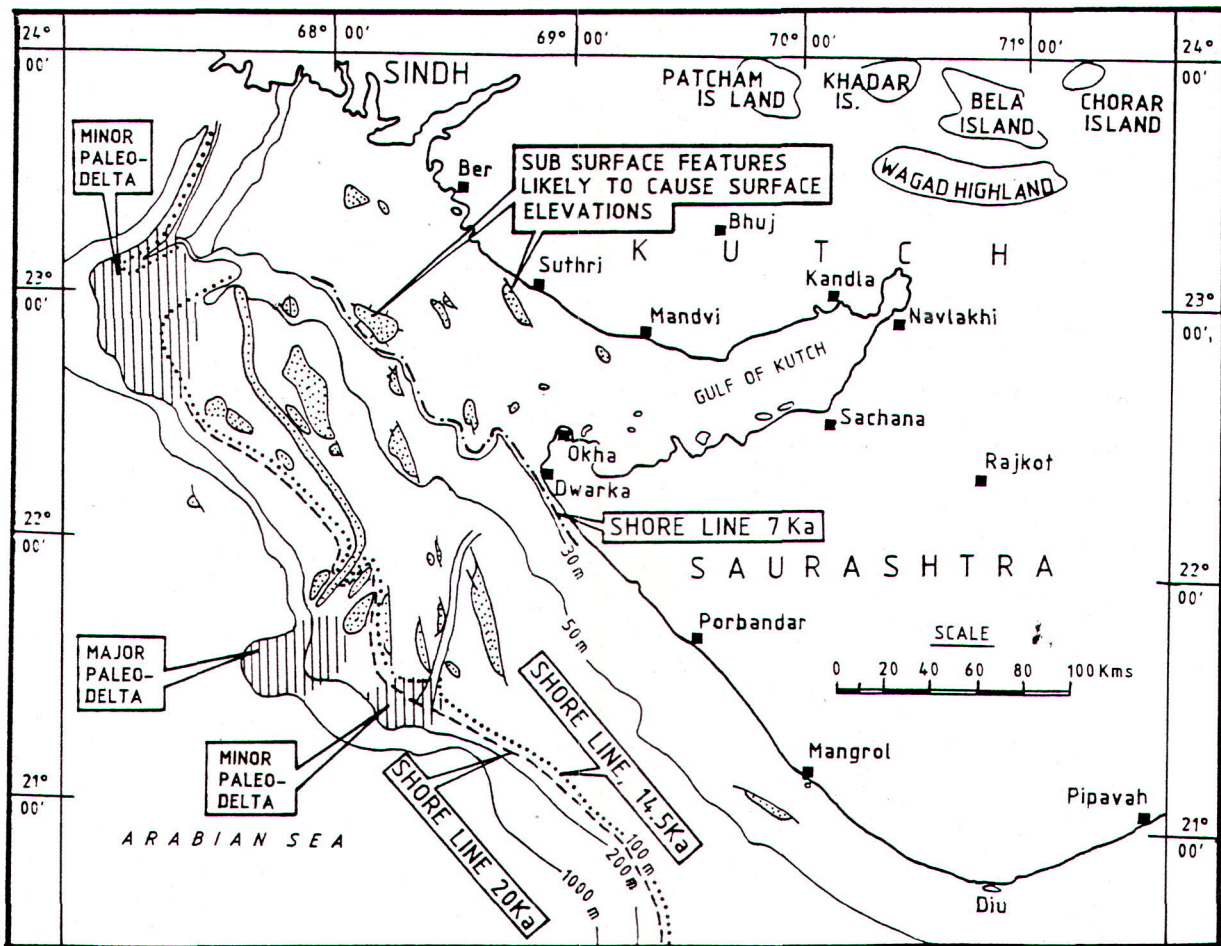


Fig. 6.13 : Regressive shore lines of Kachchh-Saurashtra region during the past twenty thousand years.

are the documents which give an idea of the upper *vedic* river systems subsequently.

The shape of the sea-bed contours in the Arabian Sea off the Sindh-Saurashtra region, suggests four major deltas at the shelf edge around 150 m (Fig.6.16). The largest among these descends down to 900 m isobath near the crossing of latitude 22° North and longitude 68° East. The second largest delta, pretty wide but lesser in magnitude lies to its south. Smaller in size, there is one more delta to the north of these. In addition to the three deltas within 150 meters isobath there are two shallower ones between 30 and 50 meters—rather small and possibly short lived. The deeper deltas are conveniently numbered sequentially D1, D2 and D3 while the shallower ones as S1 and S2 (Figs. 6.16, 6.17).

Study of closely spaced contours in the Gulf of Kachchh area brings out the undisturbed features of a bird-foot delta in the deltas D2 and S2 suggesting their very late age (Fig.6.17). The D1-D2 deltas show lobes and deep canyons at deeper depths that are conceivably, related to delta-development during the regression of sea around 25 million years at the regression of the Oligocene/Miocene boundary (Pandey, 1986). These two deltas have subsequently continued till the *vedic* period.

The major delta building of the West Coast at the time of *vedic* culture between 26 Ka and 11 Ka, focuses our attention on two deltas or river mouths. Firstly it was Delta D2, between 28 and 20 Ka; and, secondly, another delta-building process around 15 Ka, established two deltas (D1 and D3). Delta S1 and S2 relate to the regression of 7 Ka. At this period present Indus system with Baran had come to exist. In the

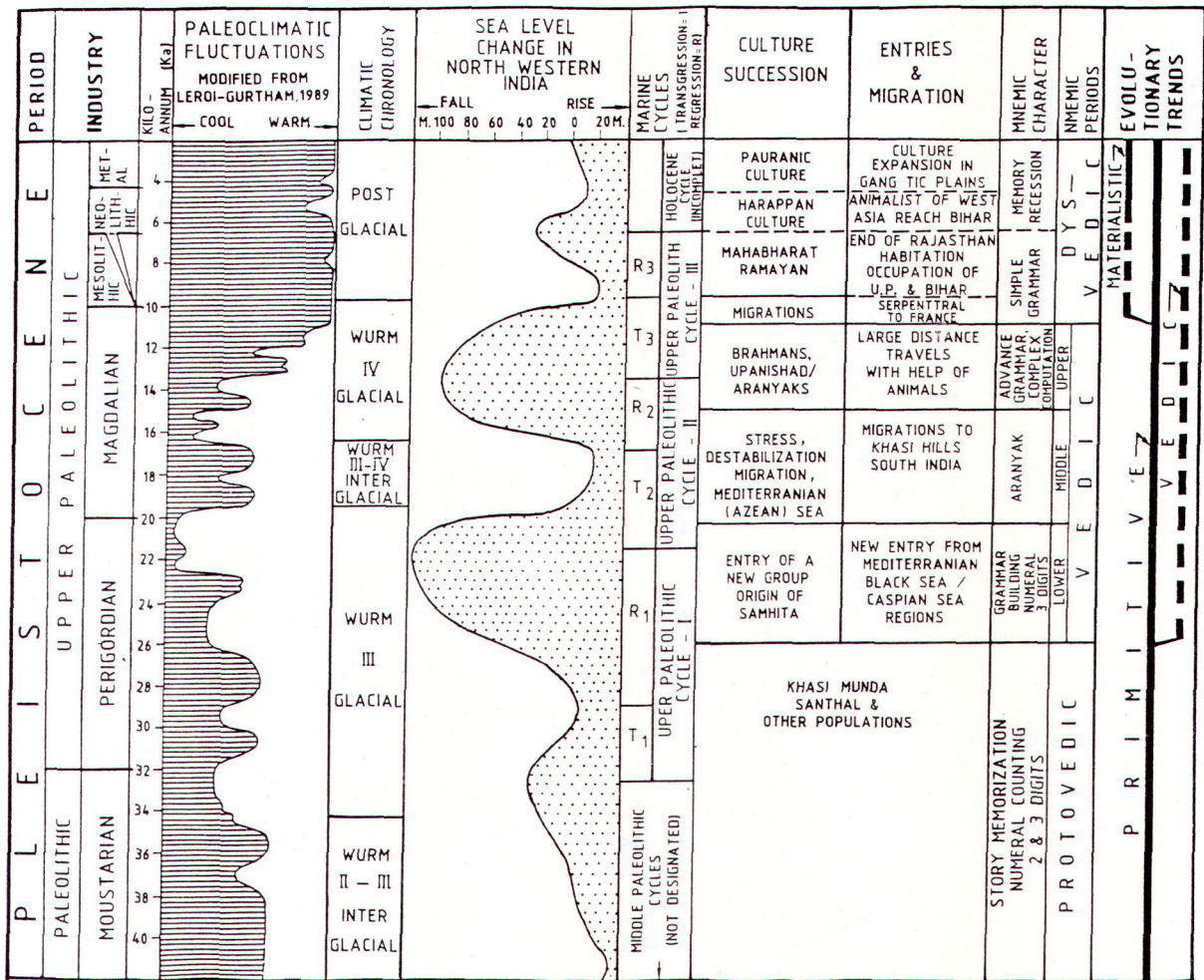


Fig. 6.14 : Rise and fall in the sea level of Kachchh-Saurashtra region, global temperature changes vis-a-vis emergence of vedic and materialist man in response to cooling and warming during the last thirty thousands years.

east, nearly a dried and feeble Saraswati joined by Ganga formed the Delta S1. At this time, as the purans mention, the Drishadwati River of the later vedic period was a nearly dried up river (Awasthi, 1953).

The Delta scenario clearly dismisses the earlier paleogeographic reconstruction of vedic land on the lines of Mc-donell and Keith (1912), taking the present day Indus as the basis. The present system of delta and mouths of Indus are mostly 4.5 Ka old (Fig. 6.17) and do not conform to the description of vedic period between 11 and 26 Ka.

Geomorphology of Head Water Region

The Landsat imageries or scanned photographs from the satellites exhibit rivers and channels as well as left out courses of past channels especially in the infrared range (Band 7). These are usually in darker shade when wet and humidity prone; and, reflecting when dry, sand-filled or/ and in the hilly tracts. In the desert of the Rajasthan alignment of water wells and dried water bodies also helps to fix past channels (Fig.6.18). It is possible to infer the migration of past channels by careful study of present river courses and their relatable past channels. Reconstruction of past channels in this way gives the history of channel migration in the Himalayan foot belt-Rajasthan region as under:

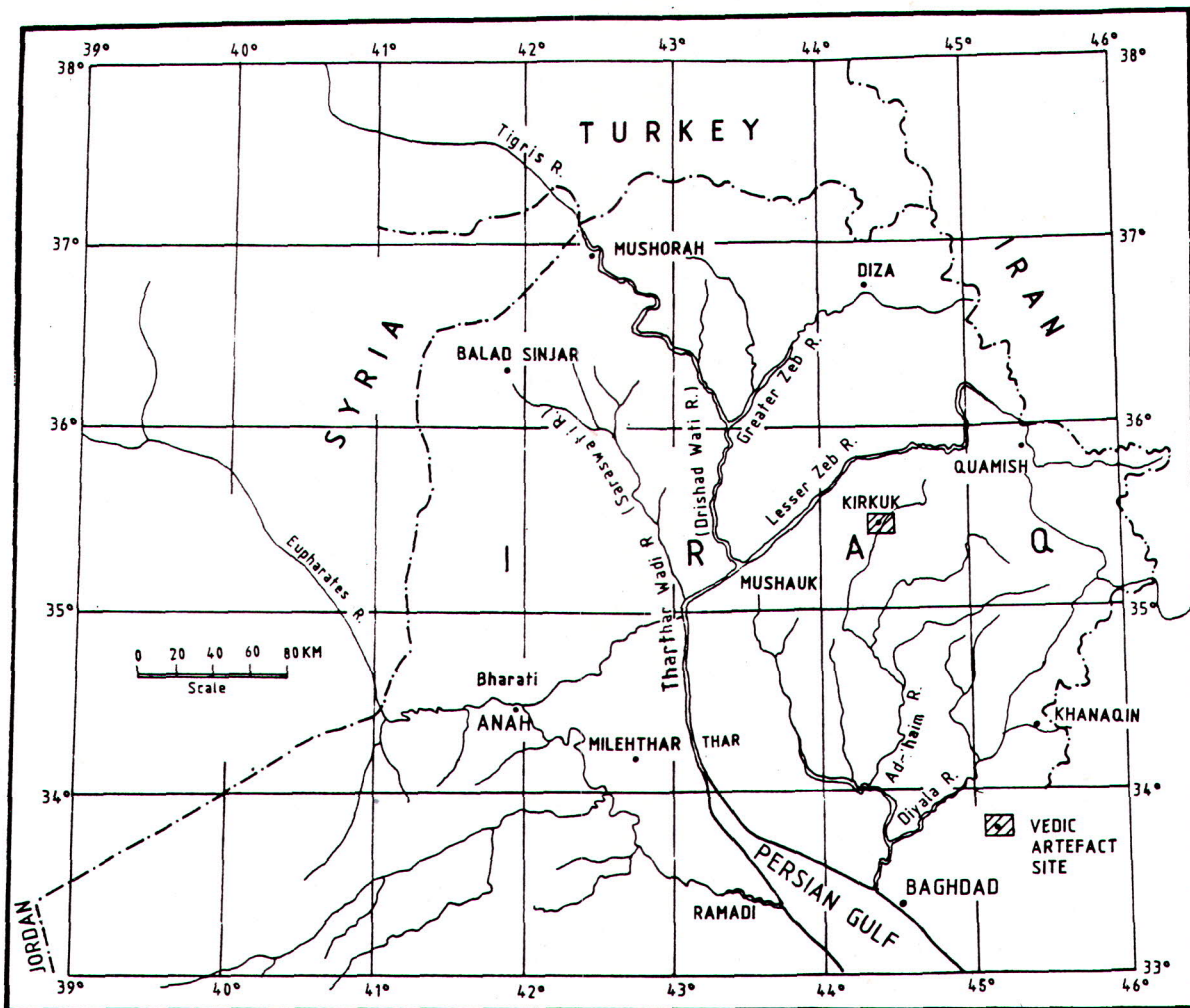


Fig. 6.15 : River system of North Iraq around 10 Ka.

Early Vedic Scenario (26-20 Ka)

1. The present course of Sutlej (Fig.6.4) now joining Beas by a strong westward shift, continued as independent channel west of Sirsa almost parallel to Indus and, joined the course of Nara to reach Chor where it joined the mainstream of Saraswati.
2. Chenab-Nara system constituted the trunk river Ganga.
3. Ghaggar River continued to Sirsa and then proceeded towards Bikaner where it joined the Ravi north of Bikaner.
4. The Saraswati-Yamuna channels of Himalayan foot-hills proceeded towards Bikaner and then, through the present day dried lakes of Bhadsar (= *Vadsar* = *Ud sar* = Water-lake) in Jaisalmer District reached Chor (Fig. 6.19).
5. Indira-Varun or Sindhu/Varun was less prominent drainage then and the flow of water in Sindhu was less than in Varun.
6. A cluster of Rivers joined near north and south of Chor from eastern Rajasthan to form a

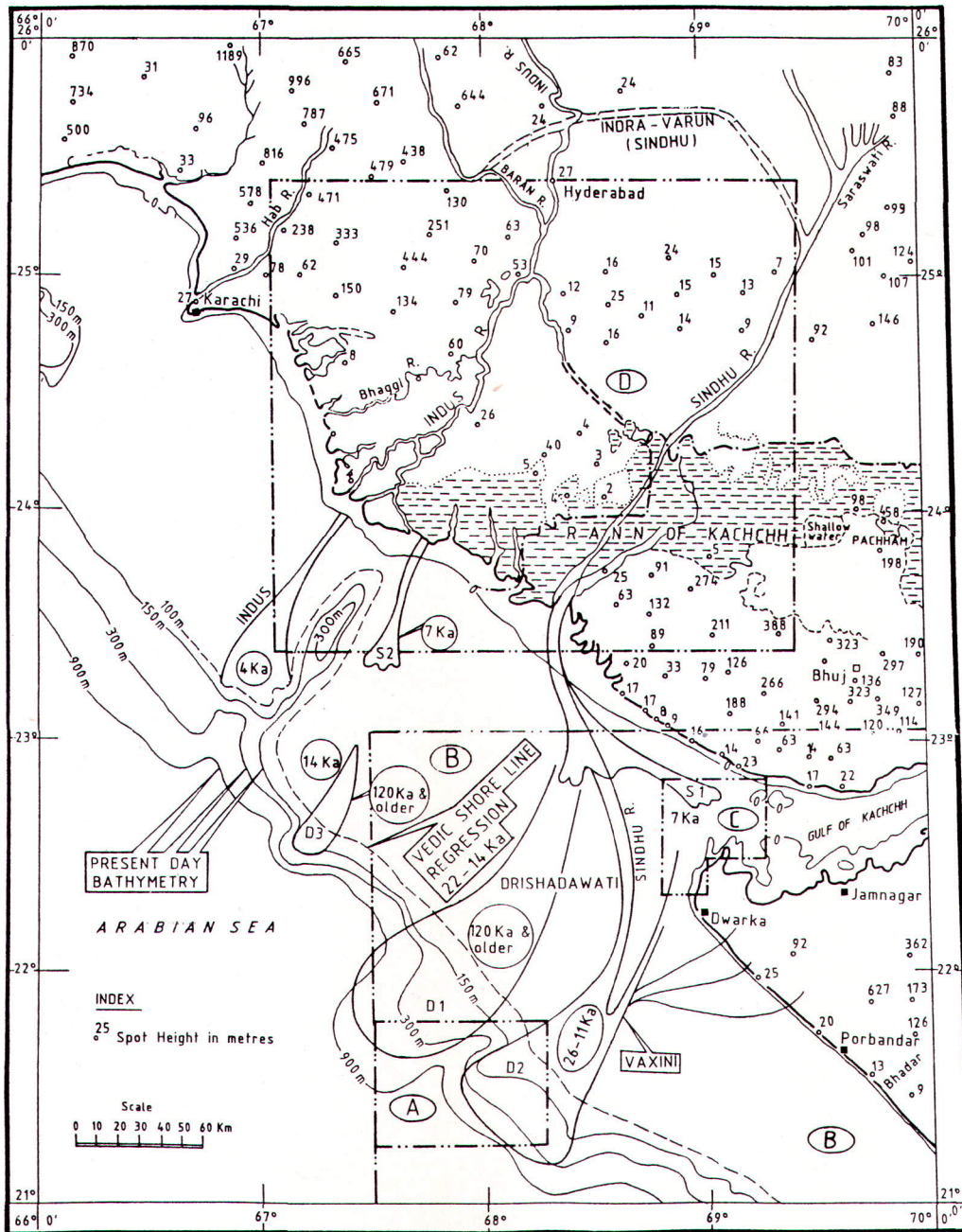


Fig. 6.16 : Rivers and paleodeltas in Sindh-Saurashtra region. A, B, C and D are the segments detailed in Fig. 6.17.

seven-sistered Saraswati, the northerly trunk river.

7. Sarayu joined Sindhu close to the present day Kori Creek.
8. Vaxini drained into Sindhu off Saurashtra (Fig. 6.16, 6.17).

Upper Vedic Scenario (15-11 Ka)

1. Ghaggar or Ganga was joined by Sutlej and Saraswati about 100 km west of Bikaner and then the water continued through the original course of Ghaggar, towards Chor.
2. Easterly course of the Abandoned Saraswati or Vinashan Saraswati joined Saraswati, Rivers Bharati, Vis and Marut form of minor watery rivers Saraswati to the farther south. The Saraswati hereafter was the main river of Rajasthan-Saurashtra country during the Upper Vedic period (Fig. 6.20, 6.21).
3. A feebler Drishadwati, literally meaning a rocky river, was the main easterly river originating in the Vis country and flowing to the south of Khadir Island (Fig.6.20).
4. There was intense tectonic activity at Pleistocene/Holocene boundary (11 ± 1 Ka). At this level of marine transgression Drishadwati disappeared and the Vis joined the Gulf of Rajasthan. In a contemporaneous development the present Yamuna (Kalsi) joined present Ganga (originally river Kan). It was by eastward turn of the drainage due to the rise of the Delhi-Ridge. At the same time Sutlej joined Beas which was a contributory of Sindhu at this date. The country between the two rivers has been uplifted in the neotectonic activity. The remaining water arteries i.e., Markanda-Saraswati-Ghaggar, all originating in lower reaches of Himalaya had no perennial water to proceed in the deserts of Rajasthan beyond Sirsa. The southwardly extending channel of Ghaggar got lost ultimately in the desert of Rajasthan (like that of today). Thus a mighty drainage of past, continuing till 12 Ka was lost for ever between 12 and 18 Ka due to a tectonic activity in the Himalayas and the northern Indian plain.

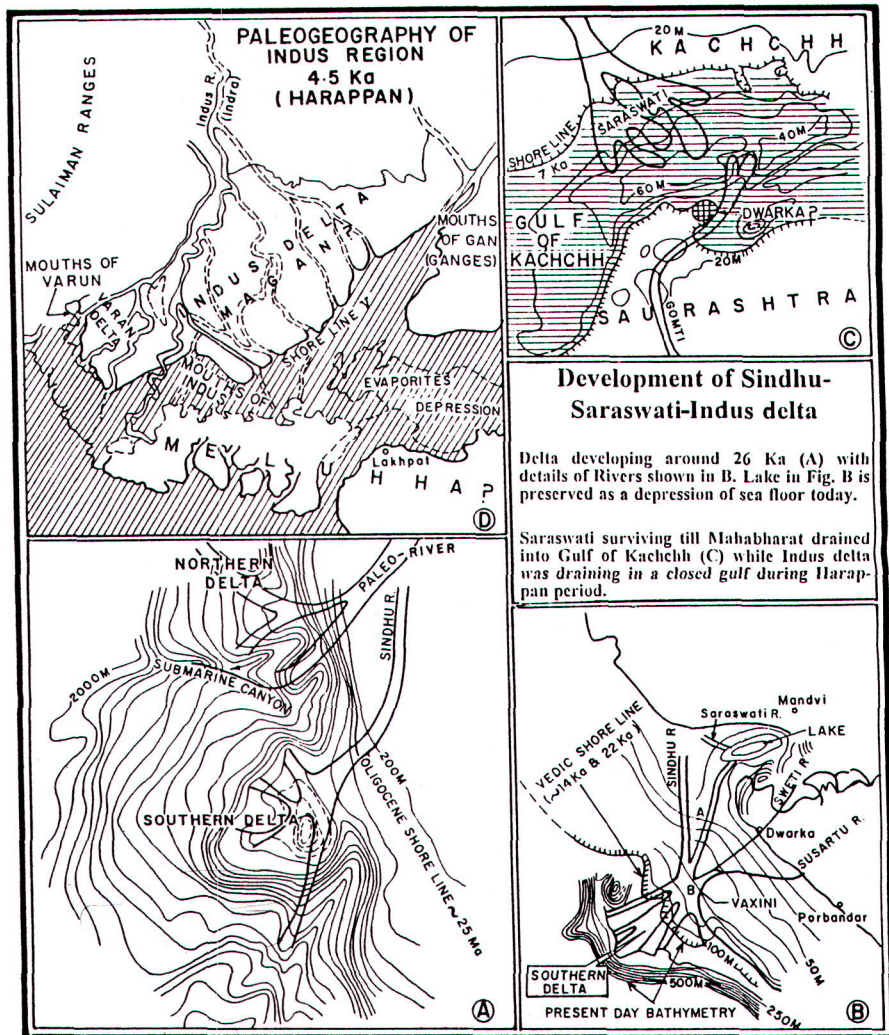


Fig. 6.17 : Development of deltas in the Sindh -Saurashtra region.

The Older Alluvium of Ganges plains, dating back to about 13 Ka in the highest horizons is followed by the Newer Alluvium, during this neotectonic activity around 10 ± 2 Ka. Past channel courses, nevertheless, are reflected by the alignment of wells and dried ox-bow lakes even now in the Sindh-Rajasthan desert. As already noted these help in the reconstruction of old channel courses.

The distribution of paleodrainage figuring above conforms to the observations of Misra (1992). He rejects the argument by several scholars on the basis of geomorphologic as well as sedimentological, historical and archaeological data that the present day dry head of Ghaggar-Hakra represents the Saraswati of the *Rigvedic* period. Ghaggar, in the present form exists since 10 ± 2 Ka and landsat based reconstruction of *vedic* paleochannel relate essentially to the geological past of Pleistocene and not to Holocene. The Saraswati drainage of *Rigvedic* period, as discussed earlier, lies comparatively far in the geological past. Although name Saraswati survives in the head water region, it cannot be taken to be same as the Saraswati-Ghaggar drainage of modern times. The *Rigvedic* river Saraswati, in the antiquity of geological past, even if identifiable with the Saraswati of Punjab, had very different headwater contributories coming from the snow-bound Himalayas and then proceeding via Jaisalmer in Rajasthan—a route now unconceivable.

Unless one looks into the antiquity of *vedic* settlements and projects the river courses during Upper Paleolithic as provided in *veds*, reconstruction of *vedic* channel system is no more better than a fiction work. Study and understanding of *veds* for proper meaning, beyond the bias of the west, is equally important for such reconstructions.

Reconstruction of *Vedic* Land

In the survey of dates for *vedic* land our attention is focused on two periods of activity of *vedic* men with reference to astronomy. The first relates to erection of asterism system and a counting with *Uttar Bhadrapad* around 25 Ka and, the second when *Chitra* was in conjugation with sun on the vernal equinox (14.7 Ka). These two dates tie up well with the initial two major regression of Western Indian Shelf with different delta developments that occurred around 22 Ka and 14 Ka. In the first regression there is only one delta. In the second regression there are two. The first of these is in deeper water now. The two earlier situations are remarkably satisfied by *Rigved* (10.75) and *Manusmriti* (2.17-23) respectively. Without going into further elaboration, the two

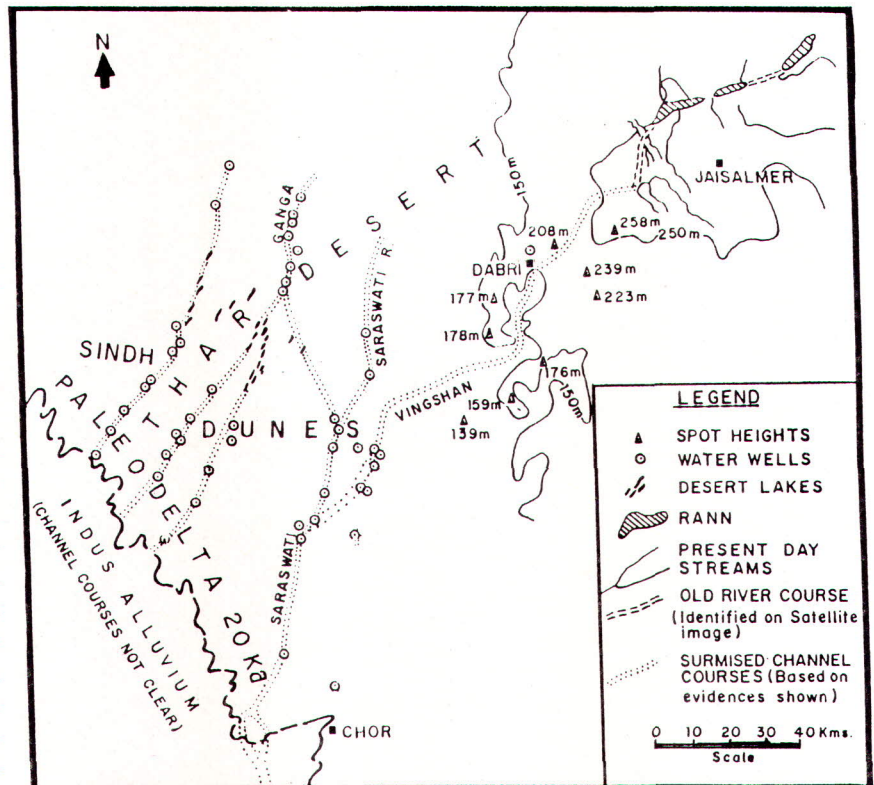


Fig. 6.18: Channel courses as indicated by the alignment of wells in Rajasthan and adjacent Pakistan.

paleogeographic reconstructions are summarized below defining *vedic* lands around 25 Ka and 14 Ka respectively.

Sindhudesh or Sindhu Land (26-20 Ka)

One of the best coherent descriptions about the worship of rivers figure in the *sukta* 75 of *mandal* 10 in the *Rigved* where Sindhudesh or Sindhu Land constitutes a major plain after *Varun* has joined Sindhu and the two have descended down from the hills to the plains. Sindhu, prior to this junction seems to be poor in flow. Today's Baran in Pakistan is unmistakably the *Va-run* of *Rigved* meaning a wide watery river which expanded River Sindu considerably when the latter joined it [RIK: 10.75]. The Landsat data also show the past trend of the two rivers and confluence close to Chor. The remaining course of Sindhu River had three main clusters of rivers to join—Saraswati, Sarayu and Vaxini. The first river etymologically means lake-bearing channel. Considering the *vedic* description, Sarayu could also have a similar prominent river course as Saraswati while river Axini or Va-axini was an estuarine southern part of Sindhu (Ax=salt). It is also obvious that the last of the three main rivers was the terminal point of Sindhu. Since there the Sindhu River was associated with Susartu [=Su (water) +Ritu=River Ritu] which is same as *Vartu* [Va+Ritu= River Ritu] of Saurashtra, the mouths of Sindhu and the estuary of Vaxini was formed close to Vartu in the Delta D2. This situation exactly fits in with the sea level fall of nearly 100 meters (Fig.6.16). Another important southerly river in this delta region was Shweti or White River presumably originating in the white Miliolite Limestone country south of Dwarka. With the identification of these two main rivers and the locale of Vaxini in the delta D2 region, mouths of *Rigvedic* Sindhu are easily placed in the offshore Saurashtra region. Accordingly, the hub of the Sindu country of *Rigved* spread between modern Hyderabad in Sindh (Pakistan) to the far offshore off Dwarka in Saurashtra. It was, a little over 400 kms in length and 100 to 150 kms in breadth. However, all the main valleys of the rivers pouring their waters into Sindhu were in close cultural continuity with Sindhu population and these all harboured the *vedic* men of Sindhu Land between Himalaya in north and Saurashtra in South. North is *Ut-tar* (higher and higher) in Sanskrit denoting direction of Himalayan ranges. Sanskrit word for South is *Daxin* which means same as Vaxin i.e., estuary of River Axini. These words of Sanskrit by themselves denote the limits of *vedic* people of Sindhudesh between Himalaya and Vaxini estuary. No wonder the carving of *Dyavaprihivi* from Basanbir in Jaisalmer confirms the geography as well as the Upper Perigordian period of the *vedic* land.

It is possible, through Landsat data, to fix the upper or first cluster of rivers belonging to Saraswati segment. These, besides Saraswati, were Ganga, Yamuna, Sutudri, Sachta and Parushni. The Saraswati drainage of the period 20-26 Ka contained large natural lakes in Bhadsar area of Jaisalmer (Fig.6.19) and the river itself was receiving Tons-Yamuna perennial water supply. It was joined also by Kanya and Ravi. The name Saraswati is an inverse of bisyllabic Vat-Sar (→Bhad-sar). The latter implies lake of water while the former means a river having lakes. The present day broad Rann of Bhadsar, with abundant Paleolithic industry on its banks dating back to Moustarian reminds of prosperity of the land during the *vedic* and older times.

Rivers Ghaggar and Ganga are etymologically related [Ga-umga= Ga-Gar=Ga-Gad= River Ga]. The township of Ganganagar is a locality name reminiscent of the *vedic* Ganga River. *Sutudri* [*sat-ud-riu*] is probably same as Sat-Laj [River Sat]. *Sachta* is seemingly *Sachi-Ta* or wife of Indra, intimately related to Indra [=Indh=Sindhu]. It was a minor but prominent river of those days. Parushni may be taken etymologically as Par-vishni River or the minor Vishnu from Vis country. Vishnu is often called Upendra or Lesser Indra (=lesser Indus). Visni appears to be a tributary of Saraswati river in the Vis country, i.e., western Rajasthan. Parushni River was a prominent channel of the Vis country contributing to Sindhu system from the north-western Rajasthan. This river is hardly traceable now due to the sand cover near Chor. Possibly the same channel figures as Bharati in the *Yajurved*. Yamuna or Yam-vana (southerly river) of Early *Rigvedic* Period arose out of Trik-ud Range (Awasthi, 1953), i.e. a mountain trifurcated by three

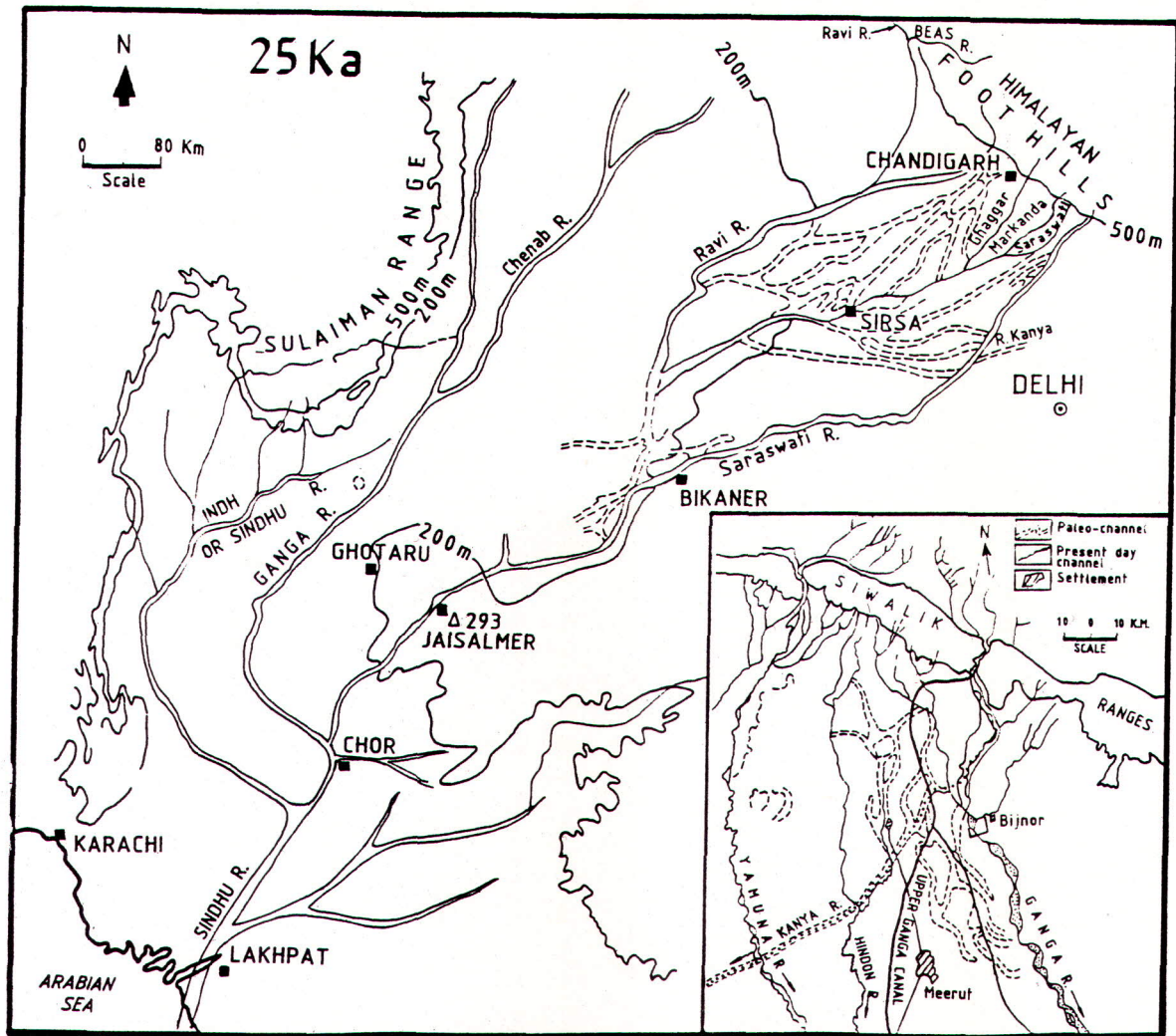


Fig. 6.19 : Major channel system of North-western India around 25 Ka.

(small) rivers. The mountain Trikud or Jamun Range is now located west of Barmer (Fig. 6.20). The river originates as three channels from the western slope of a small hill range. On its banks there are two Ja-yadu villages [=Ga Yadu= Yadav people] suggesting its identity with Yadav people during Mahabharat (7 Ka). Even the big Bull mountain (Go-varadhan) is also seen on the southerly banks of this river. There is thus a specific proof that the river is not being misidentified.

Yamuna river of the present day is a transplanted name on the original Kal-Ti (=now Kalsi, presently a village at the banks of Yamuna near its confluence with Tons]. Rivers Sachata, Ganga, and Saraswati are reflected today by alignment of the wells in the Thar desert reaching upto Chor (Fig.6.18).

The middle, second or Sarayu cluster of rivers joining the then Sindhu is somewhat hard to infer now due to strong desert sand dune development and the formation of the Rann of Kachchh after Post-Harappan tectonics and withdrawal of sea. Yet some of the six names in this cluster i.e., Asikti, Marut-vridha, Vistasta (in some texts Vitasta), Arjiki, Shrisuhi and Sushoma may be partially identified. Among these, two were

prominent rivers—the big and wide Marut and masculine or big river Vis (usage tas-ta denoting masculinity in river). Arj is related to Ajj-range or Ajmer which was also a Vis country. Mar-ut is etymologically the same as Mar-wari because both mean River Mar. Barmer (Bar+mar→war+mar) also means the same. The latter country is now hosting the Marwari population restricted to the broad valley of Luni. It was this Marwar country which had three main rivers Marut, Vis and Arjiki. These names can specifically be tied with i) a dry, hard to identify river system of Barmer draining into Rann of Kachchh where the bifurcations of a paleo-delta are clear; ii) Luni River with several tributaries; and iii) Jawai-Sukri drainage in southern part of Ajmer range. Among the remaining three Shrisuhi probably correspond to Sagi, and Sushoma to Sukal. The latter is not hard to tie up because Sukal and Su-som both mean good (watery) river. Similarly, Van-As and As-k-ti also meaning River As and Banas of today is probably *vedic* Asikiti. All these rivers, drained into Saryu the big lake, now salt encrusted country in the Gulf of Kachchh.

In the third or southerly cluster of six rivers, i.e., the only other identifiable name besides Shweti and Susartu is Mehatna which was joined by Gomti and Kramu in the upper reaches. Possibly Mehtna was *Meh-ta-na* or River Meh. Mehtna, on which now Mehsana township stands transform to Mehsana by t→s transformation. Present name of this river is Khari. The main channel of Mehatna may now be in the Gulf of Kachchh. However, since the river had three sisters—Kramu, Gomati and Mehatna—their correspondence with Khari, Saraswati and Rupen of North Gujarat may be speculated.

The river clusters discussed above have been shown in figure 6.16 where the Indus country is shown from delta D2 to the confluence of *Varun*.

Yajniodesh or Worshippers' Land (15 to 11 Ka)

There is a vivid description of lands and its major rivers in Manusmriti (2.17-23) where two prime land-segments are demarcated: one where black-bucks roam about and the other where these are absent. The former is *Yajniodesh* or Worshippers' Land and the other a *Mlechchhadesh* or Impious land. In their recent distribution black-bucks occur between Iran and India. What is most significant in this description, however, is the complete absence of any reference of Sindhu. Even the earlier mighty Saraswati too has seemingly died and exists as, *Vinashan* or destroyed Saraswati. An obvious feature, then, is a long time lapse and tectonic activity between the paleogeography of Sindhu Land and *Yajniy* country. The *Yajniodesh* came into existence after a major tectonism and sea level rise around 18 Ka destroying the Sindhu settlements. Climatic changes had also intervened around 18±2 Ka. The *Yajniodesh*, at its peak development around 13 Ka comprised of the following constituents .

1. A prime-land *Brahmavart* between two major rivers Drishadwati and Saraswati.
2. A surrounding country around *Brahmavart* named *Brahmarshidesh* which was made of Kuru-Panchala, Matsya and Soorsenak lands.
3. A *Madhya Desh* between Him and Vindh extending to the east of the first major junction of rivers Ganga-Khari-Saraswati near Lakhpat upto the western limit of *Vinashan* around Jaisalmer.
4. A land between two seas whose names commence with A, named as *Aryavart*.

Among these the third or the *Madhya Desh* has to be located, on account of its meaning as the Middle Land, between 2 and 4. It lies, between Rivers Him and Vindh which tie up with modern Ad-Heim in Iraq and Va-Indh or Indus in Pakistan (Fig.6.22). Further it was extending to the east upto Jaisalmer in Rajasthan where river *Vinashan* (= *Vinashan Saraswati*) lay. This *Madhya Desh* or Middle Land Included present day Iran, Afghanistan, Pakistan and a part of Indian territory—mostly hilly. On the eastern side of this Middle Land lay the *Brahmarshidesh* and to the west was *Aryavart* (Fig.6.22). Identification of the latter with reference to the two 'A' seas in accordance with *Lakshit Lakshana* or hinted symptoms [NYA:81] is not very difficult because *Aegean Sea* and *Aral Sea* are extant marine bodies relatable to *Ajs* (= *Aryas*); and, the hilly

country of Turkey, Northern Iraq and Western Iran, lies between these two seas confirming to the description of the Manusmriti. The Azov Sea and Aizerba also represent the land segment related to Aj Sea. Thus, we can tie up the identification of this hilly land with *Aryavart*. Etymologically *Aryavart* (\rightarrow Ajjavart) means a land surrounding the *Aj* seas. Accordingly *Ajya* (Agean) and *Ajjal* (\rightarrow Aral) seas are the water-bodies which were flanked by this land. In Sulemania and Kurd country of Iraq, Sanskrit background of the people is too obvious in their vocabulary and affinity. Past influence of *Aryavart* in language and culture still survives here. Catal Huyuk in Turkey also shows unmistakable *vedic* affinity.

Reconstruction of the easterly *Brahmarshidesh* and *Brahmavart* again focuses our attention on a regressed shore-line where a wide patch of land developed west of 'Soor-senak'. The last, by etymology and meaning is the same as modern Saur-rashtra or Saurashtra in Gujarat.

The receded strand line of 14 Ka had brought three changes after the similar shoreline of Sindhudesh. There was formation of a deep-lake north of the tip of Saurashtra (Fig.6.17) that was connected to the main river coming from west and north by a new river system in place of Sindhu of early *vedic* days. Southwardly

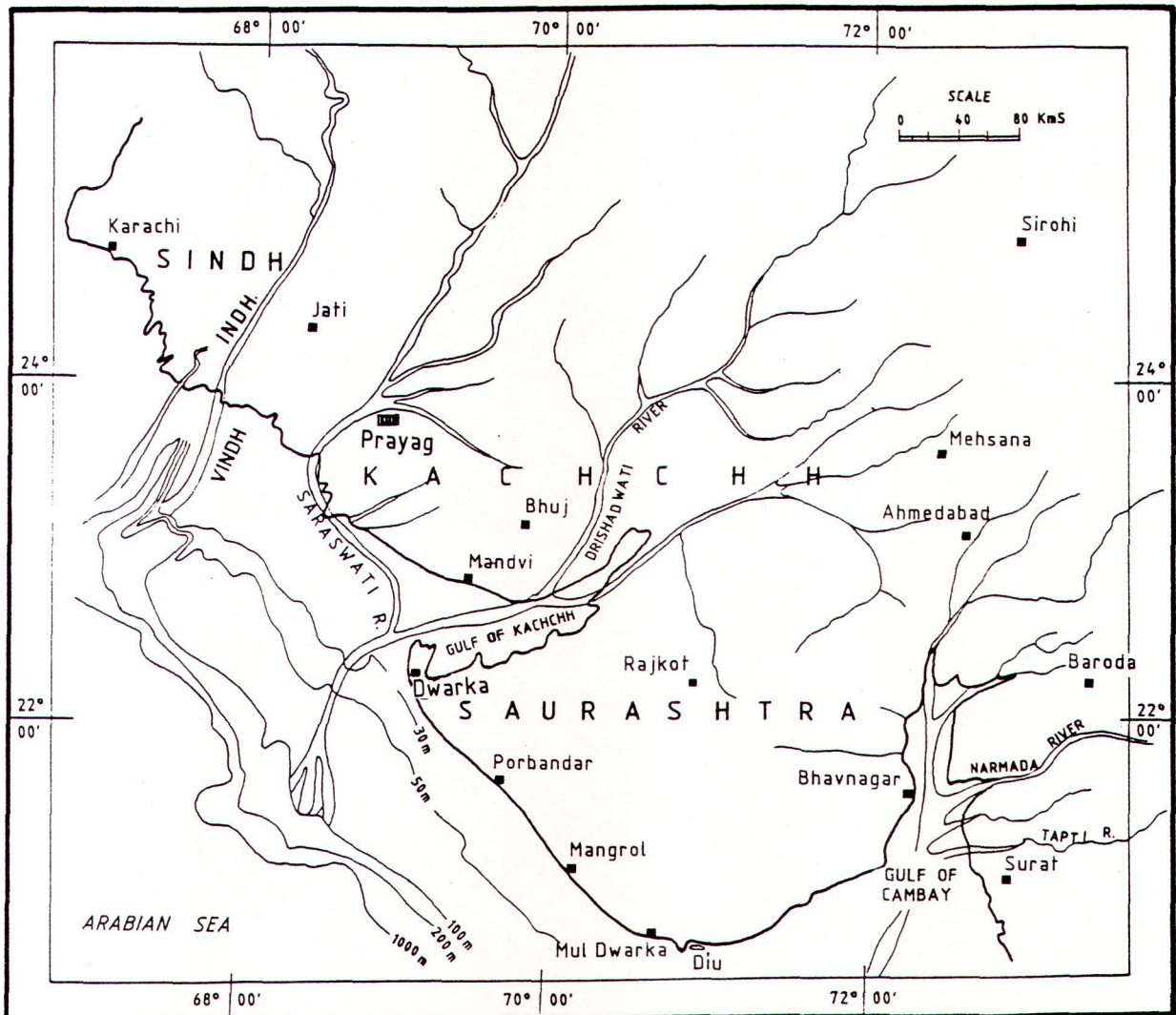


Fig. 6.20 : Saraswati and associated drainage of Rajasthan-Kachchh around 14 Ka.

this lake joined erstwhile Vaxini. The new major river of north was thus no more fat lady Sindhu. This north-easterly drainage passing mainly through Rajasthan was now named Saraswati. The other main water-artery Drishadwati came into existence in the Kachchh area due to activation of fault (fractures in earth crust) between mainland Kachchh and Wagad. *Drishad* means stone [AMA: 640] and Drishadwati was the river of Rocky country i.e. eastern Kachchh. At its northern end lay the headwaters of Luni.

The Saraswati-Drishadwati reconstruction helps to identify the *Brahmavart* as the meadows between the two main water arteries of Saraswati and Drishadwati. The constituents of *Brahmarshidesh* are also not difficult to place because "Soor-senaks" is Saurashtra and Kurukshetra turns out to be a land of River Kuri or Kori creek extending north wards up to Bharati and southwards upto Khari near Mehsana of today. It covered southwestern Rajasthan, eastern Kachchh and extended to a little south of the township of Mehsana in North Gujarat. The Matsya was a land of *Matis* or the one occupied by Sabarmati and Hathimati. It lay between River Rupen and Gulf of Cambay. Panchal, or the last among the four constituents of *Brahmarshidesh*, was again a land of five rivers which besides the main River Campee or Capee, (River Cambay) had four more tributaries: Tapi (Tapti), Narmada, Dadhar and Mahi. It is the present day South Gujarat.

The paleogeography of upper *vedic* period as constructed above includes a very wide and extensive land. Much bigger than Mc-donell and Keith (1912) conceived. They have opposed such a reconstruction because they could not imagine that the names *Mitra* and *Varun* in the document of Bohaz-koi, could be related to large migration and antiquity of *vedic* India as early as or before 1400 BC. As they put it, if these names are derived from the *vedic* India, "the *vedic* religion must have flourished in India, considerably before 1400 BC, even though the hymns that have come down to us may not have been composed before that date. **But that these names should have travelled all the way from India to Asia Minor is a hypothesis so highly improbable that it may be dismissed**". Mc-donell and Keith in their dismissal demonstrate their ignorance about long travel by Indians routinely while on pilgrimage and, also their conviction that *vedic* culture is not so old. A proof is now before us demonstrating : a) existence of *vedic* Sindhu Land to around 25 Ka; b) these very people migrated to west Asia and occupied it around 18 Ka; and, c) 14 Ka was the period of

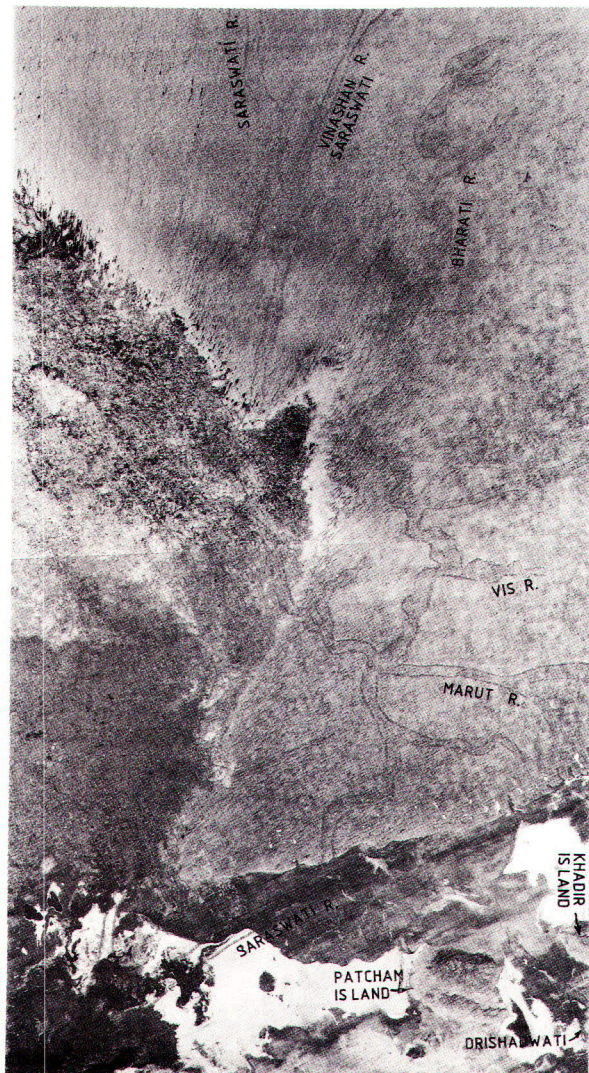


Fig. 6.21 : Upper *Vedic* drainage of Vis country.

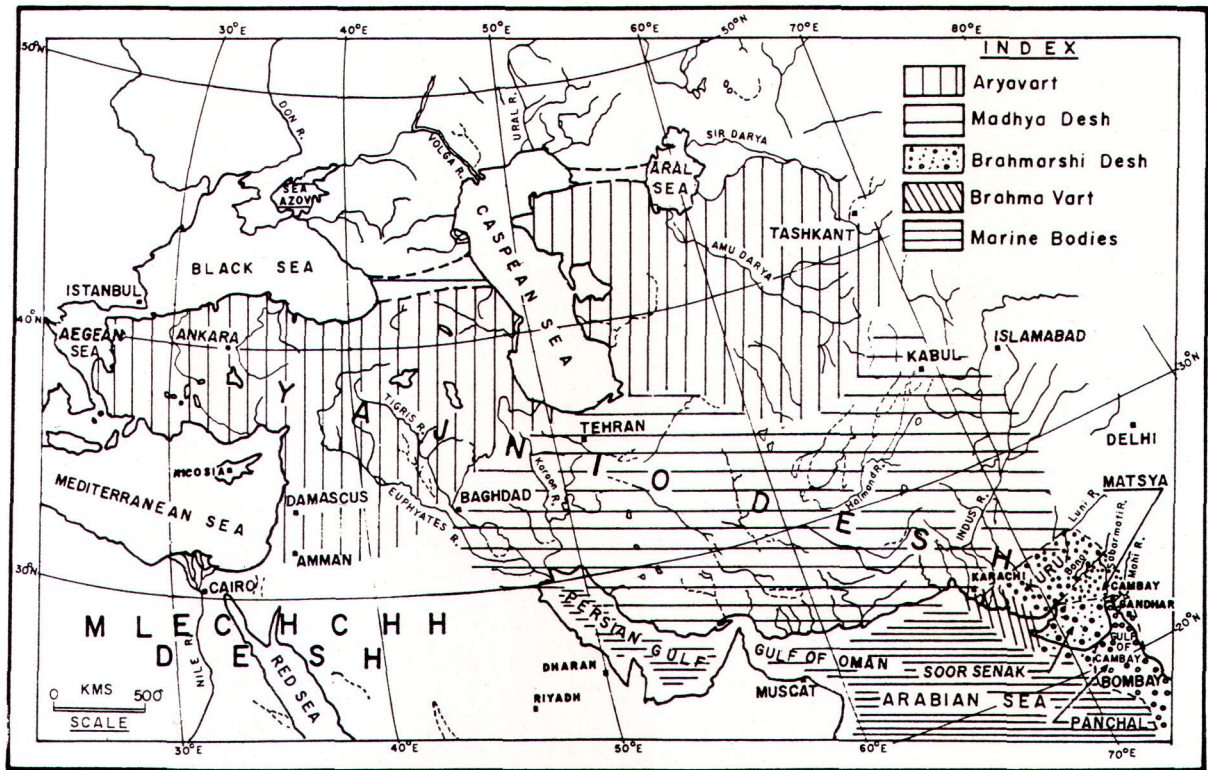


Fig. 6.22: Paleogeography of Upper Vedic Manusmriti period around 14 Ka.

their hey day when zero gold medal zone of Western India and Middle East was christened as Worshippers' Land. Mc-donnell and his followers could not conceive that boundaries of *Yajniodesh* could cover India and Turkey both with the tradition of Swastika worship. Their error now stands corrected with the material included in this work.