

A Connected Account of Ancient Indian History Using a System Approach

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Abstract

The paper presents a fresh approach to writing of history, termed as a system approach. The method consists in first documenting chronologically what is reliably known, identifying the knowledge gaps, and then making alternative hypothesis regarding the missing links. The role of alternative hypothesis is to encourage search of appropriate information. The approach is very much like scientific experimentation. The method is illustrated by briefly presenting a connected account of ancient history of India, which is currently very patchy and controversial. Starting from the early Holocene (c. 10,000 BCE) till the invasion of Alexander the Great (327 BCE), this long period is divided into seven epochs and all-out effort made to assemble and classify the vast amount of existing knowledge; and prepare a unified account of history, showing the past, present, and future as a connected whole. Two other initiatives are briefly presented, which also follow a holistic approach, but use a coarser database. Their findings essentially collaborate with the present paper.

The existing account of ancient history of India is very patchy and confusing to read, especially to Indians. It contradicts our traditional beliefs regarding the historicity of our revered heroes, Lord Rama and Lord Krishna. The farthest reference point, mostly accepted, is the 6th century BCE coinciding with the rise of the Magadha dynasty. This changed somewhat with the discovery of the Indus Valley Civilization, dated during 3000–2000 BCE. Still, little effort has been made to investigate even these: what caused the rise of this mighty civilization and what led to its downfall? The apathy towards our own history and culture can be judged from the fact that the book “Vedic

Age”, first published by Bhartiya Vidya Bhawan in 1950, has undergone six editions by 1996 without any change of its content (Majumdar *et al.*, 1996).

In the above scenario, a fresh approach to writing history, based on scientific analysis, is called for: termed here as a system approach. The method consists in first documenting chronologically what is reliably known, using the latest and most reliable information; identifying the knowledge gaps and making alternative hypothesis, in order to provide a connected and complete account of our history. The role of alternative hypothesis is to encourage

search of appropriate information. Such an investigative approach to research on history will show the weak links in the current knowledge and suggest priorities for using limited research funds. The approach is very much like scientific experimentation.

Sources of information

We will take a long sweep of time from 10,000 BCE to 500 BCE, divide it into epochs and track the rise and fall of the ancient civilization and culture over time. The following classes of information, originating from both the Western and Eastern sources, have been utilized, cutting across many disciplines:

- Archaeological discoveries in India and Pakistan
- Paleobotanical investigations
- Vedic and Post-Vedic literature and commentaries
- Ecological data
- Evidences from other cultures
- Linguistic studies
- Folklore

Many ideas presented in the existing accounts are contradictory and subject to various degrees of bias. Effort has been made to make the narrative unbiased, connected, and convincing.

Information from contemporary civilizations

Information from two other centers of advanced civilization, contemporary to the

Indus Valley, add significantly to knowledge and understanding of our civilization (see Figure 1 and Table 1). A visit to the Archaeological Museum, New Delhi, India was very useful in this regard.

Evolution of ancient Indian history: Hypothesis

Based on intensive study of literature and drawing similarities among the three centers of civilization, the ancient Indian history and culture is divided here into seven epochs (see Table 2 for author's hypothesis).

Climate and vegetation in the Holocene (Epoch 1: 10,000–8000 BCE)

The geologists usually take 10,000 BCE as the beginning of the Holocene, when the Ice Age ended and a warmer period began. Based on observations of water level in a lake in Rajasthan, the climatic pattern in Northwest India, from Holocene till the recent period has been studied by Wasson (1983), presented graphically in Figure 2. The climate at the beginning of the Holocene was dry and freezing; the vegetation was very dull. This changed with the onset of warming around 10,000 BCE; greenery started spreading; birds chirping; and flowers blooming, awakening the inquisitiveness and poetic spirit of man. Life became more normal as time went by.

The Indus-Saraswati Region, the cradle of our civilization, had then an average rainfall around 500 mm with 9–10 months of dry period, very much like Western Rajasthan presently, to support savannah vegetation, as shown in Figure 3, characterized by

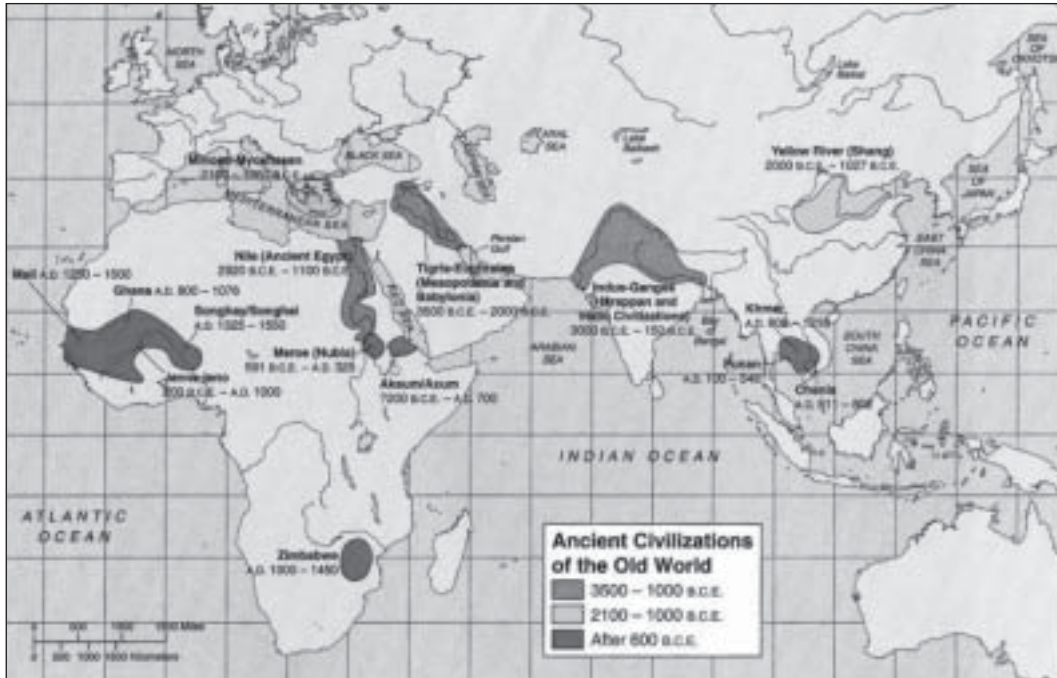


Figure 1. Civilizations contemporary to Indus Valley (Source: Archaeological Survey of India, 2012).

grasses with scattered trees (also called tree savannah). Only banks of the Seven Rivers (*Sapta-Sindhu*: Saraswati, Sutlej, Beas, Ravi, Chenab, Jhelum, and Indus), 2–3 km on either side, offered favorable sites for the growth of medium-sized trees, 20–30 m tall and relatively dense. An important point to note is that the Region benefited from the advancing as well as the retreating monsoons; and rivers got charged from melting of glaciers on both these occasions.

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It is noted that the savannah vegetation is ideal for animal husbandry and less suited for cultivation except in the river-fed regions. The low rainfall and monsoon failures must have been a major worry for agriculture, as it is even now, but the climate was salubrious. A second point noted is that the rainfall increased, eastwards. The land flooded by Indus and its tributaries and Saraswati provided limited land suitable for

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Table 1. Contemporary civilizations in the Near East.¹

Date (BCE)	Egypt	Mesopotamia	Indo-Gangetic Plains
7000+		First permanent settlements	Mehrgarh's Neolithic stage
7000–6000		Brewing of beer Agriculture develops	Farming communities at Mehrgarh Domestication of animals Domestication of rice in Central Ganges Plains
6000–5000			Cultivation of dates at Bhirrana (Haryana)
5000–4000	Copper metallurgy develops	Copper metallurgy Irrigation systems	Copper metallurgy in Indus-Saraswati Plains
4000–3000	Hieroglyphs First dynasty	Uruk Babylon Cuneiform writing Wheel-turned pottery The wheel	Pre-urban elements: weights, Indus-like signs, proportioned baked bricks, trade The wheel
3000–2000	End of Old Kingdom Great Pyramids at Giza First Pharaoh	Ur's ziggurat Sargon's reign	Mohenjo-daro's Great Bath First break-up of the Saraswati river Emergence of cities in Indus-Saraswati Plains and Gujarat
2000–1000	Amenhotep III End of Middle Kingdom	Assyrian Empire, Hittite culture, Kassites control Babylon, Hammurabi's reign	Painted Grey Ware culture, Late Harappan culture, population moves towards Ganga, iron in Gangetic Plains, Harappan urbanism ends, the River Saraswati dries up

1. Source: Archaeological Museum, New Delhi, India; Danino (2010).

agriculture. But, the region in the east (the current Punjab and Haryana) offered land with higher productivity.

Ethnic composition – then and now. The society was then divided into many a small tribe (hundreds of them!), as we still find them in the dominantly natural vegetation regions of the country. From the type of the natural vegetation present, it is obvious that cattle-raising offered greater scope

for livelihood than cultivation of crops. Observation of natural vegetation and wildlife, consisting mainly of grasses and

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Table 2. Hypothesis of cultural evolution in ancient India (10,000–500 BCE).

Epoch	Development highlights	Estimated duration
1	Hunting and gathering as the main source of livelihood; discovery of fire; domestication of plants and animals as trigger events; Early Holocene; Neolithic Age	10,000–8000 BCE
2	Agricultural developments in the Pre-Vedic Period (as revealed by Paleobotanical records)	8000–6000 BCE
3	Social and cultural adaptations to meet agricultural challenges as revealed in Rigvedic hymns	6000–4000 BCE
4	Invention of wheel; regional cooperation, trade and commerce; composition of Yajurveda; birth of Astronomy, Geometry, and Urban Planning	4000–3000 BCE (Copper Age)
5	Large-scale urbanization in the Indus-Saraswati basins; composition of Brahmanas and Aranyakas literature; disappearance of the River Saraswati	3000–2000 BCE
6	Eastwards population movement and cultural expansion; composition of Ramayana and Mahabharata; compilation of Atharvaveda and Upanishads; <i>Vedanga</i> literature	2000–1000 BCE (Iron Age)
7	Continuation of Upanishad movement; development of <i>Vedanga</i> literature; Panini's Grammar; birth of Buddhism and Jainism; rise of Magadha Empire; Alexander's invasion	1000–300 BCE

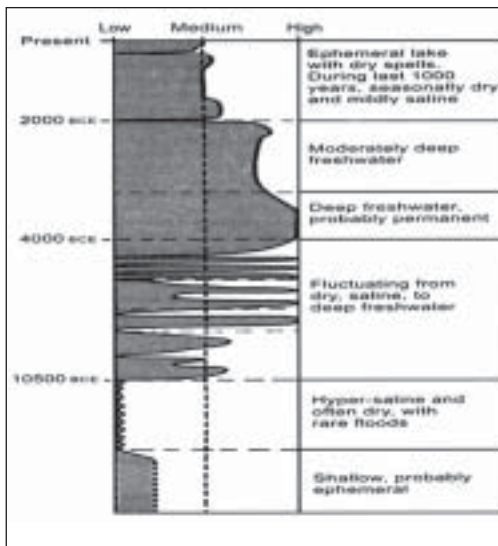


Figure 2. The water level of Didwana Lake, Rajasthan after the Holocene (Source: Wasson, 1983).



Figure 3. Savannah as the dominant vegetation in the Sindhu-Saraswati Basin (Source: Author's archive of global vegetation types).

ruminants must have provided ideas for domestication of cattle and crops. Discovery of fire and its multiple uses was a very important discovery, as mentioned in the opening portion of the Rigveda.

The ethnic and cultural background of inhabitants in those days was discussed at length in 2007 at a seminar organized by Draupadi Trust in collaboration with the Indian Council for Cultural Relations. Prof. N Kazanas from the Omilos Meleton Cultural Institute (Greece) spoke about the “collapse of the Aryan Invasion Theory” based on linguistic evidence in the Rigveda, supporting the hypothesis regarding indigenous nature of the Indian Civilization and the genetic evidence that there was no “influx of new genes after 10000 B.C. in India” (The Hindu 27/11/2010; www.dnatribes.com).

The Neolithic (New Stone Age) Revolution, according to Gordon Childe (1993), “began in the grey night of remote prehistory. Its theatre can be provisionally delimited; it is bounded on the west by the Sahara and the Mediterranean, on the east by the Thar Desert and the Himalayas, on the north by the Eurasiatic mountain spine – Balkans, Caucasus, Elburz, and Hindu-Kush – and on the south, as it happens, by the Tropic of Cancer. The geological, physiographical, and climatic conditions of this zone proved

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propitious to the revolutionary development. It provided the raw materials for the decisive discoveries. It offered inducements to intensive social organization and rich rewards for large-scale cooperation. It gave facilities for communications by which new knowledge might be pooled and essential materials collected and concentrated. Finally its cloudless skies presented nightly the impressive spectacle of the uniform motion of the heavenly bodies that in other latitudes is too often veiled.”

Growth of agriculture (Epoch 2: 8000–6000 BCE)

The new food-producing economy in the Neolithic period was a revolutionary step forward in the Region. By 7000 BCE, barley and jujube had been already domesticated followed by domestication of sheep and goat. Agricultural advancements included threshing, planting crops in rows (either of two or of six), and storing grain in granaries. The accumulation of knowledge was the basis of further advancements in agriculture. Saraswat (1992) presents a detailed account of the progress made in plant economy in the Indian subcontinent in a chronological framework from the earliest Neolithic cultures of primitive village-farming communities to highly advanced Iron Age cultures of Early Historical Period (around the beginning of the Christian era). In an impressive array of archaeo-botanical data generated during the last four decades, he reports the earliest evidence of cereal cultivation dating back to 7000 BCE in Mehrgarh, Pakistan; and the earliest evidence of rice cultivation during 6th millennium BCE in the Middle Ganges Valley of India.

Pokharia (2008), from excavations at Koldihwa, Mahagara, and Malhar in the Vindhyan region and Lahuradewa in Ganges Plains, traces the beginning of agriculture by a domesticated form of rice during 7th to 6th millennium BCE; and the diverse crop assemblage including remains of Near Eastern, African, Eurasian, Central Asian, and indigenous crops. The first evidence of cultivation of cotton and its use on an industrial scale already became available between 5000 and 4000 BCE. Well developed methods were used in cotton spinning and fabrication, which continue to be practiced even today.

The early pioneers, responsible for bringing about revolutionary changes in the thinking and living of the people, formed an integral part of the indigenous society (Singh, 2011). The chosen few, on account of their deep insight, were held as the leaders of the society: “world-builders (*bhuta-krit*)”. These “world-builders” often speak like self-chosen representatives of humanity, looking back to the remote past and forward to the distant future. The continuity of the tradition and respect for the early pioneers is obvious from the very first hymn of the Rigveda invoking Agni, the foremost placed deity of the rite (Satawlekar, 1985a):

“Agni, adored by poets of old,
Adored by new poets too;
He will bring us the *Devas* here.”
(Rigveda I.1)

The reference to still older thinkers by our old “*rishis*” (sages) is very noteworthy. They were deeply engaged with and

constantly looking into ‘laws of nature: *Rita*, the Eternal Order’, which imposes order and symmetry on chaos and creates aesthetic form or beauty. *Rita* in its social sense was understood as the fundamental Moral Law which imposes order and symmetry on the life and character of humans (that but for its discipline would have been anarchical) and produces ethical form or goodness. Both the Natural Law and the Moral Law were known as *Dharman* (in later literature, Dharma). For instance, we find such indications in the following prayer:

“Thou who by the law (*dharman*) hast spread about
Flowering and seed-bearing plants and
streams of water,
Thou who generatest the matchless lightning
in the sky.”

(Rigveda II.13.7)

It may be noted that the concern of *rishis* was not only with spiritual issues, but also all-round human development including the satisfaction of worldly desires, achieved through right means. To this end, they engaged into holistic thinking, as will be presented briefly in the following section based on Bose (1966).

The Rigvedic Period (Epoch 3: 6000–4000 BCE)

About a century back, it was not known to the world at large that in different parts of India more than twenty thousand stanzas (or prose units), making four books called “Vedas” (The Book of Knowledge), had been passed on from generation to

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generation for thousands of years through the process of oral transmission, and are still being handed down through the same process. The rise and fall of political powers, external invasion and internal strife, change of language, racial admixture, and the conflict of sects and creeds could not impede this oral tradition. Owing to the deep reverence in which they are held, the Vedic texts have been free from interpolation and corruption. In fact, few old texts in world literature have been relatively free from such intrusions. About this oral tradition, Macdonell (1900) said: “The Vedas are still learnt by heart as they were long before the invasion of Alexander, and could even now be restored from the lips of religious teachers if every manuscript or printed copy of them were destroyed.” What he said then is true even today!

The four Vedas are:

- The Rigveda, divided into ten books (*mandala*) having 1028 hymns (including 11 supplementary ones) and consisting of 10,552 (including 80 supplementary) stanzas.

- The Yajurveda (Vajasaneyi Samhita, Madhyandina text), divided into 40 chapters, having 1975 stanzas and prose units.
- Samaveda, consisting 1875 stanzas – divided into two main sections (*arcika*).
- The Atharvaveda, divided into 20 books (*kanda*) having 730 hymns in 5987 stanzas and prose units.

The Rigveda is divided into eight parts (*ashtaka*). The Yajurveda has five texts of which the Vajasaneyi Samhita consists of pure textual matter while the other four contain some exegesis too. The Rigveda, generally speaking, is the foundation of the three other Vedas. The whole of the Samaveda except 104 stanzas (of which 5 are repetitions) is derived from the Rigveda. The Yajurveda has about 30 per cent of Rigvedic verses and the Atharvaveda, about 16 per cent. There are 63 stanzas common to the four Vedic texts mentioned above. Excluding repetitions, there are some 16,000 *mantras* (hymns) in the four Vedas. The different Vedas were composed in different periods, Rigveda

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being the oldest. For a time people spoke of only three Vedas. The Atharvaveda must have been included at a later stage of the Samhita period.

The sound modulations in the chanting of Vedic words are carefully reproduced in the traditional recitation of the Veda and indicated in printing by special marks. Three accents are shown: *udatta* (raised), *svarita* (sounded), and *anudatta* (not raised). They are, respectively, the high, middle, and low pitch, represented in printing or writing by placing the special mark above the accented syllables in the Samaveda. In the other three Vedas there is no special mark for the *udatta* accent, a vertical stroke is placed above the *svarita*, and a horizontal line below the *anudatta* accent. In the Vedic language every word has its main accent, and words with the same spelling have different meanings owing to the difference in accent (e.g., ‘brahman’ with the accent on the first syllable means ‘prayer’, and with the accent on the second, ‘one who prays’). The Vedic meters form fine musical patterns in which variations of sound and rhythm produce the impression of high-strung poetic eloquence. Syllables grouped into the verse-division called *pada* constitute the metrical base.

The poet and the poetry in the Rigveda.

Who were the *rishis* and what is so special about them? Tripathi (2012) presents the background information eloquently. Here only a summary is presented. According to him, The *Rishi*-poet of the Rigveda is “an arrived sage and an accomplished poet rolled into one”. Vedic poet is a *rishi* who perceives and directly experiences transcendental reality through his inner vision, a vision that transcends both time and space, with the result that he is capable of visualizing the mysteries of the gods and the universe and reveals them to us. His speech is revelation, revelation of the highest spiritual truth. For this unique capability, he is often equated with gods and so the gods with poets. “Our umbilical cord is with gods”, says the poet of Rigveda I.39.9.

A *rishi* is distinguished from others because of his fervency and enthusiasm, has had experience of spiritual rapture, and enlightenment and is inspired to put his experience in words. The Rigvedic poet knows well that unless there is inspiration from above, poetry cannot take shape. *Rishi* is a sage, a person endowed with intuitive knowledge; nothing is hidden from him. He

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is the one who is in direct touch with the supreme powers and receives inspiration from them. Gods are the protectors of *Rita* (cosmic order) which is the source of those laws (*dharmani*) which govern and hold this universe. According to the poets of the Rigveda, the first and the foremost characteristic of a good poetry is its being righteous and in accordance with the cosmic law or *Rita* and it should contain and propagate the truth (*satyam*). A *Rishi* has intimate knowledge of these *dharmani* which he propagates through his sayings. His words and spells have magical effect. He is the one who gets emotionally charged, stirred up, and moved.

This is a considered opinion of many a poet of the Rigveda that only when the poetry emanates from the heart of the poet, it is beautiful enough to touch the heart of the listener and embrace him like a beloved embraces her lover. This is one of the most beautiful depictions of the characteristics of good poetry that one can think of. Unless the poetry touches one's heart and unless it comes from the heart of the poet, it is not exquisite. The poetry of a Vedic seer is, therefore, an expression of his spiritual experience under the inspiration of divinities who impel his *dhiyah* (imaginative and creative faculty) and with whom he identifies himself in the state of divine elevation. There can be no greater proof of the sincerity of this belief than the fact that over thousands of years, hymns have been recited meticulously memorized and passed on by the process of oral transmission, something unique in the world for such a large body of texts!

Some personal impressions of ancient Indian society from a reading of the Vedas. The social system in the Vedic period seems very inclusive promoting specialization and emphasizing due importance of all vocational groups for the advancement of the society. A broad fourfold Vocational Groups were recognized for promoting knowledge and social development. For example, in Rigveda, a poet-*rishi* says:

“I am a bard, Dad’s a physician,
Mummy throws the corn on the grindstone;
Pursuing wealth with varied plans,
We follow our callings as the herdsman cows.”

(Rigveda IX.112)

The society had questioning mind. Initially, Nature was visualized as consisting of several components (or Departments) governed by a domain Deity or a God. With passage of time, the basic unity among natural phenomena was getting realized more and more, leading towards a single entity. Questions were raised even against such acceptance:

“Who, really, knows? Who can here declare it –
Whence was it born and whence come this creation?
The *Devas* are later than this world’s production;
Then, who knows from where it came into being?”

(Rigveda X.129)

Acquisition of wealth by rightful means was encouraged as a goal of worldly life. In contrast, immorally acquired or easy

money was discouraged, as evident from the following hymn:

“Do not play with dice; cultivate thy corn fields,
Delight in the gain, thinking highly of it.
There are thy cattle, gambler, there is thy wife.
So has the noble Savitri himself told me.”
(Rigveda X.34.13)

There is a hymn on treasures:

“Bestow on us, Indra, the best of treasures:
The efficient mind and great brilliance,
The increase of wealth, the health of bodies,
The sweetness of speech and the fairness of days.”
(Rigveda II.21.6)

The purpose of composing hymns by *rishis* seems to be to leave behind systematized knowledge for humanity, initially through oral transmission.

The Bronze Age Civilization (Epoch 4: 4000–3000 BCE)

This epoch was revolutionary in many ways, with particular reference to transport and communication. It has been compared by Singh (2011) to invention of steam engines in the 17th century CE, which was responsible for bringing about the industrial revolution. This development seems to have taken place in all the three regions of the world more or less during the same period. The discovery of copper, followed by wheel, gave unprecedented mobility to people, liberated them from the limitations

of distance and unprecedented possibilities for exchange of knowledge, technology, and commerce. In fact, the Indus-Saraswati Civilization, described in the following section, owes mainly to this revolution.

Yajurveda was the torch bearer of the Rigvedic teachings. It carried forward its messages on two fronts: relation between Man and Gods and that between Man and Man. Towards the concluding part of this epoch, one also finds further realization of single all powerful God overseeing the entire universe. Among others, Yajurveda's main concern was to formalize a system for performance of *yagyas* (including sacrifices) and offering prayer to various gods. An elaborate and mathematically precise procedure was developed for the purpose. This called for development of needed mathematical knowledge (more correctly, geometry) and calendar to plan it very accurately: when and how the ceremony should be performed (Satawlekar, 1985b).

The emphasis on details, accuracy of measurements was a necessary condition for elaborate planning of cities and urban areas in the following epoch. It is very important to demonstrate the continuity of the development from this epoch to the next. Of the 363 excavation sites, located on the Saraswati bank, presently in Pakistan (see Table 3), ninety-nine belong to this period, and 264 to the proper Harappan period, following this period.

Perhaps, a greater contribution of the Yajurveda consisted in its contribution to strengthening of the social order, not exactly

the caste system, but on the need for human resources development to achieve a higher level of productivity than what is possible in a tribe-based society. This was to be achieved in a balanced manner, without attaching status to different vocations. In fact, farmers, chariot makers, and blacksmiths were much in demand during this period and earned also handsome income. The Neolithic village had to sacrifice its highly-prized self-sufficiency. Copper ore is by no means common: the mines are generally located among infertile mountains; very few villages can have had a copper mine in the immediate vicinity. Nearly always the raw material would have to be imported, its regular use involving the organization of a regular supply – trade.

It may be noted that the urban societies are very dependent on trade. Farmers must intensify their production of foodstuffs to support the urban dwellers, specialists engaged in mining, extracting, and working the newly necessary material. So before the end of the 4th millennium BCE the strength of oxen, horses, and asses, and the wheel had provided Oriental societies with the motive power and equipment for land transport which were not superseded till the

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19th century. It is reported that the Indian products reached the world via existing trading networks and foreign crops were introduced to India. Plants and animals – considered essential to their survival by the Indians – came to be worshipped and venerated. One observes a great surge of initiatives, travel to far-off places in this period. The mass production of different goods and services required a high level of technological advancement, an elaborate means of communication, and an effective political or administrative system, not achieved elsewhere in the ancient world.

The following Rigvedic hymn “Sage and the river” composed by the Poet-*Rishi* Vishwamitra, addressed to the River Vipasa, illustrates the long distance movement taking place during those periods:

“Sisters! May you listen well to the poet
Who with wagon and chariot has come from afar,
Bow down quite low, be easy to cross
Stay, Rivers, with your stream below the axles.
Yes, Singer, we will listen to thy words, as
with wagon
and chariot thou comest from afar.
I will bend before thee like a nursing mother,
I will yield to thee as a maiden to her suitor.”

(Rigveda III.33)

The Indus-Saraswati Civilization (Epoch 5: 3000–2000 BCE)

This civilization was discovered by chance! In 1906, few collected seals during road

building, caught the attention of the Director General of the Archaeological Survey of India, John Marshall. He ordered an excavation, where the first seal had been found. What was discovered led to rewriting of world history. Marshall's team found at Harappa the remains of an enormous city and went on to find many others nearby, all dating between 3000 and 2000 BCE. This took Indian civilization much further back in time than anyone had previously thought. It became clear that India was land of sophisticated urban centers, trade and industry, and even writing. It was ranked as a contemporary and equal with ancient Egypt or Mesopotamia civilization and it had been totally forgotten! The largest of the Indus Valley cities, such as Harappa and Mohenjo-daro, had populations of 30,000 to 40,000 people. They were built on rigorous grid layouts, with carefully articulated housing plans and advanced sanitation systems that even incorporated home plumbing; they are a modern town planner's dream. The architect Richard Rogers (quoted in MacGregor, 2010) admires them greatly:

“When you are faced with a piece of ground where there are few limiting constraints, there are not many buildings and it's a sort of white piece of paper, the first thing you do is start putting a grid on it, because you want to own it and a grid is a way of owning it, a way of getting order. Architecture is really giving order, harmony, beauty, rhythm to space. You can see that in Harappa; that's exactly what they're doing. There's also an aesthetic element with it, which you can see from their sculpture – they have an aesthetic consciousness, and they

also have a consciousness of order, and a consciousness of economy, and those things link us straight over the 5,000 years to the things that we are doing today.”

“Whereas in Egypt and Mesopotamia, the leap from village to city usually required one dominant ruler, with authority to coerce and deploy resources; just who ran these highly organized Indus Valley cities remains unclear. There is no evidence of kings or pharaohs – or indeed of any leader at all. What's left of these great Indus cities gives us no indication of a society engaged with, or threatened by, war. Not many weapons have been found, and the cities show no signs of being fortified. There are great communal buildings, but nothing that looks like a royal palace, and there seems to be little difference between the homes of the rich and the poor. It seems to be a quite different model of how to create an urban civilization, without celebration of violence or extreme concentration of individual power. Is it possible that these societies were based not on coercion but on consensus (MacGregor, 2010)!”

The Indus-Saraswati Civilization was earlier called simply as Indus Civilization.

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The renaming is based on discovery of a civilization in a wide geographic area much beyond the core Indus Valley, where Mohenjo-daro, Harappa, and the third urban center of Ganweriwala are located. It reached as far north as Badakhshan in northern Afghanistan and southwards along the Arabian Sea coast of Pakistan and Western India, a spread over a large territory, not ever achieved by any other civilization of the ancient world.

The mighty civilization during the period (~3000–2000 BCE) has a staggering dimension: Baluchistan alone has 129 sites against 108 in Sind, where Mohenjo-daro is located; Gujarat has 310, while the Saraswati basin has 360 – four times as many as Sind (Fig. 4). Equally staggering is the sudden decline of this civilization. What caused its rise does not seem to be well documented so far and the same can be said about its sudden fall! The illustration has been chosen because even this part of now well-founded history of our country is described in a very speculative manner: full

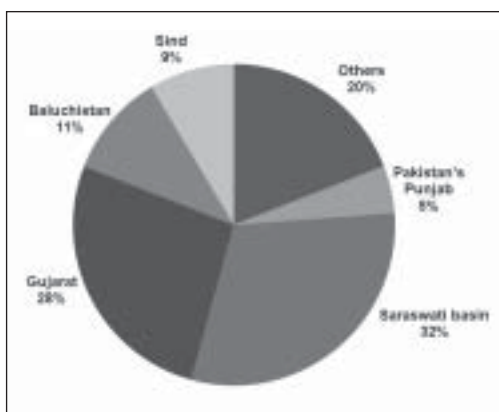


Figure 4. Distribution of Mature Harappan sites by region (Source: Danino, 2010).

of uncertainties and lack of critical analysis. A system approach is expected to provide a more connected account. This way the predictive function of system theory can profitably be utilized.

The most remarkable feature of town planning evident in Mohenjo-daro is the precise manner in which the city is divided into streets and lanes and lined with public and private buildings with an elaborate drainage system. The long life span of the Harappan cities and towns, their growth and proliferation mostly in the flood plain, clearly demonstrates availability of sufficient economic resources and surplus which were mobilized to construct huge fortifications and public buildings on artificially raised platforms of earth, and technology for effective utilization of the riparian environment to support growing numbers of permanently settled human population and inducing the rise and development of interrelated socioeconomic, political, and religious institutions. A network of inter-settlement trade and exchange of knowledge must have been in place in the Greater Indus Valley. Many well-planned streets and a magnificent system of drains, regularly cleared out, reflect the vigilance of some regular municipal government. Its authority must have been strong enough to secure the observance of town planning bylaws and the maintenance of the approved lines for streets and lanes over several reconstructions rendered necessary by floods.

In any case, society in the Indus Valley could agree upon a conventional script and numeral notation (on a decimal basis),

and on standards of weights and measures (different from the Sumerian and Egyptian). The script was current throughout the huge province of Indus Civilization. Its characters are conventionalized pictograms like the hieroglyphic, early Sumerian, and proto-Elamite writings, though quite distinct from these. The values of the characters, whether ideographic or phonetic, and the meanings of the words they transcribe are not deciphered till date. Only brief inscriptions, too short for decipherment without a bilingual but most probably incantations, survive mostly on 'seals' which were never used for sealing anything and were perhaps just carried as amulets. Of course the letters were not invented for this purpose, but the documents for which they were primarily devised have perished with the material on which they were written.

Its antiquity can be determined solely by the importation of Indus products into Mesopotamia during the 3rd millennium BCE. Nevertheless, since Indus manufactures were imported into Sumer and Akkad, and Indus cults were actually celebrated there, the forgotten civilization must have made direct, if indefinable, contributions to the cultural tradition we inherit through Mesopotamia. Moreover, the technical traditions of the Bronze Age craftsmen persist locally until today. Fashions of dress, established in the Indus cities, are still observed in contemporary India. Hindu rituals and deities have roots in the cults depicted in the prehistoric art. So classical Hindu science too, and through it Occidental science, maybe indebted to the prehistoric era to an unexpected degree. From this standpoint the Bronze Age civilization of

India has not utterly perished, 'it continueth far beyond our knowing'.

The Vedic scholar Dr Bhagwan Singh (2011) speaks about "Rigvedic Harappans: Their roots and legacy", calling it "incorrect ... to hold Aryan-speaking branch to be the sole author of Indus-Sarasvati civilization". According to him, there were three major cultural strains – Aryan, Dravidian, and Mandari – groups involved in the development of the language and culture. On the website, there is a mention of 48 principal tribes in the Vedic period with population of each varying between 5000 and 7000 people living in the region. If we would include other tribes not listed, the total number must be over hundred.

The external intrusions have been always occurring in the country off and on, and they seem to have enriched, but not altered the broad course of ancient Indian history. The Aryan Invasion theory is a subject of controversy as the term "Aryan" itself. The global DNA mapping, as mentioned earlier, shows that South Asian gene pool is essentially unchanged, since 10,000 BCE. There are no signs of significant gene inflow. In terms of the ethnic composition, the past may not be much different from the present.

An assessment of the Indus Civilization. This assessment is based on Mughal (1988, 1990, 2010). South Asia's first civilization known as the Harappan or Indus Civilization was already flourishing by the middle of 3rd millennium BCE within the vast area of the Greater Indus Valley drained by the Ghaggar-Hakra and Indus river systems of

The Indus-Saraswati Civilization was earlier called simply as Indus Civilization. The renaming is based on discovery of a civilization in a wide geographic area much beyond the core Indus Valley, where Mohenjo-daro, Harappa, and the third urban center of Ganweriwala are located. It reached as far north as Badakhshan in northern Afghanistan and southwards along the Arabian Sea coast of Pakistan and Western India, a spread over a large territory, not ever achieved by any other civilization of the ancient world.

Pakistan. Best known from its extensively excavated two principal urban centers at Harappa on the Ravi River where it was first discovered and recognized, and at Mohenjo-daro on the bank of the Indus, it is marked by many a unique and distinct feature among its contemporaneous civilizations of the Nile and Tigris-Euphrates Valleys.

The neighboring rural regions served for the procurement and supply of raw materials and distributions of finished articles. Possessing the essential elements of full urbanization, the Harappan society was sharply stratified as would be evident from the varying size of private houses and differences in their grave furniture and modes of burials. Specialized craft activities involved manufacturing of shell, faience and terracotta bangles, flint knapping, beads, pottery, seal cuttings and gravings, melting of copper and manufacture of metal utensils. The glyptic and representational arts were well developed and numerous

cultic objects are indicative of formal role of religion (Fig. 5).

Disappearance of the River Saraswati.

A major natural disaster seems to have occurred around 2200 BCE, which brought this mighty civilization to an abrupt end. The River Saraswati dried up; the cities turned into mounds of earth, and even the memory of this, one of the great early urban cultures of the world, vanished without leaving any clue. We can only hazard guesses as to why. The need for timber to fire the brick kilns of the huge building industry may have led to extensive deforestation and an environmental catastrophe. More importantly, climate change seems to have caused tributaries of the Indus to alter their course or to dry up completely, destroying agriculture and its support to cities.

Satpath Brahman (dated around 2200 BCE) mentions Videgha Mathava, the king of the Videhas, accompanied by his priest Gotama



Figure 5. Dholavira's signboard and excavation at Bhirrana (Source: Archaeological Museum, New Delhi, India).

Rahugana, carrying the sacrificial fire from the bank of the Saraswati over Kosala (Oudh) eastwards across the Sadanira (perpetual water stream), and establishing a settlement which was known as Videha (Tirhut) after the tribal name of Mathava. The Videhas rose into eminence later through their philosopher King Janaka who was a leading patron of the Vedic Philosophy.

The disappearance of Saraswati, the most splendid river of the Vedic times, seems to have been caused by a multiplicity of factors such as climate change and tectonic upheavals resulting in river piracy: Jamuna changing the course as a tributary of Ganges and Sutlej to Indus. Two recent books provide a detailed account of the event: “The Lost River: On the Trail of the Saraswati” (Danino, 2010) and “Vedic Saraswati” (Radhakrishna and Merh, 2002). Further evidence (see Figure 2) comes from an observation of water table in a lake of Rajasthan over time, in particular, after 2000 BCE (Wasson, 1983). Figure 2 shows significant reduction in water level of the lake after 2000 BCE.

Greater aridity in the region, arising out of climate change, seems one of the probable reasons. Some studies suggest tectonic upheavals, as a factor to deflect Sutlej and Yamuna water away from Saraswati (Valdia, 2013). This is a highly controversial issue, which we will not further take up. We need to know more about such catastrophic events. We just have to wait. But, the disappearance of these flourishing urban settlements in a short span of time is an uncomfortable reminder of fragility of our own city life – indeed our whole civilization.

Eastward Expansion of the Culture (Epoch 6: 2200–1200 BCE)

There are evidences that the Harappan heritage in the city planning continued and grew during this epoch: Dholavira’s dimensions are 771 m × 617 m, while Kampilya’s (Drupad Capital during the period) are 780 m × 660 m (respectively 1 per cent and 7 per cent greater). The Shatapatha Brahmana describes the trapezoidal sacrificial ground, the *mahavedi*, where the fire altars are located (Fig. 6), with its western side thirty steps long while the shorter eastern side is twenty-four steps – a proportion of 1.25 or 5:4. The seat of the “gods” is rectangular in shape, that of ancestors is a semi-circle while that of

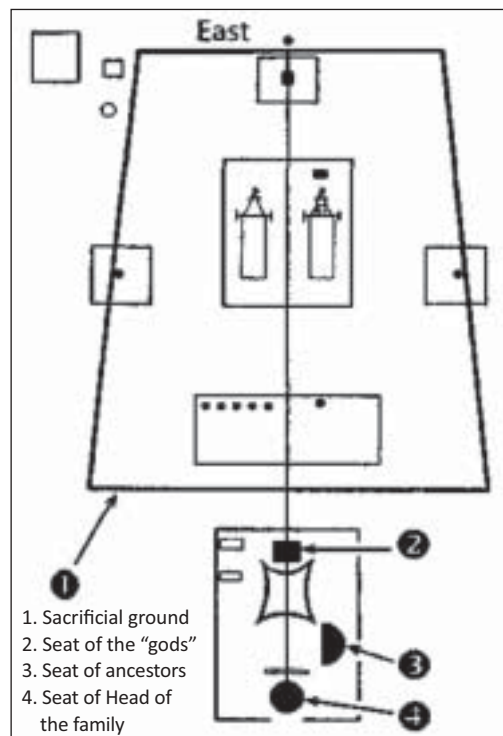


Figure 6. The *mahavedi*: the sacrificial ground (Source: Danino, 2010).

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Head of the family is circular in shape, all in geometrically fixed locations.

Table 3 gives overall increase in the number of sites during two periods: from 1140 sites during Mature Harappan (2500–1900 BCE) to 1602 sites during Late Harappan (1900–1300 BCE), showing 40% increase! Table 3 shows that the Saraswati Basin contributed highest number of sites in the Late Harappan period (viz., 1378), higher than all other subregions during the same time. The Indus subregion (in Pakistan) contributed only 12. This establishes a definitive eastwards movement of the culture. This subregion also became the seat of the cultural advancements under the leadership of the Kuru-Panchal tribes. They ruled for several generations, and are reported to have performed model *Rajasuya Yagyas*, spoken the best language (Sanskrit), and contributed significantly towards cultural advancements (Majumdar *et al.*, 1996). There is evidence of highly systematized and rational medicinal plants collection/cultivation and their use (c. 1000 BCE) found in the Ghaghra Valley of eastern Uttar Pradesh deciphering the meaningful perspective of medicinal

history in the Indian archaeological context. Atharvaveda contains documentation of substantial medical knowledge.

Lord Rama belongs to this epoch. He lived in Ayodhya around 1950 BCE. His singular contribution lay in establishing social and cultural order during 14 years of exile; and later by setting an example of a Model Rule (Ram Rajya). His life has been penned down in an epic form by the Poet-*Rishi* Valmiki (Majumdar *et al.*, 1996).

Lord Krishna lived 500 years thereafter, around 1400 BCE, in *Dwarika* and played a decisive role in victory of Pandavas in the Mahabharata war, described in the form of an epic poem “Mahabharata” by Sage Vyas. Gita constitutes a chapter of this great epic. Incidentally, Ramayana and Mahabharata are among the earliest examples of Sanskrit literature and Indian cultural heritage.

Speculations on the mysteries of the world and their mystic explanations and interpretation of the Vedic rituals are available in the texts called *Aranyakas*. ‘*Aranya*’ means forest and the texts containing philosophical speculations of the forest-dwelling hermits are *Aranyakas*. The *Aranyakas* are precursors of the Upanishads and provide the fundament on which the magnificent edifice of the Upanishads is built. Another expression for *munis* (ascetics) living in forests mostly as single, observing celibacy, and subsisting on the products of the forest is *Vaikhyanasa* about whom the Mahabharata says that they live upon the fruits of the forest, flowers, roots, or bulbs of the plants. They are persons of very strong will. Many such *munis* had

Table 3. Eastwards expansion of the Indus-Saraswati sites in different periods.¹

Regions	Early Harappan (3200–2600 BCE)	Mature Harappan (2500–900 BCE)	Late Harappan (1900–1300 BCE)	All periods
Saraswati Basin	640	360	1378	2378
Uttar Pradesh	2	32	10	44
Himachal, Jammu and Delhi	1	0	4	5
Gujarat	11	310	198	519
Indus Basin (Pakistan)	385	438	12	835
Total	1039	1140	1602	3781

1. Source: Danino (2010).

academies in their ashrams where even princes were sent to learn the scriptures and principles of state administration. Often the difference between a *rishi* and a *muni* is totally blurred and sometimes the *munis* are also designated or even addressed as *rishis*.

Most of Brahmanas and Upanishads were composed in this epoch. *Rishi* Vedvyas edited the differing versions of the four Samhitas maintained by “*Shakhas*” (theological schools that specialize in learning certain Vedic texts) and gave them a definitive form. The spirit of sincerity and respect permeates throughout varying strata of the society about these philosophical writings. The knowers are as earnest in their search after truth as the ignorant are anxious to know what is beyond. All distinctions of caste, social status, and earthly power are set aside when the highest knowledge is to be sought.

“May He protect us both (teacher and taught).
May He cause us both to enjoy the bliss of *Mukti*.”

May we both exert to find out the true meaning of the Scriptures.
May our studies be fruitful. May we never quarrel with each other.
Om Peace Peace Peace.”

“Arise, awake, and learn by approaching the excellent ones.
The wise ones describe that path to be as impassable as a razor’s edge, difficult to tread on.”

The story of Nachiketas who prefers the knowledge of the ultimate reality to the pleasures of long life, long progeny, and immense wealth and power is the best illustration to the point. Says he:

“Ephemeral things! That which is a mortal’s,
O End-maker,
Even the vigour (*tejas*) of all the powers,
they wear away.
Even a whole life is slight indeed.”

“This, in truth, is the boon to be chosen by me ...
This thing whereon they doubt, O Death:
What there is in the great passing on – tell us that!”

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This earnest desire to know the truth above all is quite in keeping with what was regarded as the highest object of life in those days, viz., striving after reunion with the Brahman. The only means to achieve it was to realize the identity of the soul with the Brahman.

From accession of Parikshit to Alexander Invasion of India (Epoch 7: c. 1200–300 BCE)

The Mahabharata war constitutes a watershed in the history of India. It was preceded by endless intrigues over a generation and resulted in great loss of life in the fratricidal warfare between Kauravas and Pandavas. Just after the war, there was infighting within the members of Yadava clan, which Krishna could not prevent, resulting in near total annihilation of men-folk. As Abhimanyu had been killed in the war, his son Parikshit was anointed as the King. The transition was smooth and he is said to be a good king of a kingdom extending from Ganges to Saraswati (Majumdar *et al.*, 1996).

The trend towards increasing urbanization produced a natural reaction of retreat to forests for deep meditation. There were also some parts of the sacrificial lore which were of an occult and mystical nature and which could be imparted to the initiated only in the privacy of the forest. Meditation, rather than performance, is the spirit of their teaching, and they naturally substitute a simpler ceremonial for the complicated one of the Brahmanas. One cannot definitely say whether the theory of the *Asramas* was deliberately formulated by Brahmanism with a view to accommodate the new doctrines that were raising their heads against the older canon of the Brahmanas and the philosophy of the sacrifice. But it must be admitted that the *Aranyakas* or "Forest-texts" came in exceedingly handy, as ideally suitable Vedic texts for the daily study of the forest-hermits, as distinguished, on the one hand, from the student and householder who could do justice to the cult of the Vedic sacrifice set forth in the Brahmanas, and on the other, for the ascetic.

During greater part of this epoch, Northern India was divided into a large number of kingdoms "*mahajanapadas*" (literally "great kingdoms") and, so far the present knowledge goes, no paramount power arose within this long period which could effectively exercise its supremacy over all or even a large number of them. One may dimly discern the struggles for supremacy, but there was no substantial effort towards the political unification of India. In spite of political fragmentation, the cultural developments went ahead unabated, thanks to the well-established "*Guru-Shishya Parampara*". Each Veda had a number of *Shakhas* (branches): 21 in Rigveda,

9 in Yajurveda, 1000 in Samaveda, and 50 in Atharvaveda; and each branch had one Upanishad. The total number of Upanishads listed is 108; the 10 most important Upanishads are: (1) Isa, (2) Kena, (3) Katha-(valli), (4) Prasna, (5) Mundaka, (6) Mandukya, (7) Taittiriya, (8) Aitareya, (9) Chhandogya, and (10) Brihadaranyaka (Swami Shivananda, 1985).

Besides spiritual knowledge, a body of literature called Vedanga (limbs of the Veda) developed, considered essential for the study and understanding of the Vedas. They included:

1. *Shiksha*: phonetics, phonology, and morphophonology (*sandhi*)
2. *Kalpa*: ritual
3. *Vyakarana*: grammar
4. *Nirukta*: etymology
5. *Chandas*: meter
6. *Jyotisha*: astrology

Traditionally, *Vyakarana* and *Nirukta* are common to all four Vedas; while *Shiksha*, *Chandas*, *Kalpa*, and *Jyotisha* texts are specific to each Veda. India's most ancient texts of geometry and algebra, the *Shulba-sutras*, made significant progress in giving detailed instructions on the construction of multilayered altars in terms of precise linear equations showing the continuity of culture. Panini's contribution (*Ashtadhyay*) to Sanskrit Grammar, compiled during 800–700 BCE, is among the greatest intellectual achievements of any ancient civilization. From his research on the spoken language, covering all parts of India then known, very useful information on the politics and economy and culture of the country can be derived (Agrawala, 1996).

This epoch is also characterized by out-of-line reformist thinking in the field of religion (“rituals”) pioneered by Mahavira (599–527 BCE) and Gautama Buddha (594–514 BCE). Some historians describe their “preaching” as a counter movement against the Brahmanic orthodoxy and ritualism. However, it may be noted that the monastic way of life and rituals were practiced side by side at all times in India, even in the Vedic age. Monasticism was not invented by Buddha. We know the names of a number of eremites whom Buddha visited and stayed with before he embarked upon his own meditative practices in the quest of fulfillment. It could be best described as an evolution of the Vedic thoughts (Tripathi, 2011).

Alexander's invasion of India in 327 BCE has been included in this connected account as it constitutes (perhaps, the first!) precisely dated event in the ancient history of India and owes that to foreign sources! Our ancient history, as the author has tried to present, has great significance not only for our national unity and development, but constitutes a major contribution to human thinking. Every Indian must know the height of cultural

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advancement made by our ancestors at the dawn of human civilization. If Ambhi of Taxila “serves as the first recorded instance of an Indian king proving a traitor to his country”, Porus provides a perfect example of a Kshatriya king upholding the “Dharma of a Kshatriya to fight and embrace the consequences” (Keay, 2000).

Other holistic accounts of ancient Indian history

The study has made an effort to research and assemble a vast amount of knowledge and develop a connected account of ancient history of India. There are two other initiatives, which weave a holistic, but a coarser, view of the ancient history. These will be presented briefly here, viz., one by Tilak (1898) using astronomical data and the other by Radhakrishna and Merh (2002) using geological/climatic data.

Astronomical data

Lokmanya Tilak (1898) introduces his approach with the following statement: “The astronomical method, I admit, is vague in so far as it does not enable us to determine the exact date of all the Vedic hymns or works, but it is certainly superior to linguistic method in as much as it supplies us with certain definite, undisputed facts, for instance, the position of the equinoxes, which can safely be made the nuclei of the different periods of antiquity.”

On the basis of the evidence furnished in different Samhitas and Brahmanas, Tilak developed a chronology for the Vedic literature briefly described here.

The Aditi Period (6000–4000 BCE). The oldest period in the ancient civilization may be called Aditi or the Pre-Orion period, which, according to Tilak, can be placed in the 6000–4000 BCE time bracket.

The Orion Period (4000–2500 BCE). This period starts from the time when the vernal equinox was in the asterism of *Ardra* (Orion) and continues up to the time when it receded to the asterism of *Krittika*. This, according to Tilak, was the most important period in the development of the Aryan civilization.

The *Krittika* Period (2500–1400 BCE). This period begins when the vernal equinox was in the asterism of *Krittika* and continues up to the period recorded in the *Vedanga Jyotish*. It was the period of the Taittiriya Samhita and many of the Brahmanas were composed during this period.

Pre-Buddhist Period (1400–500 BCE). This was the period when the Sutra (*Vedanga*) literature was composed.

Tilak further concludes: “Thus we find that of all the ancient nations the Hindus alone had well nigh accurately determined the rate of the motion of the procession of the equinoxes.”

Climatic and geological data

In a Seminar organized by the Geological Society of India, authors presented major events of ancient Indian history in a chronological manner matching with records of climate and geology in the form of a memoir with the title: Vedic Saraswati (Radhakrishna and Merh, 2002) (Table 4).

Table 4. Chronology of events in ancient India.¹

Date	Event
0 BCE	Climate as at present: Asokan edicts (270 BC) – oldest Indian script; death of Buddha (487 BC); spread of Buddhism and Jainism; continuing urbanization and growth of cities
1000 BCE	Iron age: Saraswati, a lost river
2000 BCE	Intense aridity: Great famine – movement of population eastward to Uttar Pradesh, Bihar (<i>Kuru, Panchal, Magadha</i>) and South (<i>Konkan</i>); end of Indus Valley Civilization
3000 BCE	Indus Valley Civilization (3000–1900 BCE): First sign of writing: Indus-Saraswati script; expanding agriculture; urbanization; drying up of river Saraswati (Ghaggar-Hakra-Nara) (2000–2500 BCE); people shift to Indus Valley; tectonic disturbance – capture of upper waters of Saraswati by Yamuna and westward migration of Sutlej
4000 BCE	End of wet climate: Commencement of aridity
5000 BCE	Wet climate with abundant fresh water: Flowering of Vedic civilization (6000–4000 BCE); lakes with high water levels
6000 BCE	Saraswati and its tributaries flowing in full majestic splendor: Stimulating environment; dawn of agriculture; village communities settling on banks of river; cattle rearing
7000 BCE	Wet spell – breakup of Himalayan glaciers: Release of <i>Sapta-Sindhu</i> ; mighty Himalayan rivers; massive river capture; emergence of Saraswati as major river of Northwest India
8000 BCE	End of aridity: Increase in rainfall; rapid rise in sea level
9000 BCE	Indian continent peopled by hill tribes: Proto Australoids, Veddoids, forest dwellers, hunter; Late Stone Age (?)
10,000 BCE	End of Pleistocene Ice Age

1. Source: Radhakrishna and Merh, 2002.

In broad terms, findings of the present study are in agreement with the chronological sequence of the above two narratives.

Concluding observation

Convergence of evidence from three independent sources lends credence to the use of system approach to writing of history, in particular, where available information

is often fragmentary and contradictory, as exemplified in ancient Indian history.

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There are many sources of ancient Indian history. The most important ones are the following in no particular order: Literature: Both Indian and foreign literature. For example, Puranas, especially Bhavishya Puran gives an idea of early Indian kingdoms though it is not that accurate. Arthashastra written by Chanakya throws light on administrative aspects of Mauryan Empire. There are several other literatures that have historical value. Request PDF on ResearchGate | On Jan 1, 2015, Karan Deo Singh and others published A Connected Account of Ancient Indian History using a System Approach. We use cookies to make interactions with our website easy and meaningful, to better understand the use of our services, and to tailor advertising. For further information, including about cookie settings, please read our Cookie Policy . By continuing to use this site, you consent to the use of cookies. Got it. We value your privacy. We use cookies to offer you a better experience, personalize content, tailor advertising, provide social media features, and better understand the use of our services. To learn more or modify/prevent the use of cookies, see our Cookie Policy and Privacy Policy. Changing Interpretations of Early Indian History. i. The founding of the Asiatic Society of Bengal in 1784 provided an institutional focus for scholars working in a number of related fields such as textual study, epigraphy, numismatics, and history. Consisting of 8 cantos, each called a "taranga" (wave), it gave a connected account of the kings of Kashmir from the early ones of the legend to the historical rulers of the 12th century. ii. He is often described as India's first historian. Also asserts in Rajatarangini that a person who recounts the events of the past must do so like a judge, without bias or prejudice. marital status, varna, and ashrama. The ashrama system divided the life of a male dvija into 4 stages "brahmacharya, grihastha, vanaprastha, and sanyasa.