EVOLUTION OF INDIA'S CULTURE

Pre-History to 1947AD

(a project of India Discovery Center)

India Discovery Center

PREFACE

India is the home of deep-rooted traditions in her culture. People and nations in the world have changed in time, India has only "evolved" in time. The foundation of the culture was set some five thousand years ago with an empirical thought that life has a purpose and that the purpose is contained in duties to preserve the universe. The question is not how the universe came to be, but the universe "is", "it exists". Accepting this existence as the truth, massive literature was created and a society of mutual dependence evolved. Scholars and mystics took clues and created rules of conduct which spread as religions. The security of India remained defined with the universality of life. Offering respect and shelter to all objects, both living and nonliving, became the Indian creed.

India's cultural history has been narrated and commented by travelers, historians and philosophers in various centuries either through scholarship or through government sponsorship. Rarely people of Indian origin left the shores of India to live freely in a foreign country as with the immigration to the US in the second half of the twentieth century. The book at hand is a token of contribution by a group of Immigrants in New England to review their distant land from the new perch as to be told to their children. It can be a source and a resource for adults in their quest to discover India or rediscover their roots and heritage in a changing world. The book is produced as an exploration of self-identity by each of the contributors in their area of expertise. It is organized in six parts: (i) Geography and People, (ii) Art and Culture., (iii) Language and Literature, (iv) Philosophy and Religion, (v) Science and Technology and (vi) Economy and Politics.

We will be most grateful to receive any comments and feedback on our effort. We acknowledge the help and support of scores of volunteers and well-wishers in the work. We offer the book with love and affection to the children and the young adults of the world!

Bijoy M. Misra
President
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Lincoln, Massachusetts, USA
https://www.indiadiscoverycenter.org

ACKNOWLEDGEMENTS

India Discovery Center was formally organized as a non-profit educational organization in December 2014. We thank Counsel Siddhartha Pattanayak and IDC Director Mr. Praveen Sahay for the initiative.

IDC seminar series to explore India's cultural history commenced in July 2016 and continued till November 2019. Ms. Swati Dave, Ms. Shraboni Bandyopadhyay, Mr. Jaspal Singh, Dr. Chandrika Govardhan, Dr. Krishna Gazula, Mr. Sanjeev Tripathi, Dr. Reshma Ghanekar, Ms. Paromita De, Mr. Prem Nagar, Mr. Vrittamani Ramapriya, Dr. Bijoy Misra, Mr. Raghavendra Sarangpurkar, Dr. Hemendra Acharya, Ms. Srilakshmi Srinivasan, Dr. Satyendra Sharma, Dr. Arun Karna, Ms. Hardeep Mann, Dr. Krishnakali Dasgupta, Ms. Bhavani Venkineni and Dr. Jaidev Dasgupta have contributed to the effort through research and presentation at the seminars. We offer our deep gratitude to the set of volunteers who molded the massive task into a tractable project. The presentations can be downloaded from https://www.Indiadiscovery.org/Presentations

Dr. Krishnakali Dasgupta and Dr. Sayantan Bose helped organize a Facebook essay program to help disseminate the research information to young adults. The program started in October 2020. The essays became popular with a wide following. This book is an outcome of these essays. The Facebook link is https://www.facebook.com/profile.php?id=100063673653917 We are thankful to Dr. Dasgupata and Dr. Bose for their help. Their essays are a part of this book.

Mr. Leo Rosseau helped capture the videos of all lectures. Mr. Maneesh Srivastava and Mr. Sudhir Patel helped to edit and produce the videos for education. We are grateful to their work. The videos are available for view and download at https://www.youtube.com/@indiadiscoverycenter2438

Dr. Sonal Jhaveri of Dana Farber Cancer Institute, Boston, MA, helped edit all articles and Sri Prem Nagar checked the pictures and the references. Professor Alekha Chandra Nayak from Ravenshaw University, India, helped review the material and Professor Sampadananda Mishra from Rishihood University, India, helped with the Introductions. Mr. Deepak Mondal from Ahmedabad, India, helped with the graphics preparations.Mr. Sudhir Patel from Pune, India, helped produce this e-book. We express our gratitude to these friends.

We have utilized resources from Wikipedia and various other publlic websites. Each author has acknowledged the material in the reference section of the article. We express our sincere appreciation for all research work.

We express our deep gratitude to all.

Hemendra Acharya, Sayantan Bose, Krishnakali Dasgupta, Hardik Dixit. Bijoy Misra, Prem Nagar, Rita Pandey, Satyendra Sharma

EVOLUTION OF INDIA'S CULTURE

A compilation by

India Discovery Center, Inc.

Lincoln, Massachusetts, USA

First Edition

Published, June 2023

https://www.indiadiscoverycenter.org

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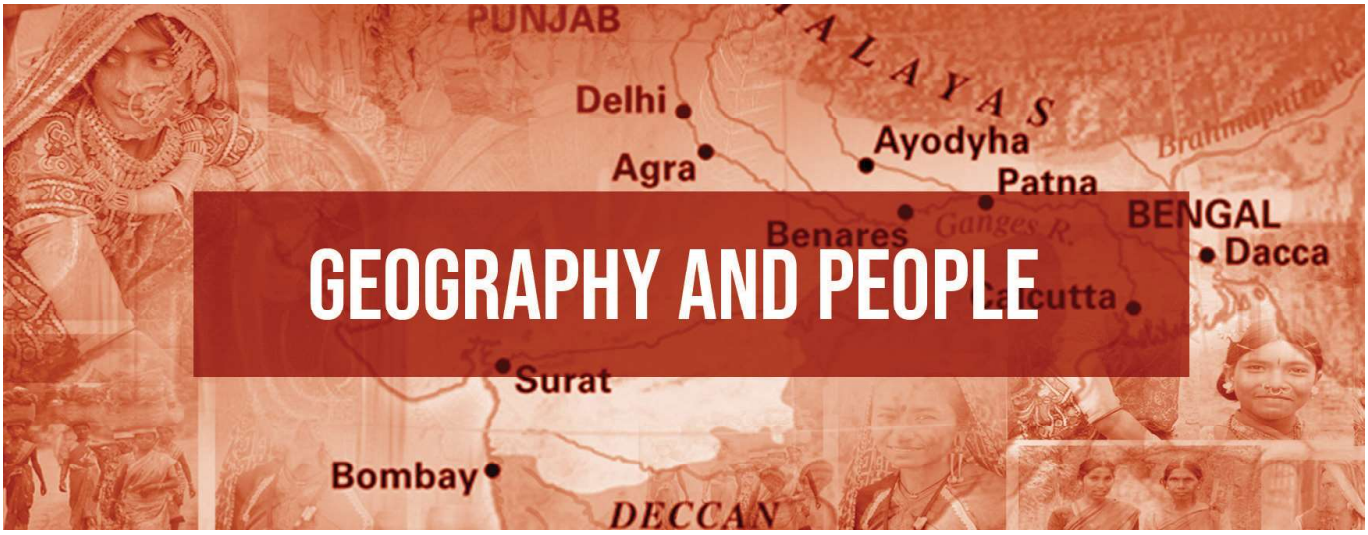
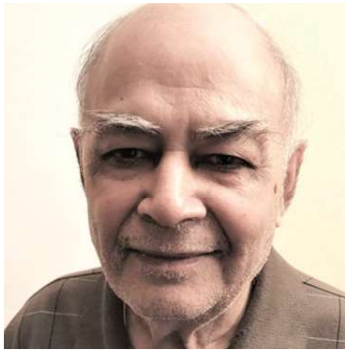


TRACK 1

Contributors

Sayantan Bose specializes in the study of viruses and develops antiviral therapeutics. He served as a Research Fellow at Harvard Medical School, Boston. Currently, he serves as Director, Discovery Project Leader at GlaxoSmith Kline, Inc. He has authored several scientific papers and acts as a reviewer of manuscripts for the research journals. He takes a syncretic view of the Indian subcontinent to understand the migration and the settlement of people, the rivers and the mountains, the food habits and agriculture.



Hemendra Acharya is a Geophysicist and Environmental Scientist. His great grandfather as well as the great uncle were Indologists. He had been a regular columnist for the e-paper India New England News for several years commenting on Indo – US relations. He enjoys exploring the contributions of India and Indians to the world. As a family tradition, he takes up the task of educating people about the heritage and culture of India.

1.0 Geography and People: Introduction

The evolution of Indian culture is an intricate tale of human migration, political, social, and religious divisions. It is an interplay between people and their environment.

An examination of Prehistory and the Indus Period, through the migration patterns of Homo sapiens in the Indian subcontinent and the environmental factors that drove this migration is helpful before one dived deep into the other facets of Indian Civilization. One needs to delve into the evolution of the Harappan civilization, its distinct mixture of the first Out of Africa humans and subsequent Central Asian agriculturalists. We explorethe potential reasons for the Harappan civilization's decline and abandonment of the major cities.

Moving forward in time, India's Vedic Period (2000 BCE - 700 BCE) helps us unpack the habitation geography of India during the Vedic period while discussing the principle of Rta, which led to the creation of a structured society, called Varna. The latter centered around Vedic rituals and designated skilled groups. Vedic culture spread to South India.A hybrid culture emerged in the south.

Urbanization with large kingdoms known as MahaJanapadas developed during the Classical Period (700 BCE - 200 BCE). The period exhibited coexistence of belief systems with individual liberty in faith and a patriarchal joint family system. Children could receive education through the residential schools. Massive construction projects with stone carvings changed the landscape. People were active in literature, music, art and theatre.

Heralded as the Golden Period (200 BCE – 500 CE), the Gupta Empire teaches us India's peace, prosperity, and intellectual growth. Takshashila, the world's oldest university, drew students from all around the world. India's culture and influence spread to Central and southeast Asia and the Pacific Islands. Religious coexistence and literary excellence suggest a society of opulence and affluence.

Moving further we see India's Hindu Period (500 CE - 1500 CE), the decline of Buddhism, rise of Monism under Adi Shankara. The Islamic invasions brought in the new faith system to the subcontinent. Despite the devastation caused by the invasions, we find flourishing economy, industry, trade, arts and culture. We learn of the powerful Hindu kingdoms of Champa, Java, and Kambuja in Indo China and Cambodia during the period.

The Mughal- Maratha Period (1500 CE - 1800 CE) witnessed the rise and fall of the Delhi Sultanate and the establishment of British colonial rule. Here what one needs to highlight are: India's agricultural expansion, the role of women in the workforce, and the emergence of new social classes in India. Arabic influence on language, manners, dress and cuisine changed the traditional pattern in a significant manner.

The British Period (1800CE - 1947CE) has been unfortunately very unkind to India. The agriculture was commercialized with massive exports abroad. People were hit with starvation and famines. The indigenous textile industry was dismantled causing unemployment and poverty. Indian people finally rose under the leadership of Mahatma Gandhi to gain freedom. British rule engineered religious divisiveness. In 1947, India was partitioned into two countries. Massive unrest and bloodshed followed.

1.1 Geography and People: India Prehistory and Indus Period (7000BCE -2000BCE)

Dr. Sayantan Bose

Around 45,000 years ago, the presence of hominid species like *Homo erectus* and *Homo habilis* had all but disappeared from the Indian subcontinent. *Homo sapiens* or Anatomically Modern Man (AMM) became the sole species that established itself throughout India. The lack of fossil evidence makes it difficult to map the exact spread of *Homo sapiens* within India, but the absence of 'haplotype nesting' (localized genetic diversity) and a relatively rapid spread of M-haplotype genomes, suggest that *Homo sapiens* spread briskly through central and southern India.

In fact, this spread was so rapid, aided by relatively lush vegetation, harboring abundant game for food – that a 2009 study suggests that between 45,000 to 20,000 years ago most AMM in the world lived in South Asia. Animals like antelope, bison, tiger, rhinoceros and even ostrich (presence of eggshells) roamed, which likely became extinct later. The concurrent ice age that worsened climates in the northern regions dried up snow-fed rivers and changed their courses. It was one of the major driving forces behind this extensive migration into the Indian peninsula and Deccan plateau (Figure 1.1.1).

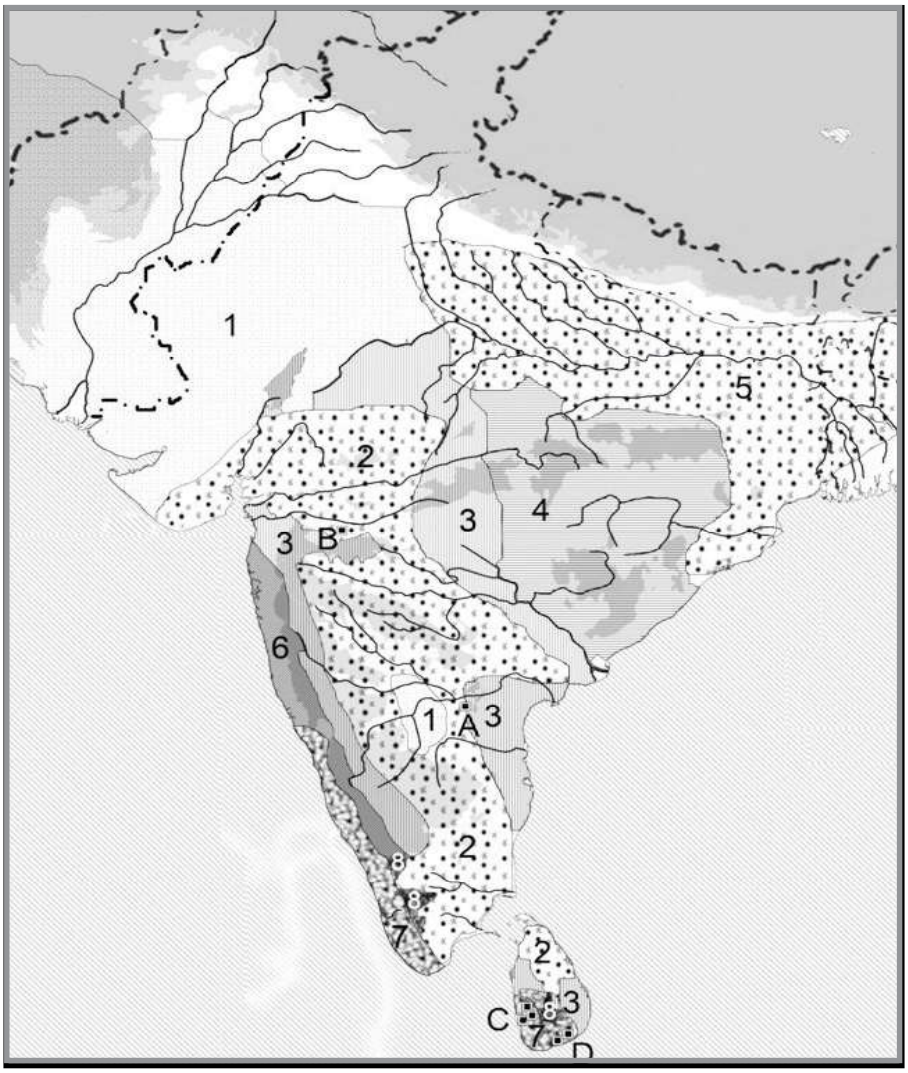


Figure 1.1.1: Showing a map with reconstructed vegetation zones for around 30,000 years ago and location of

microlithic sites. A-D: Sites of earliest Homo sapiens fossil remains. 1, desert and semidesert (Caligonum-Salvadora-Prosopis-Acacia and scattered grasses); 2, savannah and tropical dry deciduous woodland mosaic (Acacia-Anogeissus- Terminalia, Hardwickia in some localities, abundant gatherable grasses and legumes); 3, dry deciduous woodlands, including teak; 4, dry deciduous wood- lands, including Shorea-Hopea; 5, deciduous Shorea-Hopea woodland and grassland/marsh mosaic; 6, moist deciduous and scattered evergreen taxa; 7, Tropical evergreen and semi evergreen forest refugia; 8, tropical/subtropical mountain forests. From: Petraglia et.al PNAS July 28, 2009 106 (30) 12261-12266.

The earliest *Homo sapiens* fossil remains in South Asia have been found at the Fa-Hien caves in Sri Lanka, dated about 35,000 years ago but the presence of microlithic tools (very distinctly a sign of AMM) suggest a migration along the Indian peninsular coastline. All of this meant that certain geographical regions and niches in peninsular India which had provided optimal living conditions for early hominids like the unique cave dwellings in Bhimbetka and Jwalapuram, now saw an influx of *Homo sapiens*.

During the late Neolithic period, starting from the Levant up to central India, there was a continuous belt of human habitation of farmers and cattle-rearers as evidenced by microlithic stone tools found in major excavations sites like Mehrgarh (~7000 BC). Anthropological studies using DNA lineages, whole genome and ancient DNA connect this civilization to settlements in the west as well as the Indus Valley Civilization in the east.

Very recent sequencing of ancient DNA from Harappan remains (Figure 1.1.2) and genetic tracing of ancestry based on modern Indians demonstrate that the Harappan people evolved as a distinct mixture between the first Out of Africa humans who arrived in India around 60,000 years ago and subsequent Central Asian agriculturalists who arrived during the Neolithic period and settled and evolved in India before 10,000 BCE**.**

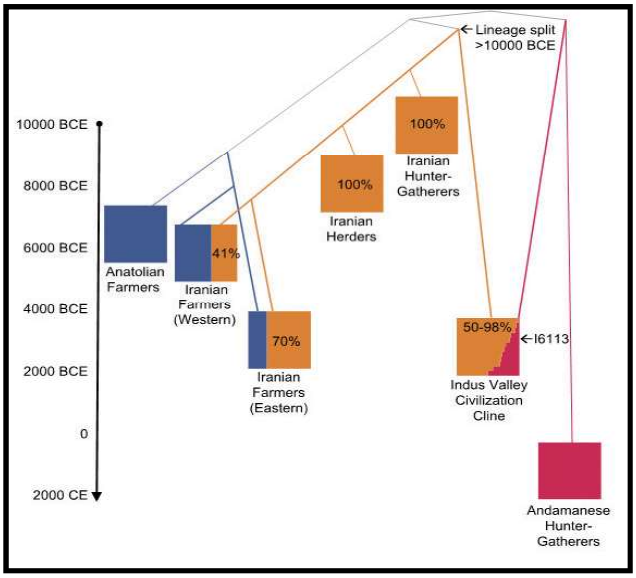


Figure 1.1.2: Genetic tree showing a split of the lineage around 10,000 BCE following which, the Indus Cline followed its own evolution in India, mixing primarily with the first OoA arrivals to India (Shinde et. al, Cell 2019)

Evidence of Harappan ancestry in ancient genomes discovered in Gonur and Shahr-i-Sokhtain modern Turkmenistan, matched to the remains in Rakhigarhi (Figure 1.1.3) suggesting that rather than a unidirectional west to east migration of the Central Asian haplotypes to India, there was a bi-directional mingling of these two populations between 10,000 to 4,000 years ago across the region.

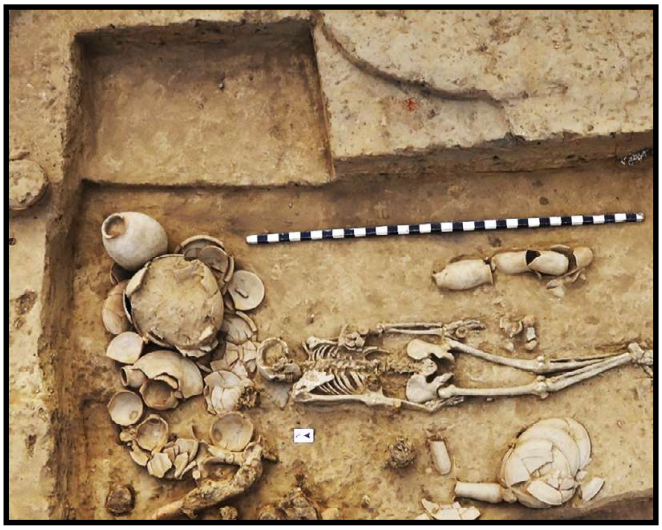


Figure 1.1.3: The skeletal remains at Rakhigarhi, from which the DNA was extracted to be sequenced (Shinde et. al, Cell 2019)

The Harappan civilization though primarily centered around rivers Indus, Sutlej and the now extinct Saraswati, its extent is believed to range from settlements in the west in Afghanistan to Rakhigarhi in the east (Figure 1.1.4). The discovery of a paleochannel and the timing of a potential migration of the river Sutlej (Figure 1.1.5) matches the time of a massive drought that affected other major civilizations of that time in China, Egypt, and Mesopotamia. Mounting evidence suggests that the hydrodynamic stress caused in ~2200 BCE, resulted in loss of the major crops of the region like barley, wheat, and gram. This resulted in a drastic migration of the Indus people in the western settlements which turned arid, to lusher, greener eastern fertile plains. Other studies have correlated the presence of the bacteria causing plague, in samples from these periods, as a possible reason for abandonment of major cities.

Figure 1.1.4: The extent of the Indus civilization during the Mature Harappan Period

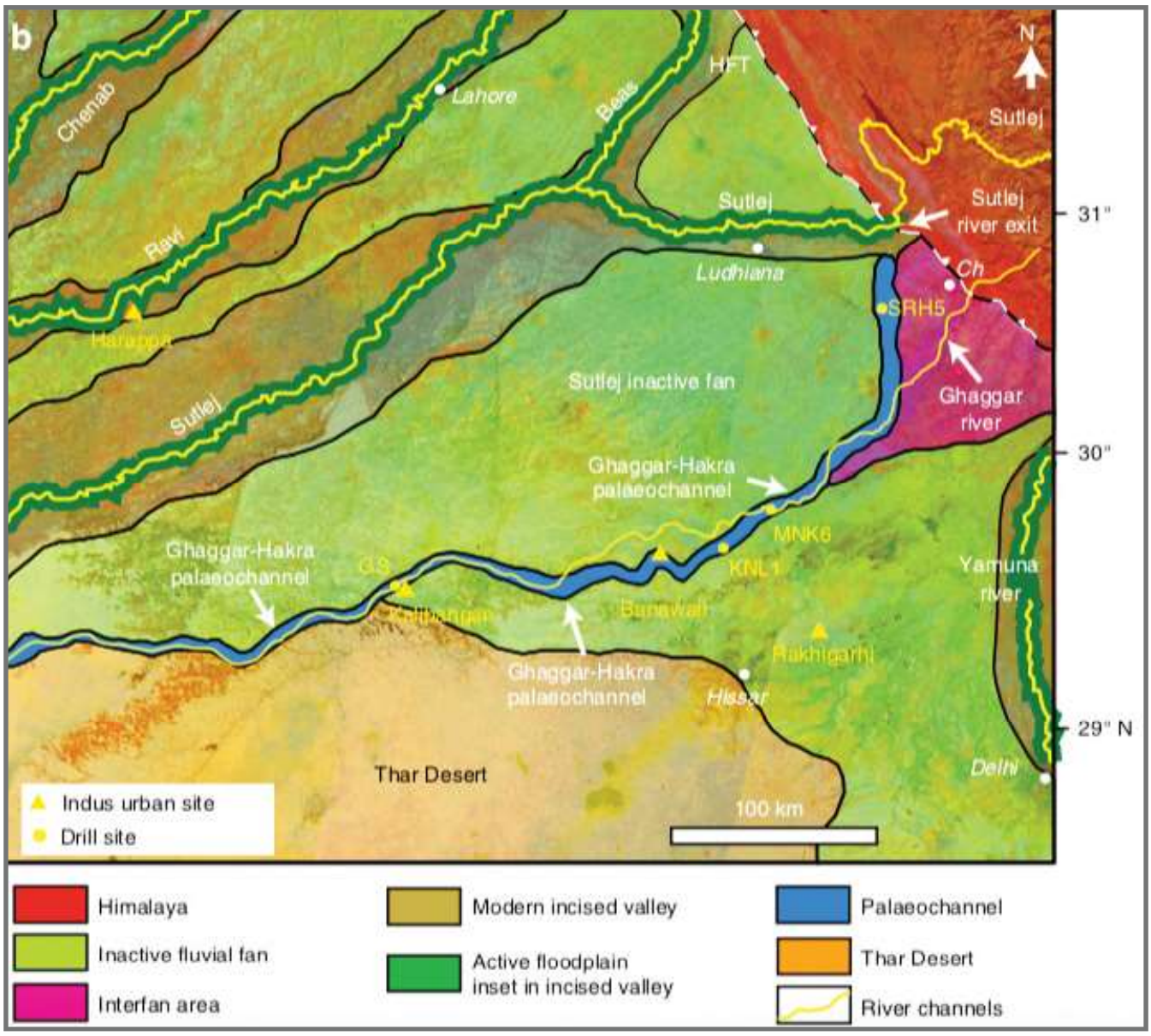


Figure 1.1.5: The Ghaggar-Hakra paleochannel showing the settlement of Harappan peoples around the area. Singh et.al Nature Communications, Volume 8, Article number: 1617 (2017)

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter/seminars/pre-history-and-indus-period/geography-and-people

Authored by: Swati Dave for India Discovery Center (IDC)

1.2 Geography and People: India Vedic Period (2000 BCE – 700 BCE)

Dr. Sayantan Bose

The habitation geography of India during the Vedic period has been reconstructed from the early Indian literature of the *Ṛgveda*, and from archaeological data obtained from various parts of India. Currently accepted reconstruction suggests the presence of nomadic groups settled in the *saptasindhu* area of the upper Punjab possibly around 1700 BC, Figure 1.2.1.

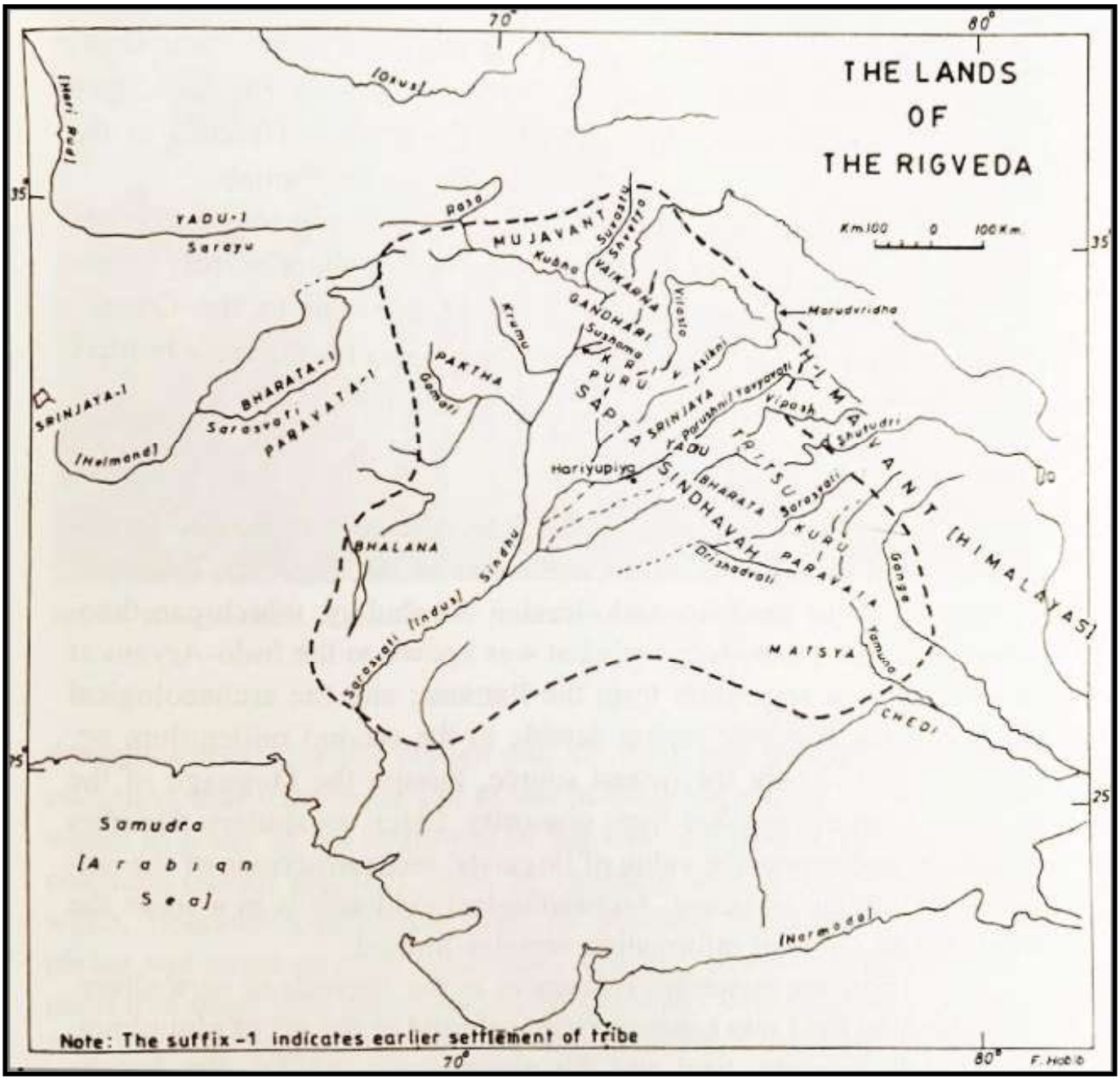


Figure 1.2.1: The Lands of the Rig Veda (A People's History of India, The Vedic Age – Irfan Habib, Vijay Kumar Thakur). Map showing the extent of Vedic geography in the Early Rig Vedic phase.

Language analysis, mythological stories and metaphors suggest a sustained development for centuries or more. Despite efforts to connect these groups/tribes to the Iranian highlands in the west, no archaeological evidence of migration has yet been discovered. Arguments that the Vedic language originated outside India are not yet convincing, since the original form of the language only lives in India.

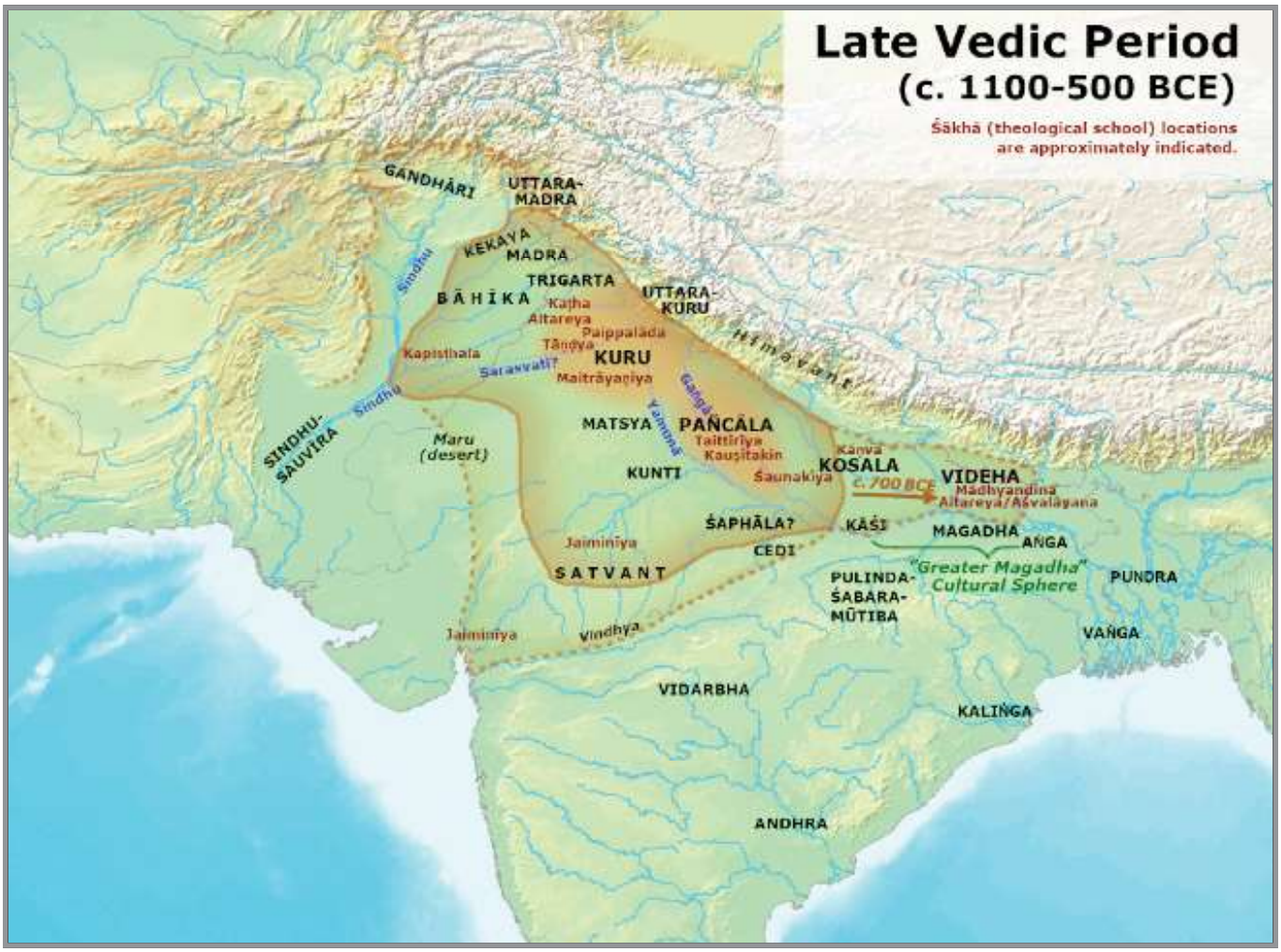


Figure 1.2.2: Expansion of the Vedic culture and recorded habitation centers in late Vedic Period 1100 BCE to 500 BCE. (Wikipedia, History of India)

While the identity of the Vedic tribes is speculative, their way of living is distinct from that of a host of non-Vedic agricultural tribes that populated the Gangetic plains and the eastern parts of India during this period. The difference between Vedic and non-Vedic is based on observations of religious rituals ordained by the Vedas (see Track 2: Language and Literature). Non-Vedic people were also prosperous, and conflicts between the two groups have been reported, as the Vedic tribes migrated eastward. The *Ṛgveda* points to eventual settlements that occurred because of negotiations and social integration. Figure 1.2.2 shows a reconstructed habitation map of India circa 1100 to 500 BCE.

The prescribed rituals referenced above were an offshoot of a principle termed *Rta*, or the "cosmic principle." Simply stated, *Rta* refers to the notion that both sky and earth operate as one geographical unit, and that all earthly events are connected to the movement of objects in the sky called *Devas*, which were animated, had human-like instincts, could be appeased through Vedic rituals, and could shower blessings. The rituals needed to be done with astronomical precision at

carefully selected geographical sites and in properly constructed geometrically designed altars. The detailed organization and precise structural needs surrounding these rituals helped create a social structure that included various skilled groups such as carpenters, blacksmiths, weavers, masons, milkmen, astrologers, hymnal groups, priests, and many more. All efforts were centered on the performance of a ritual (Figure 1.2.3).

Figure 1.2.3: A graphic simulation of a Vedic ritual

Each of these groups had their own specific work: execution of this work was termed as *Dharma,* or literally "the property to hold the society together." The word Dharma gradually encompassed a broader view and came to mean the dutifulness in the service of any component of the universe including the sun, moon, air, and water. Eventually, by about 900 BCE, these empirical practices were compiled into massive literary books called the *Dharmashastra*s or "The Book of Rules". Modern Hinduism uses this book as a guide in its social practice.

This structured society centered on family as the nucleus, and the father as the head of the family. Male members in the family assumed genetic dominance: wives and mothers had major roles in the rituals but did not own any property. The eldest son inherited the father's property, and in the absence of a son, adoptions were invoked, while daughters were given away in marriage. These practices were different in the non-Vedic tribes of the East, where communities were matriarchal.

The gradual integration of cultures led to the development of a strong foundation of a universal cosmology. This late development around 700 BCE is called the *Upanisad* period in India, and declared equality of all objects, claiming a unitary universe that endowed divinity to all creation. Composed in brilliant pieces of prose and poetry, these documents of the Upanishads have been cherished by learned people in all cultures.

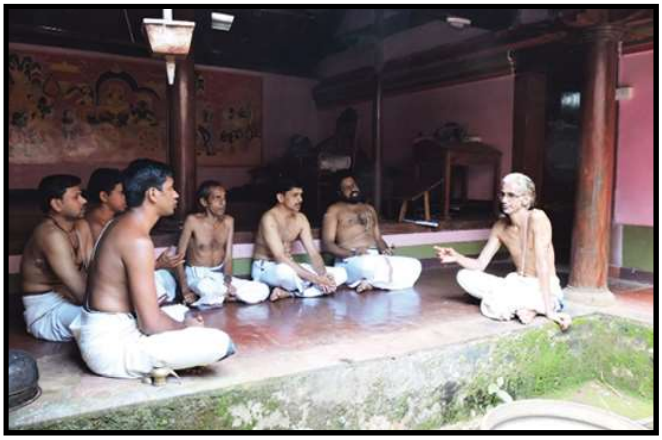


Figure 1.2.4: A view of a current Vedic school in South India.

Vedic culture gradually spread to South India, but major clashes between the two cultures are reported in literature. The Vedic period helped mature a Vedic belief system and tried to establish it throughout the country using integration and warfare. A Vedic school in modern India is featured in Figure 1.2.4.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/vedic-period/geography-and-people

Authored by: Reshma Ghanekar for India Discovery Center (IDC)

1.3 Geography and People: India Classical Period (700 BCE-200 BCE)

Dr. Hemendra Acharya

In 700 B.C. India consisted of sixteen large kingdoms, known as MahaJanapadas (Figure 1.3.1). The largest of these was Magadha which encompassed much of the northern and central sections of the subcontinent. It was ruled by the Nanda Dynasty. Most kingdoms were monarchical, though some were republics, in which people had a voice in the governance. Although kings had power they ruled with popular consent. Buddhism developed and spread, Jainism was reformulated and was made into a structured religion. Southern India was governed by family dynasties of Pandya, Cholas and Cheras. They were prosperous through maritime trade,

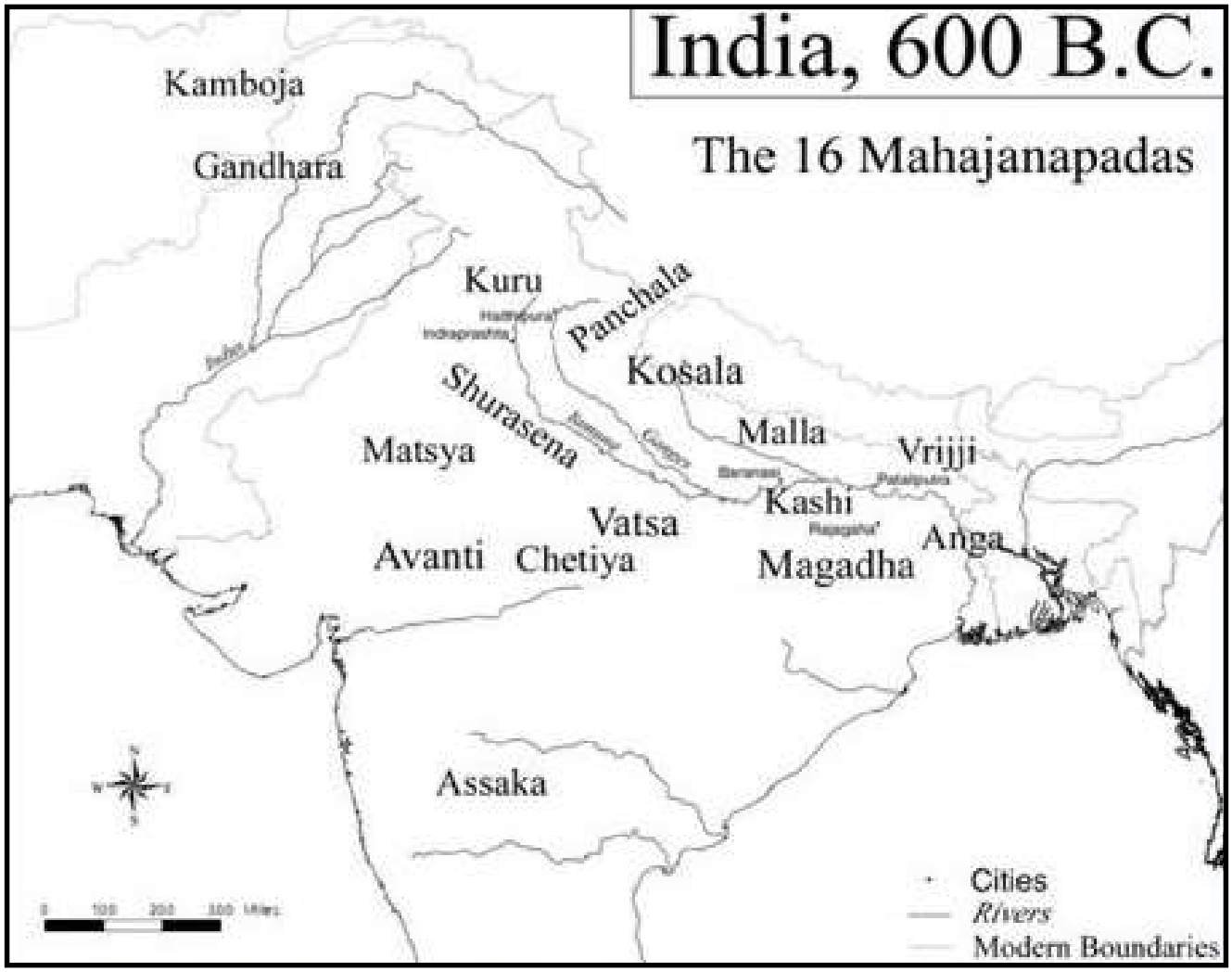


Figure 1.3.1: Sixteen Mahajanapadas in ancient India

For the first time in recorded history, the Indian subcontinent was invaded by people from the foreign lands during this period. Alexander's Invasion led to an expansion of his Empire from Greece in the West to India in the East, and is the first recorded intrusion into this land by foreign forces (Figure 1.3.2). Alexander's army was outmaneuvered. He retreated south through the Indus River. It is reported that he carried books and gold from India.

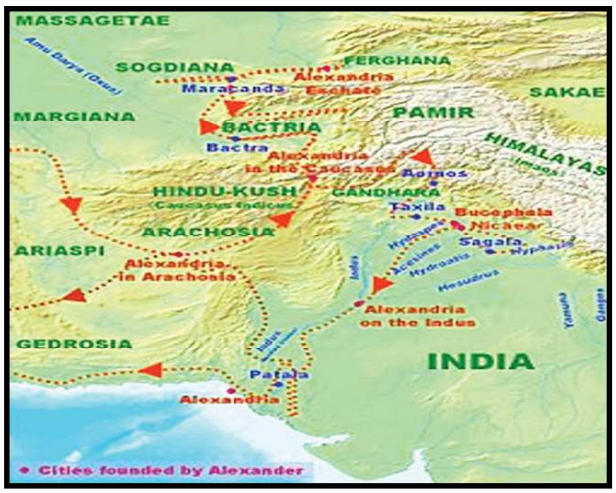


Figure 1.3.2: Path of Alexander's invasion into India, 327 BCE.

The scholar-priest Chanakya, along with Chandragupta Maurya, conspired a revolt against the Magadha Empire. Conquering other smaller kings he helped create the vast Mauryan Empire. The latter stretched from eastern Iran in the west to Myanmar in east, and from Kashmir in the north to Tamil Nadu in south. The Indian subcontinent was unified as a political entity. (Figure 1.3.3)

Mauryan King Ashoka consolidated the Empire by annexing Kalinga, the only remaining sovereign state. It was a brutal war. The violence and destruction in Kalinga led Ashoka to convert to Buddhism. He turned benevolent and provided massive welfare for the people. He sent Buddhist monks overseas to

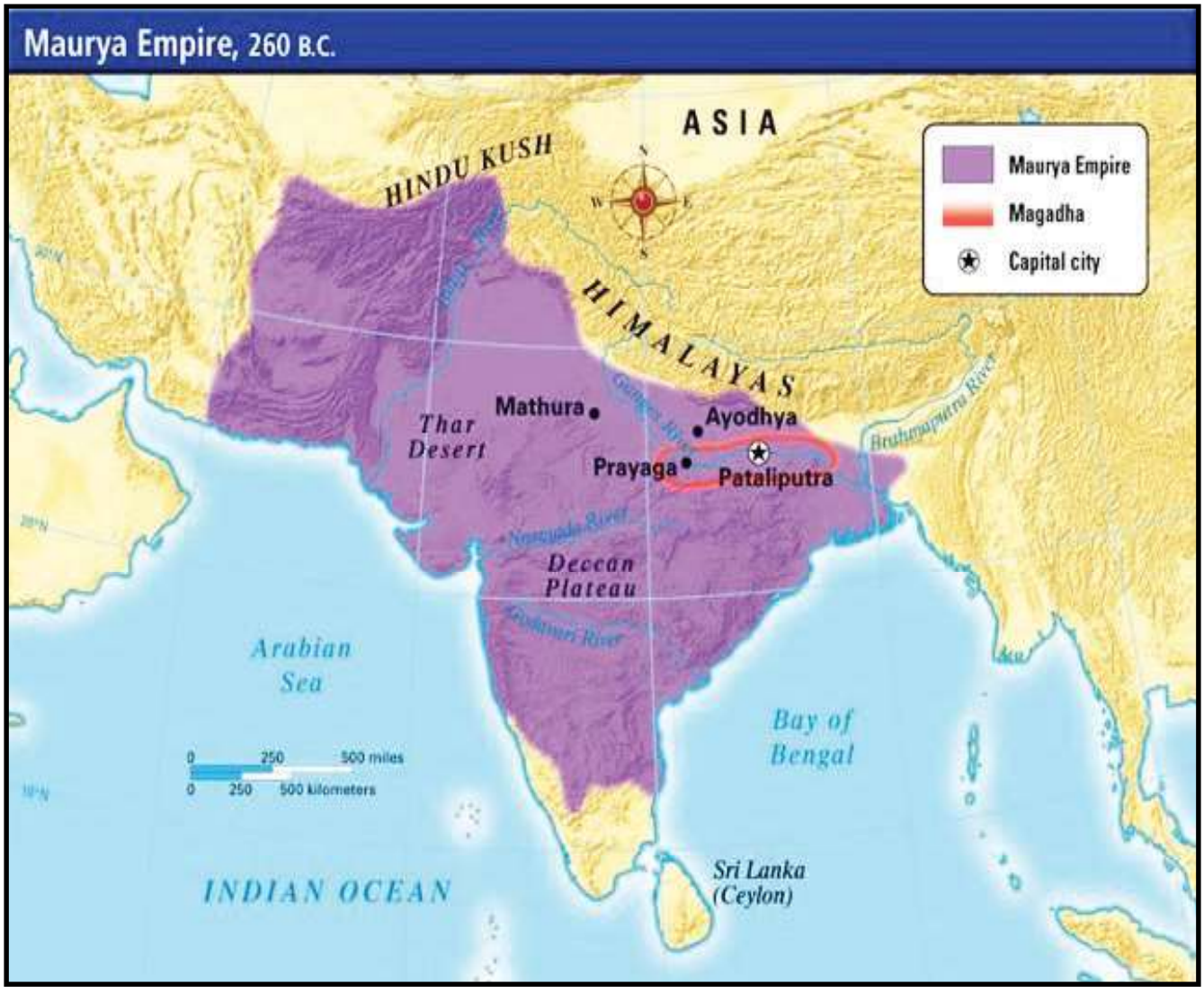


Figure 1.3.3: Mauryan Empire 260 BCE.

propagate Buddha's teachings on harmony, compassion and forgiveness (Figure 1.3.4). Ashoka recorded his declarations as carvings over massive mountain facades. These rock edicts are considered as the first record of a script in India (Figure 1.3.5).

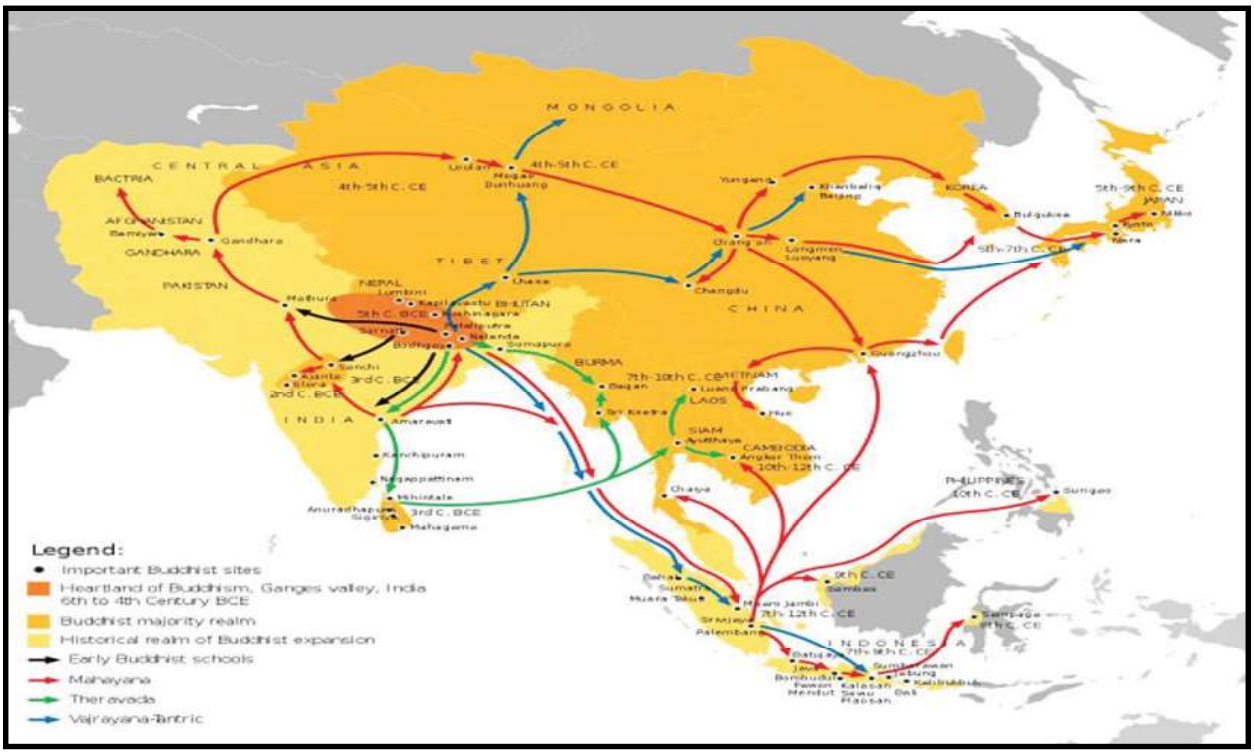


Figure 1.3.4: Travel routes of Buddhist missionaries during Ashoka' reign

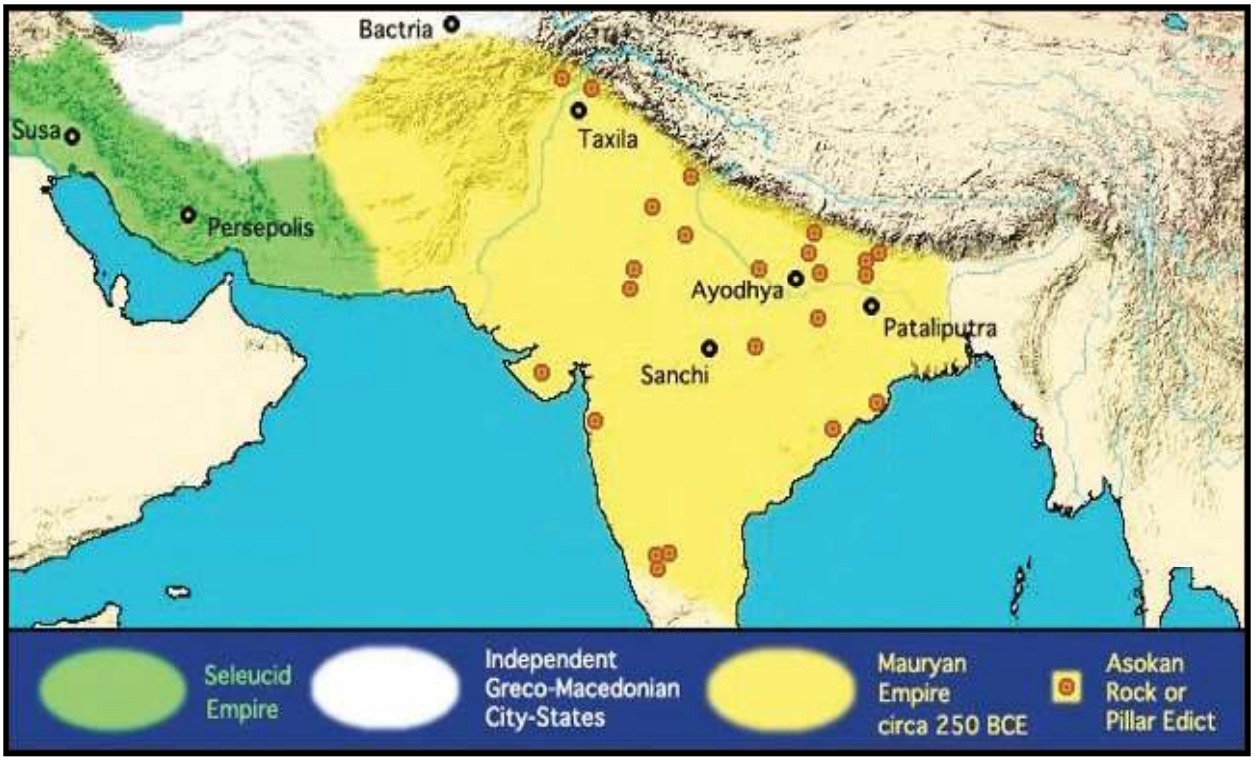


Figure 1.3.5. Locations of Ashoka's rock edicts scattered in the Empire, 250 BCE.

Society during the Classical Period was characterized by joint families, and was mostly patriarchal. Megasthenes, the Greek historian of 4th century BCE, reports the practice of polygamy. The Varna system (a social order organized in the Vedic Period) was invoked for work, remuneration and taxes. There was no social or economic inequality based on profession. Marriage between members of the same Varna was preferred, though marriage across the Varnas was allowed. Marriage for girls at or before puberty was prescribed, and was common practice.

Education was available to children in all Varnas and both genders. It was imparted by teachers in residential schools. Multi-discipline university education was the hallmark of the higher education system. Large reputable universities served as education centers for students from all parts of the world. Economics, public policy, religious studies, language, grammar, philosophy, mathematics, astronomy, military science, health sciences and construction engineering were among the disciplines taught. The University of Taxila (now in modern Pakistan) reportedly accommodated more than ten thousand students. State-sponsored scholarships were available (Figure 1.3.6)

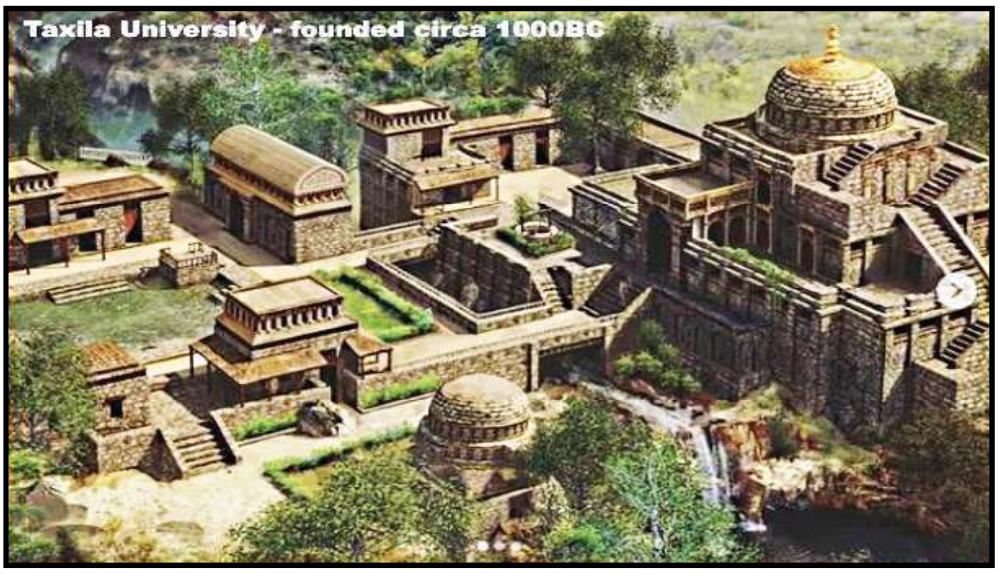


Figure 1.3.6. University of Taxila, architectural reconstruction

Massive construction projects with stone carvings changed the urban landscape in the country. Cave dwellings, sanctuaries, monasteries, monuments, and well-laid educational institutions were common. The widespread use of iron led to the development of many new skills. People were actively engaged in literature, music, art and theater, and social celebrations and festivals were common. Reflective time led to the development of high orders of cosmological speculations and philosophy.

Annexation of new territories resulted in cultural diversity of people. The period saw coexistence of belief systems with individual liberty in faith and in practice of life. The country was opulent, and diverse opinions were accommodated. Differences of opinion were resolved through congregational meetings, mediated arguments and scholarly exchanges. No internal military revolt has been reported. Indian culture spread to the Far East during the Classic Period, and continued to dominate a wide region, over many centuries.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscovercenter.org/seminars/classical-period/geography-and-people

Authored by: Dr. Hemendra Acharya for India Discovery Center (IDC)

1.4 Geography and People: India Golden Period (200 B.C – 500 A.D)

Dr.Hemendra Acharya

Soon after Ashoka died, his Buddhist leanings and pacific policy were met with open resistance. The Greeks invaded India again, and advanced into the country up to Ayodhya. Further disintegration was halted only when Pushyamitra (187-151 BCE), the Brahmana minister of the Sunga dynasty took over. In the south and south-east, the Andhras and Kalingas, together with areas in northern India had already asserted their independence. Pushyamitra ultimately triumphed over the Greeks and drove them out of Magadha. He chased them beyond the Sindhu river. (Figure 1.4.1)

Figure 1.4.1. Sunga Empire, 185 BCE

The Kushanas came from the northwest and held sway over nearly the whole of North India as well as considerable territory as far as Central Asia. They shifted the center of political activity from Patliputra to Peshawar. Kanishka, the founder of the Kushan Empire (78-101 CE) was a devout Buddhist.His son and successor followed the Vedic system. Kanishka's empire stretched from Bihar in the east to Khorasan in the west, and from Khotan in the north to the Konkan in the south (Figure 1.4.2). During his reign, the country saw important developments in religion, literature, sculpture, art and building of statues. It was a period of religious ferment and missionary activity.

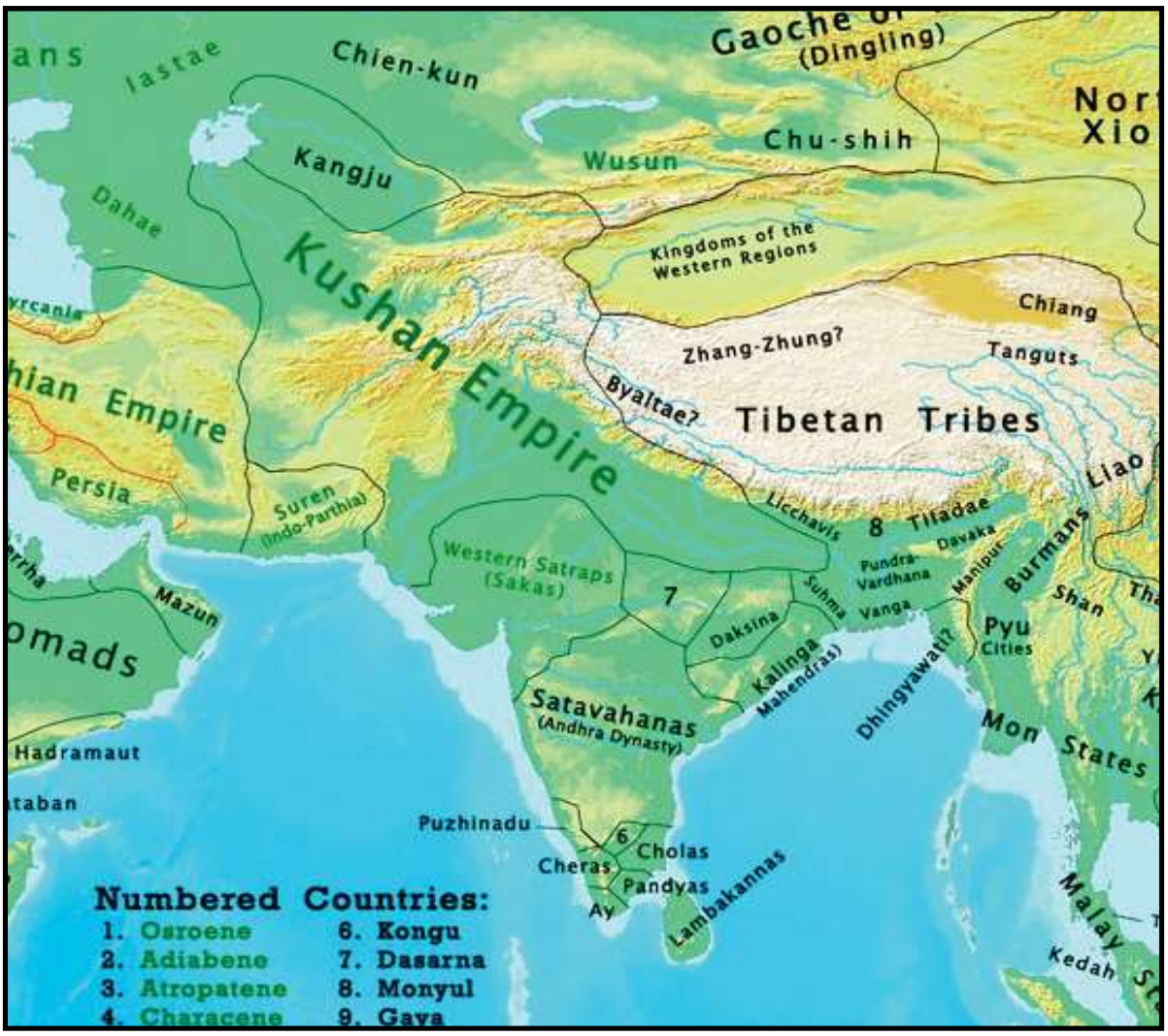


Figure 1.4.2. Kushan Empire, 100 CE.

The period witnessed the development of Shaivism and Mahayana Buddhism. Buddhism was introduced in China (61-67 CE). Takshashila (Taxila) University flourished. The Kushana Empire disintegrated by the middle of the second century CE. Many governors of provinces in Western and Central India declared their independence. Saka Satraps ruled considerable parts of western India as independent rulers. Gautami Putra (106-130 CE), the Andhra king of the Satavahana dynasty, extended his sway from coast to coast claiming suzerainty over the whole of the Vindhyan region. He vanquished the Scythians, the Indo-Greeks and the Parthians. His descendants eliminated the Sakas from western India and Saurashtra.

The literary and epigraphic texts of ancient India often refer to Sakas (Scythians) and the Pahlavas (Parthians), together with Yavanas. They soon adapted themselves to their new environs and began to adopt Indian names and religious beliefs. They also contracted matrimonial relationships with Indian families. The frescoes and the structures in Ajanta and Ellora Caves help us reconstruct religious life during the Golden Period (Figure 1.4.3). The political disintegration that followed the dissolution of the Kushan empire continued right up to the beginning of the fourth century CE. While the Kushans ruled over western Punjab, they had ceased to exercise any authority further east. The Sakas ruled over Gujarat and parts of Malwa, but their power was also rapidly declining. The rest of India was divided into several smaller kingdoms and autonomous states.

Figure 1.4.3. Courtyard in Ellora Caves (200 CE)

The Gupta Empire, founded by Chandra Gupta I around 250 CE., ensured peace and prosperity to the people (Figure 1.4.4.). The intellectual greatness that characterized the Gupta Age was exemplified by the University of Nalanda, a symbol of the great international culture of which India was the universally acknowledged center (Figure 1.4.5). There were self-contained population centers that maintained trade and economic relations internally among them. The tax system was federated, and helped to support a creative life for all sectors of the society. The village as an independent unit functioned well for agriculture, craftsmanship, art, culture, and education, operating in professional "guilds." Families lived together as tribes, and multiple tribes formed clans; migration of these tribes and clans to cities triggered the process of urbanization, which also intensified the use of coin currency.

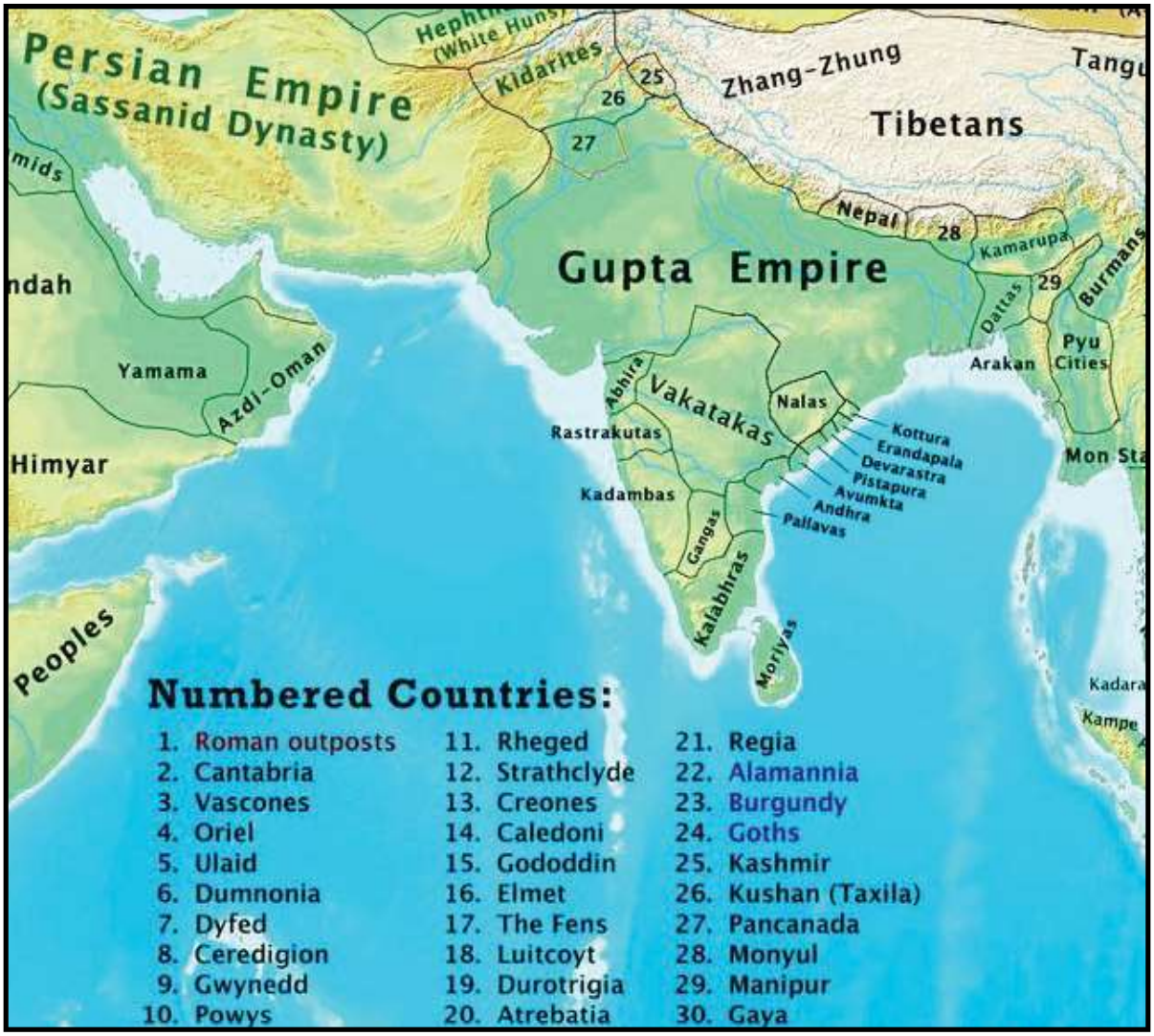


Figure 1.4.4. Gupta empire in India (400 CE).

Figure 1.4.5. Ruins of Nalanda University

Flourishing "Hindu" states arose in Burma, Siam, the Malayan Peninsula, Annam, Cambodia, Sumatra, Java, Bali, and Borneo.

Reference:

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https://www.indiadiscoverycenter.org/seminars/golden-period/geography-and-people

Authored by: Hardeep Mann for India Discovery Center (IDC)

1.5 Geography and People: India Hindu Period (500 CE – 1500 CE)

Dr. Hemendra Acharya

The lives of people in southern India continued at the same pace as in the Golden Period, but the lives of people in northern and western India were impacted drastically during the second half of the Hindu period because of Islamic invasions and the establishment of Islamic rule.

Pallavas of Kāñcīpuram must have come originally from Persia. The term Pahlava or Pallava must denote the Arsacidan Parthians, (Venkayya 1907, p.219-220). This led to the IranicPallava Empire 550-600 AD. The IranicPallava Empire, Figure 1.5.1, began the kingdom around 550-600 AD in South of India.

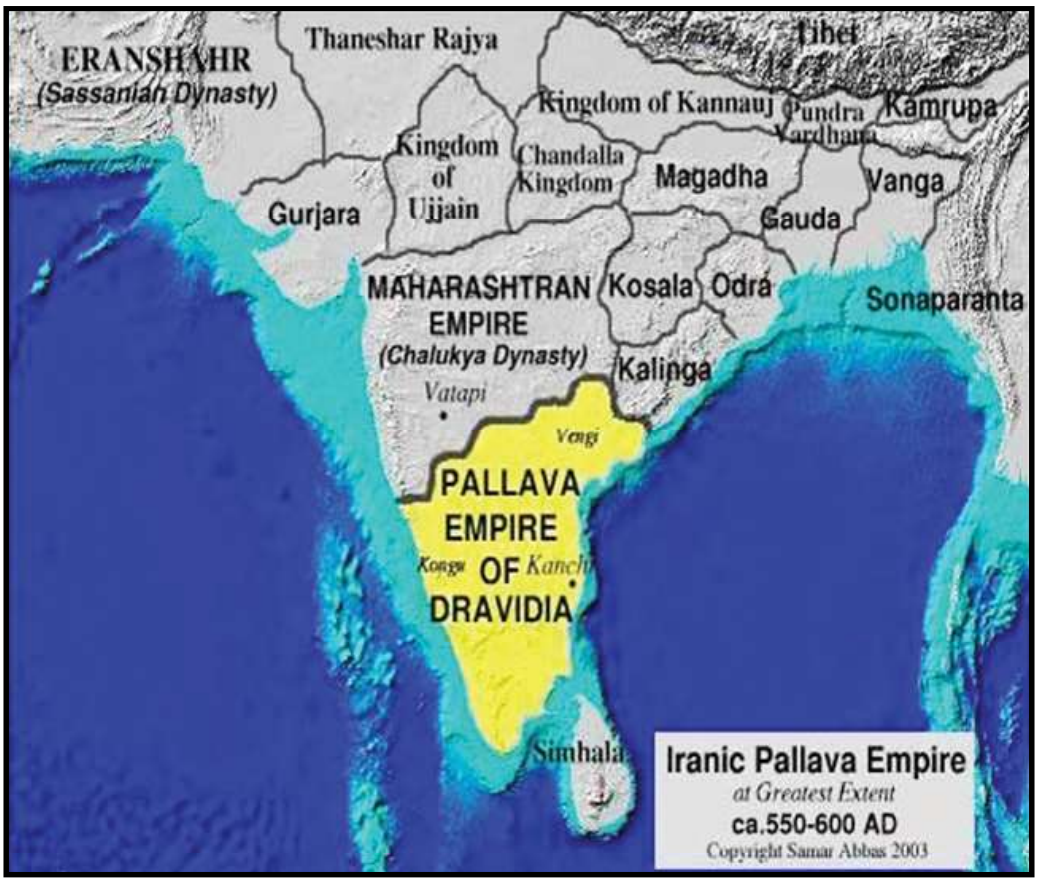

Figure 1.5.1: The empires and kingdoms that flourished in India, 600AD.

Figure 1.5.2: Coins of Harshavardhana (Wikipedia).

Harshavardhana(Figure 1.5.2) consolidated the northern states into his empire during 606-647 CE. The Chinese traveler Xuanzang visited Harshavardhana's court and wrote a very favorable account. But after the death of Emperor Harshavardhana, his empire disintegrated. Another empire was established by MihiraBhoja in the early part of the 9th century CE. At its height, the Bhoja Empire extended to the Narmada River in the South, the Sutlej River in the northwest, and to Bengal in the east (Figure 1.5.3). Under Bhoja and his successor Mahendrapala (reigned 890 CE–910 CE), the Pratihara empire reached its peak of prosperity and power. Temple architecture, as seen in the majestic Kailasa temple at Ellora and by the exquisite beauty of the Chandella Siva Temple at Khajuraho, symbolizes this period. Indian architecture flourished during the entire Hindu period.

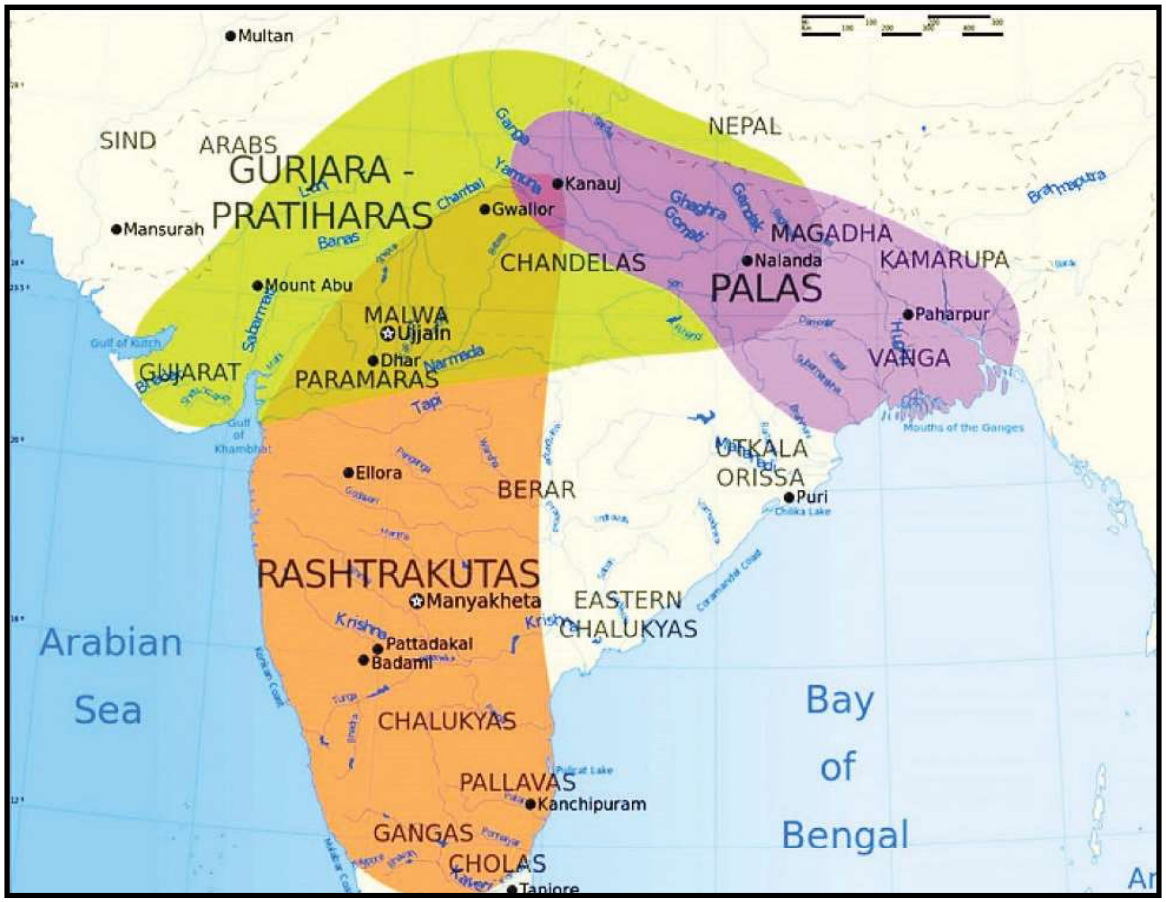

Figure 1.5.3: Rashtrakutas, Gurjara-Pratihara and Pala Empires: 800 CE to 1100 CE.

Buddhism declined after the rule of Harshvardhana, its disappearance from India being hastened by the growing unpopularity of Tantric practices. The sweeping revival movement of this Age was led by the prophet Shankaracharya, who preached Monism. He purged many religious beliefs of their gross misuse. Sanskrit was the language of the cultured and was spoken and understood by the educated elites only.

The first Turkinvasion occurred in 1000 CE and ended in the conquest of Sindh. Invasions by Mahmud of Ghazni and Mahammad Ghauri led to a pattern of looting and destruction. The horrors of these barbarian invasions, fired with the fanatic zeal for demolishing temples and idols, born of the crusading spirit of Islam, were unleashed. In 1206 CE, Qutab-ud-din Aibak established the Turkish Sultanate of India, first at Lahore and then at Delhi (Figure 1.5.4). Will Durant, in his "Story of Civilization" aptly says: "The Mohammedan conquest of India is probably the bloodiest story in history."

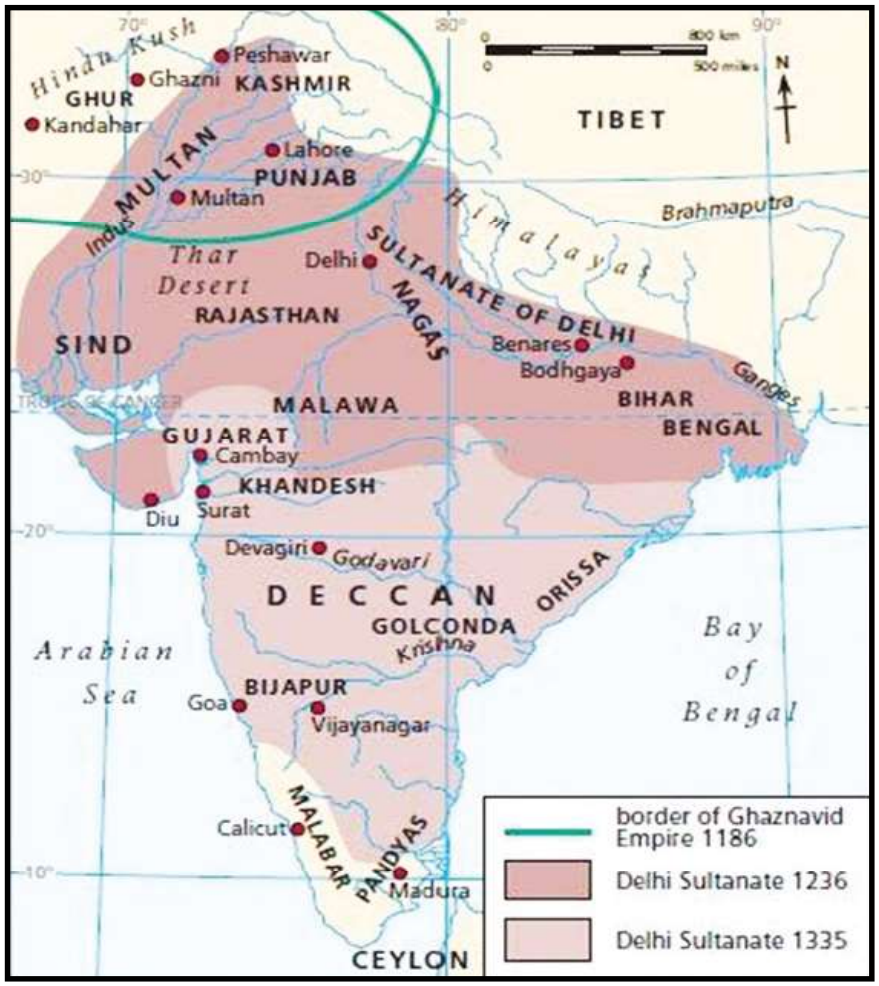

Figure 1.5.4: Islamic invasion to India 1000 CE to 1200 CE

Figure 1.5.5: Agricultural export, 10th century CE.

The invading Turks began to look down on the people as infidels to be despised and converted, or killed. The intrusion of Islam, and its existence as a separate unit in India, introduced the generic name "Hindu" for the first time. The massive repositories of knowledge in libraries were burnt. Resident monks were killed.

Nevertheless, economic conditions were good in areas of India where the Turkish armies did not operate. Agriculture yielded bountiful harvest and industry flourished (Figure 1.5.5)Internal trade and maritime commerce were brisk and profitable. Important shrines and universities were richly endowed. Men and women were simply dressed but richly ornamented and moved about freely. (Figure 1.5.6). Fairs and feasts were plentiful. Flowers were generally used as personal ornaments. Dance, drama, and music - vocal as well as instrumental - were popular. Marco Polo was astonished at the prosperity in Gujarat. Bharuch and Cambay, the two major ports in Gujarat, carried on large international trade. Malabar also was an international center of trade, and was visited by ships from the Persian Gulf, the Arabian Sea, and from South China.

Figure 1.5.6: Jewelry and ornaments, 12 century CE

At the end of the 12th century, the Hindu kingdom of Champa (Indo China) under Jayavarman VIII, extended from the Bay of Bengal on one side to the South China Sea on the other. Java also continued to be a powerful Hindu kingdom until the 15th century, when it was conquered by Muslims. The empire of Kambuja (Cambodia) reached its zenith in the 11th century, when Suryavarman II built the great temple of Angkor Vat, recognized today as one of the Wonders of the World.

References

IDC Seminar Presentation at:

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1.6 Geography and People: India Mughal-Martha Period (1500 CE - 1800 CE)

Dr. Hemendra Acharya

The Delhi Sultanate, led by Ibrahim Lodi, was a three-hundred-mile-wide strip, a thousand mile long stretching from Punjab in the west to Bihar in the east. The rest of the country was ruled by the independent kings who were occasionally at war with each other for territory and wealth. (Figure 1.6.1).

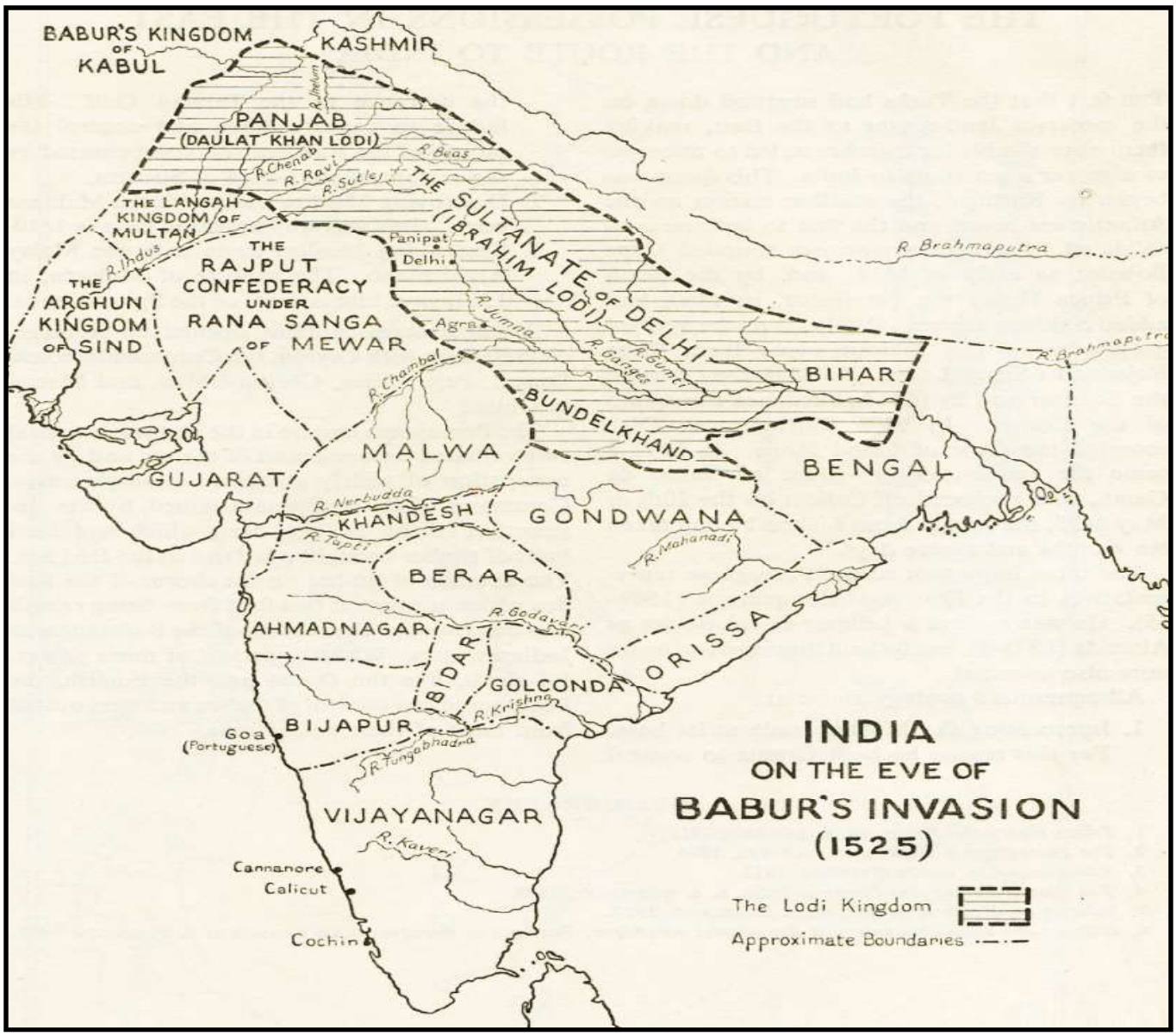

Figure 1.6.1: The Delhi Sultanate of Ibrahim Lodi in 1526 CE

The Turk Babur, born in Uzbekistan, invaded the Sultanate with army brigades and artillery. Despite having a huge army of men and elephants, Lodi was overwhelmed by the artillery. Babur succeeded in defeating the Delhi Sultanate at Panipat in 1526 CE. Rana-Sanga of Mewar unified the Rajputs and fought against Babur, but Babur prevailed in the end. He established the vast Mughal Empire, which extended from Multan in the northwest, to Banaras in the East. (Figure 1.6.2).

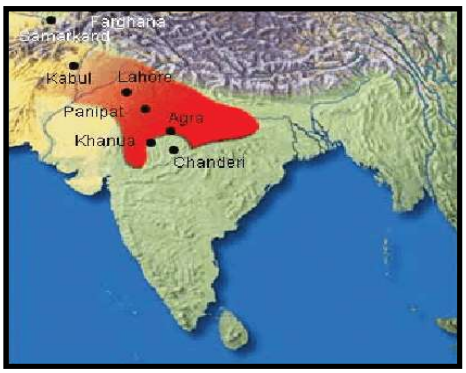

Figure 1.6.2: Invasion by Babur (1525-1530 CE) and Humayun (1530-1556 CE)

Babur was succeeded by his son, Humayun. Persian Sher-Shah-Suri defeated Humayun, and ruled India from 1540 to -1545 CE. Akbar, the son of Humayun, inherited the empire at the age of 13. He invaded many kingdoms and annexed them through force or using diplomacy. Akbar conquered Kabul and Kandahar, thuscontrollingthe entrance to India from Central Asia. He also incorporated the entire eastern Gangetic delta into the Mughal Empire.Dhaka became the Capital of the new Eastern Province.

Figure 1.6.3: Expansion, from Akbar to Aurangzeb (Akbar 1605 CE to Aurangzeb 1707 CE)

Jehangir's grandson Aurangzeb consolidated the empire in the north and organized the Muslim kingdoms in the south. During his reign, Mughals established their control from Kabul and Kashmir in the north to Chittagong and Gauhati in the east, to Goa on the west coast and to Tanjore in the south (Figure 1.6.3). Within seventeen years of his death, his empire had fragmented.

Shivaji, a Maratha warrior from western Deccan, carved out his own independent kingdom that became the genesis of the Maratha Empire. He fought the Mughals using guerilla warfare. The Maratha Empire (1674-1818 CE) ruled a large part of northern and central India and granted full religious freedom to people (Figure 1.6.4).

The Maratha Empire kept the British forces at bay during the eighteenth century.

Figure 1.6.4: The Maratha Empire 1674-1818 CE

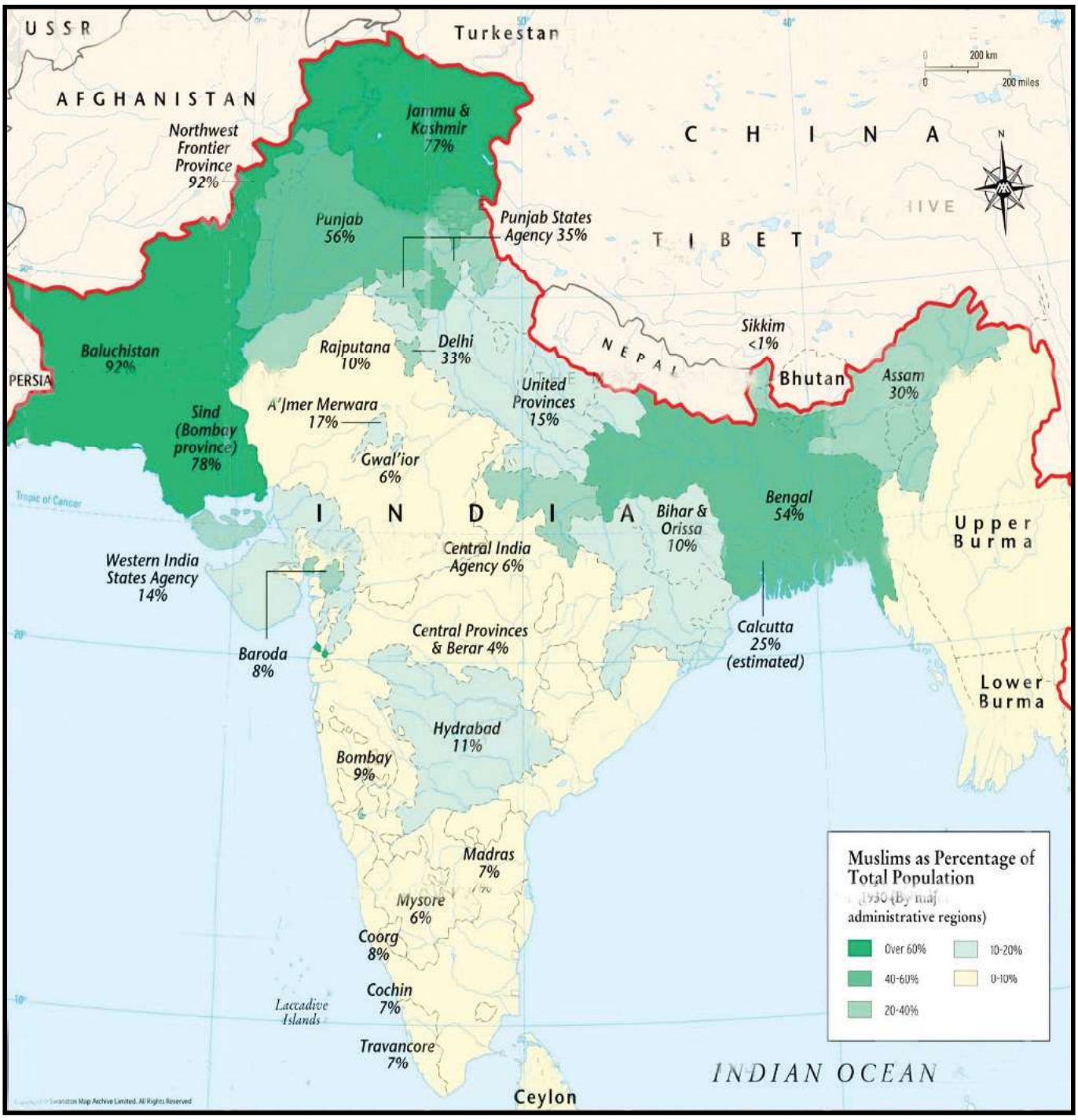

Figure 1.6.5: Agriculture expands to the North-West and North-East regions.

Agricultural expansion (Figure 1.6.5)was the hallmark of the Mughals, and no serious famines were reported during this period. Many People were engaged in the cotton, silk, and wool (shawls, blankets, and carpet) weaving, dyeing, and printing, and in the manufacture of ornamental disks, draught boards and, writing cases, inlaid with ivory and ebony. Massive construction projects, like the Red Fort in Delhi, were undertaken. Cities were built and employed people (Figure 1.6.6).

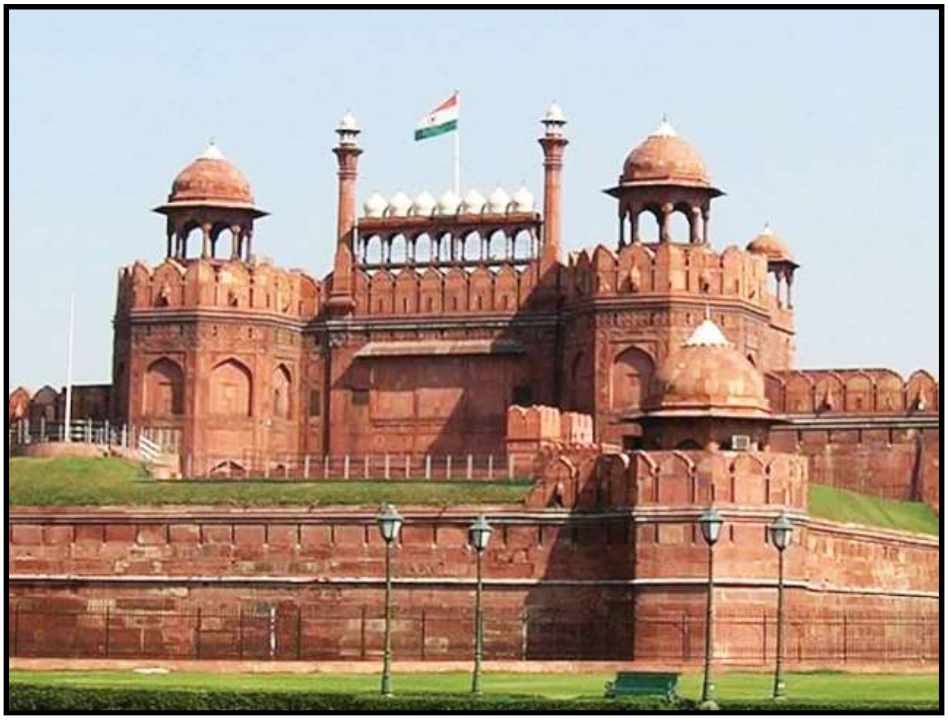

Figure 1.6.6: Red Fort in Delhi.

Women were brought into the workforce and were heavily engaged in agriculture. Figure 1.6.7 provides a mosaic of women engaged in cultivation in various regions of India.

Figure 1.6.7: Women in Cultivation

Schools were attached to temples, monasteries, and mosques. They were maintained through grants and endowments. Teachers were highly respected in society. Rice was the staple food in the east and south, and "Khichari" was a popular dish of the common people. People in the north relished "Chapati's" made of wheat, jowar or bajra.

Muslim women followed strict veiling and Hindu women adopted "purdah" as a protective measure. Monogamy was commonly practiced in the lower stratum of society.

People's occupations gradually became their castes and new social classes (e.g., Mansabdars, Amirs, Nawabs, and others) emerged.

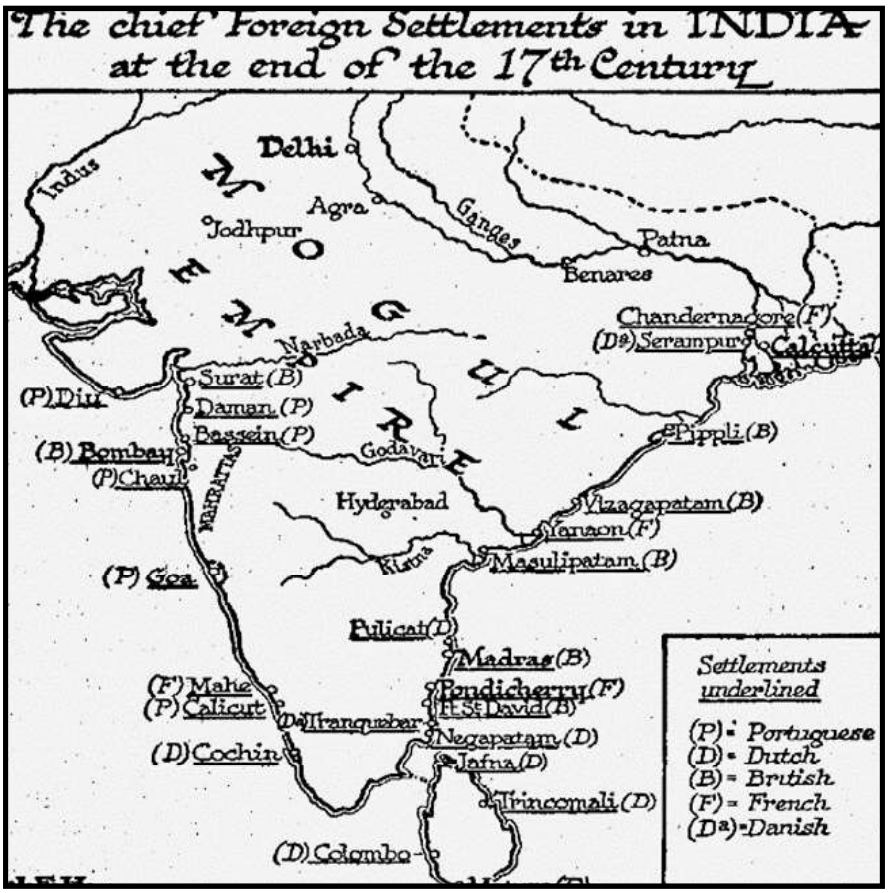

Figure 1.6.8: Foreign Settlement in India by the 17th Century

By the 17th century, many European trading settlements were established on both coasts of India (Figure 1.6.8), under the auspices of the East India Company, with French, English, Portuguese, Danish and Dutch flavors. Mutual battles continued for territory. The English destroyed the Portuguese fleet off the coast of Bombay and settled in Surat and Bombay. Robert Clive defeated the Nawab of Bengal in 1757, took control of Eastern India. Gradually the British East India Company succeeded in eliminating others and took sole control of the country by 1800 CE.

Reference:

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https://www.indiadiscoverycenter.org/seminars/mughal-maratha-period/geography-and-people

Authored by: Hardeep Mann for India Discovery Center (IDC)

1.7 Geography and People: India British Period (1800-1947CE)

Dr. Hemendra Acharya

The British treated India as a bread basket and a resource center. The culture, education and the social system in the country were trampled, with an aim to create a perpetual rule. This ambition was thwarted by the eventual active resistance by people of India. Before they left India, the British partitioned the country into two.

The Gross Domestic Product of India was 25% of the World's GDP around 1700CE, when the trade group of the British East India Company, and others from Portugal, France, Netherlands and Denmark set up their colonies in India. The East India Company prevailed on others and established their sole control by 1800CE (Figure1.7.1): India's GDP shrank to 4% by 1947, when the British left.

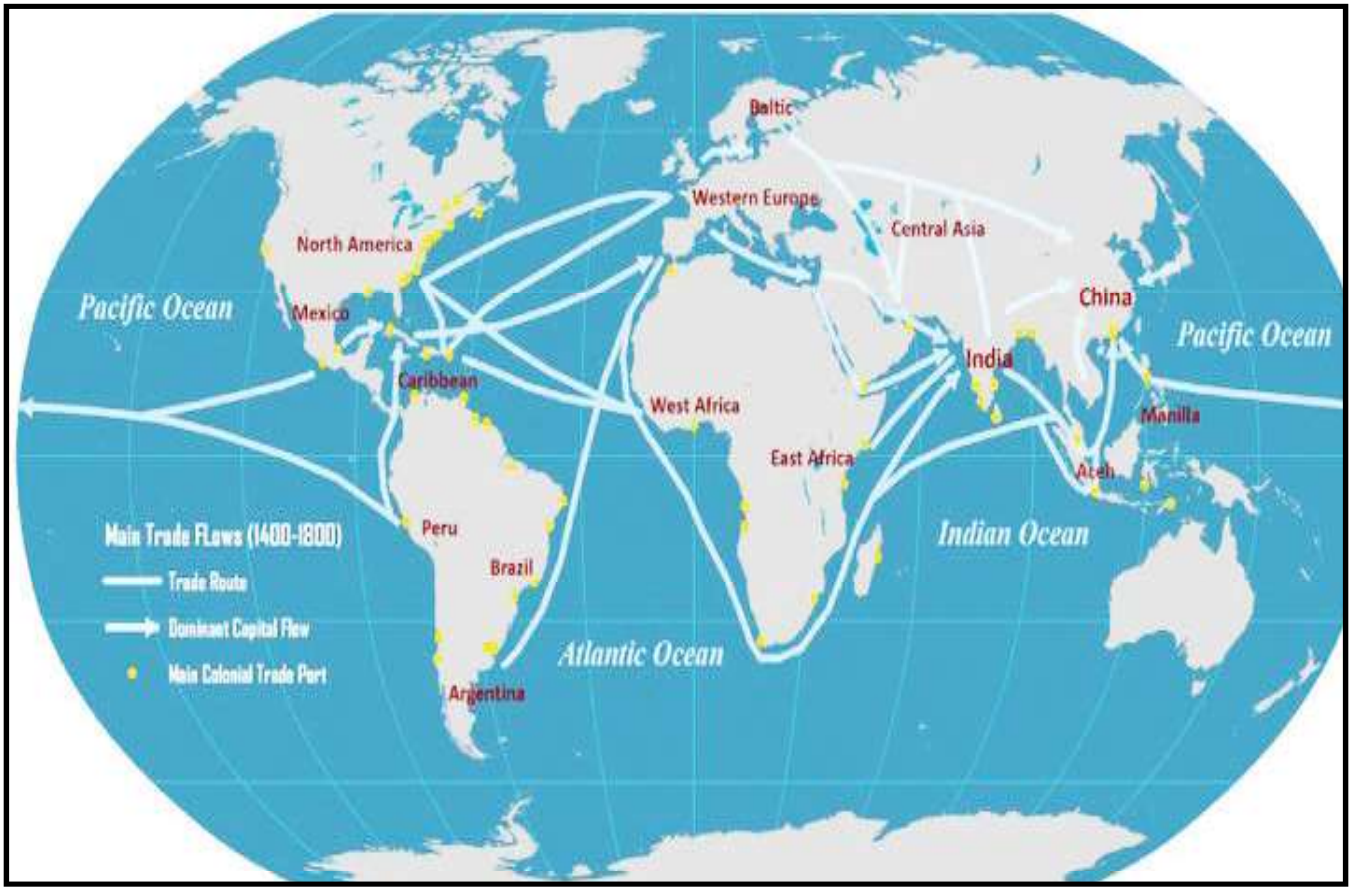

Figure1.7.1: Main Trade Routes between 1400 and 1800. Dominant capital Flows to the Indian Subcontinent and China

By the 18th century, the weakened Mughals were defeated by the native Marathas. However, the Marathas lacked governing skills, and lost to the British. The Sikhs in Punjab did create an autonomous State, but were also defeated, and Punjab was annexed by the British East-India-Company (Figure 1.7.2) in 1851CE.

Most of southern India was either under East India Company's direct rule, or was under indirect political control by the alliance of princely states that operated under the cover of the British Colonial Army. The latter increased to a massive 1.4 million personnel, most of whom were recruited from the native people. The army was organized in 100 newly

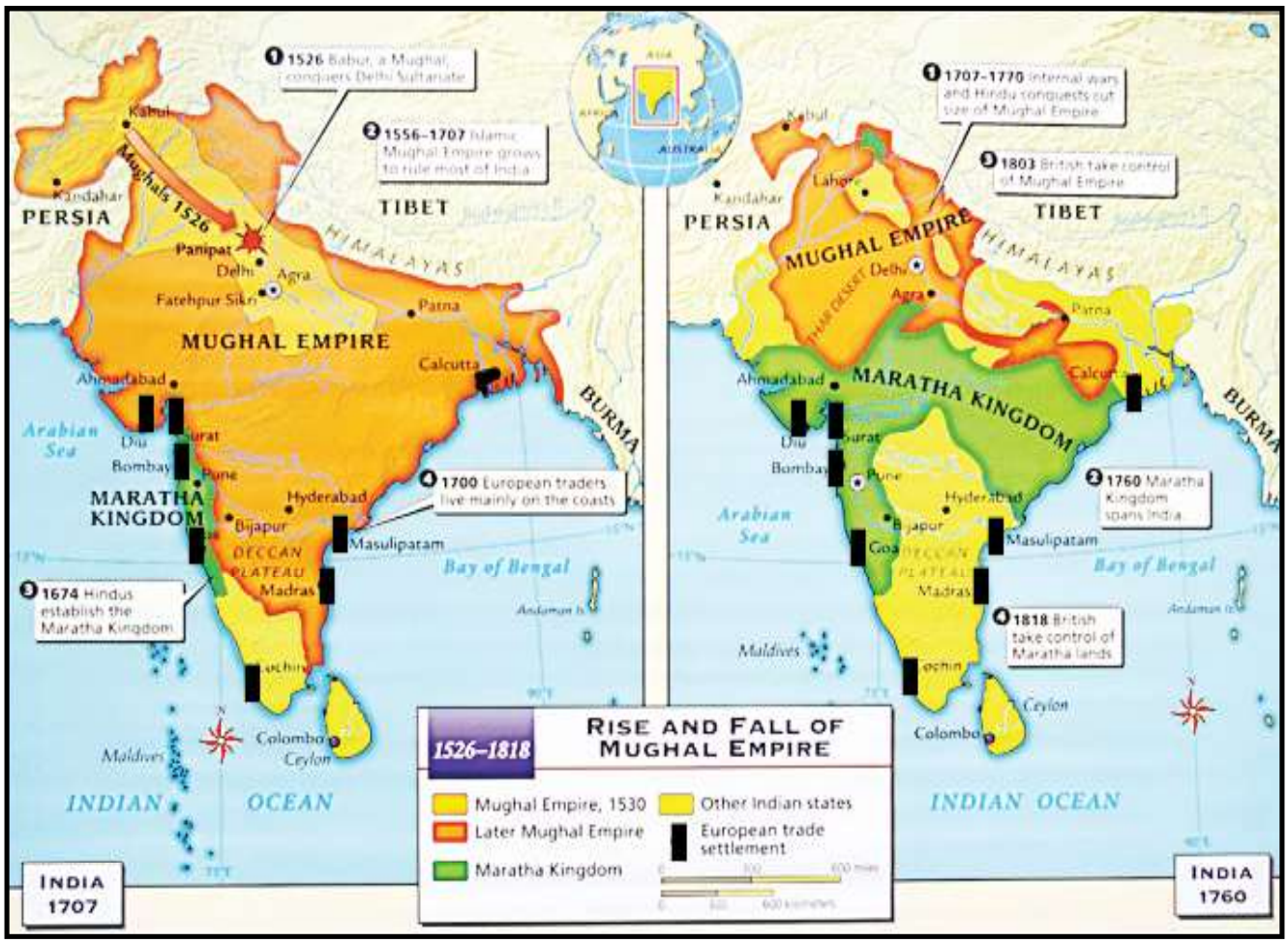

Figure 1.7.2: Changes in the political geography of India from 1707-1760-1803-1818

built cantonments (Figure 1.7.3), was commanded by the British officers, and was under the direct control of the Crown. Indians who joined the Army were alienated from their homes and friends.

Macaulay's education system and Cornwallis's colonization policy disrupted the Indian agrarian system and ruptured the traditional society. A new class of landowners called Zamindars was created as ground-level tax-collectors. Peasant lands were usurped through heavy taxation. In 1857, the resentment towards harsh land taxes and oppression fueled a mutiny among the soldiers, called the Sepoy Mutiny.

The East India Company organized their holdings across the subcontinent in four Presidencies – Bengal, Bombay, Madras and Agra(Figure 1.7.4). India's traditional marine trade was destroyed through piracy and blockades. Much of the grain-producing fertile land was forced to produce indigo and cotton. The local handloom industry was disrupted, to promote mill-textiles from England.

The British did establish India's railways and a road transport network that were used to transport goods and to deploy the Army. The progress of industrial manufacturing in England placed great demands on the export of raw materials from India, including jute, cotton, silk, wool, saltpeter, indigo, and teak. Finished commodities were sold back in India with reduced tariffs.The massive export of grains led to starvation and famines in many areas in India.

Figure 1.7.3: British India Colonial Army

Figure 1.7.4: British East India Company Territory Ruled

Parliamentary pressure from England led to efforts to create self-rule in India and to the establishment of the Indian National Congress as a political party in 1885 by the British civil servant Allan Octavian Hume. The INC became an intellectual platform for debating the future of India (Figure 1.7.5) and helped germinate India's struggle for freedom.

Figure 1.7.5: Attendees at the first session of Indian National Congress, Bombay, 1885

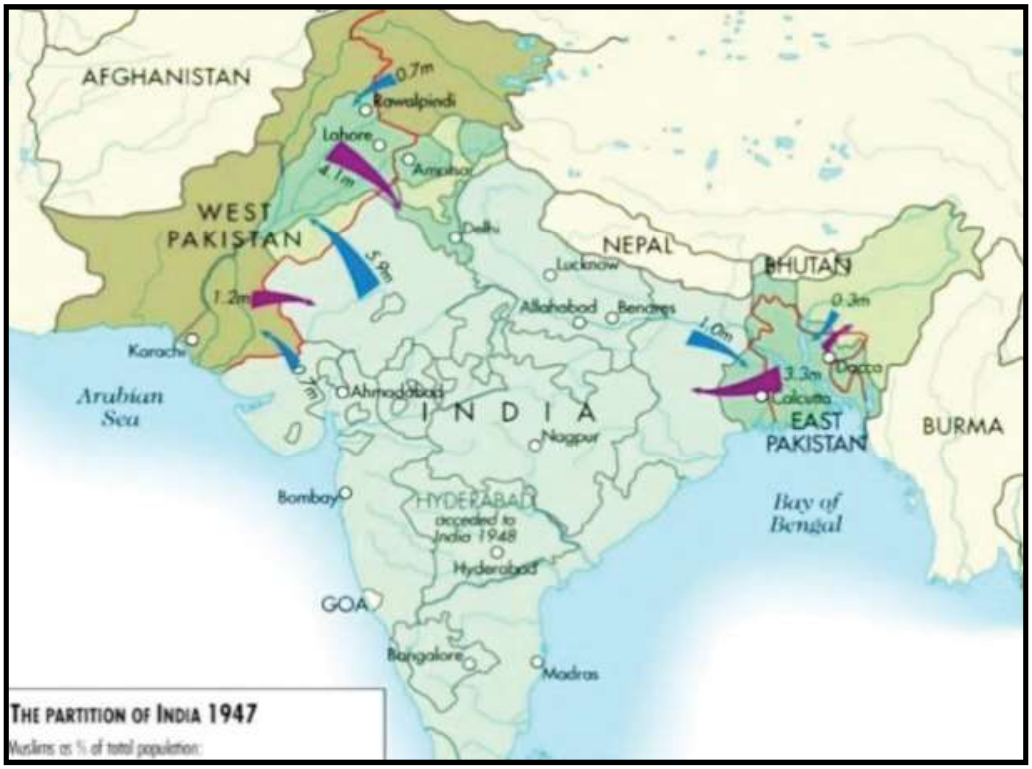

Figure 1.7.6: Post Independence (After 1947) India and Pakistan

Figure 1.7.7: Movement of people across the border In Punjab, 1947.

Mahatma Gandhi's nonviolence and non-cooperation strategy attracted millions of Indians to participate in the freedom movement. Muslims organized under a separate political party called the Indian Muslim League, led by Barrister Mohammed Ali Jinnah. They demanded a separate state for Muslims, a proposal that was opposed by the Indian National Congress. Eventually, the British hurriedly drew a demarcation line and left. The demarcation line divided Punjab in the West and Bengal in the East, to create the state of Pakistan (Figure 1.7.6.) A massive loss of life ensued, with millions of people crossing the borders under religious tension and panic (Figure 1.7.7).

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/british-period/geography-and-people

Authored by: Hardeep Mann for India Discovery Center (IDC)

Track References - Geography and People

1. An Advanced History of India, By: R. C. Majumdar, London, 1960. ISBN 0-333-90298-
2. Ancient Cities of the Indus Valley Civilization, by Jonathan Kenoyer, Jonathan Mark; Mark Kenoyer | Jan 1, 1998
3. Ancient Geography of India, By Alexander Cunningham
4. Angus Madison (2003). "The World Economy: Historical Statistics".
5. Bhartiya Vidya Bhavan, "The History and Culture of the Indian People, The Age of Imperial Kanauj", Volume 4, 1989.
6. Bhartiya Vidya Bhavan, "The History and Culture of the Indian People, The Struggle for Empire" Volume 5, 1989.
7. Das Capital 1 Karl Marx
8. Elites in South Asia, Edited by Edmund Leach and S.N. Mukherjee
9. History & Culture of Indian People, Classical Age, Vol. 2, Published by Bhartiya Vidya Bhavan,
10. History & Culture of Indian People, Classical Age, Vol. 2, Vol 3, Published by Bhartiya Vidya Bhavan,
11. India As Known to Panini – https://archive.org/details/in.gov.ignca.4695
12. India As Seen by Panini – PhD Thesis By D.N. Aggarwal, Delhi University, 1952
13. Life In the Ancient Indus River Valley (Peoples of the Ancient World), by Hazel Richardson | Mar 15, 2005
14. Our Indian Heritage – Will Durrant, The Story of Civilization Vol 1.
15. Ramakrishna Mukherjee East India Company
16. Selected Correspondence 1846, By: Karl Marx and Fredrick Engels
17. The Agrarian system 1556-1707, By Irfan Habib
18. The Ancient Indus Valley: New Perspectives, By: Jane McIntosh, 2007
19. The Basis of Indian history, By: D. D. Kosambi
20. The British and the Money Lenders in 19th century, By: Thomas R. Metcalf
21. The History of India, By: Romila Thapar, Volumes I & II, Penguin books (reprint), 1990.
22. The Indian Middle Classes, By: B.B. Misra
23. The making of British India 1765-1835
24. The Quest for the Origins of the Vedic Culture: The Indo-Aryan Migration Debate, By: Edwin Bryant, 2004.
25. The Rig Veda, 1896. By: Ralph T. H. Griffith, https://www.sacred-texts.com/hin/rigveda/index.htm
26. The Rise and Fall of East India Company, By: Ramkrishna Mukherjee
27. The Rise of the Maratha Empire, H. G. Rawlinson
28. The Wonder That Was India by A. L. Basham
29. The World Economy: Historical Statistics, By: Angus Madison (2003).
30. Will Durant, The Story of Civilization I, Our Oriental Heritage, Simon and Schuster, 1954.
31. Will Durrant, Our Oriental Heritage: The Story of Civilization, Volume 1, 1935.

Internet (generally available material)

https://en.wikipedia.org/wiki/Munda_people

https://www.britannica.com/topic/Indus-civilization

https://www.oecd-ilibrary.org/development/the-world-economy_9789264104143-en

https://iranian.com/History/2003/May/Pallava/p.html

TRACK 2

Contributors

Krishnakali Dasgupta is an Associate Research Scientist in Developmental Genetics at Yale University (formerly NYU and at Harvard University). She is an artist of the Classical Indian dance form Manipuri and received the Govt. of India Senior National Scholarship for outstanding artists. She feels the history and identity of India is passed through generations wrapped in the language of Art and Socio-Cultural rituals. She digs deep into the Indian cultural fabric and searches out stories hidden in

Rita Pandey studied Sanskrit and philosophy. She worked as the Assistant Director of Harvard Secondary School Program for more than twenty years. She is a teacher. Currently in Lexington, MA, she serves as an elected Town Meeting Member and board member of select committees. She enjoys literature, poetry, music, yoga, and nature. She helps organize the IDC Virtual India project.

2.0 Art and Culture: Introduction

Indian art is known for innovation and aesthetics. Aesthetics has to do with the beauty and grandeur of the production. Innovation is the means of creating beauty. Art influences the cultural life in the country through the textiles, living areas, furniture, cuisine and the festivities.

The prehistoric and early historic period of India is represented by the emergence of the Bronze Age Indus Valley Civilization. The agricultural society traded surplus in faraway lands through marine trade. Clay seals with various motifs have been unearthed suggesting trading houses and the traded material. Jewelry of beads and gold has been excavated suggesting style and affluence. Hierarchical nature of social stratification can also be inferred from the housing remnants.

The socio-cultural identity of people in the Vedic period (2000BCE-700BCE) was based on the Rig Veda and associated Vedic literature. The Rig Vedic tribes of the Sindh-Punjab region were pastoral societies that predominantly practiced cattle rearing along with limited farming.Their survival depended heavily on the prowess of their warriors, who used copper and bronze weaponry. Terracotta pottery and textiles are unearthed. Lute-like instruments and flutes suggest cultural activity. Dances apparently accompanied rituals. Women were literate with equal standing.

The Classical Period of India (700BCE-200BCE), we observe the flourishing of the silk industry, the development of town markets.Thriving arts like theatre, music, and dance are noticed. Terracotta pottery and bronze coins with unique iconography are some of the remarkable archaeological finds from this period. The Mauryan period saw the pioneering of stone masonry, as seen in the early rock-cut caves and Buddhist stupas. The codification books on grammar and prosody were produced in this period. This helped to create the great literary tradition of India through massive epics and story literature.

The Golden Period (200 BCE - 500CE), witnessed the commissioning of prayer halls and living quarters for monks, as well as the highly skilled craftsmen's guilds that provided the stone masons, sculptors, carpenters, and painters. The magnificent Ajanta frescoes characterize life and living during the period. Intricate iconography of Buddhist and Jain art were commissioned in various parts of the country. The textbook on drama, the Natyashastra, was compiled during the period. It spells outtheuse of many kinds of musical instruments. Silk and ornaments decorated both men and women.

The Hindu Period of India (500 - 1500 CE), saw the rise of mid-sized towns and villages and the construction of magnificent rock-cut and stone masonry temples dedicated to Hindu deities. The period witnessed the emergence of new artistic styles, including the development of miniature paintings. Music, dance and literature developed byvarious Temple communities. Buddhist art prospered and architecturally intricate Jaina temples were constructed.

Mughal-Maratha period (1500-1800 CE) brought in the fusion of Hindu and Islamic cultures. A hybrid blend of architecture, literature, music, dance, cuisine, and textiles developed. The Taj Mahal is an iconic example of Mughal architecture that incorporates both Hindu and Islamic elements. Iranian Sufism found expression in Indian Muslims and took root with prolific new literature. Devotional poetry was also propelled through Hindu mystics with some of the most popular musical compositions. South India saw its own cultural growth with music, dance and literature.

The impact of British colonialism resulted in the decline of traditional skills. Western architectural styles, painting, and technologies such as photography and cinema were introduced. Despite these changes, traditional dance and music continued through folk assemblies. The nationalist sentiment was expressed through newspapers, literature, and theatre. Political commentary also emerged in folk forms and plays, including allegorical references to British figures.

2.1 Art and Culture: India Prehistory and Indus Period (7000BCE-2000BCE)

Dr. Krishnakali Dasgupta

The earliest 'culturally conscious' Indians belonged to the H. erectus communities of the Middle Paleolithic period, who created the 'Nevasan' (and Soan) cultures 500,000 years ago. Sites for this culture are spread all over India and yield siliceous 'flake stones' and 'axe-cleavers', with rituals guiding life and death. Around 130,000 years ago, these axe wielding hunter-gatherer hominids began occupying the 'Bhimbetka' caves of central India (approx. 750 rock shelters over 10 km) which became one of the few continuously maintained 'cultural' landmarks well into recorded history. (Figure 2.1.1)

Figure 2.1.1: Depiction of the Indian bison on walls of Bhimbetka vs usage the bull insignia in Indus seals

The H. sapiens culture began around 60,000 years ago, with the rise of the Mesolithic cultures. These sites (like Sarai Nahar Rai and Mahadaha in Uttar Pradesh) are marked with large burial sites, ritualistic burial remains, bone ornaments, bone figurines and engraved ostrich-egg shells. Bones of domesticated animals like dogs, cattle, pig and deer indicate a transition from hunter-gatherers to a pastoral life. (Figure 2.1.2, A, B, C)

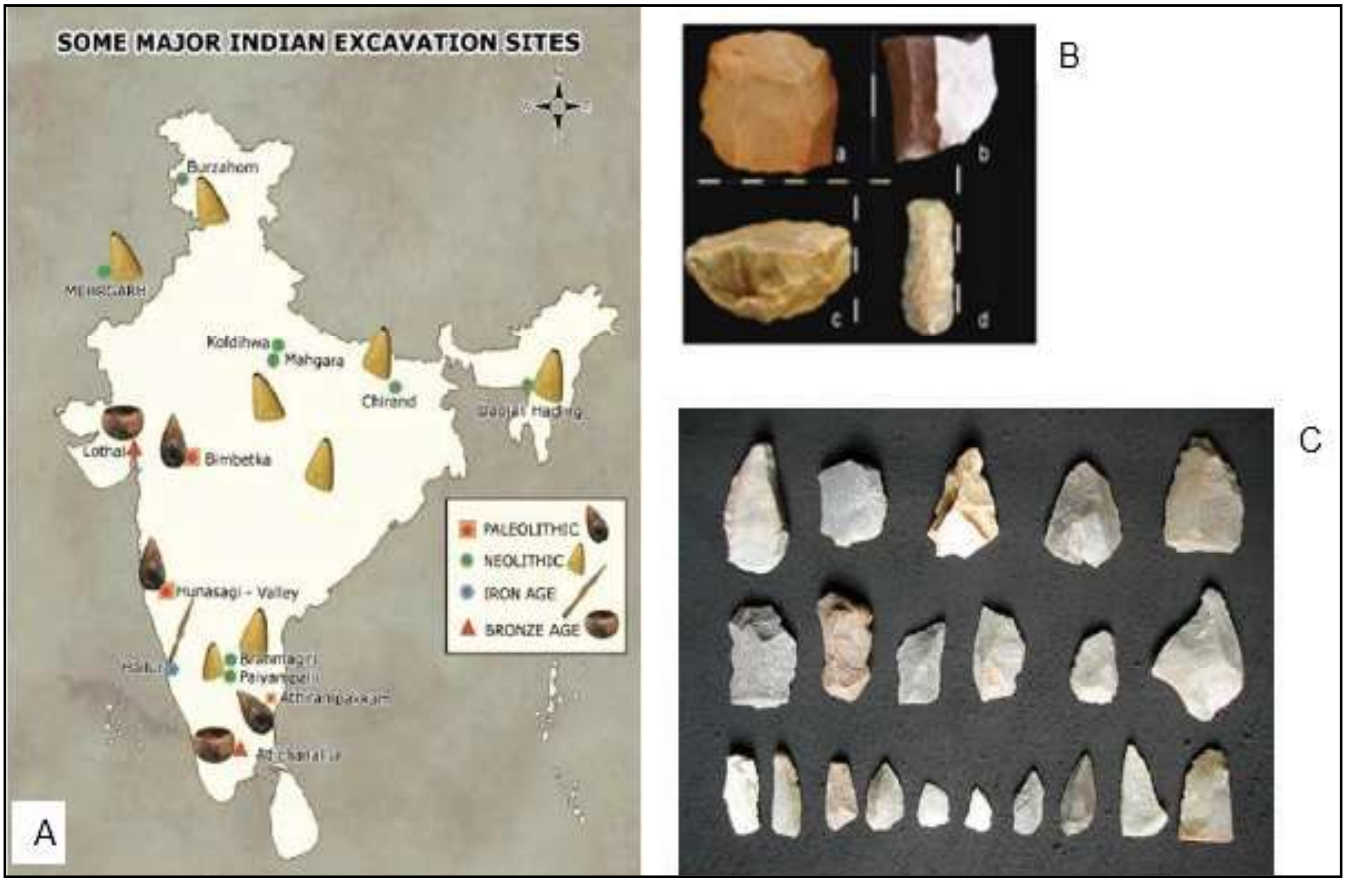

Figure 2.1.2: A. Major Prehistoric excavation sites of India, and the periods of maturation. B. Middle Paleolithic tools from Kortallayar basin. C. Microlith tools from Mesolithic periods.

Around 8000 BCE, handmade pottery and rock wall paintings start to appear at Bhimbhetka site. The paintings depict wild and domesticated animals, hunting scenes, dancing and social activities, along with 'astronomy' observations. They show great artistry and vision, indicating a thriving 'tribe' culture. (Figure 2.1.3.A). Recently, the first ever larger than life sized petroglyphs have been discovered in the Konkan coast area depicting animals, a 'master of animals' figure and abstract designs. (Figure 2.1.3. B)

By 7000 BCE, the earliest agriculturist settlement of the subcontinent is noted in Mehrgarh (Balochistan), marking entry into the Neolithic period with the first use of copper and large granaries for barley, wheat, jujube and date harvests. (Figure 2.1.3.C-D)

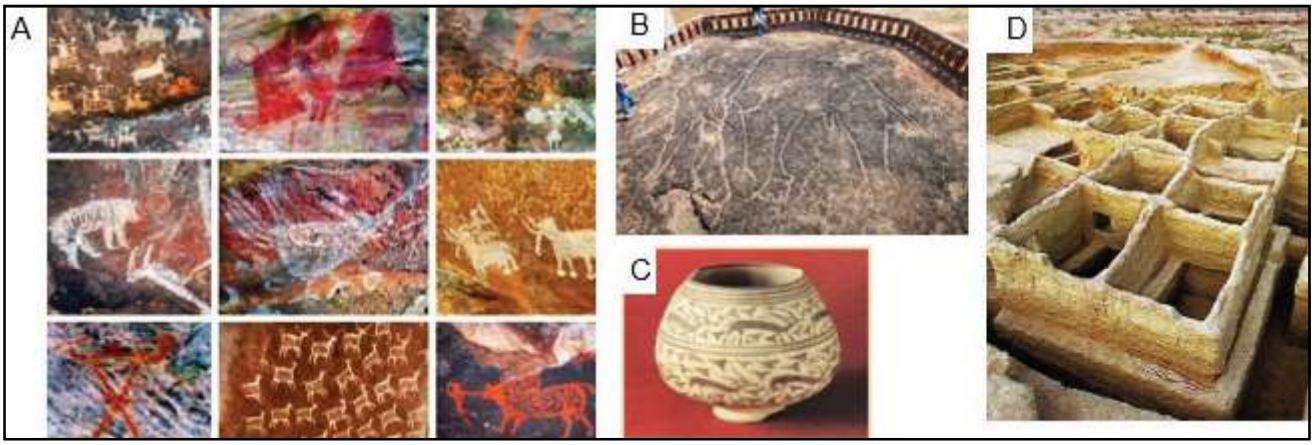

Figure 2.1.3: A. Examples of the Rock wall art at the Bhimbetka Caves. B. Life size Petroglyphs of Konkan coast, C, D Early hand painted pottery and mudbrick walls of houses at *Mehrgrah*

This agrarian society of Mehrgarh (Copper Age) developed into the technologically advanced Bronze Age culture of the Indus Valley civilization. Though the mature Indus civilization spans from 3300BCE to 1700BCE, some Indus sites like Rakhigarhi had existed since 5000BC.

All major sites of the Indus culture, including Harappa, Mohenjo Daro, KotDiji, Kalibangan, Ganeriwala, Dholavira, depict an organized, sophisticated and modern city-culture, with highly standardized town planning and advanced architectural feats, with systematized street and drainage designs. (Figure 2.1.4, A, B)

Figure 2.1.4: The excavated site of Mohenjo Daro city, one of the major towns of Indus Valley civilization.

Despite their agricultural and cattle-rearing practices, the Indus civilization was primarily a 'commerce' culture. Its urban centers controlled a flourishing trade-dependent economy. Hallmarks of this distinct culture include widespread trade, and use of terracotta (bricks and pottery), bronze and copper, precious metals, semi-precious stones and mixed material beads. (Figure 2.1.5.A)

This orderly commercial culture boasts the first use of a highly sophisticated terracotta and steatite plaque system of identification (of goods, persons, groups, locations, even commemorative plaques of events), with an inscription system (the Harappan script) that has yet to be meaningfully deciphered. (Figure 2.1.5.B)

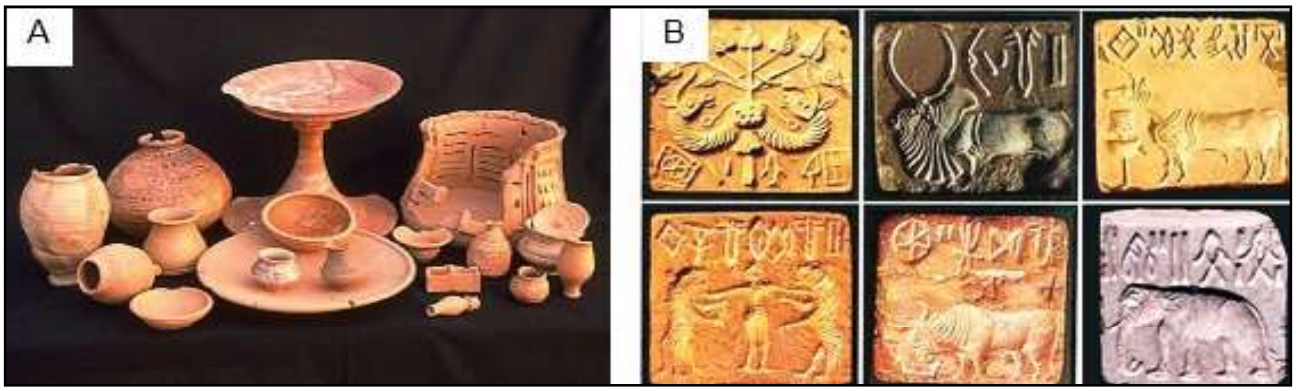

Figure 2.1.5: A. Example of pottery from Indus excavation. B. Indus seals with Harappan script.

Socially, the Indus people maintained a hierarchical setup, similar to that of contemporary civilizations. Equal significance was given to ritualistic, mercantile and cultural activities in their daily lives. Various origin myths, and reverence to the Mother Goddess as the source of creation (from earlier agrarian cultures), are noticed. Nature motifs such as trees, animals and fish appear to be popular themes in the seals and artifacts from this period. (Figure 2.1.6, A, B, C)

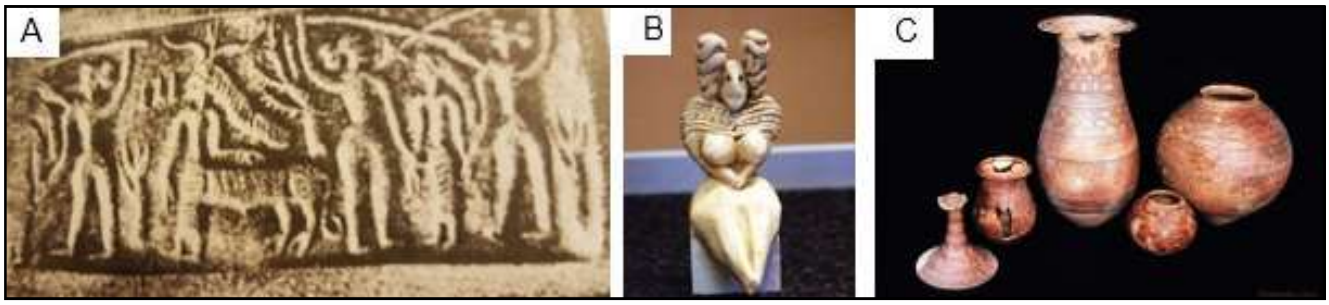

Figure. 2.1.6. A. Indus seal showing female sylvan deity worship. B. Clay mother goddess from Mehrgarh C. Terracotta burial jars

Figure 2.1.7: A. Priest King idol recovered at Mohenjo Daro, wears amulets on the forehead and upper arm, and has a highly decorated 'shawl style' fabric. B. Detailed bead and gold necklace (the gold centerpiece closely matches the

priest-king's amulet) C. High quality detailed black-painted pottery-showing bulls. D. Bronze woman riding 2 bullocks. From various Indus valley sites.

A tasteful artistic inclination is noted with widespread production of statues (including dancers) and toys of varying dimensions in terracotta and bronze, musical instruments (seven-holed flute, string instruments), delicate painted pottery (including burial jars), ivory carvings, gold and mother-of-pearl ornaments and extensive bead production (with the earliest imports of lapis lazuli and carnelian). Extensive hoard of jewelry (which appear to have passed through generations), clay toys and 'game' artefacts (dice) have been recovered from houses of "rich" merchants. (Figure 2.1.7 and 2.1.8)

The cultural significance of textile developed steadily with the use of finely patterned fabric of wool, hemp/jute fibers, and silk.

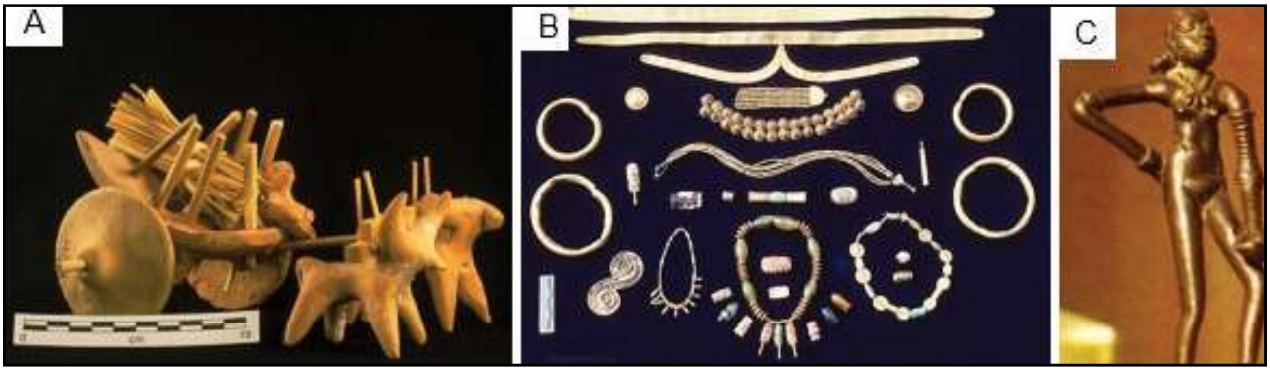

Figure 2.1.8: A. Terracotta toy bullock cart. B. Variety of gold and beaded jewelry (necklaces, armlets, bangles, earrings, brooches etc.) C. Bronze dancing girl of Harappa – wearing the famed shell bangles on left arm.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/pre-history-and-indus-period/art-and-culture

Authored by: Srabonti Bandhopadhyay for India Discovery Center (IDC)

2.2 Art and Culture: India Vedic Period (2000BCE - 700BCE)

Dr. Krishnakali Dasgupta

The Late Bronze Age period between 2000 BCE to 700BCE displays ample archeological evidence of thriving tribal cultures all over mainland India, but material gathered from these sites are inadequate to paint their full socio-cultural picture. In contrast, a huge compendium of orally transmitted hymnal literature (involving fire sacrificial rituals) named Rig Veda, its three auxiliary Sama, Yajur and Atharva Vedas and the following Vedic inspired compositions of the period have survived. They speak volumes on the sociocultural identity of the Vedic people.

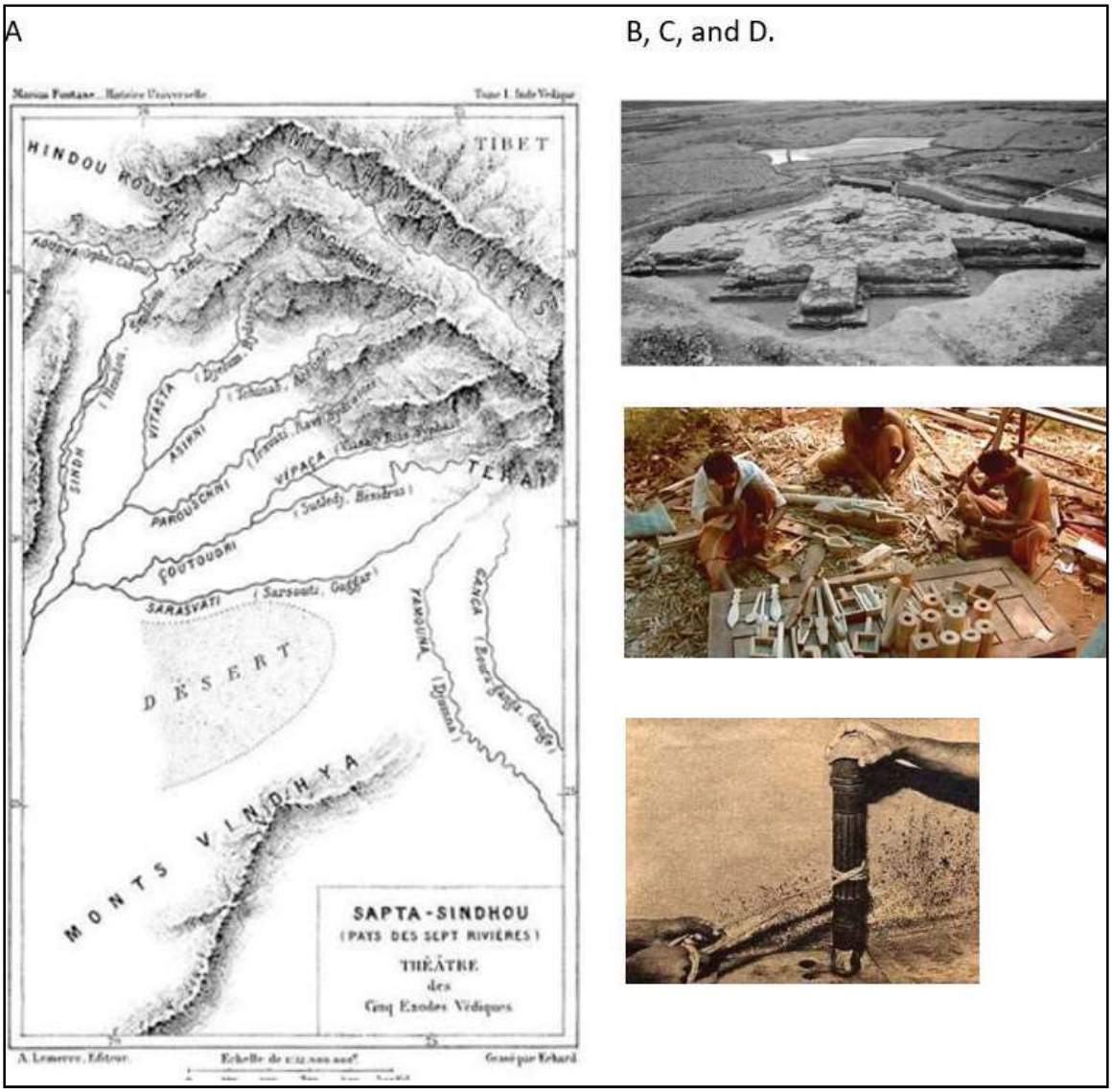

Figure 2.2.1: A. Map of Sapta-Sindhu area from book "Vedic India" (French), 1881.

1. *Syena-citi* (Garuda style brick Vedic fire altar. Chalcolithic period). *Purola Uttarkashi*.
2. Production of Yajna articles. AthirathramYagam 2011. *Panial. Thrissur, Kerala*.
3. Lighting fire of the *Yagam* using the 'Arani'. *Arthirathram*, Kerala, 1975. Illustrated weekly of India.

The Rig Vedic tribes of the Sindh-Punjab region were a multi-clan tribal coalition of semi-nomadic, non-urban, pastoral society, who predominantly practiced cattle rearing along with limited farming. The survival of the tribes depended heavily on the prowess of the warriors who used copper and bronze weaponry (bows and arrows, quivers, swords, javelin, battle-axe) and rode spoked wheeled chariots pulled by fast horses. The ploughman's hymn speaks of the plough and the heavenly furrow making agriculture sacred, with 'Yava' and 'Dhanyavija' as crops. Three primary craftsmen, the smith, the carpenter, and the weaver met the needs of the early Vedic village. (Figure 2.2.1)

The Rig Vedic literature reflects a lively society with various types of entertainment. People wore sheep wool, silk and animal skin clothing (upper and lower garments, shawls, turban) with boar skin-shoe/ sandals. (Figure 2.2.2A) Gold, silver, semi-precious stone jewelry (necklaces, breastplates, earrings, bracelets, anklets, head ornaments and crowns) and conch-shell amulets were worn. Gold Niska appeared to be a standard weight in the form of an ornament later used as currency. They consumed intoxicating drinks like the ritualistic 'Soma' during fire-rituals or the 'Sura' for relaxation. They indulged in dice-games and chariot racing. Cattle and hunted games were eaten on special occasions.

Figure 2.2.2.A: Chariot riders. Chalcolithic. Chaturbhuj Nath, Nala Rock Shelters. Madhya Pradesh.

Music and dance were performed by professionals. The Veena, lute, flute and harp were played along with cymbals, drums and conches. Sama Veda delineates all variations of the Heptatonic scale making the Indian classical Ragas, while the Rig Veda hymns use mature poetic meters. Portions of the Vedas are written as dialogues, encouraging early 'drama' forms (Pururava-Urvashi, Yama-Yami sukta).(Figure 2.2.2B, 2.2.2C)) Detailed geometric calculations are mentioned for building complex multi-layered fire-altars (falcon shaped, tortoise shaped, lotus shaped, chariot wheel, circular, triangle, hexagonal etc.) with same size bricks, laying foundations for texts on architecture and design.

Figure 2.2.2.B:Pururava- Urvashi dialogue (Ajanta Style). R.S. Sathi. India. 1950s. Museum of Oriental Art Moscow.

Women could learn the Vedas or become warriors during the Rig Vedic period, but not become a priest or host a Yagna. Monogamy was encouraged and child marriage was not practiced.

The later Vedic literature (1000BCE onwards), chronicles eastward movement of the Vedic tribes, implementation of iron for ploughs and arms, and massive expansion in crafts to include embroiderer, dyer, jeweler, leather craftsmen, mat and basket maker, potter, washerman, cook, boatman, charioteer, bowstring maker, horse attendant, elephant-keeper, moneylender, astrologer etc.

Figure 2.2.2.C: Libation vessels made of the conch shell,Mehrgarh. Early Chalcolithic.

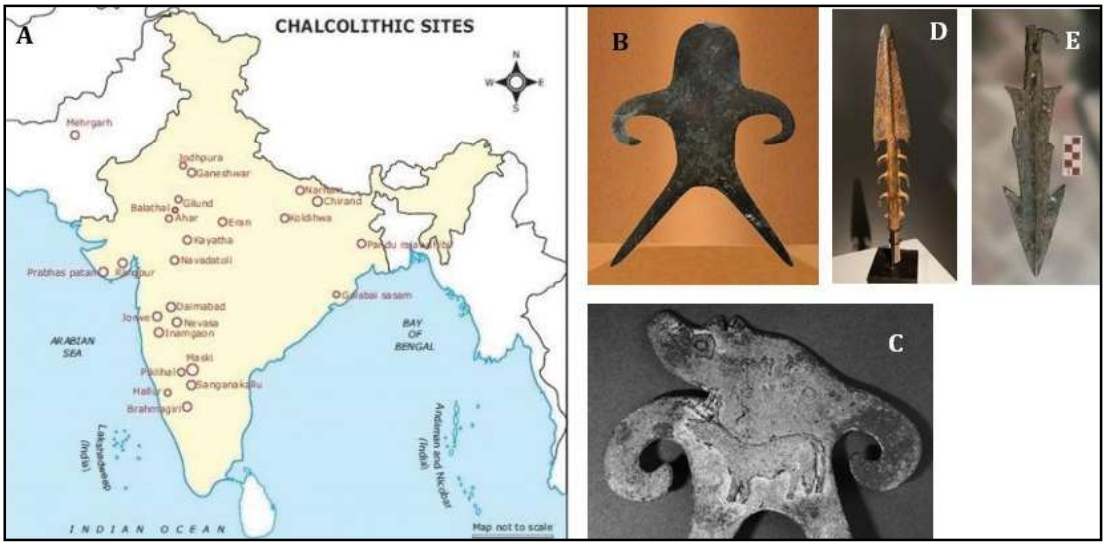

Figure 2.2.3.A: Major Chalcolithic sites in India. B-E Copper Hoard culture artefacts:, (B)Anthropomorphic figure. N. India Doab region, (C)Boar-head anthropomorphic animal seal. Haryana., (D, E) Harpoons. Uttar Pradesh & Rewari.

Archaeologically, the Vedic period corresponds to the Chalcolithic (Copper-stone) Period in India. The major Chalcolithic sites are Jhukar, Ahar, Kayatha, Malwa, Jorwe, Hallur etc. Simple square or circular dwellings of mud or wattle and daub (or pit dwelling) are found with wheat, barley, rice, legumes, oilseed, and fruit residues. Mass grave cultures arose in the Northwestern region (Gandharan grave, Cemetery-H) versus a characteristic Megalithic grave culture in the peninsula. Copper hoard found from Haryana to Tamil Nadu yield harpoons, antennae swords, hatchets, celts, double-edged axes and enigmatic anthropomorphic figurines. Granite rock paintings from Andhra and Karnataka depict humped long horned cattle, wild animals, dancers, footprints and abstract designs. (Figure 2.2.3 A, B,C,D)

Following a mixed Ochre, Black and Red, and Buff pottery phase, a fine, smooth, fast wheel Grey ware painted with simple geometric designs (PGW) became pan-Indian. Eventually, advent of iron tools (daggers, spears, swords, knives, arrowheads, bangles, sickles, hoes, celts, hammers, ploughshares, trident etc.) led to massive expansion of agriculture, ushering the era of river valley settlements that continue till today. (Figure 2.2.4 A,B,C,D,E,F)

Figure 2.2.4:

1. Anthropomorphic burial Megalith (stone). Matur. Tamil Nadu.
2. Cremation urn of the Gandharva grave culture (1200 BCE)
3. Black painted redware (BPRW)- Ceramic goblet from Navdatoli, Malwa (Central India).
4. Bronze charioteer, Daimabad, Maharashtra (Lorwe).
5. Fine and delicate Grey Ware (PGW) associated with Iron Age, North India, Ganga-Yamuna Doab.
6. Early Iron swords blades and javelin tips.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter/seminars/vedic-period/art-and-culture

Authored by: Paromita De for India Discovery Center (IDC)

2.3 Art and Culture: India Classical Period (700BCE-200BCE)

Dr. Krishnakali Dasgupta

Archaeologically, the famed Northern Black Polished Ware (NBPW) pottery with a burnished and glazed surface, marks the second phase of urbanization (Figure 2.3.1). Large hordes of silver and copper punch marked Karshapana-standard coins from the historic Mahajanapadas (City States) with distinct iconography have been recovered. Major information of the society and culture currently come from the contemporary Jaina, Buddhist, Sanskrit, Greek and Chinese literary sources (List.1). Out of the earliest available Tamil literature (2nd Sangam Period – 400BCE) only two grammar texts Akattiyam and Tolkāppiyam survive.

Figure 2.3.1: Northern Black Polished Ware (NBPW)

Pali texts mention Puras (fortified citadel city), Nagaras (fortress town), Nigamas (market town),Rajdhani (capital) and Mahanagaras (metropolitans like Champa, Shravasti, Rajgriha, Varanasi) with gates, walls, moats, and watchtowers. Remains of the fortified boundaries of Rajgriha, a garden city with a central core surrounded by numerous parks have been excavated. (Figure 2.3.2)

Figure 2.3.2: Silver Punch marked coins. Mahajanapada.

A Sanchi Stupa frieze shows Kushinagara during a battle, with three or more storied vaulted buildings with horse-shoe shaped crowning facades supported by wooden buttresses, carved railings and viewing galleries. (Figure 2.3.3)Megasthenes describes Chandragupta Maurya's luxurious timber-made palace with gilded wooden columns 'adorned with golden vines and silver birds', coloured walls, and painted frescoes at Kumrahar (Pataliputra).

Figure 2.3.3: Ruins of Mauryan Pillared Hall, Kumrahar

Figure 2.3.4 shows the frieze at Sanchi detailing the defense of Kushinagar.

Figure2.3.4: Frieze showing the defense of Kushinagara, Sanchi

Mauryan royalty wore fine muslin cloth embroidered with purple and gold (brocade) with precious stones and flower ornamentations. (Figure 2.3.5) Mahabharata mentions 'Chitravastra' (printed cloth), while fine Indian cotton, silk, linen and woolen cloth were famous in Persian, Turkish and European markets (Greek accounts). Silk cocoons reached India from China (Chinnapatta -Arthashastra) through Burma, into Bengal and Assam where the silk industry developed.

Figure 2.3.5: Mauryan Ring stone

Town markets sold luxury items like - oils, perfumes, jewelry, and liquors. Lac-insects for Shellac jewelry and lacquer for timber, and 'lake' or organic dye were widely cultured. Ivory workers and metal smiths were highly sought-after. Materials found in the northern areas include terracotta animal and human figurines, broken ivory, sculpted ringtones, terracotta seals, bone arrowheads and simple stamped pottery.

Figure 2.3.6: Stone relief of Dance of the Apsaras. Bharhut railing.

Pali and Jaina literature mentions theatrical and musical performances at royal courts, fairs, and festivals. The actors, dancers, bards, musicians, drummers, acrobats, and magicians traveled from villages to towns. Jatakas mention plays, musical

theatres, plays on open circular stage and 'women's theatre'. (Figure 2.3.6) Plots of these folk theatres recorded actual historical events later recovered from Sanskrit plays, like Chandragupta Maurya's victory of Magadha (Vishakhadatta's 'Mudrarakshasa'). Panini mentions Nata-sutras (performance manual) authored by Shilalin and Krishshva, as well as famous Veena, venu, mridanga players.

The most accomplished dancer excelling in all arts, literature and mathematics held the official post of Janapadakalyani (high courtesan and state host).The celebrated Ambapali of Vaishali met the Buddha and was deeply influenced by him. Kavya (poetic storytelling) literature started around 500 B.C. that encouraged inclusion of cities, bucolic settings, and forest ashrama scenes. (Figure 2.3.7, Figure 2.3.8)

Figure 2.3.7: Mauryan terracotta dancer playing Damaru. Bulandibaugh

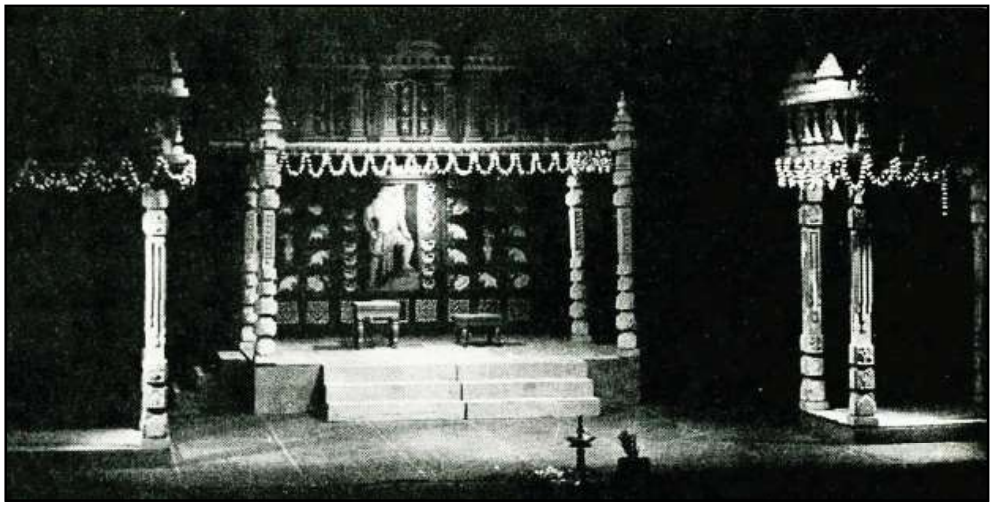

Figure 2.3.8: Stage design for 'Mudrarakshasa' play following Natya-Shastra

Figure2.3.9: Mauryan Rock cut caves. Barabar caves.

Figure 2.3.10: Stupa of Sanchi.

In the late Mauryan period Ashoka pioneered mastery of stone masonry with rock cut caves, Chaitya halls (Barabar caves), Buddhist stupas (Sanchi, Bharhut). Numerous pillars andstone edicts were built across the realm spreading the message of Buddhism and proper governance. Ashoka's emissaries to Sri Lanka, Burma and Thailand initiated the spread of Buddhism to SE Asia. (Figure 2.3.9)

Earliest stupas were a simple brick hemispherical dome placed on a circular base, crowned with a square box and a Chhatri (umbrella). Some featured a railing or a wall. The jewels of Mauryan art and craftsmanship are the innumerable intricately designed stone rings and monolithic free standing sandstone pillars called the Dhamma stambha (Pillar of Dhamma) of Ashoka, consisting of a long polished columnar shaft (some with edicts), and a capital of mostly a single animal seated on a circular abacus with an inverted lotus below it. This design has Greek and Persian influence. Stone surfaces of the pillars, rock cut cave walls, monolithic Stupa railings, carried the smoothened metallic shine of the famed Mauryan polish technique. (Figure 2.3.10)

Figure. 2.3.11 Sarnath Pillar

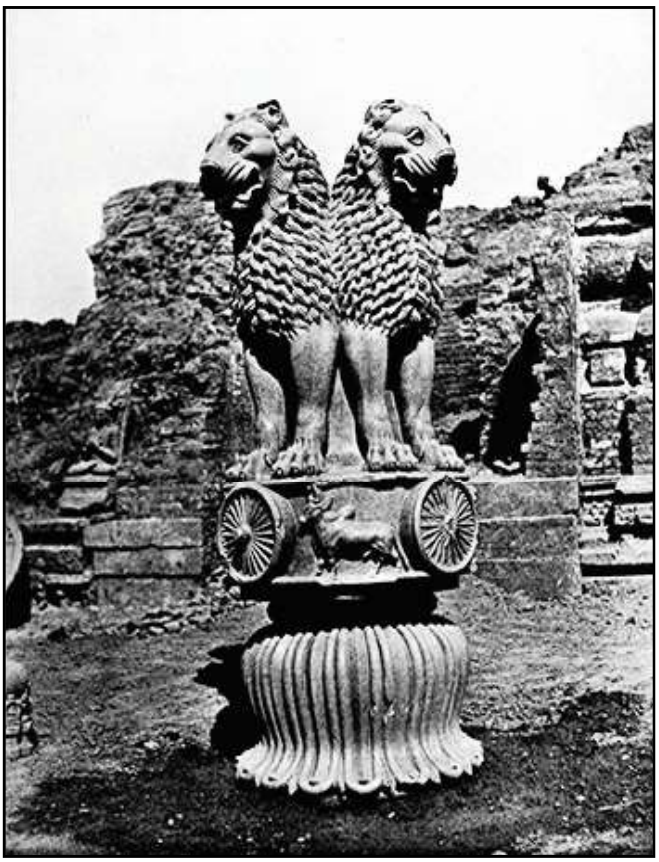

Figure 2.3.12: Sarnath Lion capital.

The most elaborate capital belongs to the Sarnath pillar, with 4 Asiatic lions seated facing outwards balancing a 32 spoke Dhamma-Chakra atop them, with four 24 spoke wheels interspersed with 4 animals (lion, elephant, bull and horse) etched on the abacus. Its symbolism, beauty and craftsmanship make it the emblem of modern India. (Figure 2.3.11, Figure 2.3.12)

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/classical-period/art-and-culture

Authored by: Srilakshmi Srinivasan for India Discovery Center (IDC)

2.4 Art and Culture: India Golden Period (200BCE– 500CE)

Dr. Krishnakali Dasgupta

The Golden period produced some of the greatest wealth of literature, art and architecture in the Indian subcontinent.

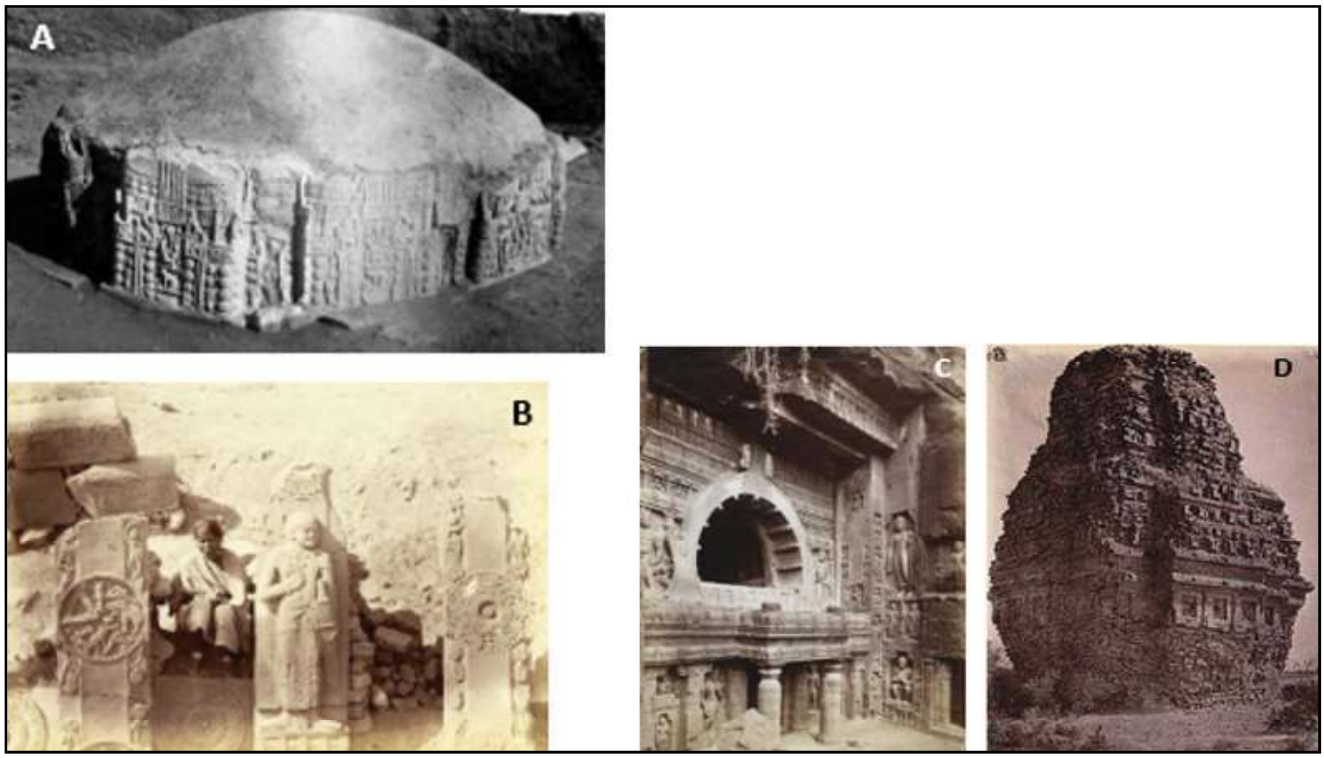

Figure 2.4.1.A: Amaravati Stupa before dismantling. B: Bharhut railings during excavation. C: Ajanta Cave 19 gate. D: Burnt brick Bhitargaon Temple with massive Shikhara.

Both Bharhut and Sanchi stupas were enlarged and decorated with beautifully engraved timber railings, while others were freshly commissioned (Amaravati). Magnificent rock cut prayer halls (Chaitya Griha- enclosing a stupa) and adjacent simple living quarters (Viharas) were excavated for Buddhist and Jaina monks in central and southern India. The entrance, vaulted ceilings, pillars, and stupa of the prayer halls were designed to mimic contemporary wooden architecture (buttresses, window panels, encasings) but later all surfaces were intricately carved with ornamental designs. Inscriptions at the sites note that the caves were commissioned by royalty, rich local and foreign merchants, and crowdfunded by common people. Highly skilled craftsmen's guilds provided the stone masons, sculptors, carpenters, and painters for these commissioned projects. (Figure 2.4.1)

Massive wealth of wood, stone and terracotta sculptural work give insight into contemporary iconography. Bharhut and Sanchi railings are heavily engraved with non-idolatry representation of the Buddha (Hinayana style), Buddha's life scenes, Mayadevi, fantastic winged apsaras and beasts. We notice foliage designs, Ashoka's pillars, and capitals and magnificent Yakshas and Yakshis (most recognizable and omnipresent pre-Buddhist forest deities). They were venerated as wise beings that guarded wealth (material and spiritual) and were heavily associated with various contemporary flora and fauna. (Figure 2.4.2 A,B,C)

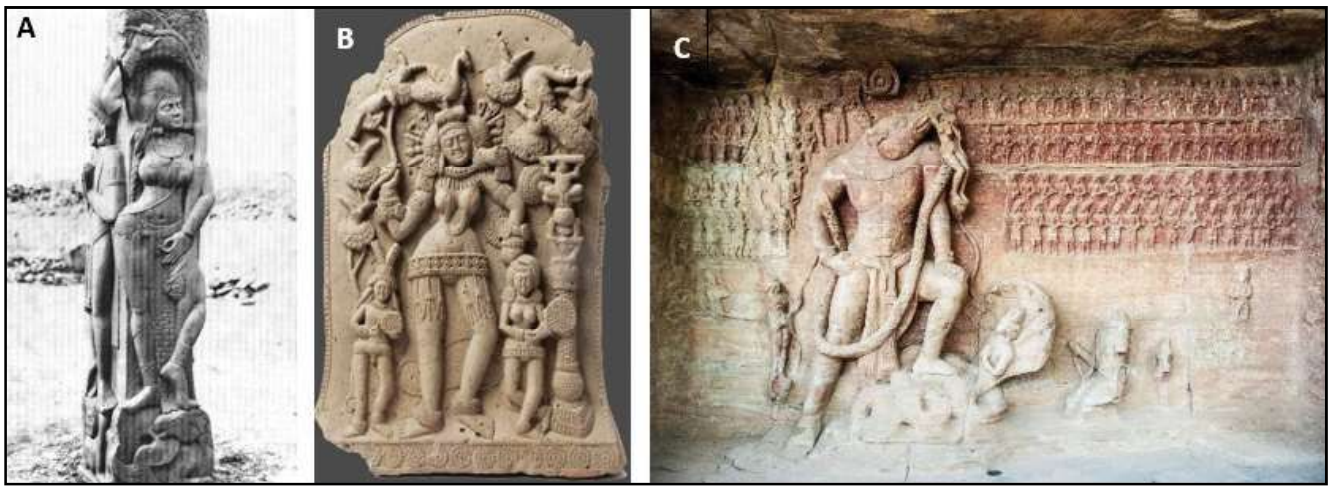

Figure 2.4.2. A: BharhutYakshi B. Shunga period Panchayudha goddess C. Varaha panel, Udaygiri

Massive amounts of terracotta plaques unearthed from Sunga areas show an unidentified fertility Goddess with five to ten weapons in her giant coiffure. In the Mahayana era, large scale stand-alone 'lifelike' sculptures of Buddha became popular. While the Gandhara school from Northwest under Greco-Roman influence focused on anatomical precision (body and facial), textile detail and a 'somber' expression in their Bodhisattvas on Grey- blue Schist, the central Indian Mathura school produced fleshy and lively Buddhas. Jinas, Yakshis and Hindu gods and goddesses were carved from characteristic red sandstone. Rock cut caves with Hindu iconography (Udayagiri), stand-alone Hindu temples in stone (Deogarh) and burnt brick (Bhitargaon) are observed during the period.

Figure 2.4.3: A. Footprint iconography of Buddha with Dhammachakra. B. Mathura style Buddha. C. Gandhara style Buddha

The Ajanta caves serve as the prime example of the magnificent dry-mural paintings produced during this period. Various episodes from the Jataka Tales and portraits of Buddha are painted in massive frescos, the whole story being narrated in a single frame with different scenes blending into each other. The highly animated characters are painted in various poses and varied skin tonality, wearing brightly colored costumes and shimmering gold jewelry. (Figure 2.4.3 A,B,C) Their theatrical presentation corroborates the importance of drama and theatre to the contemporary society, as supported by production of a large number of excellent Sanskrit plays during the period. The Natyashastra (pan-Indian contemporary dramatic treatise) speaks of highly technical classical dance forms, musical instruments, and vocal compositions. Skilled dancers and musicians are abundant on the Ajanta murals, (Figure 2.4.4 A,B,C),Bharhut railings and the Sanskrit plays. Tamil Sangam literature (including 'Silappadikaram' and 'Manimekalai' - both involving celebrated dancers) belong to this period (Figure 2.5.5 C). The renowned Sanskrit poet and playwright Kalidasa in his 'Meghaduta' chooses a Yaksha as his protagonist and describes the geographical route between Ramgiri (current Nagpur) to Alakapuri (near Mount Kailash in the Himalayas), mentioning the important cities along the way. (Figure 2.4.5 A)

Figure 2.4.4: A. Mahajanaka Jataka panel, Ajanta B. Facial Expression study, Ajanta. C. 9 human emotions (Navarasa) as mentioned in Natyashastra.

Figure 2.4.5: A. Indian Postage stamp commemorating Meghaduta. B. Recreated scene from KalidasaʼsAbhijnanaShakuntalamC. Recreated scene from IllangoAdigalʼsSilapaddikaram. (B and C produced for Doordarshan production of "Discovery of India")

Excavations have unearthed numerous well-planned towns all over India with elaborate fortifications, defense walls, organized streets, permanent mud brick houses, pillared halls, open courtyards, drains, granaries,

terracotta ring wells, stupas, shrines, apsidal temples, and elaborate brick tanks. Luxury household items of wood, ivory, terracotta, bone, glass, gold and semi-precious gems, and fine pottery of delicately painted and stamped red and grey ware and black slipped ware depicting numerous scenes of general life are abundantly discovered. Sanchi friezes show multi storied and high vaulted buildings with large open windows covered with heavy drapery. Kalidasa mentions Chinese silk and Silappadikaram mentions Madurai cloth merchants selling cotton, animal wool and silk clothing. Ajanta paintings and Sunga terracotta plaques show both stitched and unstitched garments, printed designs and fine embroidery, while dancers and royalty wear pearls, precious gems, heavy golden jewelry, and massive hairpins in elaborate coiffures. (Figure 2.4.6 A,B,C,D,E,F)

The archeological and literary sources all bespeak a bustling sophisticated city-based society, with abundantly wealthy trading and ruling classes supporting unhindered development of art and culture.

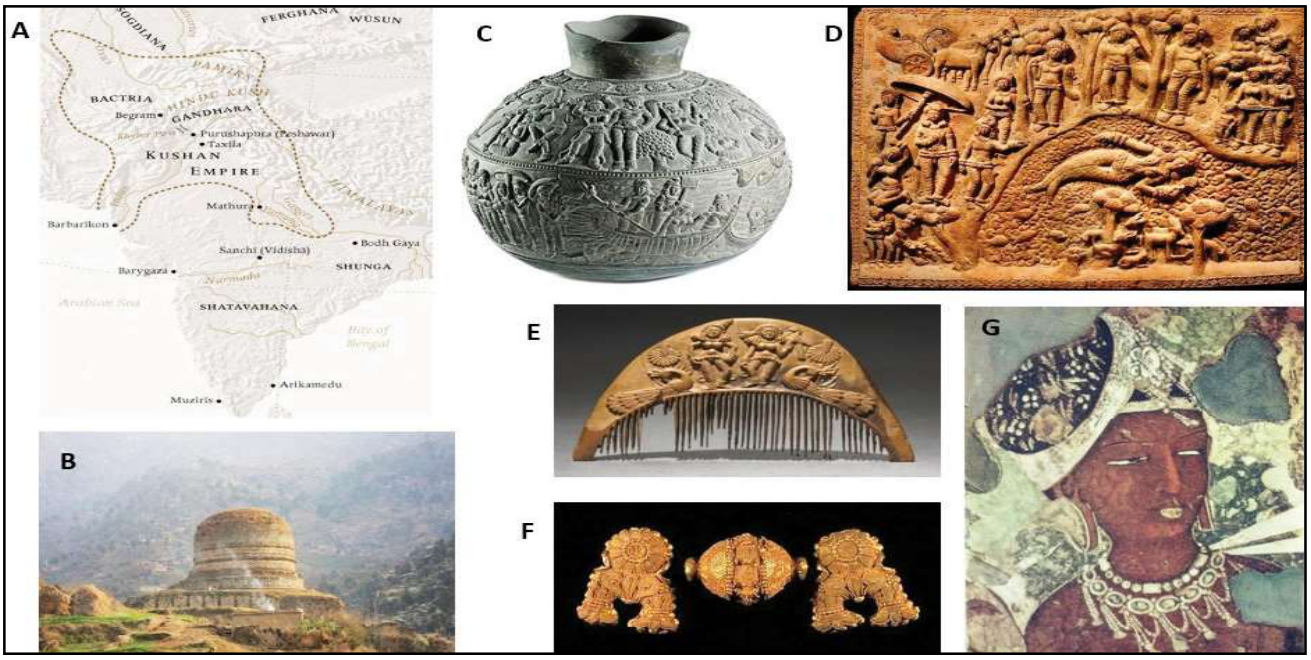

Figure 2.4.6: A. Map of known major cities of Shunga period. B, Amluk Dara Stupa, Swat valley. C. Shunga pottery showing boat D. Chandraketugarh terracotta plaque showing chariot and horses, men waiting with nets to capture mermaid like creatures. E. Ivory comb. F. Golden jewelry Shunga period. G. Ajanta apsara with embroidered cloth headwear and pearl ornaments.

Reference:

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https://www.indiadiscoverycenter.org/seminars/golden-period/art-and-culture

Authored by: Dr. Krishnakali Dasgupta for India Discovery Center (IDC)

2.5 Art and Culture: India Hindu Period (500CE-1500CE)

Dr. Krishnakali Dasgupta

In the aftermath of the fall of the imperial Guptas, numerous powerful clans continually rose to power and then declined in various parts of India. [1]As a result, the great city-centers declined, leading to the rise of numerous mid-sized towns and villages, thereby reducing the stark differences in living conditions between the fortified cities and bucolic villages. To establish legitimacy, each ruling clan associated itself with various icons of the Hindu pantheon, such as Shiva, Shakti, Vishnu, Surya, Ganesha, Kartikeya, etc., declaring the selected icon as the 'presiding deity' of their kingdom. With continued patronage to these icons, society also turned deeply religious, casting aside the former 'Nagarika'-styled 'artistic' lifestyle, and welcoming a tradition of 'pious devotion'. The expression of art and cultural activities moved away from a 'man's entertainment' to 'creating a heavenly atmosphere' for the Gods on earth.

To bring the Gods down to earth and help them meet the common man, this period stands apart from all others for the magnificent rock-cut and stone masonry temples built by various ruling clans that still stand majestically all over India. The main cluster of these astounding rock-cut temples is the Kailashnath temple of Ellora, considered to be the pinnacle of engineering and sculptural mastery. [2] These temples started the practice of massive highly ornate 'shikharas' (towers) atop the main sanctum, emulating 'a heavenly palace, floating in the clouds'. The Indian treatise of architecture 'Shilpa shastra' enumerates three main styles for Shikharas: Nagara (North Indian), Dravida (South Indian) and Besara (mixed). [3]The temples are intricately and ornately carved both, on the inside and outside. (Figure 2.5.1)

Figure 2.5.1: (upper) Kailash Temple, Ellora. Shore Temple, Mamallapuram (Dravida shikhara). (lower) Lingaraj Temple, Bhubaneshwar (Nagara Shikhara)

Figure 2.5.2: Sculpture- Brihadishwara Temple (Thanjavur) and Mamallapuram (Arjuna's penance)

Famous ruling clans: Chola, Chalukya, Pallava, Rashtrakuta, Pala, Sena, Chandella, Vakatakas etc

Main cluster of Rock cut temples: Shore Temples and Rathas of Mammalapuram, Brihadishwara (Tanjavur), Virupaksha (Pattadakal), Hoysaleshvara(Halebid), Kailashnath(Kanchi), Surya Temple (Konarak), Lingaraja and Jagannatha (Puri), Kandariya Mahadeva (Khajuraho cluster) of Hindu pantheon as well as Jaina temples (Mt. Abu) [3]The Nagara style is characterized by a square base with graduated projections of each side, the latter (projections) being continued (almost appearing indefinitely) in the Shikhara, which tapers in at the top giving an elongated half oval shape. The Dravidian style in contrast is marked by the base having more than 4 sides and a distinct pyramidal shaped shikhara (Vimana) with a heavy lodestone at the very top. Besara is a mixed style.

Figure 2.5.3: Bahubali at Shravanabelagola. Shiva at Kailash temple, Ellora. Surya at Konark.

As alluded, these temples are dedicated to one or more icons of the Hindu pantheon. Hence post Gupta, we observe the rise of the defined anthropomorphic manifestations of these icons, along with Buddha and Jaina Tirthankaras.Rock-cut sculptures along the walls of the caves, temples, and their facades, as well as free-standing sculptures (embellished with precious jewels) in the sanctum are observed. [4](Figure 2.5.2, Figure 2.5.3) Various scenes from puranic or jataka stories are etched, as friezes, on the walls. A lot of these were originally covered in gold leaf, or were painted. The Chinese traveler Hiuen Tsang describes the erstwhile Sun Temple in present day Multan displaying a freestanding gold idol of Surya, with jewels for eyes.

Fig 2.5.4. Lalita flanked by Kartikeya and Ganesha, Pala (North). Headdress of Uma, Chola (South)

Hindu Pantheon (of the Period): Shiva, Parvati, (Uma-Maheshwara), Vishnu, Surya, Ganesha, Ganga, Yamuna, Lakshmi, dwarapalakas). Buddhist pantheon: Buddha, Tathagatas, Bodhisattvas (including Avalokiteshwara, Maitreya, Tara, Manjushri, Prajnaparamita). Jaina pantheon: 24 Tirthankaras, Bahubali etc)

Figure 2.5.5: Shiva playing damaru, Chola Bronze. 10th Cent. Copper alloy Nataraja. 9th cent. Copper alloy Tara with silver inlay, Kashmir.

Arguably, the period also pioneered the production of idols of Hindu (including Tantric), Buddhist and Jaina icons in several metals and metal alloys. Notable among them are Ashta-Dhatu (8 metal mix) idolspopularized by Palas in North, and the Chola Bronzes of South. These are still prolific in India, and vary in size from a few centimeters to several feet.They are found in temples, or are regularly passed through families as family deities. The most recognizable among theseis undoubtedly the 'Nataraj' iconography of Shiva as the cosmic dancer (Chola Bronze). (Figure 2.5.5) The mixed alloy icons were specially favored for their polished gold-like shine, and for their jewel-toned painted decorative ornaments.

Painting styles of the period are observable in the colorful murals that depict the deities, and puranic stories, as well as the patron kings, their families, and entourages in the interiors of the temples. (Figure 2.5.6) The sanctums were decorated with gold, silver, and precious jewels, much as are the modern-day opulent Indian temples. Handwritten palm leaf manuscripts, which had already been in production for several centuries, began to be heavily embellished with painting, using natural pigments (iconography and decorations) - first by Jaina manuscript-makers, and later observed in Buddhist manuscripts. [5]Massive decorated ritual paintings of Bodhisattva (Thangka) also originate from this period.

Figure2.5.6: Murals Brihadishwara Temple. Illustrated original Ashtadashsahasrika Prajyaparamita. Ceremonial Thangka, Tibet.

Figure 2.5.7:Natmandapa (dance hall) flanked by female musicians on walls of Konark, Orissa.

Music and dance flourished significantly during the period, but like all other forms of art, was directed heavily towards pleasing the deities (and devotees), and thus increasingly attached to temples. Most of the larger temples had a 'Natya mandapa' (dance hall) attached to them (built within the original plan with similar detailing), where regular dance and music performances were held as a part of the daily ritual. (Figure 2.5.7) As the idea of 'sovereignty' shifted from a ruling King to the presiding deity, holding opulent entertainment for the deity was considered necessary in the temples.

Although Harshavardhana is known to have written several Sanskrit plays early during this period, Sanskrit theatre observably suffered a decline, probably due to its inherently secular themes; but theatre, dance dramas and puppetry survived in folk forms. [6](figure 2.5.8)

Folk theatres: predecessors of Chhau, Yakshagana, Therukottoo, Ramlila etc.

Regional literature in vernacular languages received heavy patronage, but the subjects were either religious

Figure 2.5.8: Memorial Hero-stone, 11th century, Karnataka. Therukottoo, Tamil Nadu.

or records of feats of the patron royalty. Nevertheless, these literary works nourished the development of vernacular languages, stories and scripts. It also helped immortalize fables of folk heroes and heroines who died defending villages and were commemorated with small 'Hero stones' that are still found all over South India.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/hindu-period/art-and-culture

Authored by: Dr. Jaidev Dasgupta for India Discovery Center (IDC)

2.6 Art and Culture: India Mughal-Maratha period (1500 CE -1800 CE)

Dr. Rita Pandey

Despite the destruction of many Hindu temples and scriptures, the Turks and Persians blended with the Hindus, creating a unique culture. An exceptional fusion of rich and admirable architecture and literature, music, dance as well as cuisine, and textiles developed.

The Taj Mahal (Figure 2.6.1), one of the universally admired masterpieces of the world's heritage, is an ivory-white marble mausoleum on the bank of the river Yamuna. The use of red sandstones and marble on a symmetrical structure became an important feature of the Mughal style. The technique was used in the BulandDarwaza and Chauburji Gate in the *monolithic* style of massive single-standing buildings.

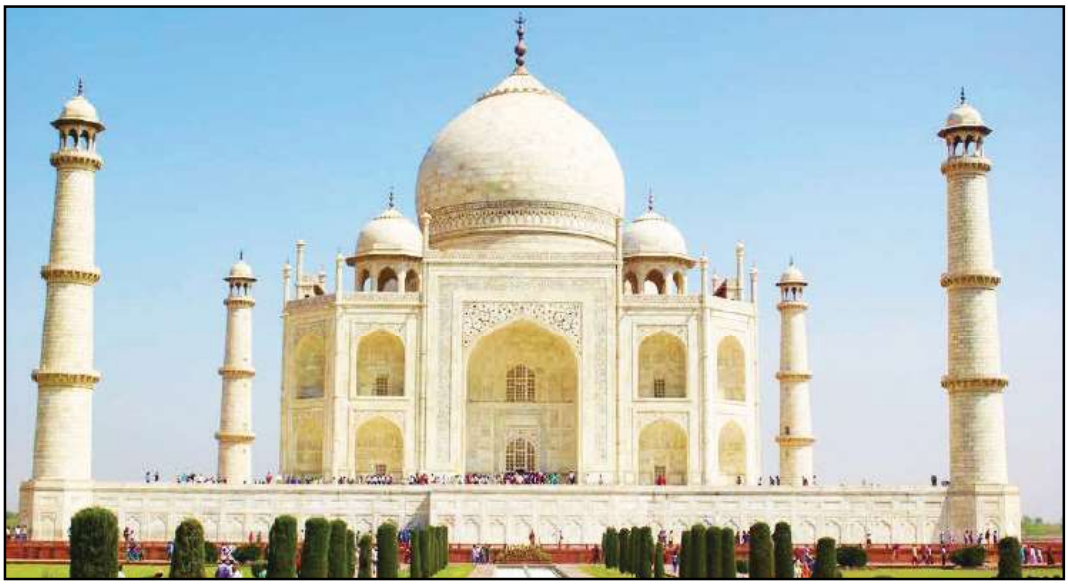


Figure 2.6.1: The Taj Mahal was commissioned by the Mughal emperor Shah Jahan (1628–1658)

Figure 2.6.2.:*Mashrabiya* - Pierced screens were used as windows to control heat and sunlight.

The Hindu architectural style of curves, colors, floral designs, and arches decorated with *Muqarnas,* honeycomb vaulting, was added to the Arabic *Mashrabiya* design (Figure 2.6.2). Elephant figures on Lahore fort, chhatris around the dome at Fatehpur-Sikri, and stalks of flowers on minarets are excellent examples of Hindu and Islamic co-creation. (Figure 2.6.3)

The Persian Charbagh layout of gardens used multiples of geometric plan, featuring four squares, two canal crossings in the center and flower beds, along with Cypress and fruit-bearing trees, with cooling fountains, ponds, and waterworks. Charbagh in Kabul, Humayun's Tomb in Delhi, Aaraam-Baagh and Mughal-Garden in Agra and others have similar designs. (Figures 2.6.4).

Figure 2.6.3: Pietra dura - Parchin Kari work, Detailed work on marble-Taj Mahal, Agra

Figure 2.6.4: Shalimar Bagh in Srinagar, and Lahore

Miniature paintings were based on Iranian symmetry and proportion, combined with local flexibility that developed distinctive elegance. Both Hindu and Muslim artists included Persian fables, Humza-Nama and local themes from the Mahabharata, Ramayana, Puranas, Nature, and Gods and Goddesses in their designs.These illustrations used Indian costumes, plants, landscape, and colors. (Figure 2.6.5).

Figure 2.6.5: Hamza-Nama and Mumtaz-Shahjahan

Figure 2.6.6: Poetry, Music, and Instruments

India's textiles included fine Dhaka muslin, silk, and velvet with brocade-Kinkhwab work. Mughal cuisines were influenced by the Iranian, Afghani, and Persian as well as Kashmiri, Punjabi, and Deccan Cuisines.

Harmonized Perso-Arab and Indian music flourished. Many new melodic structures were created such as Khayal, Tarana, Tappa, Thumri, Kajari, Ghazal, and Ashtapadi. Devotional music in the form of Bhajans became immensely popular. Rudra-Veena and Rabab fused with the Indian instrument Veena, to form the sarod. (Figure 2.6.6). The melodies of Carnatic music in the south were mostly devotional and rhythmic music, created and rendered by PurandaraDasa, Kanaka Dasaru, Tyagaraja, Dikshathar, Shyama Sasthri, and Swati Tirunal.

Sufism and Sikhism, inspired through the Ramayana and Mahabharata, reached its zenith during this period. The poetry of Surdas, Tulasidas, and Mira Bai illustrated the devotional mood of the people. Verses of Guru Granth Sahib were recited in rhythm and Ragas. (Figure 2.6.7). Sankirtan and Vaishnava Padavi (Bengal) by Chaitanya were focused on the Radha-Krishna legend.

Kathakars expressed their Bhakti through Ashtapadi, wherein the Persian dervish influence could be seen in Sufi-Kathak (Figure 2.6.8).

In the South, Padavali poetry reflected an earthy view of divine love, rooted in the Agama poetry of Tamil Sangam. People celebrated elaborate dance forms such as Koodiyattam, Bharatanatyam, Oyilattam, Karakattam, Kuchipudi, Kathakali, Thirayattam, Theyyam, Bhuta Kola, Ottamthullal, Oppana, Kerala Natanam, Mohiniattam and Yakshagana. Tukaram, a seventeenth century poet, led the Varkari Movement that emphasized devotion and love towards God, in contrast to blind obedience of rituals and arcane religious practices.

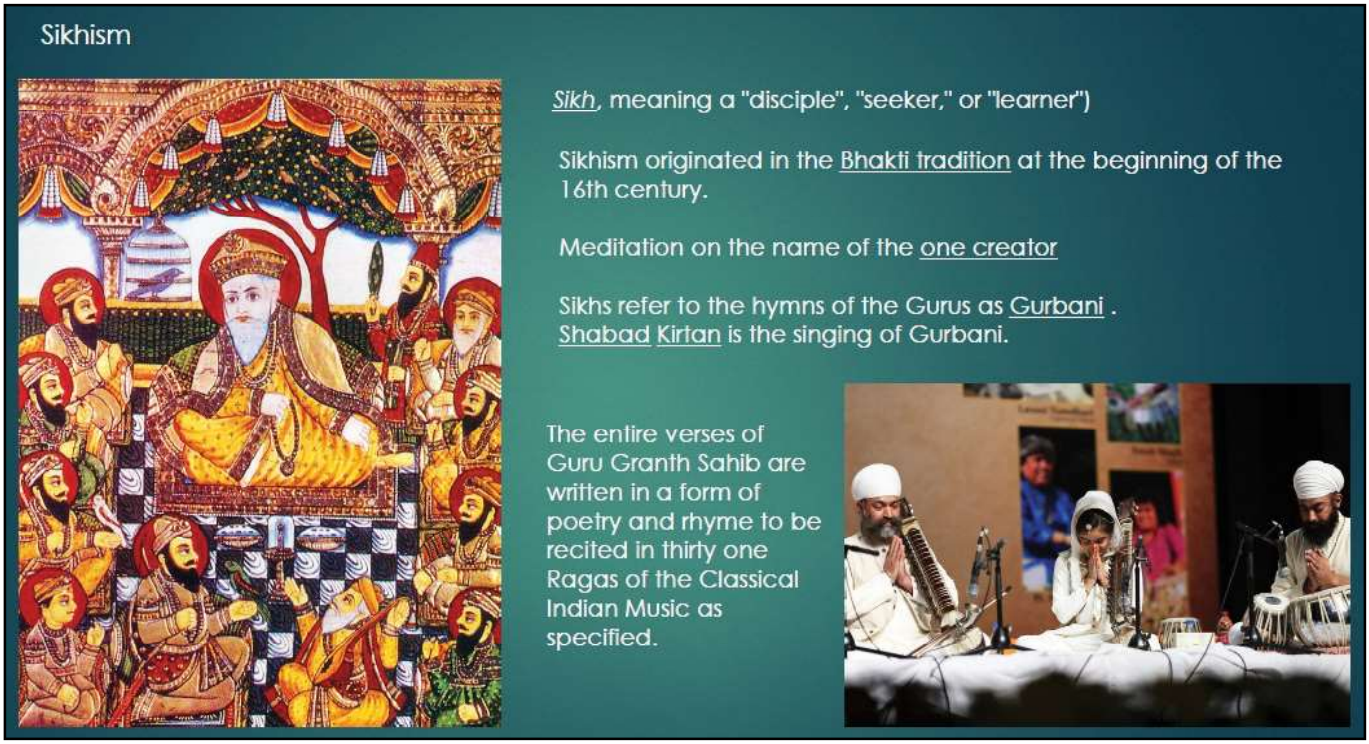


Figure 2.6.7: Bhakti movement, Sufism and Sikhism

Figure 2.6.8: Kathakar and Dance forms flourished.

Reference

IDC Seminar Presentation:

https://www.indiadiscoverycenter.org/seminars/mughal-maratha-period/art-and-culture

Authored by: Dr. Krishnakali Dasgupta for India Discovery Center (IDC)

2.7 Art and Culture: India British Period (1800AD-1947AD)

Dr. Rita Pandey

Indian skills in spinning and weaving, and in intricate ivory, gold, and silver work suffered a setback caused by the establishment of mills and factories by the British. What had emerged as a self-contained and independent agricultural community was forced under British rule to depend on low-level government employment that required knowledge of English. Indian languages became less important.

Forts, administrative buildings, factories, churches, railway stations, post offices, and bungalows were constructed to facilitate British activities. The architectural style for this construction included Gothic elements of pointed arches and stained-glass windows, as well as Indo-Islamic features. Fort William in Kolkata, Fort St. George and St. George's church in Chennai and the Chhatrapati Shivaji Maharaj railway station, as well as the Gateway of India in Mumbai, are examples of the architectural styles of this period.

Figure 2.7.1-water color painting of a black stork in landscape, 1780.

Indian artists learned to use watercolor, and to paint with oil. Western techniques of transparency of texture, broad strokes as well as treatment of perspective, volume, and recession were simulated. Rajput and Mughal art were beautifully blended with the use of soft colors, to accommodate western tastes. The British also used local artists to paint local day-to-day life, traditions, flora, and fauna (Figure 2.7.1).

Around the middle mid-18th century, Raja Ravi Verma became well known for his oil paintings, whichdisplayed the fusion of European art with Indian sensibility (Figure 2.7.2). Later, in 1894, he started the Lithographic printing press.

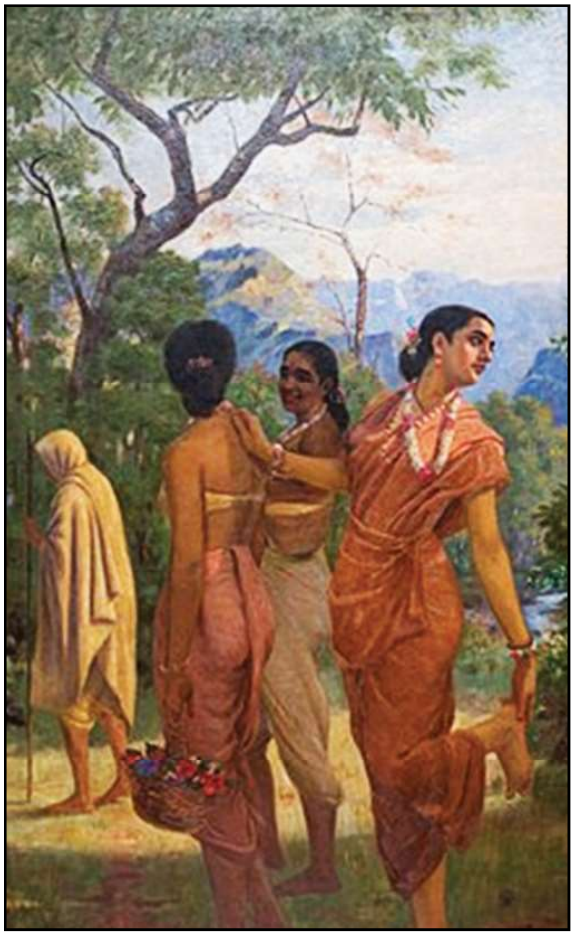


Figure 2.7.2- oil painting of Shakuntala, 1898

While artists were mastering these new painting styles, several other technologies such as photography, voice recorder, cinema, and gramophones, were developed to benefit and entertain the British. Introduced in 1840, photography captured the history as well

as culture of that period. Shakespeare became an integral part of the Indian curriculum. Western classics were translated into several Indian languages, and Indian scriptures were also translated into western languages.. Massive amounts of old Indian manuscripts were summarily removed from India and added to the western archives.

Traditional dance and music continued. Besides the mythological and spiritual themes, the court dance was encouraged, and became a profession. (Figure 2.7.3, Figure 2.7.4).

Figure 2.7.3- traditional dance by T. Balasarswati, 1918

Figure 2.7.4- Ghazal and dance performance in the court of 6th Nizam of Hyderabad, Mahboob Ali Khan (1885)

Figure 2.7.5-first silent Indian film Raja Harishchandra, 1913.

In 1897, a film presentation by Professor Stevenson featured a stage show in Kolkata. A year later Mr. Hiralal Sen made a film of scenes from that show. The Next year, H. S. Bhatavdekar's 'The Wrestlers' was the first documentary film to be shot by an Indian. And in 1913, DadasahebFalke released "Harishchandra" - the first Indian film (Figure 2.7.5).

The Gramophone company was founded in 1898 in London. Between 1899 and -1908 Indian recordings included 15 Hindu, two Sikh, five Urdu, and two Arabic records. Besides entertainment, the printing press played a major role during this time, with the first English newspaper printed in 1780 marking

the beginning of printed journalism in India. With the rise of British cruelty against the native people, newspapers called upon people to fight back. Art, literature, and theater also became the messengers of nationalist sentiments. They highlighted India's ancient glory through classical and mythological literature, to awaken the Indian pride. The Bengal art school arose as a reaction against the academic art styles previously promoted in India, (Figure 2.7.6).

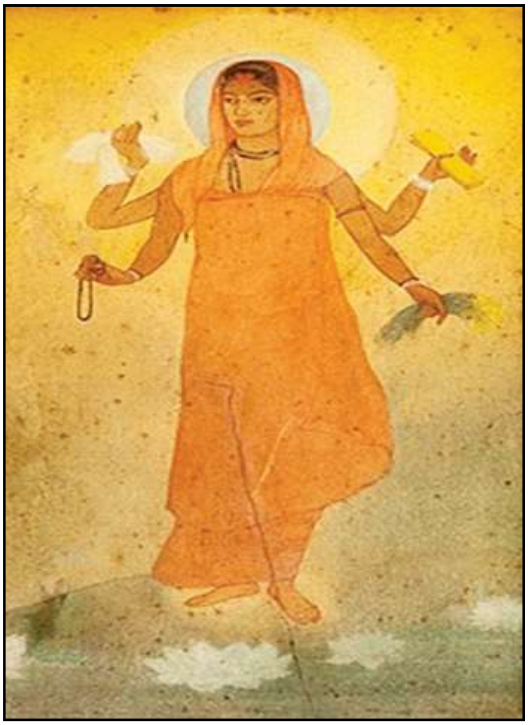


Figure 2.7.6-natoinalist painting of Bharat Mata by Abanindranath Tagore, 1905

Political commentary was incorporated into folk forms such as Powada and Tamasha, Kirtan, and in performances of the nautch girls. Plays such as Nil Darpan, Chakar Darpan, Gajadananda O Yubaraj, The Police of Pig and Sheep were written as satires against the Government. K. P. Khadilkar's play KeechakVadha is a landmark in the theatre of protest. It was the allegory of an event in the Mahabharata. Even though no names were mentioned, everyone knew that Keechak was Lord Curzon, Draupadi was India, Yudhishtira was the moderator, and Bheema the extremists in the Congress (Figure 2.7.7).

Figure 2.7.7 -KeechakVadha, 1907.

Reference:

IDC presentation:

https://www.indiadiscoverycenter.org/seminars/british-period/art-and-culture

by Dr Krishnakali Dasgupta, November 2019htt

Track References

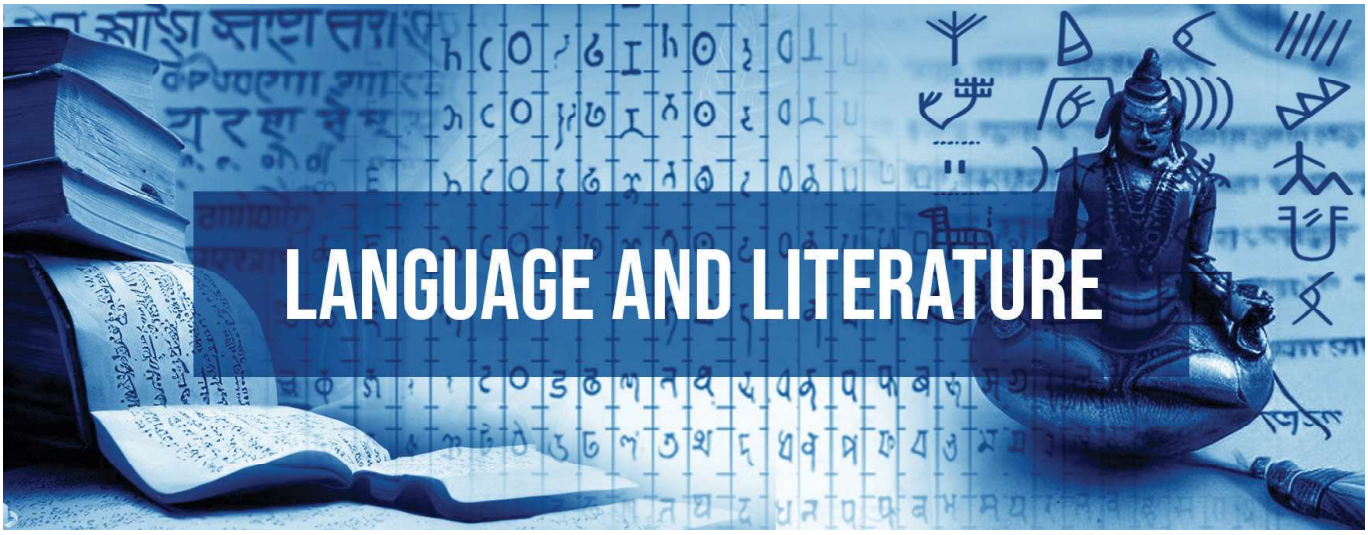
1. A Cultural History of India. A.L. Basham. 1975
2. A History of Ancient and Medieval India. Upinder Singh. 2018 impression.
3. A People's History of India. I. Habib, V.K. Thakur. 8th Edition.
4. A People's History of India. Prehistory. I. Habib, V.K. Thakur. 10th Edition.
5. Ancient Indian and Indo-Greek theatre. M L Varadpande. 1981
6. Chalcolithic cultures of India. (Lecture). Dr. Anil Kumar. (Ancient Indian History and Archeology, Univ. of Lucknow.
7. Cultural History of India. O. Prakash.2004
8. Epic India or India as described in The Mahabharata and The Ramayana. C.V. Vaidya. 1097.
9. Famous ruling clans: Chola, Chalukya, Pallava, Rashtrakuta, Pala, Sena, Chandella, Vakatakas
10. Folk theatres: predecessors of Chhau, Yakshagana, Therukottoo, Ramlila etc.
11. Foreign Influence on Ancient India. K.C. Sagar. 1992.
12. History and Culture of the Indian People, Volume 01, The Vedic Age. Ed R.C. Majumdar. 9th Edition
13. An Archeological History. Paleolithic History to Early Historic Foundations. D.K, Chakrovarty. 2nd Edition.
14. Painted manuscripts: Jain Kalpasutras, Pala-Ashatadashshasrika Prajnaparamita
15. Shilpe Bharat o Bohirbharat (Bengali), By: Manindrabhushan Gupta. 1995.
16. The archeology of early historic South Asia. F.R Allchen. 1995.
17. The Art and Architecture of the Indian Subcontinent (The Pelican History of Art) Harle, J. C.
18. The Civilization of India. R.C. Dutt.1995
19. The Vedas. Roshan Dalal. 2014.
20. The Wonder that was India. A.L. Basham. 3rd edition.
21. The wonder that was India-Part II (Roopa & Co.) Rizvi, S.A.A.

Internet - generally available material

1. https://kevinstandagephotography.wordpress.com/2019/03/14/the-konkan-petroglyphs-introduction/
2. https://www.wikiwand.com/en/Vedic_period
3. https://www.swarganga.org/articles/details.php?id=7
4. https://www.harappa.com/content/wheels-indian-rock-art
5. https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-andmaps/iconography-buddhist-iconography
6. http://www.wallswithstories.com/uncategorized/mughal-architecture-a-mixture-of-indian-turkish-and-persian-styles.html
7. https://starsinsymmetry.wordpress.com/2010/09/15/study-the-characteristics-of-persian-and-mughal-architecture/
8. https://selfstudyhistory.com/2015/01/27/mughal-music/
9. https://www.slideshare.net/salwashafiq2/taj-mahalgarden
10. https://www.apollo-magazine.com/art-diary/rembrandt-and-the-inspiration-of-india/
11. https://www.theheritagelab.in/mughal-recipe-history/
12. https://www.skyscrapercity.com/showthread.php?p=132154007
13. https://www.metmuseum.org/art/metpublications/India_Art_and_

Culture_1300_1900

14. http://www.vam.ac.uk/content/articles/i/indian-company-paintings/
15. https://www.slideshare.net/AkhilArora1/company-school-painting
16. https://www.wikiart.org/en/raja-ravi-varma
17. https://en.wikipedia.org/wiki/Hindi_cinema
18. https://en.wikipedia.org/wiki/His_Master%27s_Voice
19. Impact of British on Indian Society and Culture (yourarticlelibrary.com)
20. https://www.artisera.com/blogs/expressions/how-the-bengal-school-of-art-changed-colonial-indias-art-landscape



TRACK 3

Contributor

Prem Nagar had an interdisciplinary training and worked in the information industry. He has been associated with India Discovery Center's Language Research Project since 2013. His lecture on 'Neuro-anatomy of Cognition' is highly appreciated. He is the Contents Manager in India Discovery Center in mapping the documentary elements of Indian culture and history for the IDC Virtual India project. He is the leader of the Language and Literature track. He comes from a family of musical talents and is a member of South Asian poets of New England.

2.0 Language and Literature: Introduction

The Indian subcontinent has a long and ancient tradition of oral and written literature. It includes the highly philosophical texts like the Vedas and the Upanishads, and epics like the Mahabharata and the Ramayana. India coded the modern grammar and analyzed the intent and power of human speech.

The Indus Civilization flourished around 5000-2000 BCE. Massive amounts of seals (miniature, about one inch square) have been unearthed. They contain images of animals like unicorns, bulls, goats, tigers, buffaloes, elephants, as well as glyphs of fish symbols and water jars. The glyphs point to the possibility of a language. The language could have been widely used since similar tokens are discovered in the Arabian Peninsula. It is conjectured that the language might be connected to the Dravidian family, it is not deciphered yet. From the urbanization, construction, agricultural pursuits and trade, it is inferred that the society was literary.

The Vedic Period (2000 BCE to 700 BCE) saw the creation of the Vedas, the oral scriptures that continue to be in use in India. The Vedic language is syllable based, the sound configuring the internal semantics. The Vedic literature and the style of recitation is compared to the Avesta of in Iran, but the dates remain controversial. The Vedic period saw the development of analytical literature in the lines of pronunciation, prosody, etymology, grammar, astronomy and rituals. Much of this literature has not been fully analyzed. The Upanisadic literature has made world-wide impact on secular cosmology and monism.

The Classical period (700 BCE to 200 BCE) saw the codification of Vedic knowledge for preservation and application. Oral aphorism texts were created in mathematics, astronomy, grammar, religious conduct and performance of rituals. The first recorded script seems to be the stone carvings about 260BCE, but more archaeology is required. The period saw the preparation of the first grammar text of the world. Elaborate texts on surgery and medicine were produced. The book on economics and statecraft followed. Massive universities attracted students from all around the world to prepare in the courses of philosophy, mathematics, medicine and grammar.

The Golden period (200BCE-500CE) is known for the flourishing of Indian literature. Massive epics were compiled from the folk-lore and were treasured as required scriptural texts. Buddhist and Jaina followers also created religious texts and scriptural literature. Folk singers carried the epics to distant corners in the land. This helped to develop the regional literature. Much of Indian dialects used the Brahmi script and gradually oriented to create unique scripts depending on the local phonetics. More universities were established and they offered training in language and literature. The famous Natyashastra, the textbook on dramatics was composed and the greatest India poet Kalidas created his immortal poetry.

The Hindu period (500-1500 CE) is known for the pinnacle of Indian literature as we know today. Literature flourished all around the country sometimes poets competing with each other for the finesse. The aesthetics as the goal of literature became rooted to make the compositions lively to be sung with instruments as performance poetry. Sanskrit language and the syllable based regional languages allowed acoustic ornamentation to enhance poetic and aesthetic appreciation. Literature was converted into dramas and massive festivities. Music codification and dance codification followed. Mathematical and medicinal texts were translated and exported abroad.

The Mughal-Maratha period (1500-1800 CE) began with the imposition of Persian as the language of administration. A hybrid language mixing Persian and local languages developed. The Madrasah system of education was introduced to teach the Quran and the Persian language for the bureaucracy and judiciary. Persian literature flourished in India.Works like Abdul-Rahim-Khan's Babarnama, Abu'l-Fazl's Ain-i-Akbari, and pictorial books like Malik-Muhammad-Jayasi'sPadmavat enriched the literature.The Indian teacher-student Gurukula system of education was squeezed to extinction. Private tutoring and vocational training through apprenticeships and work in manufacturing centers came in vogue. Rebel

poets wrote devotional literature.

In the 18th and 19th centuries, there were significant efforts by Jesuit priests, scholars, and native scholars to standardize Indian languages and translate English texts into Indian languages. The English Education Act of 1835 perturbed indigenous education in India, making English the language of government employment and suppressing indigenous languages and literature. The introduction of the printing press in the 1850s and 1900s marked the renaissance of Indian literature, allowing for the publication of new works that reached the masses. In 1857, the British established universities in Calcutta, Madras, Bombay, and Lahore as centers for higher studies. Liberal education created the seed of independence. English-speaking poets and novelists produced literature based on Indian values. India received independence in 1947CE.

3.1 Language and Literature: India Prehistory and Indus Period (7000BCE-2000BCE)

Mr. Prem Nagar

The Bhimbetka rock shelters in central India have a repository of rock paintings dated to10,000 BCE. Smaller stylized figures with body ornaments from the Mesolithic Period provide an early record of creative expression. Prolific use of straight lines, circles, triangles, squares, rectangles and various drawings of animals and events suggest that the inhabitants were able to depict daily life with the use of carving tools. (India Prehistory to Indus Period – Art and Culture, Figure 3.1.1)

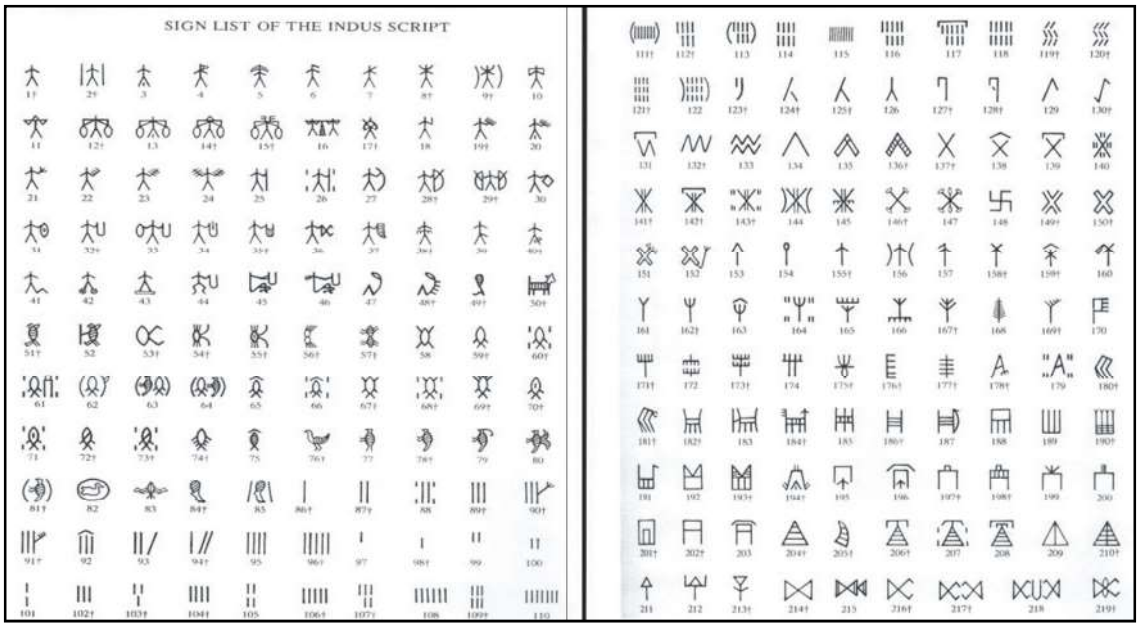


Figure 3.1.1: 417 common signs and symbols, by Tamil Scholar Mahadevan: Indus Script

The Indus Civilization is estimated to have commenced around 5000 BCE and flourished until about 2000 BCE. More than four thousand artifacts, consisting of seals, stamps, templates, amulets, and door hangings in copper, silver, gold, and terracotta have been excavated from archaeological sites in a wide stretch in this area. The artifacts have impressions of animals like unicorns, bulls, goats, tigers, buffaloes, elephants, as well as glyphs of fish symbols and water jars. A string of glyphs may indicate the general use of a script. The seals (Figure 3.1.2) are interpreted as labels on grain sacks in packing food articles like barley, rice, as well as articles for export.

The symbols can be grouped into 400 to 600 characters, which have not yet been deciphered. They are assumed to be associated with a logo syllabic

Figure 3.1.2: A steatite unicorn seal from Harappa with Indus script dated 2450-2200 BCE.

representation. Ten Indus characters from the northern gate of Dholavira(Gujarat, India) are dubbed as making a sign board that displays one of the longest known sequences of characters (Figure 3.1.3). The direction of writing is assumed to be

from right to left. The frequent occurrence of signs like a "Jar" and a "diamond" suggest the start and end of a phrase. Pure vertical strokes likely represent numbers. Language written in symbols likely started with the depiction of pictures, which later developed into a logograph.

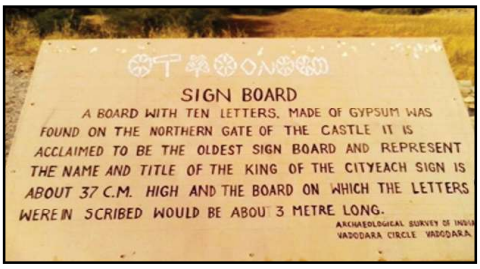


Figure 3.1.3: Showing Ten Indus characters from the northern gate of Dholavira.

The pictorial sample of Indus glyphs is shown in Figure 3.1.4. No bilingual tablet has been found, though a hint of the script connecting to the writing of a language is suggested, connecting the script to the early Dravidian language family. More than a hundred attempts have been made to decipher the Indus symbols. A typical effort is shown in Figure 3.1.5 where a Mohenjo-Daro seal is read, based on the Gondi language, and is represented in phonetic sounds.

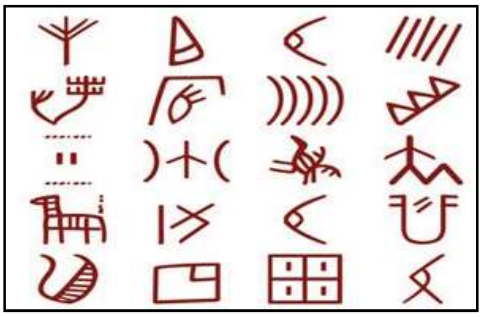


Figure 3.1.4: Examples of Indus glyphs

Figure 3.1.5: Interpreting through Gondi Language

It is fair to assume that the Indus script was used by several languages that were used in the area. Some suggest that Indus might have encoded Brahui, a language of North Dravidian that shares the Kurukh and Malto dialects.[3] Brahui was spoken in Baluchistan, Iran, and Afghanistan. There is a controversial suggestion that two-to-three syllable names in Indus text could be polysyllabic words in Sanskrit.[4]

Commercial connections with Indus have been found in Sumerian documents, written in cuneiform inscription. The word Meluhha is used and refers to the land of Indus, while the word Meluhhaites refers to the people of the Indus area. The cuneiform script of Mesopotamia (3200 BCE) was in pictorial form and represented the counting and recording of goods. Trading activities suggest wide use of oral and written communication. A system of standardized weights and measurements were in use and manuals as well as bills of sales were likely kept. Extensive use of numbers might be speculated.

Discovery of musical instruments, town organization, water management and engineering point to the existence of a literary heritage that was passed through conventions and symbols in society. Engineering designs and construction would have needed record-keeping and measurements. Rituals and faith systems suggest the existence of religious literature.

Reference

IDC Seminar presentation at:

https://www.indiadiscoverycenter.org/seminars/pre-history-and-indus-period/language-and-literature

Authored by: Jaspal Singh for India Discovery Center (IDC), 2016

3.2 Language and Literature: India Vedic Period (2000 BCE - 700 BCE)

Mr. Prem Nagar

A set of oral poetry called the Vedas (knowledge) is believed to be among the earliest organized literary works of the world. Set in Upper Punjab and Northwestern mountains of the Indian subcontinent, the Vedas reveal the life and society of the Vedic and associated people of the Vedic period. Closer examination suggests that the Vedas could be the culmination of many thousands of years of analysis and introspection on creating object definitions, communication protocols and teaching through stories. For speech, the Vedas declare that inspired thoughts,*dhī*, transform into *vāc* as the human speech.

The Vedas, later called *śruti* literature (that is heard), were passed down orally from generation to generation. A poet called a*ṛṣi* is traditionally associated with each*sūkta* or hymn, which is composed of several *ṛc* (stanzas). In the traditional compilation, a set of dozens of *sūktas* are attributed to the family of a*ṛṣi* (Figure 3.2.1).

It is generally accepted that in the later period, the *ṛṣi*, Veda Vyasa, compiled the Vedas into four *saṃhitās* (core texts). We know little about how and when this organization came about.

Principal Author's families of the Vedas	
Angiras	73 sukta (mandalas 1,9,10)
Visvamitra	24 sukta (mandalas: 1, 3)
Kanva	74 sukta (mandalas: 1,8)
Maitravaruna	130 sukta (Mandalas: 1, 7)
Kashyapa	34 sukta (mandalas: 9)
Gautama	58 sukta (mandals: 4)
Bharadvaja	62 sukta (mandalas: 6)
Atreya	65 sukta (mandalas: 5)

Figure 3.2.1: Principal Authors and their contributions

Vedas (Knowledge and Wisdom) Literature Organization			
Saṃhitā (core text - collection of hymns)	Brāhmaṇa (explainations and rituals)	Āraṇyaka (theological explanation)	Upaniṣad (philosophy of the Vedic essence)
Ṛgveda	Aitareya-Brāhmaṇa	Aitareya-Āraṇyaka	Aitareya-Upaniṣad
	Kauṣītakī-Brāhmaṇa		Kauṣītakī-Upaniṣad
Yujurveda-Kṛṣṇa yajurveda	Taittirīya-Brāhmaṇa	Taittirīya-Āraṇyaka	Taittirīya-Upaniṣad, Śvetāśvatara-Upaniṣad, Mahānārayaṇa-Upaniṣad
	Kāṭhaka-Brāhmaṇa	Kāṭhaka-Āraṇyaka	Kaṭha (Kaṭhaka)-Upaniṣad
	Kapiṣṭhala-Kaṭha-Brāhmaṇa		
	Maitrāyaṇī-Brāhmaṇa	Maitrāyaṇī-Āraṇyaka	Maitrāyaṇī-Upaniṣad
Yujurveda-Śuklayajurveda	Śatapatha-Brāhmaṇa	Bṛhadāraṇyaka-Āraṇyaka	Bṛhadāraṇyaka- Īśā(vāsya)-Upaniṣad
Sāmaveda	Jaiminiya-Brāhmaṇa, Tāṇḍya (Pañcaviṃśa)-Brāhmaṇa, Ṣaḍviṃśa (Adbhuta)-Brāhmaṇa	Talavakara-Āraṇyaka	Kena-Upaniṣad
			Jaiminiya Upanishad
			Chāṇḍogya-Upaniṣad
Atharvaveda	Gopatha-Brāhmaṇa	Tavalkar-Āraṇyaka	Muṇḍaka-Upaniṣad, Māṇḍūkya-Upaniṣad, Praśna-Upaniṣad

Figure 3.2.2: Literature Class and Its Associated literature

These four *Saṃhitā s* are:

1. The *ṛgveda*, a collection of 1028 *sūktas*divided into ten *maṇḍalas*. (*A maṇḍala* might be broadly conceived as a group of similar hymns, either for a deity or a phenomenon. *ṛgveda*has 10,552 *ṛcs* (stanzas)).

2. The *Sāmaveda* has *sāman* (songs), a melodic arrangement of hymns as *Sāmagāna,* meant to be sung in public. It consists mostly of *ṛgvedasūktas* that are arranged for singing, rather than for recitation.

3. The *Yajurveda* prescribes the ritualistic protocols for conducting services. Unlike the first two Vedas, it takes a religious tone. *Yajurveda* is grouped into two parts*: Kṛṣṇạ* and *Śukla.*

4. The Atharvaveda is believed to be a later addition to the Vedas. It deals with health, social conduct, and daily life. It possibly was composed by the agricultural community in eastern India.

Additional Vedic literatures consisted of the *āraṇyakas*(ritualistic action), an analysis developed by later monastic schools; the *brāhmaṇas* (commentary, mostly in prose form) which explains the rituals for religious service, and finally the *upaniṣads*(spirituality and abstract philosophy), which declare the universality of life and the unitarityof the universe. (Figure 3.2.2)Some of the Vedic *sūktas*can be considered as highly philosophical.

Linguistic archaeologists have identified words and notions in the Vedas that appear in the local community of languages of Vedic times, such as the *Avesta* (Iranian), *Hittites* (Mesopotamian), and *Mitannis* (Syrian). Passages like those in Vedas are found in the *Avesta* in praise of the divinity of *Miθra*(the sun). A treaty signed in 1380 BCE between Mitanni and their rivals mentions the Vedic names Indra as a cosmic witness. How such culture was propagated in these areas is debated among scholars.

Vedic texts are recited using prescribed *chhandas*(metrics), which are syllabic compositions that form a metrical unit of verse, such as a *pada* (foot). Many structures of *chhanda*s were created, each one used for different purpose, possibly with empirical adjustments. Stanzas were to be recited in different *svara* (scales), each allowing different accents, depending on the meaning to be conveyed. Three accents like *udātta* (high), *anudātta* (low) and *svarita* (normal) are recognized in the Vedic recitations and recordings. (Figure 3.2.3)

To preserve the 'contents and intents' while channeling the Vedas orally, *Vedanga*, a unique pedagogy of a system of six disciplines was established, to aid proper study of the Vedas with the correct pronunciation and, interpretation, as well as with the right use of the text in ceremonies. This consists of *śāstras* on *śikṣā* (proper pronunciation), *chandas* (prosody), *vyākaraṇa*(grammar), *nirukta* (etymological explanation),*kalpa* (ritual), and *jyotiṣa* (astronomy). (Figure 3.2.4).

Figure 3.2.3: RV 1.1 with number for three accents like *udātta* (3 high), *anudātta* (2 low) and *svarita* (1 normal) are recognized in the Vedic recitations and recordings. Phrase shows as: Object, Verb, and Subject

Vedanga (Vedic pedagogy) in six auxiliary disciplines		
Auxilliary Discipline	Related Texts	
Śikṣā (Pronounciation)	Pāṇinīyaśikṣā, Yājñavalkyaśikṣa, Nāradaśikṣā, Maṇḍukīśikṣā (Śikṣāsaṅgraha has thirty four Śikṣas)	
Vyākaraṇa (grammar)	Aṣṭādhyāyī + Vārtikas	Prakrīyā | Kāśikā + commentaries; Siddhāntakaumudī + commentaries etc.
	'+ Mahābhāṣya	Ārthika | Vākyapadīya, Śabdakaustubha, Bhūṣaṇa, Mañjūṣā etc.
Chandas (prosody)	Chandassūtras of Piṅgala, Ṛkprātiśākhya, Sarvānukramaṇī of Kātyāyana, Chandaḥpraveśikā, Śrutabodha etc.	
Nirukta (etymology)	Niruktam of Yāska with Vṛtti of Durgācārya	
Jyotiṣa (astronomy)	Siddhāntaskandha | Sūryasiddhānta, Āryabhaṭī, Siddhāntaśiromaṇi etc.	
	Muhūrtaskandha | Muhūrtamārtāṇḍa, Muhūrtacintāmaṇi	
	Jātakaskandha | Bṛhajjātaka of Varāhamihira, Pūrvaparāśarī	
Kalpa (ritual)	Śrautasūtras	Śrautasūtras Ā śvalāyana-, Śāṅkhāyana- (Ṛgveda); Āpastamba-, Bodhāyana-, Vaikhānasa-, Bhāradvā ja-, Vādhū la- (Kṛṣṇa yajurveda); Kātyāyana- (Śuklayajurveda); Jaiminīya-, Drāhyāyana- (Sāmaveda); Vaitānaś rautasūtra, Gṛhyasūtras Kauśikagrḥ yasūtra (Atharvaveda)
	Gṛhyasūtras	
	Dharmasūtras	Vasiṣṭha- (Ṛk.); Āpastamba-, Bodhāyana- (Kṛṣṇyajus.); Viṣṇu-(Śuklayajus.); Gautama- (Sāma.)
	Śulbasūtras	Āpastamba-, Bodhāyana-, Mānava- (Kṛṣṇyajurveda), Kātyāyana- (Sāmaveda)

Figure 3.2.4: Vedanga's (Vedic pedagogy) six auxiliary disciplines with associated literature, some developed at later time.

The Vedas were composed in the prevailing spoken language, or *bhā□□ā*, later referred to as Vedic Sanskrit, which was an amalgamation of the vernacular languages Prāk□□ta, Mundā, Pāli, Dravidian and otherlanguages that may have existed in the region (Figure 3.2.5). Scholars suggest that Proto-Dravidian was spoken along the Godavari River, and to its south. Accent syllables most likely carry the signature of their traditions, which are currently in use in indigenous cultures. This could be why the exact pronunciation of the text as composed was considered important for the success of any ritual. This strict discipline has helped to preserve the Vedic text through oral transmission over thousands of years. No manuscript from the Vedic time have been discovered yet.

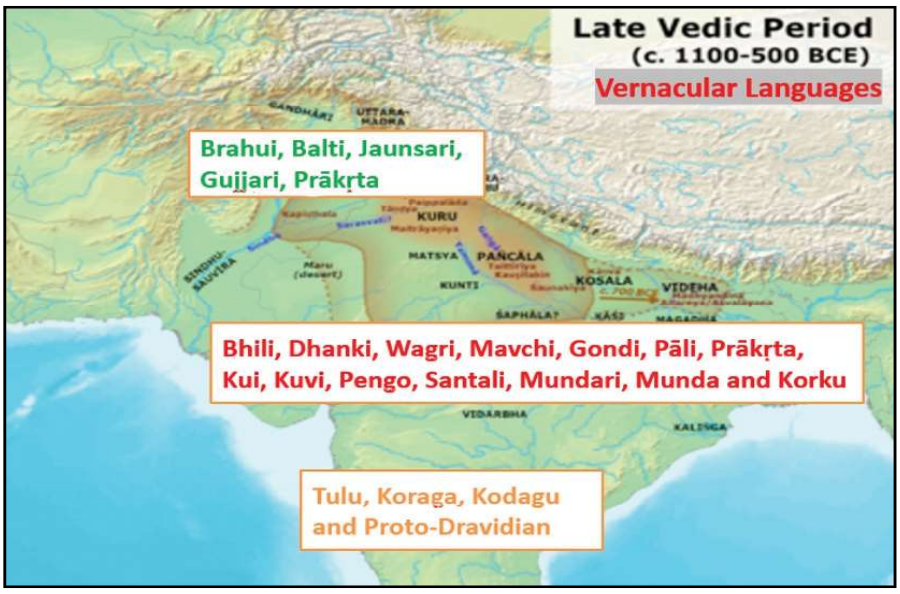


Figure 3.2.5: Languages in use during the Vedic Period

Two other styles of literature that emerged during the later Vedic period were, *sutra,* a concise enunciation of a subject of profound intensity, and *śāstra,* which dealt with the detailed systematic treatment of a subject. *Kalpasūtra*, a text prescribing the ritualistic procedures, and *Dharmaśāstra,* a text that details social conduct and family relations are examples of these.

Later, Vedanta emerged as the Upanishad, which contains the true form of the universe, the speculations and philosophies based on Vedas. Collectively, the Vedas are the foundation of intellectual and religious culture of India.

Reference:

IDC Seminar presentation at:

https://www.indiadiscoverycenter.org/seminars/vedic-period/language-and-literature

Authored by: Prem Nagar for India Discovery Center (IDC)

3.3 Language and Literature:India Classical Period (700 BCE to 200 BCE)

Mr. Prem Nagar

Language and Literature flourished in India during the Classical period. Material from the Vedas and Vedic literature were codified into knowledge texts, which developed as aphorism *sutra* literature. Books on social conduct (*dharma*), astronomy (jyotiṣa), rituals (*kalpa*), recitation (*chhanda*) and grammar (*vyākaraṇa)* were composed. Once the rules of grammar were formalized, these codes were developed into organized texts (*śāstra*), that have become foundational to Indian culture. The book on grammar (*aṣṭādhyāyī*) by Paninireceived worldwide application.

Dēvanāgarī	IAST
अइउण्	a i u ṇ
ऋऌक्	ṛ ḷ k
एओङ्	e o ṅ
ऐऔच्	ai au c
हयवरट्	ha yavara ṭ
लण्	la ṇ
ञमङणनम्	ña ma ṅaṇana m
झभञ्	jhabha ñ
घढधष्	ghaḍhadha ṣ
जबगडदश्	ja ba ga ḍa da ś
खफछठथचटतव्	kha pha cha ṭhatha ca ṭa ta v
कपय्	ka pa y
शषसर्	śaṣasa r
हल्	ha l

Figure: 3.3.1: *MāheśvaraSūtra's* fourteen verses organization. Letters (varṇa) are sixty-four in number; twenty-one vowels, forty-three consonants: twenty-five stop consonants, eight ya-kind consonants (य र ल व श ष स ह), four *yama* consonants (क॑ख॑ग॑घ॑), *anusvara, visarga*, two special tongue-sounds and one extra-long pronounced ऌ.

The Vedas were first analyzed in 6th century BCE by the grammarian Yaska who separated individual words out of the Vedic recitations. Yāska categorized words into four classes: noun (*nāma*), verb (*ākhyāta*), prefix (*upasarga*), and conjunct (*nipāta*). Phonetic units as syllables were already in use from older languages, and the grammarian Pāṇini applied these to analyzing the Vedic recitations. In the 5th century BCE, through extensive analysis, and leaning on the works of ten previous grammarians, Panini discovered the rules of human speech in forming a word and in composing a sentence. The alphabet *māheśvarasūtra* was organized in fourteen verses. He enunciated the phonemic unit (*varṇa*) and divided speech sounds into two classes: consonants (*vyañjana*, or breathing-related) and vowels (*svara*, or voice- related) (Figure 3.3.1).

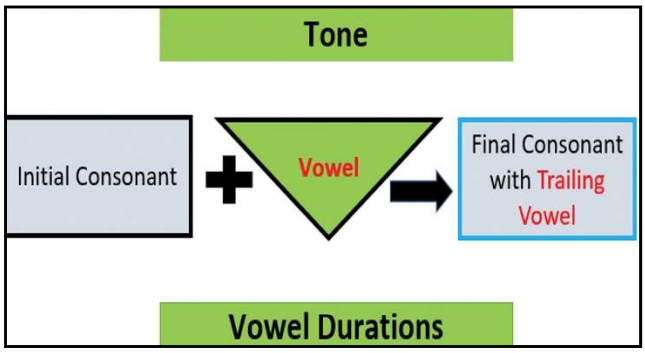


Figure 3.3.2: Syllabic representations: Consonant + Trailing Vowel

Panini noticed three levels of intonations: high-pitch (*udātta*), low-pitch (anudatta) and medium-pitch (*svarita*). In addition, he coded three time-durations in creating an utterance: short (*hrasva*), long (*dīrgha*), and prolonged (*pluta*). He categorized that a consonant must carry a vowel to express utterance (Figure 3.3.2).

For many millennia, people in Northern-India spoke *Śaurasenī, Māgadhī, Avantī, Ardhamāgadhī, Māhārāṣṭrī,* and other languages. Vararuchi compiled *Prākṛta-Prakāśa*, a Prakrit grammar (Figure 3.3.3). Buddhist literature was composed in Pāli, a hybridized language of Māgadhī and Sanskrit. The Buddhist scripture was *Tripitaka* (*Vinaya Pitaka, Sutta Pitaka, AbhidhammaPitaka*) and others. Buddhist literature spread to Southeast Asia.

Figure 3.3.3: Language spread around 500 BCE

Jainism was a religion parallel to Buddhism, and Jaina scholars composed their literature in the *Prākṛit* language: these included *KalpaSūtra, Jaina Agamas, Ṣaṭkhaṅḍāgama, and Kāsāyapahuḍa*.

Vowel/ISO	Consonant/ISO
அ a	க் k
ஆ ā	ங் ṅ
இ i	ச் c
ஈ ī	ஞ் ñ
உ u	ட் ṭ
ஊ k	ண் ṇ
எ e	த் t
ஏ ē	ந் n
ஐ ai	ப் p
ஒ o	ம் ṭ
ஓ ō	ய் y
ஔ au	ர் r
	ல் l
	வ் v
	ழ் l̲
	ள் l̤
	ற் r̲
	ன் n̲
One special character: ஃ (akku)	

Figure: 3.3.4 - Southern form of Brāhmī script. Tholkappiyar, who formulated thirty phonemes and few dependent sounds, e.g.: āytam (ஃ). Tamil Language has 12 vowels, 18 consonants and one special character (ஃ, pronounced as 'akku'), thus 31 alphabetic letters.

Several Dravidian languages were in use in South India. Vedic Sanskrit, Prakrit and Dravidian languages had a similar sound system. Śaṅgam literature and the Proto-Tamil language emerged around the 3rd century BCE. *Tolkāppiyam*, a grammar of the Tamil language, was compiled by Tholkappiyar.It helped formulate the Tamil phonemes, (Figure 3.3.4).

The origin of the written script in India is still uncertain. King Ashoka's rock-carved inscriptions from the 3rd century BCE are assumed to be the first evidence of a script in India, referred to as *Brāhmī,* (Figure 3.3.5). A different script called *Kharoṣṭhī*was used in business transactions, and its origin was in the Middle East. The alphabets of the *Brāhmī* and *Kharoṣṭhī* scripts are shown in Figure 3.3.6 and Figure 3.3.6A.

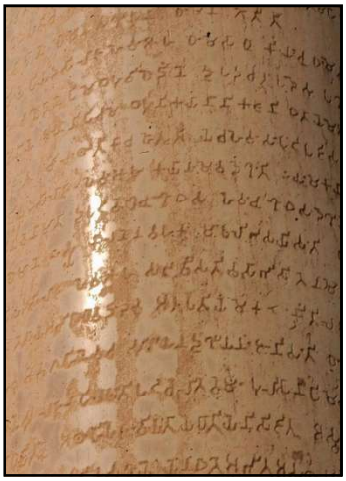


Figure 3.3.5: Edicts of Ashoka in the Brahmi script in LauriyaAraraj Bihar, 250 BCE.

Figure 3.3.6:Ashokan Brahmi Characters 300 BCE,

Figure 3.3.6A: Kharosthi Characters 400 BCE

Most Indian and east Asian scripts originated from the *Brāhmī*script.

The Figure 3.3.7 shows some of the languages and dialects used in four major regions of India. Having a structured grammar facilitated creation of the formal literature of drama, poetry, and prose.

The original materials for these were developed in Sanskrit, Prakrit, and other languages. The playwright *Bhasa* produced feature-length plays for stage production. His many manuscripts have been recently discovered. The art of storytelling was formalized by the bards who traveled around the country.This helped to build national literary foundation.

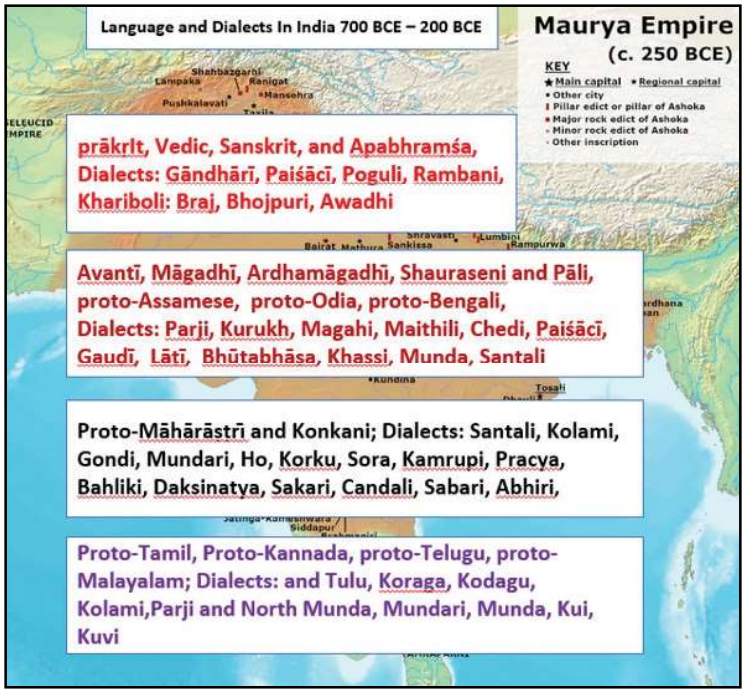


Figure 3.3.7: Language and Dialects in India – 700 BCE – 200 BCE

The *Sushruta Samhita*, India's health manual, was a compilation of the techniques of herbal treatment, nutrition, hygiene, and surgical procedures. And the economist Chanakya compiled the *Arthashastra,* a book on politics, statecraft, and social conduct. This manual helped create a structured society in India, with the inter-dependence of skills and trades. Most scholars worked at *Takshashila*, the largest university of the world. It operated from 6th century BCE to about 7th century CE.

Reference:

IDC Seminar presentation at:

https://www.indiadiscoverycenter.org/seminars/classical-period/language-and-literature

Authored by: Prem Nagar for India Discovery Center (IDC)

3.4 Language and Literature: India Golden Period (200 BCE-500 CE)

Mr. Prem Nagar

The period witnessed exceptional scholarship in Languages and literature with major developments in grammar, scriptand analysis of words. Among the important grammatical expositions, was the massive text by Patañjali (200 BCE), containing the analysis of speech sounds, – "syllables". Empirical discovery led to the conclusion that the cognition of meaning occurs through a built-in "seed" in the vocal phrases, technically labeled as "*sphota*" or "burst." Script mimicked the oral syllables that symbolized the sound, based in "places and manner of articulation." Symbolic visual representations through the *Brāhmī* and *Kharoṣṭhī* scripts led to adaptation in Sanskrit, Prakrit, Pāli and Apabhramsa languages.

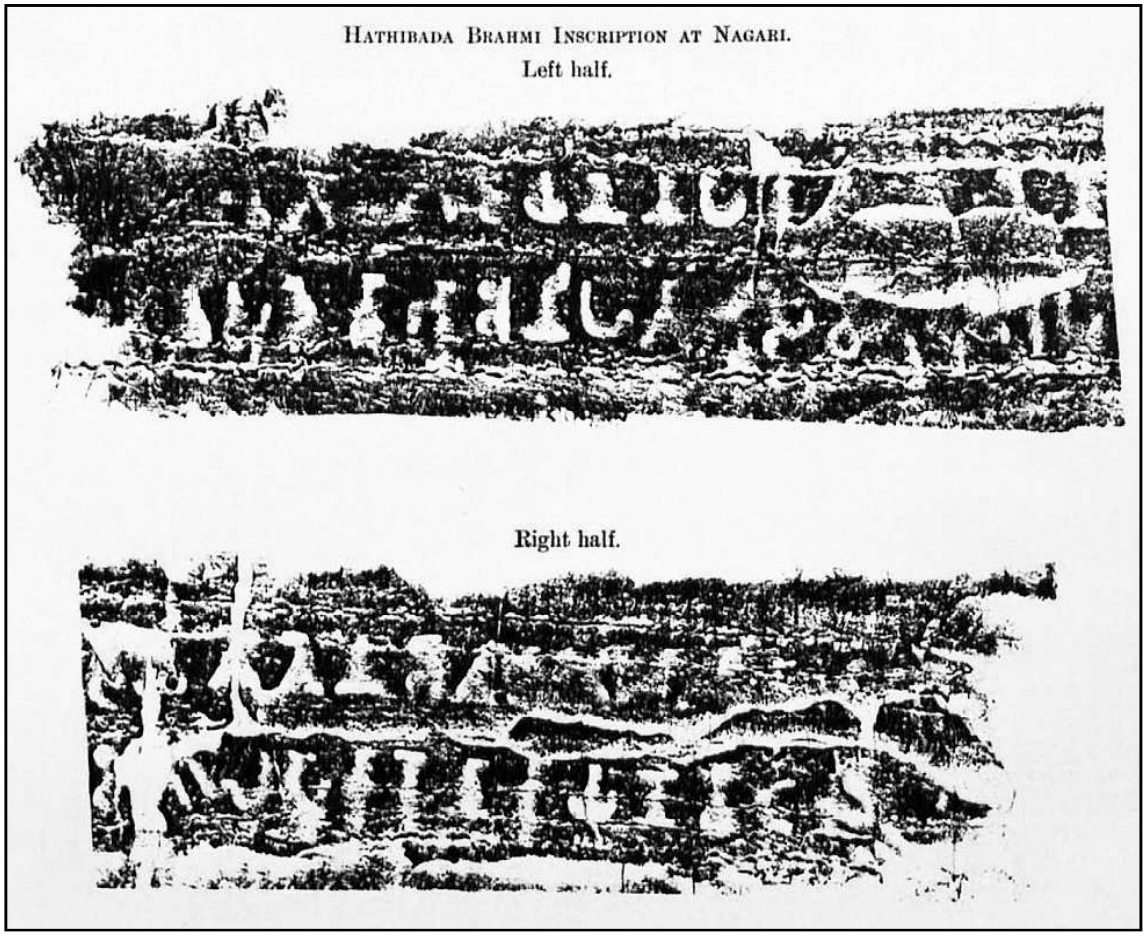


Figure 3.4.1: Brahmi script, Hathi BadaGhosundi inscriptions, in Sanskrit (2nd-1st century BCE).

Many descendants of *Brāhmī*with variations formed *Tamil-Brāhmī*, Odia for Oriya, *Kadamba* for Kannada, Bhattiprolu for Telugu, and Malayalam used Brahmic script for *Vatteluttu* alphabets. In Devanagari, a modern form of *Brāhmī:* "ka" is written as क in Sanskrit, Prakrit, Pāli and Apabhramsa; କ (Odia); க (Tamil); ಕ (Kannada); క (Telugu); and Malayalam ക(ka). Sanskrit language codification helped the codification of other languages. (Figure 3.4.1 and Figure 3.4.2). Migration of people from one region to another and urbanization with trade helped create new words and new ways of communicating. This became the foundation of a pan-Indian literary base, which led to the later process of development to the flourishing modern Indian literature.

Figure 3.4.2: Satavahana bilingual coinage in Prakrit and Dravidian (150 CE)

Figure 3.4.3: Languages in use in India – 200 BCE-500 CE

The language spread in India during the Golden period is reconstructed in Figure 3.4.3. Sanskrit evolved from the Vedic literature; Odia, a refined form of *Odra Magadhi* and Prakrit, emerged through the vernacular with dominant *Shauraseni-Prakrit*; and *Pāḷi*, the vernacular of Magadha and *Apabhramsa* (a deviance), became a mixed language. Southern languages - Old Tamil, Kannada, Telugu, and Malayalam, descended from the Proto-Dravidian language. The development of Scripts enabled the recording of pre-existing oral texts; these texts facilitated the disseminations of literature to various regions and the education of society.

Piṅgala (200 BCE) authored a sutra style *Chandaḥśāstra* on Sanskrit prosody, a systematic enumeration of meters with fixed patterns of short and long syllables. This is considered a precursor to themodern binary numeral system in representation

The metric composition of poetry was further creatively assembled, to depict human emotions and natural events through the renderings of the human voice. This signature is unique to India.

Nāṭyaśāstra, a handbook of dramatic art of all aspects of drama, dance, music, poetics, general aesthetics and organization of stage and auditorium, was compiled by Bharata. Rasa, (psychological manifestation) and Bhava (expression of sentiments) were developed as the principles of aesthetics, (Figure 3.4.4). *AlaṅkāraŚāstra* (poetic ornamentation), an art of graceful speech, was recorded, earlier in the *Ṛgveda*, but was formalized through the *Nāṭyaśāstra*. Kālidāsa (5th century CE) perfected this in his lyrical composition, *Meghadūta*, using the cloud as a messenger to convey love. In another long epical poem, *Kumārasambhavam*, he portrayed romance (*Śṛṅgāra rasa*) as the nature of the universe.

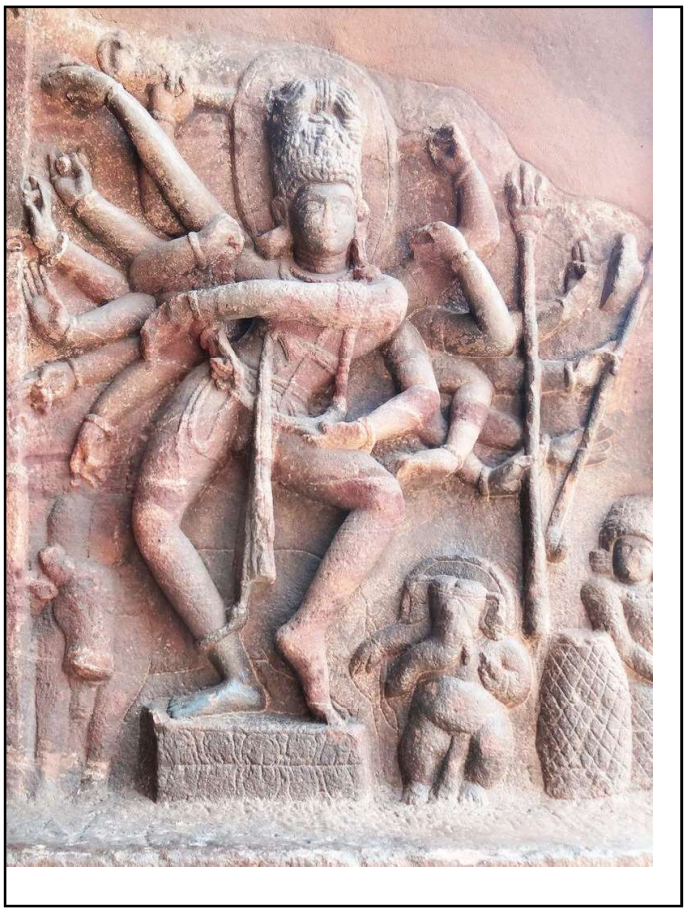


Figure 3.4.4: Dancing Shiva sculpture in Badami cave temples illustrates its dance movements and *Lalatatilakam* pose.

Various regions in India developed their unique style of storytelling. *Pañcatantra* (200 BCE-300 CE), by Viṣṇuśarman, a collection of interrelated fables (animal stories), composed in verse and prose, is one of the most translated texts in the world The Puranas dealt with cosmology and were used to instill moral values by retelling legends, folklores, and history as dramatic stories. The storyteller Vyasa commented on the text through narration. Storytelling often combined poetry, music, drama, dance, and philosophy. *Mahabharata*, the epic, and other texts were narratively expanded through this process.

Takshashila of Gandhara (modern Pakistan) was the ancient University where students twelve years and older were admitted for educational exercise on the Vedas, the Puranas, Philosophy, Military Science, Archery, Astronomy, and the Natural Sciences. Nāgārjuna (150 CE–250 CE) developed the Buddhist doctrine of Intermediate *mādhyamikā*, with tenets of*śūnyavāda* (all is void) sarvāstivāda (all is real) and *yogācāra* (idealism of the mind only). The Buddhist Mahayana chronicled *Arya-Manjushri-Mula-Kalpa* history through Buddhist principles. Around 450 CE, Nālandā, originally a Buddhist monastery, was transformed into a renowned center of learning in Magadha (Figure 3.4.5).

Figure 3.4.5: Ruins of Nalanda Mahavihara

The *Jain Sutras Agama* literature was composed in the *Ardhamagadhi-Prakrit* language, and commentaries on it were authored by Bhadrabahu II, Devarthi, Gani, Siddhasena, and Divakara in Prakrit, Sanskrit, Apabhramsa, Kannada, and Tamil. In Tamil, Tolkappiyam's*Eluttatikaram* (on phonemes); Sollatikaram (on Sound); and Porulatikaram (on prosody) and Thiruvalluvar's Kural were the important books composed during the period. Vātsyāyana's*Kāmasūtra* (Principles of Life and Living) was composed (200-300 CE). Aesthetics and critical thinking orchestrated the synergy of the wholesomeness of life during the period.

References:

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3.5 Language and Literature: India Hindu Period (500 CE - 1500 CE)

Mr. Prem Nagar

Proliferation of regionalism led to the development of many regional languages (*deśabhāṣās*), through the process of hybridization. Nāṭyaśāstra describes seven Prākrit-related languages. Northern Vernaculars were labelled as *Apabhraṃśa*. Three Principal Languages - Sanskrit, Tamil, and Prakrit/Pali - were used in trade, administration, education, and communication (Figure 3.5.1).

For grammar, the northern and eastern languages leaned on Pāṇini's *Aṣṭādhyāyī*, while the southern and western languages used Tholkappiyar's *Tolkappiyam*, alongwith *Aṣṭādhyāyī*. By 1500 CE, the regional languages in the North and East of India Pañjābi ,Awadhi, Maithili, Nepālī, Odia, Bengali, Assamese, Santali, Meitei (Manipuri), Bodo, and others, and in the West and South were Pashto, Multani (Saraiki), Sindhi, Gujarātī, Marāṭhī, Konkani, Kannada, Telugu, Malayalam, and many others.

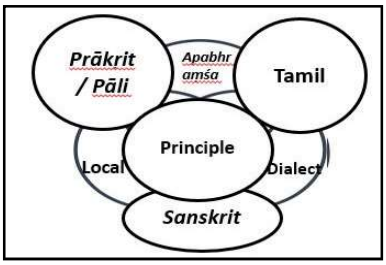

Figure 3.5.1: Process of hybridization of regional language development

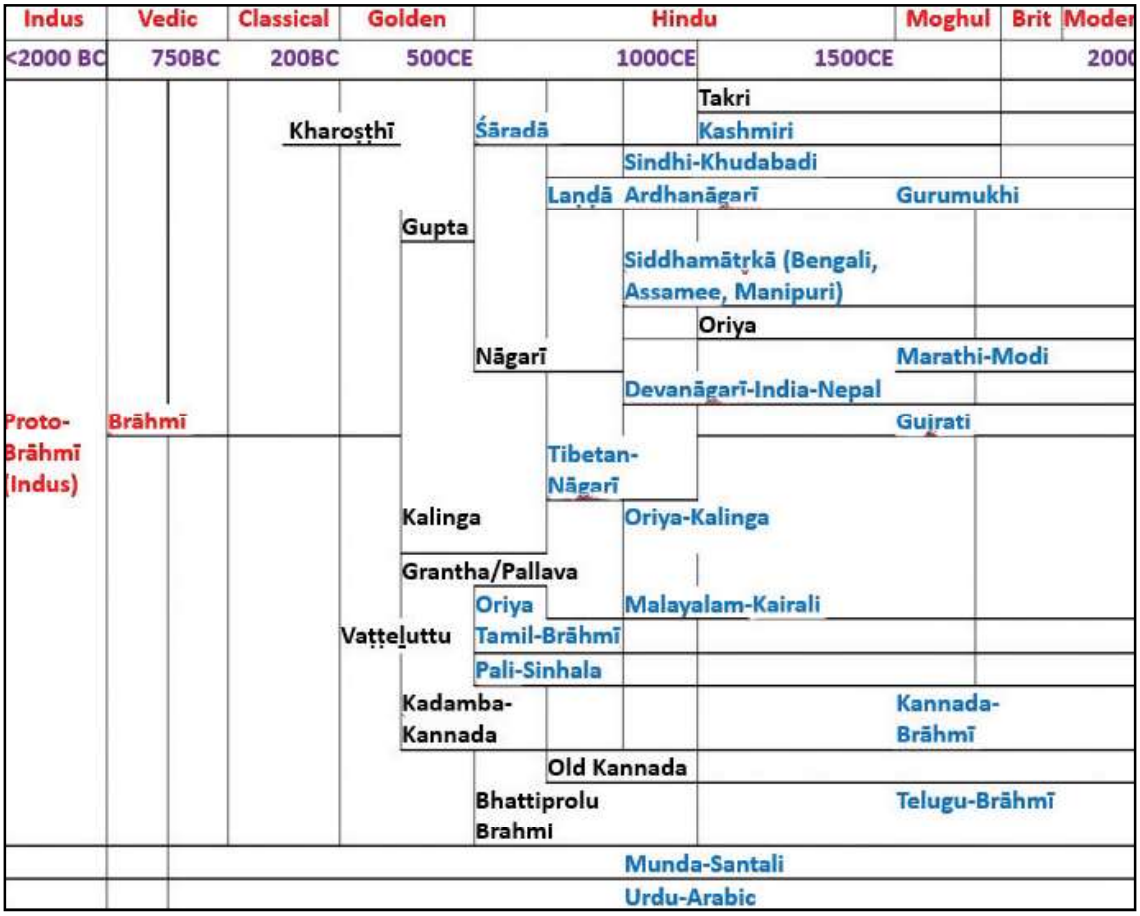

Figure 3.5.2: Development of script in various Indian languages

With the rapid propagation of the writing technology and the need for documentation necessitated the evolution of script in regional languages. These scripts are summarized in Figure 3.5.2, where columns show the name of the period and rows show the script progression with newer names the localized script acquired.

The progression of *Brāhmī* to *Devanāgarī* Consonant Syllables were found on stone or copper plates and is reproduced in Figure 3.5.3.

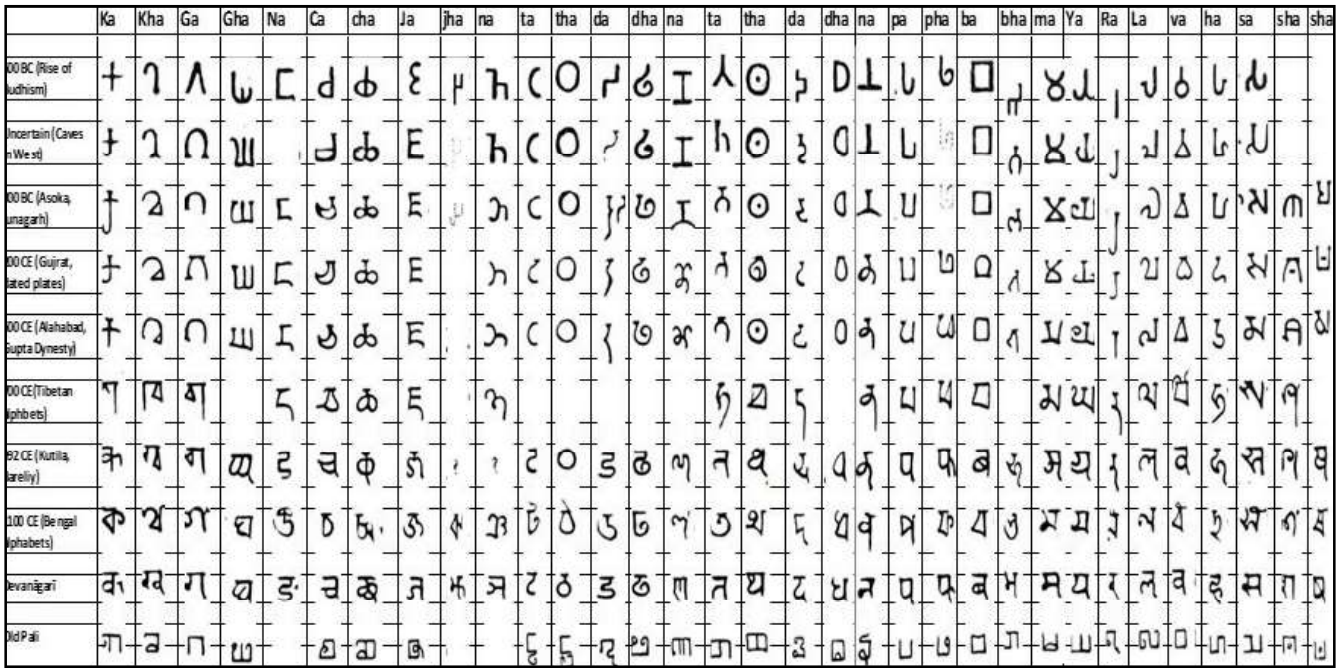

Figure 3.5.3: How the *Devanāgarī* script developed from the Brahmi script (by James Prinsep, Journal of the Asiatic Society of Bengal, March 1838 CE)

In the South, the *Pallava* script evolved into *Brahmic-Tamil* and *Grantha*, and these scripts were found in Tamil Nadu and Kerala, and into *Vatteluttu*in Tamil-Malayalam.

Ease of writing led to the transcription of oral literature. Many of these were retold in regional languages, including the *Bhagavad-Gita*, *Natyashastra*, the *Ramayana and the Mahabharata.*

In 600 CE, Bhartrihari'sVākyapadīya theorized "act of speech" in four mental stages, notion of *Sphota* at speech level and perception of a sentence in three levels, *varṇa-sphoṭa*, at syllable level, *pada-sphoṭa* or *Śabda-sphoṭa*, at word level, and *vakya-sphoṭa,* at sentence level.

Devotional (Bhakti) Literature, inspired through the *Bhagavad-Gita*, *Bhagavata-Purana,* and *Padma-Purana*, originated in South India (700 CE) and was embraced by all regions by 1500 CE. (Figure 3.5.4).

Daṇḍin's Kāvyādarśa (800 CE) characterized poem (*Kāvya*) as "beauty is derived from its use of rhetoric (*Alaṁkāra*)". Bhāmaha'sKāvyālamkāra (700 CE), Vāmana'sKāvyālamkārasutravratti (900 CE) Ānandavardhana'sDhvanyāloka (900 CE), Abhinavagupta'sAbhinavabharatī (1000 CE), Mammaṭa's Kāvyaprakāsa (1100 CE) are gems of Sanskrit literature. Jayadeva'sGītagovinda in Sanskrit explored the mood of love in eight different contexts (Figure 3.5.5). Kalidas, India's greatest playwright, established the Hero (*nayaka*), Heroine (*nayika*), and Clown *(vidusaka*), as three tenets of a typical drama.

Shankaracharya (800 CE) set up four monasteries known as *Mathas* across India. The availability of texts accelerated the proliferation of education

centers and learned debates, in *Matha* and halls attached to temples *(Ghatika*). In secular literature, Rāmānuja (1100 CE) and Hemachandra (1200 CE) are noteworthy. Education Centers flourished at: Nālandā (100-1200 CE); Vallabhi (475-1200 CE); Vikramaśīla (800CE); Dharampala (800 CE); Odantpuri (750-1200 CE); and Jagaddala, and Mithila (1200-1500 CE). Students were trained in the study of the Vedas, Upanishads, Philosophy, Economics, Law, Politics, Medicine, and received practical training.

Poet/Saint, Period, Language	Literature
Shankaracharya, 800 CE, Sanskrit	Philosopher - who consolidated Vedanta
Alvars (Vishnu) and Navanars (Shiva), 800CE, Tamil	Poet-saints, who wrote songs for Shiva and Vishnu
Andal, 700-800 CE, Tamil	Poet-saint; wrote songs for Sri Vaishnava
Basavanna, 1200 CE, Kannada	Poet-philosopher; on Nirankar Shiva
Bhagat Pipa, 1400CE, Hindi	Mystic poet of Bhakti
Allama Prabhu, 1200CE, Kannada	Mystic-saint and Vachana poet
Akka Mahadevi, 1200 CE, Kannada	Early female poet
Ravi Das, 1550 CE, Hindi	Wrote devotional songs of Ravi Das made a lasting impact on bhakti movement
Namdev, 1300 CE, Marathi	Wrote Abhyanga devotional poetry
Sankardev, 1500 CE, Assamese	Poet, playwright, social-religious reformer
Vallabhacharya, 1500CE, Hindi/Brajbhasha	Founded Krishna-centered Pushti sect, philosophy of Sudha- Advanta
Chaitanya, 1500CE, Sanskrit / Bengali	Philosopher and proponent of Vaishnavism tradition

Figure 3.5.4: Principal devotional Literature in Hindu Period

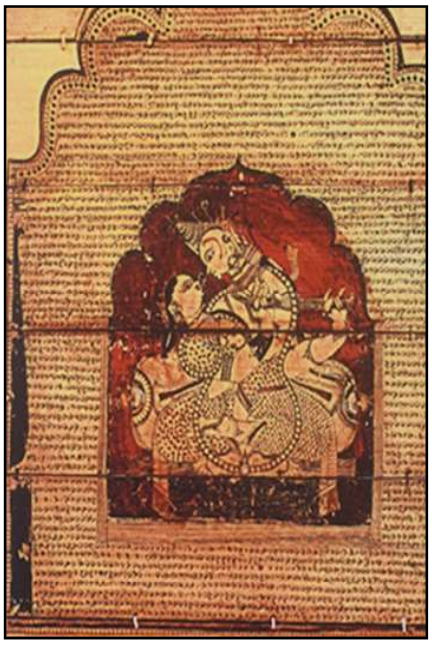

Figure 3.5.5: Gita-Govinda (Songs of Govinda) (1200 CE)

Śārṅgadeva's *Sangita-Ratnakara* (1300 CE) established the grammar of music and music genres. *Rāgas* and Tala led to Dance forms such as *Bharatanatyam, Kathak* (story telling), *Odissi, Koodiyattam*, and others. Thus, oral expression led to textual development, and then to literary Expressiveness. Literary ornamentation (*Alankar*) transformed through orchestration of literature, singing, drama and dance, into an expression of creativity (*Jhankar*).

Besides Nalanda, VikramashilaMahavihara(Figure 3.5.6) was the most important center of learning in India.

Language was influenced by social, trade and political contacts with foreigners, and by speakers of other languages. Brahmagupta's (598-668 CE) *Brāhmasphuṭasiddhānta* and *Khaṇḍakhādyaka* on the Indian decimal system was translated into Arabic by Muhammad-al-Fazari. Al-Khwarizmi (800–850

CE) wrote "*al-Jam-wal-tafriq-bi-hisal-al-Hind*" in Arabic; this in turn was translated into Latin (1300 CE), as "*Algorithmi de numeroindorum*" which led to the spread of the decimal system throughout the world. "Panchatantra" was translated into Persian (800CE) by Ibn-al-Muqaffa-tin as the "*Kalīla-wa-Dimna*". Al-Beruni's (973-1048 CE) travel diary,*Kitab-ul-Hind* (History of India in the 11th century), has become a reference document on India in the west.

Figure 3.5.6: Ruins of VikramashilaMahavihara, Antichak village, Bhagalpur, Bihar

Reference:

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3.6 Language and Literature:India Mughal-Maratha Period (1500 CE-1800 CE)

Mr. Prem Nagar

The Mughal Empire occupied Indian subcontinent during the two hundred years of their reign (Figure 3.6.1). Sanskrit was replaced by Persian, as the language of administration.. A hybrid language, consisting of Persian mixed with the local languages came into use in the Army. The Turkic word *Ordu* was localized to Urdu and became the name of this new language. Gradually the Mughals began to speak *Urdū* and adopted the *Nastaʿlīq*style of Persian calligraphy. Urdu is currently adopted as the State Language in Pakistan. A dialect that combines Hindi and Urdu, called Hindustani, has become the popular language in North India.

Figure 3.6.1: Extent of Mughal Empire in India - 1700 CE

Different areas in India developed local roots and autonomy. Most regional languages adopted their own scripts. Gujarātī, Marāṭhī, Konkani, and Bengali, were derived from the Devanagari script. Figure 3.6.2 lists the

languages and their scripts.

Language and Script
Kǒšur (Arabic کٲشُر, Śāradā कॉशुर)
Pājābī (Gurmukhī, ਪੰਜਾਬੀ)
Hindustani, Hindavī, (Devanāgarī, हिन्दुस्तानी)
Maithili, (Devanāgarī, मैथिली)
Nēpāḷī (Dogri Devanāgarī, नेपाली)
Urdu (Perso-Arabic, Nastaʿlīq style, اُردُو)
Odia (Odia, ଓଡ଼ିଆ)
Bengali (Bengali, বাংলা)
Assamese (Assamese, অসমীয়া)
Santali (Satar, ᱥᱟᱱᱛᱟᱲᱤ)
Manipuri (Meitei)
Bodo–Koch (Bodo)
Pashto (Perso-Arabic, پښتو)
Multani, Saraiki (Brāhmī and Khudawadi)
Sindhi (Persio-Arabic, Devanagari, سنڌي सिन्धी)
Gujarātī (ગુજરાતી: Gujrati)
Marāṭhī (Modi, मराठी)
Konkani (Konkani, कोंकणी)
Tamil (Tamil-Brahmi, தமிழ்)
Kannada (Kannada, ಕನ್ನಡ)
Telugu (Bhattiprolu Brāhmī, తెలుగు)
Malayalam (Vatteluttu (round writing), Modified Brāhmī / Kerala Panineeyam, മലയാളം)

Figure 3.6.2: Principal languages (along with the script name in parenthesis) in India around 1600 CE

Madrasahs or Islamic centers of learning were instituted in India by the early Mughal rulers. *Madrasah* teachings had twin objectives: – (i) to teach the Qur'an to spread Islam, and (ii) to teach the language and script for bureaucracy and the judiciary. The first Madrasah in Delhi was established by the Delhi Sultanate in 1206 CE.Figure 3.6.3 shows the *Madrasahs* in Bidar in South India which was built in 15th Century CE.

The Mughal Emperor Aurangzeb squeezed the old Indian *Gurukula*system of education to extinction. There was oppressive religious discrimination. Private tutoring came into vogue. Women's education was neglected. Girls and women of royalty were taught privately. Vocational training was imparted through apprenticeships at the homes of *ustāds* (or teachers), and through work in *kārkhānas*(or manufacturing centers). Temples and monasteries became teaching centers for the Hindus.

Figure 3.6.3: Massive Mahmud Gawan Madrasah in Bidar (Karnataka) India

Persian literature flourished in India. Abdul-Rahim-Khan's *Babarnama* (*tuzuk-I-baburi*) gives an account of the history of the period.

Figure 3.6.4: Illustrated page from *Akbarnama*, depicting Akbar's court activities (1592 CE)

Emperor Akbar's court historian, Abu'l-Fazl, wrote about Akbar's administration in a book entitled *Ain-i-Akbari*, a historical account in the *Akbarnama* (Figure 3.6.4). Pictorial books like Malik-Muhammad-Jayasi's*Padmavat*(Figure 3.6.5) appeared. Persian

translation of Bhagavad-Gita, Upanishads, Yoga-Vashista and Ramayana by Dara-Shikoh, and of the Mahabharata by Abul-Faizi, enriched literature.

Figure 3.6.5: An illustrated manuscript of Padmavat, 1750 CE

Chaupai, a stanza of a poem consisting of four lines, in the vernacular Awadhi, became a popular style of verse. It was extensively used by Tulsidas (Figure 3.6.6) in *RāmacaritaMānasa*, which is regarded as a masterpiece of vernacular literature.

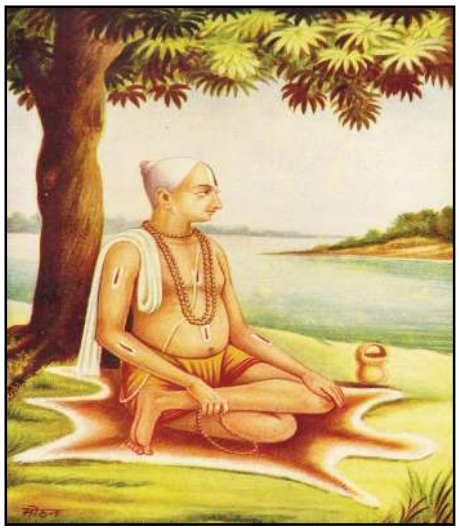

Figure 3.6.6: Poet Tulsidas, the author of *RāmacaritaMānasa*

Other styles of verse composition included the Doha, used profusely in North India, and *Abhang*(a form of devotional poetry), used in the Maratha region. *Varkari,* a group that followed a rigid devotional tradition had poets Jñāneśvar and Tukaram (Figure 3.6.7) who composed in *Abhang* style.

Figure 3.6.7: Santha Tukaram - a Varkari poet.

Champu, a style that combines prose and poetry, was used in Telugu by Nannaya-Bhattarakudu, and in Bengali by Jiva-Goswami. Picture metrics, or *Chitra-kāvya*, became a lyrical style for Upendra-Bhanja in Odia. Poetically narrated stories developed in Punjabi: - Waris-Shah's Heer-Ranjha, Guru Nanak's verses Gurbani, Guru-Arjan's Adi-Granth, Guru-Gobind-Singh's Dasam-Granth are noteworthy.

Figure 3.6.8: PurandaraDasa, melodic doyen on Kannada literature.

Purandara-Dasa (Figure 3.6.8) composed powerful devotional Krishna poems for melodic renderings in Kannada. Narsinh-Mehta's Gujarati verses for Krishna reflected the philosophy of *Advaita and*

became popular.

Notable Female Poets were Mirabai (Figure 3.6.9) and Bahinabai (*Marathi Varkari*). Brundabati-Dasi wrote *Purnatama-Chandrodaya Kavya*.

Figure 3.6.9: Mirabai, a Rajput princess, and a devotional poet

Urdū inherited literary conventions from Persian, Arabic, Turkic, and *Hindavi*(*Khariboli*). The Sufi poetry of Mir-Taqi-Mir's and Shah-Hussain was about communal harmony and pious feelings. Rhythmic renditions were entrenched in Punjabi, Sindhi, Urdu, and Pashto. Poet Bulleh-Shah used the Arabic Kafi style of repetitive verses. Zeb-un-Nissa (Figure 3.6.10) composed poems in Persian in *Diwan-i-Makhfi*.

Figure 3.6.10: Persian poet Zeb-un-Nissa (Metropolitan Museum of Art, New York City, NY, USA)

Reference:

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3.7 Language and Literature: India British Period (1800 CE – 1947 CE)

Mr. Prem Nagar

Around 1800, Jesuit priests Gilchrist, Carey, Bronson, Forbes and Campbell made industrious efforts to create standardized grammars of most Indian languages. Figure 3.7.1 gives the view of "An English-Hindustani Dictionary and A Grammar of the Hindoostanee Language", compiled by John Gilchrist (1759 CE – 1841 CE).

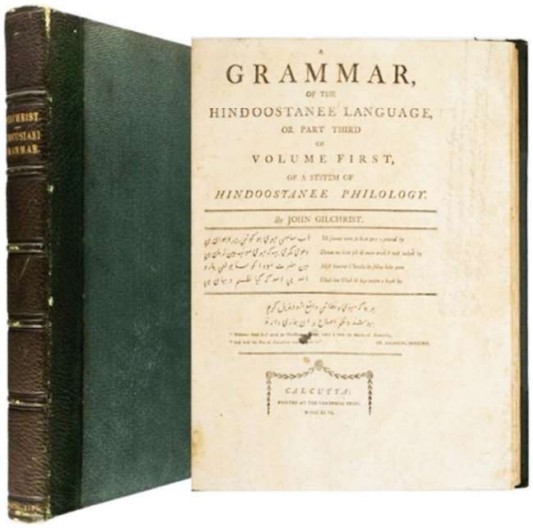


Figure3.7.1: Grammar of the Hindoostanee Language (J Glichrist, 1800CE)

The Bengal Gazette was the first English newspaper from Kolkata, and was published in 1780. Baptist missionaries published a weekly Bengali newspaper, the Samachar Darpan, in 1818. Pandit Jugal Kishore Shukla published a weekly Hindi newspaper, the UdantMartand (Figure 3.7.2) in 1826, also from Kolkata. These newspapers expressed opposition to social norms like widow-burning, the caste system, and untouchability. Urdu, a Persian-Hindoostanee hybrid language, became the medium of protest. The Urdu newspaper Urdu-Akbar was particularly vocal in criticizing the East India Company on civic matters.

Figure3.7.2: UdantMartand, weekly Hindi newspaper (1826 CE)

Native scholars pitched in to translate texts from English literature into local languages, and many translated Indian literary texts into English. German scholars took immense interest, and connected their national identity with the old Vedic civilization of India.

Indigenous education in India was severely disturbedby the English Education Act of 1835 CE. This was the brainchild of historian Lord Macaulay, who was strongly biased against India. *"We must at present do our best to form a class who may be interpreters between us and the millions whom we govern; a class of persons, Indian in blood and color, but English in taste, in opinions, in morals, and in intellect."* The education engineering became an organized restructuring of India's working public. The government employment was a prize for the English-educated, who acted as a subsidiary to the Crown. Nonetheless, English education brought a new sense of self-determination, incensed by the western liberalism. Indigenous languages and literature suffered. Fortunately, they did surviveunder heavy odds.

1850 to 1900 CE is considered the renaissance of Indian literature. Introduction of the printing press allowed new works to reach the masses. Kalimohan Banerjee compiled Vidya Kalpadruma, a Bengali encyclopedia in thirteen volumes. AnandaramDhekialPhukan, Fakir Mohan Senapati, HunnarkhanniChadai, Vishnu Shastri Chiplunkar and Sundaram Pillai enriched Asamese, Odia,

Gujarati, Marathi and Tamil literature, respectively.

Bharatendu Harishchandra (1850-1885 CE) (Figure 3.7.3) engineered the fusion of the Hindi dialects to a common platform, which uses the Devanagari script. Though he died young, Harishchandra was among the first to use his literary skills in shaping political opinion.

Figure3.7.3: Bharatendu Harishchandra 'Father of modern Hindi literature.

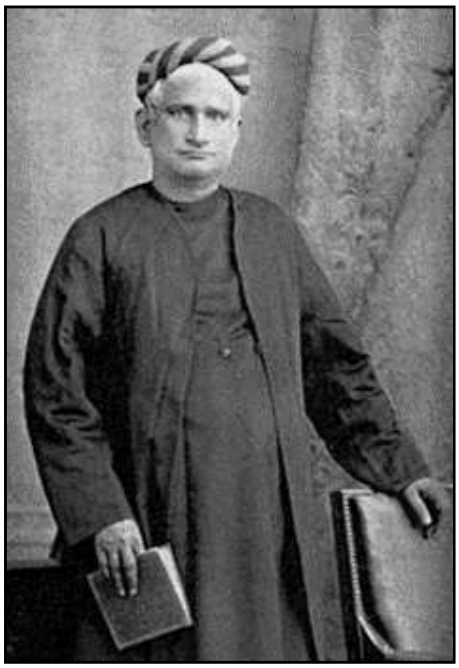


Figure3.7.4: Bankim Chandra Chattopadhyay, novelist (1838-1894)

The Bengali novelist Bankim Chandra Chattopadhyay's (Figure 3.7.4) novel Anandamath (1882) directly challenged British rule. The novel depicted India as a mother, and was the origin of the popular patriotic song VandeMataram. At the other coast, Marathi nationalism was expressed by Balagangadhara Tilak (Figure 3.7.5), who instituted the newspaper Kesari as a voice against British rule.

Figure3.7.5:Balagangadhar Tilak, (1856 CE – 1920 CE)

In southern India, Subramanya Bharati (1882 – 1921 CE) (Figure 3.7.6) contributed to traditional as well as nationalist literature in Tamil, while KundukriVeeresalingam (1848 – 1919 CE), and Narmad (1833 – 1886CE) were prolific writers contributed in Telugu and Gujarati, respectively, to the national cause.

Figure3.7.6:Subramania Bharati, the Tamil Freedom Poet

In 1857 CE, the British established four major universities - in Calcutta, Madras, Bombay and Lahore - as centers for higher studies. Translation and compilation work was included in the curriculum, but no research. Aligarh Muslim University and Indian Association of Cultivation of Science were established in 1975, through private funding by Indian businessmen.

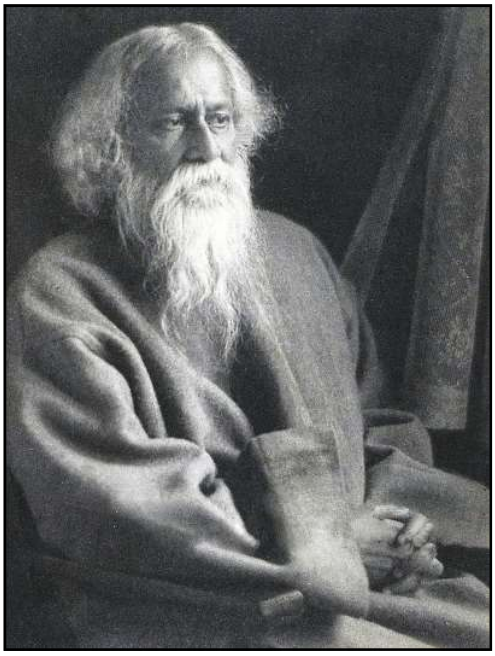


Figure3.7.7: Rabindranath Tagore (1861-1941), Nobel Prize, 1913.

Swami Vivekananda (1863 – 1902) and Sri Aurobindo (1872-1950) created voluminous spiritual literature and wrote about the uplifting of India. The Bengali polymath Rabindranath Tagore (1861–1941)(Figure 3.7.7) was awarded the Nobel Prize in literature (1913), through the translated Gitanjali collection of his poems.Massive amounts of publicationsof "freedom literature" in the 1930's helped India to procure freedom.

Many English-speaking poets and novelists were influenced by the literary works from India and wrote about Indian society. Poet Ralph Waldo Emerson instituted the United Universalist Church in the US. Edwin Arnold created a lyrical translation of Bhagavad-Gita. English novelist Joseph Rudyard Kipling, whowas born in India, won the Nobel prize in literature in 1907. Many writers of Indian descent have also made a mark for their writings in the English language.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/british-period/language-and-literature

Authored by: Prem Nagar for India Discovery Center (IDC)

References - Language and Literature

1. A comparative grammar of the modern Aryan languages of India: to wit, Hindi, Panjabi, Sindhi, Gujarati, Marathi, Oriya, and Bengali, by Beames, John, 1837-1902
2. A GRAMMAR OF THE HINDI LANGUAGE by: REV. S. H KELLOGG,1893
3. A HISTORY OF ANCIENT AND EARLY MEDIEVAL INDIA, FROM THE STONE AGE TO THE 12TH CENTURY by: Upinder Singh,
4. A Phonemic Code Based Scheme for Effective Processing of Indian Languages; (2003), By: Prof. R.K. Joshi, Keyur Shroff and Dr. S. P. Mudur
5. Ahmad, Aijaz (2002). Lineages of the Present: Ideology and Politics in Contemporary South Asia. Verso. p. 113. ISBN 9781859843581,
6. Analyzing 4,000-year-old undeciphered script of Indus civilization; By: Rajesh P.N. Rao, University of Washington
7. Approximately 99% of Urdu verbs have their roots in Sanskrit and Prakrit "Urdu's origin: it's not a "camp language". dawn.com. 17 December 2011.
8. Bharata, the Nāṭyaśāstra, by: Kapila Vatsyayan, Sahitya Akademi, 1996
9. Bhartiya Bhashaon Ka Udbhava Aur Vikas, in Dr. Nagendra (ed.), Bhartiya Sahitya ka SamekitItihas,By: Bholanath Tiwari, p.79, Hindi MadhyamKaryanvayanNideshalaya, Delhi University, 1989,
10. Chapter 5- Overview of the Munda Languages, by Gregory D.S. Anderson; Koninklijke brill NY, LIEDEN 2015 | doi 10.1163/9789004283572_006
11. Education System in Ancient India: A Historical Review by: Dr. Devidas B. Waydande, M.S. Kakade College, SomeshwarnagarDist –Pune (Maharashtra)
12. Evolution of Early Writing in India by: Subhash Kak; Indian Journal of History of Science, vol. 28, 1994, pp.375-388
13. Culture and Evolution, (2013) By:Ian Cross, W. Tecumseh Fitch, Francisco Aboitiz, Atsushi Iriki, Erich D. Jarvis, Jerome Lewis, Katja Liebal, Bjorn Merker, Dietrich Stout, and Sandra E. Trehub;
14. Four Studies in the language of Beda, Gonda 1959
15. From Orality to Writing, 2011: Transmission and Interpretation of Pāṇini'sAṣṭādhyāyī; By Madhav M. Deshpande
16. Hindavi and Dehlavi (Rahman, Tariq (2001)): From Hindi to Urdu: A Social and Political History. Oxford University Press. pp. 1–22. ISBN 978-0-19-906313-0. Archived from the original (2014)
17. The Interface Between the Written and the Oral. By: Jack Goody (1987), Cambridge University Press. pp. 110–124. ISBN 978-0-521-33794-6.
18. James Prinsep (1838), as published in the Journal of the Asiatic Society of Bengal, India
19. Klaus Klostemaier (1994), A survey of Hinduism second edition, State University of New York Press, ISBN-978-0791421093
20. Ludlow, British India,1858
21. The History and Culture of Indian People: by R.C. Majumdar& A D Pusalker (1951), Publisher: Bhartiya Vidya Bhawan, Mumbai, 400 007
22. Name Urdu was first used by the poet Ghulam HamadaniMushafi around 1780
23. Oxygen isotope in archaeological bioapatites from India: Implications to climate change and decline of Bronze Age Harappan civilization; 2016, By: Anindya Sarkar, Arati Deshpande
24. Phonology–orthography interface in Devanāgarī for Hindi by: Pramod Pandey; Jawaharlal Nehru University
25. Rasa-Sāṅkhya -Connecting Rasa to

Neuroscience; (2015), By: Bijoy M Misra, Prem S Nagar, Bela Kosaras, Jaspal Singh,

26. Lost Languages: The Enigma of the World's Undeciphered Scripts, by:Robinson, Andrew (2002).

27. Roughly 75 per cent of the total stock of 55,000 Urdu words that he compiled in his dictionary are derived from Sanskrit and Prakrit, Ahmad, Aijaz (2002). Lineages of the Present: Ideology and Politics in Contemporary South Asia. Verso. p. 113. ISBN 9781859843581,

28. Safavi, A.D. (2006): Introduction. International Seminar on Impact of Persian Language and Culture on India, Department of Persian, Aligarh Muslim University, Aligarh: India.

29. Sreedharan (2007). A Manual of Historical Research Methodology. South Indian Studies. p. 268.;

30. The Biology and Evolution of Speech: A Comparative Analysis, By: W. Tecumseh Fitch, Department of Cognitive Biology, University of Vienna, Vienna 1090, Austria.

31. The British Impact on India, 1700–1900, (1857–1947), BY: By Fritz BlackKWell

32. The Cultural Heritage of India, Volume V - Language and Literature; By: S K Chateterji, and K.M. Munshi

33. The Cultural Heritage of India, Volume V - Language and Literature; By: S K Chatterji, and K.M. Munshi

34. The History and Culture of The Indian People/ Volume 1/The Vedic Age; by Several Respected Literati

35. The History and Culture of The Indian People/ Volume 3: The Classical Age; by Several Respected Literati

36. The Impact of Persian Language on Indian Languages, By: Ali Akbar Khansir, Bushehr University of Medical Sciences, Bushehr, Iran; and Nasrin Mozafari, Bushehr University of Medical Sciences, Bushehr, Iran

37. The Indo-Iranian Language Family, The Hypothetical Proto-Indo-European Language, and a Hypothetical Homeland; By: Rajan Menon

38. THE INFLUENCE OF ARABIC ON INDIAN LANGUAGE: HISTORICALLY AND LINGUISTICALLY MUNA MOHAMMED ABBAS ALKHATEEB, HASANEIN HASAN, College of Basic Education, Babylon University, IRAQ

39. The Origins of Language, by: Alejandro Fernández https://osf.io/preprints/ socarxiv/2guqs/

40. The Wonder That Was India: a Survey of the Culture of the Indian Sub-Continent Before the Coming of the Muslims Hardcover – January 1, 1954, by A.L. Basham (Author)

41. Tomasello, M. (2008). Why do not ape's point? Trends In Linguistics Studies and Monographs

42. साँथबिऽशऽऔऽआणासऽष by Dr. Dhirendra Verma (1897–1973), first scientific history of Indian languages in 1933 and a principal editor of first —साधौथळिावौळऔाव' (Hindi Encyclopedia)

Internet - generally available material

1. https://www.outlookindia.com/magazine/story/ here-lies-the-first-human-perhaps/296859

2. https://www.harappa.com/

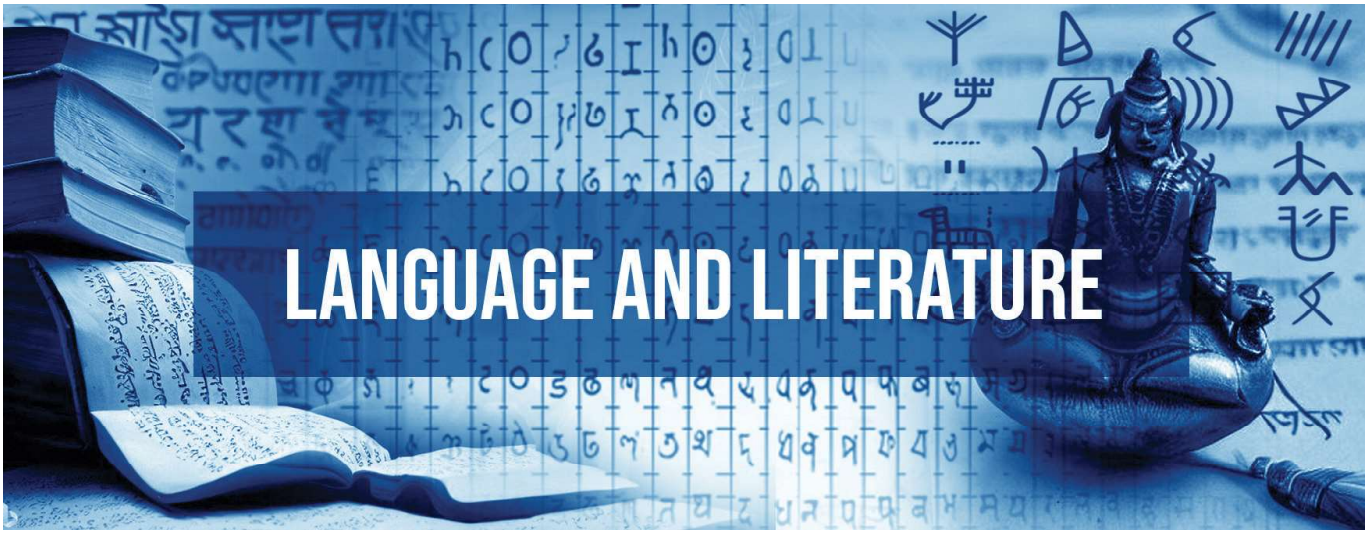
3. https://en.wikipedia.org/wiki/Hathibada_ Ghosundi_inscriptions

4. https://namami.gov.in/history

5. https://www.britannica.com/topic/language

6. https://www.historydiscussion.net/history-of-india/literature/literature-in-india-during-british-rule/5948

7. https://www.indianetzone.com/41/indian_ english_literature_during_british_india.htm



TRACK 4

Contributor

Satyendra Sharma is a physicist whospecialized in LIDAR technology (Light Detection and Ranging) and studied atmospheric aerosols. Born in a family of scholars, he was deeply influenced by his father who taught Philosophy. Satyendra was interested in the spiritual practices and studied the scriptures and the religious texts. Lately he studies world ideas and knowledge processing. He serves as the Executive Director of the India Discovery Center and leads the Philosophy and Religion track

4.0 Philosophy and Religion: Introduction

India is known for its philosophy and religion. Empirical observations on nature and the interaction of life with nature form the scriptural literature of the country. Respecting life and objects in all forms become the evolutionary creed of Indian philosophy and religion.

Animism can be speculated from the unearthed seals of the Indus Valley Civilization, which flourished from 3300 to 2000 BCE. A Mother Goddess and tree worship are observed in many seals. Upward views suggest possibly prayers skyward to receive blessings. Rituals can be conjectured with priests in attendance. Large tanks suggest ritual baths connected to places of worship. The Indus scripts remain undeciphered. More may reveal in time.

During the Vedic Period, which lasted from 2000 to 700 BCE, the development of the Vedas, the oldest scriptures of Hinduism, emerged. The Vedas portray the social picture of life, nature, conduct, ethics, mythology and rituals. The Vedic rituals are coded with astronomical precision to connect to the celestials for help. The later Vedic literature called Upanisads, enunciate the concept of Brahman, the ultimate reality that creates and maintains all existence. This has been the crux of modern Hinduism.

From 700 to 200 BCE came the Classical Period, a time of great intellectual and philosophical surge in India. During this period, a number of different analytic schools of philosophy emerged. The analysis was on the nature of reality and the relationship between the individual soul and the divine consciousness. Buddhism began as a new religion and emphasized mutual coexistence. Jainism was reformulated to claim purity through renunciation. The religious conduct for a Vedic follower (modern Hinduism) was coded and the rituals were prescribed.

The Golden Period, which lasted from 200 BCE to 500 CE, brought further cultural and religious development. With new writing methods, Buddhism and Jainism flourished with the production of educational books and scriptures. Hindu philosophy found outlet through the composition of epics and analytic literature. The Bhagavad Gita, one of the most important texts in Hinduism, was a product of this period. The period is known for religious harmony and social opulence.

Hindu Period (500-1500 CE) brought temples and deities. Individual freedom in social life created cults and sects. Theology became intertwined with philosophy developing various anthropomorphic gods in concepts and in idolatry. Vedic philosophy was reintroduced with interpretations by erudite commentators. A young mystic saint Shankara traversed the country and consolidated the Vedic teachings among people. His declaration of oneness of the universe and equality of all life is called Vedanta in Sanskrit. Islam and Christianity made their way into India through trade and occupation.

Mughal-Maratha period (1500 - 1800 CE) was a time of great upheaval. The proliferation of Islam led to the decline of Vedanta teachings. Widespread economic subjugation along religious lines led to the imposition of Islamic faith through laws and taxation. Forced conversions and systematic destruction, looting, and desecration of native temples were rampant. Defensive posture of the native population led to a multitude of cults for survival.

The British rule in India from 1800 to 1947 led to a worsening of social and religious divisions. The British used these divisions to impose Western customs and beliefs. Various religious reform movements emerged as a response. Eventually divisiveness gained and India was partitioned in 1947. Separate countries of India and Pakistan were created on religious lines. The partition led to widespread violence and displacement. Currently India has as many Muslims as in Pakistan. India is secular with strong protection of minority rights.

4.1 Philosophy and Religion: Prehistory and Indus Period (7000BCE-2000BCE)

Dr. Satyendra Sharma

Paleolithic and Neolithic communities were pastoral. Artifacts from these periods suggest elements of nature worship and animism. They appreciated terrestrial assets like land, trees and water to fulfill their daily needs. They practiced animal sacrifice. These rituals were likely also practiced by people of the Indus period, as evidenced in the Indus seals. (Figure 4.1.1)

Figure 4.1.1: Triple headed animal seal from Mohanjo-daro

Tree motif and worship under a tree are fairly common on the Indus seals. The tree as a divinity has continued through the centuries and remains a belief system for many of India's faith systems (Figure 4.1.2). Animals amidst a tree are a common grouping on Indus seals with the tree serving as a shelter to the animals. Ritualistic paraphernalia like ornate utensils, conches, and musical instruments point to a festive service possibly for a harvest festival.

Figure 4.1.2: People worshipping tree,Mohanjo-daro

Large water tanks, wells and elaborate water services point to the purification rites associated with worship. Since the scripts from this period remain un-deciphered, the existence of such a type of worship is only indirectly inferred. (Figure 4.1.3)

Figure 4.1.3: Bathing Tank at Mohenjo-daro

Clay female figurines in Paleolithic and Neolithic India have been linked to a fertility cult and the possible worship of a mother goddess. (Figure 4.1.4)

Figure 4.1.4: Mother goddess figurine from Mohanjo-daro

Evidence of bangles and garlands suggest decoration and veneration of the deity. The female contribution to the progeny, providing food and looking after the family might have been recognized as a female energy.

Figure 4.1.5: Proto Shiva or Pashupati seal from Mohanjo-daro

Human prowess possibly develops into meditation as we see a human figure seated in a yogic posture surrounded by animals (Figure 4.1.5). Similar yogic postures are also depicted on seals from Harappa. It is not clear if these postures can be associated with any kind of religious practice. The scientific date when yoga practice started in India is still debated.

All philosophical speculations were likely concentrated on terrestrial objects, with meditation being an exception. Some seals depict mythical animals. Life and growth as the laws of nature were probably understood and respected. Difficulties and distress were possibly consoled through animal sacrifice to the deities.

The Priest-King is a small male figure sculpted in steatite found during the excavation of the ruined Bronze Age city of Mohenjo-daro in Sindh. (Figure 4.1.6) It is believed to be the image of Shiva whose concept in India as a teacher and healer is seriously discussed in later literature.

Figure 4.1.6: Priest King

The discovery of a fire altar at Kalibangan in association with the earlier discovery of the seal with a priest-like image may be connected to fire sacrifice. (Figure 4.1.7)

Animal remains discovered at these sites suggest animal sacrifice. The positioning and the orientation of such pits were possibly connected to sky maps - we do find some evidence of star depiction in the seals.

Houses during the Indus Civilization era can be shown to be aligned with the orientation of the celestial bodies. This suggests the possible existence of astrological practices.

Figure 4.1.7: Fire alter at Kalibanga

Burial chambers have been discovered at most Indus sites. The terracotta utensils buried along with the deceased indicate a belief system based on life after death. Jewelry is rarely observed in this burial, though it could be a practice restricted to the burial of women only. Two body burials have been unearthed that appear similar but no connection between the two can be established. Some burial chambers are brick-lined, evoking some protection against degradation.

The opulence of the Indus society is reflected in their religious and philosophical outlook. People seem to have developed a belief system that associated Nature with the future, and blessings from the heavens. They buried their dead with pottery and household objects indicating a belief in afterlife.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/pre-history-and-indus-period/philosophy-and-religion

Authored by: Chandrika Govardhan for India Discovery Center (IDC)

4.2 Philosophy and Religion: India Vedic Period (2000 BCE - 700 BCE)

Dr. Satyendra Sharma

Etymologically, *Veda* means knowledge. The Vedas are a collection of empirical suggestions on how a person may conduct life with his/her religious obligations. They remain prescriptive for a person of the Hindu faith today.

Figure 4.2.1: Graphic rendering of the congregated scholars.

During the Period, people appear to have devoted time to contemplate on the day-to-day events, changing seasons, night sky and general surroundings (Figure 4.2.1). The *Rig* (praise) *Veda samhitā*mostly consists of hymns (Figure 4.2.2) addressed to various gods– *Agni, Indra, Varuna, Ashwini Kumaras, Soma, Vishvedevas, Rudras,* etc., which are the presiding deities for material elements as well as personal gods (4.2.3). Hymns were offered to please them for the fulfillment of the desires, and to seek protection.

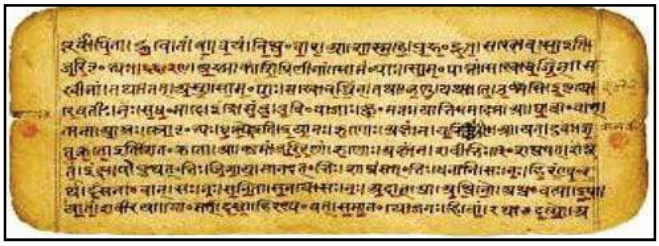


Figure 4.2.2: Vedic Text on a Palm Leaf

Figure 4.2.3: Graphics showing the invocation to Vedic Gods

***Vedic* Philosophy**

The Rigveda contains inquiry regarding the cosmology and the origin of the universe (*Nāsadiyasūkta*). Questions such as what existed before the *sat*(perceivable) and *asat* (imperceivable), what covers space and beyond are analyzed, though the text does not give any definitive answers regarding these inquiries. The concept of universal order or *rta*is inferred as an explanation.

Partaking in *soma,* a plant extract, was auspicious. The relationship of *soma* extract to *Chandra (*the moon god), possibly highlighted the connection between the harvest and the lunar cycle. This relationship also links to the belief in animism (*chetanavāda*). Many hymns in the *Yajurveda* are addressedto*yajña* and *yajña* equipment, such as *vedi*(altar), *yupa*(post), *havi*(offerings) etc., which point to animism.

*Udgitha*in *Sāmaveda* is the practice of chanting the divine syllable *Om,* also considered to be *akshara brahma*.Meditating on *Om*is supposed to open up pathway to realizing the ultimate reality (*Brahman*). The concept of a universal all-encompassing *Brahman* was the final postulate of the Vedic period.

The *Atharvaveda* is atext devoted to occult practices. Some of the *sūktas* in this text deal with the cosmological questions, including the nature of existence. The *Skambhasūkta* is addressed to the *brahman,* which can be attained by contemplating on *tatvatraya– cit, acit*and *ishvara* (soul, matter and God).

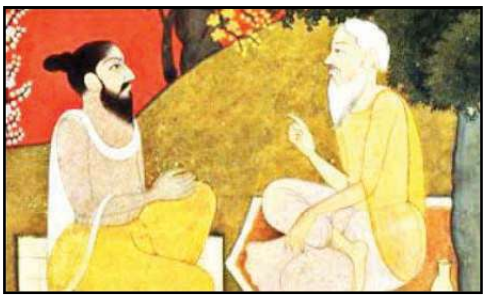


Figure 4.2.4: Teacher and Student - *Upanishads*

The *Āranakyas,* the literature developed through secluded forest living, contain discussion on the nature of *Brahman*. They form the major content for the *Upanishads,* also referred to as *Vedānta.* Vedanta postulated that the goal of human life is to realize the identity of the individual soul or *ātman,* and of *Brahman*. The path to this realization or *brahmajñāna*was through the institution of realized preceptors or *gurus* imparting their knowledge to their students or *shishyas*. (Figure 4.2.4)

Vedic Religion

The very first *Sūkta*(verse) of the *Rig Veda* is addressed to *Agni*, who serves as the facilitator for other gods that are invoked during the rituals. *Agni* is pure, and is a carrier of everything in it. *Agni* is an essential element for all *yajna* (symbolic surrender of all possessions) processes, during which oblations are made to the gods.

Rigvedic and *Sāmavedic*rituals contain the common theme of offering *soma* juice mixed with *dadhi*(yogurt), *ghrita*(clarified butter), *madhu* (honey), milk and water to the gods. Tools used in the rituals are given in the picture below (Figure 4.2.5). The animal sacrifice interpretations arise from the word *medha*, meaning"killing".

Figure 4.2.5: Utensils used in the *Vedic* ritual

The *Sāmaveda* is the musical (*sāman*) rendering of the hymns in praise of the gods who are mentioned in the *Rigveda*. *Sāma* has two parts – *Archic*(related to *rk*or praise) and *Gāna*(melody). The *Atharvaveda* mostly contains hymns to remove maladies, or for the fulfillment of desires. The *sūktas* in the *Atharvaveda* deal with formulas to counteract diseases, and ward off evil. They may reflect the influence of *Tantric* practices in the Vedic hymns.

Other Religions

People outside the Vedic area had their own belief systems based on rivers, mountains, earth, demons, and snakes. (Figure 4.2.6) With time, many of these ideas were gradually absorbed into the Vedic fold. Conflicts between the Vedic and non-Vedic cultures are reported in the literature.

Figure 4.2.6: *Ayyanār*, a Folk Deity

References:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/vedic-period/philosophy-and-religion

Authored by: Vrittamani Ramapriya for India Discovery Center (IDC)

4.3 Philosophy and Religion: India Classical Period (700 BCE – 200 BCE)

Dr. Satyendra Sharma

Philosophy:

The Vedic inferences of *sat* (real) and *asat*(unreal) were rigorously analyzed during the Classical Period. Based on these analyses, six schools of philosophy developed.

Nyāya(conclusion of a syllogism or reasoning) philosophy defines what exists. It affirms that proofs are of four types: *pratyaksha*(direct perception), *anumāna*(inference), *upamāna*(comparison) and *śabda* (verbal testimony). *Sat* is what exists and is real, whereas *asat*is afalse perception that leads to *viparyaya*(confusion). The philosophy was propounded by Rsi Gautama (Figure 4.3.1) about 6th century BCE.

Figure 4.3.1: Gautama – *NyāyaSūtra* author

Vaisheshika is a philosophy based on the concept of *kāla* (time), where the objects of knowledge are transient. Thus, *sat* is *nitya* (eternal) and is beyond *kāla*(time). However, an entity such as *anu* (atom), is indestructible/eternal and is motionless.It gets its initial motion from *adrishta*(unseen power). Figure 4.3.2 gives the picture of the mystic Kanada, who picked grains to eat.

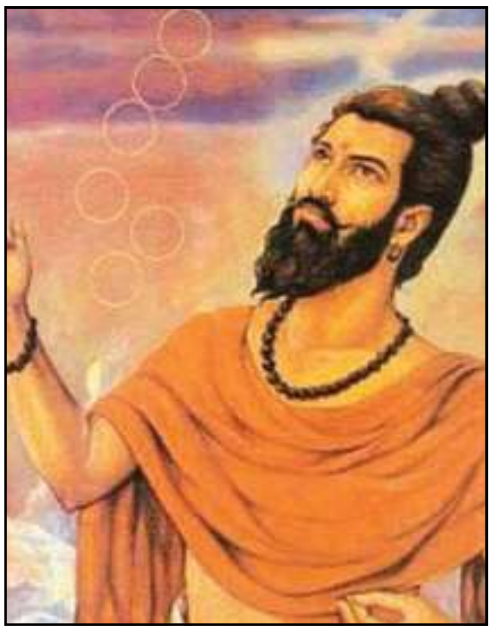


Figure 4.3.2: Kanāda–author of the *VaisheshikaSūtra*

Sāṇkhya philosophy admits three proofs of valid knowledge – *pratyaksha*, *anumāna* and *śabda*. How an object is perceived depends on the perceiver, who is influenced by the *manas* (mind). *Prakrti* (nature) is the material cause of the universe and is *asat*(unreal). *Prakrti*remains *avyakta*(unmanifested) till it meets the *Purusha* (the supreme self), at which point it becomes *vyakta* (manifested). Figure4.3.3 gives a rendering of Kapila, the originator of the *Sānkhya*

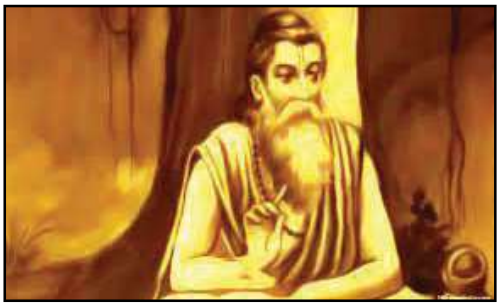


Figure 4.3.3: Kapila, the founder of Sānkhya

Yogaunderscores that *viveka* (discrimination between real and unreal) is needed to realize *sat* or *purusha*(self). To help realize the purusha, *manas* needs to shed the *vr itti* (mental aberrations). Yoga prescribes *ashtanga yoga* (an eight-fold methodology) Figure 4.3.4 gives a rendering of Patanjali, the founder of Yoga philosophy.

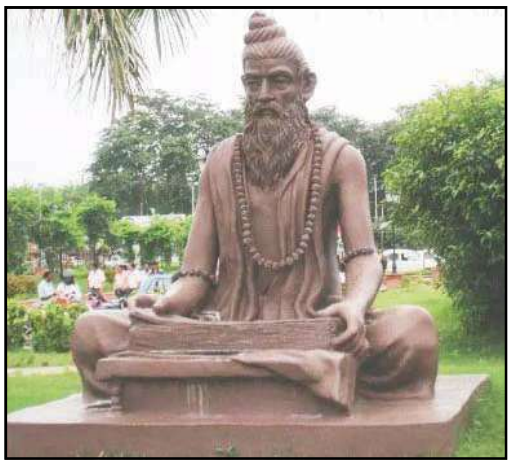


Figure 4.3.4: Patañjali, the founder of Yoga philosophy.

Mimāṃsā accepts the authority of the *Vedas* in the inquiry of meaning of true knowledge. As per Jaimini, Truth can be revealed in multiple ways. These six *pramāṇas* (ways) of valid knowledge include *arthāpatti*(hypothesis) and *anupalabhi* (negation) to the four types of proofs described in *Vaisheshika*. Figure 4.3.5 gives a rendering of Jaimni.

Figure 4.3.5: Jaimni Propounded *Mimānsā*

Vedānta considers *Brahman* as the ultimate reality that pervades everything and is beyond *sat*(real) and *asat*(unreal). Having knowledge of *Brahman* would mean becoming *Brahman. Māyā* (illusion) is responsible for multiple perceptions. The *Vedānta* philosophy is embodied in the *Upanishads*and *Brahmasātras.*Vadarayana Vyasa(Figure 4.3.6) is credited with the philosophy.

Figure 4.3.6 *Vādarāyana,* the author of the Vedanta text *Brahmasūtra*

Several **non-vedic** schools also established their thoughts with rigor during this period.

Lokāyatavādais a materialistic philosophy that accepts *pratyaskhapramāṇa* or direct perception as the only basis of right knowledge. The *pratyaskhapramāṇa* line of thought states that the *svabhāva* (nature) is all pervading and events occur *yadrachiya*(by chance), as opposed to having a higher power controlling them. Since death is the eventuality, penances, sacrifices, and asceticism do not help in any way.

Jainaphilosophy brought in the concept that an individual is accountable for their *karma* (actions) by undergoing atonement for unrighteous actions, and that s*anchita* (accumulated) *karma* is what drives the cycles of birth and death. Periodic teachers drive the philosophy. The latest was Mahavira (Figure 4.3.7) in 6th century BCE.

Buddhism proposed a middle ground between the extreme austerity of Jainism and *Vedic* rituals for liberation of the soul. *It*taught that everything in the universe is transitory, including pleasure and pain. V*āsanās* (desires) lead to bondage. To achieve the goal of *nirvāṇa*(liberation from bondage) an individual must follow an eightfold path. Buddha (Figure 4.3.8) became very popular.

Figure 4.3.7: Mahāvir – 24thJainaTirthankar

Figure 4.3.8: Gautama Buddha

Religion:

V*edic* rituals were a part of daily life for the vedic people. *Dhārmic (religious)* rituals were performed for the fulfillment of *artha*(prosperity), *kāma* (desires) and *moksha* (liberation). Non-*vedic* people had religious beliefs connected to nature. Idol worship began around the time of Buddha. A statue of Buddha might be the first anthropomorphic symbol of divinity. Stone worship was popular in the south. Naturally formed objects "*linga*" (symbol for Shiva) were worshipped. While *Vedic* rituals were performed in open air, Buddhists and Jainas constructed rock cutcaves for residence and meditation. Buddha Viharas (monasteries) were built, many of which were converted to Hindu temples in later years. Artistic iconography of the Vedic deities had developed by around 3rd century BCE. Earlier motifs of religious scenes and depiction of auspicious events were gradually replaced by anthropomorphic deities, believed to be of divine origin. Excellent iconography continues to be unearthed.

Many religious events were converted to become large-scale social celebrations with festivities, food, music, and dance. All parts of society participated in these events and contributed their skills and expertise. There was overall religious harmony in the country.

References:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/classical-period/philosophy-and-religion

Authored by: Dr. Satyendra Sharma for India Discovery Center (IDC)

4.4 Philosophy and Religion: India Golden Period (200 BCE – 500 CE)

Dr. Satyendra Sharma

The period witnessed a serious debate on Vedic authority. *Sānkhya* dominated and championed the concept of freedom of action. Other analytic models developed further.

Philosophy

As per *Sānkhya*, *prakṛti* with its three *guṇas* (qualities) - *satva, rajas* and *tamas* - is responsible for the actions of an individual. Multiple views of the object of knowledge result. It depends on the perceiver, who is under the influence of the three *guṇas*. *Purusha,* the passive, unchanging and eternal spectator, is not affected by the *gunas.*

Vaisheshika puts the burden of good and bad experiences, which are otherwise not explainable by substances, qualities and actions, on the *adṛṣṭa* (unseen).

Lokāyatas would not agree to the existence of any higher power to explain life events, since direct perception was believed to be complete..

Jainas hold individuals responsible for their own actions and prescribe progressively severe atonement measures for bad actions. This led to inaction, for fear of committing sinful actions. A technical term "*Karma"* evolved as a repository of life's activities for the migration of the *jīva* "soul" to different regions of the universe as per their *karma.*

In the *Bhagvdvadgitā* (Figure 4.4.1), Krishna extended *Sānkhya* philosophy by proposing the concept of desireless action. According to Krishna, a true *sanyāsin* (renunciate) is one who rejects actions by observing *karma-saṇyāsa.* A *tyāgī*, on the other hand, is one who renounces the fruits of his actions altogether. According to Krishna, unattached performance of actions leads to *mokṣha* (liberation).

Figure 4.4.1: Palm leaf manuscript of *Bhagvadgitā* text.

The *Yogasūtra* of Patañjali established the science of mind control by following *aṣṭāṅga* (eight-fold path) *yoga* methodology. It helps a practitioner to transcend from individual identity to full cosmic realization. The *Yogic practice* enables an individual to go beyond consciousness of the physical body by getting rid of the collection of memories that bind the mind to the body.

Buddhism enunciated a golden mean between the *Vedic* ritualism to achieve *dharma*, *artha*, *kāma* and *moksha* and the extreme self-renunciation of *Jainism*. *Buddhism* allowed room for error in achieving this goal through *samyak* (appropriate) action.

The theory of *pratityasamutpāda* (dependent origination) was created as a derivative of Buddha's teachings. It is based on a process of perpetual changes that have direct or indirect causes. A realized person perceives this dependent origination.

The mid-to-late Golden period witnessed

developments in *Buddhist* thought, with the advent of the *mādhyamikā* (middle way) school of thought, propounded by Nagarjuna (Figure 4.4.2). This school takes a middle path between the two extremes – eternal existence of the essence that makes up all existence and the essence of the extinguished post-existence. As per Nagarjuna, all existence is *śūnya*(void) of any inherent nature: when the candle wick gets extinguished, the light is non-existent. The state of *Nirvāna* (liberation) can be achieved by extricating oneself from the realm of existence and realizing *śūnya*.

Figure 4.4.2: Nagarjuna

The Buddhist *saṁgha* (like-minded) model gave rise to social and professional guilds that operated as economic units in the society.

Religion

Temple worship as practiced in modern India had its origin during the Golden period. *Viṣṇu* (Figure 4.4.3) and *Śiva* were the preferred deities in the north and south. Old, naturally formed pillar-like formations were worshipped as a fertility symbol *liṅga* (phallus). Caves were carved to create the abode of religious symbols. Temples to Śiva (figure 4.4.4) propped up all around the country.

Figure 4.4.3: The bronze statue of Vishnu

Figure 4.4.4: Shiva temple, Thane, India

Figure 4.4.5:Buddhist stupa at Sanchi

Buddhist stupas (Figure 4.4.5) were also popular throughout the country.

Massive river-based religious festivals were popular. Congregations occasionally lasted for several weeks. The observance of the festivals had a strong astronomical input. Social intercourse included recitations, discourses, musical as well as dramatic presentations. Religious observances entered daily living, and into professional practice. Scriptures like the *dharmashāstra* and *manusmṛti* were followed to create protocols of daily living.

Mendicants and monastics helped to educate people on religious principles and to propagate religious ideas. Religious texts were scribed and copied, as large-scale monastic endeavors. Jaina (Figure 4.4.6) and Buddhist (Figure 4.4.7) manuscripts proliferated. Scriptures of modern Hinduism were formally documented during this period.

Different religions coexisted peacefully. *Buddhism* was the state religion for the most part. Austere Jainism did propagate to the south. Various grass root practices and belief systems among the people were integrated to create the foundation of modern Hinduism. Sectarian integration led to the social institution of "caste," which became a family-oriented privilege.

Figure 4.4.6: – Jaina manu script, palm leaf

Figure 4.4.7: Buddhist scriptural manuscripts, wood block print on parchment.

References:

IDC Seminar Presentation (2018 May) at:

https://www.indiadiscoverycenter.org/seminars/golden-period/philosophy-and-religion

Authored by: Dr. Satyendra Sharma for India Discovery Center (IDC)

4.5 Philosophy and Religion: India Hindu Period (500 CE - 1500 CE)

Dr. Satyendra Sharma

Figure 4.5.1: ***Varāha*** (the Wild Boar) ***Avatāra*** (incarnation) of ***Vishnu***

Theology entered into philosophy with the interpretation of *avatāras* (incarnations) as personified gods (Figure 4.5.1). Buddhism underwent a similar evolution with the personification of deities, pivoting towards anthropomorphic forms to represent the *Buddha.* Idea of reincarnation of Buddha as *bodhisattvas* proliferated. Islam and Christianity made their way into India via foreign invasion and trade, respectively. Meanwhile, the *Tantra shāstra*–a study in functions in human body, evolved as a separate path to create the material cosmology of evolution with macrocosm (physical universe) reflecting in the microcosm (individual).

Philosophy

The need for an avatāra possibly arose as the result of the inability of classical philosophy to explain birth and death (Figure 4.5.2). Anthropomorphism likely entered the post-*Bhagavadgītā*period (4th century), with Krishna being identified as the *purus a*of *Sāṇkhya*(refer to the Golden Period in this series).

Figure 4.5.2: Anthropomorphism – *Navagrahas* (personification of the nine planets)

Tantra evolved into a religious discipline. The belief was that the body is a microcosm of the universe (Figure 4.5.3), and that the elements that form the body are associated with the environment or *prakr ti.* The symbolic representation of the creative force in the universe was called a *yantra*.

Figure 4.5.3: Yantra – A Tantra Symbol

The medicinal sciences in *Charakasamhitā*and *Sushrutasamhitā* had their origins in *Tantra*. The *Shavasādhana,*the use of a human corpse for meditation, was in actuality the study of human anatomy. The female principal Shakti was hypothesized to be the doer of activities in the world (Figure 4.5.4).

Figure 4.5.4: *Kali* or *Shakti* – the female principle in *Tantra*

The later Hindu period witnessed a re-introduction of *Upaniṣadic* philosophy, with multiple interpretations by various *bhāśhyakāras* or commentators. Among them, notables were Gauḍapāda (6th Century), Shaṅkara (8th century), Rāmānuja (11th century), Nimbārka (12th century) and Mādhva (13th century). Gauḍapāda (Figure 4.5.5) proposed the doctrine of *ajātivāda,* or oneness of the Bahmanand the unrealness of the phenomenal world.

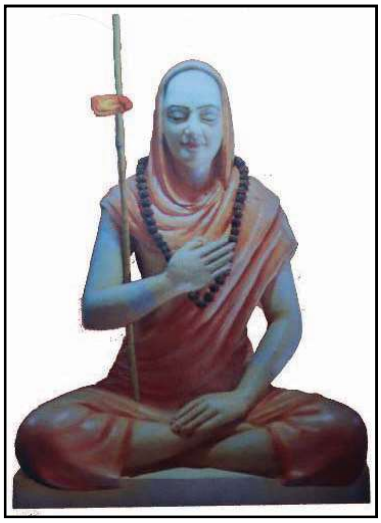


Figure 4.5.5: Gaudapādācharya, the Vedic reformer

Shankaracharya (Figure 4.5.6) modified this doctrine by proposing that the *jīva* - or individual soul - is not able to realize its true nature of being one with the Brahman because of the superimposition of *Māyā*(phenomenal world). Brahman is impersonal, formless, attribute-less and unchanging. The *jīva* attains liberation once it realizes the *Brahman* by overcoming the illusion of *Māyā*.

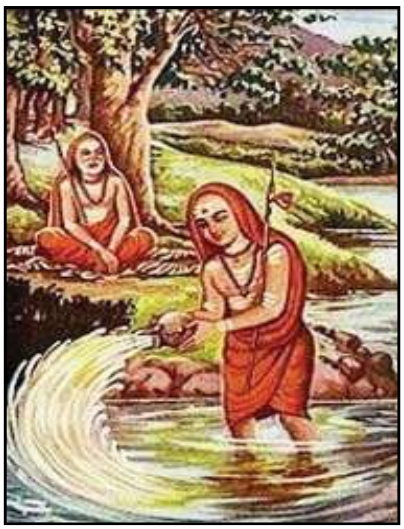


Figure 4.5.6: Shankarāchārya, the Monist

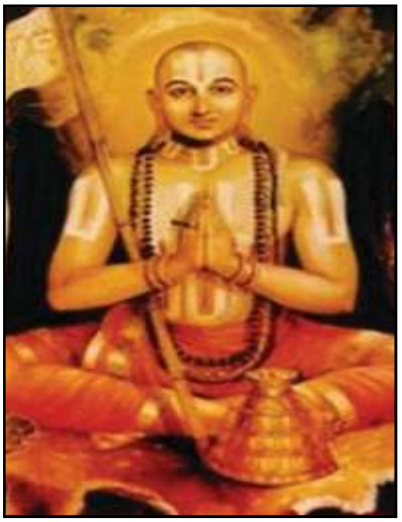


Figure 4.5.7: Rāmānujāchārya, the Qualified Monist

The qualified monism of Rāmānujacharya (Figure 4.5.7) proposed the existence of a supreme reality or a personal God or Brahman, described by Satchitananda (*sat* or everlasting truth, *çit* or consciousness, and *ānanda* or blissfulness). The Qualified Monism teaches that the Supreme Reality remains separate from the individual soul because of *avidyā* or ignorance, and that the soul can be liberated through *bhakti*(devotion). Nimbārkacharya's (Figure 4.5.8) dualistic non-dualism was based on the concept of a three-fold reality: God, soul and matter. *Dvaitādvaita* considered God as immanent in all beings, but having an identity distinct from that of the humans.

Figure 4.5.8: Nimbārkāchārya, Dualistic non-dualist

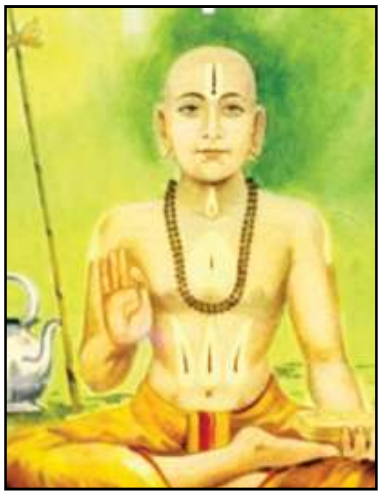


Figure 4.5.9: Madhvāchārya, the Dualist

Madhvāchārya's (Figure 4.5.9) *dvaitavāda* or dualistic dualism differentiated between Brahman, *jīva* and *ajiva.Jīva* and *ajīva* were considered to be *paratantra* or having a dependent existence, but could not survive without Brahman. Any attempt to unify *ātman* with *Brahman* undermines the supremacy of the latter. Liberation is achieved by worshipping Vishnu who is the *Brahman* incarnate.

While the above *achārāyas* used Sanskrit for their *bhāṣyas* or commentaries, a significant contribution to philosophy during this period was made by Jñāneshwara (13th century) in the Marathi language (Figure 4.5.10). To explain the nature of Brahman,he reconciled Gauḍapāda's *ajātivāda*, Shaṅkaracharya's *māyāvāda* and his own *Sphurtivāda* or spontaneous manifestation of Brahman in his *Jñāneshwari*(a commentary on the *Bhagavadgītā*). He declared that creation is a manifestation and a Ṣidvilāsa or a sport of Brahman. Nothing else but Brahman exists.

Figure 4.5.10: Jñāneshwar, the Marathi saint of 13th century

Figure 4.5.11: Bodhisattvas

Mahāyāna Buddhism states that perceived reality is a mental construct, and that the mind makes external objects appear real. The objects and their states have dependent origination where everything that exists has a prior cause, while the state of *Nirvāṇa* has

an independent origination. Thus, the *Bodhisattva* (Figure 4.5.11) or Buddhahood is a state where the seeker has realized the path to *Nirvāṇa* and helps other seekers to get to achieve this path, before attaining his own *Nirvāna*.

Religion

The theological interpretation of classical philosophy led to the advent of multiple sects, paths and cults. And the anthropomorphic representation of divine powers was extended to create places of worship and pilgrimage. A sample is given in Figure4.5.12.

Figure 4.5.12: Wall carvings at a Temple at Kiradu, Rajasthan

Local rulers attempted to achieve divine status by tracing back their lineage to the gods in the scriptures. This anthropomorphism was also observed in *Buddhism* and *Jainism*. Jainas worshipped *thirthankaras* (spiritual teachers). Many places of pilgrimage with statues of the *thirthankaras* developed over this period (Figure 4.5.13). Similarly, following the *Mahāyāna* doctrine of *Bodhisattvas,* places of pilgrimage were developed with human figures representing *Bodhisattavas*.

Figure 4.5.13: Gomateshwar, Karnataka

Islam came to India via trade and invasion. Hindu and Buddhist idols. and their places of worship came under attack by the Islamic rulers. Islam believed that only God has authority to create human forms. Sufism, brought to India by Turkish and Persian scholars, had similarity with *Advaita,* where self-realization is achieved by removing the veils of ignorance. Likewise, Christianity was introduced in India primarily via trade, although a nascent group of Christians existed in Southern India as early as the first century CE.

References:

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4.6 Philosophy and Religion: India Mughal-Maratha Period (1500 CE - 1800 CE)

Dr. Satyendra Sharma

The Mughal-MarathaPeriod was marred by widespread economic subjugation along religious lines. Imposition of the Islamic faith through laws, taxation and conversions eroded freedom of expression. Saints and poets brought hope to the oppressed masses. Devotional service and surrender to God turned out to be the only solace.

Systematic destruction, plundering, and desecration of the temples continued. *Śaiva*and *Vaiśṇava* schools argued different theories about a personal versus impersonal God. This helplessness and instability led to the decline of "*Vedānta* teachings". They were replaced by the worship of the "savior" deities.

A few of the major personalities of this Period are described below.

Kabir (1440AD-1518AD) (Figure 4.6.1) was the most influential reformer. His compositions were influenced by Islam as well as Hinduism. With devotion to *Saguṇa*, a personal God, he preached the realization of the *nirguṇa, the* impersonal.

Figure 4.6.1: Kabir, the mystic poet

Ravidas (1450AD–1520AD) (Figure 4.6.2) preached in Punjab. He believed in monotheism, and strongly opposed idolatry. His preached equality of men. Ravidas deeply influenced Nanak, the founder of the Sikh religion (see below).

Figure 4.6.2:Ravidas, the saint from Punjab.

Dadu (1544AD-1603AD) (Figure 4.6.3) was another north Indian poet, who preached against the sectarian biases and taught that God is *Nipakh,* one without any bias.

Figure 4.6.3: Dadu, the north Indian poet

Vallabha (1479 AD –1531 AD) (Figure 4.6.4) originated from South India, and became an influential preacher. He propounded *Śuddhādvaita*, or pure monism, in which Krishna is both *sākāra* (personal) and *nirākāra* (impersonal) *Brahman*. The creation is the personal aspect of Krishna, and his

grace could be achieved through love and devotion to him. Vallabha's path is known as *Pushtimārga* which means path of nourishment (*pushti*) of the individual soul through divine love.

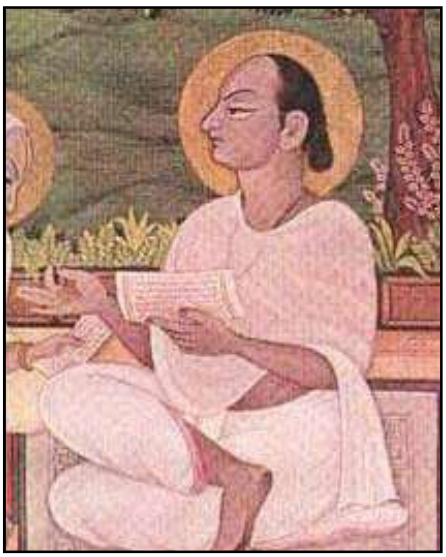

Figure 4.6.4: Vallabhacharya, the propounder of Pushtimarga.

Chaitanya (1479AD–1531AD) (Figure 4.6.5) propounded *AchintyaBhedābhedavāda,* or an inconceivable oneness and difference, wherein *Brahman* is simultaneously one with and different from his own creation yet has an overall control over it.

Figure 4.6.5: Chaitanya, reformed the Krishna movement

Surdas (1483 AD–1584 AD) (Figure 4.6.6) considered Krishna as the creator of the universe and the primordial human being. Surdas's verses are popular poetry in Hindi literature to this day. Meerabai (1498 AD-1547 AD) (Figure 4.6.7) preached total immersion and believed that liberation could be achieved by having a personal loving relationship with Lord Krishna.

Figure 4.6.6: Surdas, popular poet

Figure 4.6.7: Meerabai, princess turned poet

Narsinh Mehta (1414 AD – 1503 AD) (Figure 4.6.8) was from Gujarat and was also a Krishna devotee. He believed that God has many names, but there is only one universal God.

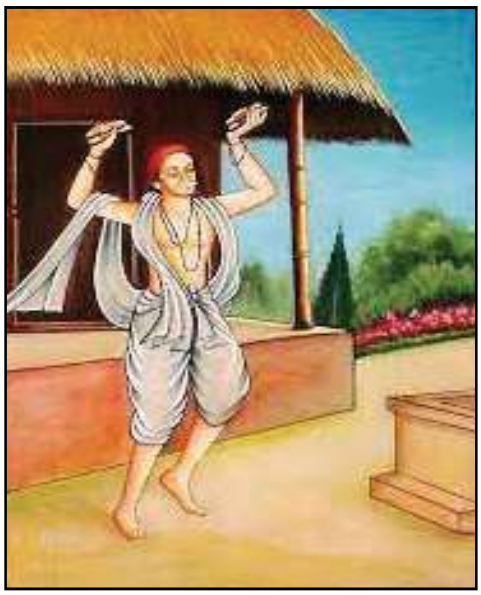

Figure 4.6.8: Narsinh Mehta, popular Gujarati poet

Tulasidas (Figure 4.6.9) (see Language and Literature track) retold the epic *Rāmāyana* in the *Awadhi* dialect, as "Sri RamacharitaManasa". He preached the message that the un-manifest God gets manifested for his devotees through incarnations such as Rama.

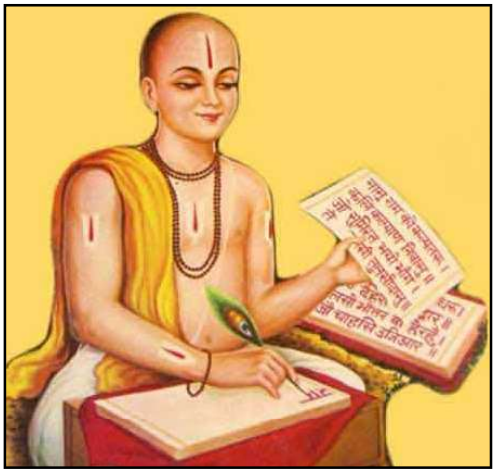

Figure 4.6.9: Tulasidas, the author of popular

SriRamacharitamanasa

Rahim (1556 AD-1627 AD) (Figure 4.6.10) was a minister in Akbar's court. A prolific poet, his writings are instructional through their universality. As per him, the world is in a perpetual flux leading us towards death. The only way to realize God is through contemplation on the nature of flux.

Figure 4.6.10: Rahim, The Islamic poet

Eknath (1533 AD–1599 AD) (Figure 4.6.11), a *Vārakari*poet ofMaharashtra, believed in equality, forgiveness, compassion, and peace. For him, devotion to God was to recognize the divine nature of all, while forgetting God was to be trapped in the illusion of self.

Figure 4.6.11: Eknath, Varakari Marathi poet

SamarthRamdas (1608 AD–1681 AD) (Figure 4.6.12) was a poet and saint during Shivaji's regime. He composed spiritual literature that combined moral conduct with devotion, e.g.: *Dasabodha* and *Manache Shlokas* (verses addressed to the mind).

Figure 4.6.12: Ramdas, teacher of Shivaji

Srinivas Nayaka or Purandaradasa (1484 AD – 1564 AD) (Figure 4.6.13) was in the court of Krishnadevaraya of Vijayanagara. He was influenced by the *dvaitavāda* of Madhva, wherein the individual self reflects the universal self.

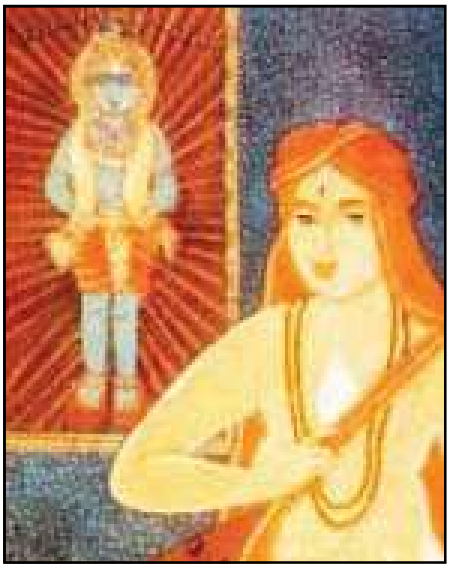

Figure 4.6.13: Purandaradasa, the Kanataki poet

Nanak (1469 AD–1539 AD) (Figure 4.6.14) believed in the oneness of God, and equality among many schools of thought. He viewed *prakṛti*as the *lilā*(or sport) of the all-pervading Reality, *Brahman,* who can be known through *Mūla*(root) *Mantra*. *Brahman* being *Ek Omkāra,* is both *nirgun a* and *sagu n a*. The *guru* (orspiritual teacher) is a guide to the *sikh*(or disciple), rather than an incarnation of God. This is the essential part of Sikhism.

Figure 4.6.14: Guru Nanak and the Sikh Gurus

Sufism influenced the religious beliefs of this Period. Bullhe Shah (1680 AD–1757 AD) (Figure 4.6.15) was a prominent Sufi poet and saint, and championed universality and unity of Being. He exhorted people to respect different ideologies and creeds.

Figure 4.6.15: Bulhe Shah, the Sufi poet

References:

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4.7 Philosophy and Religion: India British Period (1800 CE-1947 CE)

Dr. Satyendra Sharma

Multiple accounts of Western travelers to India during the late Mughal-Maratha period suggest a remarkable tolerance between the various religious sects as they lived their daily life.[1]Over all, the British period saw the deterioration of Indian society through social and religious divisions. Aslow reconstruction by new Indian thought leaders began in the nineteenth century. It culminated in the liberation of India in 1947CE.

Fissures in the society of 18th century India occurred mostly through urbanization. Industrialization forced the creation of a service classto do the menial jobs of cleaning toilets and disposing the dead. British Period taxation caused massive landlessness. Migration to urban centers in search of livelihood followed. The new menial class was looked down upon,asocially outcast class evolved.

Voluminous literature was created in Germany by invoking the existence of a mythical race in India, based on evidence of warriors in the epic Mahabharata[2]. Adolf Holtzmann (1810 CE – 1870 CE) and others tried to interpretthe *Mahābhārata* and *Bhagvadgītā* to promote this hypothesis, constructing the Aryan race model in north India.The artificial north-south divide constructed in the country continues to this day as a major fissure in Indian society.

The British used these divisions for their army recruitment policies,by selecting people from the so-called "martial races," and creating units with names coined after the names of these races. Army recruitment was a vehicle through which the British aimed to inculcate Western customs and beliefs in colonial India. However, this had an adverse effect, and resulted in the Sepoy Revolt of 1857 (Figure 4.7.1), considered to be the beginning of India's awakening.

Figure 4.7.1: Artist's rendering of the Sepoy Mutiny of 1857 CE

V.P.S. Raguvanshi, Religious life in India at the Advent of British Rule, Proceedings of the Indian History Congress, Vol. 23, Part - II (1960), pp. 100-107

[2]Vishwa Alduri and Joydeep Bagchee, The Nay Science, Oxford University Press, 2014, pp-490.

Hindus adopted orthodox beliefs to escape oppression. Uncertainties in life, starvation, and constant frightledto superstitions. The ritual of *sati*, untouchability, child marriage, idolatryand subjugation of women proliferated in the name of purification. However, the spread of English education did bring Indian intellectuals in touch with western liberalism.[3][4]

Figure 4.7.2: Raja Ram Mohan Roy, the reformer

[3]Cameron Freeman, Christianity in British Colonial India and the Crystallization of Modern Hindu Religious Identities (https://camronfreeman.com/socio-cultural-anthropology/)

[4]Kumar, Sunil. Contribution of Western Culture in Nationalism of India, International Journal of History and Cultural Studies, Volume 3, Issue 4, PP 22-25, 2017.

[5]Sivanath Sastri, History of the Brahmo Samaj, Sadharan Brahmo Samaj, pp 663, 1974 (second edition)

A religious movement was initiated by Raja Ram Mohan Roy (Figure 4.7.2), a local leader in Bengal. Titled the "Brahmo Samaj", the aim of this movement was to reform the socio-religious landscape of Hinduism, by rejecting idolatry and rituals. A unitarian approach of belief in one supreme *brahman* was the key.[5]

Figure 4.7.3: Swami Dayanand Saraswati, reformer of modern Hinduism

The Hindu monk Swami Dayananda Saraswati (Figure 4.7.3) developed Arya Samaj in Punjab, whereby idolatry and the multitude of rituals were rejected, and the authority of the *Vedas* and Vedic prescriptions were stressed. His monthly journal Satyartha Prakash became popular.[6]

Figure 4.7.4: Ramakrishna Paramahansa, the mystic saint from Bengal.

[6]Lajpat Rai, Arya Samaj, Longmans, Green and CO., pp352, 1915.

Ramakrishna Paramahansa (1836CE-1886CE), a Hindu priest in Bengal, claimed God-realization is possible through loving God within one's own belief system.He preached religious harmony, with respect for all beliefs (Figure 4.7.4).

Figure 4.7.5: Swami Vivekananda, propagated Vedantic thoughts in the west.

[7]Swami Nikhilanada, Swami Vivekananda A Biography, Ramakrishna-Vivekananda Center, New York, pp 232, 1953

His disciple Narendranath Datta (1863CE-1903CE) traveled the world as a monk, using his new name "Swami Vivekananda" (Figure 4.7.5). Swami Vivekananda became an icon for Indian nationalist revival.[7]

Figure 4.7.6: Sri Aurobindo Ghose, the mystic and prolific scholar.

Sri Aurobindo Ghose (1872 CE- 1950 CE, Figure 4.7.6) was trained in England, and qualified as a British administrative officer. He then became a revolutionary, and evaded British capture. In French-occupied Pondicherry in South India, he contemplated the rebirth of a more powerful India. His teachings on Integral Yoga have a world-wide following.

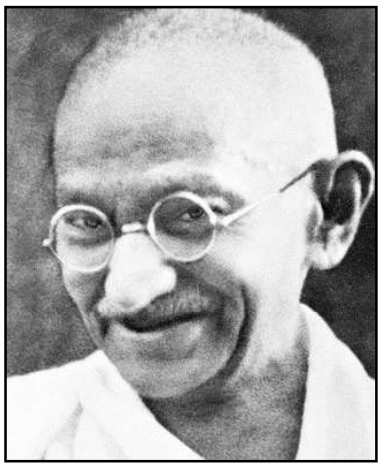


Figure 4.7.7: Mahatma Gandhi

[8]Ranade, R.D, Spiritual Awakening in Gandhi and other Indian Saints, Sarva Seva Sangha-Prakashan, Rajghat, Varanasi, India, 2003, pp 207

[9]Rolland, Romain, Mahatma Gandhi the man who became one with the universal being, , Publication Division, IB Ministry, India, pp 126, 1924

Mahatma Gandhi (1869 CE – 1948 CE (Figure 4.7.7) developed his socio-religious ideas and political philosophy during his political struggles in South Africa. *Satya* (Truth) and *Ahimsā* (non-violence) arethe two main pillars of Gandhian thought. He believed that Truth is God, with morals and a code of conduct as its basis. All life has one divine origin, and thus violence towards others is violence on one's own self. He made the spinning wheel "*Charkhā*"into a symbol of passive resistance, economic freedom and moral virtues.[8][9]

The Hindu Mahasabha was founded in 1915 to protect the interests of the Hindus in then Indian National Congress (see Tack 6, Economy and Politics). Fear of Hindu domination was exploited by the British to encourage Muslims to adopt a separate political identity for the Indian Muslims. The formation of All India Muslim League, was eventually instrumental in the formation of Pakistan.

References

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/british-period/philosophy-and-religion

Authored by: Dr. Satyendra Sharma for India Discovery Center (IDC)

References: Track 4, Philosophy and Religion

1. Athravaveda Samhita, By Charles Rockwell Lanman, Harvard Oriental Series, 1905.
2. Bhagavadgita as a Philosophy of God-Realization, R.D. Ranade, 1964, Bharatiya Vidya Bhavan, Mumbai, India
3. Bhakti and Bhakti Movement: A new perspective: a study in the history of ideas, by Sharma, Krishna, MunshiramManoharlal, New Delhi, 1987
4. BULLHE SHAH (archive.org)
5. Christianity in British Colonial India and the Crystallization of Modern Hindu Religious Identities, By: Cameron Freeman (https://camronfreeman.com/socio-cultural-anthropology/)
6. Contribution of Western Culture in Nationalism of India, International Journal of History and Cultural Studies, By Kumar, Sunil. Volume 3, Issue 4, PP 22-25, 2017.
7. Four Vedas – English Translation, By R.T. Griffith, A.B. Keith and M. Bloomfield. Internet Archives – Archive.org.
8. Guadapada-Karika, R.D. Karmarkar, 1953, Bhandarkar Oriental Research Institute, Pune, India
9. Hindi Rig Veda - Shakal Samhita, By R.G. Trivedi, Indian Press, Prayaga, 1954
10. History of the Brahmo Samaj, Sadharan Brahmo Samaj, by SivanathSastri, pp 663, 1974 (second edition)
11. History of the Tantrik Religion – An historical, ritualistic and philosophical study, N.N. Bhattarcharya, 2015, Manohar Publishers, New Delhi, India
12. Jainism and Buddhism – Internet Archives (Archive.org)
13. Lajpat Rai, Arya Samaj, Longmans, Green and CO., pp352, 1915.
14. Mahatma Gandhi the man who became one with the universal being, by Rolland, Romain Publication Division, IB Ministry, India, pp 126, 1924
15. Mimamsa Darshanam (Hindi) – Tulasiram Swami, Swami Press, Meerut, 1915
16. Mysticism and Contemporary Philosophy, By: M.L. Sharma, 2019, Academy of Comparative Philosophy and Religion, Belguam, India
17. Mysticism in Maharashtra, By Ranade, R.D, Aryabhushan Press, Poona, 1933
18. Mysticism in Maharshtra, R.D. Ranade, 1933, Aryabhushan Press, Pune, India
19. Outlines of Mahayana Buddhism, By DaisetzTietaro Suzuki, 1907, University of Chicago Press.USA
20. Pathway to God in Hindi Literature, by Ranade, R.D, Adhyatma Vidya Mandir; Allahabad; 1954
21. Pathway to God in Kannada Literature, by Ranade, R.D,
22. Religious life in India at the Advent of British Rule, Proceedings of the Indian History Congress, V.P.S. Raguvanshi, Vol. 23, Part - II (1960), pp. 100-107
23. Samveda – Bhagavati, By Devi Sharma – YugNirman Publications, 2014
24. Spiritual Awakening in Gandhi and other Indian Saints, By Ranade, R.D, Sarva Seva Sangha-Prakashan, Rajghat, Varanasi, India, 2003, pp 207
25. Stanford Encyclopedia of Philosophy - https://plato.stanford.edu/
26. Swami Vivekananda A Biography, by Swami Nikhilanada, Ramakrishna-Vivekananda Center, New York, pp 232, 1953
27. Tattvārthasutra – Vijay K Jain, Vikalpa Printers, Dehardun, 2011,
28. The Nay Science, Vishwa Alduri and JoydeepBagchee, Oxford University Press, 2014, pp-490.

29. The Nyaya Sutras of Gotama –The Sacred Books of Hindus – B.D. Basu, Vijaya Press, 1913

30. The philosophy of Vallabhacharya, By Marfatia, Mrudula I, MunshiramManoharlal, New Delhi, 1967

31. The Sankhya Aphorisms of Kapila – James Ballantyne, Trubner& Co, London, 1885

32. The Vaisheshika Sutras of Kanada - The Sacred Books of Hindus – B.D. Basu, Vijaya Press, 1923

33. Thithankara Mahavir's Life and Philosophy, S.C. Diwakar, 1975, Jain Mitra Mandal, Delhi, India

34. Yajurveda – Bhagavati Devi Sharma – YugNirman Publications, 2014

35. Yoga Sutras of Patanjali with exposition of Vyasa -Pandit Ursharbudh Arya, Pennsylvania ,1986

Internet – Generally Available

1. https://swarajyamag.com/culture/a-vedic-touch-to-logic-in-the-indian-thought - Gautama

2. org – Kanada

3. https://fr.wikipedia.org/wiki/Kapila - Kapila

4. https://yogawithsubhash.com/2021/02/05/ysp-am-intensive-online-0221/ - Patanjali

5. https://www.astroved.com/astropedia/en/gods/jaimini - Jaimini

6. http://www.hindupedia.com/en/Maharshi_Vyasa - Badarayan

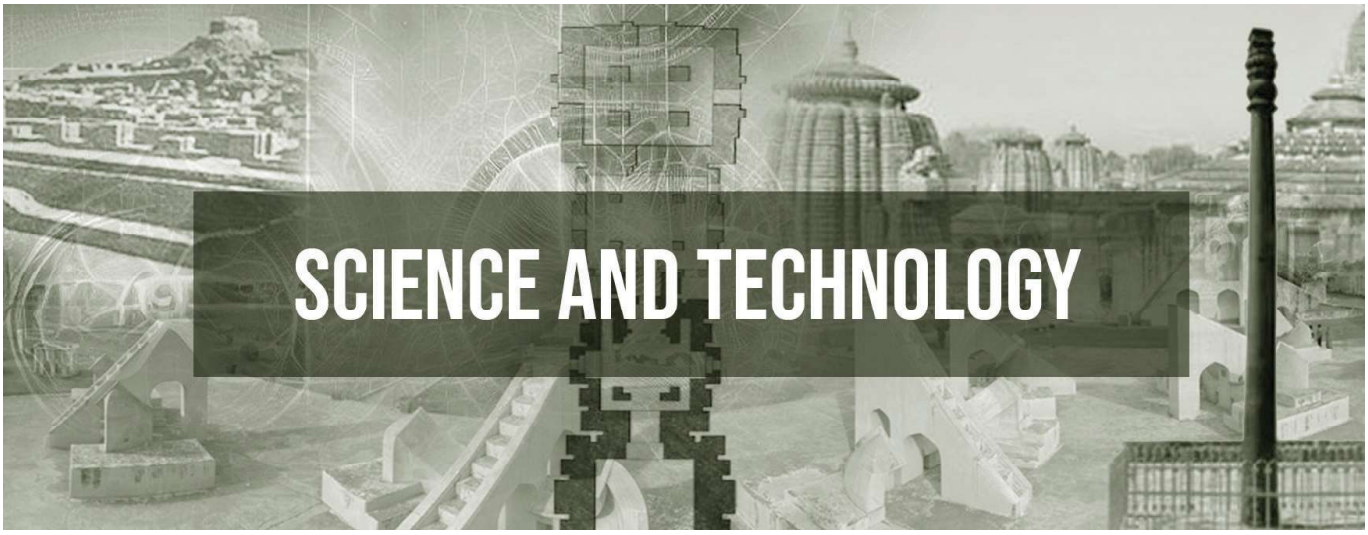
7. https://www.dlshq.org/saints/mahavira.htm-Mahavira

8. https://www.timesnownews.com/ - Buddha

9. https://wellcomecollection.org/

10. Wikipidia.org

11. Vedic Heritage – www.vedicheritage.gov.in



TRACK 5

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5.0 Science and Technology: Introduction

From the early days of human settlement, India has steadily progressed to understand nature and to create tools and technologies for survival and development. Sky-mapping and celestial calculations are among the early innovations in Indian cultural history. The major thrust has been in the life sciences, vegetable products and human speech

While the early man knew how to draw pictures, analytical work started with the Indus valley civilization (3300BCE-2000BCE) with the process of brick-making and town construction. Standardization of bricks and to maintain size is a significant achievement. Granaries, tanks and houses were built. Irrigation and agriculture are noticed. The trade practices used measurements in weights in fractions. Massive amounts of seals indicate factory production. Drilling bones and stone beads with copper tools suggest technological innovation. Traces of fabric and copper toys are discovered. Maritime trade is inferred from the port facilities.

The Vedic period (2000 BCE to 700 BCE), India experienced remarkable advancements in astronomy, language and speech systems, music, health sciences, and mathematics. The Vedic texts revealed insights into the measurement of time, lunar and solar calendars, fire production, phonetics, and pronunciation. Sky-mapping helped create a first order cosmology with a two-tier sky-earth system. Ayurveda, an extensive medical system focusing on herbal medicine, agriculture and botany, took shape. Iron smelting, carpentry, and brick-making technologies improved leading to significant advancements in craftsmanship. Iron tools and weapons show organized use of technology.

Classical period, extending from 700 BCE to 200 BCE, witnessed notable contributions across fields of mathematics, astronomy, grammar and prosody. Indian scientists recognized the mind as distinct from the body. Ayurveda assumed the role of primary healthcare for people. Surgical procedures were formulated and tools were fabricated. Speech production and its impact on mental state and health were studied. Sound therapy with prosody was experimented. Grammarians formulated rules for composing words and phrases with mathematical precision. Astronomy advanced through rigorous celestial observations. The period also witnessed advancements in statecraft, stone carving, pottery, jewelry, textiles, and construction techniques.

The Golden period, spanning 200 BCE to 500 CE, India thrived in mathematics, geometry, metallurgy, construction engineering, dyes, and textiles. Cosmological models based on accurate sky observations were developed reaching their zenith in the 5th century CE with the discovery of the westward rotation of the earth. Rock cut caves and cave paintings mark diligence and sophistication. Musicology, aesthetics, and perception sciences were studied. Ornamentation was applied to objects, art forms and textiles. Metallurgical advancements includedalloy making and rust-freeiron production. Maritime navigation and trade flourished.

The Hindu period (500 CE to 1500 CE) was marked by progress in mathematics, health sciences, art, sculpture, construction, weaving, and coloring techniques. India excelled in accurate sky observations and the development of asymptotic methods for solving equations. The scholars studied the psychophysics of sound as a musical tool. Music was coded. Ayurveda continued to evolve. Persian and Arabic influences were incorporated. Mathematical texts were translated into Arabic. Metallurgical innovations facilitated the construction of religious shrines and the production of commercial boats. Aesthetics extended to various aspects of life, including taste, conduct, food, and dress. Mathematical inventions and advancements in architecture, textiles, and metallurgy characterized the period.

The Mughal-Maratha period (1500 CE to 1800 CE) witnessed further contributions in mathematics, astronomy, medicine, agriculture, music, and construction engineering. The Kerala School of Mathematics and Astronomy made notable mathematical inventions on infinite series that preceded Newton's work on differential calculus. Astronomical observatories were constructed

enabling accurate planetary position calculations. The Ayurvedic system integrated Persian and Arabic methods. Crop hybridization and irrigation techniques were developed. Monumental construction projects were undertaken. Industrial production flourished.

Finally, the period of British rule in India from 1800 CE to 1947 CE marked a significant transition in scientific pursuits. British personnel conducted surveys and studies across various disciplines like botany, zoology and land. Railroads were constructed and port facilities were expanded. The British tried to suppress native education and the language training suffered. Institutions of scientific research were organized privately by native Indians helping to win a Nobel Prize in Physics. Indians excelled in mathematical sciences and chemical Physics. The discipline of modern Statistics originated from India.

5.1 Science and Technology: India Prehistory and Indus Period (7000BCE-2000BCE)

Dr. Bijoy Misra

Agriculture and irrigation represent some of the early traces of technological innovation in India. Stone tools found in Bhimbetka suggest that the Neolithic cave dwellers were adept in mechanical skills and had likely developed knowledge of high-heat smelting. Pendant-like copper sheets suggest the use of metals, and pottery shards indicate the use of utensils in cooking and food storage. Early traces of grain have been discovered at Mehrgarh in modern Pakistan, and are dated to about7000 BCE. Rice farming can be traced to the Eastern highlands in the Sind area from the prehistoric period

The urban settlements found in the valleys of twin rivers Indus and Saraswati are together believed to have evolved around 5000 BCE and continued until 2000 BCE. Excavations indicate the use of town-planning, roads, housing, granaries, baths and underground sewerage systems (Figure 5.1.1).

Figure 5.1.1 Mohen-jo-daro, the excavated town in Pakistan

The manufacture of standard-sized bricks and their use in construction count as significant achievements in world history,while use of measurements and sizing point to knowledge of counting and number systems. A system of wide roads possibly enabled wheeled transports to ply, but we don't have any record of such vehicles.

Settlers in this area were agriculturists and traders. They collected rainwater through an extensive reservoir system, which also reflected a major innovation. The use of granaries and production centers is indicated as also of sturdy sacks, which likely helped the export of grain to faraway lands. We can infer that the people had some knowledge of weaving to create sacks as well as textiles. The extent of cultural development is documented by the Indus seals. An engraved terracotta token was apparently used to tag the sacks, and the seal showing a priest-like person (see Track IV, Philosophy and Religion) suggests the use of textile garments. Cotton cultivation had likely already started.

Figure 5.1,2 Terracotta tablet from Mohenjodaro

Figure 5.1.3 Port facilities at Lothal

Evidence also suggests that Indus traders engineered boat making (Figure 5.1.2) and were able to construct port facilities (Figure 5.1.3**).**

Figure 5.1.4 Unprocessed shell s from Glo Dara, Rann of Kutch

Port ruins have been discovered in Lothal in the modern state of Gujarat, India – the port may have allowed inland river traffic as well as marine traffic through the coastal sea. Copper and gold were likely among the items that were imported, and beads and ornaments were among the exported goods. Engineering tools for fabrication have also been discovered and production centers in various towns have been unearthed (Figure 5.1.4)

Figure 5.1.5 Glass, stone and bone beads from Harappa

Manufacture of glass and bone beads was a part of the industrial preoccupation of the time, and clearly the technology for producing glass from silica was known. Bone beads were made from animal bones cut to size (Figure 5.1.5). Stringing beads by fiber ropes seems to have been a household practice. Steatite (soapstone) was used to make larger beads. Metal inlay had been developed as an art, and gold dust-coated beads as well as gold jewelry have been discovered in Harappa (Figure 5.1.6).

The discovery of a copper statue of a bull, and of an ornamented woman (Please see Track II, Art and Culture) indicate a fair amount of use of copper and lost wax technology. Holed terracotta bird-shaped hollow toy-like objects appear to be bird-whistles. Holes in barrels of bones could indicate flute-like musical instruments.

Health and sanitation were among the important public health concerns involved in town planning. Pit latrines, sewerage drains and underground sewer disposal were integral parts of construction (Figure 5.1.7).

Figure 5.1.6 Gold and bead ornaments from Harappa

Figure 5.1.7 Sanitation and waste water disposal

Bath houses. and liberal use as well as disposal of water, were carefully planned, although the civilization later suffered due to water scarcity caused by climate change and shifting river beds. There are hints of an observatory for astronomical and weather observations (Figure 5.1.8**).**

The entire region was deserted by about 1700BCE.

Figure 5.1.8 Observatory, Mohenjodaro

References:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/pre-history-and-indus-period/science-and-technology

Authored by: Dr. Krishna Gazulafor India Discovery Center (IDC)

5.2 Science and Technology: India Vedic Period (2000 BCE - 700 BCE)

Dr. Bijoy Misra

The Vedas describe sophisticated scientific concepts in astronomy, language and speech system, music, health sciences and mathematics.

The sky was defined as a two-layred system: a lower layer containing the atmosphere, and an upper layer containing the stars and other luminous objects. The material universe comprised six elements: the first was "sky", which gave rise to "air", "air" gave rise to "fire", "fire" gave rise to "water", "water" gave rise to "vegetation", and "vegetation" produced "food." The human was made out of "food".

Various time measurement techniques such as water clocks, shadows, and solar elevation angles were used to fix various celestial conjunctions.. Books on astronomy and geometry were compiled. The decimal numbers were in use. The lunar orbit was measured by association with twenty-seven stars (nakshatra's), making out a "lunar month".

The production of fire was considered mystical. The flames were viewed as animated. Animation was assumed to be a natural property of all objects, whether in motion or steady. This animation principle was transformed to the scientific notion that each object had a vibration, resulting in an "expressive voice" (Vak). Exploration of this voice and its simulations became the basis of the Vedic science. The concept of hymnal poetry was built in terms of communicating to the desired object through rhythm, syllables and intonation. Speech formation was postulated to be made in four steps: origination, visualization, phonation and articulation. Phonetics and pronunciation became a new science (Figure 5.2.1).

Musical instruments such as the plucked lute (veena) (Figure 5.2.2) were made. It helped to extend the range of human octaves. Made out of hollowed out hardwood, these instruments were played by women to support Vedic recitations. Drums, flutes, conches and cymbals were added to create the rhythm. Complete immersion in expression produced therapeutic mantras.

Figure 5.2.1: A modern recitation of the Vedic hymns in a fire ritual. Unison of pitch is considered to be a necessity.

Figure 5.2.2: A modern version of the traditional Veena instrument (Wikipedia)

Healing through chanting mantras became an important aspect of the technology of Ayurveda, the science of health. Ayurveda involved the discovery of healing herbs. It experimented on how to apply them. Agriculture and botany became part of science. Juice extraction, drying and grinding, paste-making and distilling were widely used (Figure 5.2.3). Scholarly books on health and nutrition were produced. Sage Sushruta compiled a book on surgical procedures during the late Vedic Period

The period saw the advent of iron use in the Indian subcontinent. Iron smelting needed higher temperatures. It was achieved by specially created blow ovens that allowed the slag to flow out. By adding carbon in the form of leaves and twigs iron could be hardened. It was then made into sharp-edged instruments and weapons. Carpentry advanced. The Rg Veda mentions cities "made of iron" (RV VII.15.14). Well-designed wooden utensils and

kitchen tools continue to be used to date, as relics of Vedic period technology.

Figure 5.2.3: An artist's rendering of a Vedic Ayurveda laboratory around 1000 BCE

Brick-making technology was improved, to create bricks of various geometries, which were assembled to create mythical designs for rituals (Figure 5.2.4).

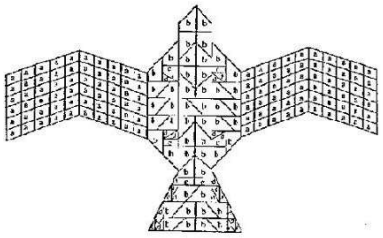

Figure 5.2.4: Brick design graphics of the altar of the mythical Agnichayana fire ritual.

The ritual altars gradually became more sophisticated, with pillars, potteries, textile coverings accompanied with various types of food preparations. Mixing iron in clay enabled the mark of intense colors on the potteries. However, unlike the pottery from the Indus period, no pottery from this period has yet been found with script engraved on it (Figure 5.2.5).

Figure 5.2.5: Excavated pottery products from the Vedic era (from the book by Upinder Singh

Figure 5.2.6: Two solid copper statues excavated in north India (from the book by Upinder Singh)

Several specimens have been discovered (Figure 5.2.6) that exemplify the use of wax technology to create life-like solid copper objects. Chariots with three wheels are referred to in the Rg Veda (I. 183.1), which also references maritime travel (RV X.56.5).

Reference:

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5.3 Science and Technology: India Classical Period (700 BCE – 200 BCE)

Dr. Bijoy Misra

The principal contribution of Indian scientists during this period was the identification of the mind separate from the body. It was enunciated that the human mind acts as the custodian of human health and conduct. While encyclopedic treatises were composed on ailments, symptoms, cures, therapy, herbal treatment and surgery, a cheerful mind was determined to be a major prerequisite to good health. The principle called Ayurveda remained the mainstay of Indian medicine for more than two thousand years. The physician Sushruta is known to have a complete medicine lab and a full surgical facility. Some of the surgical tools are illustrated in Figure 5.3.1.

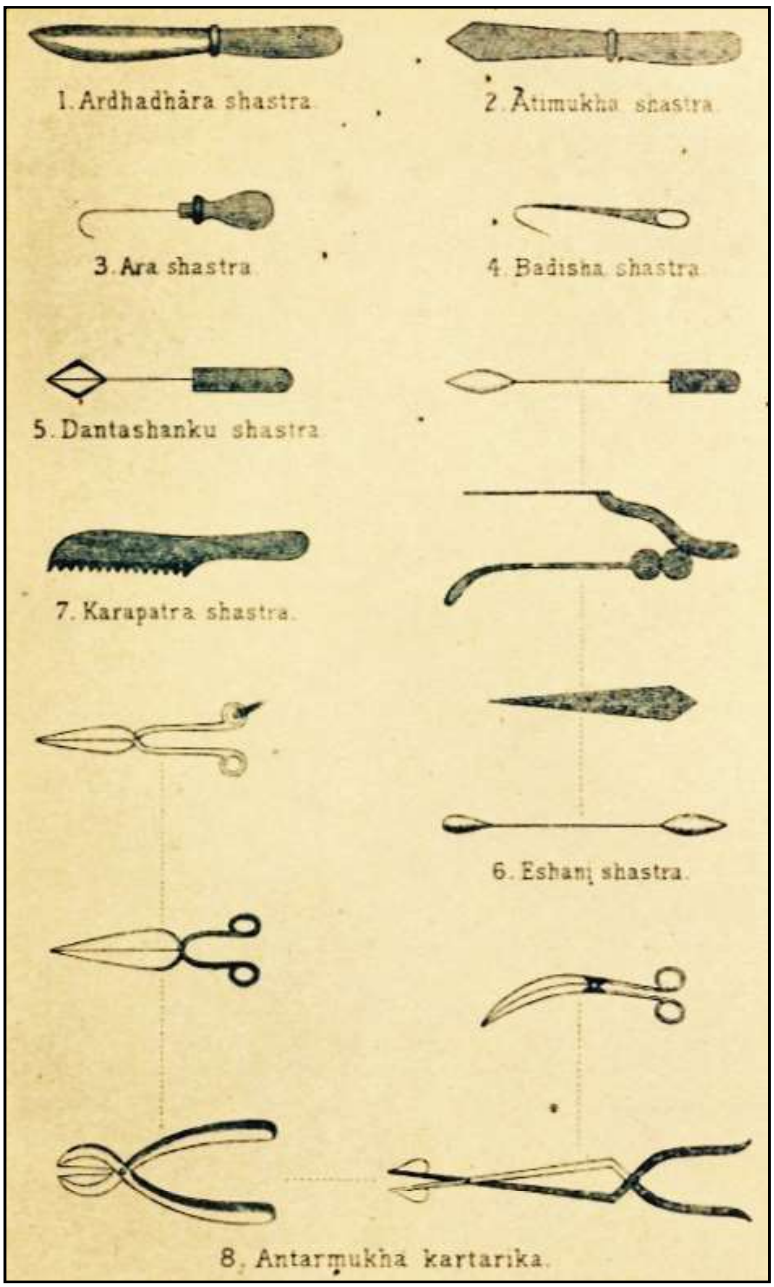

Figure 5.3.1: Surgical tools recreated from Sushruta description (from Wikipedia)

Speech production was determined to be an attribute of the mind. Speech sound was considered to be an indicator of the state of mind, and hence the state of health. Human emotion was analyzed, and its effect on physiology was studied. While these findings had their roots in anatomy, they were used to compile a text of gestures and tones in the ancient world. *Chhandraśāstra*, the book of prosody was compiled to document the effects of emotion on the voice. Created as a manual to be used in ritual services, the science of prosody has not to date been fully deciphered. The mathematician Pingala is considered the father of Indian music (Figure 5.3.2).

Figure 5.3.2: A statue of Pingala. From Gandhara, Pakistan

The other significant contribution was the discovery of phonetic rules in creating the structured language Sanskrit. The language was founded on sixty-four phonetic syllables (Track III above), and the grammarian Panini (Figure 5.3.3) determined built-in biological rules of composing words and phrases. Panini defined the etymology of words through generalized principles of roots and suffixes, mapping the realm of human communication into grammatical rules. This massive work by Panini named *Aṣṭādhyāyī*, and its sister book of synonyms by Yaska was called *Nirukta. T*heseare the only books of words and grammar from the ancient world.

Figure 5.3.3: Picture of Panini on a postage stamp issued by the Government of India.

The study of Astronomy proceeded through celestial observations, and by understanding the sky maps as a function of months and seasons. Constellations were considered to be static objects, while planets and the moon in the local sky were believed to affect events on Earth. Detailed astronomical calculations led to the development of geometry, sine functions, projections and algebra. The number system was known, but the numeric symbols are not seen in the texts. Shadows and water clocks were used for keeping track of time. Human hair andthe width of fingers served as units of measurement.

Human aptitude for engagement was classified into four categories, stressing the dignity of all types of work. Political science enunciated by Kautalya (Figure 5.3.4) (sometimes written as Kautilya, also known as Chanakya) remained the official statecraft for two thousand years. It created social stability, leading to opulence and prosperity. Technological innovations were achieved through family training and private economy. Excellent artisan works in stone carving, pottery, jewelry and textiles were produced. Stone monuments of the period continue to shine even today (Track II). Engraving and stone carving led to the development of script.

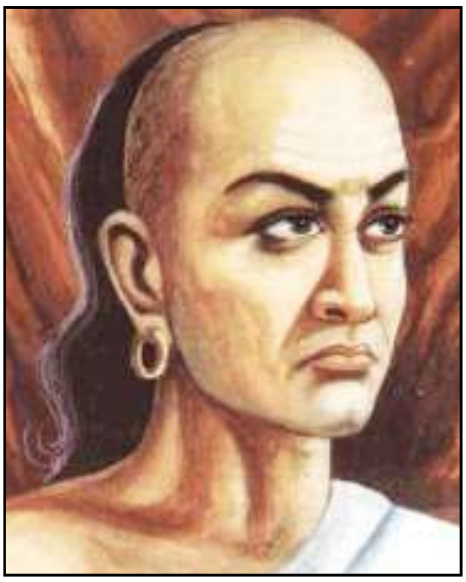

Figure 5.3.4: Economist Kautalaya (Chanakya), reconstructed image from Wikipedia.

Carpentry flourished, as reflected in literary references of wooden buildings and palaces. Brick-making with use of special iron mixed red clay helped create structures that stood the test of time. Darkly stained pottery developed. A special technique was used to mix carbon with smelting iron by using forest materials as fuel (Figure 5.3.5). Rust-proof iron was a major innovation of Indian technology. Massive boats were created that plowed in the rough seas, and ocean navigation with maritime trade became a hallmark of the period (Track I above).

Chemistry of distillation, desiccation, heat treatment and oxidation through burning were in operation. Oil pressing, also known as also extracting oil from flowers, was used to create fragrances. Textile weaving was advanced and silk was woven for export. Reconstructed models of the dress and attire of a woman and a man from this period are shown in Figure 5.3.6.

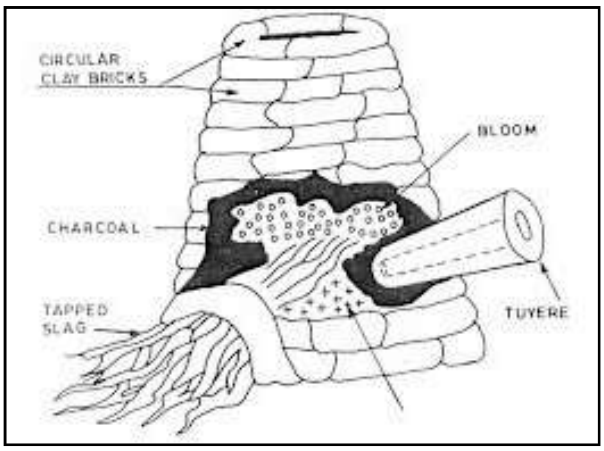

Figure 5.3.5: Iron smelting in India round 700BC (reconstructed by Indian National Science Academy)

Figure 5.3.6: An artistic sketch of a dressed Indian couple around 300 BCE

Reference:

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5.4 Science and Technology: India Golden Period (200 BCE-500 CE)

Dr. Bijoy Misra

Science and technology continued to flourish, with many analytic tools in mathematics and geometry, and more technological innovations in metallurgy, construction engineering, dyes and textiles. Evidence exists for sustained efforts in accurate sky observations for astronomical predictions. Various schools of cosmology developed through university work and religious speculations. One of the foremost among these models to be analyzed was the conjecturethat the universe is composed of a bounded visible sphere surrounded by an unlimited dark space. By containing the universe, various numerical procedures were formulated, to measure the spread and count the number of objects. This led to the arithmetic of large numbers, and to tools of algebraic manipulations. Various layers of "infinity" were proposed for mathematical closure . Writing technology helped to record these in palm leaf manuscripts (Figure 5.4.1)

Figure 5.4.1: Palm Leaf manuscripts (2nd century CE)

Direct astronomical observations were refined with better time measurements using solar clocks and water clocks. The projections of spherical arcs to linear distance gave rise to the development of sine functions and trigonometric calculations. The theory of residues, theory of fractions and number theory developed. They were used in astronomical calculations. Decimal numbers were formulated, but we don't see any script for the decimal numerals. Numbers were scribed in coded form, with reference to the ordering followed in Sanskrit alphabet. The astronomical sciences peaked in the 5th century CE with Aryabhatta (Figure 5.4.2), who deduced the westward rotation of the earth from the night sky observations.

Figure 5.4.2:Aryabhatta, the Astronomer (5th century CE)

Perception sciences developed through experiments in literature and were formalized in musicology. A perceptive unit called the *shruti* was coded with twenty-two *shruti*s covering the seven notes. The melody of vocal music was ascribed to the *shruti*s, with the acoustic expression of voice being a function of the production of sound. The sentence structure of the music was analyzed for rhythm and tone, in order to express emotion. Various string, wind and percussion instruments are referred to in the literature and displayed in frescoes (Figure 5.4.3)Aesthetics in music influenced textiles and ornamentation for artistic rendition of perceptual beauty. Visual aesthetics is seen in architectural proportions, use of dyes and pigments in frescoes, and in pottery.

Research on perception led to the scientific analysis of the mind, with the development of yoga as a discipline of study. Cosmological speculation on the asymptotic nature of truth led to various theories of logic and rhetoric. This found its way to analytical exploration of human speech, and the role of grammar

in expressing thoughts. Grammar also played a major role in technological innovations, and in formulating structured processes, particularly in health sciences. Rigid routines of health and hygiene developed, to maintain health and virility. Aesthetics transferred to human appearance and general living. More detailed material innovations such as metallurgy and construction followed. A four and half foot circular cylindrical rust-free iron pillar, twentyfour feet high, in Delhi declares the industry of disciplined fabrication (Figure 5.4.4)

Figure 5.4.3: Musical instruments in Ajanta fresco (3rd century CE)

Figure Figure 5.4.4: Rust-free Iron Pillar in Delhi (4th century CE)

Figure 5.4.5: Palace caves in Udayagiri, Odisha (1st century BCE)

Massive caves were cut from the mountains. The Buddhist caves in Ajanta and Ellora were carved as religious sanctuaries, and for the habitation of monks. The Jaina caves in Khandagiri and Udayagiri were used as royal palaces and theaters (Figure 5.4.5). Textile technology advanced. Fine silk products were manufactured and exported. Marine navigation was formalized, and sea traffic was common between India, the Far East and the Arab countries. Metal tools helped to develop agricultural technology and irrigation. Metal alloys, gem inlays and ivory crafts developed, and many of these products found markets worldwide.

Herbal medicine and chemistry of plant extracts were a large part of scientific research (Figure 5.4.6). Discovery of forest products and wild herbs for treatment were among the major professions. Empirical knowledge of climate, soil conditions, ground water and elevation were connected to developing herbal medications. Domestication was discouraged, the claim was that the potency was bred in the natural environments. The flesh and blood of animals were tested as medicinal products. Theywere prescribed for the treatment of difficult-to-cure diseases.

Figure 5.4.6: Medicinal herbs and spices (4th century CE)

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5.5 Science and Technology: India Hindu Period (500 – 1500CE)

Dr. Bijoy Misra

This period witnessed remarkable progress in astronomy and mathematics, with more accurate observations of the sky.Asymptotic methods of solving nonlinear equations developed. Speech science took a detailed analytic look in creating empirical observations on phonemes, which were coded in soundto the developmentof Indian classical vocal music.Extracts of herbs and plants found a permanent home in the field of health sciences. Industrial production of rust-free iron supported the building of massive religious shrines and commercial boats. Peace and stability gave rise to the discovery of new techniques in art, sculpture, and carving, along with the design of finer patterns in weaving and coloring.

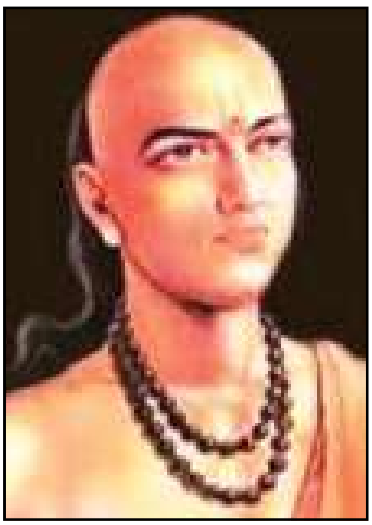

Figure 5.5.1:Varahamihira (505CE- 587CE) astronomer, mathematician and astrologer, compiled the reference text, Brhatsamhita, an encyclopedia of Indian sciences to date. (Wikipedia).

In the 6th century, Varahamihira (Figure 5.5.1) calculated the relative distances of the planets from the sun. He helped standardize the almanac, and put together tables of seasonal corrections. His encyclopedic book Brhatsamhita remains a reference text for astronomy, engineering, agriculture and mathematics, even to this day. Brahmagupta in the 7th century introduced the concept of zero, and of negative numbers. Mahaviracharya in the 9th century introduced the decimal fractions.

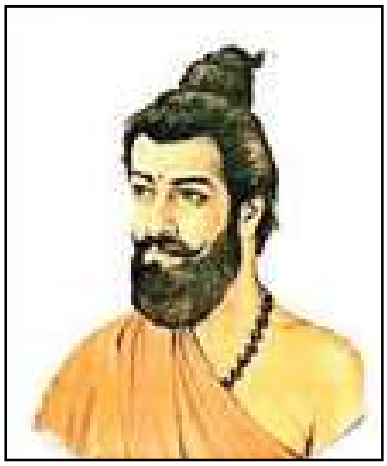

Figure 5.5.2:Bhartrhari, a grammarian and linguist from approximately the 5th century, authored the Vakyapadiyam, a scientific reference treatise on the theory of speech. (Wikipedia).

In the 5th century, Bhartrhari (Figure 5.5.2) helped create the most analytic work on speech science ever produced. He analyzed sound quality, sound diction, and sound interpretation by reintroducing the theory of "burst", or an information packet of sound. And in the 9th century, Anandavardhana went a step further, by proposing the theory of "suggestion" in poetic expressions. Abhinavagupta in the 10th century formalized the "rasa" theory (see Art and Culture track in Classical Period) in acoustic communication, by introducing the analysis of sound he called "dhvani". And in the 12th century, Hemachandra (Figure 5.5.3.) deduced the Fibonacci series from musical syllables.

A push for the general wholesomeness of life propelled exacting standards of aesthetics in taste, conduct, music, food and dress. Nutritional methods were discovered through the principles of Ayurveda, and food was customized, respecting each individual's empirical traits. Research led to the discovery of natural dyes that could fix on fiber, cotton and silk, to produce color garments and decorative objects.

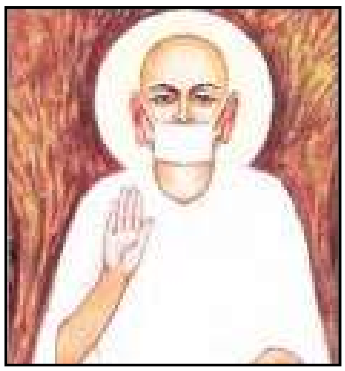

Figure 5.5.3:Hemachandra (1088CE-1173CE) poet, mathematician, grammarian and linguist, contributed to all scientific disciplines, including prosody. (Wikipedia).

High temperature ovens led to technological innovations in metallurgy and alloy-making. Electroplating through acidic interactions was common. Alchemy and the transformation of metals became a passion for many, and increased with Arab trade. Metallic oxides and ground ores were used as pigments and in medicinal preparations. Mercury was discovered as a noble metal that had transformative properties.

The Hindu Period was known for explorations in geology and hydrology. Ground moisture and airflow were carefully evaluated, to select sites for temple construction. The stability of structures and geometric configurations was studied (Figure 5.5.4.). Decorative counterweights were added to structures at different heights, to maintain balance (Figure 5.5.5.). While the principles have been uncovered, the calculations and the planning documents have yet to be discovered. Massive cargo boats plied from both coasts to far-away lands. These were prepared for high winds and strong currents. Navigational measurements were accurate for maritime traffic in Bay of Bengal.

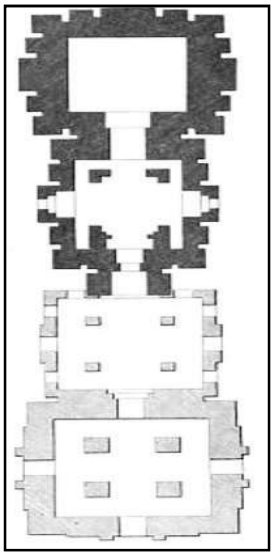

Figure 5.5.4: The foundation design of Lingaraja Temple (180 Feet), Bhubaneswar, 11th century CE. (Wikipedia)

Figure 5.5.5: The Lingaraja temple today. (Wikipedia)

Fine work in gold, silver, ivory, bones, hard wood, silk and textiles (Figure 5.5.6, Figure 5.5.7) made the Indian goods desirable around the world. Palm leaf manuscripts were produced with artistic calligraphy and color inserts. Projection geometry and the visual impact of light and shadow were studied for their artistic applications. Statues and images produced during this period were lifted to divine status, for their beauty, construction and physical appeal (Figure 5.5.8). Explorations of divinity in the physical world became a source of curiosity for scholars during this period.

Figure 5.5.6: Color fixing and weaving with silk (Wikipedia)

Figure 5.5.7: Foil and design work on textiles through weaving (Wikipedia)

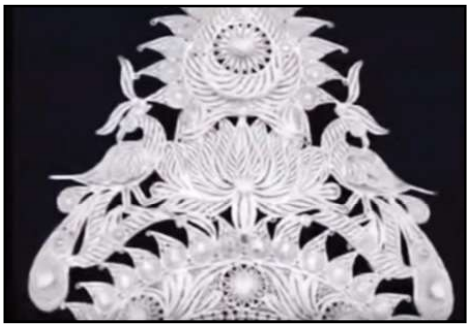

Figure 5.5.8: Silver filigree work (13th century) (Wikipedia)

References:

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5.6 Science and Technology: India Mughal-Maratha Period (1500 CE - 1800 CE)

Dr. Bijoy Misra

While North India was being ransacked by invasions and wars, South India was relatively quiet. Great advances in Mathematics took place in Kerala, at the Kerala School of Mathematics and Astronomy. The astronomer Madhava had established the school in the late fourteenth century. It remained active until the middle of the seventeenth century. There is reason to believe that the ideas of differential calculus were developed through this school, two hundred years before Newton. Other important contributions of Indian mathematicians include the infinite series representation of sine and cosine functions, and the accurate representation of pi. NilakanthaSomayaji (1444CE to 1544) (Figure 5.6.1) is considered the most prominent contributor from the school.

The Rajput King Jai Singh supported the building of five observatories (Figure 5.6.2), separated by an average distance of two hundred miles: at Delhi, Jaipur, Ujjain, Varanasi and Mathura (Figure 5.6.3), These were set up for astronomical recordings, and for calculations of planetary positions. The observatories that were built between 1735CE and 1745CE were used to help correct the traditional astronomical almanacs, which had been created from single point observations.

Figure 5.6.1:NilakanthaSomayaji, the Kerala mathematician

Figure 5.6.2: Observatory at Delhi (current picture)

Figure 5.6.3: Geographic distribution of the observatories established by Raja Jai Singh: Delhi, Jaipur, Ujjain, Varanasi and Mathura.

The Indian Ayurvedic system took a new turn, with the introduction of Persian methods of using plant and animal extracts. The Arabic Unani system benefited in reverse by incorporating new herbal therapies and diet regimens. The Unani method stressed attitude as a parameter, with the human voice as the sickness detector. Use of compounds of Mercury and Sulphur were explored for difficult conditions.

Hybridization of crops and the introduction of new crops were important contributions of Moghuls in India. The arid lands in the west and the hilly terrains in the east were brought under cultivation, and new techniques of sowing and irrigation were developed. The Mughal Emperor Jehangir made an effort to document the animals that inhabited the land. The Dutch in the seventeenth century created the first floral atlas of the vegetation in the country.

Traditional musicology was coded into specialized raga music for court performances. Various string instruments were designed to create proper tonal quality. Empirical methods of balancing voice and

instruments were developed to create mood and harmony with nature. Expressive works in theater with creative tuning of literature to musical rendering enriched the regional culture. Grouting technology and construction engineering took bold turns in creating massive monuments and mausoleums (Figure 5.6.4.). Large infrastructure projects were undertaken to connect various parts of the country and create access to the production centers. Industrial production of textiles, silk, leather and iron goods created new market-driven population centers that needed careful planning. The economy during the period was good.

Figure 5.6.4:Hawa Mahal, Jaipur

Rivers were used for transportation.Boat-building technology matured. The Maratha king Shivaji maintained a naval force that subdued the British Navy. Celestial navigation helped mercantile boats trade in Arab lands as well as in far-away Cambodia and Indonesia. Science and technology from India spread into foreign lands through cultural exchanges and settlements.

The Mughal-Maratha Period is known for calligraphic book design (Figure 5.6.5) and illustrated chronicles. The technique of miniature paintings was developed in Persia and was heavily used in the Mughal courts and those of the Rajput kings. Extremely subtle designs in paper and cloth have been preserved as masterpieces of world art. Calligraphic work was also incorporated in building design and ornamentation. Fine brocade designs in silk were highly prized and sought after in all royal courts.

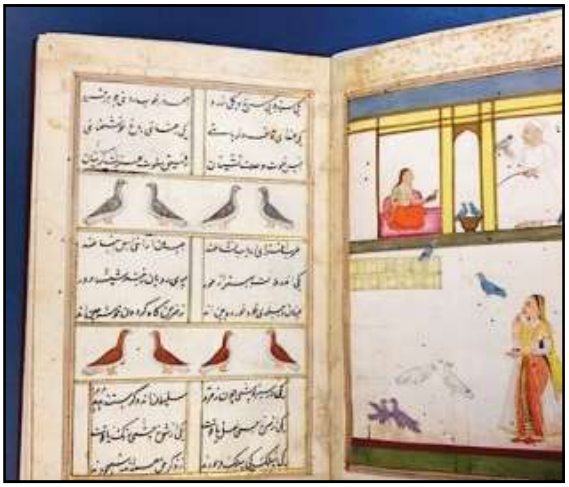


Figure 5.6.5:Kabutarnama, the book of Sparrows, 17th century

A special kind of cotton was experimented on and was cultivated in the delta of the river Brahmaputra in modern-day Bangladesh. With proper moisture control, the cotton could be spun into extremely fine yarns which produced the finest muslin in the world. The thread count in the woven fabric reportedly exceeded two thousand per inch (Figure 5.6.6).

Figure 5.6.6: Fine muslin, 1750 CE

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/mughal-maratha-period/science-and-technology

Authored by: Dr. Bijoy Misra for India Discovery Center (IDC)

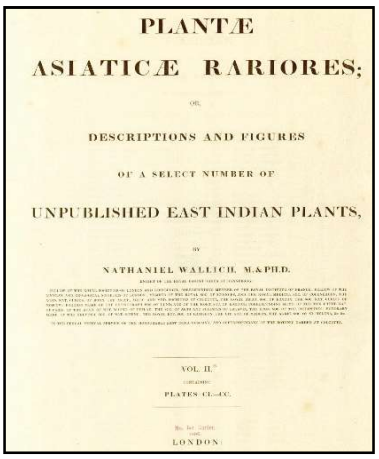
5.7 Science and Technology: India British Period (1800 CE – 1947 CE)

Dr. Bijoy Misra

Science in India had moved to alchemy by the end of the Moghul Period, though fundamental mathematical and astronomical calculations continued in several pockets of the country. The East India Company, and then the British Empire brought their own young men from England to survey India's hills, rivers, minerals and vegetation. They supplied raw materials for British industry. Native Indians recovered later through the efforts of a few individuals.

William Lambton (~1751-1823), a British soldier-turned-surveyor, led the land survey of India. He measured all mountains including Mount Everest. The mathematician RadhanathSikdar was an Assistant on this survey project. The massive "Plantae AsiaticaeRariores"(Figure 5.7.1) was compiled in three volumes, and cataloged 20,000 plants from the Indian subcontinent. These volumes were published by Nathaniel Wolf Wallich (1786-1854), a Danish surgeon and botanist.A survey of mammals and birds on the subcontinent was compiled by the geologist W. T. Blanford (1832-1905), in a volume entitled "The Fauna of British India, including Ceylon and Burma". A geological map was produced bythe surgeon Henry Wesley Voysey (1791-1824). These catalogs are still used as reference books in India.

Henry Blanford created the first scientific report on the Monsoons in India (1875), and established the India Meteorological Department. John Eliot (1839-1908), the next Director of this Department, studied tropical disturbances and cyclones. Some of the reports from these reports are studied even to date. The Geological Survey of India was organized in 1851 under the leadership of Thomas Oldham (1816-1878) - he documented deposits of coal, iron, mica, bauxite and manganese throughout the country. These were then mined and exported to England.


PLANTÆ

ASIATICÆ RARIORES;

OR,

DESCRIPTIONS AND FIGURES

OF A SELECT NUMBER OF

UNPUBLISHED EAST INDIAN PLANTS,

BY

NATHANIEL WALLICH, M.A.P.H.D.

VOL. II.

PLATES CI.–CC.

LONDON.

Figure 5.7.1: The front cover of the Plant catalog, published in 1831 CE.

It is alleged that the British scuttled the Indian textile industry by cutting off the fingers of the muslin weavers in Dacca (currently in Bangladesh). All consumer textile was imported from England under heavy subsidy. The massive railway network in modern-day India is a relic of British engineering in India. Though designed for transporting goods to ports for onward transport to England, the railway network nonetheless continues as the foundation of India's transport system today. Milling technology was imported to India and was applied to grains and oil seeds. Infrastructure civil engineering works included the development of ports, bridges, irrigation projects and memorial monuments (Figure 5.7.2). However, the health system in the country faltered, with an increase in infant mortality and a decline in longevity.

The Indian Association of Cultivation of Science was established in Calcutta in 1876, through the personal funds of Dr. Mahendralal Sarkar, a physician. Jamsetji Tata (Figure 5.7.3), another entrepreneur, established the first steel mill in India in Jamsedpur in 1907. He followed this in 1908 by establishing the Indian Institute of Science, the first science education institution. The Bose Institute, a multidisciplinary research institution was established by Acharya Jagadish Chandra Bose (1858-1907), who showed that the plants could be much closer to the animals in cognitive abilities than previously believed.

Figure 5.7.2. Victoria Memorial in Kolkata, 1921

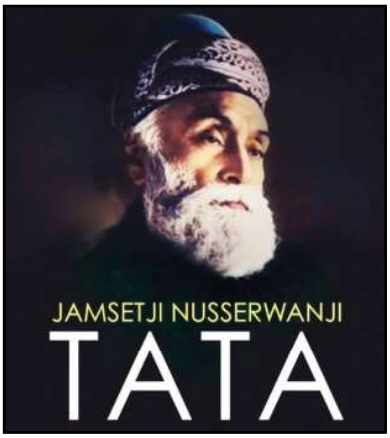


Figure 5.7.3. Commemoration of Jamsetji Tata

Figure 5.7.4. Physicist Nobel Laureate C. V. Raman

Physicist Sir C V Raman (Figure 5.7.4) did his research work on the premises of the Indian Association of Cultivation of Science and won the Nobel Prize in 1929.

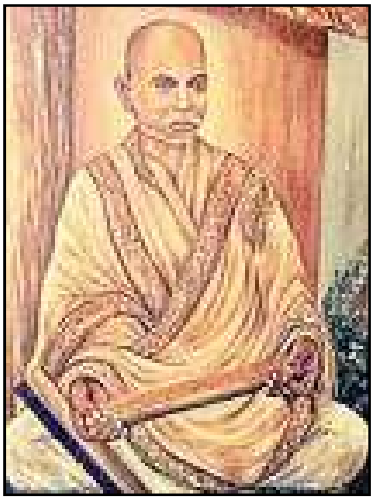


Figure 5.7.5. Astronomer Samanta Chandrasekhara

A treatise on astronomy was produced by SamantaChandraskhara (1835-1904) (Figure 5.7.5) in Puri, who corrected the Almanac errors that had continued because of the locational coordinate errors. Prafulla Chandra Roy (1861-1944) helped establish the Indian indigenous chemical industry, to compete

with the British imports. MeghnadSaha(1893-1956) worked on thermionic emissions and on the identification of stars through temperature. The Saha Equation is used today as a standard tool in modern Astrophysics to calculate the degree of ionization of gases in a star that are in thermal equilibrium.

Figure 5.7.6. Physicist Satyendra Nath Bose

Satyendra Nath Bose (1894-1974) (Figure 5.7.6) studied general relativity, and eventually developed statistics to define the quantum states of identical particles like photons; this work is popularly known as Bose-Einstein statistics in Physics.

Figure 5.7.7. Srinivasa Ramanujan, the Indian mathematician

Figure 5.7.8. Prasanta Chandra Mahalanobis, the founder of modern statistics

Srinivasa Ramanujan (1887-1920) (Figure 5.7.7) has been called the "boy wonder" of mathematics. He wrote elaborate mathematical formulas through intuition, claiming his insights were based on "visions." Denied higher education, he was noticed by the mathematician Thomas Hardy, and was invited to visit Cambridge University. He published papers with Hardy. Prasanta Chandra Mahalanobis (1893-1972) (Figure 5.7.8) helped establish modern quantitative tools in statistics. The method of creating a non-dimensional metric to quantify the scatter in data is a standard tool in Statistics.

References:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/british-period/science-and-technology

Authored by: Dr. Bijoy Misra for India Discovery Center (IDC)

References - Science and Technology

1. A Concise History of Science in India – Edited by D.M.Bose, S.N.Sen, B.V. Subbarayappa, Orient Black Swan, 2009.
2. Aīn-i-Akbarī – Vo III of Akbarnāma – The History of Akbar by Abul Fazl-i-Allami in Persian,
3. āryabhaṭiyaṁ (आर्यभटियम्) by Aryabhatta- https://archive.org/details/Aryabhatiya1976
4. Carakasaṁhitā (चरकसंहिता) by Charaka – Text with translation – Ram Karan Sharma, Vidya Bhagwan Das, Chowkhamba Sanskrit Series, 2013, Varanasi, India.
5. Eight Upanisads (commentary of Shankaracharya) Vol II - Swami Gambhirananda, Advaita Ashrama, Kolkata, India.
6. History of Ancient and Early Medieval India: From the Stone Age to the 12th Century – Upinder Singh, Pearson Education, Delhi, 2009.
7. Tattvārthasūtra (तत्त्वार्थसूत्र) by Umāsvāmī - https://archive.org/details/tattvarthbook10webf
8. The Cultural Heritage of India, Volume VI, Science and Technology, The Ramakrishna Mission Institute of Culture, Calcutta, 1937, reprinted 1986.
9. VakSukta – Rg Veda X.125
10. बृहत्संहिता by Varahamihira, translation by N. Chidambaram Iyer, 1884,

Internet - Generally Available Material

1. ArthaShastra - https://en.wikipedia.org/wiki/Arthashastra
2. Ashtadhyayi - https://archive.org/details/ashtadhyayitrans06paniuoft
3. Chhandashastra - https://en.wikipedia.org/wiki/Sanskrit_prosody
4. https://en.wikipedia.org/wiki/Veena
5. Sushruta Samhita - http://sushrutaproject.org/
6. Sushruta Samhita - http://sushrutaproject.org/
7. https://www.wisdomlib.org/hinduism/book/brihat-samhita

TRACK 6

Contributor

Hardik Dixit is a senior engineer at Dell Technologies, the personal computer company. He studied Economics at Harvard Extension School. His research includes agricultural economy, export-import, tax system and labor. He studies the negotiated judiciary in Indian village systems and the administration policies of the regional Indian kingdoms that respect the will of the people.

6.0 Economy and Politics: Introduction

India holds a rich historical legacy that spans political structures and cultural eras. The Bhimbetka cave paintings (10,000BCE) provide evidence of organized communities existing before the Indus civilization (3000BCE), depicting scenes related to agriculture, hunting, and festivals. Similarly, the pre-Harappan site of Mehrgarh in Afghanistan (7000BCE) showcases technological advancements like granaries and brick houses and possibly of a central administration.

During the Indus civilization, agriculture and trade formed the backbone of economy. Stone carvings and seals depict agricultural activities. Crops like wheat, barley, and cotton were cultivated. Advanced agricultural technology is evident from artifacts like toy ploughs and copper tools. The importance of water management and food storage is demonstrated through the remnants of irrigation systems and granaries. Trade played a significant role. Agricultural products, metals, textiles, and jewelry were exchanged. The absence of currency suggests a possible barter system. The society was possibly hierarchical,two separate size housing colonies are noticed.

The Vedic Period economy was agrarian. It was supplemented with manufacturing and services. Society was organized into four classes, with agriculture emphasized as the means of wealth accumulation. Different types of irrigation were employed.Agriculture and livestock played crucial roles in trade. Manufacturing activities included production of household goods, weapons, and jewelry. Service industries thrived with carpenters, weavers, cobblers, and entertainers. Joint families and collective welfare were encouraged., Education was valued the highest. Vedic rituals were intertwined with political and administrative decisions.

The political organization during the Classical Period consisted of organized kingdoms and republics. The Mauryan empire integrated India.The economist Kautalya produced the text on economics entitled arthaśāstra. The statecraft and the social economics coded in the book became helpful in streamlining the human resources and technical talents. East-west and north-south Trunk roads were established. Massive exports made India the most opulent nation on earth. Gold, silver and bronze coins were minted. Large-scale construction projects were undertaken. Emperor Ashoka is known to have taken interest in maritime trade with boats carrying goods to China.

Kingdoms flourished with various administrative systems during the Golden Period. Some developed feudalism, others had grassroot democracy. India engaged in both exports and imports, with spices, artwork highly valued in foreign markets. Imports included horses from Arabia and silk from China. Southern India came to prominence with extensive autonomous regions trading with the Middle East and South East Asia. Kushanas entered through the northwest and ruled a major section there. They minted their own coins.Exchange policies were introduced. Hindus, Buddhists and Jainas created their religious books for social justice and discipline.

Hindu Period saw the consolidation of India society through the religion-based administrative system. Massive temples and monasteries became centers of economic activity with markets and tourism. Indian artisans were commissioned to build temples and cities in South East Asia. The trade was prolific. By 1000CE, India had the highest GDP of 30% of the world as recorded by historians. Islamic invasions ensued plunder.The religious conversion created a separate rule of law in pockets. The divisions and insecurity made the social stratification stronger. The country was divided into small kingdoms that operated with mutual treaties.. The Moghuls and Portuguese entered by about 1500CE and made roads for foreign occupation.

The Mughals occupied India for two hundred years and then disintegrated. They instituted strict pyramidal administration and created discipline through heavy punishment. Religious conversion was imposed through tax structure, causing the creation of aparallel Islamic population.Agriculture expanded and the national GDP remained on par with trade to the Arab countries. Land usurpation was common,it created landless laborers. The brutality

led to the disintegration of the Empire, challenged by a nationalist Shivaji who ranguerilla warfare. The nationalists were poor administrators. They levied heavy taxes and caused deep divisions. India's infrastructure decayed through bad governance. The British found it easy to enter through the cracks.

The British colonial period brought a significant decline in India's GDP. India's share of world GDP diminished from 24% to 4% recorded in 1947CE. The British commercialized agriculture and exported grains from India to feed England at home and to nurture their colonial aspirations elsewhere. India's native farming system was destroyed through heavy taxation. There wasan administrative imposition tocultivate indigo and other cash crops which were popular in Europe. India was impoverished with heavy starvation deaths.The British helped establish railways and port facilities thus exported massive amount of raw material to the British mills. Indian revenue was used to support the colonial splendor. Eventually the Empire became unstable. Mahatma Gandhi and the Indian National Congress succeeded in releasing India from the British rule.

6.1 Economy and Politics: India Prehistory and Indus Period (7000BCE-2000BCE)

Mr. Hardik Dixit

The Indus valley inscription in Figure 6.1.1 depicts social scenes of agriculture, hunting, and festivals. The Bhimbetka cave paintings depict community groups and point to a civilization that existed before the Indus period.

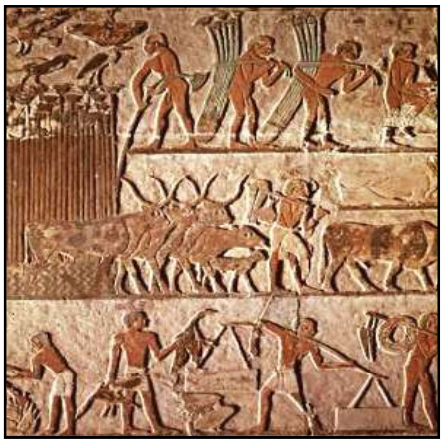


Figure 6.1.1: Indus valley inscriptiondepicting agricultural activity

Mehrgarhartefactsin Afghanistan are dated 5000BCE. The site has a relationship with Indus civilization with the evidence of granaries and brick houses, The economy of the Indus civilization focused on grains and trade. The primary crops were wheat, barley, and cotton.

A ploughed field at Kalibangan sheds light on the use of sophisticated farming. A toy plough (Figure 6.1.2) and copper tools (Figure 6.1.3) indicate advanced state of agricultural technology used during these times. Farmers harvested rain for use in irrigation. The Great Granary at Harappa Mound – "F" depicts methods of storage and preservation of grains. Food supply was supplemented by animal husbandry as can be inferred from the seal in Figure 6.1.4. Bullock carts were possibly used for ground transportation, as surplus food was brought from the countryside to the cities.

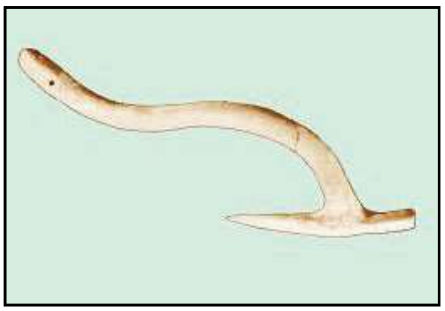


Figure 6.1.2: Toy plough discovered at Kalibangan

Figure 6.1.3: Copper agricultural tools, Kalibangan

Figure 6.1.4 Animal seal from Mohenjodaro

Most commerce appears to be done with grains and cotton. Special commodities such as copper, pearl, cloth, and jewelry were likely traded. Gold and other metals were imported. From seal findings we can infer that the trade link was with Mesopotamia and Sumeria. Seal with the 'Elephant' sign (Figure 6.1.5) was possibly primarily used in commerce. Seals with large boats (Figure 6.1.6) confirm the existence of maritime trade. Standardized weights and measures have been found but there is no indication of coins. Road routes suggest that raw materials from Rohri hills and the southern part of India were brought in. We can infer that urban center factories converted raw materials into finished products.

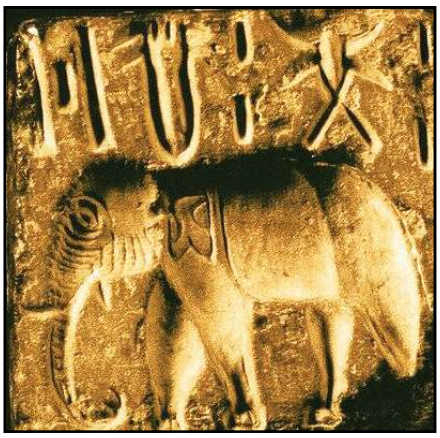


Figure 6.1.5 Elephant seal from various locations, likely used in commerce

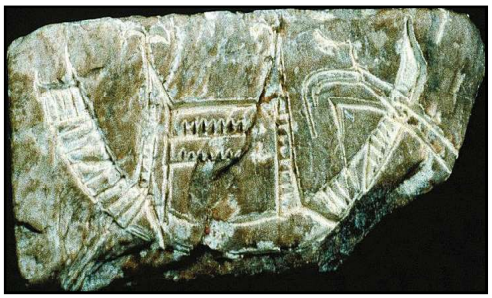


Figure 6.1.6 Boat seal found at Mohenjodaro

Unfinished shell circlets and beads made from a variety of materials suggest that these items were furnished as part of systematic manufacturing activities. Evidence of dyer's workshops and samples of cotton and jute indicate textile production. Various pottery items suggest that common householders had an artisan nature. Cities were centers for industry, craft and trade. The Harappan sites show many open areas as seen in Figure 6.1.7 from Shikarpur, Gujarat. Buildings with doors that face the street may have served as shops, with possible workshops or storage spaces located in the rear.

Animal seals with images of Zebu bull (Figure 6.1.8), male water buffalo, tiger and unicorn were widely used. They may be related to an administrative hierarchy with each level carryingits own seal. The unique feature of these sites is the management of space in the city areas. Residences and administrative offices were in separate areas of the city. There are hints of an upper town with larger properties, and a lower area with more densely packed homes. The Citadel was the main administrative area.An administrative body likely managed trade, taxation, and food granaries. Public buildings such as great baths, granaries, citadel, and city walls would have been built by the central administrative body. Wastewater management was elaborate, with covered street drainage systems. Existence of brick wells (Figure 6.1.9)suggests use for fresh drinking and cooking water. No weapons have been found at any of these sites.

Figure 6.1.7: Open area (likely bazar) at Shikarpur, Gujarat

Figure 6.1.8 – Seal depicting a Zebu bull

Figure 6.1.9: Brick well at Lothal, Gujarat

The ancient Indus port city of Lothal recreated by the Archaeological Survey of India is depicted in Figure 6.1.10.

Figure 6.1.10 Port city of Lothal as envisioned by ASI.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/pre-history-and-indus-period/economy-and-politics

Authored by: Mr. Sanjeev Tripathi for India Discovery Center (IDC)

6.2 Economy and Politics: India Vedic Period (2000 BCE-700 BCE)

Mr. Hardik Dixit

The economy of the Vedic Period was based on agriculture, manufacturing, and services. Labor was classified with *varna*, a classification defined by the individual's profession. *Brāhmaṇa* (priests), *vaiśya* (tradesmen), *kṣatriya*(warriors) and *śudra* (menials) were the four major classes. *viś* is an old root word that is widely used in the Atharva Veda (see Track 2) for all classes of workers: traders, merchants, agriculturists, home builders and artisans. The Vedic framework was governed by four aspects - *dharma* (religious values and righteousness), *artha* (wealth creation and management),*kāma* (social living and family life) and *mokṣa*(release from obligations). Each aspect was supposed to be lived to its fullest potential.

The Ṛgveda advises that landfarming is the best means of gaining wealth. The Brahmanas text (see Track 3- Language and Literature) give references to four stages of production: tilling land (*karṣaṇa*), sowing seeds (*vapana*), harvesting the crop (*lavana*), and threshing (mardana). The *Ṛgveda* describes four types of irrigated water: rainwater (*divyāḥ*), well water (*khanirtimā*), natural water(*svayaṃjāḥ*) and water from those rivers that are mixed with the sea (*samudrārthāḥ*). Agricultural products were used for bartering. Cows, horses, gold, and other metals (copper, tin, mercury, lead, zinc, bronze) were used as a means of barter in trading.

Figure 6.2.1: Black and Red Ware household utensil (reference 3)

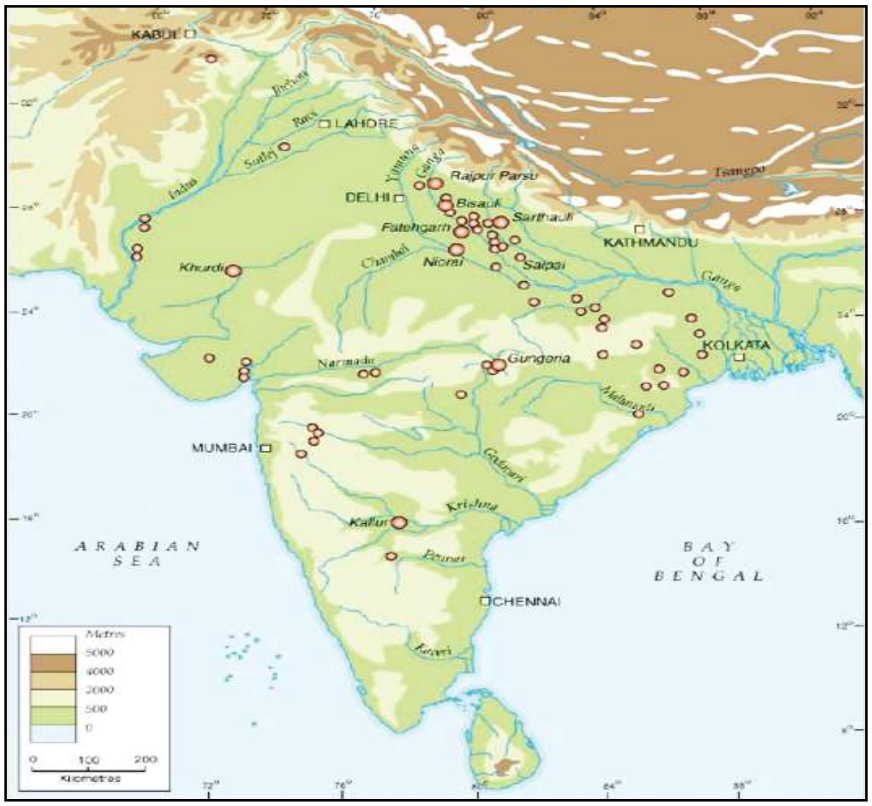


Figure 6.2.2: Copper hordes during the Vedic Period (reference 3)

The Jhukar culture in Sindh, Cemetery-H culture in Punjab, and excavations of the Doab region point to continuation of the late Harappan civilization. Doab excavations have identified Ochre Colored Pottery (OCP), and Black and Red Ware (BRW) pottery (Figure 6.2.1). Manufacturing products propelled economic activity during this period. Household utensils, transport vehicles, weapons and jewelry were manufactured. Processing of dairy and herbal products were popular (for example – ghee, herbal medicines). The Rgveda mentions *Samudra* (Ocean) and describes Varuna's (One of the gods) knowledge of the ocean-routes, which points to maritime activity in the period.

A good amount of copper was in use during this period, as was some iron (in later times). Excavations in the Eastern part of Ancient India have revealed microliths and wheels made of pottery and iron slag. Other excavations around the country (Figure 6.2.2) indicate usage of copper. Various metalswould have been used to produce a range of weapons (Figure 6.2.3). The organization of Vedic rituals must be responsible forgiving rise to a massive service industry. Carpenters, potters, craftsmen, weavers, cobblers, singers and wisemen participated in this activity. The communities lived on mutual support.

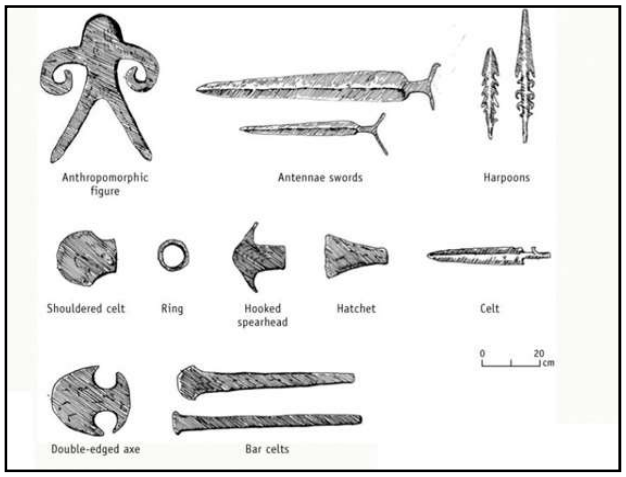


Figure 6.2.3: Display of weapons and tools of the Vedic period

Vedic society consisted of tribes (*jana*), which were divided into clans and families (*kula*).A*Kulapati* headeda clan. Individual villages were governed by a *grāmasabhā* (village assembly). A *grāmaṇī*served as a village officer, he ensured law and order within the village. Joint families and collective welfare were emphasized. Physicians provided health services, and education was given prime importance. Each student (*brahmacārī*) was initiated by a teacher (guru) for his studies, and then stayed with the teacher in a residential *Gurukulam* (Figure 6.2.4). Students offered their services in various daily activities on the *Gurukulam* campus.

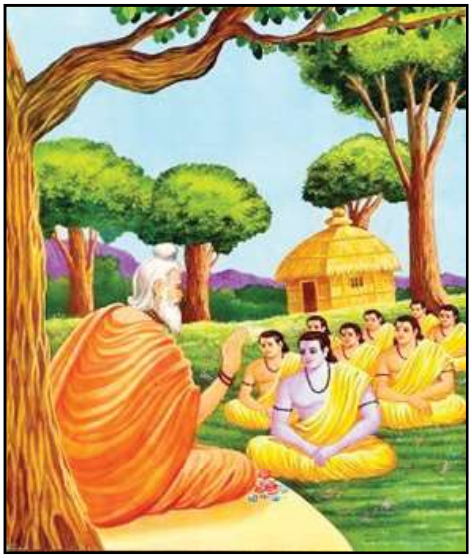


Figure 6.2.4: Graphics depicting a Gurukulam

Politics and administration of the kingdom were heavily focused on Vedic rituals. Kings relied on the wisdom of the Council for making decisions. Priests and the governing officer (*senānī*) were of prime importance and were advisers to the king. A grassroot folk assembly (*samiti*) elected the King. A subgroup *sabhā* focused on judicial issues, with decisions being made within the framework of dharma (morality) as the moral compass. A substantial region maintained the old matriarchal hierarchy of family structure.

Vedic framework flourished on gaining wealth within the framework of *dharma*(righteous conduct) with the focus on the collective goods. Kings governed with the counsel of their advisers (council) as well as the assembly by upholding dharma as the highest ideal. The vedic principles spread through the country via conflicts and persuasion. A reconstructed map around 1000BCE is given in Figure 6.2.5.

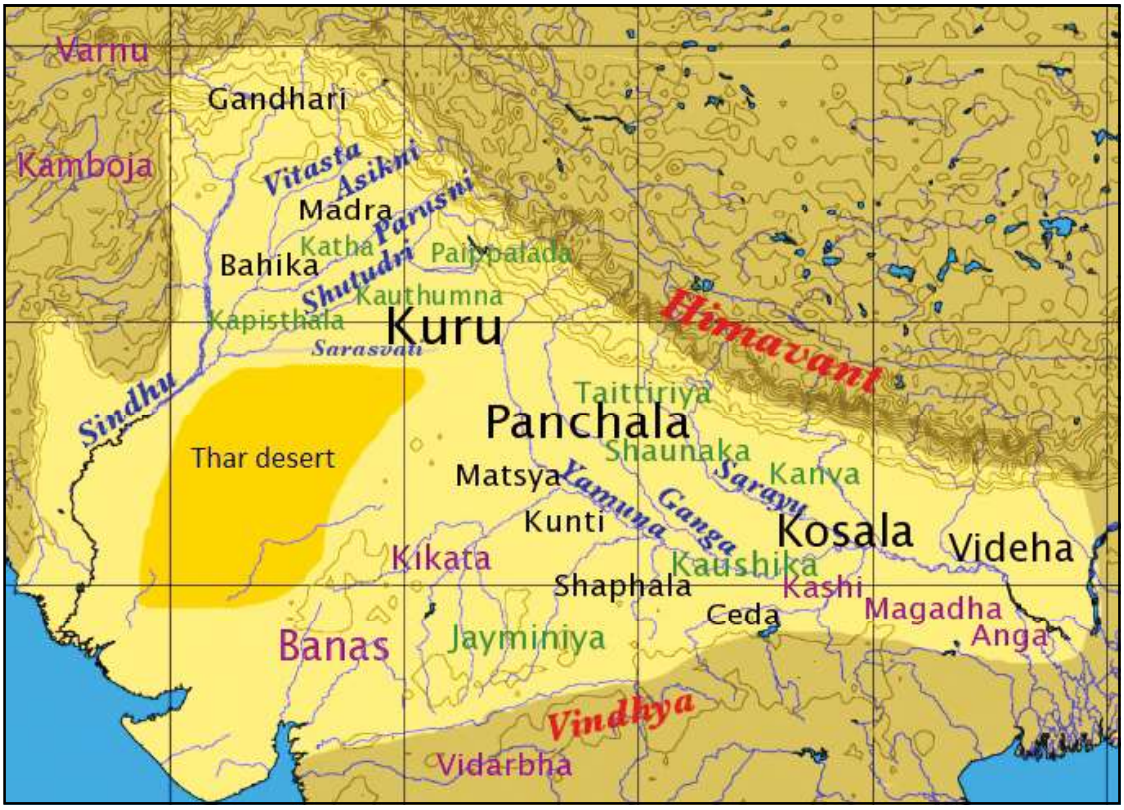


Figure 6.2.5: Map showing the spread of Vedic society from the Saptasindhu (Indus River) to the Gangetic plains (wikipedia).

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/vedic-period/economy-and-politics

Authored by: Mr. Raghavendra Sarangapurkar for India Discovery Center (IDC)

6.3 Economy and Politics: India Classical Period (700 BCE-200 BCE)

Mr. Hardik Dixit

Sixteen organized *mahajanapadas* (large kingdoms) are recognized during this period. There were small kingdoms in existence as well. Kashi, Kambhoj and few others were the known *janapadas* from the Vedic times. Mallas, Kashi, and Panchal were single tribe janapadas. Few of these kingdoms were governed by *Ganas*, wherein power was exercised by a restricted group of families, usually by the heads of leading kshatriyas. There was a chief known as *Ganapati* or *Ganaraja*. The *gana's* greatest asset – governance through discussions – was also their greatest weakness, because making decisions could take much longer. Chandragupta Mauryaestablished the first known integrated empire (Figure 6.3.1). He built this empire by taking advice from his mentor named Kautilya (also known as Chanakya).

Ashoka expanded the Mauryan empire to the south, by annexing Kalinga. Later, he replaced the doctrine of "Expansion by War" with "Expansion by Dharma." The Ashoka Symbol is depicted in Figure 6.3.2 and is the current national emblem of India.

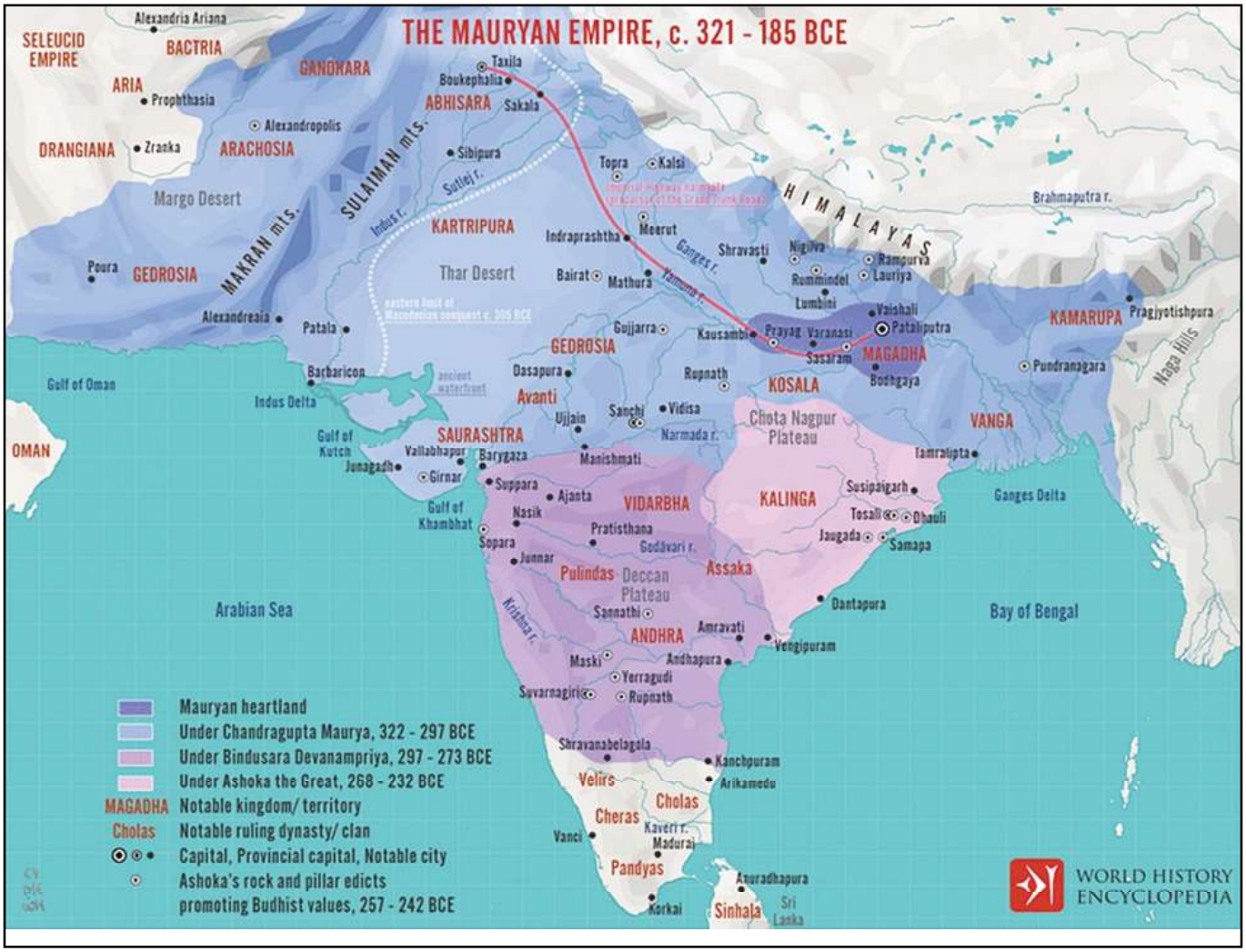


Figure 6.3.1: Chandragupta Maurya empire at 320 BCE

Figure 6.3.2: Ashoka's pillar edict with symbol (Image courtesy from Wikipedia)

Probably the very first extensive work on Economics in the world was done by Kautilya. Kautilya's*Arthshastra*, was compiled in around 300 BCE.It consists of 15 books (*adhikaranas*). The first five of these deal with internal administration (tantra); the next eight with inter-state relations (*avapa*); and the last two with miscellaneous topics. The *Arthashastra* remained the guiding document for policy and administration for hundreds of years. Kautilya stresses the role of espionage in statecraft, describes what a king's daily routine should be, and how the king should conduct business. According to the *arthashastra*, the state has seven limbs (*SaptāṁgaRājya*): *Svāmī* (the king), *Amātya* (ministers), *Janapada* (territory and people), Durga (the fortified capital), *Koṣa* (the treasury), *Daṇḍa* ("punishment is the science of governance"), Mitra (ally). The army had four divisions: the infantry, the cavalry, the chariots, and the elephants, which were under the control of *patyādhyakshas*, *ashvādhyaksha*, *rathadhyaksha*, and *hastyādhyaksha*respectively. According to the Greek traveler Megasthenese, Chandragupta Maurya's army consisted of 600,000 infantry, 30,000 cavalry, 7,000 chariots, and 9,000 war elephants. The focus on the manufacturing of military weapons contributed to the economy and jobs.

Figure 6.3.3: Silver punch-marked coins of Kashi, Koshala and Magadha

Agriculture was the most important economic activity. Rains, the fertility of the soil, and ability of the cultivators have been reported by Greek travelers. The major industries were weapon-making, weaving textiles, brewing liquor, making salt, and manufacturing jewelry. Gambling, betting, and rest houses comprised the service industries. Structured use of coins was prevalent during this period. Kingdoms applied punch-marks to their coins with various motifs (Figure 6.3.3). Gold, copper, lead, tin, and ironwere mined as commodity metals.The Vindhyas in the South provided iron, copper, and other stones.

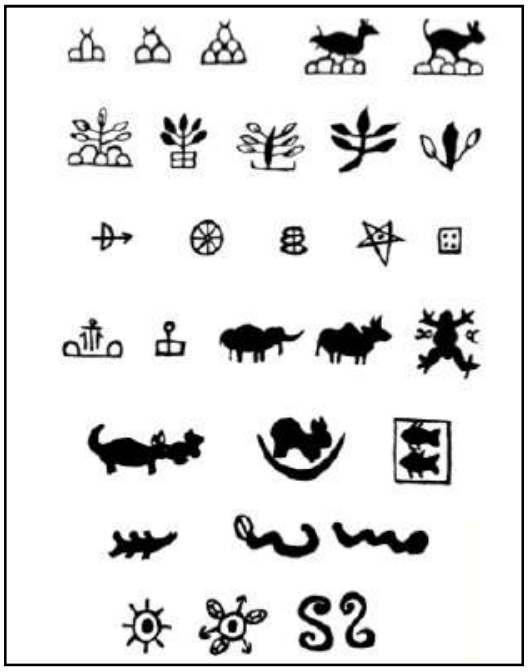


Figure 6.3.4: Symbols used in Mauryan coins.

The prominent coin had the value of one pana: it was minted in a rectangular shape and was 11/16th parts silver, 1/4th part copper, and 1/16th part tin (or lead, or antimony, or iron). Coins were made in one paṇa, ½ paṇa, ¼ paṇa and 1/8 paṇa denominations. The value of a coin was proportional to its weight.Figure 6.3.4 gives a sketch of various symbols used in Mauryan coins.

The two main trade routes were the Uttarapatha and the Dakshinpatha. The Uttrapatha stretched from north-west to the Indo-Gangetic plains and on to the Bay of Bengal. The distribution of NBPW (Northern Black Polished Ware) Pottery along the entire route

suggests trade activity. Evidence has been found of materials being transferred along this route. Lapiz lazuli from Afghanistan was found in the Burdwan district of Bengal. There is also evidence of silver along the Uttarapatha. The Dakshinpathais mentioned in the arthashastra and stretches from Pataliputra to Pratisthana on the Godavari River. The Silk Road was a prominent trade route which spanned across Asia and is displayed in Figure 6.3.5.

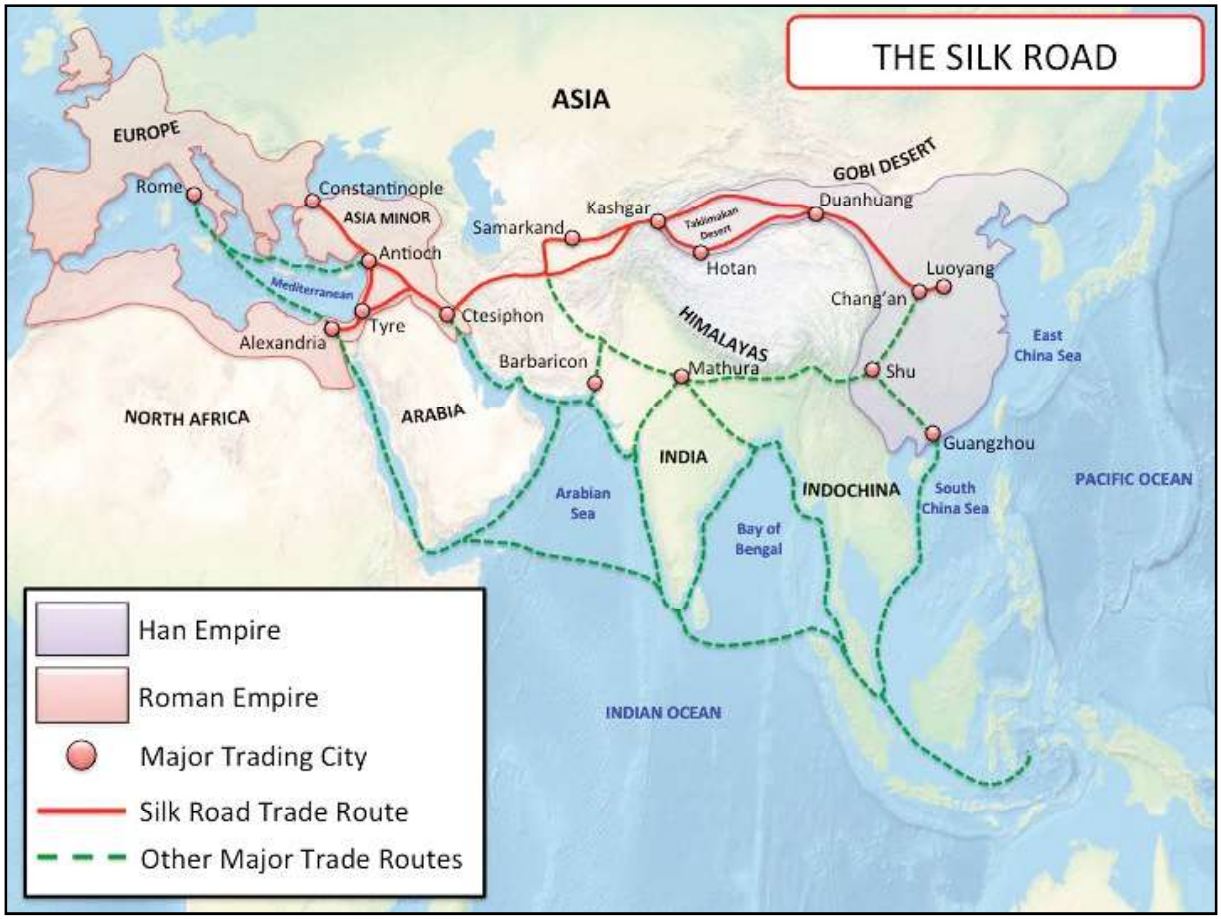


Figure6.3.5 – Trade routes India 300BCE (Wikipedia)

References:

IDC Seminar Presentation at:

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6.4 Economy and Politics: India Golden Period (200 BCE-500 CE)

Mr. Hardik Dixit

There were quite a few kingdoms across the country during this time as displayed in Figure 6.4.1

Each Kingdom had aunique style of governing.

There were examples of kingdoms supporting people of all faiths. *Khāravela* in Kalinga was a Jaina, but tolerant towards all religions. He constructed majestic rest houses for Jaina Sramanas, Brahmanical Rishis, and Buddhist *Samghayanas.*

A feature of the strong *Satavahana* empire was the presence of feudatories of different grades. The empire was marked by urban centers, royal inscriptions, and the issuance of state coins. The kingdom *(janapada*) was the highest political unit, and was divided into districts (*aharas*), and then further subdivided into villages (*grámas*)

Figure 6.4.1: Various Kingdoms of India during Golden Period

The Magadhas were the first to use elephants in warson a large scale

The famous Chola king Karikala built big irrigation channels along the river Kaveri in the South. Figure 6.4.2.

Figure 6.4.2: Kallanai dam, originally constructed in 2nd century CE.

Madurāi was the prominent port and served as the capital of the Pandya kingdom, whereas Korkai was the major trade center. The Pandyas were wealthy and prosperous.

The most important individual in district administration was the governor (nagaraka), who was responsible for preserving law and order, collecting revenue, looking after street cleanliness, troop-maintenance, secret agents and preventingfire, flood, famine, and plague.

The political system was decentralized, into regions and administrative units. Kautilya's charter (see Classical Period) was followed. Political peace was maintained through economic prosperity. Administration of justice was delegated to the king's court. The counselor acted as King's chief legal adviser. Punishment was imposed based on written law. Judicial standards were set. Judges were free, impartial, and honest.

Taxes were collected in moderation. A basic land tax called bhaga (share) was a fixed fraction of the crops produced, the highest being one sixth. Taxes were levied on livestock, dairy produce, pottery, and textiles. Trade was taxed by export and import duties.

Merchants paid road tax. A tax officer (Antapala) collected the taxes.

The Kushanas minted large quantities of gold coins (Figure 6.4.3) and low value copper coins. The Satavahana Empire produced coins of silver, copper, lead and potin. Graeco-Bactrians coins circulated around north of the Hindu Kush, and were made of gold, copper, silver, and nickel.

Figure 6.4.3 Gold coins used during the reign of Kanishka II.

Many coins were also produced by the non-monarchical states of Arjunayanas, Uddehikas, Malavas, and Yaudheyas (Figure 6.4.4). In addition, several 'city coins' were produced by individual cities such as Tripuri, Varanasi, Taxila, Ujjayini etc.

Figure 6.4.4: Copper coins of Yaudheyas, Ayodhya, and Kunidas

Agriculture was the main occupation.Co-operative irrigation was practiced. Cattle were used for plowing fields. The crops and vegetables include rice, pulses, pepper, saffron, gourds, pumpkins, sugarcane. Land was distributed among individual holdings, and was divided into cultivated lands for fruit groves, sugarcane plantations, and grazing. New towns sprang up near the coast, such as in the Godavari delta, or the ports of Broach, Cochin. The network of the 'Grand Trunk Road' (Figure 6.4.5) played a vital role in trading activities.

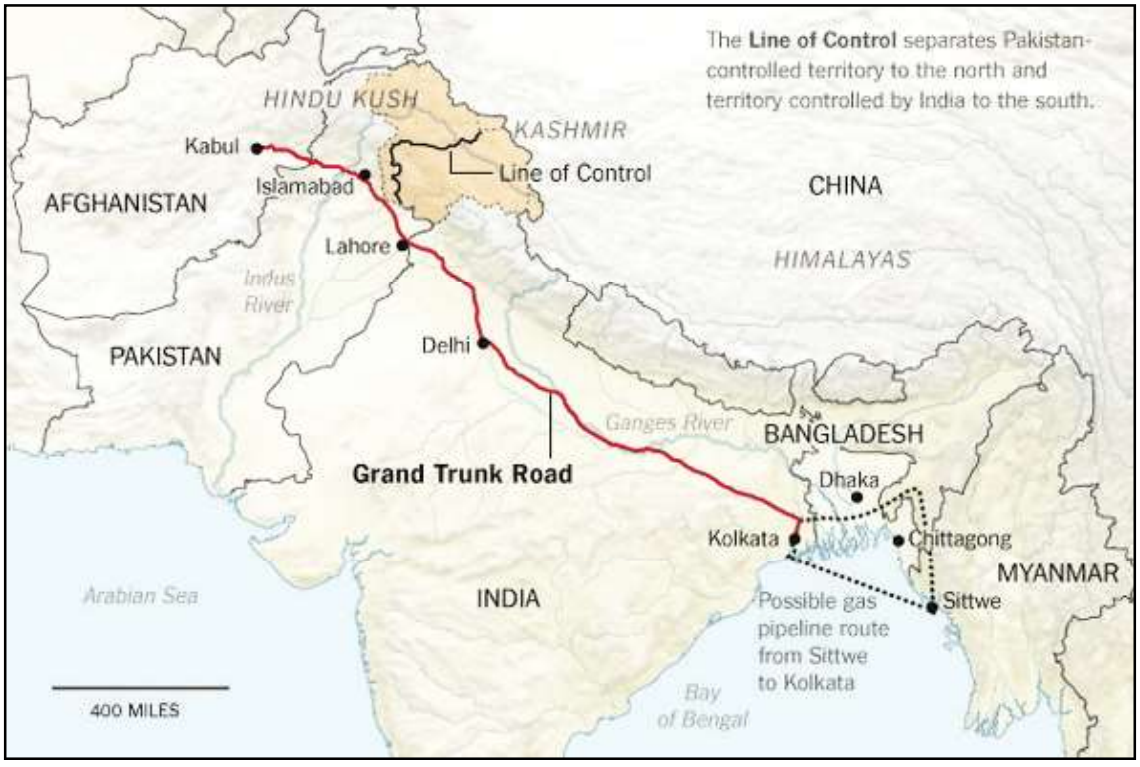

Figure 6.4.5: Grand Trunk Road 200CE (in red indicated on a modern map).

Several inscriptions across India point towards the existence of many guilds consisting of artisans such as wood workers, painters, leather workers, etc. They had relationships with the Kings and worked in alliance with the king. Guilds acted as banks where people invested money and received interest.

The markets of Puhar and Madurai traded in flowers, garlands, aromatic powders, bangles, garments etc. There was a huge maritime trade between India and other lands (Figure 6.4.6). Apart from traders, other travelers included students, professionals, teachers, and entertainers. Trade continued along the routes of Uttarapatha and Dakshinpatha (North route and south route respectively). The economy was stable, and the land was prosperous.

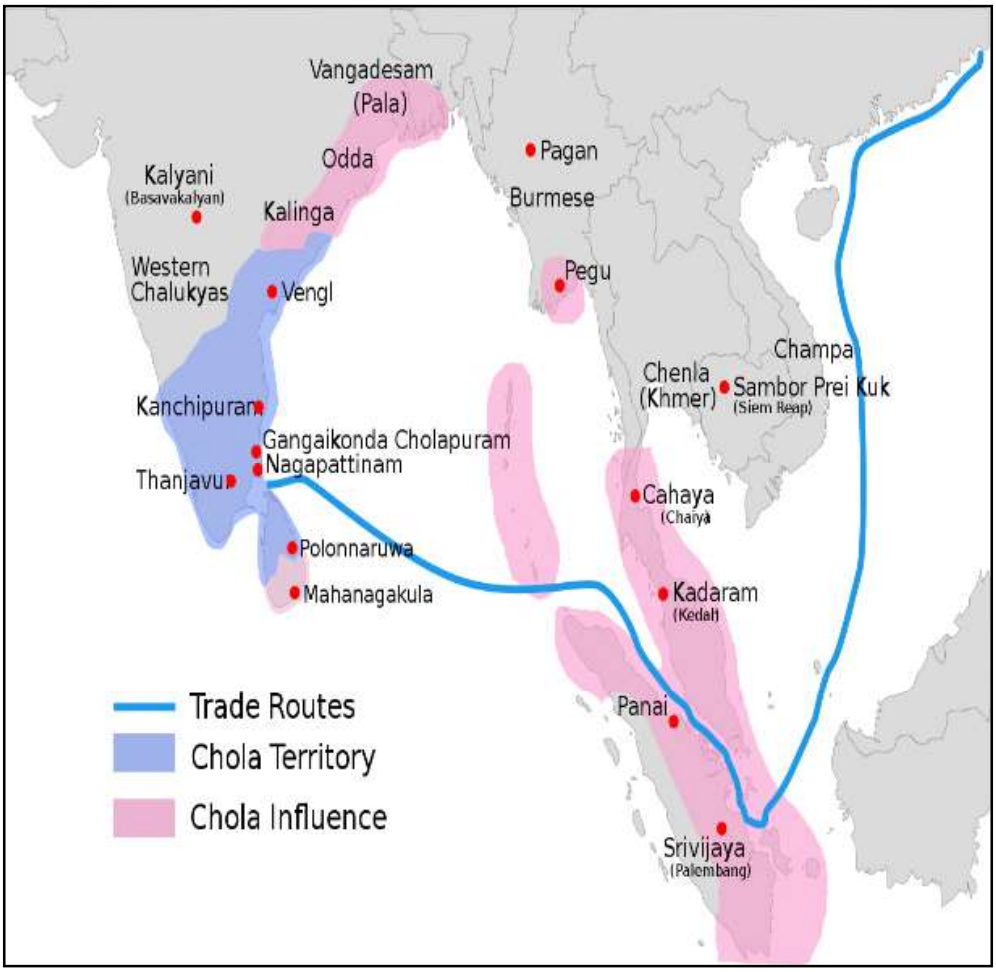

Figure 6.4.6: Chola marine trade route

The Exported items included a range of categories such as Agricultural products: Grains, sugarcane, millets, spices, tamarind;forest Products: sandalwood, rosewood, teak, medicinal herbs, ivory;metals – gold, silver, copper;marine products: pearls, corals, conch shells, and textiles, muslin, bangles. The Imported items included Arabian horses, Chinese porcelain and silk, Roman jars, and Tortoise shell from Southeast Asia.

References:

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Authored by: Ms. Bhavani Venkineni for India Discovery Center (IDC)

6.5 Economy and Politics:India Hindu Period (500 CE-1500 CE)

Mr. Hardik Dixit

India saw enormous economic prosperity during the Hindu Perioddue to export of agriculture and manufacturing surplus. Indian aromatic spices were in high demand abroad and were valued more than gold. Artwork and jewelry, both gold and silver, were popular in foreign markets.

Maritime trade prospered and reached the Mediterranean, the Arab countries, Persia, Rome, and much of Europe. India's naval shore extended from Tiz (Chabahar) in Persian Gulf to the southern point of Kanyakumari. Persian Gulf trade also flourished. Spices and pottery made their way to Indonesia. Figure 6.5.1 depicts various trading posts of India and the surrounding nations.

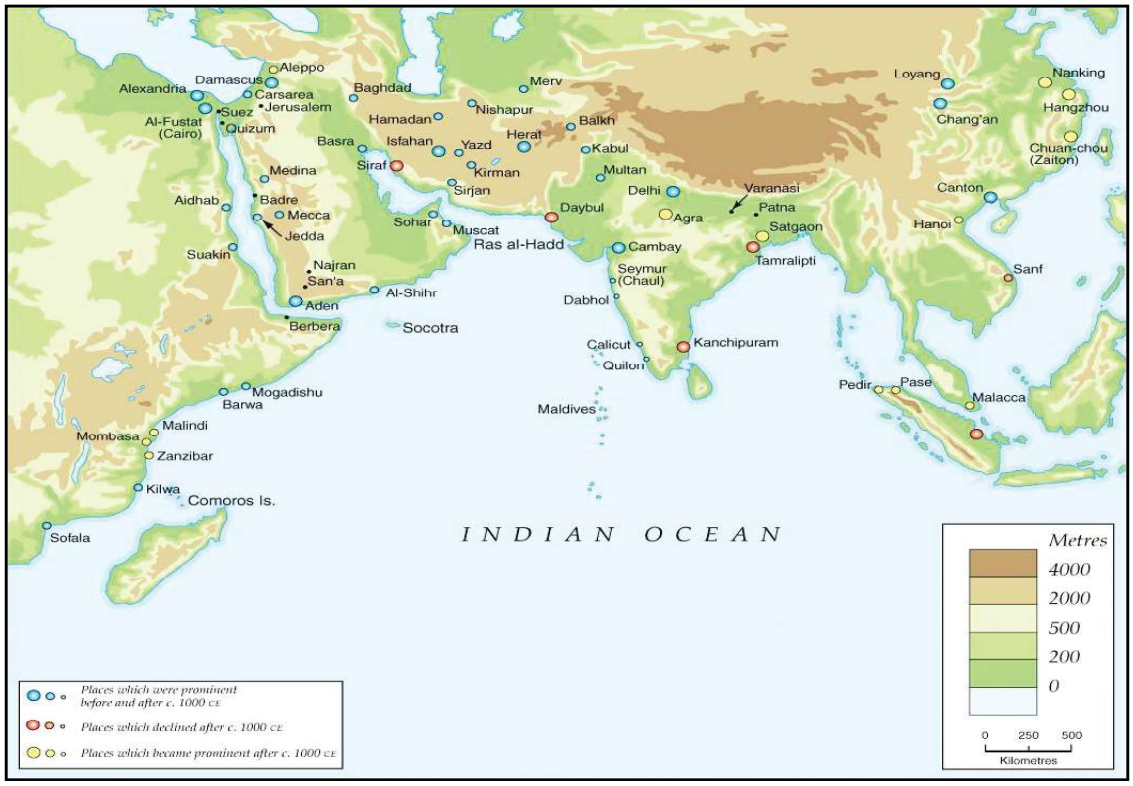

Figure 6.5.1: Trading ports of India and surrounding nations.

India imported horses from Arabia, silk from China, elephants from Myanmar and rose water from West Asia. Internal trading continued between east and west coasts. Marco Polo noted the astonishing prosperity in Gujarat.

Local makeshift marketplaces, called 'Kattas' in Bengal, developed.They played an important role in the rural economy. Various mercantile guilds thrived. *Sreni,* a group of professionals, and *Sangha,* a community of the like-minded, acted as bankers. They dealt with the kings, and collected money from the public, extending their reach as far east as Burma and Sumatra.

Universal education that spread through the Classical Period, declined sharply during the Hindu Period. Despite multiple foreign invasions, commerce continued to be enhanced, due to improved infrastructure combined with increased security. Silver and gold coins were in use. Kings built and maintained roads, ports, ships. Lavish temples were constructed that helped to improve the socio-economic activities. India's economy had a high 24.5% share of world's GDP at the onset of 15th Century (Figure 6.5.2).

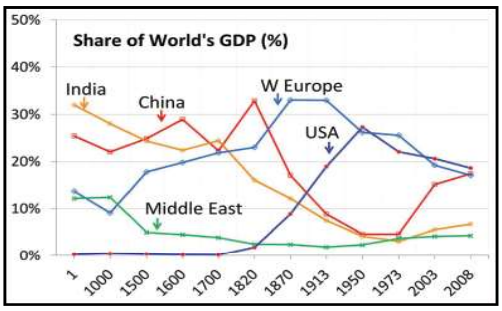

Figure 6.5.2: Angus Madison (2003). "The World Economy: Historical Statistics."

Mahmud of Ghazani (1030AD) looted the Somnath temple of Gujarat multiple times. The Vijayanagar Empireconfronted the Islamic invasions with the support of southern powers. Vijayanagar Empire maintained a huge army (Figure 6.5.3). The Empire had a strong infrastructure. It was engaged in building ships.Itgenerated revenue by taxing agricultural produce, animal husbandry, social events, and gardening. The villages had their own assembly to adjudicate cases. Efficient administration and vigorous overseas trade helped develop newer technologies.

Figure 6.5.3: Gajashaala or elephant's stable, built by the Vijayanagar rulers for their war elephants.

The Delhi Sultanate was established in 1206 by Qutub-u-din-Aibak, who enforced Islamic Sharia law. The Sultanate collected 1/6th of the produce as tax from agriculture, industry, and land ownership. People paid taxes in the form of grains, animals, cash, raw materials, and manual labor. The revenue-system supported the army, the bureaucracy, the Sultan's personal expenditure and the palaces. Figure 6.5.4 displays a few coins by the Delhi Sultanate. By 1500 CE, the Delhi-Sultanate, Lodi-Sultanate, Ahom-Kingdom, Vijayanagara-Empire, Gajapati-Empire, Deccan-Sultanates, Chitradurga-Kingdom, Garhwal-Kingdom, and Mysore-Kingdom, were in active.

Brahmins were respected by the locals.They assumed authority. They were exempt from the taxes, they benefited from agricultural land ownership. The upper classes exploited the lower ones economically and socially. The Sultan's desire to extend territory resulted in power conflicts between the Muslims and Hindus.

Figure 6.5.4: Coin from the period of Muhammad ibn Tughluq of Delhi Sultanate

Coins were prevalent and were made of several different materials. Few of these coins are displayed in Figure 6.5.5 and Figure 6.5.6.

Figure 6.5.5: Gold coins of Chola Kings.

Figure 6.5.6: Silver coins of Gurjara-Pratihara king Bhoja

Hindu temples and monasteries were powerhouses of economic activity. At times, they served as banks. Temples housed many employees including dancers, teachers, drummers, goldsmiths, and accountants. Kings, large landowners, and rich merchants donated land to the temples. Many inscriptions (figure 6.5.7) in temples within southern India describe donations made to the temples which gives an idea about wealth.

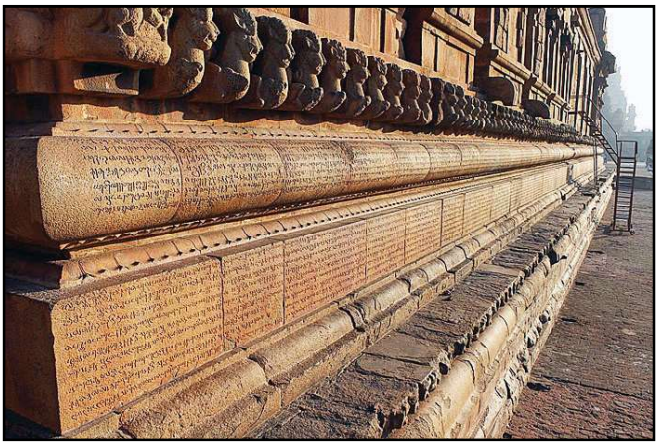

Figure 6.5.7: Inscriptions on Brihadeshwara temple

The Portuguese were the first Europeans to arrive in India by sea and conducted trade through the Portuguese state-run organization 'Casa da India'. They eventually colonized and subjugated pockets of land in western India.

Reference:

Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/hindu-period/economy-nd-politics

Authored by: Ms. Bhavani Venkineni for India Discovery Center (IDC)

6.6 Economy and Politics: India Mughal-Maratha Period (1500 CE - 1800 CE)

Mr. Hardik Dixit

The Mughals expanded on agriculture as their main source of revenue. Forests were cleared to create new farmland. Irrigation networks were created. Produce was organized, and the surplus was exported. Cotton, textile, indigo and opium were popular in foreign countries. Agra, Lahore, Fatehpur-Sikri and Banaras were new centers of trade. Urban development also created jobs.

Taxes were centrally managed, with efficiency. The Economy was around 24.5% of the world's GDP at 1500 CE. India's GDP stayed steady during the Mughal rule but declined with the fall of the Mughal rule (Figure 6.6.1).

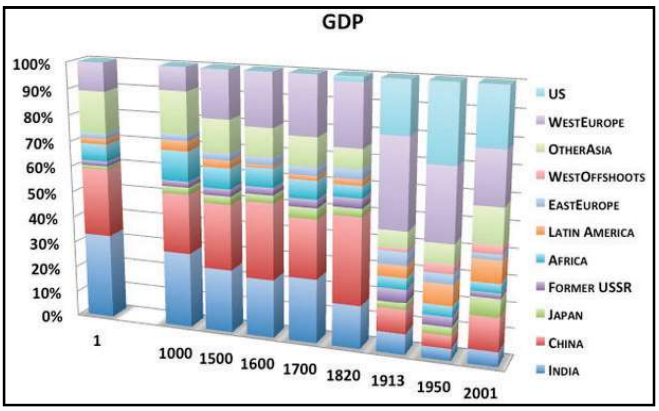

Figure 6.6.1: Share of India's GDP in the World

Through European settlements and their new warehouses, Indian goods were transported to Dutch, Portuguese, French, Danish and English communities (Figure 6.6.2). Principal imports were horses, velvets, guns, and perfumes. Surat on the western coast, and Hugli on the eastern coast of India were two major seaports that flourished during this period (Figure 6.6.3).

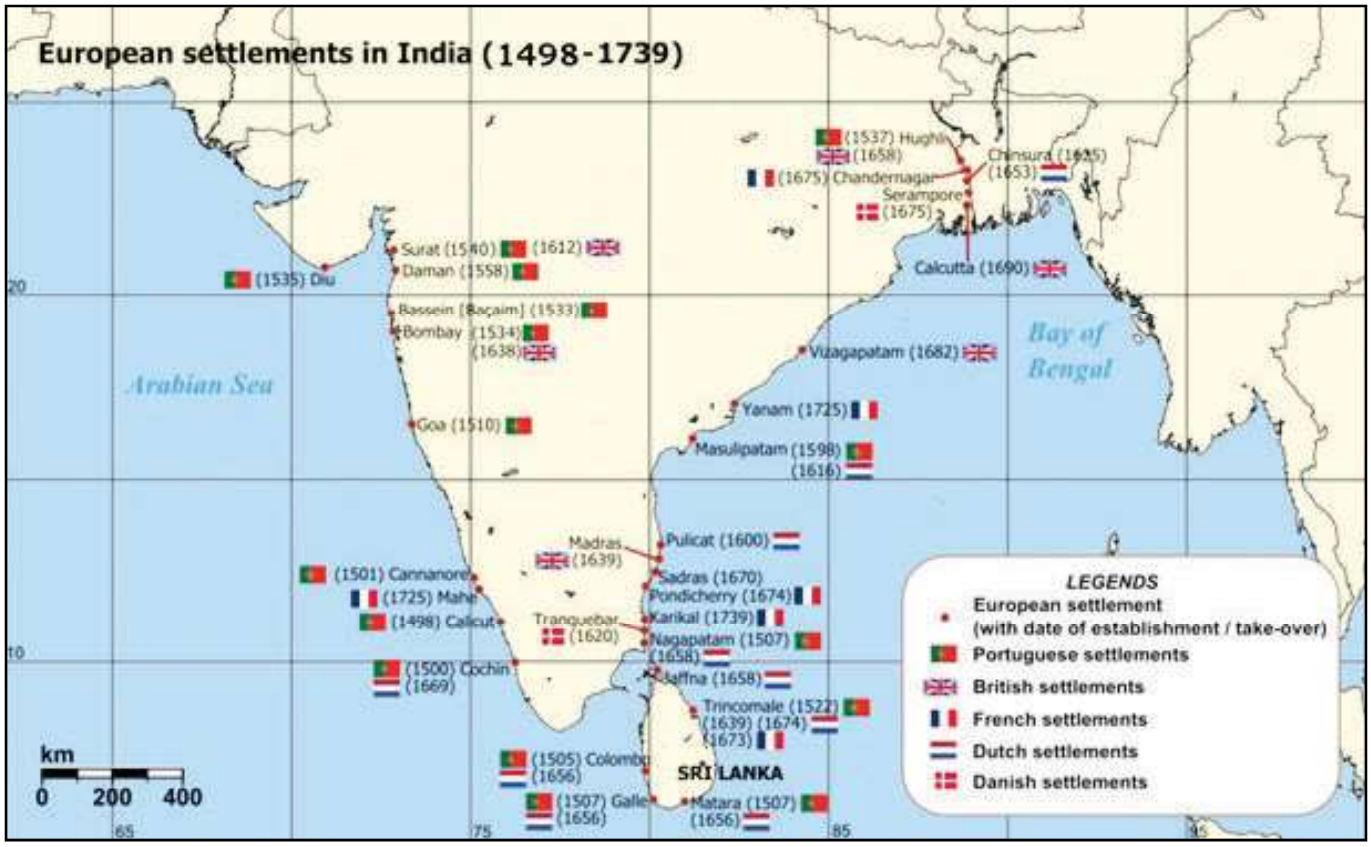

Figure 6.6.2: European settlement in India for trade

Figure 6.6.3: Surat seaport in 1690

The Mughal administrator had a governing structure with several ministerial posts. It included four principal officers: the Diwan (who performed activities of the chief minister), Mir Bakshi (who headed the military), Mir Saman (an officer responsible for making all purchases for the royal household), and Sadr (an officer in charge of religious matters). Figure 6.6.4 shows the Mughal King Akbar's assembly of ministers. The example of coins during Mughals is displayed in Figure 6.6.5.

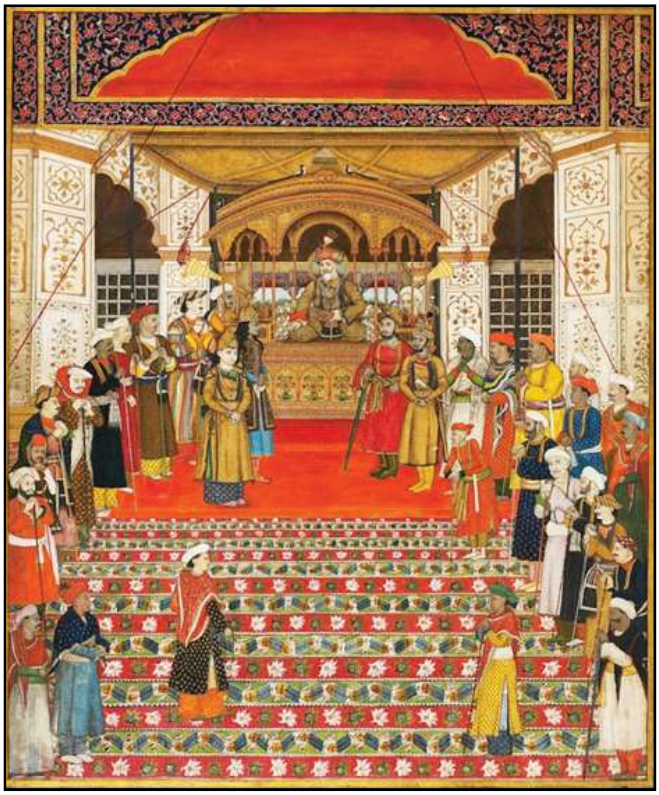

Figure 6.6.4 – Akbar's court (painting of the period), 1600 CE

Figure 6.6.5: Coins in use during the reign of Aurangzeb, 1700 CE

Emperor Akbar took advantage of the internal rivalries among the Rajput Kings and succeeded in penetrating Rajputana (current day Rajasthan). The empire expanded and reached its zenith around 1700 CE. Aurangzeb faced internal strife, and the Mughal Empire collapsed after he passed away.

Judicial courts during the Mughal Period were mostly religious, rarely secular. Cruel punishments like whipping, impalement, and execution made people fearful. The penalty of not paying taxes led to the confiscation of lands. This produced landless peasants who turned into laborers. These insecurities impacted the economy of the village.

The Maratha kingdom, founded by Shivaji (Figure 6.6.6), rose in opposition to the expansion of the Mughals. The old Vijay-Durg on the west coast was re-engineered to be a hideout of the strong Maratha Navy (Figure 6.6.7).

Figure 6.6.6: Maratha King Shivaji, 1670CE

Figure-6.6.7: Fort Vijay-Durg on the Arabian Sea.

Shivaji and the Marathas strove to grant religious freedom to all. Eight central ministers advised the king on finances and politics. Talented people were hired, irrespective of their religion and caste. Ministers were accountable and were not allowed any inheritance while in administrative office.

The kingdom was structured into provinces, which were further divided into districts and villages, headed by a "Mamlatdar," and a "Deshpande" or "Patel," respectively. Judiciary was conducted by the village panchayats. Difficult cases were presented to the king.

The Marathas collected two taxes. (i) *Chauth* which was one fourth of the farm income, and (ii) *Sardeshmukhi*, a 10% levy to the king. Land was measured, and produce was estimated to calculate the tax. Cultivators paid roughly 35% of their revenue as tax.

The Ryotwari system was established whereby tax was collected directly from the farmers. In case of famine, the state offered loans to peasants.

During this period, many foreign countries established their trading centers in India. The British East India company started trading on a large scale, and Britain gradually emerged as a dominant player on the Indian subcontinent.

Reference:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/mughal-maratha-period/economy-and-politics

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6.7 Economy and Politics: India British Period (1800 CE – 1947CE)

Mr. Hardik Dixit

The Britishers came as traders. The trade centers expanded and they encroached into administration and taxation. Agriculture was commercialized through middlemen. The installation of the railways helped in transporting goods to the ports. India's grains and raw materials were "drained" in London. A quarter of the government of India's revenue was spent on these procurements and shipping. Remainder of the revenue was used for administrative extravagance, exorbitant salaries for the officers and in military adventures.

India accounted for around 24% of world GDP in 1750 CE. By the end of the British period in 1947, India's fraction of world GDP was a paltry 4%. One can visualize the drain of resources by following the orange rendering in the picture below (Figure 6.7.1).

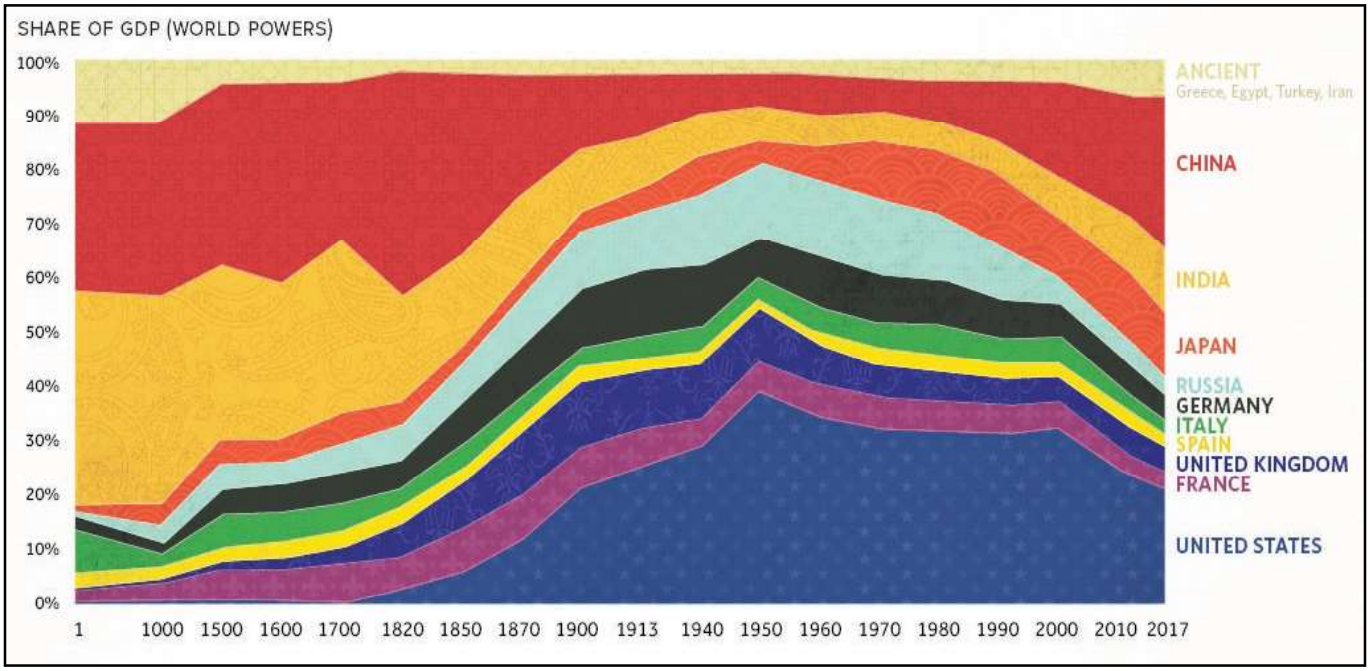

Figure 6.7.1: Graphical chart of World GDP percentage share among principal nations

The Moghul type Ryotwari tax collection system continued where a farmer directly paid revenue to a government agent. The fraction was negotiated with a view to the weather and crop-yield called "settlement". In large chunks of land, a new class of local strongmen called Zamindars developed. The zamindarpaid a fixedquota to the government andhad the option of transferring the land ownership towhoever he chose. These zamindars exploited the cultivators. Land revenue reforms resulted in widespread famines, thus causing massive loss of lives. Millions, in some areas one third of the population,perished in famines between 1850 CEand1900 CE. A map of the utter disorganization of the revenue system is given in Figure 6.7.2.

The British Industrial revolution resulted in weakening of Industrial strength in India. India's share of global industrial output declined from 25% in 1750 down to 2% in 1900. At the same time, the United Kingdom's share of industrial output rose from 2.9% in 1700 up to 9% in 1870. Britain replaced India as the world's largest textile manufacturer in the 19th century. In 1826, the British took over the Assam region from Ahom kings. The British East India company established the first tea garden in 1837. A memento is reproduced in Figure 7.5.3.

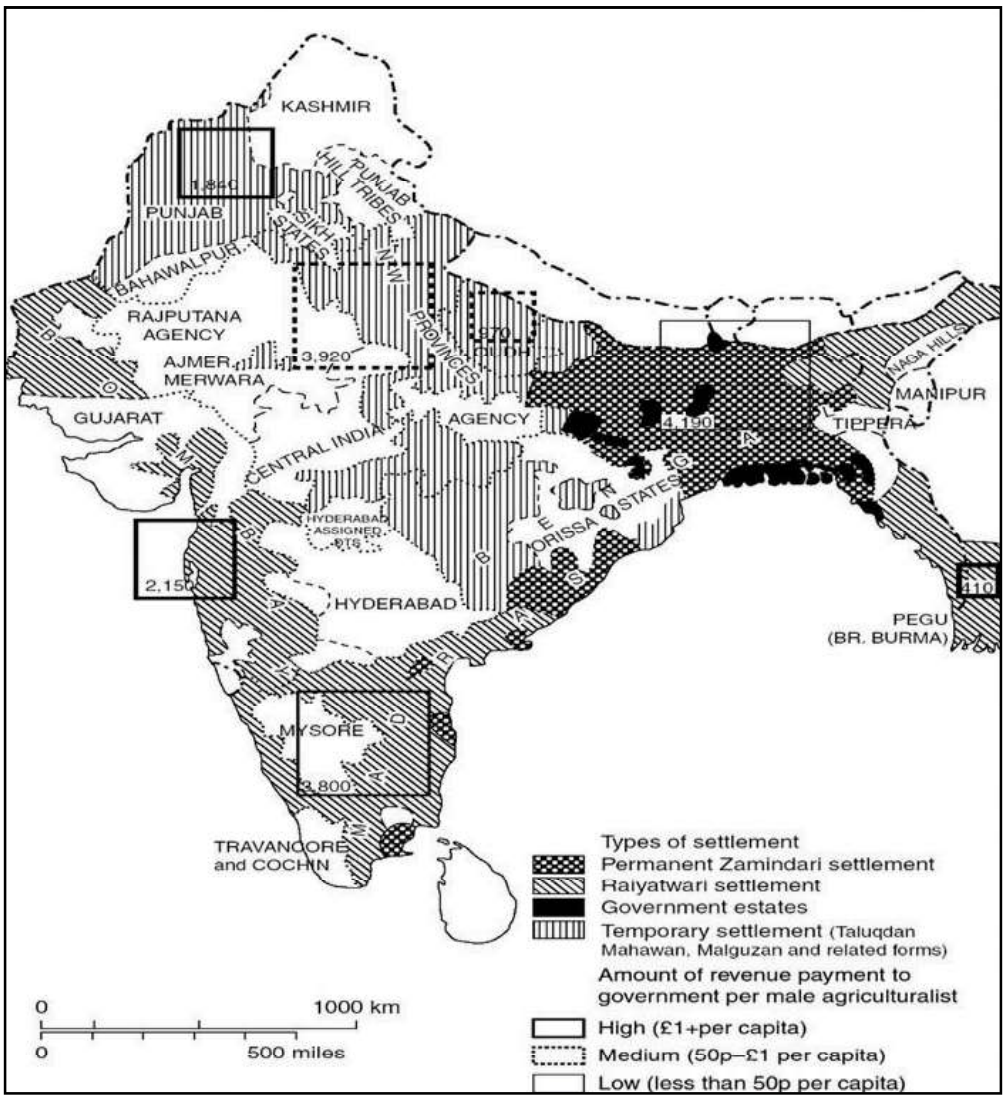

Figure 6.7.2: British Land Revenue Systems across India.

Figure 6.7.3: British East India Company label for Tea Price

The Sepoy Mutiny of 1857 is considered the first rebellion by the Indians against British rule. The Mutiny resulted in the administration being transferred from the East India Company to the British Parliament. Eventually Queen Victoria was crownedas the empress of India in 1877 though she did not personally visit (Figure 6.7.4). India was ruled as two divisions, (i) British India, where the British rules were applied, (ii) Princely states, which were autonomous under the overall supervision of the Crown. The leaders of the Princely states mostly sided with the British for their own protection.

Indian National Congress as a political party was formed in 1885 to vent the grievances of Indian people against the British rulers. Eventually an extremist group called *swadeshi* emerged who wanted to boycott British goods and to promote native goods in all

levels. Bengal was divided into East and west in 1905 on religious lines, leading to the founding of All India Muslim League in 1906.

Figure 6.7.4: Queen Victoria receiving India, 1877
(Oil portrait, Library of Congress)

Mohandas Gandhi, an English-trained Barrister, returned to India from South Africa in 1915. He had tried out a method of passive resistance called *Satyagraha* through his work in South Africa. His principle was to cause civil disobedience against the "unjust" laws. He had strong principles not to resort to violence. Gandhi could mobilize the country in *Satyagraha* through his famous Dandi March in an agitation to repeal the Salt Tax levied by the British (Figure 6.7.5)

Figure 6.7.5: Salt March led by Gandhi, 1930

The first general elections in India were held in 1937 with about ten percent participation. The National Congress won plurality in eight States and the Muslim League in three. The British went to war with Germany in 1941 and enlisted the Indian Army alongwith it. Gandhi called for the British ouster through the massive Quit India movement of 1942.

The Muslim League leader Mohammed Ali Jinnah demanded a separate country on religious grounds claiming cultural inhomogeneity. Pakistan was carved out from India in two parts, in the west and in the east. Both countries were declared free together on August 14/15 of 1947. Large trains ferried people across the boundaries for months (Figure 6). There was massive loss of life and property. The six hundred princely states merged with the Indian union in 1948, some voluntarily, some by force.

Figure 6.7.6: Panicked people overload trains to across the border to India, 1947

References:

IDC Seminar Presentation at:

https://www.indiadiscoverycenter.org/seminars/british-period/economy-and-politics

Authored by: Ms. Bhavani Venkineni for India Discovery Center (IDC)

References - Economy and Politics

1. A History of Ancient and Early Medieval India: From the Stone Age to the 12th Century (PB) Paperback – (2009) by Upinder Singh (Author)
2. A Wonder that was India – A. L. Basham 1954
3. Angus Madison (2003). "The World Economy: Historical Statistics". - https://www.oecd-ilibrary.org/development/the-world-economy_9789264104143-en
4. Economic history of Bengal (400-1200 A.D.), By: Kamrunesa Islam, Thesis presented at University of London, 1966; https://eprints.soas.ac.uk/29147/1/10731242.pdf
5. Evolution of the World Economy, Precious Metals and India https://eh.net/book_reviews/evolution-of-the-world-economy-precious-metals-and-india/
6. How the princely states, used by Britain to consolidate its empire, faded into obscurity
7. IMPACT OF BRITISH RULE ON INDIA: ECONOMIC, SOCIAL AND CULTURAL (1757-1857)
8. India A History by John Keay, Publisher: Grove Press, Year: 2011, ISBN 9780802195500
9. India as Known to Panini – V.S. Agrawala. 1953, University of Lucknow.
10. Kautilya – The True Founder of Economics – Balbir Singh Sihag, 2014
11. Ramakrishna Mission - Institute of Culture, Calcutta
12. RigVeda, YajurVeda, AtharvaVeda
13. Tahqiq-i-Hind (1000CE), By: Al-Bīrūnī
14. The cultural heritage of India, Volume II, Ramakrishna Mission - Institute of Culture, Calcutta

Internet – (Generally available)

1. Gajashala – By Shashikantha521 - Ownwork,CCBY-SA3.0, https://commons.wikimedia.org/w/index.php?curid=21336984
2. Government of the Raj 1858-1914 - https://www.parliament.uk/about/living-heritage/evolutionofparliament/legislativescrutiny/parliament-and-empire/parliament-and-the-american-colonies-before-1765/government-of-the-raj-1858-1914/
3. Government of the Raj 1858-1914 - https://www.parliament.uk/about/living-heritage/evolutionofparliament/legislativescrutiny/parliament-and-empire/parliament-and-the-american-colonies-before-1765/government-of-the-raj-1858-1914/
4. How the East India Company Became the World's Most Powerful Monopoly: https://www.history.com/news/east-india-company-england-trade#:~:text=In%201784%2C%20the%20British%20Parliament,Company's%20land%20holdings%20in%20India.
5. How the East India Company Became the World's Most Powerful Monopoly: https://www.history.com/news/east-india-company-england-trade#:~:text=In%201784%2C%20the%20British%20Parliament,Company's%20land%20holdings%20in%20India.
6. https://eprints.soas.ac.uk/29147/1/10731242.pdf
7. https://peppertrail.com/brihadisvara-temple-a-treasure-trove-of-culinary-inscriptions/
8. https://scroll.in/article/1036979/how-the-princely-states-used-by-britain-to-consolidate-its-empire-faded-into-obscurity
9. https://www.ancient-civilizations.com/chola-dynasty/

10. https://www.britannica.com/place/Delhi-sultanate

11. https://www.nios.ac.in/media/documents/SecSocSciCour/English/Lesson-05.pdf

12. https://www.oecd-ilibrary.org/development/the-world-economy_9789264104143-en

13. https://www.theatlantic.com/business/archive/2012/06/the-economic-history-of-the-last-2000-years-part-iii/258877/

14. https://www.visualcapitalist.com/2000-years-economic-history-one-chart/

15. Queen Victoria Receiving India - https://www.historyextra.com/period/victorian/victoria-rise-of-an-empress/

16. Salt March – Gandhi - By Yann (talk) - Scanned by Yann (talk)., Public Domain, https://commons.wikimedia.org/w/index.php?curid=138627

17. Tea exports - https://clairepetras.com/eic/

18. Trains from Pakistan to India, 1947 - https://www.npr.org/sections/parallels/2017/08/13/542803259/giving-voice-to-memories-from-1947-partition-and-the-birth-of-india-and-pakistan

19. Various Land Revenue Systems during British - https://brainly.in/question/11640251

20. Image 6.3.1 – World History Encyclopedia - https://www.worldhistory.org/Mauryan_Empire/

21. Simeon Netchev - https://www.worldhistory.org/image/15895/the-mauryan-empire-c-321---185-bce/

"This is indeed India! the land of dreams and romance, of fabulous wealth and fabulous poverty, of splendor and rags, of palaces and hovels, of famine and pestilence, of genii and giants and Aladdin lamps, of tigers and elephants, the cobra and the jungle, the country of a hundred nations and a hundred tongues, of a thousand religions and two million gods, cradle of the human race, birthplace of human speech, mother of history, grandmother of legend, great-grandmother of tradition, whose yesterdays bear date with the moldering antiquities of the rest of the nations—the one sole country under the sun that is endowed with an imperishable interest for alien prince and alien peasant, for lettered and ignorant, wise and fool, rich and poor, bond and free, the one land that all men desire to see, and having seen once, by even a glimpse, would not give that glimpse for the shows of all the rest of the globe combined."

Mark Twain, author,

January 20, 1896, Bombay, India

"A Journey around the Equator" – Chapter XXXVIII

"India was the motherland of our raceand Sanskrit the mother of Europe's languages.India was the mother of our philosophy,of much of our mathematics, of the ideals embodied inChristianity... of self-government and democracy.In many ways, Mother India is the mother of us all."

Will Durrant, historian,

1931, "The Case for India", Chapter II, A Perspective on India

Saṁgacchadhvaṁsaṁvadadhvaṁsaṁvomanáṁsijánatám,

Let us walk together, let our voices come together, let us know our minds together.

Rg Veda, Chapter X, Hymn 191

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