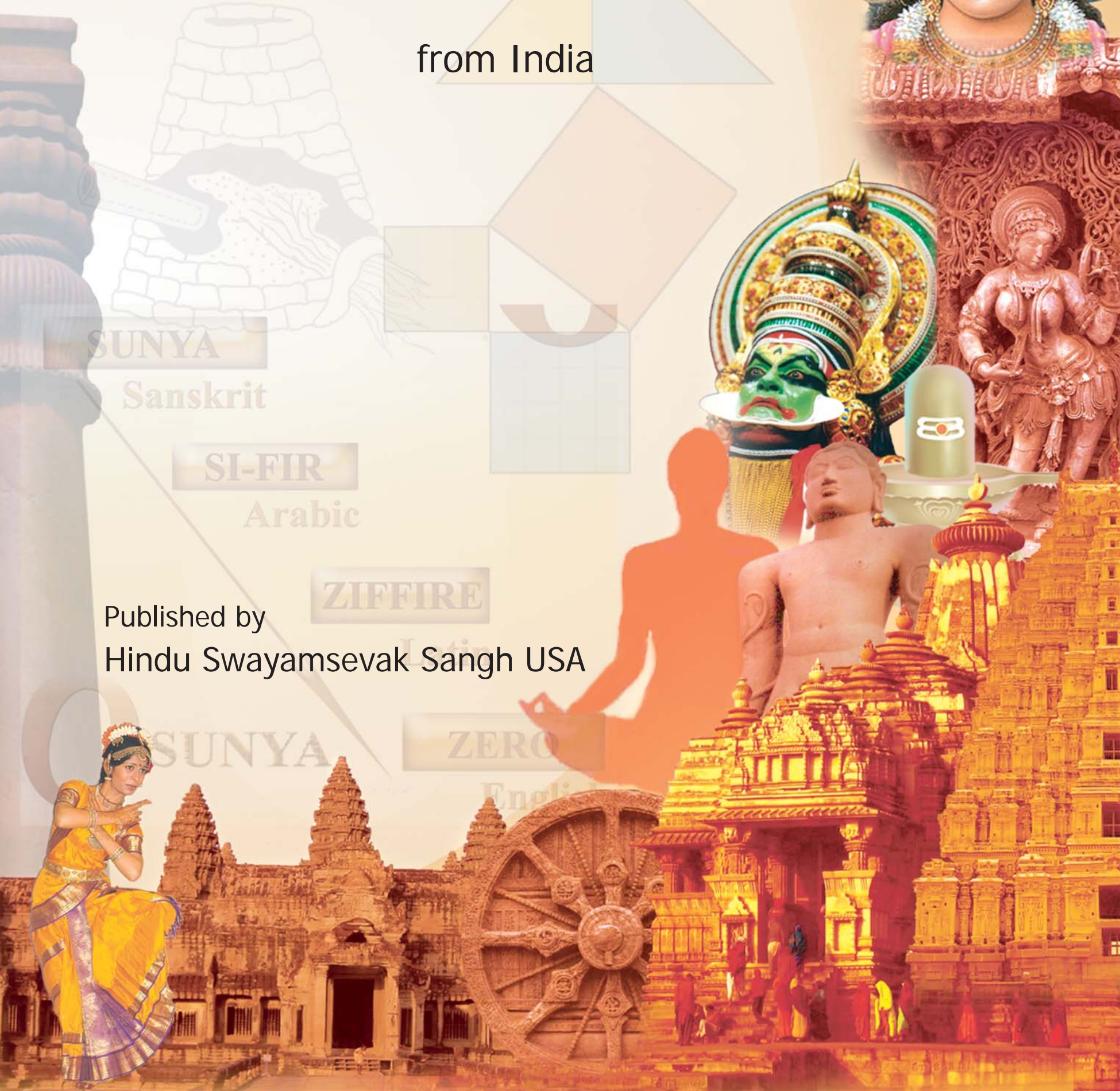


Hindu Culture and Dharmic Traditions from India



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Published by
Hindu Swayamsevak Sangh USA

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Hindu Culture

and

Dharmic Traditions

from India

Publisher: Hindu Swayamsevak Sangh, USA

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Regd. Office: 121 HAWTHORNE CT, ROCKAWAY, NJ 07866

<http://www.hssus.org> email: exhibition@hssus.org

Team

Concept, content and design

Khanderao Kand

Coordinator

Manisha Kand

Graphics Design

Mandar Bankhele

Anupam Shekhawat

Uday Nayak

Manisha Kand

Shubhangi Kadhe

Tejas Rane

Vijay Simha

Editors

Rajasekhar Kuppa

Nandini Kuppa

Dr. Govinda Rao

Jayadeep Unni

Content Team

Saumitra Gokhale

Dhanashree Kulkarni

Harish Kandapal

Makarand Kashikar

Logistics Coordinator

Ramesh Subramaniam, India

Illustrations

Rekha Joshi

Advisors

Dr. David Frawley

Prof. Shiva Bajpai

A Tribute to Shri Guruji

This book is our humble tribute to Shree Madhav Sadashiv Golwalkar (Guruji), a saint, philosopher, social reformer and organizer on his birth centenary. Shri Guruji was initiated in the path of spiritual realization by Swami Akhandananda. Subsequently Shri Guruji joined Dr. K. B. Hedgewar on a dedicated path of India's national upliftment. His vision, motivation and affection inspired thousands of people to dedicate their lives in the service of India and Hindu Dharma. He united all Dharmacharyas to proclaim that untouchability has no place according to Hindu Shastras (scriptures). During his 33 years as Sarasanghachalak of Rashtriya Swayamsevak Sangh (RSS), he inspired the founding of Vanavasi Kalyan Ashram to serve our sisters and brothers in tribal areas, and encouraged many leaders to start organizations such as Vishwa Hindu Parishad (religious field), Akhila Bharatiya Vidyarthi Parishad (student field), Bharatiya Mazdoor Sangh (labor field), Sewa Bharati (service field) and Vidya Bharati (education).



SHRI GURUJI (1906 - 1973)



with Chinmayanand ji



with Dr. Hedgewar



with Field Marshal Cariappa



with President Radhakrishnan



with Saints



with Ram Manohar Lohia



with Veer Savarkar

Preface

India's ascendance as a global economic and political power is currently being acknowledged by everyone. The profound and gloriously rich ancient cultural Hindu heritage, however, still remains a mystery to many in the West, although several Hindu concepts and terms such as karma, yoga, ayurveda, pundit, and mantra have gained currency as part of the everyday vocabulary.

In order to provide an accurate portrayal of the rich Hindu cultural heritage, which is not properly appreciated, Hindu Swayamsevak Sangh, USA, (HSS) has undertaken the initiative to create an exhibition which is being hosted by several universities, libraries, temples and city halls across the U. S. This special exhibition is a resplendent portrayal of India's glorious past. This booklet is a catalog of the exhibition. It shows the amazing temples where Hindus worship God through icons or deities and which serve as centers of religious, cultural and social activities. The magnificent monuments are manifestations of the unique architectural principles based on Hindu scripture called Vastu Shastra. The exhibition strikingly presents Hindu Dharma and various dharmic traditions such as Jainism, Buddhism, Sikhism and two of the special contributions of Hindus to humanity - yoga and ayurveda (science of life). It vividly depicts how Hindus consider service to humanity as equivalent to service to God.

The exhibition reminds us that significant progress was made by Hindus in astronomy and in mathematics, as zero, the decimal system, and various concepts in trigonometry and calculus are substantial contributions of Hindus, and that in chemistry, metallurgy, and medical sciences too, Hindus have made enormous advances. The marine compass is also said to be based on an ancient Hindu technique. Many of these facts are not very well known.

The exhibition unfolds historical events showing that Hindus did not confine their cultural heritage within India, but generously shared it with India's neighbors as evidenced by the Angkor Wat Temple in Cambodia and several temples in Bali, Indonesia, for example.

I hope you will appreciate the value of this experience.

Prof. Ved P. Nanda, Vice Provost and John Evans University Professor, University of Denver and Thompson G. Marsh Professor and Director, International Legal Studies Program, University of Denver Sturm College of Law.

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Namaste

I bow to the divinity within you

Hindu Culture and Dharmic Traditions of India

Hindu Culture

Hindu civilization is one of the most ancient civilizations of the world. It has its roots in the sacred Hindu scriptures called the *Vedas* revealed to the great sages much more than 6000 years ago. Over the millennia the Hindu culture evolved philosophies, religions, science, art, architecture etc., contributing to almost every imaginable field of human endeavor. This exhibition is a bird's eye view of the vast Hindu cultural heritage.

Dharmic Traditions

Dharma is the natural, eternal and universal law that maintains the cosmic as well as the social order.

Human Dharma comprises the duties of an individual towards family, society, humanity and the environment.

The eternal principles of Dharma form the basis of the philosophies, beliefs and practices that originated in India, such as Hinduism, Buddhism, Jainism and Sikhism.

This exhibition also provides an overview of the Dharmic Traditions of India that are amongst major world religions.

Mark Twain: India is Land of religions, cradle of human race, birthplace of human speech, grandmother of legend, great grandmother of tradition.

Mahatma Gandhi: I think I have understood Hinduism correctly when I say that it is eternal, all-embracing and flexible enough to suit all situations.

Sir Vidiadhar Surajprasad Naipaul: The key Hindu concept of Dharma - the righteous way is an elastic concept. At its noblest it combines self-fulfillment and Truth to the Self with the ideas of action as duty.

नमस्ते

ॐ असतोमा सद्गमय तमसोमा ज्योतिर्गमय मृत्योर्मा अमृते गमय ॥

Lead me from untruth to truth
From darkness to light
From death to immortality
May there be peace everywhere

Let noble thoughts come
from all sides.

Entire universe is one
family.

आनो भद्राः कर्तव्या यन्तु विश्वतः वसुधैव कुटुम्बकम्



Hinduism

Eternal, Essential Hinduism

Hinduism or Hindu Dharma is known as 'Sanatan Dharma' (Eternal Tradition) by its followers. It is the world's third largest religion and one out of every six people on Earth is a Hindu. Hinduism, the world's oldest religion, has no beginning - it predates recorded history. Hinduism is credited for the original creation of concepts and practices as Yoga, Ayurveda, Vastu, Karma, Ahimsa, Vedanta, etc. Hinduism has no human founder.

ETERNAL TRUTH - SANATANA DHARMA:

Hindu Dharma, the world's oldest tradition, is Universal in its outlook. Its source, the Vedas, is the collective wisdom of saints and sages in the quest of Truth.

ONE GOD (SUPREME CONSCIOUSNESS) MANIFESTING IN MANY FORMS:

Hindus believe in a one, all-pervasive Supreme Being (Brahman) who is both immanent and transcendent, both Creator and Unmanifest Reality

DIVINE CONSCIOUSNESS EVERYWHERE:

ईशावास्यमिदं सर्वं यत्किञ्च जगत्यां जगत् . - Divine consciousness permeates all matter in the Universe

A CYCLICAL UNIVERSE:

From the Hindu perspective, all processes in the Universe are cyclical "Divine being, like a sea, surges upward in a wave of creation, then subsides again into its own nature. Waves of universe rise incessantly, in infinite numbers, one after another." - Yoga Vasishtha 2:19

RECEPTIVE TO KNOWLEDGE

"Let noble thoughts come to me from all directions"

ESSENCE OF HINDU DHARMA

Dhriti (fortitude, patience) in sadhana (life governed by spiritual practice), guided by damah (self-control) and indriya nigraha (sense control) leads to realization of satya (eternal truths).

PRAYERS FOR THE WELL BEING OF ALL.

"sarvepi sukinah santu"

HARMONY AT ALL LEVELS OF EXISTENCE

Perfecting the individual, then family, then society, then the Universe itself

SECTS: There are four main denominations: Saivism, Saktism, Vaishnavism and Smartism.

It accepts all genuine spiritual paths - from pure monism (God alone exists) to theistic dualism (When shall I know His Grace?). Each soul is free to find his own way, whether by devotion, austerity, meditation (yoga) or selfless service.

Stress is placed on temple worship, scripture and the guru-disciple tradition. Festivals, pilgrimage, chanting of holy hymns and home worship are dynamic practices. Love, non-violence, good conduct and the law of dharma define the Hindu path. Hinduism explains that the soul reincarnates until all accumulated karma are resolved and God Realization is attained.



शून्य



Ten Commitments

YAMA



Ahimsa
Do not harm



Satya
Do not lie



Asteya
Do not steal



Hindu Way of Living

The Goal & the Path

The Hindu way of living synthesizes both spirituality and materialism. This practical view is based on both an understanding of human desires and the ultimate reality that the body is transient. We must enjoy, but we should renounce, as we shall go. The Hindu view provides a purpose, a path and a plan for the journey of life. This plan is sufficiently broad to accommodate the individuality and happiness for everyone. The path has a destination (liberation), four stages, direction (*Samskars*), and marks and warnings (*Yama - Niyama*).

Prosper and enjoy within the boundaries of Dharma and Moksha

Four pillars (goals) of human life

1. *Dharma*: Selflessly and properly performing duties of the role
2. *Artha*: Prospering materially and being successful
3. *Kama*: Fulfilling desires as appropriate to the stage of life
4. *Moksha*: Liberation (self-realization)



The four cornerstones are based on the simple principle that one should follow duties in righteous way, enjoy life without getting attached to the objects of pleasure and always keeping in mind the ultimate purpose in life.

Four stages (*Ashrama Dharma*)

Brahmacharya

Do not overindulge

Brahmacharya
Student Life

Sanyasa
Letting go

A life plan for fulfillment of life. According to Hindu thought, life is divided into four logical stages called *Ashramas*.



1. *Brahmacharya*: Student life Learning from Gurus with inquisitiveness, service and discipline.
2. *Grihastha*: Family as a base of society. Taking care of the needs of students, parents, and engaging in charitable activities.
3. *Vanaprastha*: Retiring from family attachments, but still being an important asset to the society, for intensive spiritual practice, social service and passing experiences of life to the younger generation.
4. *Sanyasa*: Letting go. This is the preparation for ultimate liberation. Pilgrimage and austerity are the characteristics of this phase of life. Reach the goal yet live fully and joyously.

Aparigraha
Don't be greedy



NIYAMA



Santosh
Be Content



Shaucha
Keep it clean



Tapas
Self-discipline
austerity



Swadhyaya
Self-study.



Ishvara Pranidhana
Surrender to God

Images courtesy:
Hinduism Today(HA)
Nirmitee Arts (CA)

Sixteen Samskaras (Impressions)

A process of creating permanent positive mental impression is called "Samskar". There are 16 rituals known as samskars. Most commonly followed are *Namakaranam* (naming), *Annaprashan* (first consumption of solid food), *Chudakarma* (head shaving), *Karnabheda* (ear piercing), *Vedarambha* (formal education), *Vivaha* (marriage), and *antyeshti* (last rites).



Five aspects of life (*mahayagnas*) that need to be supported on an ongoing basis

- Deva Yagna* Worship of God
- Pitri Yagna* Remember ancestors / departed souls
- Brahma Yagna* Study and reflect on knowledge
- Athithi Yagna* Respect fellow beings
- Bhoot Yagna* Feed creatures as a symbol to respect Mother Nature

Three Rina (Debts) to fulfill

- Pitrarina* (to family) Offerings and perpetuating one's family line by having children
- Samajrina* (to society) Selfless service
- Devarina* (to God) Religious rituals and reflection on scriptures for God realization

Consequence of uncontrolled desires:

Desires for sense objects come from attachment to sense objects, and anger arises from unfulfilled desires, delusion comes from such activities, and the mind becomes bewildered thus losing the sense of reasoning. With the loss of reasoning comes complete ruin.

Bhagawad Gita 2.61.63

The six foes or weaknesses to overcome: Attachment, pride, anger, envy, passion and greed.

Respecting divinity in others

Respecting others especially elders is a part of the culture.

मातृदेवो भव । पितृदेवो भव ।
आचार्य देवो भव । अतिथि देवो भव ।

Treat your mother, father, teacher and guest as God.

Welcoming guest

Respecting parents



Honoring teachers HSS, CA





Cosmic Rhythm

Cosmic Dance symbolizes creation and destruction cycle of universe

Dr. Carl Sagan, the famous astronomer said, "The most elegant and sublime of Hindu ideas is a representation of the creation of the universe at the beginning of each cosmic cycle, a motif known as the Cosmic dance of Shiva."

Dance of subatomic particles

Dr. Fritjof Capra noted the parallel between Shiva's dance and the dance of subatomic particles as "for modern physicists, Shiva's dance is the dance of subatomic particles".

At CERN, the European Center for Research in Particle Physics in Geneva, there is a 2 meter tall statue of Dancing Shiva.

Ananda K. Coomaraswamy, the famous Indian art historian: "It is the clearest image of the activity of God which any art or religion can boast of"

Hindu Units for Time from 34,000th of a second to 8.64 Billion Years

1	Krati	34000 th of a second
1	Truti	300th of a second
2	Truti	Luva
30	Luva	1 Kshana
60	Kshana	1 Vipala
60	Vipala	1 Pala
60	Pala	1 Ghadi (24 min)
2.5	Ghadi	1 Hora (1 hour)
24	Hora	1 Divas (1 day)
7	Divas (days)	1 Saptah (week)
4	Saptah	1 Masa (1 month)
2	Masa	1 Rutu (season)
6	Rutu	1 Vasha (year)
100	Varsha	1 Shatabda (1 century)
10	Shatabda	1 Sahasrabda
432	Sahasrabda	1 Yuga (Kaliyug)
2	Yuga	1 Dwaparyuga
3	Yuga	1 Treta Yuga
4	Yuga	1 Kruta Yuga
10	Yuga	1 Mahayuga (4,320,000 years)
1000	Mahayuga	1 Kalpa
1	Kalpa	4.32 billion years
2	Kalpa	One Brahma day (cycle)

Cyclic and Eternal Time

According to Hindu scriptures, the flow of Time is cyclic and eternal. Creation (big bang) is a manifestation in concrete terms of the Absolute. Annihilation (Dissolution-big crunch) is when the entire created universe merges in the Absolute. These are the days and nights, 4.32 billion years each, of Brahma.

Age of Universe.

According to Carl Sagan, "The Hindu religion is the only one of the world's great faiths dedicated to the idea that the Cosmos itself undergoes an immense, indeed an infinite, number of deaths and rebirths. It is the only religion in which the time scales correspond to those of modern scientific cosmology. Its cycle run from our ordinary day and night to a day and night of Brahma, 8.64 billion years long, longer than the age of the Earth or the Sun and about half the time since the Big Bang".

Comparison with modern research

Current research estimates Earth's age as 4.5 billion years while that of the Universe's as between 13 billion to 14 billion years.

Madeleine Biardeau in 'The Anthropology of Civilization', has compared the cyclic time in the West is associated with the idea of cosmology governed by movements of the stars, in Hinduism it is linked to the idea of creation and reabsorption of the world, the process which is endlessly repeated.

Trimurti: God fulfilling three different roles is often depicted as three in one.

Concept of God

One Supreme Reality: Ishwara, Bhagawan, Sat-Chit-Ananda (absolute existence, absolute consciousness and absolute bliss) or God

The One Supreme absolute as *Brahman* (a cosmic consciousness) who is both immanent and transcendent.

Hindus believe that God is timeless, formless but can manifest in various forms, all-pervasive (divinity is everywhere: omnipresent) and all knowing (omniscient).

Learned call God by different names.

Shiva, Vishnu, Mother Goddess Durga are revered as Supreme Being by their devotees.

Cosmic power is feminine: *Shakti*

When the Divine Being takes form, it assumes both male and female attributes. The ultimate reality as a female is called as *Shakti*, power or energy.

Three main approaches to perceive the Ishwara based on the concept of:

- With/without attributes (*Saguna - Nirguna*)
- With/without form (*Sakara - Nirakara*)
- Based on an individuals' emotional and intellectual makeup, he or she can choose appropriate form
- *Saguna - Sakara:* People with predominantly devotional mind follow the path of Bhakti (devotion) to God with attributes and form
- *Saguna - Nirakara:* Some intellectually inclined people approach God with attributes but without form
- *Nirguna - Nirakara:* Some others approach God as the all-pervasive spiritual reality without attribute or form

Avataras: A finite manifestation in earthly form of the infinite consciousness is called an Avatara. Rama and Krishna are the most famous Avataras.

परित्राणाय साधूनां विनाशाय च दुष्कृताम् ।
धर्मसंस्थापनार्थाय सम्भवामि युगे युगे ॥

Chapter 4:8

"For the deliverance of the devotees and for the annihilation of the miscreants and to reestablish principles of Dharma, I do appear time to time".

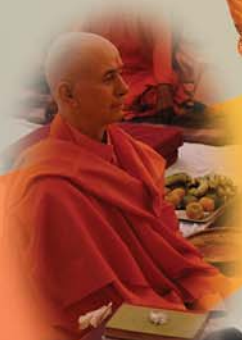
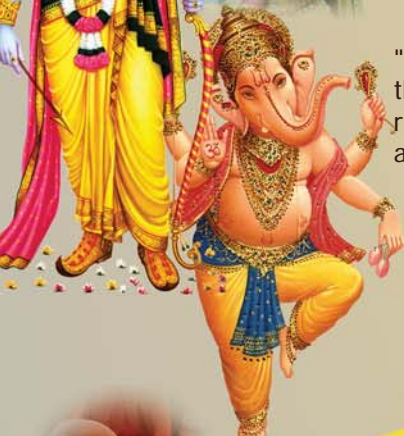
A relationship with God:

- There are three principle thoughts about relationship of individual divinity (Atman) with God (Brahman): Advaita, Dvaita and Vishishtadvaita
- Atman is defined as the ultimate reality (God) appearing as our essential Self. One school of Hindu thought, says that both the Atman and Brahman are the same (*Advaita - Aham Brahmasmi*), some believe that they differ (Dvaita) as fire and spark of the fire

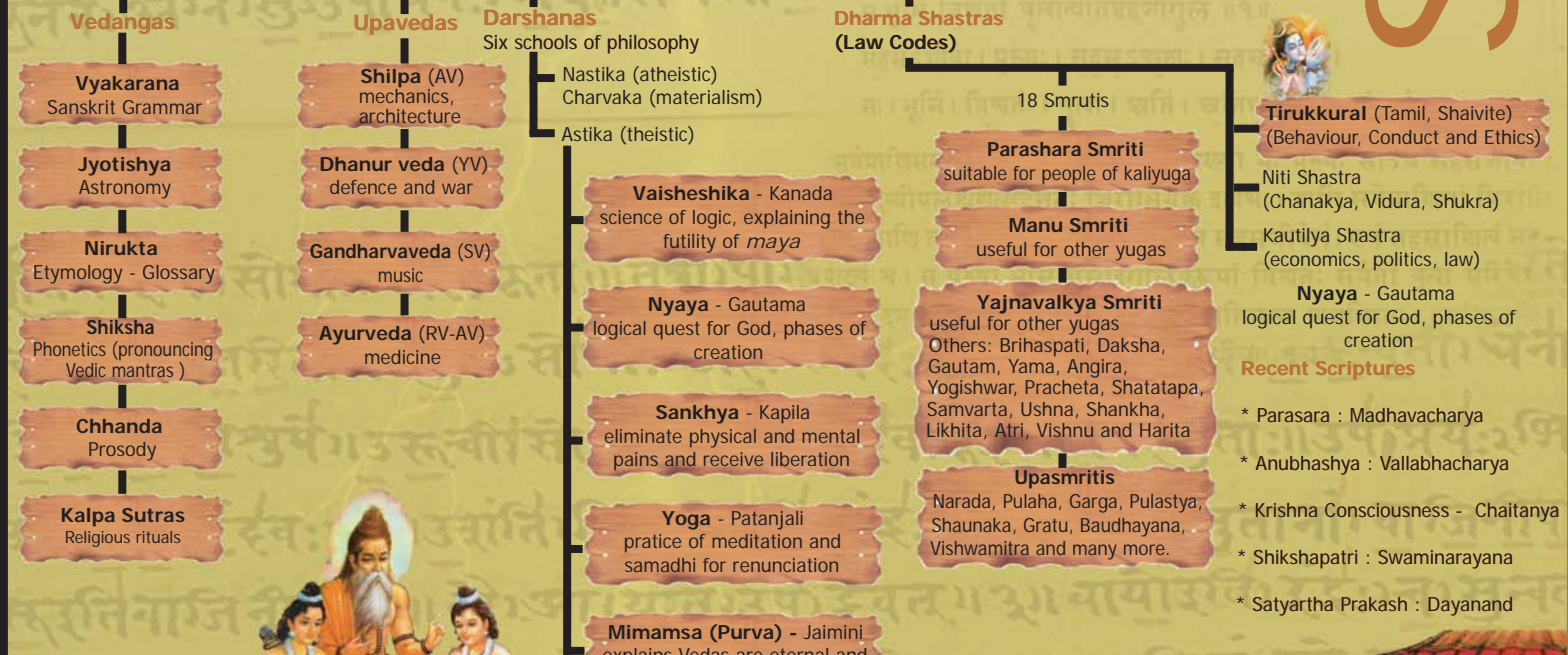
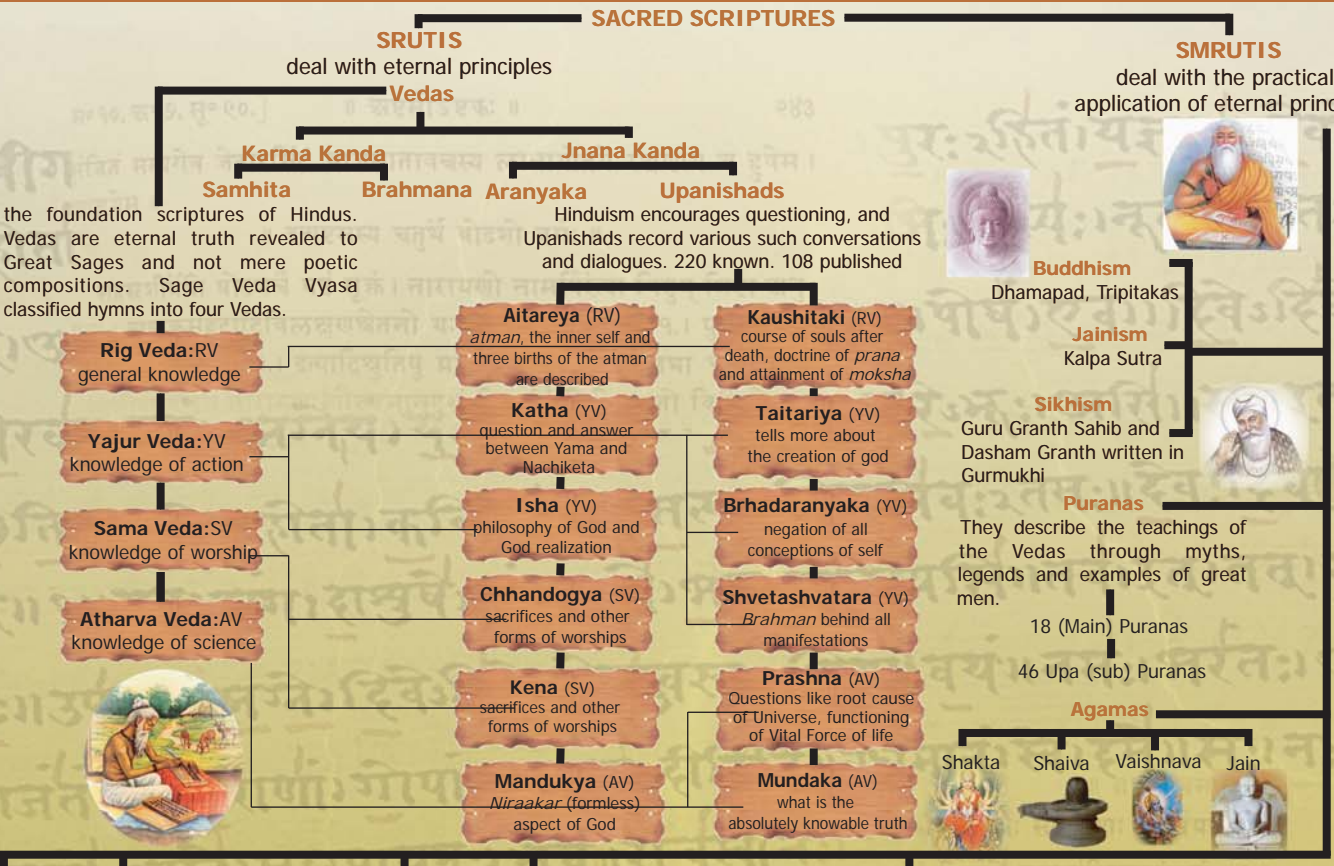
Many devotees perceive relationship with God as personal relationship like father, mother, friend etc.

एकं सत् विप्राः बहुधा वदन्ति

Hinduism gives freedom so that different people may relate to God in different ways



Scriptures



Itihasas (History)

Ramayana by Valmiki
The Life history of Sita and Rama teaching ideals and values, which has strong influence on society

Mahabharata by Veda Vyasa
Story of Pandavas, Kauravas and Shri Krishna, depicts challenges of human life, clash of Dharma and Adharma

The Bhagawad Gita
The essence of vedic knowledge has been crystallized into 700 concise shlokas, which provide a definitive guide to the science of self-realization

Selected quotations from Gita

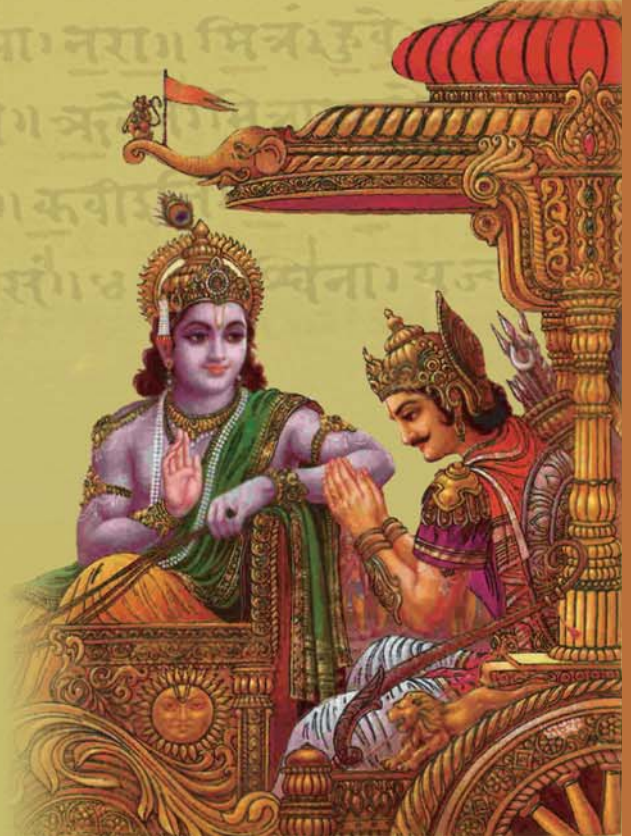
Just as man gives up old garments to put on new ones similarly the soul casts off worn out bodies enters into new ones. (2:22)

Senses are said to be superior, mind is greater than the senses, the reason is greater than the mind. What is beyond reason is He (the self). (3:42)

Whensoever there is decay of Dharma (righteousness), I bring forth myself to restore Dharma. (4:7)

I serve people in the way which they approach me. (4:11)

One should uplift oneself by self help and should not degrade, because one is one's own friend and enemy. (6:5)



Cultural Continuity

A birth place of Rigveda, the oldest and sacred scripture of Hindus

- Evidences strongly suggest Indus Saraswati Valley or the Vedic Civilization as birthplace of the Vedas. Many historians wrongly attributed Rigveda to some mythical invaders (Aryan) supposedly came from Central Asia.

Indus Saraswati Valley (Harappan) Civilization

- Over 2500 archaeological sites have been discovered in an area twice the size of ancient Egypt or Mesopotamia
- Trades with distant central Asia and local exchange networks
- Developed objects out of bronze, gold, silver, ceramics etc.
- Understanding undeciphered script would provide more information about culture and traditions of that time

Lost and Found Saraswati River:

- The mighty Saraswati River is extolled in Rigveda
- The Saraswati kept changing its course and gradually dried up before 2000 BCE
- The cumulative knowledge gained through geology, landsat (satellite) and archaeological finds revealed the traces of the



lost river from Siwalik Mountains right up to Hakra (Ghaggar) River and the Rann of Kutch

- Over 2000 ancient sites including Rupar, Kalibangan, Lothal, Dholavira and Banawali belonging to the Indus-Saraswati Valley Civilization have been discovered along the Ghaggar-Hakra River and its tributaries
- The rediscovery of Saraswati River establishes roots and period of the Vedas

Myth of Aryan (a noble person in Sanskrit) Invasion:

- For generations the Aryan Invasion/Migration Theory is just "assumed" and was never proven with archaeological evidences. The Theory was merely based on linguistic similarities with few European languages.
- There is no mention of such invasion/migration in ancient scriptures.

- Recent genetic evidences also disproved any migration between 6000 to 1000 BCE.
- Rigveda mentions flora and fauna of South Asia.



Terracotta of Mother Goddess with lamp, similar to Laxmi images made during Diwali

Supposedly fire altars and ceremonial baths at Kalibangan, Rajasthan



Terracotta wheel at Rakhigarhi, Hariyana

Archaeological evidences indicating cultural continuity over 5000 years

Artifacts found at sites like Harappa, Mohenjo Daro, Kalibangan (Rajasthan), Lothal (Gujarat), Dholavira (Gujarat) etc. confirm roots of Hindu rituals and symbols in ancient Indus Saraswati Valley civilization.



Namaste

This terracotta figure shows Hindu way of greeting with a Namaste.



Similar to married Hindu women, many female terracotta figurines found with Sindhur (vermillion) [2800- 2600 BCE].

Vermillion filled conch shells as used in Hindu rituals, have been excavated in Harappa.



Evidences show many deities including Shiva found placed at the base of pipal or banyan tree.



Meditating Shiva found in many excavations.



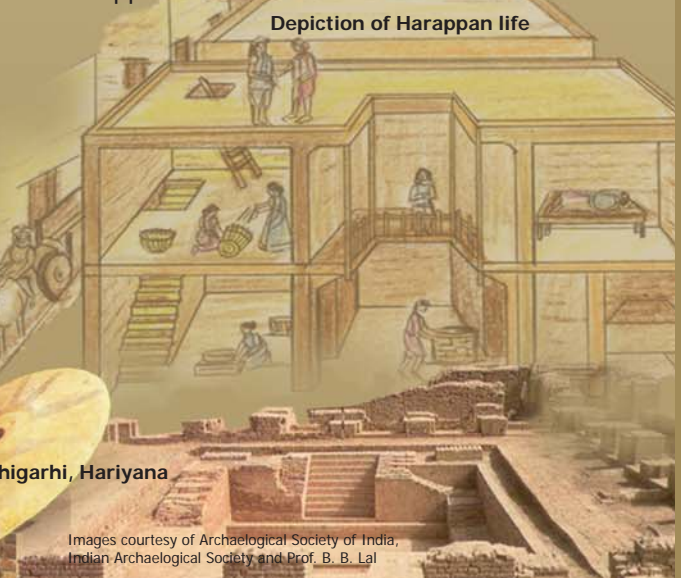
Terracotta of Shiva *linga* found at Kalibangan.



Hindu sacred *Swastika*, symbolizing ancient order of the universe is found on seals, motifs etc.

Yoga:

Yogasanas, which are now becoming fashionable even with the elites, were being already practiced by the Harappans.



Depiction of Harappan life

Images courtesy of Archaeological Society of India, Indian Archaeological Society and Prof. B. B. Lal

The Great Bath at Mohenjo Daro, Sindh

Festivals



Ram Navami



Maha Shivaratri

Deepavali

Janmashtami

Bihu

HSS Celebrating Ganesh Chaturthi



The Hindu festivals are joyous celebrations splashed with colors, music, folk dances and songs as well as an opportunity for self-realization. There are different festivals to celebrate the various incarnations of Gods and Goddesses, as well as those that honor the seasons, harvests and relationships.

Yugadi, the first day of the month *Chaitra* is a festival to welcome the new year.

Ram Navami celebrated in *Chaitra*, is the birth anniversary of Shri Rama, the human incarnation of Lord Vishnu

Baisakhi, or Vaisakhi is the first day of *Vaishakha* month, marks the entering of the Sun into *mesha rashi*. This is a harvest festival.

Karvachauth in *Ashvina* is a day when married women fast for the long life of their husbands.

Ganesh Chaturthi celebrated in *Bhadrapada* marks the birth anniversary of Lord Ganesha, master of knowledge, intelligence and wisdom

Guru Pournima, also celebrated as Vyasa pournima in the month of *Ashadha*, honors guru or teacher.

Birth anniversaries of Mahavir, Guru Nanak, Buddha, Shankaracharya and other great gurus are celebrated.

Janmashtami, celebrated in *Shravana*, commemorates the birth anniversary of Lord Krishna. Statue of Lord Krishna is placed in a cradle. *Puja* and *Prasad* are offered.

Raksha Bandhan is celebrated in *Shravana* in honor of sea God, Varuna. Also, symbolizes the relationship between brother and sister.

Dasshera/Vijaya Dashami is celebrated in the month of *Ashvina*. It symbolizes the victory of Lord Rama over Ravana.

Navaratri, a festival of "nine nights", is a pooja in honor of nine manifestations of Goddesses "Durga, Laxmi, Saraswati". Garba, a famous folk dance, is performed on all nine nights.

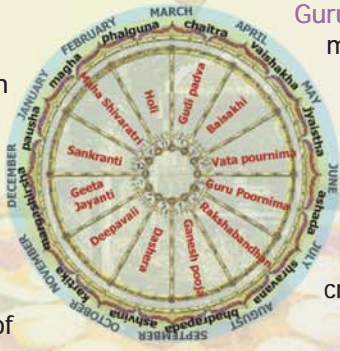
Deepavali, known as "Festival of Lights" celebrated in *Kartika*, symbolizes the elimination of darkness through the light of knowledge.

Sankranti marks the commencement of the Sun's journey to the Northern Hemisphere. Sankranti is celebrated in *Pausha* with different names all over India. Pongal in the south and Lodhi in the north.

Maha Shivaratri is celebrated in *Magha* in honor of Lord Shiva. Devotees celebrate by fasting and performing pooja all through the day and night.

Holi, in *Phalguna* marks the arrival of spring. On the night before Holi, bonfires are lit and on the day of Holi, people enjoy by playing with colors.

Hindus believe that everyday is a significant day for festivity. There are many more festivals celebrated.



HSS Guru Pournima

Pongal

Navaratri

Raksha Bandhan

Baisakhi

Holi

Vijaya Dashami

Dahi Handi

Ganesh Visarjan

Pooram

Boat Festival



Classical Art

Art is an expression of devotion

The *Natya Shastra* written by Bharata around fourth century BCE. is the oldest surviving text on stagecraft which speaks in depth about different kinds of postures, facial expressions and *mudras* (hand expressions). All dance forms follow the same hand movements, with some local variation.

Indian dance and music have strong influence of Hindu religion. Many of the traditional themes are based on Hindu epics. Dance and music prospered in temples.

Seven major classical dance forms

Bharatanatyam (Tamil Nadu)

The hallmark stance of the *Bharatanatyam* dancer is the *ardhamandali* posture, which consists of an erect torso, bent knees, and out-turned feet. Dancers depict the greatness of Gods and Goddesses.

Kathak (Northern India)

Kathak started as a method of story telling. Bards explain the stories of Lord Krishna as they twirl gracefully to the beat of *pakhavaj* (drums). Under the influence of Islamic rule, Kathak evolved into public entertainment.

Odissi (Orissa)

Odissi dance is the only form in which the dancer stands in the *tribanghi* posture (a posture where the dancer's body is in all three physical planes). Odissi depicts the greatness of Lord Krishna.

Mohiniattam (Kerala)

Mohiniattam depicts the *sringara* and *bhakti rasas* (emotions). The dance is an exquisite feminine style with undulating flow of body movements.

Manipuri (Manipur)

Dancers depict Radha and Krishna. Another feature of Manipuri is the *Pung cholam* or drum dance, where dancers leap high into the air and make fast turns as they play on their drums.

Kuchipudi (Andhra Pradesh)

Dancers depict the greatness of God. Dancers dance on a plate, and also paint images of animals on cloth with their feet as they dance rhythmically.

Kathakali (Kerala)

Makeup and masks are very special features of Kathakali. The dancers tell stories about Lord Vishnu as they sing and tap their feet to the beat of drums and cymbals.

Great Artists



Pt. Bhimsen Joshi
(Singer)



Amjad Ali Khan
(Sarod Maestro)



Lata Mangeshkar
(Singer)



Pt. Jasraj
(Singer)



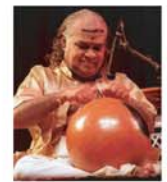
Pt. Ravi Shankar
(Sitar Maestro)



M.S. Subbalakshmi
(Singer)



Gangubai Hangal
(Singer)



Pt. Vikku Vinayak Ram
(Ghatam Artist)



Zakir Hussain
(Tabla Maestro)



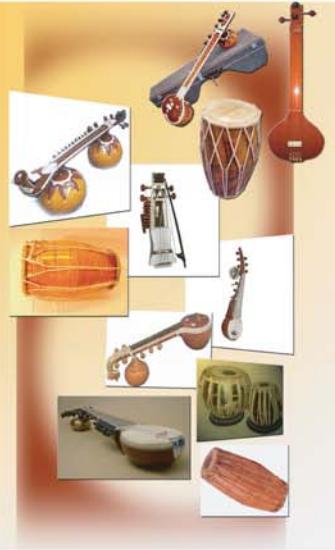
Pt. Hariprasad Chaurasia
(Flute Maestro)



Pt. Shivkumar Sharma
(Santoor Maestro)



Bala Murali Krishna
(Singer)



Basics of Indian Music

Origins of Indian classical music are found in the *Samaveda*.

The Indian Musical notes: The 7 notes or "Swar" of the scale are Sa, Re, Ga, Ma, Pa, Dha and Ni.

Raaga: Raagas are made of different combinations of *sapta swara* or seven notes.

Taal: The basic element of Indian music is the taal. It is a rhythmic cycle containing a fixed number of beats.

Types of Indian Music:
Hindustani (Northern India)
Carnatic (Southern India)

Nine rasa or emotions expressed in performances:

1. Hasya (happiness)
2. Shoka (sorrow)
3. Krodha (anger)
4. Karuna (compassion)
5. Bhibhatsa (disgust)
6. Adhbhuta (wonder)
7. Bhaya (fear)
8. Vikram (courage)
9. Shanta (serenity)



Bharatanatyam

Manipuri

Kathakali

Odissi

Kathak

Kuchipudi

Hindu Women

Hindus worship God in feminine form also. Hindus believe women have the same divinity as of men. Hindu women played various important roles in history.

Jhansi Rani



Protector

- Jhansi Rani (Queen of Jhansi) died in the First War of Independence against British at the age of 22
- Rani Chennama (Kittur, 1778 - 1829) fought against British
- Rani Avantibai fought against British and died in 1858
- Rani Rudramma Devi (Andhra Pradesh) ruled from 1261 until 1295.
- Queen Durgavati, Gondwana 16th century, died in a battle against Akbar

Mother

- Jijamata (mother of Shivaji) inspired Shivaji to liberate land from oppressors
- Yashoda (mother of Krishna) a symbol of mother's unconditional love
- Kunti (mother of Pandavas) inspired Pandavas to fight for justice



Jijabai - Shivaji

Saint

- Meerabai (Rajasthan 16th century) a princess who devoted her life to Lord Krishna
- Kaaraikkaal Ammaiyaar of Tamil Nadu (600 BCE)
- Akka Mahadevi (Karnataka 12th century)
- Muktabai - Janabai (Maharashtra 13th century)
- Lalleshwari (Kashmir 14th century), Poetess, Yogini and Shiva devotee
- In modern times, Ma. Sharada, Mata Amritanandamayi, Ma Anandamayi, Karunamayi, Mother Mira Aditi, Sister Nivedita, Mata Nirmala Devi, Didima Ritambara Devi and many others



Saint Meerabai

Administrator

- Ahilyabai Holkar (Indore, 1725 - 1795) reconstructed roadways and pilgrimage places
- Rani Rashmonidevi (Kolkotta, 1793 - 1861) constructed Dakshineswar Temple, and donated to universities and libraries



Ahilyabai Holkar

Recitation of Atharvaveda starts with invocation to Devi.

यत्र नार्यस्तु पूज्यन्ते रमन्ते तत्र देवताः । (Manusmriti)
Where woman is worshipped, Gods reside there.

मातृदेवो भव । (Taittiriya Upanishad)
Let your mother be God to you.

A family whose women live in sorrow perishes. The family whose women are happy always prospers. A household whose unhappy women members curse perishes completely - Manusmriti 3.56-58

Sir Monier-Williams (1860 - 1888) Indologist and head of the Oxford's Boden Chair, wrote: "Indian wives often possess greater influence than wives of Europeans."

Intellectual

- Of the 407 Sages of Rigveda, 21 are women (e.g. Gargi)
- Ubhaya Bharati was the judge in a debate between Mandana Mishra and Adi Shankaracharya
- Gangadevi (14th century) wrote the Sanskrit epic 'Madhuravijayam'.
- Saulabha Shakha of Rigveda named after Rishika Sulabhaa
- Temples such as Lingaraj (Orissa) show women teachers with both male and female students
- In modern times, Mahadevi Varma, Sarojini Naidu and others are sterling examples



Sage Gargi

Organizer/Social Worker

- Laxmibai Kelkar started women's voluntary organization 1936
- Savitri Phule, social worker



Laxmibai Kelkar

Dharma Patni (Sustainer of Dharma)

Hindu women guide the family in sustaining Dharma with their dedication and sacrifice.



Draupadi

- Sita
- Savitri
- Parvati
- Draupadi

In Hinduism, God's energy or shakti is personified in the female form. It is significant to note that only Hindus worship God in the form of Divine Mother. In Hindu Dharma the deities for knowledge, learning, material wealth, and power are of female form.

Sarasvati is the patron deity of Vedas, music, arts and all learning.

Laxmi is the deity of wealth and prosperity.



Divine Nature

Hinduism is an Eco-friendly tradition:

According to Hinduism, Nature is the manifestation of God.



Respecting nature and all life forms

Hindus regard everything around them to be pervaded by a subtle divine presence, may it be rivers, mountains, lakes, animals, flora, the mineral world, or the stars and planets. Every ceremony and ritual has a thanksgiving part to Nature and gift to all living beings on Earth.

Hindu *Dharma* values the power of the natural world as five great elements (*mahabhuta*): earth (*prithivi*), water (*apa*), fire (*agni*), air (*vayu*), and space (*akasha*). Daily worship (*puja*) employs and evokes these five powers.



Hindu Ecological Movements:

The Chipko Movement - started in 1973 (Uttaranchal, India) when villagers formed a human chain and hugged trees marked to be cut down for the development of a sports equipment factory.

Reverence to forests:

Likewise, forests that provide us with so many resources are

believed to be presided by *Vanadevis* and *vanadevatas* (*vana* = forest; *devi* = Goddess; *devatas* = God)

Reverence to Rivers:

Rivers have been and continue to be an integral part of Hindu religious practice.

Rivers, their confluences, their mouths and their origins form prominent Hindu pilgrim centers.

Vedas solemnly declare the enduring filial allegiance of humankind to Mother Earth: माता भूमिः पुत्रोहं पृथिव्याः
Earth is my mother, I am her son

The Atharvaveda has the magnificent Hymn to the Earth (*Bhumi-Sukta*) which is full of ecological and environmental values

The evening worship of *Ganga Ma* ('Mother Ganga') in the pilgrim center of Haridwar with hundreds of lamps which are set afloat on the river at sunset everyday is a breathtaking spectacle.



Ganga Poojan at Rishikesh

द्यौः शान्तिः अन्तरिक्षः शान्तिः आपः शान्तिः
ओषधयः शान्तिः वनस्पतयः शान्तिः द्विपदाः
शान्तिः चतुष्पदाः शान्तिः शान्तिरेव शान्तिः ।
ॐ शान्तिः शान्तिः शान्तिः ॥

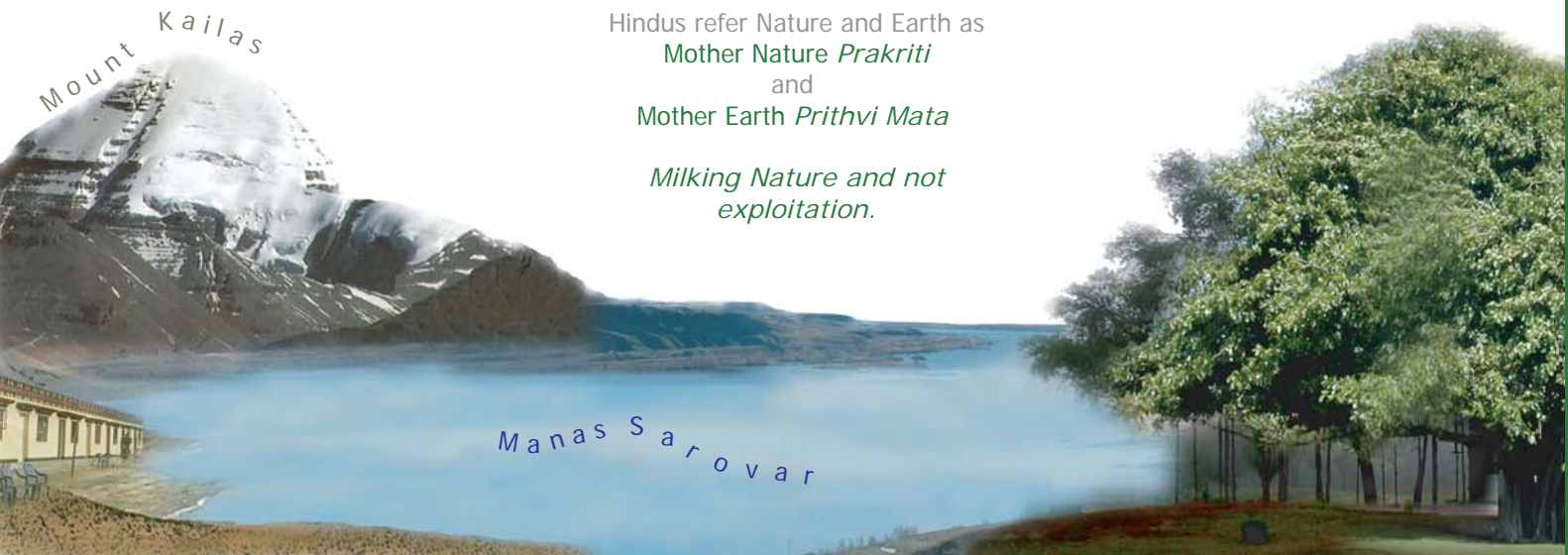


May there be peace in heaven
May there be peace in the atmosphere
May there be peace across the waters
May there be peace on earth
May peace flow from herbs, plants and trees
May all the celestial beings radiate peace
May peace pervade all quarters
May that peace come to me too
May there be peace, peace, peace.

"Earth, my mother, set me securely with bliss in full accord with heaven,
O wise one, uphold me in grace and splendor."

Hindus refer Nature and Earth as
Mother Nature *Prakriti*
and
Mother Earth *Prithvi Mata*

Milking Nature and not exploitation.



Mount Kailas

Manas Sarovar



Sewa International

RSS serving Tsunami victims

Service

Serving Humanity is Serving God

Concept of 'Seva' (Service) in Hindu Dharma

Nishkaama seva (Service without any expectation of returns)

सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामयाः ।
सर्वे भद्राणि पश्यन्तु मा कश्चिद् दुःखभाग्भवेत् ॥
- Brihadaraanyaka Upanishad 1.4.14

May all be happy; May all be without disease;
May all see auspicious things; May none have misery of any sort.

Seva or service to others is a principle advocated by Hindu **Dharma**. To serve others in need is considered one's duty.

Seva, considered an integral part of human **Dharma**, is an act, word or thought which helps to alleviate the sufferings of others and increase their happiness.

Service is worship

ईश्वरः सर्वभूतानां हृद्देशेऽर्जुन तिष्ठति ।
- Bhagavad Gita 18:61

God resides in the heart of all beings.

According to Hindu thought, God resides in all beings from animate to inanimate objects. Therefore, serving another human being or any other being is service to God. Service is thus worship.

Attitude while serving

One should dedicate his **tana, mana, dhana** (physical, intellectual and financial resources) to help others.

दातव्यमिति यद्दानं दीयतेऽनुपकारिणे ।
देशे काले च पात्रे च तद्दानं सात्त्विकं स्मृतम् ॥
-Bhagavad Gita 17:20

That gift which is made to one who can make no return, with the feeling that it is one's duty to give and which is given at the right place and time and to a worthy person, that gift is considered noble.

जीवने यावदादानं स्यात् प्रदानं ततोधिकम् ।
Let us give more than what we take in life.

Mahatma Gandhi on service

The best way to find yourself is to lose yourself in the service of others.

Mahatma Gandhi was quite impressed with the story of Ranti Deva mentioned in Bhagavata written by Sage Veda Vyasa. Mahatma Gandhi adopted Ranti Deva's message as a basis for all his **seva** work.

Inspiring story of Ranti Deva

Ranti Deva's kingdom was gripped by severe and devastating famine. Moved by the suffering of his subjects, the King decided to fast himself until all the hungry were fed. During his fast for forty-eight days he served his poor subjects. When he was about to break his fast by taking a glass of water, he heard the cry of Pulkasa asking for water to drink. The King immediately gave the glass of water to Pulkasa. When he then proceeded to eat a morsel of food, a guest came at his door asking for food. The King gave even that to the guest in spite of others pleading not to. Thus, Rantidev in the true spirit of selfless service took upon himself all the suffering of his subjects without worrying about his own sufferings.



Image Courtesy of BAPS Temple London, UK

BAPS Swamiji

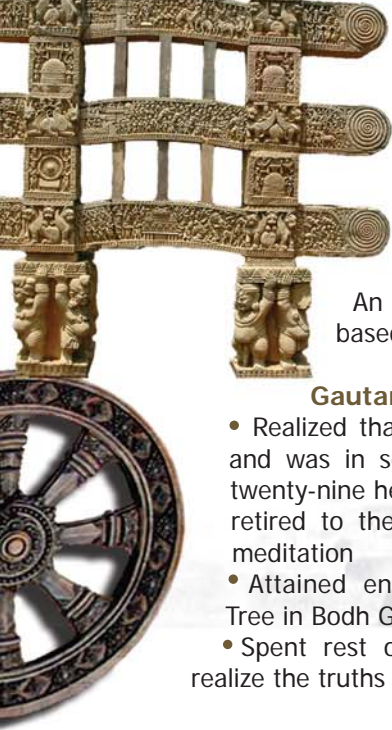


Compassionate Ammachi



Swami Chidananda Saraswati





Buddhism

A Dharmic Tradition

Introduction

An ancient religion and philosophy based on the teachings of Buddha.

Gautama Buddha (563 - 483 BCE)

- Realized that this world is full of suffering and was in search of lasting happiness. At twenty-nine he left the luxuries of the palace, retired to the forest and followed a life of meditation
- Attained enlightenment under the Bodhi Tree in Bodh Gaya, India
- Spent rest of his life, teaching others to realize the truths he himself had discovered

Philosophy

Buddhism inherits principles of dharma, karma, ahimsa, rebirth and nirvana (moksha) from Hinduism.

Four Noble Truths

The Truth of Suffering (*Dukha-satya*), that life is suffering.

The Truth of the Cause (*Samudaya-satya*), that suffering is caused by desire (*Tanha*) and by ignorance (*Avijja*).

The Truth of Cessation (*Nirodha-satya*), that suffering can be ended if its causes, desire and ignorance, are removed.

The Truth of the Path (*Marga-satya*), the Eight fold Way

- i. Right Knowledge
- ii. Right Resolve
- iii. Right Speech
- iv. Right Conduct (or Action)
- v. Right Livelihood
- vi. Right Effort
- vii. Right Mindfulness
- viii. Right Meditation

Key Concepts

- **Dharma** is understood as the practice (paripatti) of the Truth. To take refuge in the Dharma is to take refuge in Buddha.
- **Karma** is intentional action, physical, verbal or mental.
- Good karma brings happiness, bad brings suffering.
- **Avijja** and **Tanha** - ignorance or not knowing the true nature of things and craving are the two root causes of **karma**

• Cycle of Rebirth

We are born and reborn in six realms of existence based on one's previous **karma**.

• Nirvana (Enlightenment)

To go beyond the cycle and achieving blissful state is **Nirvana**.

Scriptures

Buddhist scriptures are called the **Tripitaka**, or the "Three Baskets"

1. **Suttapitaka**, Buddha's sermons
2. **Vinayapitaka**, monastic rules
3. **Abhidhammapitaka**, early philosophical treatises

Three main schools of Buddhism

Theravada or **Hinayana** (Sri Lanka, Thailand, Burma, Cambodia)

Mahayana (China, Japan, Vietnam, Korea)

Vajrayana (Tibet, Mongolia and Japan)

Rituals and Practices

Variety of practices aid in the journey to enlightenment. As Buddhism spread from India across many parts of Asia, it absorbed many local religious beliefs and traditions. Therefore practices differ widely in various parts of the world.

The five rules to abstain from: killing, stealing, sexual misconduct, lying, taking intoxicants such as alcoholic drinks

Meditation: Various types of meditation in various traditions

Chanting: Hymns of homage to the Buddha, refuge in Buddha, Dhamma and Sangha etc.



Jainism



Introduction

Jain philosophy is based on eternal truths which reappear through the teachings of the enlightened souls. They are called '*Jina*', conquerors of inner enemies or '*Tirthankaras*', those who show the way. According to Jain tradition there have been 24 *Tirthankaras*.

Jainism as practiced today was largely taught by Bhagwan Mahavir, the 24th *Tirthankara* in this era.

Adinath or Rishabhadev, the first *Tirthankara* existed thousands of years before Mahavir.



History

- Lord Mahavir born as Vardhaman in 599 BCE in a royal family in Bihar, India.

- At the age of thirty he renounced the royal palace to live a life of an ascetic.

- Spent twelve and half years in deep silence and meditation to conquer his desires, feelings, and attachments

- Carefully avoided harming other living beings including animals,

birds, and plants. Also went without food for long periods. Remained calm and peaceful against all unbearable hardships. Hence the name Mahavir, meaning very brave and courageous.

- Spiritual powers fully developed. Attained *keval jnana* or the perfect enlightenment.

- Mahavir spent the next thirty years traveling bare foot around India preaching to the people the eternal truth he realized.

- Attained *nirvana* or complete liberation in 527 BCE

Beliefs

God: Jainism believes in God, not as a creator, but as a perfect being.

Universe: It has always existed and will always exists in exact adherence to the

laws of the cosmos. Karma philosophy: Intentions behind the actions of mind, speech and body bind us with Karma. Karma is matter determining the fate of the soul in rebirths. Goal of human life: To destroy all karmas and attain *Moksha* or liberation and live in perfect blissful state forever. *Anekantavad*: Truth is multifaceted. It can be expressed in many ways.

Path

Conquer desire by own effort to attain liberation

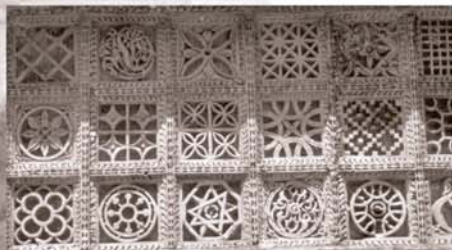
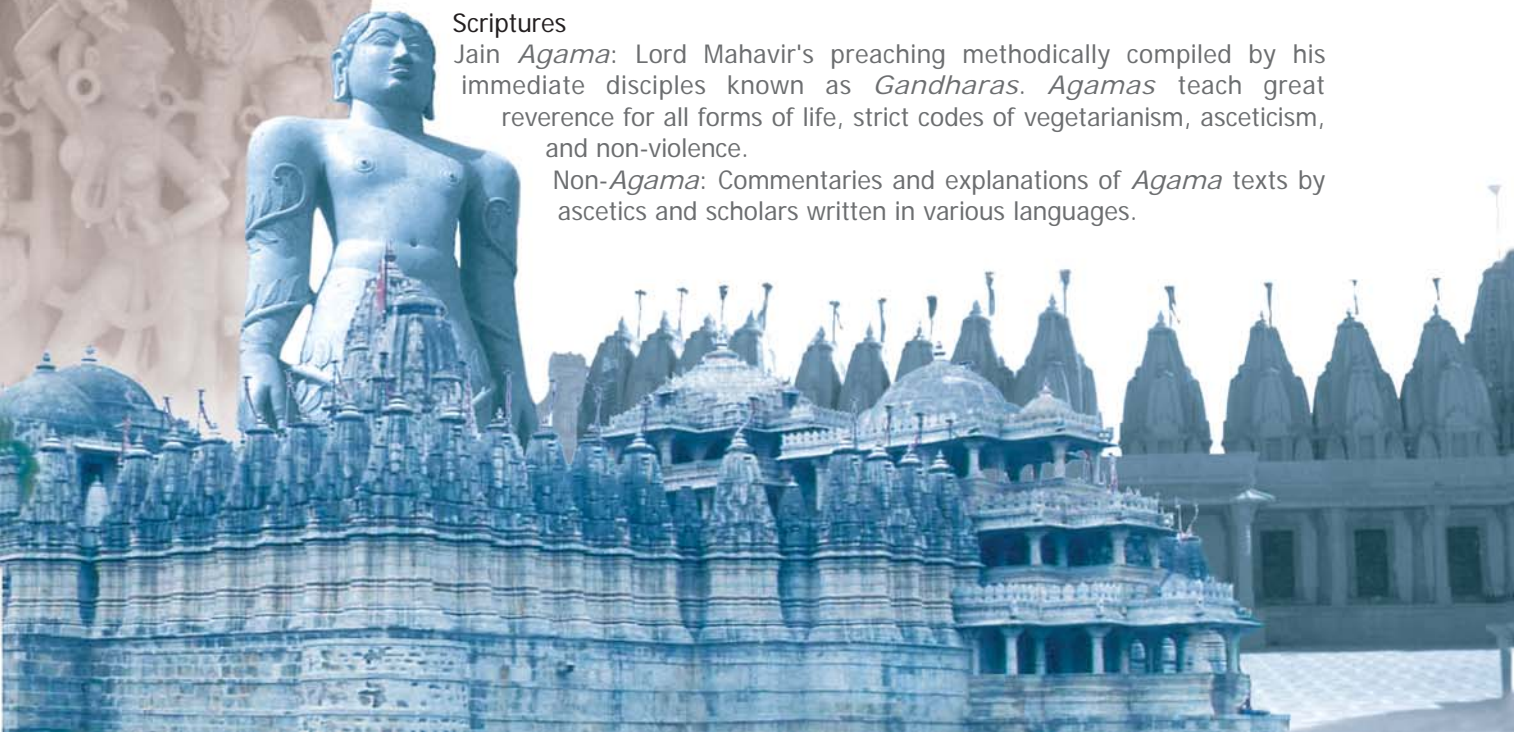
Can be achieved through *Samyak Darshan* (Right Perception), *Samyak Gnyan* (Right Knowledge) , *Samyak Charitra* (Right Conduct)

Five Great Vows - 1. *Ahimsa* (Non violence) 2. *Satya* (Truth) 3. *Asteya* (Non stealing) 4. *Brahmacharya* (Chastity) 5. *Aparigraha* (Non attachment)

Scriptures

Jain *Agama*: Lord Mahavir's preaching methodically compiled by his immediate disciples known as *Gandharas*. *Agamas* teach great reverence for all forms of life, strict codes of vegetarianism, asceticism, and non-violence.

Non-*Agama*: Commentaries and explanations of *Agama* texts by ascetics and scholars written in various languages.



Sikhism

A Dharma Tradition

Sikhism:

A way of life, a discipline to be learned with grace of the **Guru**, a discipline to be followed.

Sikh means a disciple or a learner. Sikhism was founded by Shri **Guru Nanak Dev ji** who was born in 1469 at Rai-Bhoi-Di-Talwandi in the present district of Shekhupura (Pakistan).

Messages:

Equality in humanity is the spirit of this religion and the same is seen through the messages and practices adopted by all the **Gurus**. Whether it is the "**Langar**" (Common Kitchen where people from different caste, creed and color come together, prepare and consume food) or the formation of the "**Khalsa**", the same principle is learnt through the eternal **Guru** of sikhs.

Guru Granth Sahib:

Guru Granth Sahib is a collection of devotional hymns and poetry which proclaims God, emphasizes meditation on the True **Guru** (God), and lays down moral and ethical rules for development of the soul, spiritual salvation and unity with God.

Guru Granth Sahib, living **Guru** of sikhs, has teachings from the sikh **Gurus**, saints and prophets from all walks of life.

Ek Omkar:

The First **Shabd (Shlok)** in the **Guru Granth Sahib** starts with **Ek Omkar** (One God). The first **shabd** is as follows:

"There is but One God, His name is Truth, He is the Creator, He fears none, he is without hate, He never dies, He is beyond the cycle of birth and death, He is self illuminated, He is realized by the kindness of the True Guru. He was True in the beginning, He was True when the ages commenced and has ever been True, He is also True now." (**Japji**)



Ten Gurus:

The message of **Guru Nanak** was spread over the years by the Nine **Gurus**. Names of the ten sikh **Gurus** are: **Guru Nanak Dev ji**, **Guru Angad Dev ji**, **Guru Amardas Ji**, **Guru Ramdas Ji**, **Guru Arjan Dev ji**, **Guru Hargobind Ji**, **Guru Har Rai Ji**, **Guru Harkrishan Ji**, **Guru Tegh Bahadur Ji**, **Guru Gobind Singh Ji**. The tenth **Guru** was the last sikh **Guru** in human form. He passed on the spiritual authority of the sikhs to **Guru Granth Sahib** and ordered all sikhs to maintain **Guru Granth Sahib** as their eternal **Guru** (teacher).

Khalsa - "The Pure" : The Saint and Soldier

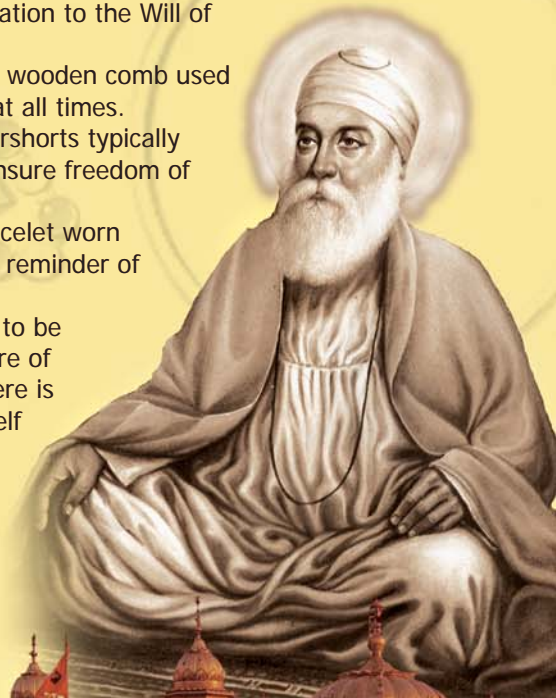
Waheguru Ji ka Khalsa, Waheguru ji Ki Fateh
(Khalsa belongs to the GOD and Victory belongs to Him)

Khalsa:

The Tenth sikh **Guru, Guru Gobind Singh**, moulded the sikh religion into its present form today with the formation of the **Khalsa**. He formed the **Khalsa** on day of **Baisakhi** in 1699 at Anandpur.

Khalsa sikhs keep five emblems of their faith intact on their bodies at all times. These collectively form a uniform for members of the community of "Pure Ones."

1. **Kesh** - Uncut hair. Historically, unshorn hair was a sign of spirituality and sainthood; keeping one's hair intact indicates resignation to the Will of God.
2. **Kangha** - A small wooden comb used to keep the hair tidy at all times.
3. **Kach** - Long undershorts typically worn by soldiers to ensure freedom of movement.
4. **Kara** - A steel bracelet worn around the wrist as a reminder of one's faith.
5. **Kirpan** - A saber to be used as a last measure of protection in case there is need to defend oneself or others.



Land of Spirituality

उत्तरं यत् समुद्रस्य हिमाद्रेश्चैव दक्षिणम् ।
 वर्षं तद्भारतं नाम भारती यत्र सन्ततिः ॥

Vishnu Purana

From the Himalayas all the way to Indian Ocean,
 the Devas created the sacred land called Hindustan



Four abodes of God (Char Dham)

- Badrinath
- Rameshwaram
- Dwarka Dham
- Jagannathpuri

Twelve Jyotirlingas

- Somnath
- Mallikarjuna
- Mahakaleshwar(Ujjain)
- Omkareshwar
- Kedarnath
- Bhimashankar
- Vishwanath
- Tryambakeshwar
- Vaidyanath
- Nageshwaram
- Rameshwaram
- Ghrushneshwar

Sacred Rivers

- Ganga
- Yamuna
- Saraswati
- Godavari
- Narmada
- Kaveri
- Sindhu

Four Shankar Mutt

- Jyotir Mutt
- Goverdhan Mutt
- Shringeri Mutt
- Sharada Mutt

Four Kumbh Sthal

- Haridwar
- Prayag
- Avantika
- Nasik

Seven Sacred Cities (Mokshapuri)

- Ayodhya
- Mathura
- Haridwar
- Kashi
- Dwarikapuri
- Kanchipuram
- Avantika

Seven Mountains

- Himalaya
- Aravali
- Vindhyachal
- Raivatak
- Mahendra
- Malaya
- Sahyadri

- India, is the motherland of the spiritual quest. Her ascetic tradition is older than history itself. - *Dr S Radhakrisnan*
- In the whole creation the Earth has a place of distinction, because unlike any other planet it is evolutionary with a psychic entity at its centre. In it, India, in particular is a divinely chosen country. - *Sri Aurobindo*
- Bharat is the birthplace of the Vedas and of the Sastras, Epics and Puranas that have elaborated the principles enunciated therein for the education of the common man. It is the nursery of music and other fine arts, inspired by the noble passion of consecrating human skills for adoring the Divine and communicating the supersensuous. It is the staff and sustenance of the mystic and the ascetic, the intellectual and the dynamic adorer of God; it is the field where the Science of Yoga (union with God) was cultivated and systematized. - *Satya Sai Baba*



Northern style temple at Modhera (1100)

Mohenjo Daro City

Reconstruction of Kusinagar (~700 BCE)

Southern style temple

Rock cut: Kailas Temple (Ellora)



Vastu-Shastra is the science of Architecture. Cosmic symbolism dominates Hindu religious traditions and ideology. The art of Vastu originates in the Stapatya Veda, a part of the Atharva Veda.

Vastupurushamandala is a geometrical device with Cosmic Man (purusha) in it. Designed on the cosmic principles, it is the fundamental motif of all Hindu Architecture.

Stapati, a design architect, should be proficient in various sciences such as mathematics, astronomy, astrology, acoustics, philosophy and the arts.

Rock-Cut Architecture

Marvelous rock cut constructions at Ellora, Carla, Elephanta Caves, Mahabalipuram, etc shows architectural style of ancient period. They have the vaults supported by a series of curved wooden ribs, the balconies and horizontal cylindrical roof-tops. These cylindrical rooftops were ingeniously designed so they permitted free flow of air and light. The Kailas Temple in Ellora, Maharashtra is the largest single piece of sculpture in the world - built downward from top to bottom.

Town planning and public buildings

Marvelous examples of town-planning and public buildings are found in the archeological findings of Mohenjo Daro & Harappa Civilization (2500 BCE). It had straight streets at right angles to one another. It also had a network of covered drainage that was unique in the ancient world. Mohen-Jo-Daro had a citadel that consisted of a huge platform of mud-bricks on which the Great Bath was built. Lothal, Gujarat had a huge artificial dock for berthing ships.

Military/Residential Architecture

Military, and residential architecture were made to withstand enemy attacks, as a second line of defense. Often, water from outside would be drawn for the people inside a fort through an underground duct, hidden from the enemy.



Cave architecture: Kondane, ~200 BCE

Models of ancient architecture courtesy: Vignan Bharat(India)

Temple Construction

The Indian craftsmen mastered the technique of transferring the load from top down into the earth by balancing it through the application of poise, counterpoise, and load bearing cross beams.

Temple Architecture

All the architectures are based on basic principles of Vastu Shastra. Temple is conceived as a cosmos in miniature

Nagara (northern India): This style (developed around fifth century) is characterized by a beehive shaped tower (shikhar) made up of layer upon layer of architectural elements such as Kapotas and Gavaksas, all topped by a large round cushion-like element called an Amalaka.

Dravida (southern India): This style (developed around seventh century) has a pyramid shaped tower consisting of progressively smaller stories of small pavilions, a narrow throat, and a dome on the top called a shikhara. Enclosure walls were built around the whole complex and along these walls elaborate and often magnificent gateways called Gopurams were erected.

Vesara (hybrid): These are distinct styles in Bengal, Kerala, and the Himalayan valleys.



Architecture

Temples

in India

Mahabalipuram, Tamil Nadu,
(Pallava) 830-1100 CE



Gopuram, Belur
(Hoysala) 13th
century



Lingaraj, Bhuvaneshwar,
(Yayati Kesari), 7th century



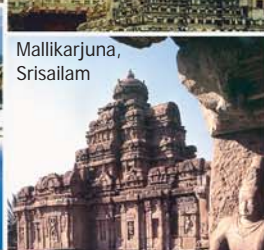
Kanyakumari, Tamil Nadu



Khajuraho
(Chandella), 10-12th century



Konark, Orissa,
(Ganga),
13th century



Orissa, (Orcha)

Jagannath Puri,
Orissa

Mallikarjuna,
Srisailam

Tiruvannamalai
Tamil Nadu

Brihadeshwara Temple,
Tamil Nadu

Hindu Mandirs (temples)

Hindus consider the *Mandir* or the temple as the earthly home of God. Hindus worship God through *Murti* (image or icon of a deity) placed inside sanctum. Temples are often elaborately decorated with stone, wood or plaster carvings depicting religious stories as well as contemporary events. Historically, temples have been centers of religious, social and educational activities.

A long history

During more than two thousand years various dynasties such as the Mauryan, Ashoka, Gupta, Satavahana, Chedi, Chandella, Chalukya, Solanki, Pallava, Chola, Hoysala, Vijayanagar and others, constructed magnificent temples which are beautiful architectural wonders.



Subrahmanya Temple,
Tanjavur Tamil Nadu



Channakeshava, Belur (Hoysala)
12- 14 century



Govindaji, Vrindavan, (Goswami) 1590 CE

Surya Temple, Modhera, (King Bhimdev)
1126 CE

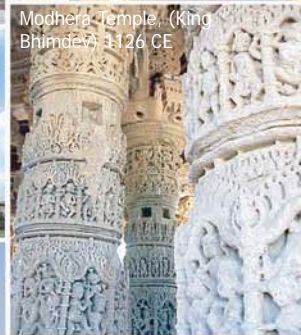
Brahmeshwara Temple, Bhuvaneshwar

Akshardham, New Delhi

Girnar, Gujarat
1177 CE

Mandir - A Cosmic Person:

The essential parts of a temple are: the *Garbhagriha*(sanctum sanctorum); the *Sukanasi* (nose), the *Antarala* (adjoining passages), the *Mandapa* (hall), the *Dhwaja sthambha* (flag post) and the *Bali peeth* (the pedestal for offerings). The structure of a temple symbolizes God as the cosmic being.



Khajuraho
(Chandella), 10-12th century

Rameshwaram, Tamil nadu

Modhera Temple, (King
Bhimdev) 1126 CE

Surya Temple, Modhera



Vitthal Temple, Hampi (Tuluvas)
1136-1565 CE



Badami, Karnataka (Chalukya)
6-8th century

Ellora, Maharashtra
(Chalukya), 6-8th century

Temples in America

- Hinduism established itself in United States and Canada in last 150 years
- Hinduism first came to the United States, during the Transcendentalist literary movement. Two main figures, Ralph Waldo Emerson (1803 - 82) and Henry David Thoreau (1817 - 62), of this movement were influenced by the translations of Hindu scriptures, especially Bhagawad Gita
- The charismatic speech by Swami Vivekananda (1863 - 1902) in the World Parliament of Religions in 1893 in Chicago, IL captured the interests of Americans and the press

- Vedanta Society is credited with building the first Hindu temple in the United States, in San Francisco in 1906

- In the last 30 years more than 450 temples were built across USA

- Hindus visit the temples to worship the deities, to maintain their religious traditions, to celebrate their cultural heritage and also for community gatherings

- One can easily notice the architectural innovations used in building these temples, with resemblance to the temples in ancient India



Sri Radha Krishna Temple
Spanish Fork (UT)

Hindu Temple, Bridgewater (NJ)

New England Hindu Temple, Ashland (MA)

Malibu Temple
Los Angeles (CA)

Barsana Dham
Austin (TX)

Hindu Jain Temple
Monroeville (PA)

Vimana In Livermore (CA)

Swaminarayan Temple
Chicago (IL)

Shiva Vishnu Temple
Lanham (MD)

Kauai's Monastery
Hawaii

Hindu Jain Temple, Monroeville (PA)

Vrindavan and Golden
Place, Moundsville (WV)

Ganesha Temple
Nashville (TN)

Hindu Temple
Livermore (CA)

Vishwanatha Temple
Flint (MI)

Hindu Society Of
Las Vegas (NV)

Jain Temple, Milpitas
(CA)

Hindu Temple Shiva Shrine
Richmond Hills (ON)

Rama Temple
Chicago (IL)

Hindu Samaj Temple
Wappinger Falls (NY)

Meenakshi Temple
Pearland (TX)

Shiva-Vishnu Temple
Davie (FL)

Lord Vasudevan, Pomona (NY)

Hindu Temple,
Fairborn (OH)

Venkateshwara
Temple
Aurora (IL)

Kalinga Dynasty
Style in Lemont (IL)

Hindu Temple
Lemont (IL)

Ganapathi Temple
Flushing (NY)

Hindu Sabha
Brampton (ON)

Images Courtesy:
Hindu University of America
Orlando, FL

Maritime History

Indian Naval History spanning 4000 years offers tangible evidence of seafaring skills



Sculpture at Borabudur Temple



Model of ancient boat



A map of India's interaction along with ancient Sanskrit names

Maritime history predates the Western civilization

- Since vedic period Indians understood the principles of navigation
- World's first tidal dock at Lothal (Gujarat) 2300 BCE
- Alexander and his army returned to Mesopotamia in ships built in India.
- Chandragupta Maurya established an admiralty
- Indian ships sailed to countries in the Pacific & Indian Ocean
- The Chola kings dispatched great naval expeditions (984 - 1042) to parts of Burma, Malaya and Sumatra
- Pliny (23 - 79), a Roman writer, documented Indian sailors
- Marco Polo (1254 - 1324) described Indian ships
- 700 person capacity ships built in 14th century
- 15th Century Indian ships were built in compartments, if one part was shattered, the next remained intact, thus enabling the ship to complete her voyage
- Ships built by Indians were inducted into the British Navy

Navigation in Vedic Period

Indians at the time of the Rig Veda had knowledge of navigation. Many technical navigation terms appear in Vedas.

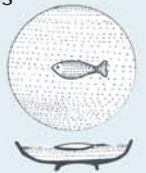
Indus Saraswati Valley Civilization (Harappan) had internal as well as external maritime trade.

Ships in Kautilya's Arthashastra

Kautilya's *Arthashastra* (400 BCE) describes duties of different personnel on ship

Maccha-yantra - The ancient Indian mariner's compass

Indian navigators used a mariner's compass nearly 1500 to 2000 years ago. European expert, **J.L. Reid**, suggested that "The Hindu compass was an iron fish that floated in a vessel of oil and pointed to the North. This older Hindu compass seems placed beyond doubt by the Sanskrit word Maccha Yantra, or fish machine, which Molesworth gives as a name for the mariner's compass".



Ship Building & Navigation

Yukti Kalpa Taru, compiled by *Bhoja Narapati* in Sanskrit, gives minute details about types of ships, their sizes and materials.



- Begini 88m
- Plavini 72m
- Dharini 80m
- Janghala 64m
- Tari 56m
- Gamini 48m
- Santa Maria 24m
- Sea Gabriel 32m

Largest Dockyard, Lothal, Gujarat (2300 BCE)



Influence in Asia

Hindus went to far-off lands since ancient times. They went as agriculturists, traders, scholars, kings and even as missionaries. The period from 5th century BCE to 15th century CE was the most glorious one as far as the spread of Hindu culture out of India is concerned. For more than a millennium there was a very profound Hindu-Buddhist influence ranging from Central Asia to Indonesia and from Afghanistan to Japan. The Hindu influence is seen in the philosophy, religious practices, music, dance, art and architecture, literature and even social and political organization. The magnificent temple complex of Angkor Wat in Cambodia, the Ramayan dance in Java and Philippines, the Hindu deities in Japan ... all stand testimony to this influence. Most importantly this cultural expansion was a peaceful one.

Persia

- Zend Avesta, the Zoroastrian sacred text, almost literally similar to portions of the Vedas.
- The Vedic Sun-god Mitra was worshipped in Persia and Roman empire as Mithra.



Central Asia

- Buddhism flourished in Kighizia, Tadjikistan and southern Uzbekistan. Several 1st century monasteries have been excavated. Sogdiana (Uzbekistan) witnessed the worship of five Hindu Gods, namely Brahma, Indra, Mahadeva, Narayana and Vaishravana.



Japan

- Many Hindu Gods and Goddesses are worshipped in Japan. They have Japanese names like Shoten for Ganesh, Benten for Saraswati, Daikoku for Shiva etc.

Egypt

- According to the Skandha Purana, Egypt (Africa) was known as Shankha-dvipa.
- At Alexandria, in Egypt, Hindu scholars were a common sight.

Afghanistan

- Referred to as Gandhara and Vahlka in ancient Hindu-Buddhist scriptures, Hinduism (Saivite) and Buddhism (Mahayana) were the dominant faiths until 8th century CE.

China

- Kasyapa Matanga and Dharmaratna- the first Buddhist monks, crossed Himalayas and arrived in the Chinese capital during the reign of Emperor Ming between 58 - 75 C.E.
- Bodhidharma, a South Indian Prince started the Dhyana (Chan) School of Buddhism.
- Established a monastery at Shaolins also introduced the martial arts of gongfu and stick-fighting.



Vietnam

- Hindu dynasty of Champa founded between 150 and 200



Philippines

- Received Hindu cultural influences through Shri Vijaya and Majapahit empires. Ramayan dance and many religious practices have Hindu influence



Thailand

- Thailand is today predominantly Buddhist. There are traces of Hindu influence, visible mostly in the court ceremonials.
- Erawan shrine, consecrated to Brahma, is one of the most sacred shrines to the Thai people.
- The King of Thailand bears the royal title as Ram the story of Ramayana is depicted on the palace and temple walls of Bangkok

Indonesia

- Until 15th century Hinduism was the predominant religion. Several Hindu-Buddhist temples like the Shiva temple at Dieng, Prambanan and Borobudur where the Ramayan ballet goes on all the year round. 93% Balinese practice Agama Hindu Dharma

Krishna and Arjun, Jakarta

Cambodia

- Around 2nd century CE, Hindus arrived in Funan (South Cambodia-Vietnam). Kaundinya married the daughter of the local Naga king and introduced Hindu religion, culture and Sanskrit language to the region.
- Angkor Wat, a temple complex dedicated to Lord Vishnu was built in 12th century CE during the reign of King Suryavarman II.

Angkor Wat, Cambodia

Yogyakarta, Indonesia

140 FT Lord Murugan, Malaysia



Contributions in Arithmetic

India is the birth place of several mathematical concepts, like zero, the decimal system, algebra, arithmetic and geometry. Use of basic mathematics was found in Indus Saraswati civilizations. The primary use was with weights and measuring scales.

"It is India that gave us the ingenious method of expressing all numbers by ten symbols, each symbol receiving a value of position, as well as an absolute value. We shall appreciate the grandeur of this achievement when we remember that it escaped the genius of Archimedes and Apollonius." - Pierre Laplace (France)

"We owe a lot of to the Indians, who taught us how to count, without which no worth-while scientific discovery could have been made." - Albert Einstein

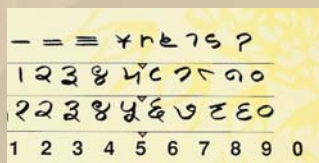
Zero: A Jewel from the Hindu Mind

Hindu → Arabic → Latin → West
 Shunya → Si-fir → Ziffre → Zero



Number Symbols

Brahmi inscription (300 BCE)
 Gwalior inscription (870 BCE)
 Devanagari inscription (1100 CE)
 Modern



Large and Small Numbers

In India, from the time of Vedas, very large and small numbers were defined.

How big? How small?

Koti	10^7	Pada	1/4
Titilamba	10^{27}	Sapha	1/8
Sarvabala	10^{45}	Kustha	1/12
Tallakshna	10^{53}	Kala	1/16

References of Arithmetic and Numerical Concepts

- Decimal system - decimal units go back as far as the Indus Valley civilization
- Binary number system - first used by Pingala (Panini's brother)
- Arithmetical Progressions, Indeterminate Equations, Summation of fractions - Bakhshali manuscript
- Zero - The Bakhshali manuscript
- Floating point numbers - Kerala School

References of Number Theory Concepts

- Infinity - Yajur Veda
- Transfinite numbers - Jain Mathematics
- Irrational numbers - Shulba Sutras

Square and Cube Roots (5th Century)

The method of extracting the square root and cube root by division was formulated by Aryabhata (476 CE)

भागं हरेदवर्गान्नित्यं द्विगुणेन वर्गमूलेन ।
 वर्गाद्द्वगं शुद्धे लब्धं स्थानान्तरे मूलम् ॥

Divide the non-square place by twice the square root of the square place, then subtract the square from the next square place; the quotient placed at the next place is the root. (to be counted from right to left)

Counting

Vedic Indians defined the decimal scale using 10 as the base. They coined Number-names to denote numbers.

Eka	Dvi	Tri	..	Nava
1	2	3	..	9
Dasa	Vimsati	Trimsati	..	Navati
10	20	30	..	90
Sata	Sahasra	Ayuta		
100	1000	10000		

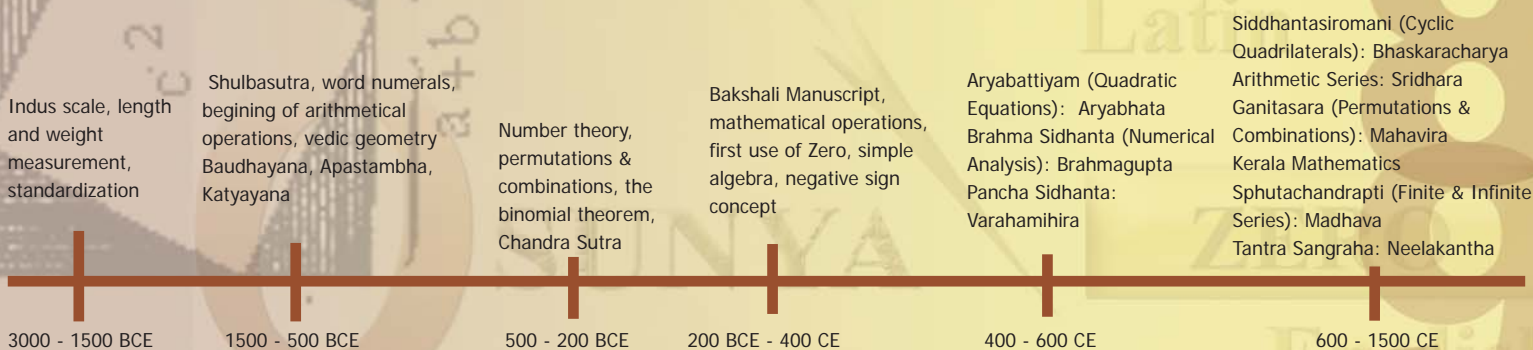
Vedic Mathematics (1500 BCE - 450 BCE)

- All four basic arithmetical operators (addition, subtraction, multiplication and division)
- A definite system for denoting any number up to 10^{e-55}
- Use of Prime numbers

Jain Mathematics (500 BCE - 100 CE)

Permutations and Combinations:

- In Bhagavati Sutra (300 BCE) there are number of problems involving permutations and combinations
- Indices and Logarithms - *Anuyogadwara Sutra* lists sequences of successive squares and square roots, like (a) , (a^2) , $([a^2]^2)$,.....



Contributions in Geometry

Many formulations in Geometry and Trigonometry were made in ancient India.

The Shulbha Sutras of Vedangas are manuals for construction of various complicated geometrical shapes for fire altars.

The key knowledge: Baudhayana Sutra (Pythagoras Theorem), area of triangle, value of pi, rules for the construction of the circles, squares, triangles, rectangles and parallelograms.

The *Surya Siddhanta* contains the roots of modern trigonometry.

Area of Triangle

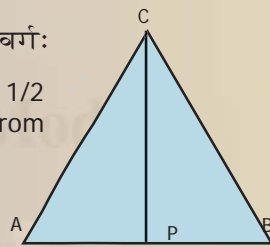
Aryabhata (476 CE)

त्रिभुजस्य फलशरीरं समदलकोटी भुजाधसंबर्गः

The area of a triangle is the product of 1/2 of any side and the perpendicular (from opposite vertex) to it.

$$(1/2 AB) \times CP.$$

Modern method
 Area ABC = 1/2 X
 Base X (Altitude)

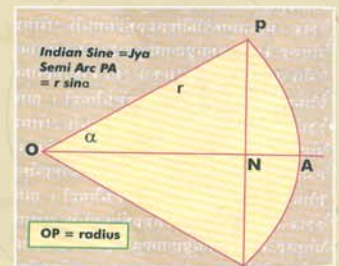


Trigonometry

Concept of Trigonometry is an important gift of ancient India to the world of Mathematics.

The Indian *Jya* and *Koti* Jya became the sine and co-sine in European languages.

Indian Sine = *Jya*
 Semi Arc PA = $r \sin Q$



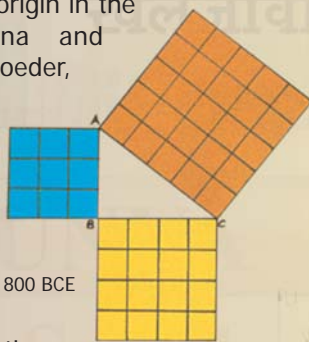
Sulba /Baudhayana Sutra (Origin of the Pythagoras Theorem)

"The Pythagoras Theorem had its origin in the Shulbha Sutras of Baudhayana and Apastamba" - Leopold Van Schroeder, Indologist.

दीर्घचतुरसस्याक्षय्याः रज्जुः
 पार्श्वमानी ।
 तिर्यग्मानी च यत्पृथग्भूते
 कुरुतस्तदुभयं करोति ॥

Sulba Sutra, 1.12, Bodhayanah 800 BCE

Meaning: The diagonal of a rectangle produces by itself both the areas produced separately by its two sides.

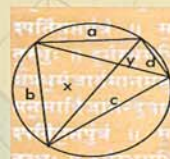


Brahmagupta's Cyclic Quadrilaterals (598 - 668 CE)

One important contribution in Geometry is Brahmagupta's Cyclic Quadrilaterals i.e. quadrilaterals inscribed in a circle. He was the first mathematician to give exact formula for the area of a cyclic quadrilateral in his famous book *Brahma Sphuta Siddhanta*.

$$\text{Area of a cyclic quadrilateral} = \sqrt{(s-a)(s-b)(s-c)(s-d)}$$

Where a, b, c and d are sides and $s = 1/2(a+b+c+d)$



$$x = \frac{\sqrt{(s-a)(s-b)(s-c)(s-d)}}{\sqrt{ad+bc}}$$

$$y = \frac{\sqrt{(s-a)(s-b)(s-c)(s-d)}}{\sqrt{ad+bc}}$$

Value of PI (Aryabhata,476 CE)

चतुरधिकं शतमष्टगुणं द्वाषाष्टिस्तथा सहस्राणाम् ।
 अयुतद्वयविष्कम्भस्य आसन्नो वृत्परिणाहः ॥

Aryabhatiyam Ganitapada 2 Shloka10

Add four to one hundred, multiply by eight, add sixty two thousand; the result is approximately the circumference of a circle of diameter of twenty thousand.

$$\text{Circumference/Diameter} = 62832/20000 = 3.1416$$

Madhava(Kerala Mathematician 1340 - 1425 CE) gave pi value to 11 decimals 3.1415926539.

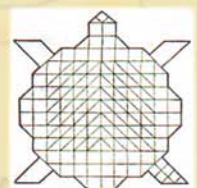
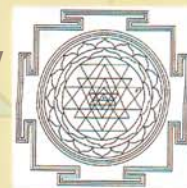
Karnapaddhati gave upto 17 decimal places:
 3.1415926535897932

Bharati Krishna Tirtha in Katapayadi gave a value of pi upto 32 decimal places by a numerical code in a verse:
 3.1415926535897932384626433832792



Ritualistic use of Shulbha Sutra Geometry

Sriyantra: A hymn in Atharva Veda refers to complicated geometric construction for meditation, which involves construction of several accurately intersecting triangles.



Vakrang Kurma

Important Theorems in Shulbha Sutra

Diagonal of a rectangle bisects the rectangle.
 Diagonals of a rectangle bisect each other.
 Diagonals of a rhombus bisect each other at right angles.

Mention of diverse geometric forms in Vedas

Sthananga Sutra
 Katyayana
 Pingala- Apastamba Shulbha Sutra
 Baudhayana
 Shatapatha Brahmana-Yajnavalkya Samhitas

Bakhshali Manuscript
 Jain Mathematics
 Surya Pragnapti

Surya Siddhanta- trigonometry roots
 Value of PI - Aryabhata
 Brahmagupta Siddhanta

Lilavati - Bhaskara II (11th CE)
 Plane and solid geometry
 Kerala Mathematics (1300 - 1750 CE)
 Many works of Madhava (1400 CE)

Contributions in

Astronomy

Rotation of Earth

अनुलोमगातनौस्थः प्रश्यत्यचलं विलोमगं यद्वत् ।
 अचलानि भानि तद्वत् समपश्चिमगानि लङ्कायाम् ॥

Aaryabhattyam 1.4 Sloka 9 (499 CE)

Just as a person in a boat moving forward sees the stationary objects (on the bank) as moving backwards, the stationary stars are seen by people at equator as moving towards the west.



Aryabhata wrote 1,582,237,500 rotations of the Earth = 57,753,336 lunar orbits. Fundamental astronomical ratio $1,582,237,500/57,753,336 = 27.3964693572$, and is perhaps the oldest and closest astronomical constant calculated to such accuracy.

The path of all celestial bodies is elliptical

त्रिनाभिचक्रमजरमनर्वं येत्रेमा विश्वा भुवनाधिः तस्थुः ।

Rigveda 1.164.2 Yajurnyakam 3.11.7-828

The elliptical path through which all the celestial bodies move, is imperishable and unshaken. This is called *Trinabhichakram* because to form an ellipse three points are required. Ellipse is the path of a point that move so that the sum of its distances from two fixed points called foci is constant.



Sun is the centre of solar system

मित्रो दाधार पृथिवीमुतद्वाम् । मित्रं कृष्टीः ।

Taitteriya Samhita 3.4.10.3-4

The Sun holds the Earth and the celestial region together. The Sun is the attracting power of all heavenly bodies.

Planetary motion

कक्ष्या प्रतिमण्डलगा भ्रमन्ति सर्वं ग्रहाः स्वचारेण ।
 मन्दोच्चादनुलोमं प्रतिलोमञ्चैव शीघ्रोच्चात् ॥

Aaryabhattyam (Kalaakriyaapaada)3.17 (499 CE)

It means planets move on their orbits and the true planets on their eccentric circles. All the planets whether moving on their orbits or on the eccentric circles move with their own (mean) motion, anticlockwise from their apogees and clockwise from their sigrochhas (perigees).

Eclipse



छादयति शशी सूर्यं शशिनं महती भूच्छाया ।

Aaryabhattyam 1.4 (Golapada) Sloka 37(499 CE)

The Moon covers the Sun and the great shadow of the Earth covers the Moon.

Moon - the satellite of Earth

आयङ्गौः पृश्निरक्रमीदसदन्मातरं पुरः ।
 पितरञ्च प्रयन्स्वः ।

Rigveda 10.189.1

Yajurveda Taitteriya Samhita 1.5.1.3-4

The Moon, being the satellite of the Earth, revolves around its mother planet and follows it in its revolution around the self-luminous father planet (the Sun).



Western Signs	Yogas taras	Corresponding to these asterisms
Aries	1	Chitra
Taurus	2	Swati
Gemini	3	Jyestha
Cancer	4	Mool
Leo	5	Purashadha
Virgo	6	Uttarashadha
Libra	7	Chaitra
Scorpio	8	Swati
Sagittarius	9	Mool
Capricorn	10	Purashadha
Aquarius	11	Uttarashadha
Pisces	12	Chaitra

Aryabhata

476 CE
 - Aryabhattyam
 Aryabhata presented a mathematical system that took the Earth to spin on its axis and considered the motions of the planets with respect to the Sun (in other words it was heliocentric). His book, the *Aryabhatiya*, presented astronomical and mathematical theories in which the Earth was taken to be spinning on its axis and the periods of the planets were given with respect to the Sun.

Brahmagupta

598 - 668 CE
 - Brahmasphutasiddhanta
 Brahmagupta was the head of the astronomical observatory at Ujjain and during his tenure there, he wrote a text on astronomy, the *Brahmasphutasiddhanta* in 628 CE.

Bhaskara

1114 - 1185 CE
 - Siddhantasiromani, Beeja Ganitam, Karana Kutahala.
 Bhaskara was the head of the astronomical observatory at Ujjain, continuing the mathematical tradition of Brahmagupta. He wrote the *Siddhantasiromani* which consists of two parts: *Goladhyaya* (sphere) and *Grahaganita* (mathematics of the planets).

Yajnavalkya

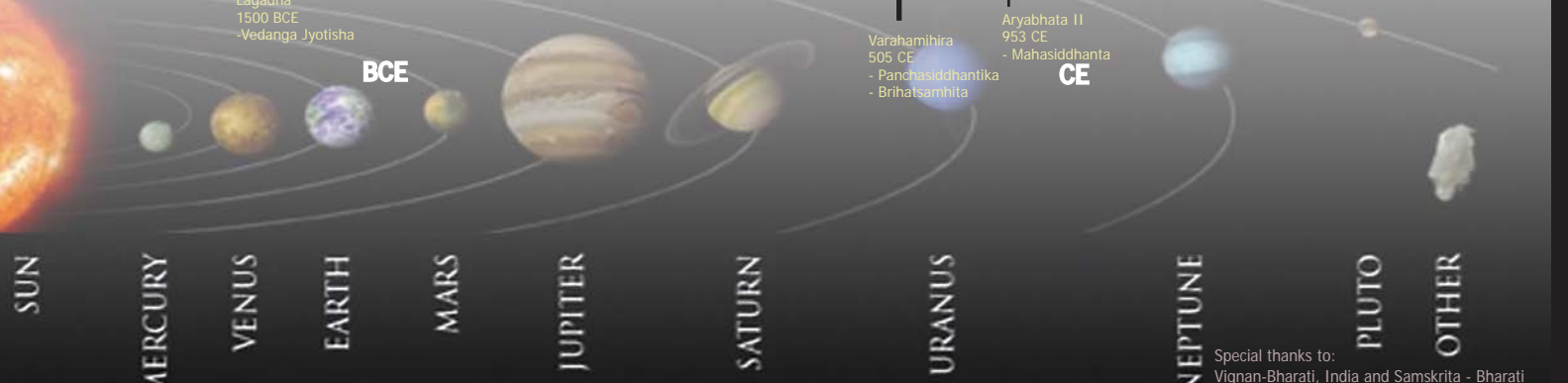
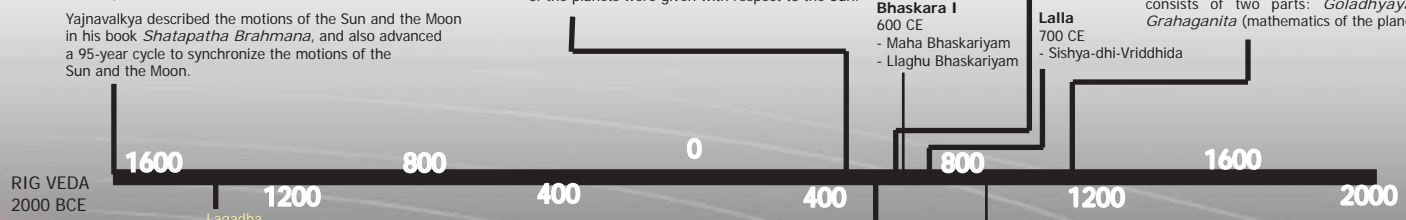
1800 BCE
 - Shatapatha Brahmana
 Yajnavalkya described the motions of the Sun and the Moon in his book *Shatapatha Brahmana*, and also advanced a 95-year cycle to synchronize the motions of the Sun and the Moon.

Bhaskara I

600 CE
 - Maha Bhaskariyam
 - Llaghu Bhaskariyam

Lalla

700 CE
 - Sishya-dhi-Vridhdhida



Knowledge in Physics

- It is amazing to note that ancient Hindu philosophers (seers) theorized inner structure of materials to conceptualize atoms and molecules, their state, force fields, interactions and energy.
- No wonder W. Heisenberg (German Physicist, 1901 - 1976) said "After the conversation about Indian Philosophy, some of the ideas of Quantum Physics that had seemed so crazy suddenly made much more sense."
- The laws of mechanics, action-reaction, gravitation were known in the ancient Hindu world
- Various measurement scales to measure mass, length, temperature and time were established from micro to macro level

Quantum Physics (600 BCE Vaiseshika by Sage Kanada)

Ancient Indian philosopher Kanaada described elements as physically palpable and hence comprised of miniscule particles. The smallest indivisible particle was called *paramanu* in Sanskrit, from *param* (ultimate or beyond) and *anu* (atom). Vaiseshika discusses various concepts of quantum physics.

धर्म विशेष प्रसूदात् ।

According to Sage Kanaada matter particles interact with other particles due to their inherent nature

यत्तेऽभ्युदयनिःश्रेयससिद्धिः ।

It is the property of the particle to develop and attain the final state i.e. state of minimum free energy.

Cause and Effect (1000 BCE Vaisheshika 1.2.1)

कारणाभावात् कार्याभावः ।
न तु कार्याभावात् कारणाभावः ॥

There is no effect possible without a cause. But absence of effect does not mean the absence of cause.

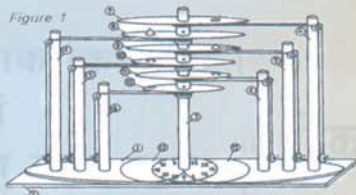
Various Concepts from Vaiseshika and Nyaya

- Gurutva (gravity) is the cause of falling of liquids and solids. Gravity acts not only on the body but equally on its finer constituents (Nyaya Kandili)
- Due to elastic forces solid bodies when stressed or sheared recover their original form (Nyaya Kandili)
- Aristotle (384 - 322 BCE) and Archimedes (287 - 212 BCE) laid foundations of such basic concepts which were revived by Galileo, Kepler and Newton in 17th century

Sage Bharadwaja's Spectrometer

Maharshi Bharadwaja studied the nature and properties of ultraviolet, visible and infrared radiations.

In his book "Anshu Bodhini" he described 5 spectrometers to measure the spectra in three optical regions.



Measurement (micro to macro)

जालानतर्गते भानौ यत् सूक्ष्मं दृश्यते रजः ।
तस्यषष्टितमो भागः परमाणुः प्रकीर्तितः ॥

Vaiseshika Darsana defines "Sixtieth part of the smallest particle seen in sunlight entering (a room) through a window is called paramanu."

Length Scale:

8 Paramanu	= 1 Trasarenu
8 Trasarenu	= 1 Renu
8 Renu	= 1 Balagra
8 Balagra	= 1 Likhya
8 Likhya	= 1 Yuka
8 Yuka	= 1 Yava
8 Yava	= 1 Angula
24 Angula	= 1 Hasta
4 Hasta	= 1 Danda
2000 Danda	= 1 Krosa
4 Krosa	= 1 Yojana

Angle Scale :

According to Surya Siddhanta	
60 Vikala	= 1 Kala
60 Kala	= 1 Bhaga
30 Bhaga	= 1 Rasi
12 Rasi	= 1 Bhagana

Weight Scale:

Basic unit - Ratika (weight of red seed of Gunja plant)	
5 Ratika	= 1 Masha = 0.729 gms
16 Masha	= 1 Tola
4 Tola	= 1 Pala
4 Pala	= 1 Tula

Time Scale:

The units of time were:	
60 Vipala	= 1 Pala
60 Pala	= 1 Ghadi
2.5 Ghadis	= 1 Hora
24 Horas	= 1 Solar day

Speed of Light

Sayanacharya comments (14 th century CE)
तथा च स्मर्यति योजनानां सहस्रं द्वे द्वे च योजने ।
एकेन निमिषार्धेन कममाण नमोऽस्तु ते ॥ इति ॥

It is remembered that the sunlight travels 2,202 *yojanas* in half a *nimisha*.

1/2 Nimisha	= 8/75 second
1 Yojana	= 9.0625 miles
Velocity of light	= 2,202 Yojanas / 8/75 sec. = 19955.625 miles / 8/75 = 1,87,083.984375 miles/ sec = 1,86,300 miles / sec
Value by above shloka	
Modern value	

Magnetics, Hydrogen balloon...

Rasarnavah (12th Century CE): described various properties of Magnetism

Agastya Samhita: A flying machine, Hydrogen gas balloon

Concept of five elements exists in Vedas measurement concept

Vaiseshika Darshana gives Concept and structure of matter Basic laws of motion of bodies Elastic and Gravitational forces

Philosopher Kanaada gave *parmanu* theory *Sapekshavad*, principle of relativity (not same as Einstein's Theory of relativity)

Spectrometer invented by Bharadwaja 3 optical regions given as - infrared, visible, ultraviolet Anshu Bodhini: Wavelength

Pre 2500 BCE - Vedic

1000 BCE

600 BCE

400 BCE

Knowledge in Chemistry

"They (ancient Indians) knew how to prepare sulfuric acid, nitric acid, the oxide of copper, iron, lead, tin and zinc, the sulphate of copper, zinc and iron, and the carbonates of lead and iron" historian Elphinstone said in his book 'History of India'.

"Chemistry in Ancient India ... These medical chemists did succeed in producing many important alkalis, acids and metallic salt". A. L. Basham, Australian Indologist

Acid (*Amla*), Alkalis and Salts (*Lavanas*) are discussed in many Vedic texts.

Activities like distillation of perfumes, dyes, pigments and colors preparation and polishing of mirrors are good examples of advancement in chemistry in ancient time.

Paintings on the walls of Ajanta and Ellora world heritage sites still look fresh after 1000 years, which again testifies high level of science.

Pharmaceuticals: Medicines were derived from plants, few originated from animals. Preparations involved collection of the ingredients, purification, extraction of their essences and compounding of these extracts.

Glass: Known for at least 3000 years. A mention of India exporting a huge lens to China. A 5th century glass factory at Kepica, Uttar Pradesh. Soda-lime-lead glass, a highly transparent glass, was found in Taxila.

Minerals: The Indus valley people used a number of minerals for a variety of useful products such as medicinal preparations, plasters, hair washes etc. Faience, a sort of proto-glass, was quite popular with the Harappans and was used for ornaments.

Ink: An inkpot was unearthed during the excavations at Taxila, which suggests that ink was known and used in India from 4th century BCE. The Ajanta caves displayed some inscriptions that were written with coloured ink. The recipe for ink was also given in *Rasaratnakara* of Nityanatha.

Pottery: Pottery was being used since (9000 BCE) in Nal (Baluchistan) and Amri (Sindh, 2000 BCE), several kilns were found in Mohenjodaro and Harappa 5th - 1st BCE 18 sites in northern and north central India includes Sarnath, Mathura, Patna, Sanchi etc.

Bricks: Burnt bricks were manufactured on a large scale for making houses, drains, boundary walls, public bath etc.

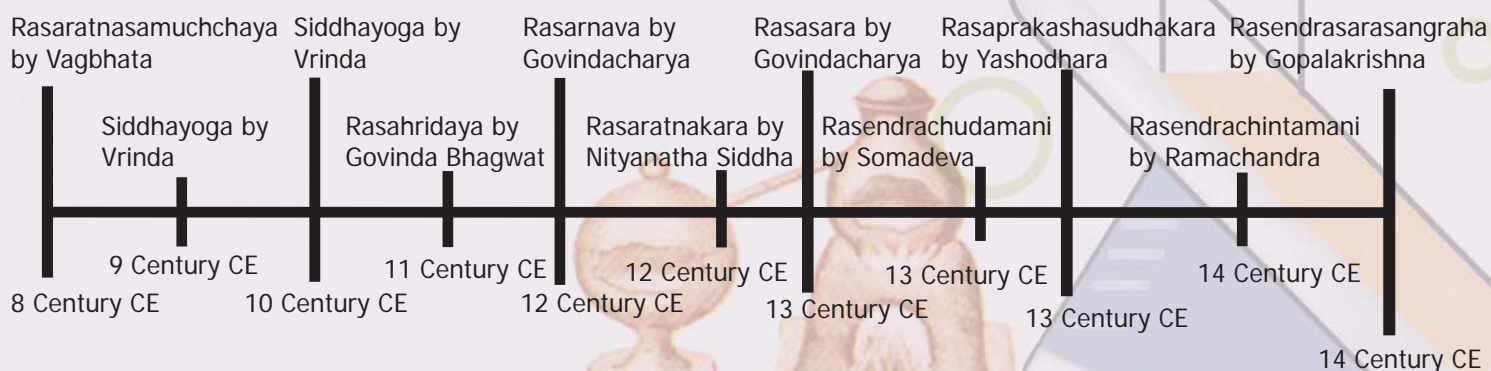
Paper: According to Chinese traveller I-tsing paper was known to India around 7th century CE. The main centers of paper making in medieval India were Sialkot, Zafarbad, Murshidabad, Ahmedabad, Mysore etc.

Cosmetics and Perfumes: A large number of references to cosmetics and perfumes in Sanskrit literature were found in *Brihatsamhita* of Varahamihira.

Cement: Gypsum cement was used in the construction of a wells in Mohenjodaro. It was light grey and contained sand, clay, traces of calcium carbonate and lime.

Soap: There are references to soap like substances called *Phenaka* in ancient texts like *Manusmirti* and *Yajnavalkyasmirti*. In Gujarat, the oil of *Eranda* (*Ricinus communis*), seeds of plant *Mahua* (*Madhuca indica*) and impure calcium carbonate were used.

Nagarjuna (9th Century CE), a chemist, wrote following treatise - *Rasaratnakara*: The treatise dealt with the preparation of rasa (liquids, mainly mercury) and shows that the chemical processes like distillation, liquification, sublimation and roasting were well known those days.



Archaeological evidences trace the history of ancient metallurgy beyond 2500 BCE.

The Vedas make several references to metals like Gold, Silver and Copper. Krishna Yajurveda mentions more metals - Iron (Ayasam), Lead (Sisakam), and Tin (Trapu).

सुवर्णं रजतं ताम्रं त्रपु सीसकमायसम् ।
 षडेतानि च लोहानि कृत्रिमौ कांस्यपिलौ ॥

In Kautilya's *Arthashastra* (4th century BCE) mines were considered important for economic and defence purposes.

Export steel (Wootz) since 200 CE
 From 200 CE onwards India used to export steel to Iran, Arabia, Damascus and other countries for high quality armament. The famous Damascus swords had used Wootz steel from India.

Contributions in Metallurgy



ZINC

Ancient Indians knew the extraction of Zinc from ore by distillation as early as 400 BCE

The Europeans came to know the Zinc distillation process only in 1748 CE when William Campion patented it.

Recognition by the American Society of Metals
 Hailed the pioneering technological process of Zinc (Zinc Distillation Furnace Sawarmine, India) production in India as **"International Historical Landmark for Metallurgy"** (1988)

Bell Metal



Rasaratnasamuchchayah 8.37 (900 CE) described the bell metal technology: "If Bronze and a little Arsenic sulphide is mixed and heated in *Vankanaala* (an apparatus), a part of Arsenic sulphide is lost and it forms a metal called *Ghoshakrishta* (Bell metal)."

Archeological Evidences of use of Gold

Gold in use from atleast 3000 BCE

Gold and Silver alloys in Harappan cities.

Lothal, Gujarat, 100 Gold objects

Taxila & Lothal thin foils and beads of Gold

Gold



Iron

Iron technology was known in several parts of India from 1400 BCE



Megalithic Iron Smelting Furnace Naikund 700 BCE

Brass and Bronze



Rasaratnasamuchchayah 5.204 (900 CE) described: "Bronze is obtained by melting 8 parts of copper and 2 parts of tin." This was practiced more in Saurashtra.

100 ft brass temple near Nalanda

The Chinese pilgrim Huen Tsang described the temple built by King Harsh.

Chalcolithic period (2000-900 BCE)

Ujjain (Madhya Pradesh)
 Daimabad (Maharashtra)

Some archaeological copper mining and smelting sites in Rajashtan, Uttar Pradesh and Bihar from 11th century BCE

Huge (7' 6") statue of Buddha (currently at UK) shows spectacular achievements

Copper



Rustproof wonder

"The still unrusted **fourth century** Iron Pillar of Delhi opens our eyes to find Hindus at that age capable of forge-welding a pillar of iron larger than any that have been forged even in Europe up to a very late age, and not frequently even now!"
 - Historian James Ferguson, 1910

More than 1600 years old, but still rustless

The 22 ft and 6 ton wrought Iron pillar was fabricated around 370 CE as a flag staff for a Vishnu Temple in Mathura. It was shifted to Delhi around 1050 CE.

Tallest pillar of wrought iron type
Dhar (Madhya Pradesh) 46'
(1000-1055 CE)

Kodachadri, Karnataka, 33'

Rustproof Iron Pillar



Ayurveda

The science of life

Ayurveda, having its origin in Vedas, is the oldest continually practiced holistic health care system in the world. Ayurvedic treatment is based on mind, body and spirit focusing on root cause and not merely on symptoms.



Acharya Charaka (600 BCE)
Father of Medicine
author of "*Charaka Samhita*"

- Described medicinal qualities and functions of 100,000 herbal plants
- Revealed various facts on human anatomy, embryology, pharmacology, blood circulation and diseases like diabetes, tuberculosis, heart disease etc.
- Proved the influence of diet, spiritual and ethical living on mind and body



Acharya Sushruta (600 BCE)
father of Surgery
author of "*Sushruta Samhita*"



- Introduced plastic surgery 2,600 years ago
- Sushruta used 125 types of surgical instruments
- Sushruta described 300 different operations, 42 surgical processes and 1120 illnesses

" The surgery of the ancient Indian physicians was bold and skillful. A special branch of surgery was devoted to **rhinoplasty** or operations for improving deformed ears, noses and forming new ones, which European surgeons have now borrowed. "

Sir W. Hunter (British Surgeon. 1718-1783)

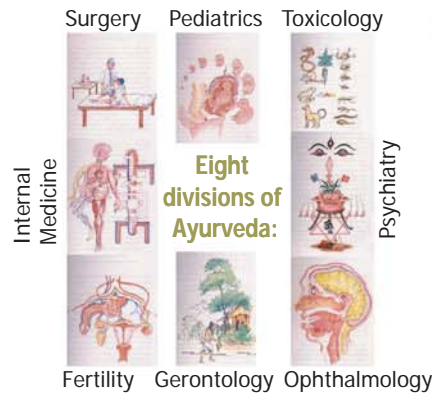
Two main branches of Ayurveda

Atreya Sampradaya

The school of physicians.

Dhanvantari Sampradaya

The school of surgeons.



Pancha Karma (Detoxification)

Pancha Karma is a detoxification process which works through a combination of massage, herbal saunas, special foods, diet and mild fasting.



Influence in world

- Ayurveda influenced medicinal sciences in Egypt, Greece, Rome, Tibet, China, Russia and Japan via visiting students and translations.
- Ancient physicians *Avicenna* and *Rzi Sempion* quoted Ayurveda.

Ayurveda in modern world

- A thriving tradition in India and many countries
- Annually 10,000 students graduate from Ayurvedic Universities in India
- "Pulse diagnosis" is still widely practiced



Personalized Teatment

According to Ayurveda, each person has a unique combination of five basic elements of body:

Three *doshas* (bio-forces) *Vata*, *Pitta* and *Kapha*,
Seven tissues (dhatus) and
Three waste products (malas)

Hence, each person requires a personalized treatment.

Secret of good health

Balanced state of the *doshas*, *dhatus*, *mala*, good ojas and perfectly working senses.

समधातु मलक्रियः प्रसन्नात्मेन्द्रियमनः
स्वस्थ इति अभिधीयते



Yoga

Yoga is unifying with Supreme Being with great devotion and deep awareness
Sage Patanjali: Yoga is mastery over mind
Lord Krishna: Yoga is a state of harmony
Yoga helps enormously in managing stress better and strengthening immune systems

Four Paths of yoga



Lord Sri Krishna described four Paths of yoga in Bhagwad Gita, a Hindu sacred scripture.

- Karma* (action) Yoga:
By action without attachment
- Bhakti* (devotion) Yoga:
By complete surrender.
- Jnana* (knowledge) Yoga:
By seeking knowledge.
- Raja* (self control) Yoga:
By self discipline



Swami Vivekananda
(1863 - 1902)

Yoga in America:

- Swami Vivekananda first introduced Yoga in America in late 19th century. In the early years, Swami Paramashansa Yogananda, Maharshi Mahesh Yogi, and many others popularized Yoga.
- Today Yoga has become an integral part of American life. As per "Yoga in America" study by Yoga Journal in February 2005, the number of Yoga practitioners increased to 16.5 million in America.

Eight limbs of Raja yoga

Sage Patanjali further explained **Raja Yoga** by giving 8 progressive steps called *Ashtanga Yoga*. Two of the 8 steps are *Asana* and *Pranayama* which help in reducing stress and health issues to achieve a perfect harmony.

यमनियमासनप्राणायामप्रत्याहारधारणाध्यानसमाधयोऽष्टावङ्गानि ॥

1. *Yama*: Control at interaction level
2. *Niyama*: Control at individual level
3. *Asana*: Physical postures for body
4. *Pranayama*: Breathing exercises to calm mind
5. *Pratyahara*: Withdrawing from sense objects
6. *Dharana*: Fixing the mind on one object for meditation
7. *Dhyana*: Meditation, Perfect contemplation by complete withdrawal
8. *Samadhi*: Oneness with God, Highest State of Yoga

"Yoga constitutes the practice side of Vedic wisdom. Lord Krishna is the great avatar of Yoga and the main deity of Yoga is Shiva Yogeshwar. Hatha Yoga derives from the Nath Yogis who go back to Adi Nath Lord Shiva. Lord Sri Krishna explained the four primary systems on Yoga in Bhagwad Gita. Yoga is one of the six Vedic Darshanas (school of philosophy). Its founder is Hiranyagarbha. Sage Patanjali systematically compiled yogic principles of Raj Yoga in Yoga Sutras".

David Frawley (Vamadeva Sastry)

Asana, Pranayama and Meditation



Shashankasan

Ardhamatsyendrasan

Chandrasan

Two of the 8 steps outlined by Sage Patanjali are *Asanas* and *Pranayama*.

Main types of *Asanas* - standing, seated, supine and prone

Practising Yoga methods like *Asanas, Pranayama* and meditation help enormously in managing stress better and strengthening immunity systems.

Stimulation and relaxation in yoga practices and breathing practices returns balance in the autonomic nervous system.

Hatha Yoga derives from the Nath Yogis who go back to Adi Nath Lord Shiva



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Ink Pot: Brihatsamhita, Rasaratnakara, Paintings in Bhimbetka Caves in Madhya Pradesh

Metallurgy

Metal: Gold and others metals in Vedas, rust proof iron pillars of Vaishali (Bihar) and Delhi.
Bell Metal: Krishna Yajurveda
Zinc: International Historical Landmark for Metallurgy
Brass: Indus Valley Civilization
Copper: As per Museum & Art Gallery of Birmingham, UK, Indus Valley Civilization

Influence in Asia

The Bodhisattva Warriors - Dukes Terence

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Sewa International: Images of Service

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Hindu civilization is one of the most ancient civilizations of the world. Over the millennia the Hindu culture evolved philosophies, religions, sciences, arts and architecture etc., contributing to almost every imaginable field of human endeavor.

Hindu Swayamsevak Sangh prepared an exhibition in 2006 to introduce this great heritage to the world. In USA, this exhibition was displayed at 8 state Capitol buildings, 30 Libraries, 21 Universities, 57 temples and 64 various public events where more than 41,000 people viewed it. This book is a catalog of the exhibition giving a glimpse of the vast Hindu cultural heritage and the Dharmic traditions from India.

Covering topics...
Basic Concepts and Way of Living
Temples, Cultural Continuity and Architecture
Art, Dance and Music
Hindu Diaspora and its influence
Contributions in Mathematics and Science
Yoga and Ayurveda
Divine nature and service
Role of Hindu Women

The best display on Hinduism available: comprehensive, easy to understand and covering all the main points. Examining it will dispel the many misconceptions about Hinduism and help enlighten the viewer as to the real meaning of life and Dharma.

.... **Dr. David Frawley**, an author of many books on Hinduism, Yoga and Ayurveda

These posters represent an excellent introduction to Hinduism and the scientific achievements of India. They show how Indian ideas of spirituality, philosophy, and science have played a key role in world history.

....**Professor Subhash Kak**, Louisiana State University

This illuminating book on Hinduism allows both Hindus and non-Hindus to reflect on important contributions and wisdom that has been part of Indian culture and heritage. While much of the information presented has been used to sustain and maintain the flow of consciousness from eternity to modernity, this book evokes curiosity, deeper awareness and further exploration through dialogue. I recommend this to every Indian and Indophile.

....**Prasad Kaipa**, Ph.D. An intellectual and executive coach and advisor to CEOs.

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Hindu Swayamsevak Sangh (HSS) USA

<http://www.hssus.org>

HSS, non-profit organization, aims to create awareness about Hinduism in order to preserve, practice and promote Hindu ideals and values for Global peace and harmony.