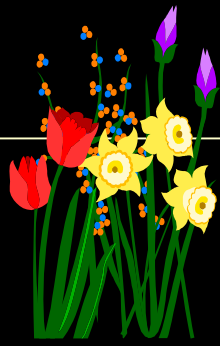
INDIA: A passage from a Glorious Past to a Glorious Future

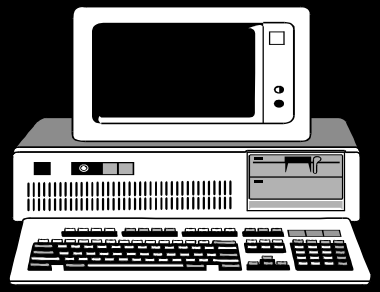


DR. K. CHIDANANDA GOWDA

Former Vice-Chancellor, Kuvempu University

In earlier centuries, foreign invaders conquered India.

In this century, Indian ancient thoughts and wisdom will conquer the world.



- Arnold Toynbee

(Famous British Historian)

MAIN TOPICS

- 1. Glorious Past
- 2. Great Indian Mind Sleeping (During 13th to 18th centuries)
- 3. Challenging Present
- 4. Glorious Future (How?)

ANCIENT INDIA'S CONTRIBUTIONS TO THE WORLD

Indian was the Mother of our Philosophy;

Mother of much our Mathematics;

Mother, through the Buddha, of the ideals embodied in Christianity;

Mother through the village community of self-government and democracy;

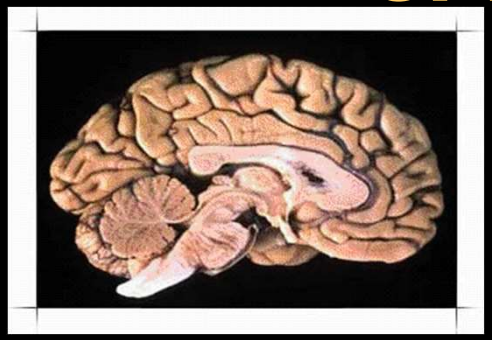
Mother India is in many ways the Mother is us all.

- Will Durant, American Historian

I am convinced that everything has come down to us from the banks of Ganges: Astronomy, Astrology, metempsychosis, etc.

- Voltaire

PANINI (about 500 BC) : Grammarian? Or Father of Computer science?



Panini uses meta-rules, transformations, and recursions with such sophistication that his grammar has the computing power equivalent to a Turing machine.

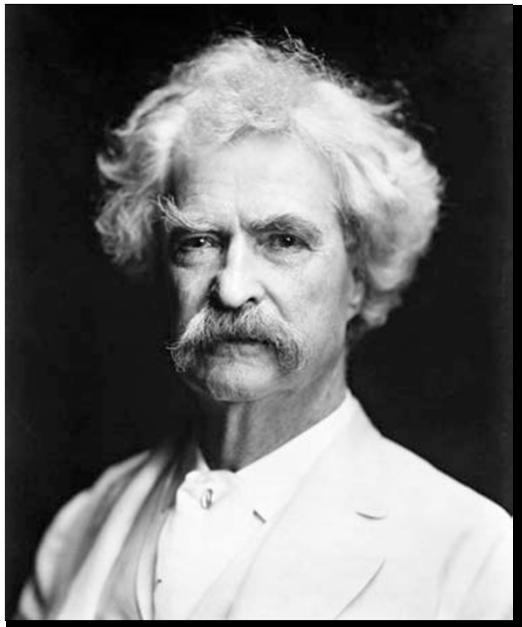
*In this sense Panini may be considered the father of Computing machines.

*His work was the forerunner to modern formal language theory, and a precursor to computing.

*Paninian grammars have also been devised for non-sanskrit languages.

*The Backus-Naur form (Panini-Backus form) or BNF grammars used to describe modern programming languages have significant similarities to Panini's grammar rules.

*His "Karaka Sidhanta" is similar to Semantic network of computer science.



“India is the cradle of the human race, the birthplace of human speech, the mother of history, the grandmother of legend, and the great grand mother of traditon. Our most valuable and most constructve materials in the history of man are treasured up in India only”…. *Mark Twain*

"India was the motherland of our race

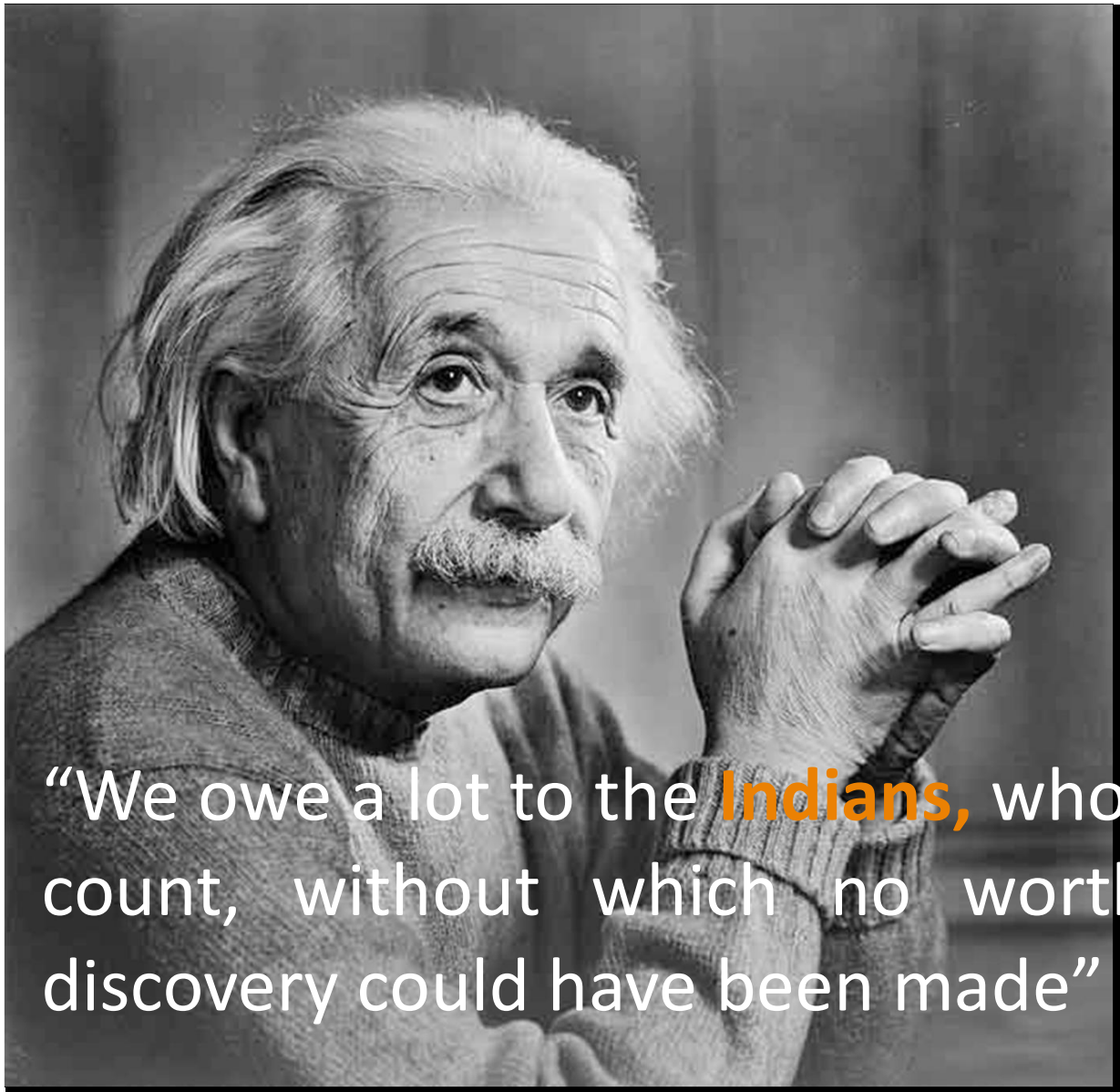
and Sanskrit the mother of Europe's languages.

India was the mother of our philosophy,
of much of our mathematcs, of the ideals embodied in christanity... of self-government and democracy.
In many ways, Mother India is the mother of us all."

– Will Durant
– American Historian 1885-1981

“If there is one place on the face of this Earth where all the dreams of living men have found a home from the very earliest days when Man began the dream of existence, it is **India."**

…Romain Rolland - French Philosopher 1886-1944

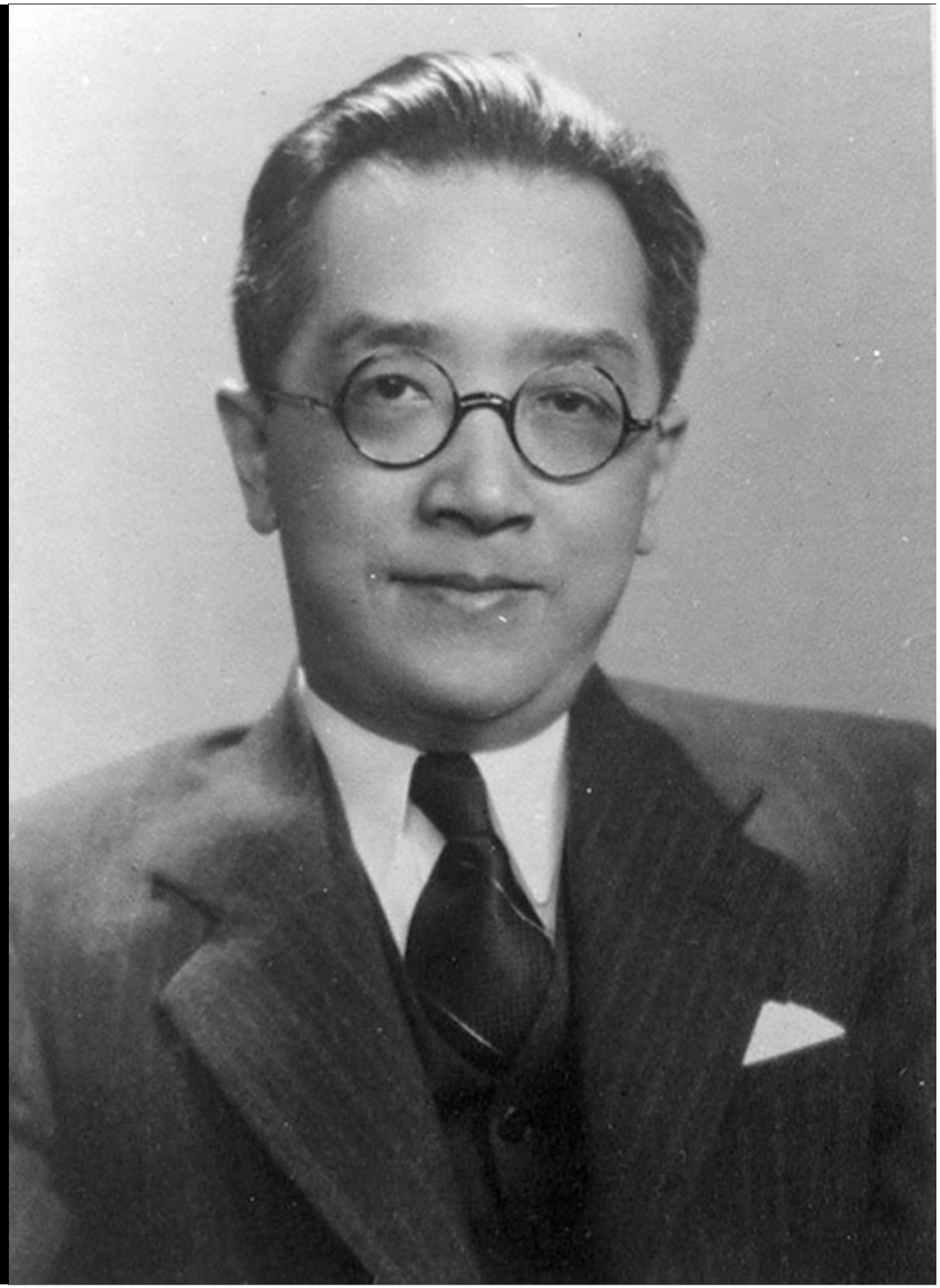


"We owe a lot to the **Indians,** who taught us how to count, without which no worthwhile scientific discovery could have been made"

Albert Einstein

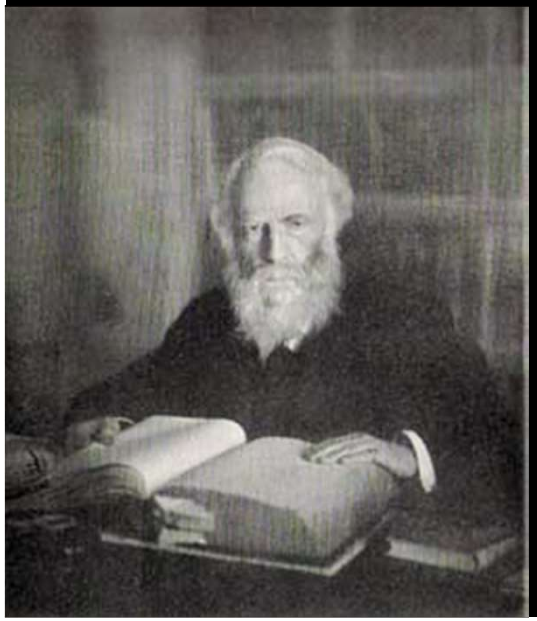
“India conquered and dominated China culturally for 20 centuries without ever having to send a single soldier across her border.”

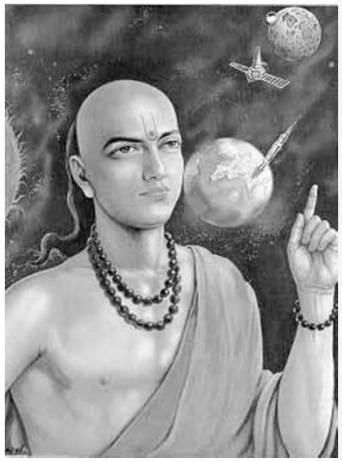
Hu Shih, former Ambassador of China to USA



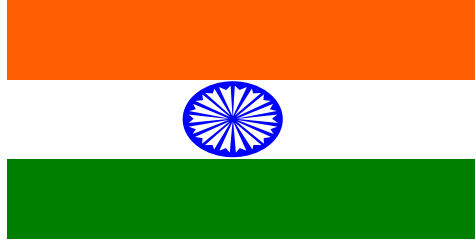
“Many of the advances in the sciences that we consider today to have been made in Europe were in fact **made in India centuries ago”**

Grant Duff BriMsh Historian of India





India invented the Number System. Zero was invented by Aryabhatta.



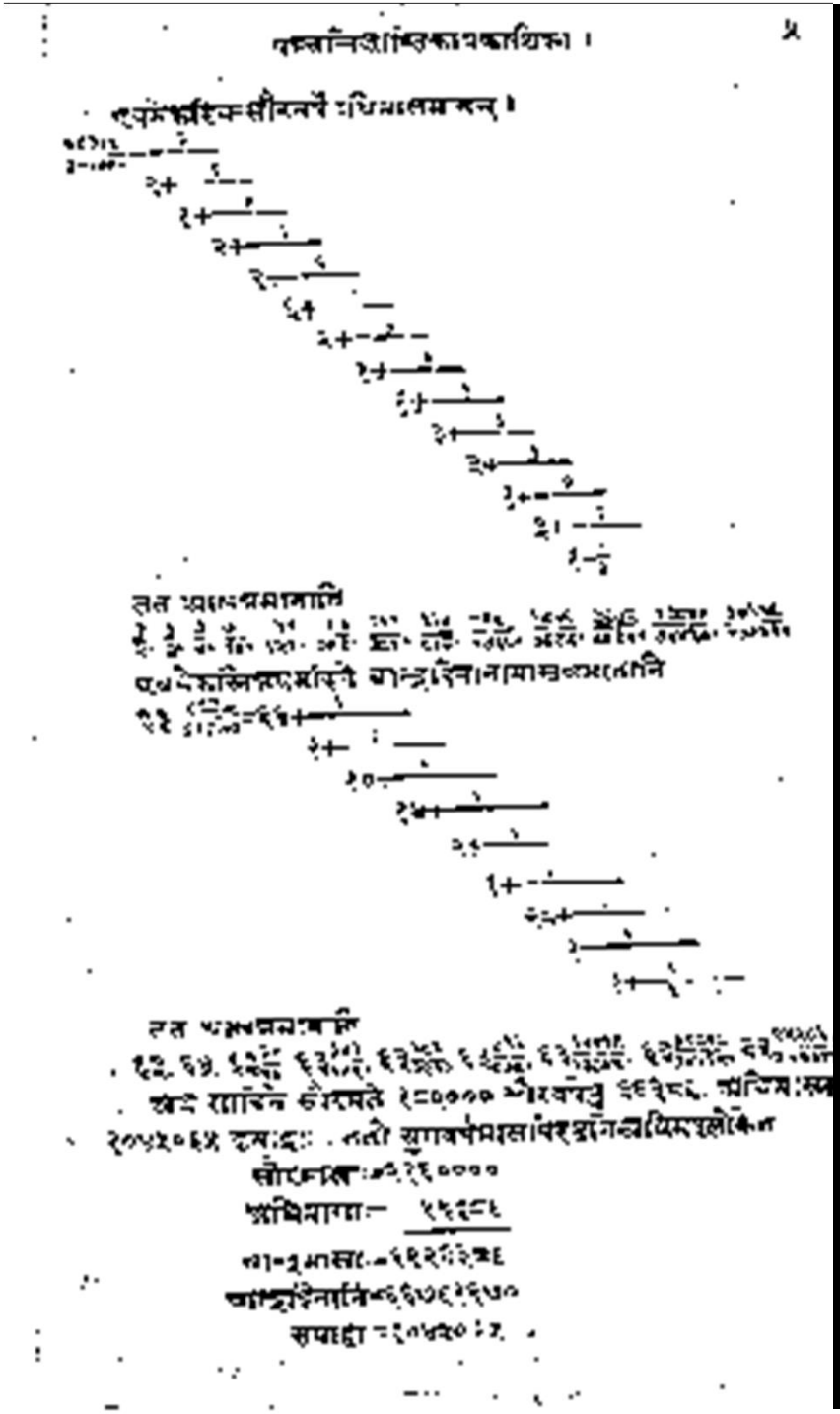
The place value system, the decimal system was developed in India in 100 BC.

śūnya = void

kha = sky

ākāśa = space

bindu = dot

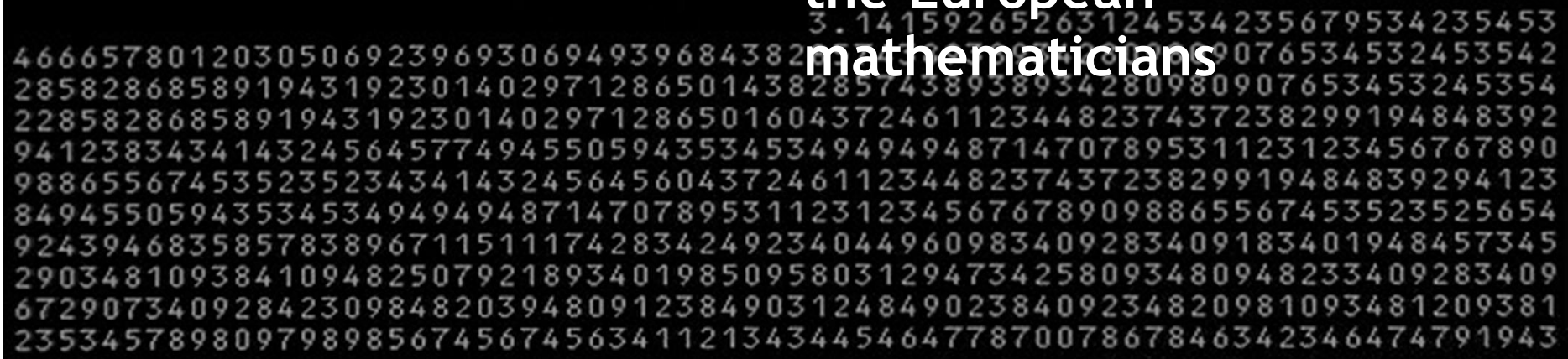


This method of graduated calculation was documented in the Pancha-Siddhantka (Five Principles) in the 5th Century.

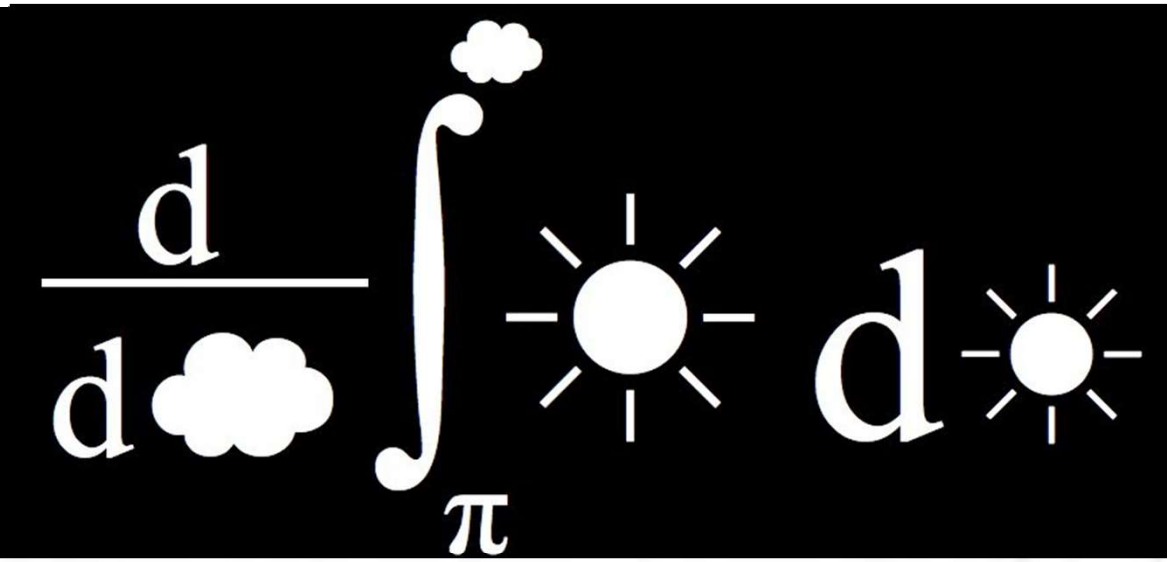
But the technique is said to be dating from Vedic times circa 2000 B.C.

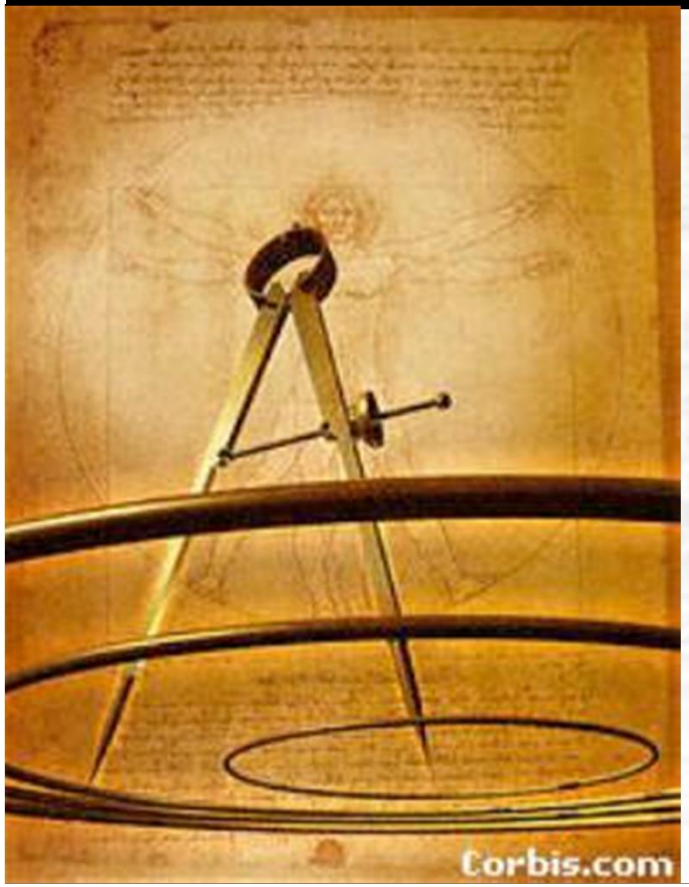
The value of pi was first calculated by Budhayana, & he explained the concept of what is now known as the Pythagorean Theorem

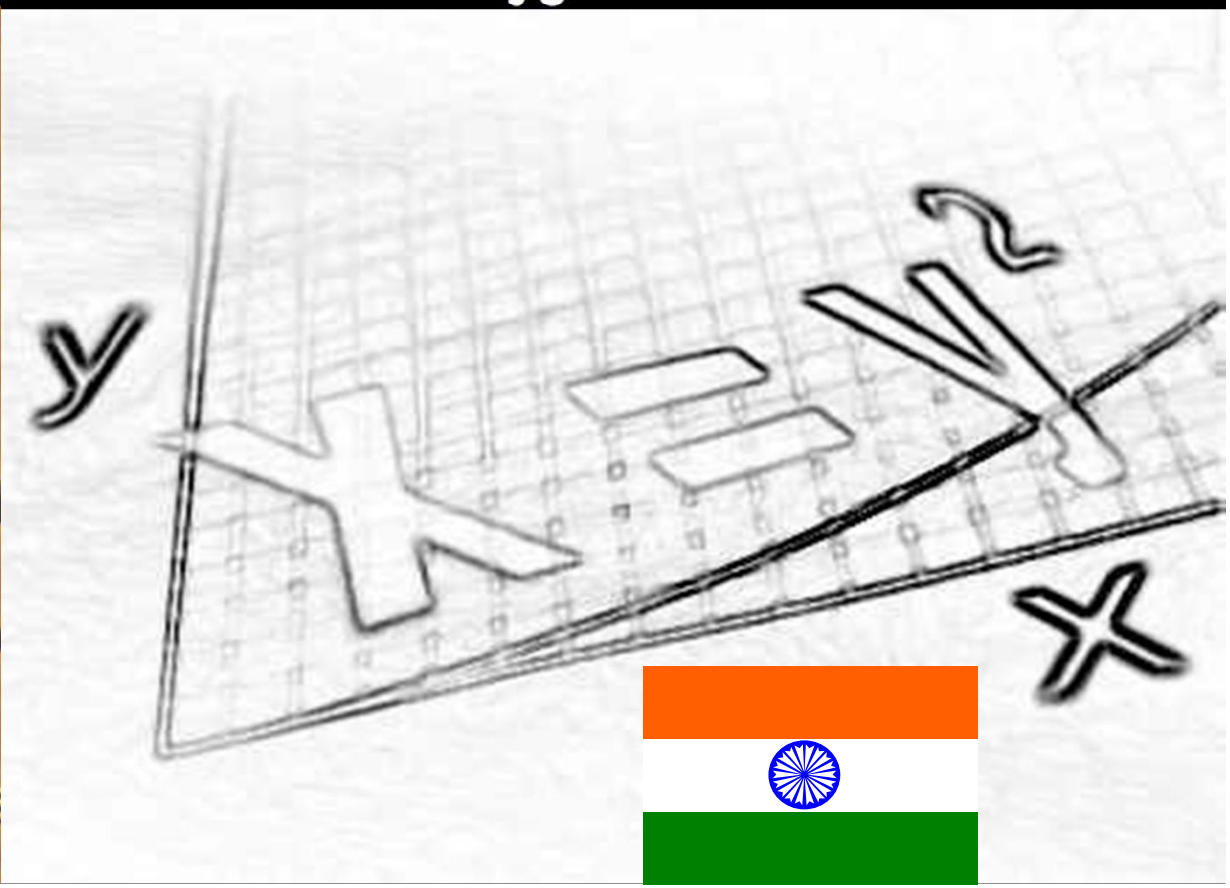
British scholars have last year (1999) officially published that Budhayan's works date back to the 6th Century, which is long before the European mathematicians



Algebra, Trigonometry & Calculus came from India.







$$ax^2+bx+c=0$$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

Quadratic equations were by Sridharacharya in the 11th Century

BIG NUMBERS

- The largest numbers the Greeks and the Romans used were 10**6(10 to the power of 6) whereas Hindus used numbers as big as 10**53(10 to the power of 53) with specific names as early as 5000 BCE during the Vedic period.
- Now the biggest number we know is Googolplex, 10 to the googol power, or
- (10)^(10^100). That is written as a one followed by googol zeroes.

The World's first university was established in Takshila in 700BC.

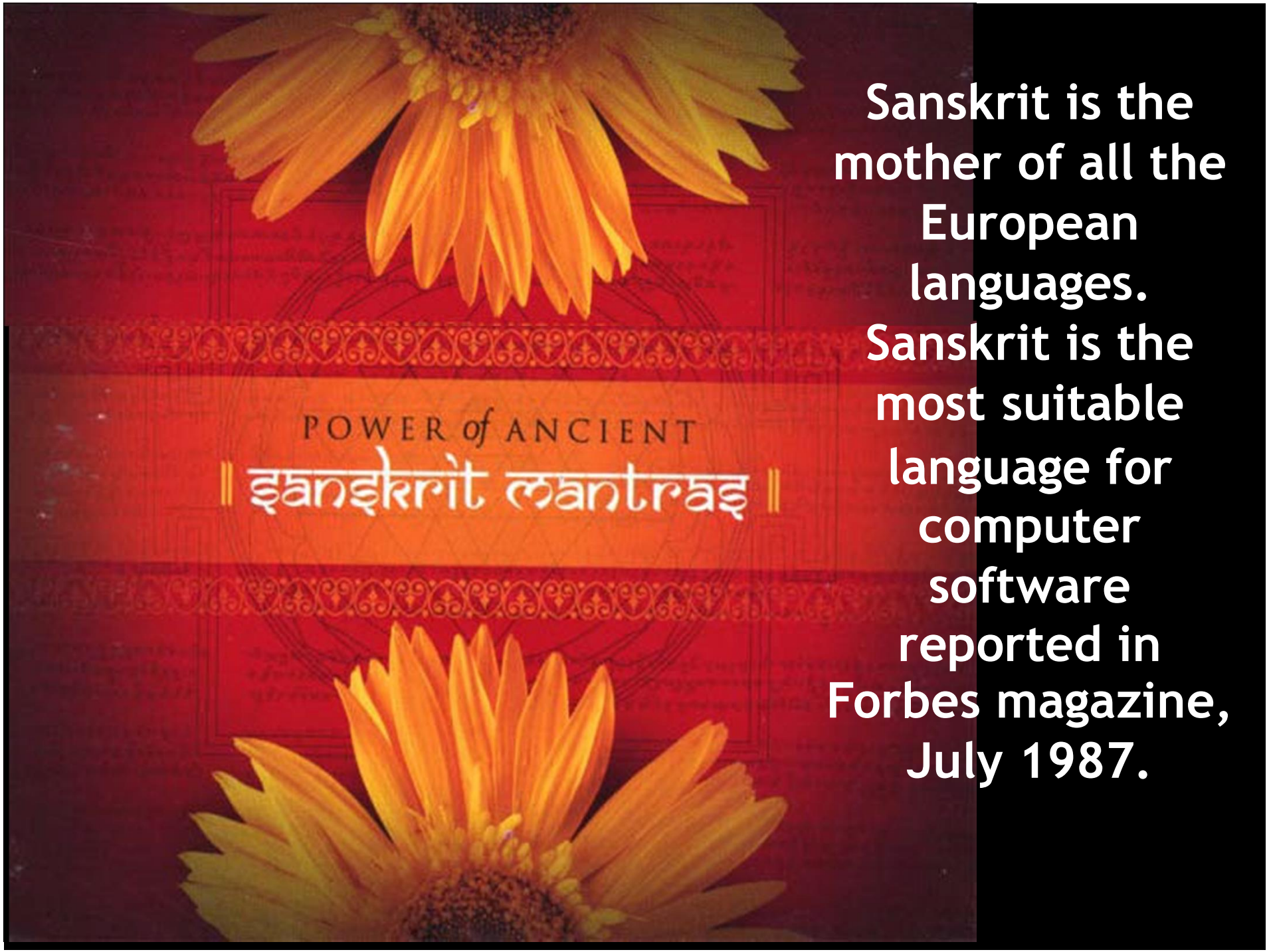
More than 10,500 students from all over the world studied more than 60 subjects.

The University of Nalanda built in the 4th century BC was one of the greatest achievements of ancient India in the field of education.

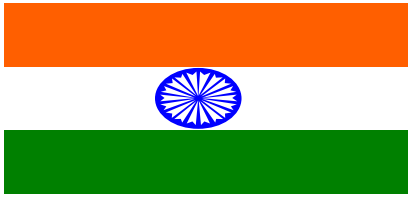
GLOBAL UNIVERSITIES IN ANCIENT INDIA

*700 BC: In Takshashila, the first university of the world existed.
More than 10500 students from different countries studied here.
More than 60 subjects were taught.

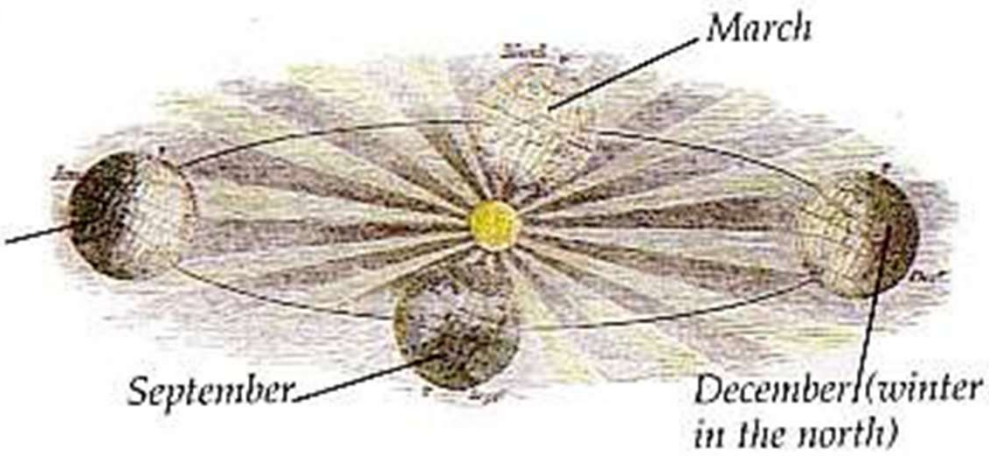
*400 BC: In Nalanda, during the time of King Harsha the Chinese traveler Huyantsang studied here and later taught also.
In 1205 AD, a group of 18 invaders under the leadership of Khilgi destroyed this where 15000 lived and studied.
It seems the big library of Nalanda was burning continuously for 6 months.



Sanskrit is the mother of all the European languages. Sanskrit is the most suitable language for computer software reported in Forbes magazine, July 1987.



According to the Forbes magazine, Sanskrit is the most suitable language for computer software



Bhaskaracharya calculated the time taken by the earth to orbit the sun hundreds of years before the astronomer Smart.

Time taken by earth to orbit the sun: (5th century) 365.258756484 days

Ayurveda is the earliest school of medicine known to humans.Charaka, the father of medicine consolidated Ayurveda 2500 years ago.

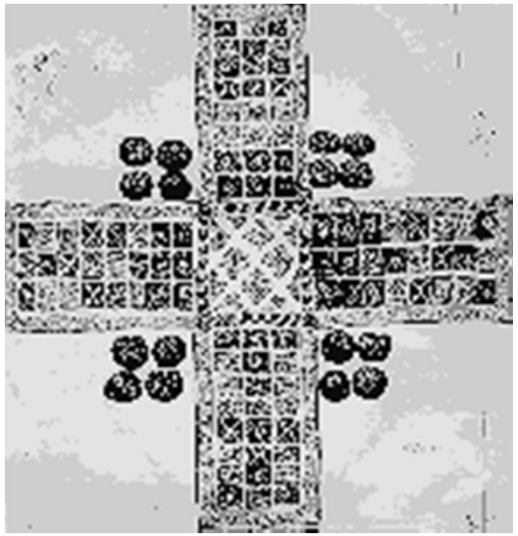
Today Ayurveda is fast regaining its rightful place in our civilization.

The art of Navigation was born in the river Sindh 6000 years ago.

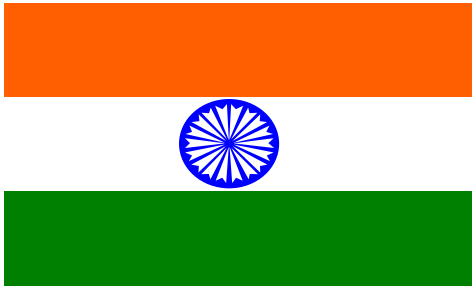
The very word Navigation is derived from the Sanskrit word NAVGATIH.

The word navy is also derived from Sanskrit

According to the Gemological Institute of America, up until 1896, India was the only source for diamonds to the world.



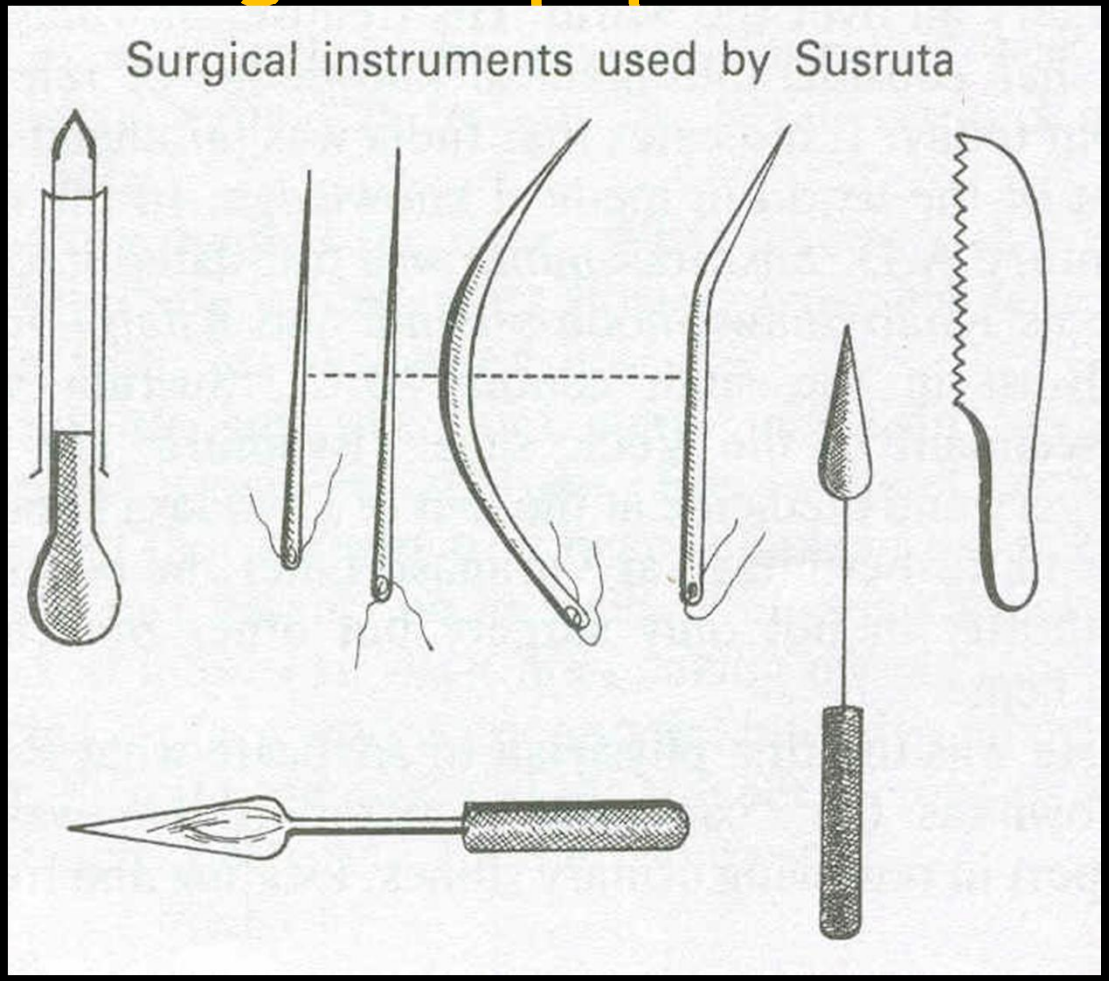
Chess (Shataranja or AshtaPada) was invented in India



Susnruta is the father of surgery.

2600 years ago he and health scientists of his time conducted complicated surgeries like cesareans, cataract, artificial limbs, fractures, urinary stones and even plastic surgery and brain surgery.
Usage of anesthesia was well known in ancient India

Over 125 surgical equipments were used



Deep knowledge of anatomy, physiology, etiology, embryology, digestion, metabolism, genetics and immunity is also found in many texts

The earliest reservoir and dam for irrigation was built in Saurashtra

Ancient Indus Civilization

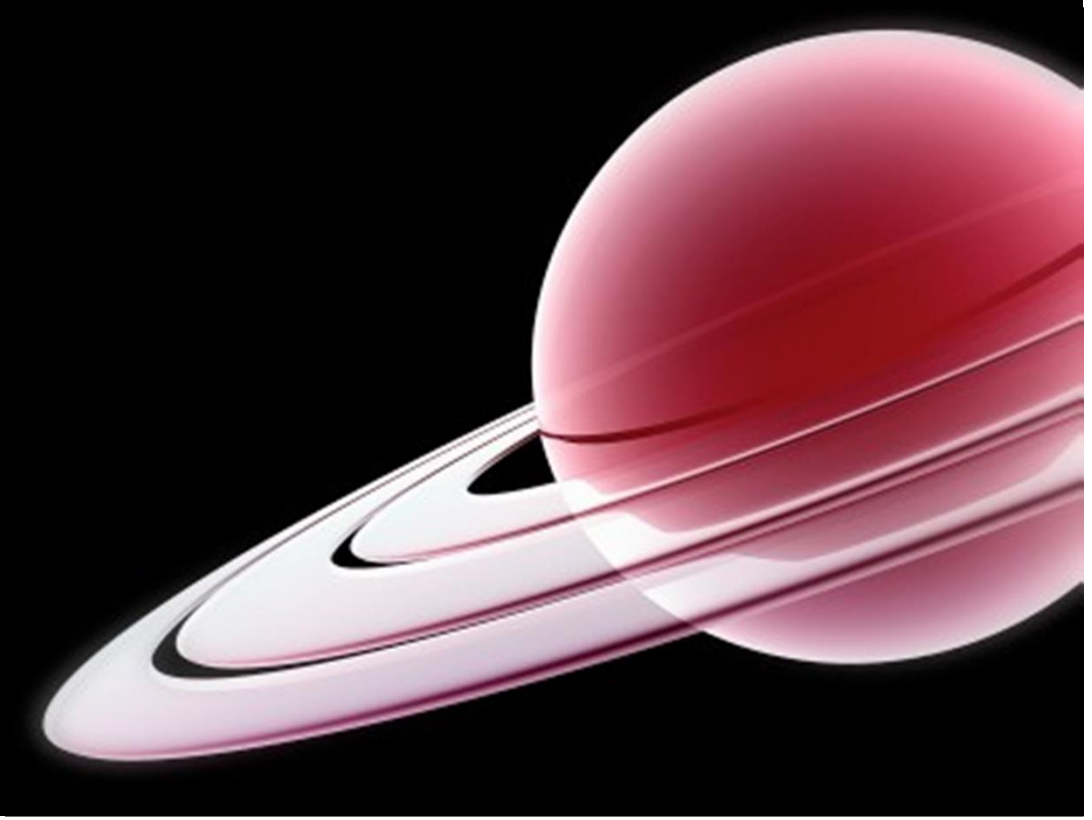
When many cultures were only nomadic forest dwellers over 5000 years ago, Indians established Harappan culture in Sindhu Valley(Indus Valley Civilization)

In ancient times, commodities like sugar, palm oil, coconut oil, cotton cloth, clarified butter, cast iron, tin sheets, copper vessels, dyes and pigments like cinnabar (ochre), indigo and lac, perfumes like sandalwood oil, musk tamarind, costus, macir, camphor, and even crude glass crockery were being exported from India

The earliest recorded use of copperware in India has been around 3000 B.C.

The findings at Mohen-jo-daro and Harappa, bear this out The earliest documented observation of smelting of metals in India is by Greek Historians in the 4th Century B.C

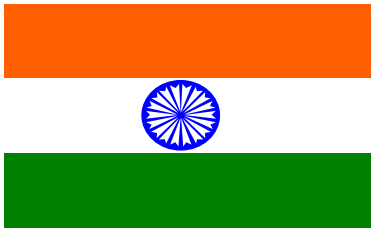
India's Contribution to - ASTRONOMY



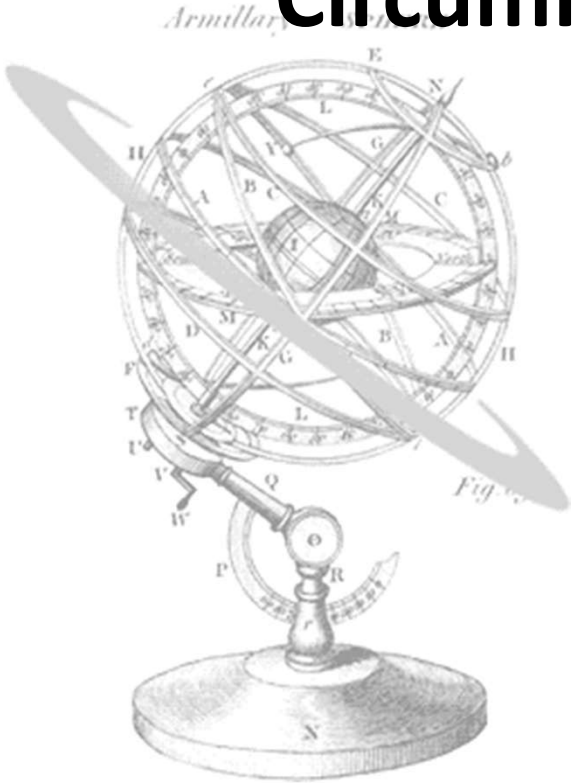
"In **India** I found a race of mortals living upon the Earth. but not adhering to it. Inhabiting cities, but not being fixed to them, possessing everything but possessed by nothing". - Apollonius Tyanaeus

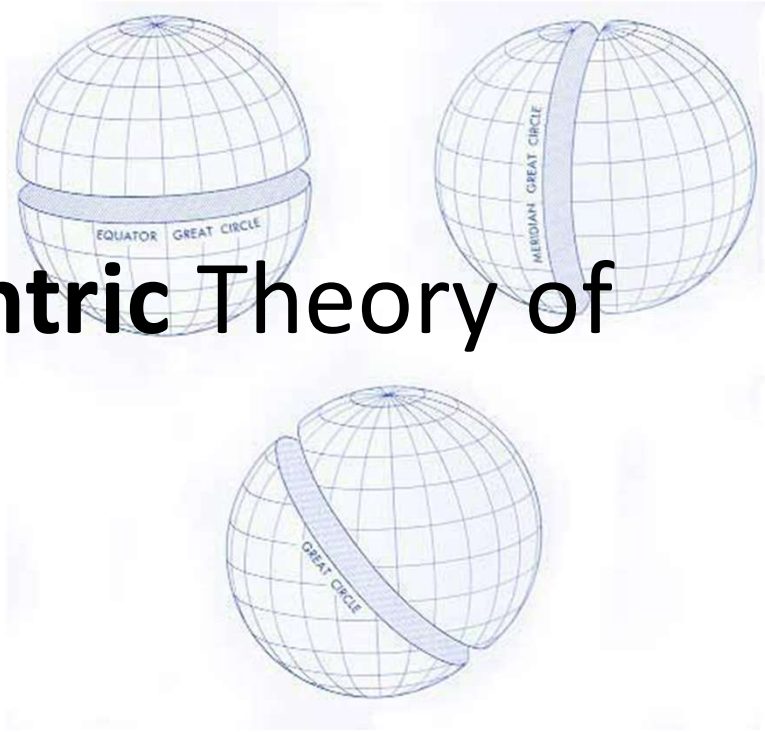
Greek Thinker and Traveller 1st Century AD

In India the first references to astronomy are to be found in the Rig Veda which is dated around 2000 B.C

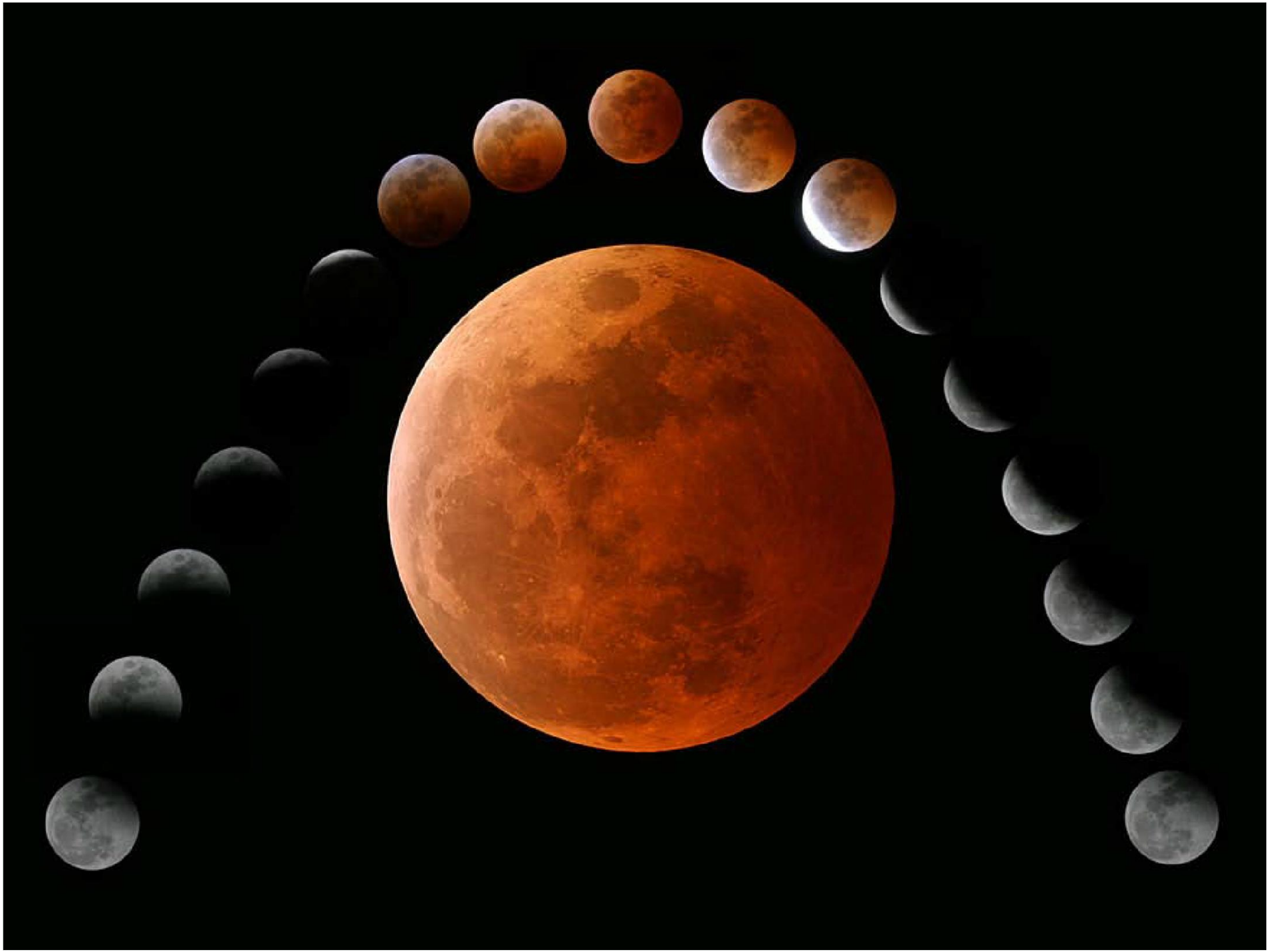


The Calculation of Eclipses And The Earth's Circumference



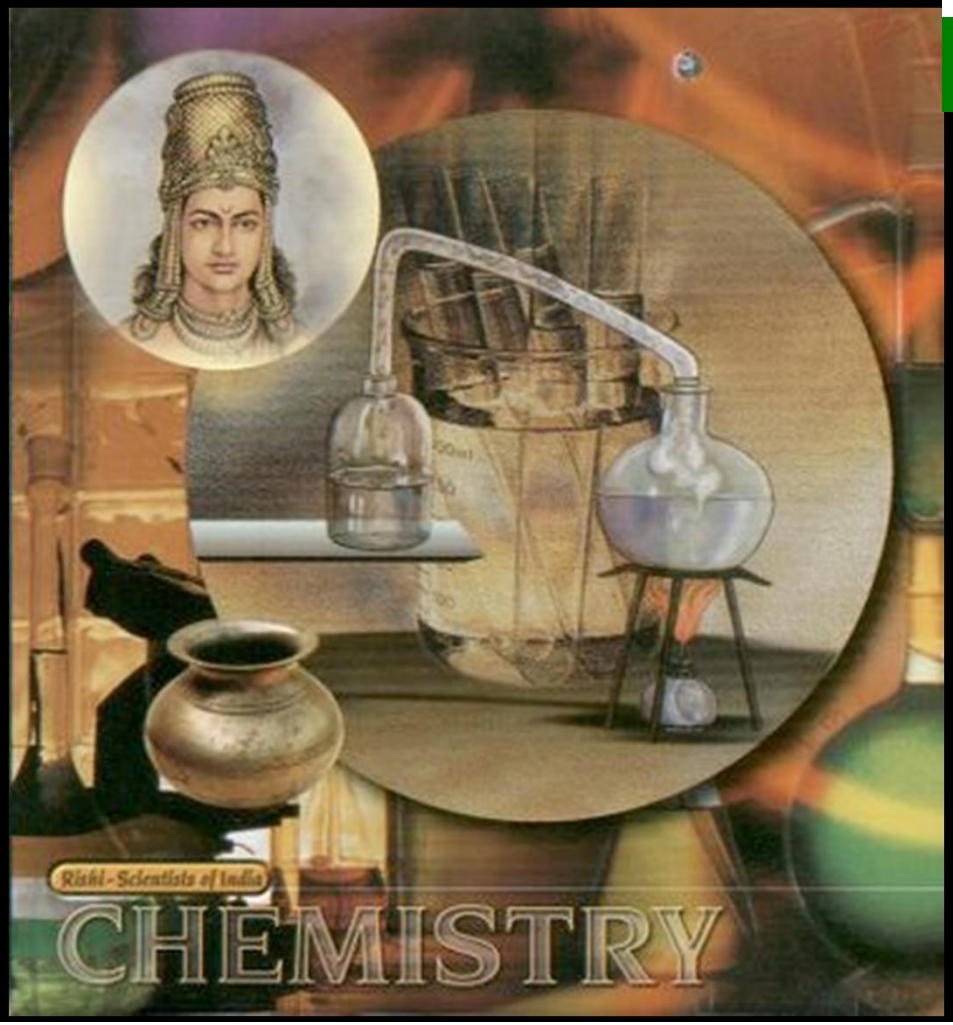


The **Heliocentric** Theory of Gravitaton



This fascmile is fromthe Pancha-siddhantika (Five Principles) dated around the 5th century. This text graphically shows how eclipses are to be calculated. Thus this text foreshadows what Westeren Astronomers propounded nearly one thousand years later

India's Contribution to – PHYSICS & CHEMISTRY



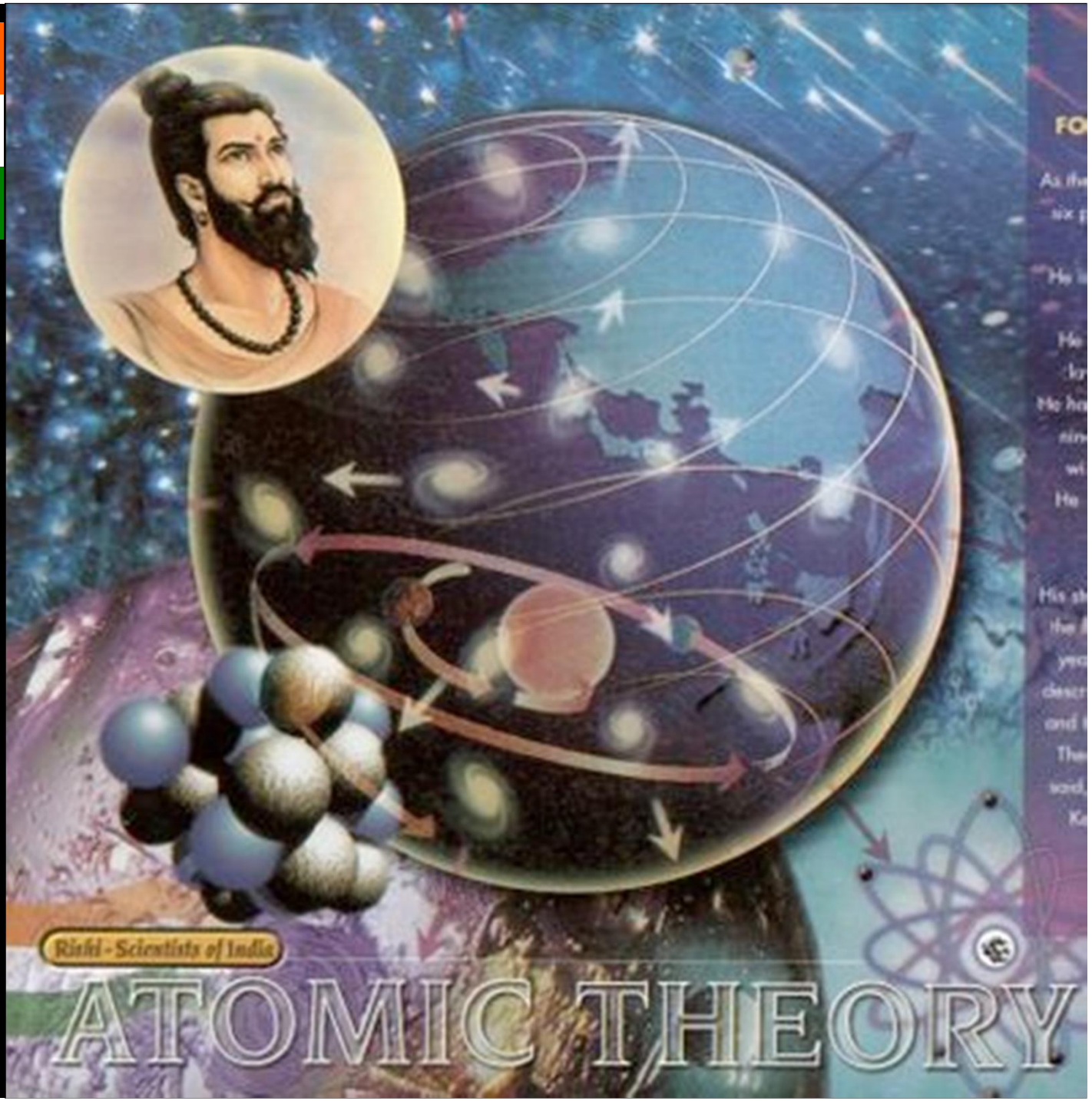
"Ancient Indian theories lacked an empirical base, but they were brilliant imaginative explanations of the physical structure of the world, and in a large measure, agreed with the discoveries of modern physics"

A.L. Basham, Australian Indologist

The Five Basic Physical Elements

Anu &
Parmanu

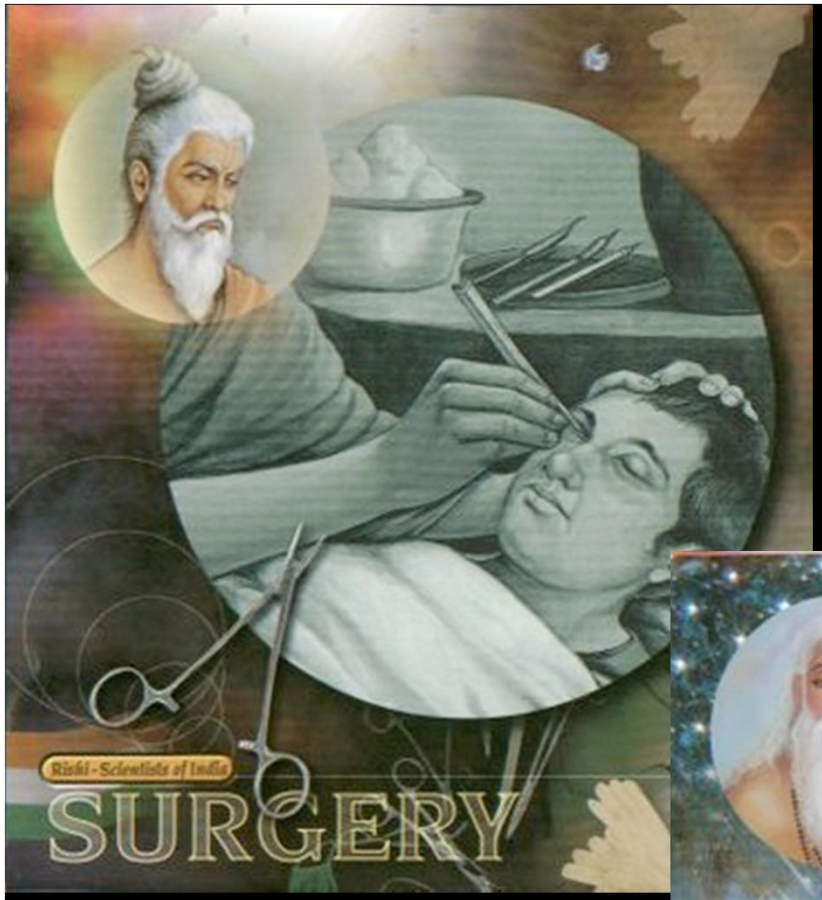
Indian Ideas on Atomic Physics



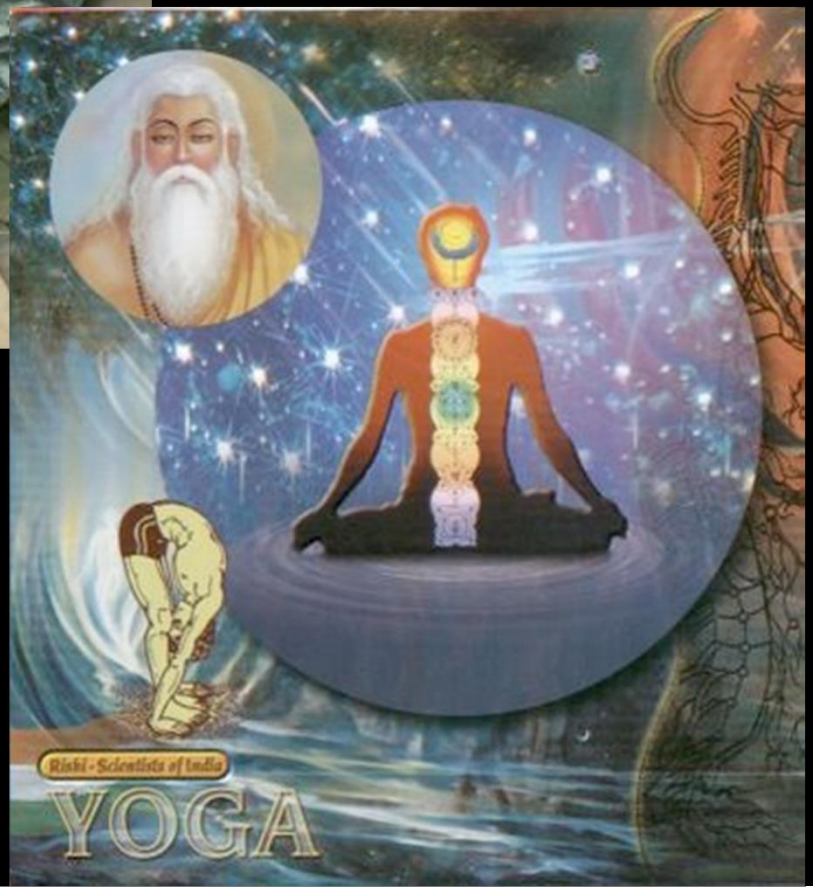
India's Contribution to MEDICAL SCIENCE

"In the great teaching of the Vedas, there is no touch of sectarianism. It is of all ages, climes and nationalities and is the royal road for the attainment of the Great Knowledge“

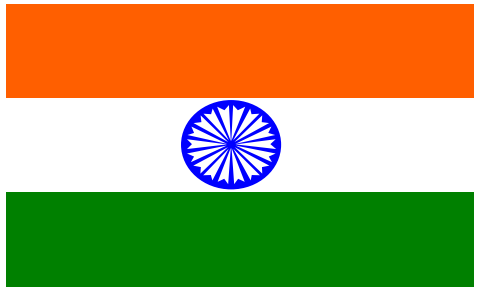
Thoreau, American Thinker



SHASTRAKARMA, THE ART OF SURGERY



AYURVEDA THE SCIENCE OF LONGEVITY



YOGA - HEALTH OF THE BODY AND MIND

India's Contribution to THE FINE ARTS

"If I am asked which nation had been advanced in the ancient world in respect of education and culture then I would say it was **– India”**

… Max Muller German Indologist

MUSIC

PAINTING

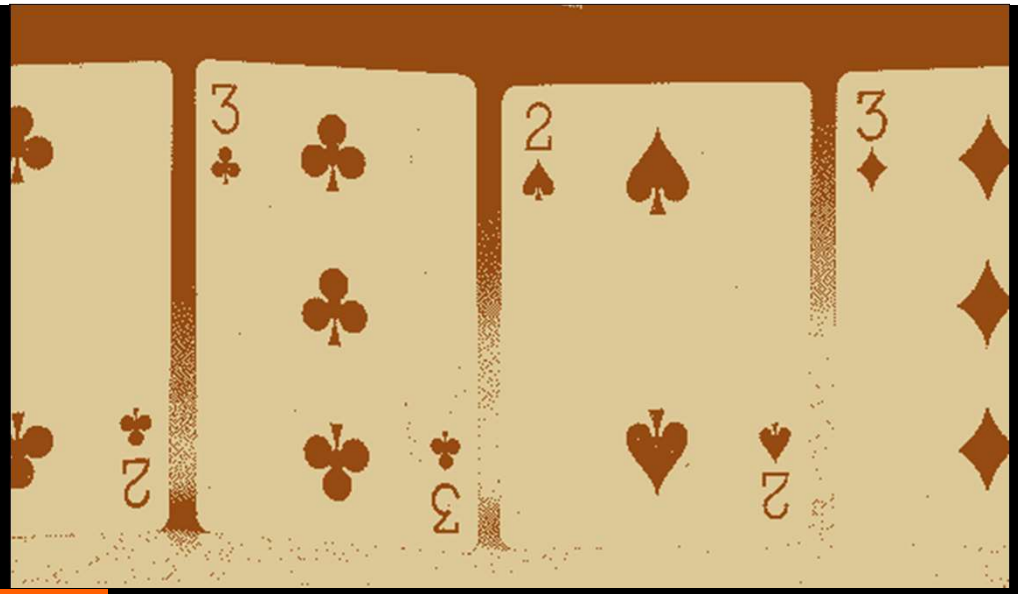
LINGUISTICS

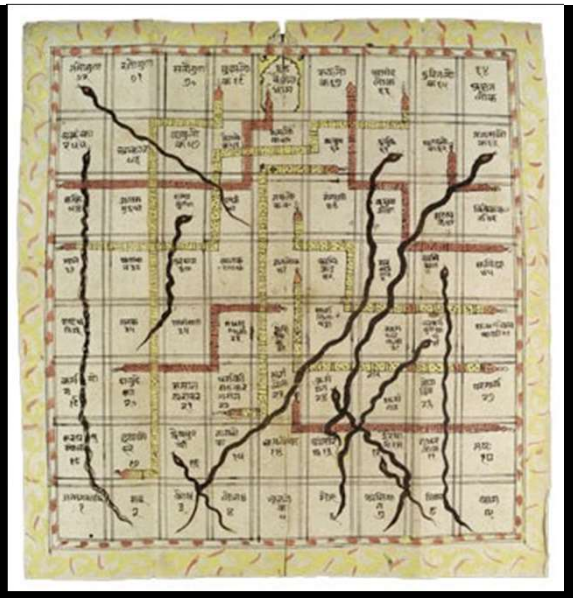
DANCE

THEATRE

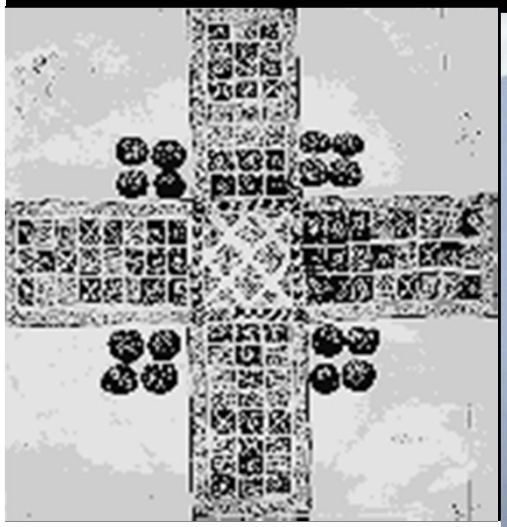
SPORTS AND GAMES

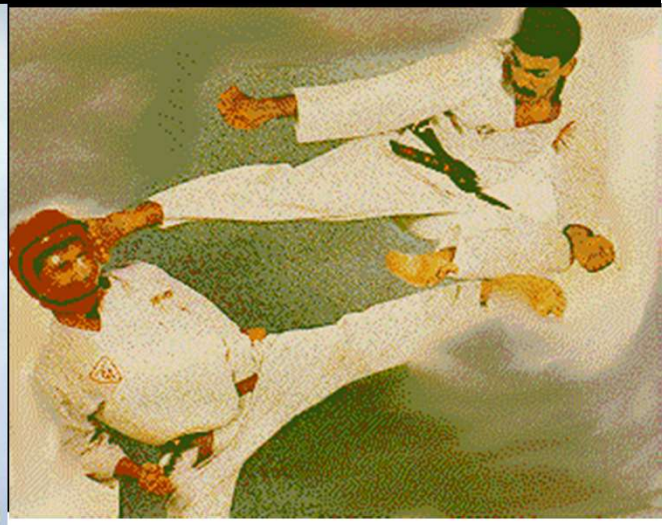
- In Ancient India





Chess, Snakes and Ladders, Playing Cards, Polo, the martial arts of Judo and Karate





India's Contribution to –

PHILOSOPHY

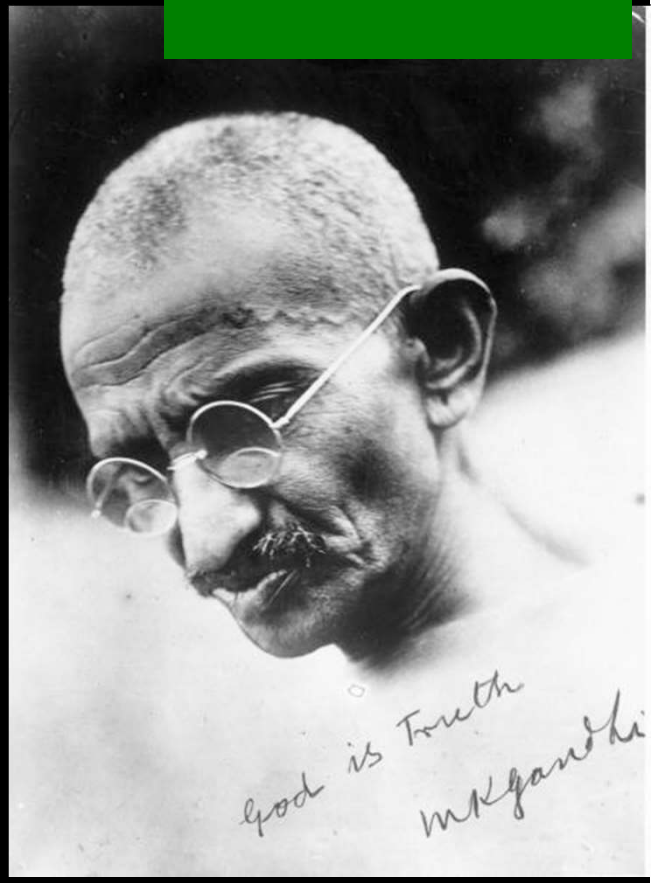
RELIGION

- **"In religion, India is the only millionaire** .... The One land that all men desire to see and having seen once, by even a glimpse, would not give that glimpse for all the shows of all the rest of the globe combined".

- ... Mark Twain, American Author 1835-1910

MEDITATION AND RENUNCIATION

AHIMSA - NON VIOLENCE



RELIGIOUS TOLERANCE

Human excellence depends on development of culture

Many small civilizations were formed but were confined to small regions. Only Indian culture can be called as first world culture.

Indian Culture = Human Culture

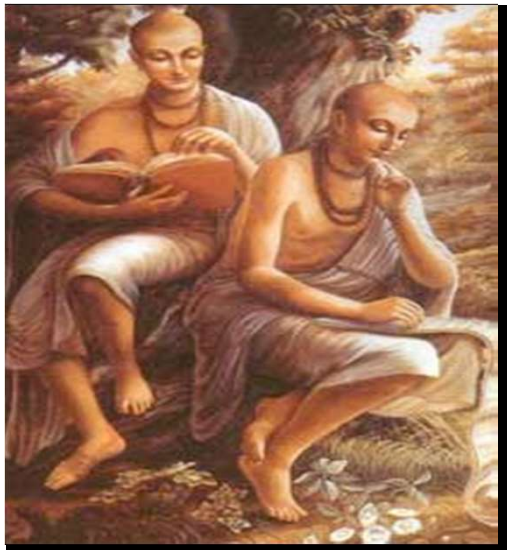
Culture that focuses on inculcating human values in a man

Unique features of Indian Culture

1. Freedom of thought

Every thought is allowed to develop freely.
-Theist & Atheist
-Vedanta speaks of soul as image of the Supreme
-Everyone is free to imagine and accept God's form according to one's beliefs.
-Every thought school is part & parcel of Indian Culture.

-A garden has variety of flowers and plants. These differences increase t



2. **Theory of Karmaphal - Rebirth**

3.Idealistic families

4.Abundance of saints & reformers.

5.Division of society order (based on personal choice, interest, capabilities & personal life for personal development, for development of society

INDIAN WAY

- **It is already becoming clearer that a chapter which has a western beginning will have to have an Indian ending if it is not to end in the self-destruction of the human race... At this supremely dangerous moment in history the only way of salvation for mankind is the Indian Way“**

- ***Dr. Arnold Toynbee British Historian 1889-1975***

Indian Economy

Trade between Kerala & Rome: 1st century 1/2

- ☹ **Roman coins of 123 BC & 117 AD are found in Kerala.**
- ☹ **2000 years ago Kerala had a Trade link with Rome.**
- ☹ **Indian exports included Spices, Aromatics, textiles (Muslin & Cotton), ivory, iron, gem etc.**
- ☹ **Indian pepper was known as 'black gold' and Muslin as 'woven Air'.**
- ☹ **Romans supplied India Cut-gems, Coral, Wine, Perfumes, Papyrus, Copper, Tin, and lead ingots.**
- ☹ **2000 years ago, Indian exports exceeded Indian imports.**

Trade between Kerala & Rome: 1st century 2/2

- ☹ **The surplus was kept by Indian traders in the form of gold coins or silver coins or red coral (Hard currency of ancient world).**
- ☹ **During 23-79 AD, the cost of luxury items imported from India were so costly that a Roman wrote: "Not a year passed in which India did not take 50 million sesterces away from Rome."**
- ☹ **A Roman Senator: "All our gold is going to India…It is a heaven on earth."**

GLOBALISATION & INDIA: A History of 2000 years

- **1st Century A.D.** : India enjoyed 20% of global trade (Large ships sailed to Far Eastern countries from ports along the East coast, and to Rome from Kerala) Indian traders earned lot of gold
- **Gupta Era** : International trade connections reached their peak because of trades to Far East, West Asia, Africa, and Rome.
- **8th Century onwards (Post-Gupta Era)** :Indian international trade started to decline because Arabs became the most powerful maritime power & grabbed trades to West Asia, Africa & Rome.
- **8th to 12th Centuries** : Initial supremacies in trade in the Far East was also lost to Arabs and Chinese.

- **12th to Mid-19th centuries** : With loss of Global trade, Indian economy and society became inward-looking.
- **Around 1870** : " Asiatic mode of production" with I self sufficient villages or their clusters as the units of of economy.
- **1870-1914** : 19th Century globalization started and ended with 1st World War.
- **1948** : GATT was established.
- **1995** : WTO was established.
- **1996** : GATS came into force.

INDIAN GLOBAL TRADE: Reasons for Decline

1. POLITICAL : Inability to protect trading centers from foreign invader resulting in plunder & destruction.

2. GEOGRAPHIC : Many ports had to be deserted due to silting of rivers.

3. TECHNOLOGICAL : Ships of the competitors were improved in build, size, speed, & armory.

4. SPIRITUAL : A greater India was established by a gentle fusion of races, which gave a spiritual heritage to the original inhabitants. The advent of foreign rule destroyed this spiritual base.

Lord Macaulay: About INDIA

- **I have traveled across the length and breadth of India and I have not seen one person who is a beggar, who is a thief.**
- **Such wealth I have seen in this country, such high moral values, people of such caliber, that I do not think we would ever conquer this country,**
- **unless we break the very backbone of this nation which is her spiritual and cultural heritage,**
- **And therefore I propose that we replace her old and ancient education system, her culture,**
- **for if the Indians think that all that is foreign and English is good and greater than her own,**
- **they will lose their self esteem, their native self culture,**
- **and they will become what we want them,**
- **a truly dominated nation.**
- **-*Lord Macaulay*, in his speech of Feb.2,1835 in British parliament.**

INDIA: A SLEEPY NATION

- India has become a sleepy nation.
- The philosophy we adopted for about a thousand years had the effect of putting us to sleep, of making us lazy.
- Two lines of a German poet may describe our people during recent centuries:

  "Sweet is sleep; death is better, but it is best never to have been born."
- That is the state from which Vivekananda worked hard to rescue us.
- We are slowly awakened to the sense of Manliness, strength, and capacity for work.

-Swami Ranganathananda

INDIAN & EUROPEAN MINDS

- ANCIENT INDIA & GREAT INDIAN MIND: The spirit of enquiry and quest for ultimate truth characterized the Indian Mind in ancient India.
- 12th TO MID-19th CENTURIES:

- The great Indian Mind went into deep slumber.
- All the subsequent failures, slavery, poverty, backwardness of Indians resulted from that slumber.

- ANCIENT EUROPE & THEIR HALF-AWAKE MIND:This continued till about the end of the 12th century and then, their mind started waking up:
- 13th & 14th CENTURIES:
  - The European Mind underwent an Intellectual awakening.
  - Subsequent achievements and prosperity of the West resulted from that awakening.

AUROBINDO: On decline & resurrection of Indian civilization(1/3)

- QUESTION: What was the real cause for the gradual decline, and final arrest of Indian civilization?
- Aurobindo:

  -Tamasic men and tamasic states of societies discouraged independence of opinion.

  -Their watchword was authority

  -The society was full of Inertia

  -Every detail of our life was fixed by Shastras & customs

  -The result was increasing impoverishment of Indian Intellect.

AUROBINDO: On decline & resurrection of Indian civilization(2/3)

- QUESTION: How shall we recover our lost intellectual freedom elasticity?
- **AUROBINDO:**
- ***By liberating our minds in all subjects from the thralldom(slavery) of authority**
- ***If India is to survive and do her appointed work in the world, the youth of India must:**

--Learn to think

--To think on all subjects

--To think independently, fruitfully, going to the heart of things

--Shearing sophism and prejudice

--Striking down obscurantism

AUROBINDO: On decline & resurrection of Indian civilization(3/3)

- AUROBINDO:
- A time will come when the Indian Mind will shake off the darkness that has fallen upon it,
- Cease to think or hold opinions at second and third hand,
- **And reassert its right to judge and inquire in a perfect freedom into the meaning of its own culture, and tradition.**

---(Song of Humanity(1911)

INDIA TODAY

INDIA TODAY 1/3

- 1. One third of all NASA Scientists are Indians
- 2. 34% of Microsoft's creative team is India born.
- 3. Over 5,000 Indian Professors in US Univ. & Colleges
- 4. Over 30,000 Indian doctors in US.
- 5. GE has the second largest R & D Centre in India with >1000 Ph.D's.
- 6. 50% of Fortune 500 Companies outsource work to India.
- 7. Among 3 nations who have built Supercomputers.
- 8. Among 6 nations who built Satellites & Launch vehicles.

INDIA TODAY 2/3

- **9.Over 35% startups in Silicon Valley is by Indians.**
- **10.We have largest English speaking technical manpower.**
- **11. Indian Software professionals work in all developed countries.**
- **12. Emerging as a high quality manufacturing destination.**
- **13. 5 Indian Companies won Deming prize for quality in 2004.**
- **14. Indian Companies Becoming Global.**
- **15. Indian brands becoming respectable.**
- **16. India becoming a preferred destination for high quality health service, R & D, & manufacturing.**

INDIA TODAY 3/3

- 17. First democracy to elect a woman Prime Minister.
- 18. India is the 7th nuclear power in the world
- 19. India is the 5th largest economy in the world
- 20. India is the largest democracy in the world
- 21. India has the 2nd largest population in the world
- 22. India is the 4th nation in the world to have developed/or developing a nuclear submarine
- 23. India is the 5th nation in the world to be in the multi billion dollar space commerce business.
- 24. India is the 4th nation in the world to develop(or nearly to) ICBM's(can travel up to 14,000km)
- 25. India is the 3rd nation in the world, to be able to develop land based and sea based cruise missiles

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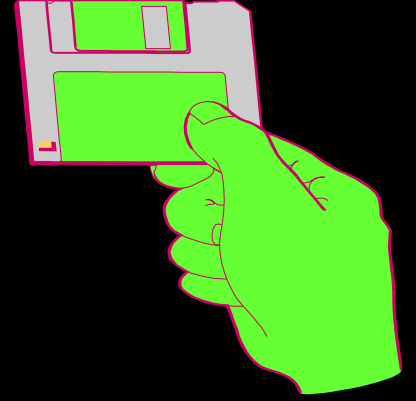
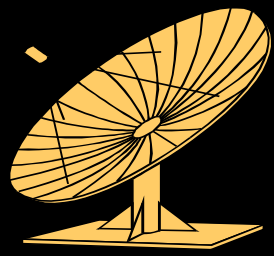
ONE IT TO MANY IT's



India has been sending crusaders fully armed with the knowledge of IT to conquer foreign countries.



In Silicon Valley:

Every third person you meet is an Indian.

More than 70% Software Companies are owned by Indian Engineers.

34% of Microsoft's creative team is India born.

"IT" has shown the way to India's Tomorrow ;

But the future of India is not in "IT" as in Information Technology.
It is in " IT" as in "Indian Talent" -

R.A. Mashelkar

SWOT OF MANY IT's

STRENGTH

ITM : Indian Talented Mind-power
IT-SC : IT - Super Computer
ITPR : Indian Trees and Plant Resources
ITK : Indigenous Technical Knowledge
ITYM : Indian Techniques of Yoga & Meditation
ITS : Indian Technology of Space
ITHR : Indian Treasure - Human Resource
ITMI : Indian Technological & Management Institutes
ITE : Indians Trained in English

WEAKNESS

ITM : Indian Tainted Mindset
ITH : Indian Toiling (work) Habit
ITQ : Indian Thrust towards quality
ITE : Indian Team Effort
ITI : Indian Third-rate Infrastructure
ITS : Indian Trust of Self
ITCM: IT for Common Man

OPPORTUNITY

ITI : Indian Tourism Industry
ITES : IT enabled Services
ITBT : IT for Biotechnology
ITAB : Indian Talent in Arts for Business
ITC : Indian Trials-Clinical

THREAT

ITEA : Indian Trailing Ethical Awareness
ITW : Indian Thirst for water
ITSA : Indian Toilet & Sanitation Awareness
ITL : Internal Tensions & Losses
ITC : Indian Tree Cover

STRENGTH

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THREAT (Challenge)

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INTEGRATION : "SCIENCE OF THE MATTER" with the "SCIENCE OF THE SOUL"

- The "**Technical Excellence**" must be integrated with the "**Spiritual Excellence**".
- Swami Vivekananda called **Newton and Galileo** as "**Prophets of physical science**", and **Upanishadic Rishis** as "**Prophets of Spirituality**".
- What the world needs today is **"Scientific Saints", "Technological prophets", and "Engineering Sages" – an integration of Technology without, and Spirituality within.**

PROJECTION BY SWAMI VIVEKANANDA

- **In Belur Mutt, Calcutta, after a long meditation, Vivekananda said:**

" I have seen 500 years of the future of our our nation".

- **" Swamiji, what did you see?" a disciple asked earnestly.**
- Vivekananda replied:

" **- I saw that India has become great,**

- and her glory has become so great that

- all her past glory has faded into insignificance"

CONCLUSIONS

By 2050, conditioned on policies supportive of growth of economy, Economic and Financial powers will be in this order:

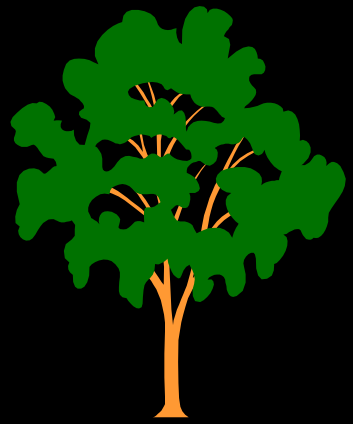
1. China 2. USA 3. India

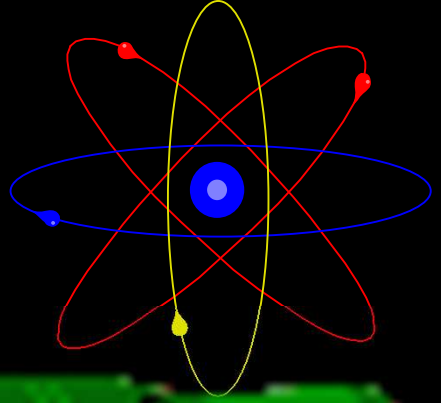
- Projection by Goldman Sachs

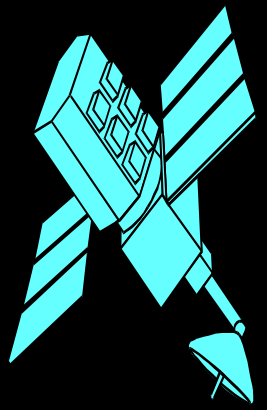
For achieving the above, one IT (Information Technology) has demonstrated before the world, what Indians are capable of doing.

For making India a developed country by 2050, we should concentrate on 25 or more IT's , some of which are Strengths, some are Weaknesses, some opportunities, and others Threats:

- IT Strengths to be utilized
- IT Weaknesses to be Overcome
- IT Opportunities to be seized
- IT Threats to be eliminated







THANK YOU