



International Conference India's Scientific Wisdom: Emerging Worldview (ICISW-2016)

**Indian Science Writers' Association (ISWA)
International Centre for Science Communication (ICSC)
Indian Science Communication Society (ISCOS)**

**Conference Hall, Haryana Bhawan, Copernicus Marg,
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www.iswaindia.com/icisw2016

International Conference India's Scientific Wisdom: Emerging Worldview (ICISW-2016)

The Concept

India is known for her early scientific wisdom and a treasure of scientific heritage. Several sages and scholars had been working on medicinal, mathematical, astronomical, agricultural, physiological, physical, chemical, metallurgical and architectural sciences in Indian subcontinent for the time immemorial. They had composed volumes in their respective fields based on their experiences and experiments. They have used various means of communication, like oral communication, Guru-Shishya-Parampara (teacher-pupil tradition of teaching and learning), and dissemination of information by interacting people. Thus, for a long time, the tradition of oral communication continued, in addition to scientific texts written by such knowledge creators. According to Sappier: "Every cultural pattern and every single act of social behaviors involve communication, in either an explicit or implicit sense".

India has a tradition of acquiring knowledge, discovering the secrets of the nature; by examining and thorough observations and by applying certain procedure; what we call today, the method of science. The then Indian intellectuals transmitted the knowledge through oral communication and unique compositions, for generations after generations. However, much later, they had written down such information on different surfaces, like rocks, palm leaf, Bhojpatra, bark of various trees, copper and bronze plates, and eventually on paper. These communication materials have now become the potential sources of the information on early science and technology that has made tremendous impact on the emergence of modern science and technology.

According to Toynbee (1976), in Asia, people were so intelligent to make boats and found their way to Australia crossing Timor Sea around 3,200 BC. Undoubtedly, the knowledge of production, use and control of fire was a great discovery of mankind, but it is uncertain that when it was made. However, according to various archaeological evidences, it appears that man first developed the primitive stone tools, followed by the knowledge of use and control of fire, and the development of the civilized society was the next step. According to Satyaprakash (1967), the fire churning technology was first invented by sage Atharvan, sometime around 4000 BC or earlier as described in a number of hymns in Rigveda (6.16.17), and Yajurveda (11.32). Atharvan belonged to the Angiras clan. The fire churners were in great demand at that time who communicated knowledge of the fire churning techniques.

"The priests churn thee, Agni, as was done by Atharvan and bring him from the glooms of night, wandering deviously, but not bewildered".

-Rigveda

"O fire, thee the source of survival for living beings. Thee the energy for the universe. Sage Atharvan first invited thee by churning. O fire, Atharvan derived thee from the head of priest Vishwa by churning lotus".

-Yajurveda

The scholars have opined that the recent "debate about Indian contribution to science must not be seen as jingoism and we must talk about what India has given to the world as well to have a balanced worldview over India's scientific wisdom". Unfortunately, the talk of ancient Indian science has been branded as jingoism by a section of the so called intellectual class. Undoubtedly, India has learnt many things from the West, but there seems no talk about what India has given to others. Even some international publications, reference books and encyclopedias do not mention or recognize the Indian contribution. The time has now come for a "reappraisal" of the history of

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science. "This is the responsibility of the academic institutions, authors and thinkers to ponder over this issue and initiate an academic debate and we can act as facilitator and can encourage people explore space and time and compare it with rest of the world. There should be an objective view as far as sharing of knowledge is concerned.

There is plenty of evidence, to suggest that India has made significant contribution to science in the past, many experts and academicians have said this for a long time. Let's have a look at their writings in several books. According to Jean Filliozat, the trigonometric "sine" is not mentioned by Greek astronomers and mathematicians; it was used in India from the Gupta period onwards: the Surya Siddhanta gives a table of sines, which the Arab astronomers picked up from their Indian contacts and passed them to Europe in 12th century. The only conclusion possible is that the use of sines was an Indian development and not a Greek one. John Playfair, in 1789, referred to certain astronomical tables received from the East Indies by European scholars at an early stage in their contact with the East. Some of these tables were received from Siam (Thailand) and their "epoch" corresponded to 21 March 638 AD. Nevertheless, the "meridian" of these tables was not Siam but Benares. Other tables received from southern part of India had one thing in common. Their epoch coincides with an era of 4th Yuga, that is, with the beginning of 3102 BC. Playfair finds that the position of the planets given in these tables is close to the position calculated with the help of modern integral calculus and the theory of gravitation.

Similarly, E.J. Urwick has said that Pythagoras accepted the most popular Indian theories of the time. Almost all the religious, philosophical and mathematical doctrines ascribed to him were known in India in the 6th century BC. According to Urwick, the transmigration theory, assumption of five elements, the Pythagorean theory in geometry, etc., have their close parallels in ancient India. Seidenberg, while discussing the origin of geometry, argued that the Babylonians knew the algebraic aspect of this theorem as early as 1700 BC, but they did not seem to know the geometric aspect. The Shatpatha Brahman, which preceded the age of Pythagoras, knew both the aspects.

Surprisingly, nobody is discussing all these aspects. As a result, people tend to take extreme positions. Nevertheless, while talking about Western contribution, we should not forget to discuss India's impact on growth of modern science. We must create conditions so that India becomes the principal contributor to science once again. For this, there should be a proper vision and encouragement. It should be working for the overall well-being of civilizations.

Hob'ble Prime Minister NarendraModi's remark that surgery existed thousands of years ago basically highlights the achievements of Indian science asSushrut had done it in 500-600 BC. Let's discuss ancient Indian science, traditions, context and level of scientific theory and evidence.

While delivering Dr. Rajendra Prasad Memorial Lecture on 'Science and Culture' organized by All India Radio, Former Minister of Science & Technology, Dr. MuraliManoharJoshi equated a German physicist Werner Heisenberg's principle of uncertainty with the notion of 'Brahma' to invoke country's rich cultural and scientific glory. He said, "We cannot see or understand Brahma just as Heisenberg stated that there was a limit to our sense of understanding of the behaviour of quantum particles".

WernerHeisenberg has once said that India could be the "compass" to the modern world that is mired in consumerism. Heisenberg said that the western world is a ship that has material abundance but it lacks a compass and India could provide that compass that will guide the ship. In his famous uncertainty principle, Heisenberg had said that there is a fundamental limit to our understanding of

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the behaviour of quantum particles adding that at most we can calculate probabilities for where things are and how they will behave.

According to Vilanilam (1993), the Neolithic Indians were producing handmade earthen vessels. The Indus valley civilization, which developed from early Harappan Neolithic cultures that are several millennia older, flourished around 2600-1800 BC, in north-western parts of India during the Bronze Age. One of the major breakthroughs of this civilization was its original pictographic Indus script, visual representation of people, things, events, tools, processes, methods, and actions, etc., which represents the earliest type of real writing, which still awaits decipherment.

Toynbee (1976), has written: "The scriptures of Hinduism cannot be dated. They were composed and transmitted orally for an unascertainable length of time before they were committed to writing, but the oral transmission of them is likely to have been accurate, since the efficacy of a liturgy was believed to depend on its words being recited correctly".

According to Satyaprakash (1967), the CharakaSamhita, appears to be the proceedings of first ever symposium on the subjects related to medical sciences (Ayurveda). The world's first symposium held on the medicinal plants in relation to diseases was presided over by Sage Bharadvaja somewhere in Himalayas during 700 BC. The whole account appears in CharakaSamhita. Names of different participants are also given. CharakaSamhita also lays the rules for debates and discussions – a prominent form of intellectual discourse and creative communication! Science in ancient, Vedic, classical and medieval India are well established as per the studies made by several scholars, and it can be taken as the precursor to the foundation of the emergence of modern science.

Euclid of Alexandria was a Greek mathematician, his Elements is one of the most influential works in the history of mathematics, serving as the main textbook for teaching mathematics especially geometry. Euclid deduced the principles of what is now called Euclidean geometry from a small set of axioms. The Hindu numeral system and the rules for the use of its operations in use throughout the world today, evolved in India and were subsequently transmitted to the west via Islamic translations.

There are ample evidences of Indian influences on Quantum Dynamics from the work of Schrodinger who was deeply interested in Vedanta philosophy and Hinduism. Erwin Schrodinger was a Nobel Prize-winning Austrian physicist who developed a number of fundamental results in the field of quantum theory, which formed the basis of wave mechanics: he formulated the wave equation (stationary and time-dependent Schrodinger equation) and revealed the identity of his development of the formalism and matrix mechanics. He paid great attention to the philosophical aspects of science, ancient Indian and oriental philosophical concepts, ethics, and religion. Erwin Schrodinger was particularly fascinated by Vedanta and Upanishads and also wrote about "The Basic view of Vedanta". Erwin Schrodinger is a prominent example showing how eastern philosophy can profoundly influence western thought in the field of fundamental science. While scientists like Schrodinger did not possess a direct knowledge of Sanskrit to discern first hand both the letter and spirit of Upanishads, there are persons like Robert Oppenheimer who were not lacking in such an advantage.

From the Vedic times they were keen observers of the sky and were aware of the sun's path, the motion of the moon, eclipses, solistics and developed lunisolar calendars with methods of intercalation. They tried to explain the maximum of phenomena with the minimum of postulates. There were leading mathematicians, like Aryabhata I (5th century AD), Bhaskar I, Brahmagupta (7th

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century), Mahavira (9th century), Aryabhata II, Sridhara and Sripati (10th – 11th century) and Bhaskaracharya-II (12th century). Many Indian mathematicians were also astronomers. They wrote beautiful verses to explain various equations and concepts.

As Hilgartner (1990) describes it, the globally dominant and ascendant view during the last century implied a two-stage model firmly distinguishing the work of producing new knowledge from that of disseminating it: first scientists develop genuine new knowledge; subsequently, communicators carry suitably simplified accounts of it into the public domain.

Communication has been defined as an effective source of moulding public opinion for positive change, which is described by Bharatmuni as 'sadharanikaran' - process of simplification. Gautama Buddha described it as 'BahujanHitaya - BahujanSukhaya', which means it must be in tune with the welfare of masses (Dharurkar 2009).

One of the great scholars of Sanskrit and Ayurved, Vachaspati Mishra has written a commentary on 'SankhyaKarika' titled 'SankhyaTatwaKaumudiTika', It gives guide lines on how one should go about investigating the various theories and propositions before reaching on any conclusion. The research method proposed by him includes 5 stages. The first is called 'Taram' where one is required to study the whole issue under a bonafide 'Guru' – the teacher. Next is 'Sutaram', which specifies that the researcher must understand the terminology very clearly. In the third stage of 'Tartaram' requires collection of data and analysing them critically. The fourth step was named 'Ramyak'. It means that the results of the analysis should be discussed in a seminar with other experts in the field or at least with the teacher. When all the doubts have been cleared and the questions have been answered then one can present his findings in the final form. This fifth step is named as 'Sadmuditam'.

Gosling (1973), observed that the *SambadPrabhakar*, popular but somewhat conservative, founded by Iswar Gupta in 1839 was well accepted by the readers. It contained a number of well-informed editorials, often written with a strong orientation towards science and technology. Within a decade of its establishment in 1839, the *SambadPrabhakar* was thundering the message to its readers:

"No country can progress without the advancement of science and technology. No useful purpose is served by teaching arts and literature. The work of Kalidas, Shakespeare and others may provide literary pleasure but there will be no real progress without scientific instruction".

Therefore, a pragmatic, balanced and realistic worldview over the issue would help India move forward with a fine blend of ancient scientific wisdom and modern scientific excellence, as we cannot afford to "reject" anything in the name of "old" or "accept" anything in the name of "modern" unless there is a scientific evidence - and this is the "spirit of science", as well as the spirit of the "Indian logic", and "theory of cause and effect" that have been prevalent in India even centuries before the advent of the concept of "science" itself!

In view of this background it was thought that an evidence based debate involving scholars, scientists, philosophers, historians, academicians from India and abroad would pave the way for a scientific discourse and concretize the base for a clear worldview on a treasure of India's scientific wisdom. A well-researched exchange of contents, views and ideas would lead to arrive at a consensus understanding amongst scholars in India and abroad especially on India's contribution and impact on foundations of modern science. The proceedings of the academic deliberations would lead to further in-depth studies under an existing or new organizational form and would eventually help restore India's glory of scientific excellence(*Patariya, M. 2015).

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The present International Conference is an initiative towards evidence based discourse over the issue.

Main Theme:

The focal theme of the conference is:
India's Scientific Wisdom: Emerging Worldview

Sub Themes:

The deliberations may cover a wide range of sub themes:

- Scientific Wisdom: The Genesis
- Scientific Wisdom: Evidence Based Reappraisal
- Scientific Wisdom: Connecting links from where we left
- Scientific Wisdom: Reshaping the Emerging Worldview
- Scientific Wisdom: The Role of Scientific Culture
- Scientific Wisdom: The Way Forward

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PROGRAMME

Date/ Time	Event	Name	
February 27 Saturday			
09:00-10:00 AM	Registration/ Interaction		
10:00-11:30 AM	Inaugural Session		
09:55	Arrival of Guests		
10:00	Floral Presentation		
10:05	Welcome Address	Dr. Manoj Kumar Patairiya	Addl. Director General, Doordarshan, Prasar Bharti
10:10	Vigyan Deep		
10:15	Vandana		
10:20	Keynote Address	Prof. Kamal Kant Dwivedi	Former Vice Chancellor, Arunachal University, Former Science Counselor, Indian Embassy, USA
10:30	Address by Guest of Honour	Swami Vigyananand	World Hindu Conference
10:40	Address by Guest of Honour	Shri Baldeo Bhai Sharma	Chairman, National Book Trust, India, MHRD, Govt. of India
10:50	Address by Chief Guest	Prof. Murli Manohar Joshi	Hon'ble Member of Parliament, Lok Sabha Former Union Minister of Science & Technology, Earth Sciences, HRD
11:10	Felicitations		
11:15	Address by Chair	Dr. L.S. Rathore	Director General, India Meteorological Department
11:25	Vote of Thanks	Dr. V.K. Srivastava	Senior DDG, Indian Council of Medical Research
11:30	National Anthem		
11:30-12:00	Tea		
12:00-01:30 PM	Scientific Session I Scientific Wisdom: The Genesis		
	Chair	Dr. R.K. Bhandari	Former Director, CSIR-Central Building Research Institute
	Distinguished Speaker	Prof. Ganesh Shankar Paliwal	HNB Gharwal University, Srinagar
	Distinguished Speaker	Dr. Rameshwar Singh	Project Director, Directorate of Knowledge Management in Agriculture, ICAR, New Delhi
	Paper Presentations	Gaurav Sharma	Scientific Verification of Vedic Knowledge and Worldview

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			(Genesis of Scientific Wisdom)
		Pulugurta Sekhar	Kisan Vani: An Innovative Approach by All India Radio
		Birat Padhan	Science behind ancient tradition
		Rita Malik	Information Technology and Mankind
		Dr. Phuldeep Sheoran, DRDO	Sharing of views
01:30-02:30 PM	Lunch		
02:30–04:00 PM	Scientific Session II Scientific Wisdom: Evidence Based Reappraisal		
	Chair	Shri K.G. Suresh	Senior Consulting Adviser, Doordarshan News
	Distinguished Speaker	Shri Rajendra Pratap Gupta	Innovation Working Group – Asia Mumbai
	Distinguished Speaker	Prof. Raja Ram Yadav	Department of Physics, Allahabad University
	Paper Presentations	Tushita Rohilla	On the trail of a mystical metaphysical entity- Prana
		Narsimha Bhumi	Effective Science Teaching through Activity based Training Programmes
		Jyoti Shukla	Natural Catastrophe: An Anthropological Perspective
		Manoj Mishra	Emergence and Understanding of Scientific development from Ancient Literatures of India
		Dharmendra Kumar, CSTT	Sharing of Views
04:00-04:30 PM	Tea		
04:30–06:00 PM	Scientific Session III Scientific Wisdom: Connecting links from where we left		
	Chair	Dr. C.S. Raghav	Senior Scientist & Head, ICAR-Krishi Vigyan Kendra, Basar, Arunachal Pradesh
	Distinguished Speaker	Dr. Prabhat Ranjan	Director, TIFAC, New Delhi
	Distinguished Speaker	Dr. K.S. Charak	Professor & Head, Department of Surgery, Indian Spinal Injuries Centre, New Delhi
	Paper Presentations	Amarnath Shukla	The Role of Indigenous Knowledge in Public Health Care
		Arvind Mishra	Science Fictional Ideas in Indian Mythology: A Brief Review

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		Ankit Awasthi	Organic Farming
		Manish Sharma	Source of Scientific Knowledge for Common Peoples
		Pooja Virmani	Scientific Wisdom
06.30-07:30 PM	Evening Programme		
	Scien-tainment based programme by Shri Pradeep Srivastava, Former Drug Scientist, CDRI, Lucknow		
07:30–09:00 PM	Conference Dinner		
February 28 Sunday			
09:00-10:00 AM	Panel Discussion Scientific Wisdom: The Way Forward		
	Chair	Dr. Manoj Kumar Patairiya	Addl. Director General, Doordarshan, Prasar Bharti
	Panelists	Dr. V.K. Srivastava	Senior DDG, Indian Council of Medical Research
		Dr. Sanjeev Varshneya	Advisor & Scientist G, International Affairs, Department of Science & Technology, Govt. of India
		Shri Anirban Sharma	UNESCO
		Shri Hitesh Shankar	Editor, Paanchjanya
		Shri Raj Kumar Bhardwaj	Office of the Hon'ble Chief Minister of Haryana, Haryana Bhavan, New Delhi
		Dr. Apoorva Pauranik	Neuro Physician and Associate Professor, MGM Medical College, Indore
		Shri Anil Saumitra	Spandan Features, Bhopal
		Shri Manish Bhardwaj	Officer Incharge, DRDO
		Prof. V.N. Mishra	Delhi University
10:00–11:30 AM	Scientific Session IV Scientific Wisdom: Reshaping the Emerging Worldview		
	Chair	Prof. G.S. Paliwal	Former Head, Botany, HNB Garhwal University, Srinagar
	Distinguished Speaker	Dr. Madhavendra Narayan	Indian Journal of History of Science, INSA, New Delhi
	Distinguished Speaker	Dr. Pradeep Sharma	Former Scientist/ Editor, Bharat Ki Sampada (The Wealth of India), CSIR
	Paper Presentations	Anant Bhaskar Garg	Sustainable Consciousness: An Emergent Scientific Wisdom Ecological Worldview
		Anil Sharma	Technology Transfer with Traditional Media
		Voore Gurunadha	What Drives Scientific Wisdom

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		Rao	Forward: Go Back to our Roots
		Jaya Sharma	Reinforcing scientific wisdom through mass media
		Ruchi Singh Gaur	Agriculture loss through the lens of media: Case study of media reports on crop loss in India- 2015
11:30–12:00 Noon	Tea		
12:00–01:00 PM	Scientific Session V Scientific Wisdom: The Role of Scientific Culture		
	Chair	Dr. Rakhi Mehra	Ayurveda Central Research Institute (ACRI), CCRAS, AYUSH, New Delhi
	Distinguished Speaker	Dr. M.C. Tiwari	Head, International Boundaries, Ministry of External Affairs, New Delhi
	Distinguished Speaker	Dr. P.K. Ingle	Scientist, National Chemical Laboratory, Pune
	Paper Presentations	Sonali Bhandari	Necessity of revival of traditional knowledge systems for environmental protection
		Kalpana Sangwan	Scientific Wisdom: The Role of Scientific Culture
		Sarika Gharu	Declining interest in science amongst students
		Kuldeep Sharma	Combating Antibiotic Resistance through Public Awareness
		Saltanat Benazeer	Indigenous knowledge and wisdom of science among Tharu tribe of Bahraich
01:00-02:00 PM	Valedictory Session		
01:00	Arrival of Guests		
01:05	Felicitations		
01:10	Welcome Address		
01:15	Expressions		
01:20	Address by Guest of Honour	Shri S.S. Parihar	Joint Secretary, Sales Tax Department, Govt. of Delhi
01:30	Address by Chief Guest	Shri D.R. Kaarthikeyan	Former Director, Central Bureau of Investigation
01:45	Address by Chair	Shri Prabhat Jha	Hon'ble Member of Parliament, Rajya Sabha
01:55	Vote of Thanks		
02:00	National Anthem		
02:00 PM	Lunch		
End of Programme			



PAPERS

Necessity of Revival of Traditional Knowledge Systems for Environmental Protection

Sonali Bhandari¹

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ABSTRACT

The genesis of contemporary science coincides with the Renaissance movement in Europe when intellectuals and thinkers began to question the value system imposed by the Orthodox Church. It was the questioning spirit or inclination to doubt that led to inventions and discoveries. However, the vast knowledge base created as a result of probing secrets of nature is not necessarily new to human civilization. Other civilizations have created similar repositories of knowledge. However, European colonization ruined most of this knowledge and replaced it with European educational and political system which devalued what remained. In addition, the novelty of contemporary science lies in triggering the Industrial Revolution, which divided the world into developed and developing nations by endowing the developed world with economic benefits. Yet never before in the history of mankind has scientific advancement caused so much threat to the environment as it has in today's day and age. This presentation will examine how revival of traditional knowledge systems has become essential to counter the destruction caused by technology.

The challenges of modern science lie in the inability to integrate results and concepts arising from different levels of analysis, approaches and disciplines. The reductionist approach requires proposing models based on selected variables to explain natural phenomena and testing these models experimentally. On the contrary, traditional knowledge observes nature from a global point of view although strictly linked to the local culture and its predominant philosophy. Experts of pre-colonial Africa were well-versed in soil and climactic conditions required for crops. They had precise knowledge about the tropical flora, desert bushes and had developed a sophisticated classification system of plants. Mayan scientists had developed a sophisticated calendar based on their observations of the Sun and stars. The interdisciplinary nature of traditional knowledge and its synthetic and holistic approach may enable new ways of observing and studying complex phenomena.

Key Words: Renaissance, Colonization, Industrial Revolution, Interdisciplinary, Holistic

I. ORIGIN OF MODERN SCIENCE

Modern Science has its origins in the Renaissance movement that took place in Europe between the 14th and 17th centuries. [1-4] The movement is considered the bridge between the Middle Ages and Modern Science. Renaissance began as a cultural movement in Italy in the Late Medieval Period and soon flourished all over Europe. It left an impact on literature, philosophy, art, music, politics, science, theology among other disciplines. The Renaissance movement had a humanistic approach and searched for realism and human emotion in art.

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Renaissance Humanism was a response to the orthodox and dogmatic approach associated with medieval scholasticism¹.

II. IS MODERN SCIENCE SO NEW?

However, the vast body of knowledge created as a result of observing nature is not necessarily new to human civilization.[6] Other civilizations have created similar repositories of knowledge databases. For instance, Mayan scientists in South America developed a highly sophisticated calendar through their observations of the Sun and the stars. American Indians and Australian aborigines have gathered an immense amount of biological knowledge based on their observations of nature. In pre-colonial Africa, specialists knew well the characteristics of the local climate and soil and were well-versed in conditions required for growth of crops. They had precise knowledge of tropical flora and desert bushes, and had developed a sophisticated classification system that divided plants into families and groups, based on their cultural and ritual properties. Science and technology in Africa were once quite advanced, comparable to European levels of the time, in the fields of human and veterinary medicine, agriculture, food conservation, fermentation, metallurgy and the preparation of soap and cosmetics

TABLE I: Comparisons between Ancient Indian Philosophy and Modern Science [7]

Indian Philosophy	Western Science
Brahmagupta's Lemmas (1150 AD)	Euler (1674) and La Grange (1768) rediscovered these Lemmas
Combination (Mahaviracharya, 850 AD)	Heriogone (1643)
Sulba Theorem, 800 BCE	Pythagoras Theorem
Rotation of the Earth (Aryabhata, 499 AD)	Leon Foucault, 1851 AD
Heliocentric Theory (Vedic Period)	Copernicus (1473 – 1543 AD)
Speed of light (Rig Veda, 6000 BCE?)	Oalus Roemer, 1676 AD (approx. computation)
Elliptical Path of Planets (Rig Veda, 6000 BCE?)	Johannes Kepler (1609 AD)
Embryology, Blood Circulation in Foetus (Vedic Period)	Heironymus Fabricius (1604 AD)
Surgical Instruments – Forceps (Susruta Samhita, 6th Century BC)	Analogous modern instruments are available
Classification of Plants (Susruta Samhita, 6th Century BC)	Carlous Linnaeus (1735 AD)

III. INDUSTRIAL REVOLUTION AND COLONIALISM

The Industrial Revolution (1760-mid 1800s) is a landmark event in human history since the domestication of plants and animals. [8] It involved transition from hand production to machines, new chemical manufacturing and iron production processes, increased use of steam power, development of machine tools and rise of the factory system. An unprecedented growth was seen in average income and population. Along with the agricultural revolution, industrial revolution

- ¹ Scholasticism is the system of theology and philosophy taught in medieval European universities, based on Aristotelian logic and the writings of the early Christian Fathers and emphasized tradition and dogma [5]

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resulted in increase of living standards for the general population and the emergence of capitalist economies. [9-11]

Imperialism and Colonialism was a direct consequence of the industrial revolution. Factories in Europe and the United States required raw materials to produce goods and new markets were also needed to sell those goods. Thus began a scrambling for colonies in Asia and Africa. Factories also led to poor working conditions for the working class and led to the rise of trade unions.[12] However, the industrial revolution led to disfiguration of nature to the extent that is unprecedented in human history.

IV. SUSTAINABILITY- CALL OF MODERN TIMES

The rapid industrial and technological progress was accompanied by consumption of natural resources at an alarming pace. Scientists, thinkers and philosophers began to raise voices about 'environmental protection'. 'Sustainable development' was widely recognized as the requirement of modern times where development meets the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs.[13] The three pillars of 'sustainable development' are economic, social and environmental.

V. COMPARATIVE ANALYSIS BETWEEN MODERN SCIENCE AND TRADITIONAL KNOWLEDGE [14,15]

The challenges of modern science lie in the inability to integrate results and concepts arising from different levels of analysis, approaches and disciplines. The reductionist approach requires proposing models based on selected variables to explain natural phenomena and testing these models experimentally.

Traditional knowledge is a complex system of integrated information about the relationship of events, plants, animals, and the cosmos developed over thousands of years to enable people to lead fulfilling lives in harmony with nature. It is held by indigenous people and provides detailed understanding of the natural, cultural and spiritual worlds. It is based on thousands of years of observation and experiment. It is holistic in nature and represents a value system.

Similarities

- Both operate in a systematic manner
- Both are based on field observations and experimentation
- Both create hypotheses to derive relationships
- Both create predictive models
- Both are moderated: Science by peer review and TK by elders
- Interpreting TK and Science requires expertise

Differences

TABLE II: Differences between Modern Science and Traditional Knowledge

Modern Science	Traditional Knowledge
Intellectual	Spiritual, practical and experiential

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Research method but sometimes results in western lifestyles	Way of life so it is shared knowledge
Predictive, based abstractions of nature into models	Predictive, based on indirect relationships
Accumulates knowledge by documentation	Accumulates knowledge by oral traditions such as stories, songs, practices and dance
Aims to understand the physical universe	Aims to understand all Universes
Requires extensive and diverse infrastructure	Requires extensive and diverse protocols
Analytical and tends to identify influence of individual variables	Holistic and focuses on integrating information
Variables are not meant for belief systems	Variables can be derived from spiritual understanding and beliefs
Avoids moral and spiritual values in results	Value system
Not practical but yields technology, techniques and knowledge which is practical	Practical knowledge

VI. DOUBTS CAST BY MODERN SCIENCE ABOUT TRADITIONAL KNOWLEDGE

- Distrust of non-scientific data
- Uncertainty about accuracy and precision of data
- Skeptical about dealing with sacred information
- Stereotyping of TK as data-level information only
- Dismissal of non-familiar indicators of change in biological systems

VII. WORKING TOGETHER FOR THE BENEFIT OF MANKIND

- The two knowledge systems complement each other
- Working with both knowledge systems will benefit humanity in general
- Sum of two knowledge systems generates a greater knowledge base at the data, relationship and predictive levels
- Using both systems reduces rather than increases the complexity of working with the **Environment**

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SCIENTIFIC WISDOM: THE ROLE OF SCIENTIFIC CULTURE

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ABSTRACT

In this paper new pedagogy is critically analysed how learning science within a multicultural environment make children move easily between their everyday life-world and the world of school science. When children cross these cultural borders, few of them do not face serious problems which affect their learning of science. But many do experience serious problems and deals with cognitive conflicts between those two worlds. Different cultural processes are involved in the acquisition of science culture when students accept that each student in the group has something valuable to contribute. This paper involves the acquisition of scientific culture by the students in the school with teacher support during teaching learning process and cultural clashes between individuals'life-worlds and the world of science.

Key words: scientific culture, school, teachers, students, teaching learning process.

INTRODUCTION

Every Institution or society has its own culture and culture is that complex whole which includes knowledge, belief, art, morals, law, custom and other capabilities and habits which are acquired by man as a member of society (E.B. Taylor). It is defined by its geography or ethnicity (For example American culture, Chinese culture) .This term is also applied to the practices, behaviors, and expectations of smaller groups of people.

Few attributes of culture are as follows:-

- Communication
- Social structures
- Skills (psychomotor and cognitive)
- Customs and norms
- Attitudes, values, beliefs, expectations.

Within every culture always exist a certain subgroup which is commonly identified by indigenous language, ethnicity, race, social class, beliefs, occupation, gender, religion, values etc. An individual can belong to several sub groups at the same time. Each subgroup belongs to a particular culture. For example, Sub culture of any school, sub culture of our peers and of a particular science classroom etc. Culture is the system of knowledge shared by a relatively large group of people. It is the sum total of the learned behavior of a group of people that are commonly considered to be the tradition of that group of people and these are transmitted from one generation to another.

Science is a part of culture and how science is done largely depends on the culture in which it is practiced.

SCIENTIFIC CULTURE

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Scientific Culture refers to systems of shared ideas, the conceptual designs, and shared systems of meaning. The set of factors, various events and actions of mankind during social interactions, dissemination, teaching and the implementation of scientific knowledge helps in the development of a particular type of culture and is known as scientific culture.

When we speak of "scientific culture" it is necessary to understand at least three possibilities of meaning:-

1. Culture of science

- a) Culture generated by science
- b) Culture appropriate to science.

2. Culture through science

- a) Culture by means of science
- b) Culture in favor of science.

3. Culture for science

- a) Culture geared to the production of science
- b) Culture geared to the socialization of science.

ROLE OF SCHOOLS IN DEVELOPMENT OF SCIENTIFIC CULTURE

Science always plays an important and remarkable role in the development of an individual's critical thinking and every nation has included it in the school curriculum since long time. The values, different methods of inquiry, various innovative practices, broad perspective and the curiosity of asking questions are the essential part of science education. All these components of science education should be used effectively for meaningful learning and its development.

Transmission of culture takes place in science teaching and acquisition of culture takes place in science learning where culture means an ordered system of meaning and symbols in terms of which social interactions takes place (Spindler 1987). *For example*, in case of western culture or an Indian culture where members of these groups share a particular way of communication and similar symbols for the purpose of social interactions.

Transmission of a scientific culture among students can either be supportive or sometimes it can be troublesome as well. If the subculture of science harmonizes and supports student's everyday life and Science instruction supports the students' view of the world, the result is enculturation (Hawkins 1987). When enculturation occurs critical thinking enhances an individual's everyday thinking. Whereas, if the subculture of science is not supportive for a student's daily life culture then science instruction will tend to create trouble for student's view of the world by trying to isolate it (assimilation). Enculturation attracts those students who are science enthusiasts while assimilation attempts to dominate the thinking of students. Both enculturation and assimilation requires crossing cultural boundaries into the subculture of science. This also requires contextualization of science wherein the boundaries are dissolved and science becomes a way of life.

Science teaching can be:

- *Culture free*
- *Culture fair*

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Culture free teaching of science says that different cultures of students should not be introduced into the classroom. Many Teachers feels that student's culture can become an obstacle while teaching science, so they prefer culture free teaching learning process in their classroom. These teachers do not accept diversity in the classroom easily as they are not culturally competent and are unable to cater to the need of diverse students.

Culture fair teaching of science says that teaching learning process should not be separated from the culture of the students. "Learning science in the classroom involves children entering a new community of discourse, a new culture" as given by Mortimer and Scott in 1994. According to Maddock(1981) the view of learning science as culture acquisition, affords an intuitive, holistic, and rich appreciation of students' experiences in a science classroom.

For the Teachers who feel that culture is never a barrier in science classroom rather it provides an alternative system of knowledge for better explanation opts for culture fair teaching in their classroom. These teachers always cater to the need of diverse students and are able to handle the diversity.

UNESCO (2005) emphasized the following aspects in teaching learning process to ensure culture fair practices:

- Recognizing diversity
- Respect and Accept the difference in culture
- Use of local indigenous knowledge
- Identifying and working with culture specific ideas of society and world instead of ignoring them.

According to many researches when students observe difference in culture of their daily life and classroom like how effectively students move between their daily life culture and the culture of science, then academic achievement of science is affected accordingly, and the help that students receive from their teachers in making these changes is much easier and are ready to adapt to the different environment too.

ROLE OF TEACHERS IN ACQUISITION OF SCIENTIFIC CULTURE AMONG STUDENTS

The role of the science teacher must be that of a catalyst for change. The changes required should be conceptual and cultural. The changes should be helpful to students in a way that they outshine the typically over-learned ways of thinking about the role of science education and to implement their knowledge into actual habits of practice.

According to National Curriculum Framework (2005), In Science Education, teacher should focus on inculcation of values of honesty, integrity and cooperation along with the development of scientific skills and critical thinking among students.

Teaching Approach and Culture

The teachers' choices of teaching approaches have been classified into four main categories:

- Approaches which ignore culture means culture free teaching: - According to various researches ,Teachers who adopt this approach, feels science has nothing to do with culture or even if it has, then also, the classroom is not the place to establish a relation between culture and science.

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- Approaches that utilizes indigenous knowledge systems means culture fair teaching: - According to these researches, the teachers who adopt for this approach, feels that culture plays a major and important role in science teaching in today's classroom.
- Approaches which recognize the contributions of various cultures to Western science.
- Approaches which consider science itself as being a subculture among various cultures.

CONCLUSION

Teacher's classroom practices are highly influenced by their conception about scientific culture. For effective teaching learning process, teacher should collect complete and authentic information about students' everyday environment. As success in science teaching also depends on how effectively and easily individuals relate their life world culture and the culture of science taught in classroom. Schools need to realize the importance of student's daily life culture to enhance their scientific skills and to develop their critical thinking. Teachers should recognize cultural diversity in order to broaden the path of scientific development as students who study with a diverse population develops a better understanding of scientific concepts by interacting with students in a multicultural environment. Hence, Schools as well as Teachers need to be proactive to create a positive and healthy environment where students from different cultures are respected and accepted equally.

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Natural Catastrophe: An Anthropological Perspective

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Abstract

The Present study emphasises the value of disasters for anthropologists and scholars interested in analysing cultures and the important insight that an anthropological perspective can offer to the academic study of disasters and the policy makers. The study of catastrophe by social scientists is a fertile area for the development, both to tackle the immense human problems and their involvement. At the time of increasing globalization and worldwide vulnerability, the study of disasters become an important area of concern for anthropological research. The present study aims to explore the potentials of calamities for ecological and socio-cultural approaches to anthropology along with the perspective of archaeology and history. Worldwide statistics revealed the increasing number of disasters and disaster impacts within the last decade. Indeed, only within the last four decades, natural disasters have caused more than 3.3 million death and 2.3 trillion dollars economic damage (WB 2010:10). In last three decades many developing countries especially those in Asia, have increasingly been impacted with collective disaster events causing various challenges. It is not one blow that is likely to be devastating for a society but rather a recurrent set of blows and problem caused by attempted interventions. Most civilizations have either met a slow demise or were wiped out by natural disasters or invasion however there are few societies whose disappearance confused the scholars totally. The main theory which emerged as the reason for disappearance was of climatic changes and natural disasters. The study of collapse of past societies raised many questions. Interest in the extinct, extends into the natural sciences and sustainability policy. Recognition of the dynamic role of social processes that lies at the heart of the human communities and connection between theory and practice is important. Thus the role of anthropologists in disaster management cannot be overruled. There are still other than December 2012 Blackout (NASA), predicted dates for Apocalyptic Events such as Rapture, Last Judgement or another event that would result in the end of humanity, civilization, the planet or the entire universe.

Keywords: Catastrophe, Worldwide, Vulnerability, Civilization, Challenges, Sustainability, Apocalyptic

Introduction

In the course of globalization and worldwide vulnerability, the studies of disasters become an important focal point for anthropological research. Nature has created certain natural disasters like earthquake, flood, drought, famines, tornado, hurricane, volcanic eruption, heat wave, and landslide leading to enormous financial, environmental or loss and suffering to the mankind. The resulting loss depends on the vulnerability of the affected population to resist the hazard, also called their resilience. These disasters are at one hand maintained the ecological balance on earth and at the other are equally disastrous for human race. This could be better understood as disasters occur when hazards meet vulnerability eg. Strong earthquakes in uninhabited areas are hazardous where as disastrous in the densely populated areas. Man has therefore always endeavoured to predict, control and mitigate the damage caused by these natural disasters.

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The term *natural* has consequently been disputed because the events simply are not hazards or disasters without human involvement. A natural hazard is a threat of naturally occurring event that will have a negative effect on people or the environment. Many natural hazards are interrelated, eg. Earthquakes can cause Tsunamis and drought can lead directly to famine or population displacement. The differences that appear between disaster and catastrophe can be especially seen at the organizational, community and more likely from the individual to the societal level. The study of catastrophe by social scientists is a fertile area for the development; both to tackle in immense human problems and their environment. Effects of natural disaster vary from immediate to long term. The human impact of natural disaster is population displacement, health risks, food scarcity and emotional aftershocks.

Natural disasters are global phenomenon, which may occur, any time with or without any indication. These adversely affect almost every part of human lives and cause considerable damage to the property, environment and the infrastructure worldwide, leading to physical distress, massive economic loss, innumerable environmental problems and emotional concerns. India is major disaster prone country in Asia- Pacific region. 85% of land area is vulnerable to one disaster or the other. Among the country's total states and union territories, 22 are multi-disaster prone. As much as 40 million hectare of land in country is identified as flood prone, and on an average 18.6 million hectare land is flooded annually. About 57% of area is vulnerable to seismic activity. 18% of the area is drought prone; approximately 50 million people are annually affected by drought and 685 of total sown area of the country is drought prone. Long coast line of 8400 Kms which is exposed to tropical cyclone arising in Bay of Bengal and Arabian Sea in the ratio of 4:1. Indian Ocean is one of the six major cyclone prone regions of the world. The Coromandal Coast line is extremely cyclones prone, with about 80% of the cyclones generated in this region (Jain A. K., 2008).

In recent years anthropology has added significant width to the study of disasters. Anthropology's long term perspective, an in-depth field work has added significantly to assimilate the elongated repercussions. Calamities provoke furthers enhancing the inclusion of the factors that lead to people's vulnerability. An attempt has been made to prepare a comprehensive paper on natural disasters with reference to Indian susceptibility, based on world's experience.

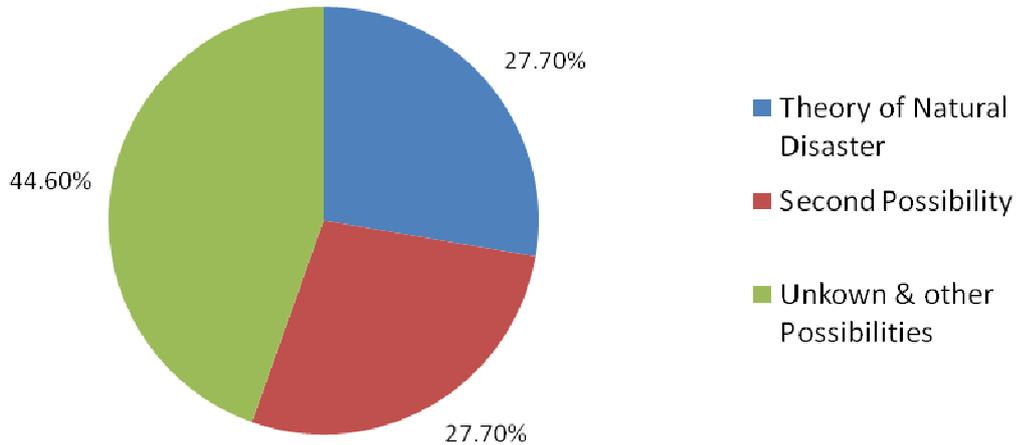
Methodology

Facts reveal that any of the scientific research methods are valid contributors to scientific knowledge. This descriptive study is based on archives, therefore documents and texts are taken into account. Data collected through secondary sources. Different approaches in gathering, analysing and interpreting qualitative data have been implied. The paper is concerned primarily with textual analysis. In retrospect, records of the disappeared ancient societies of the world were included. Chronological data of the occurrence of natural catastrophe all over the world led to the longitudinal study.

Result

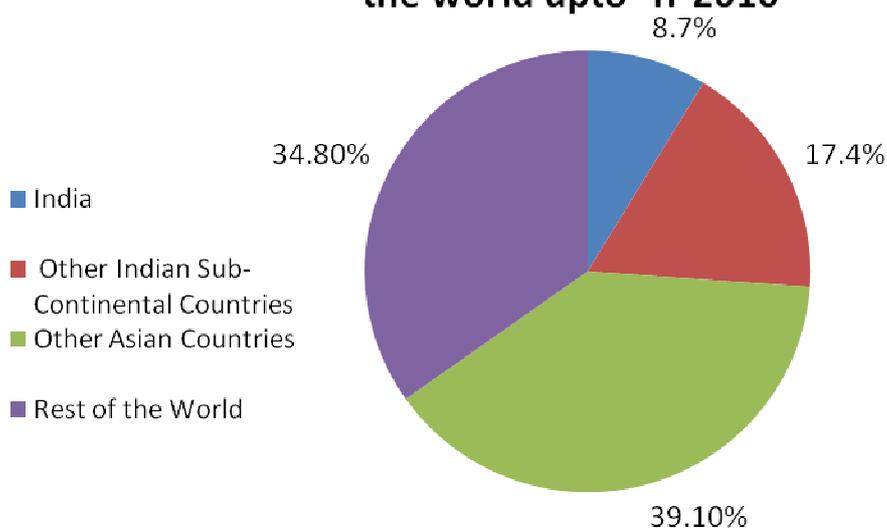
In the developing country like India mounting rage of nature is quiet alarming. Following figures have been drawn as a result of the study of occurrence of natural catastrophe all over the world since ages. Several ancient civilizations disappeared in mystery giving the insight to conservation of human race. It has been derived that most popular theory of disappearance of ancient civilizations, is of the natural disaster and climatic changes followed by invasion theory.

Fig 1: Theories for the Disappearance of Ancient Civilizations of the world



On the basis of archaeological studies, excavations and the scholar's views, the theory of natural disaster and climatic changes shows an equal percentage i.e. 27.7% probability of the theory of the natural disaster causing disappearance and 27.7% for the second possibility of the extinct of the civilization. 44.6% of the total is under the unknown or other possibilities for the end of the ancient civilization all over the world.

Fig 2: Worst Natural Disasters ever Recorded all over the world upto Yr 2010

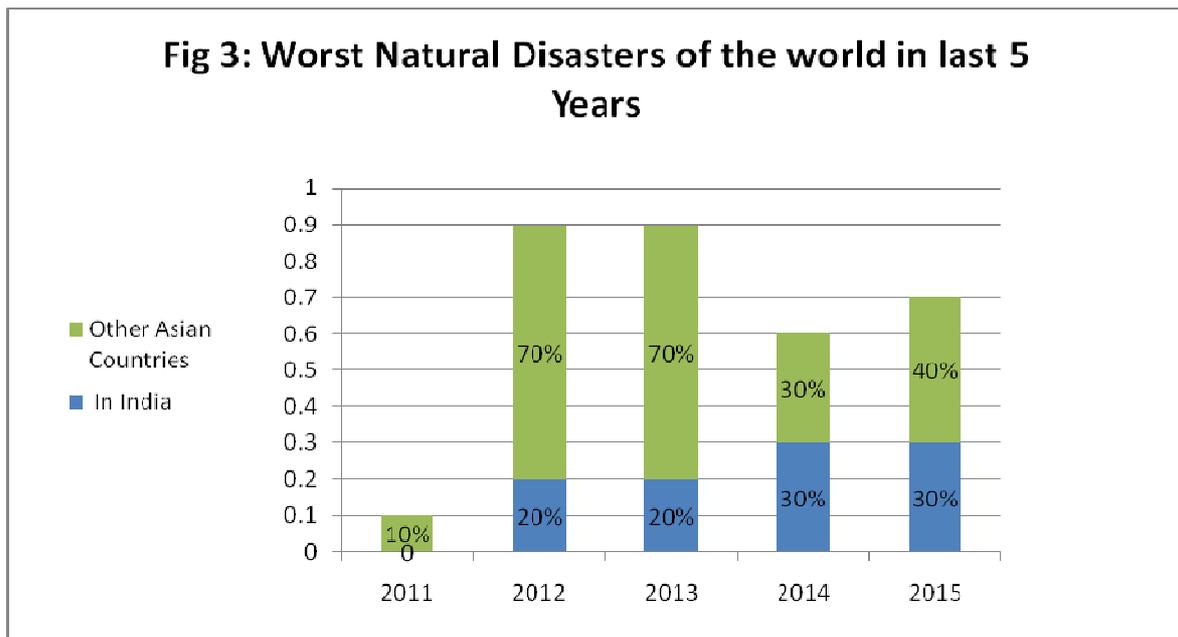


According to the records of the world's worst natural disasters till year 2010, out of total occurrence of natural disasters, India witnessed 8.7% whereas other countries of Indian Sub-continent observed

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17.4%. However other Asian countries suffered upto 39.1% and the rest of the world facing 34.8% in totality.

Indian sub-continent along with the other Asian countries has been victim of natural catastrophe throughout. 65.2% i.e. approximately 2/3rd of the total number of recorded natural disasters occurred in Asia which has affected the large population inhabiting the respective continent.



As shown in the Figure above, India in year 2011 recorded no major natural hazard however the possibility of minor calamities with negligible destruction and human loss is not denied. In the years 2012 and 2013 the percentage of occurrence of natural disasters all over the world, 20% each year suffered by India, followed by 30% in year 2014 and 2015. Noticeable rise in the occurrence of natural catastrophe in India in recent years must be viewed as a threat to the environmental and socio-cultural sustainable development. This should be viewed as an alert to the existence of human race.

Discussion

Disturbances arising from natural disasters continue to mount worldwide, though the most alarming social and economic dislocations are occurring in developing countries. This paper is an attempt to assess anthropological contribution to natural disaster studies and appraises their relevance for disaster mitigation policy. An inclusive account of the nature of disaster, this complex includes physical, biological and socio-cultural aspects, and their use in the explanation and appeasement of social life which is the goal of the anthropologist as well.

The studies of the collapse of past societies raise many questions for the theory and practices. Interest in collapse, extends into the natural sciences as well as environmental and sustainability policy. The social and economic consequences, of recent natural disasters across the world have recapitulated the need to place more attention to natural disaster, as part of the global agenda for sustainable development. There is mounting evidence that global climate change is increasing hazards in vast parts of the world, such as hurricanes and floods.

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The literature on natural disaster and its social and economic consequences is still scarce and can be divided mainly in these strands. One factor exacerbates vulnerability to natural events. They have developed a framework considering changing climate, deforestation and geophysical factors (McGuire, Mason and Kilburn, 2002), in addition to increasing urbanization which brings environmental hazards and exposure to risk from lack of adequate urban planning and dual political discourse (Pelling, 2003 and 2003a), or even geographical proximity to exposure, access to assets and public facilities as well as political and social networks (Bosher, 2007).

Despite the fact that human has made tremendous progress in various aspects in terms of technological growth, yet there is one area where they have not been able to surpass and that is the supremacy of nature. Even though there are lot of technological and scientific advancements and achievements, nature has always proved itself much more powerful than the human race. In spite of development in weather forecast techniques, disaster at many times cannot be prevented. In today's age, the natural calamities in the form of flood, Tsunamis, Famines, cyclones, earthquakes are mainly due to global warming. Time and again we have seen and read about many natural disasters occurring in the country and outside which has caused a great havoc in the society, killing thousands of people and destroying lives and properties.

The worst that comes to mind are the Paradeep supercyclone (1999) and the Gujarat earthquake (2001) and one can never forget the Tsunamis of 2004 that killed an estimated 280,000 people across 14 different countries. The Gujarat Earthquake of 2001 happened on January 26, India's Republic Day. Final death toll amount to about 20,000 people more than a 150,000 injured hundreds of villages destroyed and over \$5 billion in damages. The earthquake measure 7.6 on the Richter scale. The Paradeep cyclone hit the coast of Odisha, one of India's states on its east coast. Over 10,000 were killed, vast tracts of farmland destroyed, over a million people rendered homeless, and the list goes on. But the best thing about all this is that we Indians have learned disaster management when the cyclone Phailin struck in 2013, over 900,000 people were evacuated, bringing the death toll from 10,000 in 1999 to 36 in 2013. Kashmir flood in September, 2014, region's worst flooding in over a century led to flooding of many rivers causing property loss and heavy casualties. In October cyclone Hudhud caused massive loss. More than 100 deaths were confirmed in the most destructive cyclone. Assam floods affected the lives of more than one lakh people. Due to heavy rains and deforestation for a Windfall Project Malin village in Ambegaon area in Pune was suffered by Landslide. Meanwhile Odisha, Meghalaya, Allahabad, Guwahati and many other regions were also affected by floods in 2014. India was among the top three most disaster- hit countries in 2015 with whooping economic damages worth \$ 3.30 billion, a new analysis released by the UN Office for disaster risk reduction (UNISDR) revealed. India's cities might be expanding but are more vulnerable to natural disasters.

Although there was no Apocalyptic events such as Rapture, Last Judgment or another event that was predicted resulting in the end of humanity, civilization, the planet or the entire universe including December 2012 Blackout (NASA), according to the result of the study, the Asian continent witnessed almost 90% of the world's catastrophes occurred in the years 2012&2013. In the years 2014 and 2015, a decline was observed to 60% and 70% respectively, yet the susceptibility of the geographical region remains. The ecological and socio-cultural vulnerability of the region appears significantly high which may lead to massive destruction of properties and life and even to the disappearance of it all.

With respect to the percentage of occurrence of natural catastrophe in India at large, an ascending trend is noticed from 0% in 2011, 20% in 2012 & 2013 heading to 30% in 2014 & 2015. Natural

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disasters are hindrance to attain sustainable development as they can derail hard-earned development plan and progress. A shift from reactive disaster management to disaster risk management at all level of societies is need of the hour. Post disaster recovery processes should be considered as opportunity for development, revitalising local economy and upgrading livelihood and living conditions

Conclusion

The increase in number of disasters and their consequences is related to increase in the vulnerability of communities throughout the world as the result of the development model adopted. Recent rage of nature in the form of catastrophe could be an alarm to the mankind as a whole. In view of the inferences drawn from the extinct ancient civilizations and swelling frequency of disasters in recent years, subsequent increase in global vulnerability should be the main focus for sustainable development. Limiting human intervention and endeavour sustainability of socio- cultural development, may stand up to minimise the effects of catastrophe or to some extent lead to the preservation of our existence and also to the revival and rehabilitation of the sufferers. The increase of vulnerability is not uniform and there is significant variation between region, nation, provinces, cities, communities, social economic classes, castes and even gender (cf. YODMANI, 2001). As natural disaster affects the poorest countries more than other, the most vulnerable and marginalised populations have to deal with the most serious consequences (FRETAS et al., 2012: IFRC, 2003, 2010). It is not one blow that is likely to be devastating for a society but rather a recurrent set of blows and problems caused by attempted intervention.

Nothing lasts forever however struggle for survival is human nature.

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Information Technology and Mankind

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ABSTRACT

One of the most important contribution in man's progress has been perfecting the Information communication system by which a constant inter change of knowledge is brought about. The early men were able to communicate with one another only through the use of signs. Then came the development of language and writing, by means of which men could express an infinite variety of concepts and also transfer them from one generation to the next. The centuries that followed, saw the rise of other forms of information communications like printing, type writing, photography, telegraph, telephone, sound recording devices, radio, television, radar, facsimile transmission, micro filming , internet, mobile communication 2G, 3G and 4G which provide world over connectivity along with high speed inter net facility on mobile phones for surfing net, chatting,viewing television etc.Information technology as a discipline, has developed very rapidly in theory and in practice since last three decades,but its roots are as old as human civilization. Man's greatest scientific discovery,the use of fire dates back to pre-historic time. Importance of writing in the development of every other branch of knowledge can never be ruled out.A good information communication between scienceand society leads to the development of scientific culture which can be utilized to solve global, regional, physical and social problems.

INTRODUCTION

This paper is an attempt to analyse the history of science communication from the dawn of recorded history to today's era of information technology. One of the most important contributions in man's progress has been perfecting the information communication system by which a constant inter change of knowledge and idea takes place. The ancient men were able to communicate amongst themselves only through the use of signs.^{1k} Then came the development of language and writing, by means of which men could express an infinite variety of concepts. This aided in the documentation of knowledge for posterity, which was a paradigm shift from the prevalent transfer of knowledge through the word of mouth from one generation to the next. The centuries that followed^{2k}, saw further refinement and improvisation with the rise of other forms of communication like printing, type writing, photography, telegraph, telephone, sound recording devices, radio, television, radar, facsimile transmission, micro filming , internet, mobile communication and so on.

Science is concerned with the quest to learn about the nature and processes to utilise natural resources for benefit of mankind (technology) and the never ending race for modifying and optimising the technologies to the fullest extent as far as possible. We shall never know when this never ending task began. The importance of documenting information² for posterity can be taken as the advent Information technology era.

Information technology as a discipline has grown and developed very rapidly in theory and practice since last three decades. Its necessity stems from the fact that communication between science and

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society leads to the development of scientific culture which can be utilized to solve global, regional, physical and social problems leading to progress and overall well being of the global society.

2. Journey of Information Technology

2.1 Ancient Age We can date back man's greatest scientific discovery, the use of fire and use of language to communicate to pre historic period. In this period man learnt to make some tools, which enabled him to survive and win mastery over other The movement of heavenly bodies like sun and moon may be recorded as the earliest scientific observations. We can say that science of observation started with priests who can be called Priest-Scientists. These priests' scientists were anonymous.

As the time progressed, the Egyptian architect-Physician 'Imhotep" designed the step pyramid in 2980 BC. His contemporaries had knowledge about medicine and surgery. The Edwin Smith surgical papyrus is the oldest scientific document written on papyrus and rolled up in the form of a scroll. Hippocrates was regarded as father of medicine since 450 BC. Among primitive people medicine, magic and religion all went together. It seems that the Babylonians had knowledge of Botany as well because they were familiar with date palm.

Early Greek thinkers were keen to find what the world is made of? To early Greek thinkers what we call today science was only a part of philosophy^{3k}. It was only embracing search for wisdom. Pythagorean brotherhood was one of the most important groups that influenced the development of science in Greece. Pythagoras was founder of this group. He travelled widely. He set up a philosophical school whose members were bound by a vow to follow religious rites prescribed by which it remained powerful till 450BC. Pythagoras^{4k} Theorem still appears in the geometry textbooks all over the world .In fourth century BC, Greek philosophy reached its peak with Plato, Aristotle and their followers^{3k}. Their ideas, metaphysics and ethics influenced the development of science. Socrates, 399BC was the creator of scientific method: inquiry, dialect and conclusions.

Plato, 347BC was one of the accomplished mathematician and a philosopher. He introduced logic into study of mathematics and made the way for Euclid in the next century. Aristotle was the student of Plato. He introduced the concept of diagrams, reviewed and criticised the prevalent knowledge and gave his own observations and opinions. Aristotle's work on biology in which he described life and breeding habits of 540 species of animals is very close to modern scientific method.

2.2 Middle Age Science From seventh century Islam religion founded by Prophet Mohammad played a great role in transmitting knowledge. Followers of Prophet spread their master's knowledge and by ninth century Arabs became the standard bearers of scientific knowledge. It lasted from 900-1100 AD. The number system originated with the Hindus and was carried to the western world by the Arabs. It fits into the most of our commercial and technical needs till date. Persian born physician Rhazes classified substances as animals, vegetables and minerals, a classification which still prevails in day to day dialogue. One of the great Arab physicists was Alhazen^{5k} whose main contribution was in the field of Optics. Eminent physician Avicenna was the author of Canon of Medicine, its translation became the famous text book for Western Europe for several centuries.

In the middle age, advancements in pure sciences were comparatively insignificant but application of science to industry started developing. Glass making, iron foundries, paper making, printing press, mariners compass, gun powder to be used in warfare were some of the noticeable industrial developments. The first complete book printed from movable type of printing press was an edition

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of bible known as Gutenberg Bible 1455 AD. The importance of printing press in Science communication was to involve masses in scientific culture, to create an awareness of technological revolution which 20th century had witnessed and an attempt to achieve 'need to know' type of awareness. By the end of twelfth century the language barrier had been crossed, and Greek and Arabian scientific work has been translated to Latin. West came in contact with east, their literature, philosophy, science, architecture, art and industry started interacting. The growing thirst for learning resulted in setting up of universities and cathedral schools which were influenced by religion. The incorrect scientific views were hardly challenged. Aristotle, Ptolemy and physicians were supreme authorities. This view point was entirely hostile to spirit of free investigation. In the thirteenth century, Roger Bacon (1214-94) challenged the restriction for free investigation. He developed the science of experimentation. He was the first to suggest the use of lens for spectacles^{6k}. But he is today remembered more popularly for the invention of gun powder. He was ahead of his age, he predicted horseless carriages, ships with sail, flying machines, and machines to lift weights, and fortunately we are using all these things today.

Progress in science comes from communication and criticism of ideas and theories. In the seventeenth century for scientists and philosopher's income and support came from other sources, they had to struggle hard to communicate with each other. This led to development of scientific societies. Probably the earliest scientific society Secretorum Naturae, was founded in Naples in 1560 but it was abandoned for the fear of magic and black art. Another Italian academy was founded in Rome in 1603 Accademia dei Lincei. This was more respectable and its modern version still exists today. These invisible colleges were more in number in England during seventeenth century. Robert Boyle was a regular user of it at the one at Oxford. These invisible colleges had no building, no faculty, no students, no resources and no regular funding. They were informal association of brilliant men anxious to share and compare thoughts, ideas and observations.

The humble beginnings of invisible colleges led to the development of Britain's famous Royal Society^{7k} in about 1645. This society flourishes today also. In March 1665, the society began the publication called The Philosophical Transactions of the Royal Society. This and the French JOURNAL DES SAVANTS are one of the few oldest journals published. With the founding of Royal Society the science became fashionable, many rich noble men, dressed up well, attended the theatre to watch a 'show'. They observed the spectacular experiments in each weekly meeting. Royal Society focussed on experimental demonstrations^{8k}. The evolution of scientific societies had the most beneficial effect on the process of careful observation and experimentation. They learnt the advantages of selfless cooperation among each other to find out the scientific truth.

2.3 New Age Science

In 1672 Newton reported to Royal Society his findings on which he was already working and an Era of Newton began. Newton's Principia was published in Latin. Newton system of universe remained uncontested for more than two hundred years. One of the Newton good friend and learned disciple, astronomer and mathematician Edmund Halley is best remembered for the accurate prediction in 1704 of Halley planet which bears his name. The period of 1765 -1815 may be called as age of chemistry; Lavoisier has been called the Father of Chemistry^{9k}. He published Elementary Treatise of Chemistry, and Methods of Chemical Nomenclature. Henry Cavendish performed great many electrical experiments but did not publish them; he thought them to be not as per his high standards. His laboratory notes were published by James Clerk Maxwell in 1879. French military engineer Charles Augustine Coulomb made significant contribution in electricity.

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The period of 1800-1900 saw a group of British scientists Faraday, Maxwell, Hertz and others making unifying generalization and establishing connection between light, electricity and magnetism. Twentieth century enjoyed the fruits of discovery that light is an electromagnetic wave. Its technological use by Marconi and others led to revolution in communication which we are witnessing today. The great Technological capacity of EM waves to carry energy has revolutionised the life style on this planet, apart from making life possible on earth.

3. Role of Information Technology in World War I and II

Before World War I 1914-18, the education of military men always was to teach them how to fight the last war over again and not how to fight the next one. Their education material was a three volume treatise by Karl von Clausewitz on war which was based on Napoleonic times. But the advances in science and technology applied to ordnance, explosives communication and transportation caused the old ideas to be outdated. The World War II represented the triumph of applied science, technology^{10k}, engineering and industrial know-how and an age of atomic weapons with atomic bombs^{11k} began. It was a scientist's war and more particularly a physicist's war. In World War II the victory fell not on the side of strongest battalions but on the side of best scientist and engineers.

4 Electronic Era

Control of electrons, the invisible negatively charged particles led to the development of electronics which revolutionised our livings in every corner of the world^{14k}. The journey started with the electronic tubes followed by transistors, computers, LSI, VLSI, lasers, masers, ultrasonic's etc. The incredible growth of electronics has come from miniaturisation of transistors and improvement in the manufacturing. This synergy has revolutionised not only electronics but also society at large.

5.0 Future of Information Technology

The twenty-first century is going to be the era of information technology due to rapid advancements in the Third Generation - Systems of Nanosystems (2010-2015). In this stage assemblies of nanotools work together to achieve a final goal. At this stage significant advancements in robotics, biotechnology, and new generation information technology will begin to appear in products. Fourth Generation -Molecular Nanosystems (2015-2020). This stage involves the intelligent design of molecular and atomic devices, leading to unprecedented understanding and control over the basic building blocks of all natural and man-made things. At this stage a single product will integrate a wide variety of capacities including independent power generation, information processing and communication, and mechanical operation.

Fifth Generation - The Singularity (2020 and beyond). Every exponential curve eventually reaches a point where the growth rate becomes almost infinite. This point is often called the Singularity. If technology continues to advance at exponential rates, what happens after 2020? Technology is likely to continue, but at this stage some observers forecast a period at which scientific advances aggressively assume their own momentum and accelerate at unprecedented levels, enabling products that today seem like science fiction.

8.0 Conclusion

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Purpose of this paper is to highlight for the twenty first century living beings that they should not forget how differently people lived before they learnt how to harness the power and set the forces of nature to work. Quest for knowledge and its sharing shall continue to remain fundamental human right for any individual born on this planet. Due consideration is to be given to morals and ethics when new scientific discovery is applied to technology. Perils of atomic age have to be kept in mind when we are harnessing nano technology as a future scientists' tool. The impact of nanotechnology on human beings, ecology and environment and to the society as a whole are uncertain and they need to be addressed urgently. We may assume at the moment that the benefits of nanotechnology are more as compared to the risk. Adequate safeguards are needed when nanotechnology takes a boost in the 21st century. Nanotechnology has a great potential no doubt but it can also convert this earth into a graveyard by just simple a bio weapon accident or a laboratory accident.

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It will affect the society in the same way as information technology and internet have become essential component of our lives.

विज्ञान के क्षेत्र से किशोरियों का कम लगाव ---कारण एवं निराकरण

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किशोरियाँ भावनात्मक रूप से लड़कों की अपेक्षा ज्यादा मजबूत होती हैं, किन्तु फिर भी वो आधुनिक तकनीकी एवं विज्ञान के विषयों की अपेक्षा परम्परागत विषयों जैसे कला समूह, संगीत व साहित्य की ओर ज्यादा आकर्षित होती हैं। लड़के मानसिक रूप से एकांगी होते हैं जबकि किशोरियाँ बहुआयामी होती हैं। इसके बाद भी वह विज्ञान के क्षेत्र में अल्पसंख्यक हैं।

समस्या प्रारंभिक शिक्षा से शुरू होती है। समाज में ये रूढ़िवादी धारणा व्याप्त है की कुछ विषय सिर्फ पुरुष ही पढ़ सकते हैं। भारतीय समाज विशेष कर ग्रामीण क्षेत्रों में ये धारणा अभी भी बहुत प्रबल रूप से व्याप्त है की लड़कियाँ विज्ञान एवं गणित पढ़ने के लिए उपयुक्त विद्यार्थी नहीं हैं, बचपन से उनके अवचेतन मन में ये बात बिठा दी जाती है कि गणित व विज्ञान उनके लिए कठिन व अनुपयुक्त विषय हैं व उनके अध्ययन के लिए कला समूह ही उचित विषय है। इस कारण से उनका झुकाव गणित व विज्ञान विषयों से हट जाता है।

हम इस बात पर तो खूब बात करते हैं कि किशोरियाँ विज्ञान पढ़ने के लिये क्यों उत्सुक नहीं हैं लेकिन हमें इस बात पर भी बात करना चाहिए कि हमारे पास ज्ञान व तकनीकी के कौन से साधन मौजूद हैं ? क्या वो साधन किशोरियों को दृष्टि में रखते हुए क्रियान्वित किये जा रहे हैं?

विज्ञान के क्षेत्रों में किशोरियों की कम रुचि के कारण

- ◆ समाज, माता पिता व शिक्षकों की ओर से किशोरियों को विज्ञान पढ़ने के लिये उपयुक्त व पर्याप्त प्रोत्साहन नहीं दिया जाता है, परिणामस्वरूप किशोरियों के मन में ये हीन भावना घर कर जाती है कि भौतिकी और गणित जैसे विषय में वे लड़कों से अच्छा नहीं कर सकती हैं।

- ◆ भारतीय परिवारों में विशेष कर ग्रामीण क्षेत्रों में किशोरियों की शिक्षा पर विशेष ध्यान नहीं दिया जाता है एवं उन्हें विज्ञान की जगह घरेलू वातावरण से सम्बंधित विषयों की ओर धकेला जाता है।
- ◆ किशोरियां सांस्कृतिक एवं सामाजिक रूढ़िवादिता से प्रभावित होकर परम्परागत विषयों की ओर उन्मुख होती हैं।
- ◆ विद्यालय स्तर पर विषयों की चयन की स्वतंत्रता के कारण किशोरियां अपने आसपास के वातावरण एवं संस्कृति से प्रभावित होकर विज्ञान विषयों से इतर अन्य विषयों में अपनी अभिरुचि बना लेती हैं।
- ◆ किशोर हमेशा किशोरियों की विशिष्टता को चुनौती देते हैं विशेष कर विज्ञान के क्षेत्र में किशोरियों की योग्यता को हमेशा संदेह की दृष्टि से देखा जाता है।
- ◆ किशोरियों को कक्षा में शिक्षकों से सही उत्तर नहीं मिलते हैं उनके प्रश्नों के प्रतिउत्तर में कहा जाता है "किताब में देख लो " " बुद्ध हो" या "विज्ञान गंभीर विषय है तुम्हारे बस का नहीं है" आदि।
- ◆ विज्ञान व रिसर्च के क्षेत्र में किशोरियों के लिए काम के क्षेत्र व रहवासी क्षेत्र ज्यादा सुरक्षित नहीं हैं।
- ◆ विज्ञान के क्षेत्र में कैरियर एवं व्यवसाय में भी किशोरियों अथवा महिलाओं को लिंगभेद का सामना करना पड़ता है। उन्हें पुरुष साथी की अपेक्षा कम वेतन, भत्ता,रहवासी सुविधाएं आफिस में जगह एवं अवार्ड इत्यादि में कमतर स्थितियां प्राप्त होती हैं।
- ◆ विज्ञान पढ़ने वाली किशोरियों को किताबी कीड़ा मन जाता है एवं उनका यह गुण स्वाभाविक महिला चरित्र के विरुद्ध माना जाता है।
- ◆ किशोरियों के अवचेतन मन में ये बात बिठा दी जाती है कि शादी के बाद परिवार संभालना प्रमुख कार्य है अतः विज्ञान की अपेक्षा समाज शास्त्र से जुड़े विषयों का अध्ययन उनके लिए श्रेयष्कर है।
- ◆ किशोरियों में आत्मविश्वास की कमी होती है कि वो विज्ञान के क्षेत्र में अपना कैरियर नहीं बना पाएंगीं।
- ◆ भारत में किशोरियों के लिए रोल मॉडल की कमी है। जब किशोरियां अपने परिवार में माँ, चाची, बुआ, दीदी किसी को भी विज्ञान पढ़ते नहीं देखती तो स्वाभाविक तौर पर उनकी रुचि विज्ञान में नहीं होती है।

भारत में विज्ञान के क्षेत्र में किशोरियों की वास्तविक स्थिति

- ◆ मिडिल स्कूलों में 74 % किशोरियों का झुकाव विज्ञान की तरफ रहता है जो हायर सेकण्डरी स्तर पर 45 % एवं उच्च शिक्षा में 23 % राज जाता है।
- ◆ 60% किशोरियां विज्ञान के क्षेत्र में अपना करियर नहीं बनाना चाहती हैं।
- ◆ 10 % किशोरियों के माता पिता उनको विज्ञान पढ़ने के लिए प्रोत्साहित करते हैं।
- ◆ पूरे भारत में 15 से 60 वर्ष के उम्र समूह की महिलाओं की जनसंख्या का 6.5 % हिस्सा ही स्नातक हैं जिसमें 2.3 % ही विज्ञान के विषयों में स्नातक हैं।

निराशाजनक आंकड़े

आंकड़े दर्शाते हैं कि भारत में किशोरियों का झुकाव विज्ञान की ओर बहुत कम है ,इस कारण से कार्यक्षेत्रों में लिंगानुपात प्रभावित हुआ है।

1. विश्वविद्यालयों में विभिन्न विषयों में बालक व बालिकाओं का अनुपात

विषय	बालक	बालिका
कला समूह	9.4	10.5
जीव विज्ञान	6.5	7.4
इंजीनियरिंग	15.2	2.6
सामाजिक विज्ञान	6.1	11.7
टेक्नोलॉजी	3.7	1.4
कम्प्यूटर विज्ञान	4.3	1.2

2 -इंडियन नेशनल साइंस अकादमी के सर्वे के अनुसार महिलाओं की संख्या नेशनल लेबोरेटरीज एवं महत्वपूर्ण विश्व विद्यालयों में पुरुषों की तुलना में 15 % कम है।

R & D एजेंसियों में महिला वैज्ञानिकों की स्थिति

एजेंसी	पुरुष वैज्ञानिक	महिला वैज्ञानिक	प्रतिशत
DBT	456	121	26.5
CSIR	5526	595	10.76
ICMR	615	168	11.8
ICAR	11057	1056	9.5

DST 147 18 12.24

3 .भारत के वैज्ञानिक संस्थानों एवं विश्व विद्यालयों में पुरुष आधिपत्य है। महिलाएं कनिष्ठ पदों पर हैं वरिष्ठ पदों पर पुरुष संख्या ज्यादा है।

पद	पुरुष	महिला	
असिस्टेंट प्रोफेसर	45 %	57	%
एसोसिएट प्रोफेसर	40 %	38	%
प्रोफेसर	15 %	5	%

उपर्युक्त आंकड़े दर्शाते हैं की किशोरियों का भविष्य विज्ञान के क्षेत्र में बहुत ज्यादा उज्ज्वल नहीं है। यह स्थितियां प्रतिक्रियात्मक हैं। यह किशोरियों के विज्ञान न पढ़ने का यह नतीजा है, या किशोरियों के विज्ञान में रुचि न होने से ये स्थिति निर्मित हो रही हैं। आकड़ों में समय के साथ सुधार जरूर हुआ होगा लेकिन स्थिति उतनी संतोष जनक अभी भी नहीं है। किशोरियों को विज्ञान क्यों पढ़ना चाहिए ?

कुछ तथ्य

- ◆ जो किशोरियां विज्ञान पढ़ती हैं वे अपनी सहेलियों से जो दूसरा विषय लेकर पढ़ती हैं से 26 % ज्यादा कमाई करती हैं।
- ◆ विज्ञान पढ़ने वाली किशोरियां अन्य विषय पढ़ने वाली किशोरियों की अपेक्षा ज्यादा प्रतिस्पर्धी एवं हार न मानने वाली होती हैं।
- ◆ जो किशोरियां विज्ञान विषय लेती हैं उनकी तार्किक क्षमता एवं कठिन परिस्थितियों से निपटने की क्षमता अन्य किशोरियों की अपेक्षा ज्यादा अच्छी होती है।
- ◆ वैज्ञानिक ढंग से सोचने के कारण अपने व्यक्तित्व एवं वातावरण को अधिक प्रभावशाली बनाती हैं।
- ◆ अपने परिवार, समाज एवं देश के निर्माण में महत्वपूर्ण योगदान देने की क्षमता विज्ञान पढ़ने वाली किशोरियों में होती है।
- ◆ किशोरियों को कैसे विज्ञान के प्रति प्रोत्साहित करें ?

निराकरण

- ◆ माता पिता एवं समाज को परम्परागत व रुढ़िवादी सोच को बदलना होगा। किशोरियों में बचपन से ही विज्ञान व गणित के प्रति उत्साह पूर्ण वातावरण तैयार कर उनके अवचेतन मन में यह बात डालनी होगी कि विज्ञान जीवन के लिए बहुत महत्वपूर्ण विषय है।
- ◆ विद्यालय एवं सामाजिक परिवेश में विज्ञान से सम्बंधित कार्यक्रमों का आयोजन कर विज्ञान ,इंजीनियरिंग ,तकनीकी ,कम्प्यूटर , फार्मसी या अन्य विज्ञान के विषयों में अग्रणी स्थानीय महिलाओं को आमंत्रित कर सम्बोधन करवाना चाहिए। इस से किशोरियों के सामने उनके रोल मॉडल्स होंगे एवं उनसे प्रभावित होकर विज्ञान के विषयों में उनकी रुचि बढ़ेगी।
- ◆ विद्यालयीन पाठ्यक्रमों को इस प्रकार से प्रारूपित करना चाहिए जिससे किशोरियों को विज्ञान विषय में सहभागिता के अवसर अधिक मिलें।
- ◆ शिक्षक छात्र एवं शिक्षा के बीच की बहुत महत्वपूर्ण कड़ी है ,विज्ञान के क्षेत्र में नवाचार से परिचित कराने के लिए शिक्षक प्रशिक्षण अत्यंत महत्वपूर्ण है। प्रशिक्षण के दौरान शिक्षकों को किशोरियों की विज्ञान के प्रति अभिरुचि बढ़ाने की तकनीकों से परिचित करवाया जाना चाहिए।
- ◆ प्राथमिक स्तर पर साइंस कॉम्पिटिशन,साइंस फेयर ,विज्ञान प्रश्नोत्तरी पाठ्यक्रम में अनिवार्य घोषित की जानी चाहिए ताकि बच्चियों की अभिरुचि विज्ञान के प्रति बढ़ सके एवं प्रोत्साहन के लिए उनको ट्राफियां ,प्रमाण पत्र एवं अवार्ड देने चाहिए।
- ◆ वर्कशॉप का आयोजन कर किशोरियों को विज्ञान के अनेक रहस्यों को सरल ढंग से समझाना चाहिए। सरल मशीनों की क्रियाविधि एवं सञ्चालन की जानकारी से उनके मन में विज्ञान के प्रति उत्सुकता जाग्रत होगी।
- ◆ रसायन के अनेक चमत्कारों का विश्लेषण उनके सामने करना चाहिए। रासायनिक अभिक्रियाओं के जादू देख कर उनके मन में विज्ञान के प्रति अभि रुचि जाग्रत होगी।
- ◆ सरल प्रोजेक्ट जैसे *मिश्रण को अलग करना *बिजली के मेंढक का फुदकना *रोबोट का सञ्चालन *केन्डी वाटर फॉल *दूध का प्लास्टिक बनना *LED नृत्य ग्लोब आदि का प्रदर्शन निश्चित ही उनके मन में विज्ञान के प्रति अभिरुचि पैदा करेगा।
- ◆ विज्ञान से सम्बंधित आसपास के कल कारखाने ,बांध ,बिजली बनाने वाली इकाइयां, पवन चक्कियां, एवं फैक्ट्रियों का भ्रमण कराना चाहिए ताकि वे विज्ञान के रहस्य एवं उसकी उपयोगिता को समझ सकें। इन जगहों पर काम करने वाली महिलाओं से भी उनकी मुलाकात करवाना चाहिए जिससे उनके मन में विश्वास बन सके की वे भी इन क्षेत्रों में अपनी सहभागिता देकर करियर बना सकती हैं।

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वैश्वीकरण के इस दौर में समाज, परिवार और तंत्र की मानसिकता में बदलाव आये हैं व पहले की अपेक्षा अधिक संख्या में किशोरियां विज्ञान के क्षेत्र में भागीदार बनी हैं लेकिन ग्रामीण क्षेत्र में अभी भी बहुत असंतुलन है। शिक्षा तक पहुँच ही इसका हल नहीं है इसके लिए बहुआयामी योजनाओं के बनाने की एवं धरातल पर उनके क्रियान्वयन की आवश्यकता है। माता पिता को अपनी मानसिकता में परिवर्तन लाना होगा उन्हें परिवार में किशोरियों के प्रति पक्षपातपूर्ण व्यवहार बंद करना होगा एवं इसमें शिक्षकों, समाज व तंत्र को सहयोग करना होगा ताकि अधिक से अधिक किशोरियों को इस क्षेत्र में आने के लिए प्रोत्साहित किया जा सके।

(आंकड़े विभिन्न स्रोतों से एकत्रित हैं जो समय के साथ परिवर्तनशील हो सकते हैं)

IRRIGATIONAL IMPACT OF DISTILLERY SPENTWASH ON THE PRODUCTION OF QUALITY ADDITIVE FORAGE CROPS ON LIVESTOCK DIGESTIBILITY

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Abstract

Cultivation of forages namely; Sorghum (*Sorghum bicolor* L. Moench) and Napier Bajra (*Pennisetum purpureum* P. glaucum) was made by irrigation with distillery spentwash of different proportions. The distillery spentwash i.e., primary treated spentwash (PTSW), 1:1,1:2 and 1:3 distillery spentwash were analysed for plant nutrients such as nitrogen, phosphorous, potassium(NPK) and other physical and chemical parameters. The plants were cultivated by irrigation with raw water (RW), 1:1, 1:2 and 1:3 distillery spentwash in the prepared pots. The impact of distillery spentwash on proximate principles for quality forage (Crude protein, Neutral detergent fibre, Acid detergent fibre and Total digestible nutrient) i.e., forage digestibility for livestock were analysed. It was observed that good nutrients uptake in case of 1:3 spentwash and requirements of livestock digestibility components were observed when compared with 1:1, 1:2 spentwash and raw water irrigations. This could be due to the maximum absorption of NPK by plants at more diluted condition of spentwash. This concludes that the diluted spentwash can be conveniently used for the effective cultivation without using any external fertilizers. Hence, spentwash serves as a liquid fertilizer, eco-friendly irrigation medium and without adverse effect on environment and soil.

Key words: Distillery spentwash, Irrigation, Napier Bajra, nutrients, proximate principle, Soil, Sorghum.

Introduction

Molasses is one of the important by-products of sugar industry which is the chief source for the production of alcohol in distilleries by fermentation method. Nearly 10-12 litres of spentwash are discharged for every litre of rectified spirit produced and is known as raw spent wash (RSW), which is characterized by high biological oxygen demand (BOD: 5000-8000mg/l) and chemical oxygen demand (COD: 25000-30000mg/l) (Joshi,1994), undesirable colour and foul odour. The discharge of spentwash into open field or water bodies result in environmental, soil & water pollution. Hence discharge of spent wash is a great problem. The RSW is highly acidic and consists of easily oxidisable organic matter with very high BOD and COD (Patil, 1987). The spentwash is rich in organic carbon & plant nutrients (Ramadurai and Gearard, 1994). Since it is from plant source extract it contains negligible heavy metals & other toxic substances (Eyini et al, 1990). Meanwhile it is rich in plant essential nutrients it can be used in agriculture so the problem of disposal becomes easy along with the utilisation of nutrients by plants. It also helps to utilise spentwash in a proper method to avoid adverse effects on the environment. Its application to soil has been reported to be beneficial to increase sugar cane (Zalwadia, 1997), rice (Devarajan and Oblisami,1995), wheat and rice yield (Pathak et al., 1998), quality of groundnut (Amar Singh et al.,2003) and physiological response of soybean (Ramana et al.,2000). Diluted spent wash could be used for irrigation purpose without adversely affecting soil fertility(Kaushik et al.,2005; Kuntal et al., 2004; Raverkar et al., 2000), seed

germination and crop productivity (Ramana et al., 2001). The diluted spent wash irrigation improved the physical and chemical properties of the soil and further increased soil micro flora (Devarajan, 1994; Kaushik et al,2005; Kuntal et al.,2004). Twelve pre sowing irrigations with the diluted spent wash had no adverse effect on the germination of maize but improved the growth and yield (Singh and Raj Bahadur,1998). Diluted spent wash increases the growth of shoot length, leaf number per plant, leaf area and chlorophyll content of peas (Ravi and Srivastava, 1990). Increased concentration of spent wash causes decreased seed germination, seedling growth and chlorophyll content in sunflowers (*Helianthus annuus*) and the spent wash could be safely used for irrigation purpose at lower concentration (Rajendra,1990; Ramana et al.,2001). The spent wash contained an excess of various forms of cations and anions, which are injurious to plant growth and these constituents should be reduced to beneficial level by diluting the spent wash, which can be used as a substitute for chemical fertilizer (Sahai et al., 1983). The spent wash could be used as a complement to mineral fertilizer to sugarcane (Chares, 1985). The spent wash contained N, P, K, Ca, Mg and S and thus valued as a fertilizer when applied to soil through irrigation with water (Samual, 1986). The application of diluted spent wash increased the uptake of Zinc(Zn), Copper(Cu), Iron(Fe) and Manganese(Mn) in maize and wheat as compared to control and the highest total uptake of these were found at lower dilution levels than at higher dilution levels(Pujar,1995). Mineralization of organic material as well as nutrients present in the spent wash was responsible for increased availability of plant nutrients. Diluted spent wash increases the uptake of nutrients, height, growth and yield of leaves vegetables (Chandraju et al., 2007; Basvaraju and Chandraju, 2008), nutrients of cabbage and mint leaf (Chandraju et al., 2008), nutrients of top vegetable (Basvaraju and Chandraju, 2008), pulses, condiments and root vegetables (Chandraju et al., 2008). However, not much information is available on the impact of distillery spent wash on the quality additives in forage crops. Therefore, the present investigation was carried out to investigate the impact of irrigation of different concentration of spentwash on the quality of additive forage crops on livestock digestibility.

Materials and Methods

Physio-chemical parameters and amount of nitrogen (N), potassium (K), phosphorous (P) and sulphur (S) present in the primary treated diluted spentwash (1:1, 1:2, 1:3 SW) were analysed by standard methods. The PTSW was used for irrigation with a dilution of 1:1, 1:2 & 1:3. A composite soil sample collected prior to spentwash irrigation was air-dried, powdered and analysed for physio-chemical properties. The forage plants selected for the present investigation were Sorghum seeds and Napier Bajra root slips which were sowed in different pots [25.5cm (h), 45.5cm (dia)] and irrigated by applying 0.75 to 1 lit/pot (depending upon the climatic condition) with raw water (RW), 1:1 SW, 1:2 SW and 1:3 SW at the dosage of once a week and rest of the period with raw water as required. At the maturity time, forage samples were harvested air dried and proximate principles on forage quality were analysed.

Parameters	Values
Coarse sand ^c	8.99
Fine sand ^c	41.06
Slit ^c	25.87

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Clay ^c	21.80
pH (1:2 soln)	8.32
Electrical conductivity ^a	562
Organic carbon ^c	0.98
Available Nitrogen ^b	392
Available Phosphorous ^b	239
Available Potassium ^b	99
Exchangeable Calcium ^b	163
Exchangeable Magnesium ^b	251
Exchangeable Sodium ^b	119
Available Sulphur ^b	296
DTPA Iron ^b	201
DTPA Manganese ^b	210
DTPA Copper ^b	9
DTPA Zinc ^b	62

Table: 1 Characteristics of experimental soil

Units: **a**- μ S, **b**- mg/L, **c**-%

Chemical parameters	PTSW	1:1 PTSW	1:2 PTSW	1:3 PTSW
PH	7.52	7.60	7.66	7.70
Electrical conductivity ^a	28600	19900	8650	5290
Total solids ^b	46300	31090	22380	15890

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Total dissolved solids ^b	36250	16930	11565	6420
Total suspended solids ^b	10360	6031	5119	1930
Settleable solids ^b	9690	4260	3390	2840
COD ^b	40820	19190	9998	3010
BOD ^b	15880	6960	4285	2620
Carbonate ^b	Nil	Nil	Nil	Nil
Bicarbonate ^b	12800	7030	3320	1120
Total Phosphorous ^b	39.20	23.39	16.20	9.97
Total Potassium ^b	7200	4590	2990	1860
Calcium ^b	920	602	391	203
Magnesium ^b	1552.68	892.19	201.3	101.6
Sulphur ^b	75.2	35.6	18.9	9.9
Sodium ^b	502	296	218	172
Chlorides ^b	6122	3829	3212	2868
Iron ^b	7.9	6.2	3.4	2.3
Manganese ^b	1020	829	442	201
Zinc ^b	1.5	0.98	0.59	0.51
Copper ^b	0.272	0.201	0.092	0.056
Cadmium ^b	0.005	0.003	0.002	0.001
Lead ^b	0.15	0.09	0.07	0.014
Chromium ^b	0.05	0.021	0.01	0.007
Nikel ^b	0.08	0.049	0.03	0.011
Ammonical Nitrogen ^b	744.7	332.42	274.4	155.09
Carbohydrates ^c	21.64	11.32	7.93	5.92

Table: 2 Chemical characteristics of distillery Spentwash
Units: a- μ S, b- mg/L, c-%, PTSW- Primary treated distillery Spentwash

Chemical parameters	PTSW	1:1 PTSW	1:2 PTSW	1:3 PTSW
Ammonical Nitrogen ^b	744.7	332.42	274.4	155.09

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Total Phosphorous ^b	39.20	23.39	16.20	9.97
Total Potassium ^b	7200	4590	2990	1860
Sulphur ^b	75.2	35.6	18.9	9.9

Table: 3 Amount of N, P, K and S (Nutrients) in distillery Spentwash

Unit: **b**- mg/L, PTSW- Primary treated distillery spentwash

	Raw water	1:1 PTSW	1:2 PTSW	1:3 PTSW
Crude protein (CP)	3.34	2.99	3.11	4.98
Neutral detergent fibre (NDF)	56.47	57.88	55.21	54.70
Acid detergent fibre (ADF)	50.29	49.22	47.28	45.08
Total digestible nutrient (TDN)	44.59	45.39	46.85	48.50

Table-4 Proximate principles of Sorghum at different irrigations (in %)

	Raw water	1:1 PTSW	1:2 PTSW	1:3 PTSW
Crude protein (CP)	4.31	4.29	5.31	6.09
Neutral detergent fibre (NDF)	55.65	59.26	54.44	52.53
Acid detergent fibre (ADF)	49.44	51.92	47.86	45.07
Total digestible nutrient (TDN)	45.23	43.36	46.41	48.51

Table-5 Proximate principles of Napier Bajra at different irrigations (in %)

Results and Discussion

Characteristics of experimental soils such as pH, electrical conductivity, the amount of organic carbon, available nitrogen(N), phosphorous(p), Potassium(K), sulphur(S), exchangeable calcium(Ca), Magnesium(Mg), Sodium(Na), DTPA iron(Fe), manganese(Mn), copper(Cu) and zinc(Zn) were analysed and tabulated (Table-1). It was found that the soil composition is fit for the cultivation of

plants, because it fulfils all the requirements for the growth of plants. Chemical composition of P_{TSW}, 1:1,1:2 and 1:3 SW such as pH, Electrical conductivity, total solids(TS), Total dissolved solids(TDS), Total suspended solids(TSS), Settelable solids(SS), Chemical oxygen demand(COD), Biological oxygen demand(BOD), carbonates, bicarbonates, Total phosphorous(P), Total potassium (K), Ammonical Nitrogen(N), Calcium(Ca) Magnesium(Mg), Sulphur(S), Sodium(Na), Chlorides(Cl), Iron(Fe), Manganese (Mn), Zinc(Zn), Copper(Cu), Cadmium(Cd), Lead(Pb), Chromium(Cr) and Nickel(Ni), were analysed and tabulated (Table-2). Amount of N, P, K and S contents are presented in Table-3. The proximate principles for quality forage: Crude protein, Neutral detergent fibre, Acid detergent fibre and Total digestible nutrient of all plants were very good in 1:3 spentwash as compared to 1:1, 1:2 and raw water irrigations. However, nutrients uptakes were high in 1:3 than in all other types of irrigations for both plants and there was no negative impact of spentwash on the quality of forage crops on livestock digestibility (Table 4 and 5).

Conclusion

It was noticed that the nutrients uptake for both the forage crops was largely influenced in case of 1:3 and 1:2 diluted spent wash irrigation than with raw water and 1:1. But 1:3 spent wash irrigation it shows more uptake of nutrients when compared to 1:2 and 1:1 diluted spent wash in all the tested forage crops. This concludes that, the treated soil is enriched with the plant nutrients such as nitrogen, potassium and phosphorous. It further concludes that, the subsequent use of diluted spent wash for irrigation enriches the soil fertility and hence the diluted spent wash (1:3) is effective eco-friendly irrigation medium for cultivation of forage crops without any adverse effect.

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Technology transfer with Traditional Media

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Abstract

Agricultural knowledge is fast equating and is doubling every six years and its transfer to the needy through appropriate media is lagging behind. The knowledge transfer seems to be the weakest link. Low literacy rate and inaccessibility of the modern can be overcome by the traditional media. It can be used as a main tool to transfer the information. In studies it was found that there was significant hike in knowledge level of the respondents. The entire respondent from different profession gained the knowledge after watching the street play. About half of the respondent belongs to high category of retention in knowledge.

Keywords: Dramatization, Aware, Judicious use.

During the last 58 years, only 30% of modern Agri-knowledge was disseminated among educated and progressive farmers in India. There still exists appalling poverty, glaring inequality and growing destitution among the people. It is irony of destiny that in spite of more than 68 years of independence very little science had reached the needy in villages. Agricultural knowledge is fast generating and is doubling every six years but its transfer to the needy through appropriate media is lagging behind. The knowledge transfer seems to be the weakest link. This may be due to less efficiency of modern tools of dissemination, not accessibility of the farmers, different agro climatic conditions, low literacy rate etc.

Even the poorest man in India has access to the traditional media, cultural media, or folk media expressed in various forms such as story, poem, play, song, proverbs, drama, wall paintings, symbols, socio-drama paintings, *kavad* and *pad*. Folk media for non-formal education programme is popular in Malaysia, Niger, Thailand, Pakistan, Taiwan and China. In each cultural region of India, there are various traditional media. Folk media, traditional media and cultural media are common terms, which include folk songs and dances. The folk media are based on the content of communication derived from the traditional beliefs and customs. Not restricted only to developing countries it is very well accepted by the developed countries. It is worth here to mention the activities of Dr. Davinder Sharma who is working as Associate Professor in University of California Fresno. Born in India did his doctorate from Ohio State University with Dissertation: Performing Nautanki: Popular Folk Performances as Sites of Dialogue and Social Change Invited by number of best Institutes of the world to organize the workshops for *Nautanki*.

Dramatization is one of the methods that makes a special appeal to farmers as it reproduces reality in life. Dramatization depicts the characters proceeding through the use of language accompanied by facial expression, gesture and movements. Dramatization methods not only help in quick learning but also in better retention. The farmers learn through recreation and make use of their sense of hearing and seeing, which results in permanent learning. The Dramatization used as tool of dissemination from ancient time as it is very closely embedded with the cultural ideology of the

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people. The evidences of the Folk Media - Theatre also found in Greek civilization which was followed in China and later on developed as Sanskrit.

The earliest form of Indian theatre was the Sanskrit Theatre. It emerged sometime between the 2nd century BC and the 1st century and flourished between the 1st century and the 10th, which was a period of relative peace in the history of India during which hundreds of plays were written. These plays were big source to transfer the information regarding religion, spirituality, folk lores etc. In an attempt to re-assert indigenous values and ideas, village *theatre*, *kavad* *nautanki* etc. was encouraged across the subcontinent, developing in a large number of regional languages from the 15th to the 19th centuries.

Case I

Keeping in mind the embededness of the traditional media in the cultural ideology of the Punjab farmers the strategies of the insecticides resistance project was planned in 2005 to disseminate through the educational street plays. These street plays are organized in the IRM adopted villages of *Bathinda*, *Mansa* and of *Abohar* districts of Punjab.

Material and Method

The present investigation was conducted in the IRM villages of Bathinda, Mansa and Abohar districts. The street play were staged in the six villages of the area with 2 performances in two villages of each district. From each village 25 IRM farmers. The data comprising a sample of 150 farmers. The data was collected comprising different steps. Firstly the knowledge test was administrated to IRM farmers to judge this existing knowledge about the selected concept of environment implications caused due to injudicious use of pesticide. Then the after on the scheduled date the street plays was staged. Post-test was administered to the entire respondent immediately after the performance. After fifteen days the save test was again administered to find out the relation of knowledge. This formed the basis to see how far the respondent gained knowledge and to extent to which they retained the knowledge.

Comparison of variance in gain in knowledge of the farmers regarding judicious use of pesticides

Variables	Mean score			F value
	Pre-test	Post-test	Gain in knowledge	
Age (yrs)				
1-23	12.00	33.6	21.6	3.87**
23-45	14.00	37.16	23.16	
45-67	16.70	40.20	23.50	
Education				
Illiterate	12.79	35.33	22.54	5.95*
Primary	15.10	41.30	26.20	
Matriculate	16.77	45.42	28.65	
Graduate	16.80	46.37	29.57	
Occupation				
Agriculture	14.99	40.37	25.88	2.55 ^{NS}
Business	30.10	37.43	25.33	

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Service	16.90	44.57	27.67	
Family Income				
Low	13.97	40.94	26.67	3.92**
Medium	14.96	41.72	26.76	
High	16.69	45.85	29.16	
Operational land holding(acre)				4.04**
1-44	12.79	37.64	24.85	
44-87	16.85	38.12	21.27	
87-130	12.62	36.40	23.78	
Area under cotton crop (acre)				
1-23	12.93	37.90	24.97	3.87**
23-45	16.89	38.49	21.60	
45-67	13.05	36.66	23.61	

* Significant at .05 per cent level

** Significant at .01 per cent level

If was found from the investigation that there was significant like in knowledge in all the three categories of the age and similar was in the case of education level. The respondents who were graduates gained more i.e. 29.57 units as compared to the respondents who were matriculate (28.65), Primary (26.20) and illiterate (22.54). The results in Table also showed that all the respondents engaged in different profession got enhanced their knowledge and F value showed that this enhancement is not significant to any profession. In case of family income more the family income more the farmers gained the knowledge from the pre-test evaluation and gain in knowledge is significant to family income. At the same time land holding and area under cotton crop were significant to gained knowledge. The F value for the operational land holding and area under cotton crop was 4.04 and 3.87 respectively.

Distribution of the respondent according to their retention of knowledge score

n=150

Retention of knowledge category	Frequency	Percentage
Low (9-19)	35	23.34
Medium (19-27)	74	49.33
High (27-36)	41	27.33
Total	150	100.00

The data in the table shows that about fifty percent of the respondents retained their knowledge up to fifty percent whereas 27.33 percent and 23.44 percent of the respondents belongs to high level of retention of knowledge and low level respectively.

The Results of the Project were as follow

- | | | |
|---|---|--------|
| a) Reduction in number of sprays | = | 58.7% |
| b) Reduction in insecticide formulation | = | 20.0% |
| c) Reduction in insecticide entire ingredient | = | 16.0% |
| d) Reduction in cost of spray | = | 527.7% |
| e) Increase in seed cotton yield | = | 17.2% |
| f) Net profit due to adoption of IRM strategies Rs/ha | = | 1311% |

Case II

Material and Method

Three special days were observed in the Punjab state. Street plays were organized under the project from United State India Education Foundation (USIEF). Awareness exhibition and guest lecturers were the part of the activity. Technical street plays were staged in three different locations i.e. Mansa, Moga and Hoshiarpur of Punjab. The technical plays were based on the message to judiciously use the Natural Resources. Firstly the knowledge test was administered to farmers to judge their existing knowledge about the selected concept of environmental implications caused due to injudicious use of pesticides before entering the venue. The farmers were given a Performa for filling prior to their exposure and after the exposure they are requested to fill the back same side of the Performa with red ink pen (provided by volunteers). This formed the basis to see how far the respondent gained knowledge.

It was found from the investigation that there was significant like in knowledge in all the three Districts. Data in table no. 2 revealed that in Moga district 21 of the respondents from total One hundred fifty respondents were aware regarding the pollution caused by pesticides before exposure and after visiting the exhibition and watching street play total 33 of the respondents were aware. Similarly in the case of Mansa district 22 respondents were aware before exposure and total 34 respondents were aware after the exposure. It has been noted that before exposure total 67 of respondents were aware of the pollution of water bodies by pesticides which were hiked to 96 after exposure. Similarly awareness regarding injudicious usage of pesticides affecting environment was hiked after the exposure. One hundred five respondents were aware after exposure regarding injudicious usage of pesticides being lethal to friendly insects. Earlier this was known to 73 members of the respondents. It has been observed that one third of other respondents were known about the change of the group of pesticides. This figure was significantly above the 50% mark (80). The knowledge of respondents significantly hiked in awareness regarding mixture of pesticides, seed treatment, friendly insects, economic threshold level, recommended varieties and surveillance of the field.

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Table 2 Gain in knowledge level of the farmers regarding environmental implications

Sr. no.	Exposure Statement	Moga		Mansa		Hoshiarpur		Total	
		Before Score	After Score						
1.	Pesticide pollute water bodies	21	33	22	34	24	29	67	96
2.	Injudicious usage of pesticide affect environment	21	31	19	31	25	33	65	95
3.	Injudicious usage of pesticides is lethal for friendly insects	24	31	23	37	26	37	73	105
4.	The groups of pesticides should be changed frequently	14	23	11	26	17	31	32	80
5.	Mixture of pesticides is not good	17	29	13	27	20	36	60	92
6.	I know the process of treatment	22	27	20	30	22	29	64	86
7.	Friendly insects are beneficial for us	17	24	17	29	19	38	53	81
8.	Whether the pesticides should be used according to economic threshold level	14	18	12	29	17	29	44	76
9.	we should not use the unrecommended varcities	20	29	21	27	23	34	64	90
10.	The pesticides should be used after surveying the field	22	27	21	29	23	33	66	89

*Multiple Response

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Conclusion

The power of printed words and electronic Media is amazing. However, there are several problems in communicating through these Medias, such as low literacy percentage and inaccessibility. The number of people who can read in India is small. The number of those who read with any purpose is much smaller and the number of those who are too tired of read after a hard day's work is enormous. More exploration in indigenous communication theory should be encouraged to promote more productive and relevant communication research in non-western societies. Traditional Media can play a Vital role for the dissemination of the Informationas Indigenous channels carry a wide range of messages as it include entertainment, information and other social culture aspects.

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Emergence and Understanding of Scientific development from Ancient Devine Literatures of India

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Science and Technology both play important role in the development of Human civilization followed by Arts and Literatures. The concept of science arises from the philosophy of world's ancient religion *ie* SANATAN DHARMA like cause and effect; whatever you gave that would be returns to you etc. Thermodynamic principals and Newton's Theory both are based on aforesaid concept, which makes revolution in the field of Physics. We must be remember that the root of all the scientific thought/concepts to understand the nature and principals of natures having in our ancient divine literatures *viz.* Vedas, Upanishads etc. The mysteries of these divine literatures are unexplainable and some time beyond of understanding due to their language (Sanskrit and Indus scripts). Several modern human thinkers and learners fellows are unable to understand to whole concepts of ancient literatures. Meanwhile, the root of Astronomy, Mathematics, Medicine, Archaeology, Science etc. are originate from ancient divine literatures. It is absolutely true for any nations who are in the race of developed countries of the world, must be under the umbrella of Scientific and Technological development. Several thinkers of the world highlighted their views for ancient Indian literatures like Henry David Thoreau said: "In the morning I bathe my intellect in the stupendous philosophy of the Bhagavad Gita, their writings contain many thoughts from Vedic Philosophy. Alfred North Whitehead (British mathematician, logician and philosopher), who stated that: "Vedanta is the most impressive metaphysics the human mind has conceived. Aryan Invasion theory given by Max Muller, the principal architect, admitted the purely speculative nature of his Vedic chronology. The Six Systems of Indian Philosophy, he wrote: "Whatever may be the date of the Vedic hymns. Recently, Indian President Late Dr. A.P.J. Kalam known as Missile Man and who wrote in his book (Wings of Fire) the concept of missile were developed in his mind during childhood from Ramayana. Ancient divine literatures also provide us how to leave a healthy life as a good human beings, Gro Harlem Brundtland is a former Prime Minister of Norway gave the concept of Sustainable development [Our Common Future, also known as the Brundtland Report, from the United Nations World Commission on Environment and Development (WCED) was published in 1987] to the world and this concept make revolution in the field of scientific development, *ie* Sustainable development is the integrated parts of Ethics and Socio-scientific development. The ethics are earlier reported in several literatures of India and worlds. Hence, the Scientific development must be sustainable and under the enlightenment of divine literatures.

“Sustainable Consciousness”: An Emergent Scientific Wisdom Ecological Worldview

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While wisdom figures in the oldest surviving literary documents, but the contribution of India's scientific wisdom is neglected. But ancient Indian literature contributed to the advancement of science and development of civilization. Gregory Bateson, one of the original thinkers emphasized that the most important task facing us is to learn to think in new ways. The emergent worldview is multifaceted and described as systemic, holistic, and feminine. There is belief of interaction and participative nature of actions that result in the learning. In this embodied worldview we act as co-creator of our world. The human mind makes its world by meeting the given, interacting, and participating in its being. Thus, theories and models of the world must be grounded in embodiment which have basis in Indian scientific wisdom prevalent as participation in the learning process [1].

Central to this emerging worldview is an ecological worldview in which sustainability needs to be concerned for the long-term balance of the three elements viz Environment, Social, and Economic. Sustainability means use only what we need for life and to leave space for the other. Thus optimize and to live justly on a fragile and only planet with limited resources. With rich Indian culture and traditions we can evolve an emergent worldview which results in “sustainable consciousness” of being.

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PREVENTION OF GENETIC CONDITIONS: AN ANCIENT TRAIL

SHRUTI MATHUR

Approximately 4 million babies are born per year with 3 to 4 % risk of a genetic disease and 1 % risk of chromosomal abnormalities. Such prevalent **genetic disorders** are categorized as rare diseases but bear a collectively large sustenance pressure upon population, social as well as economic condition at the global level. Thompson & Thompson [1].

A rational health care strategy focusing upon prevention of such genetic disorders has been adopted by concerned professionals in various part of the world (particularly South East Asia). Major preventive issues include:-Awareness about consanguineous marriages which increases rate of recessive inheritance such as hemoglobinopathies , advanced age of conception which leads to chromosomal aberrations such as Down syndrome. Such conditions can be prevented as no cure from roots is available till now. WHO report [2].

This concern regarding health, genetics and preventive measures has been found to be more evident in the Vedic *Samhitas*, *Brahmanas* and the *Upanisads*. Dispersed discussions of genetics within other medical fields continued to post – Vedic traditions in *Aurveda* with *Caraka-*, *Susruta-* and the more ancient *Bhela- Samhita* starting with the ancient most evidence in *Atharvaveda*. Chattopadhyaya & Kumar[3]

The nature of inheritance of certain characteristics and traits were being so clearly recognized that it was deeply rooted in the perceptions behind Indian cultural and values system. NK Bose [4]

This study first states the preventive structures of today, identify key elements and then see how much was known in the past and how the knowledge was acquired at such a level that it was accepted as a social custom.

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वैज्ञानिक ज्ञान के प्रतिस्थापन में मीडिया की भूमिका

JAYA SHARMA

सारांश: मीडिया विकास प्रक्रिया का एक महत्वपूर्ण साझी है। मीडिया सरकार की विज्ञान संबंधी नीतियों एवं कार्यक्रमों को आम जन तक पहुँचाता है। अपने विभिन्न माध्यमों और साधनों के साथ ही यह कार्यक्रमों के क्रियान्वयन तथा आम जीवन पर पड़ने वाले उनके प्रभाव की प्रतिक्रिया सरकार तक पहुँचाने का महत्वपूर्ण कार्य करता है, जिससे सरकार की नीतियों को मूर्त रूप देने में सहायता मिलती है। संचार एक ऐसा महत्वपूर्ण साधन है जिसका उपयोग मानव विज्ञानों, राष्ट्र के सामाजिक तथा सांस्कृतिक जीवन के प्रत्येक पहलू पर कार्य कर सामाजिक तथा सांस्कृतिक माहौल को समझने के लिए करते हैं। मानव विज्ञान में संचार का उपयोग समाज में सामाजिक तथा सांस्कृतिक विकास की प्रक्रिया को व्यापक रूप में प्रभावित करता है। वैज्ञानिक संरचनाओं और संस्थाओं की प्रकृति तथा स्थिति का अध्ययन एवं मूल्यांकन करने के लिए व्यक्तियों को शिक्षा और प्रशिक्षण देने के लिए संचार माध्यमों का प्रयोग किया जाता है। इससे संस्थाओं, कार्य-स्थलों के रूप में, संचारात्मक गतिविधियाँ प्रभावपूर्ण रूप में कार्य कर पाती हैं। विज्ञान के सांस्कृतिक उत्पादों, सामाजिक गतिविधियों और विज्ञान की जनभागीदारी को ऐतिहासिक विकास के रूप में मीडिया महत्वपूर्ण इकाई है। यह अध्ययन मुख्य रूप से मीडिया संस्थाओं-चैनलों और समसामयिक पत्र-पत्रिकाओं द्वारा भारतीय ज्ञान के प्रतिस्थापन के संदर्भ में किया गया है।

DESIGN AND DEVELOPEMENT OF REINFORCED EARTHEN WARES FOR DAILY USES INSTEAD OF POLYETHYLENE PRODUCTS

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Abstract

The 20th century has seen the immense application of Polyethylene or simply Plastic. Because of its light weight plastic has exerted a great influence on many household items ranging from plates to cups, bottles, bowls etc. so much so that India has almost forgotten about an indigenous product: clay objects or simply earthen wares.

A common problem with earthen wares is that they are brittle and quite heavy due to a considerable thickness. So, here we propose to **design earthen wares reinforced with wire-mesh**. The wire mesh will ensure that despite the reduced thickness there is certain ductility within the object. Thereafter, clay reinforced with carbon fillers will be cladded on the wire mesh which will impart adequate strength to the wares. Also both clay and carbon fillers are highly bio-compatible materials, which are easily available. Therefore, the product is safe to use.

In preparing the product, we first make a wire mesh section of the object and then dip it in semi-fluid mixture of clay and carbon fillers in appropriate temperatures. Then the product is cured to make it usable.

Indigenous knowledge and wisdom of science among Tharu tribe of Bahraich

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Abstract

Indigenous knowledge is the basis for local-level decision making in agriculture, education, health care, food preparation, natural-resource management, and a host of other activities in communities. We live in a culture which, while largely dependent on science for its material welfare, is largely ignorant of the new ideas and perspectives on which science is based. After reviewing the history of how science grew to be both useful to, and feared by society. This paper aims to clear away some of the popular misconceptions about science and to put in their place a wider and deeper understanding of the nature of science and its value to Tharu tribe of Bahraich. The present paper also aimed at documenting medicinally important species of trees used by Tharu tribe in the Himalayan Tarai region. It has also been observed that the majority of youth in Tharu tribe are very less aware of their indigenous knowledge and are also not so much interested in such learning. Thus, a precise documentation of this information with traditional knowledge base from the ethnic people has great relevance for the human welfare. The study also suggests the need for training local people for sustainable utilization of these plant resources and their proper conservation. The youth should be encouraged learning to sustain their ethnic wisdom which would also help creating employment among Tharu tribe of Bahraich.

Keywords: Indigenous knowledge, Wisdom, Science, Youth, Human welfare, Tharu, Tribe

WHAT DRIVES SCIENTIFIC WISDOM FORWARD: GO BACK TO OUR ROOTS

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Abstract

The Indian civilization, among world's oldest and richest, has a strong tradition of Science and Technology. Our contributions to astronomy, mathematics, medicine and practical arts are not adequately acknowledged in the Western World, either due to ignorance or prejudice. When Copernicus (15th century) and Galileo (16th century) established the dynamics of solar system that the earth is spherical and orbits around the sun. For this scientific statement to the world, Copernicus was forced to withdraw his statement and Galileo was imprisonment for lifetime. Whereas in 500 AD, nearly a millennium before Galileo and Copernicus, Indian astronomer and mathematician Aryabhatta discovered and publicly announced that earth orbits around the sun in about 365 days, the Indian society accepted this scientific wisdom of Aryabhatta and he happily continued to propagate his scientific work. When we talk about the planet's earliest civilization, we are talking about the world's earliest sophisticated society after the last ice age. This means that according to the Vedic time tables, various forms of civilization have been existing for millions of years. But the first record of an organized and developed society was the Vedic culture that arose in ancient India with the Indus Sarasvati civilization, and then spread out from there in all directions around the world. Often times we see that students, even in India's academic system, have not studied or encountered the contributions that were made by early civilization in the area of ancient India. Not only are they not aware of such developments that had been given from India, but there is often a lack of such knowledge to be studied. Therefore, this book is to help fill that gap of information and to show how this area of the world, indeed, had a most advanced civilization, but was also where many of society's advancements originated.

It can be found that what became the area of India and its Vedic culture was way ahead of its time. This can be noticed in such things as industry, metallurgy, science, textiles, medicine, surgery, mathematics, and, of course, philosophy and spirituality. In fact, we can see the roots of these sciences and metaphysics in many areas of the world that can be traced back to its Indian or Vedic origins. The Constitution of India upholds "cultivation of scientific temper" as one of the duties of citizens and exhorts the state to create conditions that encourage critical thinking. Cultivation of scientific thinking was therefore an essential element of creation of a secular culture in the country. We must make a deliberate effort to increase networking in the sense of collaborations both at the national and the international level. Science has a critical role to play in addressing humanity's most important challenges in the twenty-first century. However, the contemporary scientific enterprise has developed in ways that prevent it from reaching maximum effectiveness and detract from the appeal of a research career. By marrying traditional wisdom with scientific knowledge, India needs to create dynamic, location-specific content, and build the capacities of local people to make meaningful use of communication technologies for rural development. "Content creation and capacity building are critical. We need knowledge centers, which convert generic content into location-specific information and build the capacities of local people. Unless this is done, you will

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have a room with an unused computer," more and more scientific leaders were now concerned about whether the benefits of their innovations reached the local people for this appointing one man and one woman in each village as science communicators. A policy framework and mechanism, which encourages and supports the filing of patents, technology licensing, the establishment of start-up companies etc. in scientific institutions, thus creating an eco-system which promotes innovation and entrepreneurship, is desirable.

Key Words: Civilization, Scientific Wisdom, Traditional Wisdom



PRESENTATIONS

Concept of



DR. K.K. DWIVEDI

President
Global Academy of Doctorates
Former Vice Chancellor, Arunachal University and
Apeejay stya University



Natural Signatures of Time



Tree rings



Fossil



Fission tracks



Peking Man

2

About Time...

Definition : The continuous passage of existence in which events pass from a state of potentiality in the future, through the present, to a state of finality in the past. – The Collins Dictionary.

According to Physics definition : A quantity measuring duration, usually with reference to a periodic process.

Time is considered as fourth dimension required to specify an event.

Thesaurus : age, chronology, date, duration, epoch, era, hour, interval, period, span, spell, stretch and term etc.

Phrases : In time, on time, against time, ahead of time, at one time, at times, in good time, in the nick of time, beat time, from time to time, time and again, time bound, time bar, time out, real time, prime time, time sharing, time table, time capsule, time off, time signature and Time is money.

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Time is money

$$V = [W \{ (100-t)/100 \}] / C$$

where V is the value of an hour, W is a person's hourly wage, t is the tax rate and C is the local cost of living.

According to the equation, the average value of an hour in England is £ 9.00 and in the USA is \$ 15.

In India, the value of one hour of a young Scientist is about Rs. 300.



Time is NOT Money

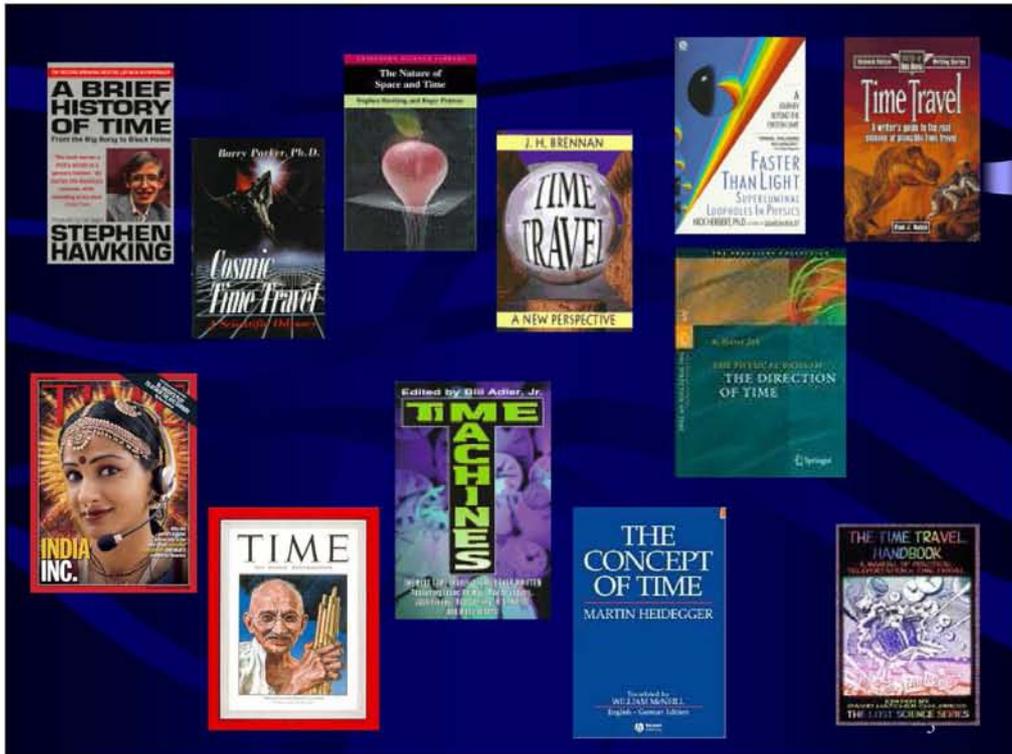
All of us have same time every day (86,400 s). So, if time is money then every person of same age should be equally rich or poor. Which is not true.

Physics says: $\text{power} = \text{work}/\text{time}$, we know that $\text{knowledge is power}$ and if we take as time is money .

Then, this leads to $\text{Money} = \text{work}/\text{knowledge}$, which is empirically not true.

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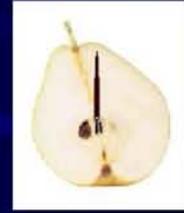
TIME - by EYAN DESIRE



Time, you were here from the beginning
 Time, You, turn day into night
 You turn the seeds into plants
 You turn babies into men
 We cannot afford to waste time.

Time, you move to flipping fast
 Once it passes, you can't get it back, just focus on tomorrow
 Time, you take away all my sorrows
 Time, thanks, you keeps this world running
 Time, one day, the creator will stop you from always running.

समय



यह कौन है, जो मौन है
जो मुड़ता भी नहीं, झुकता भी नहीं,
जो जमता भी नहीं, थमता भी नहीं,
यह रुकता भी नहीं, थकता भी नहीं
यह कौन है जिसके गुजरे हुए लम्हों को याद कहते हैं
यह कौन है जिसके आने वाले पलों को ख्वाब कहते हैं
हाँ यह समय है

7

The concepts of Start of Time



- When we speak of time this immediately brings us to the beginning of the universe.
- Modern Science believes that the Universe was created some 15 billion years before after a Big Bang.
- The Vedic concept postulates that the Universe began with the life of Brahma, the creator and is cyclical in nature.
- Christianity believes that the Time has a beginning and an end. Time is a historical parenthesis within the endless eternity.
- Time in Islam is a creation of Allah, just like a book, a pen, a computer etc. anything.
- Jainism believes in infinite time, without any beginning or end.
- Buddhism proposes continuum of present, no past and no future. Present moment transforms to another present moment.

8

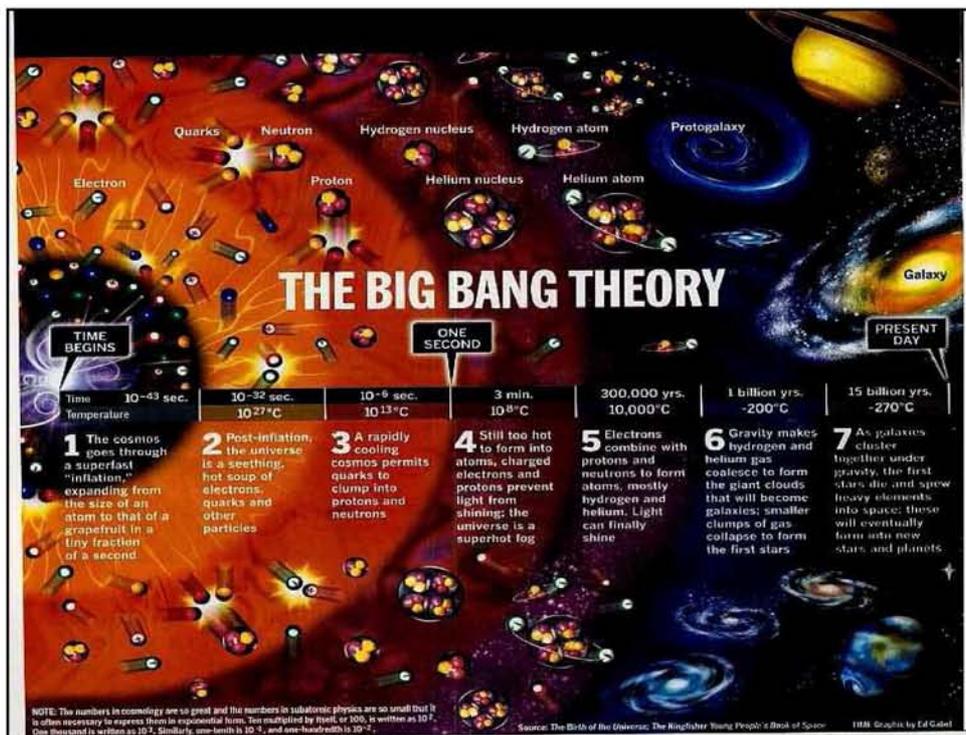
Perception of Time

“Time and Mind are inseparable. Remove time from mind and it stops”

- Eckhart Tolle, in the book “Practicing the Power of NOW”

- This means that we perceive and feel the time. Mind is the most fascinating lump of matter created by the nature. It records events that we see or perceive on a time strip and has a power to recall.
- We call it Memory. The presence of time is felt in mind and preserved as memory.
- Hence, without memory the time is non-existent for man.

9



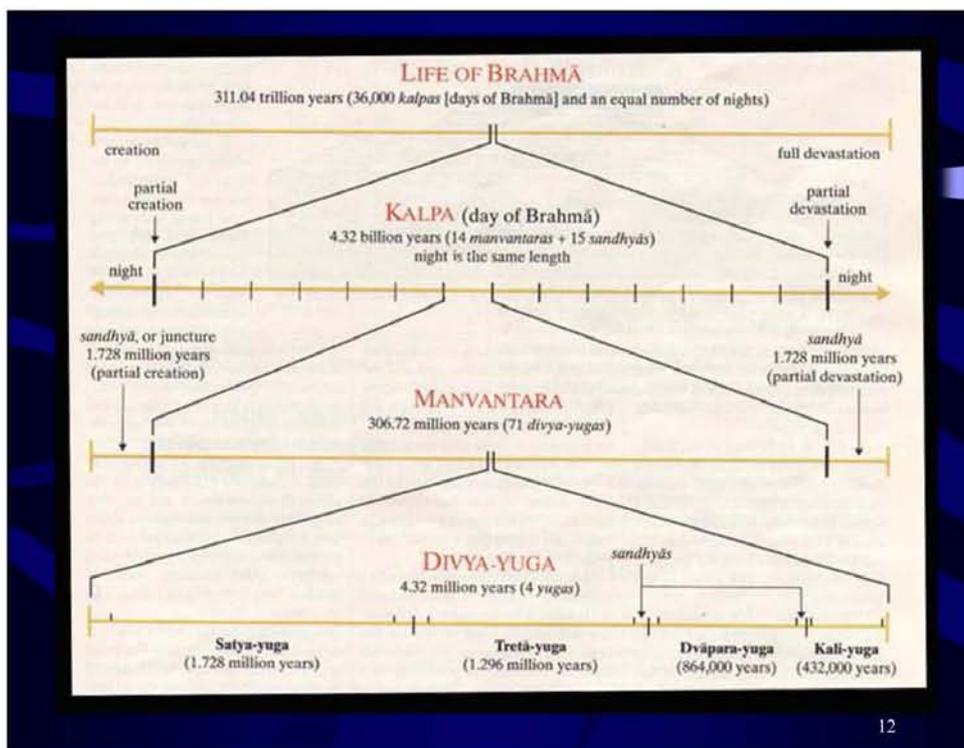
A Vedic Concept of Time

त्रिलोक्या युगसाहस्रं बहिराब्रह्मणो दिनम्
 तावत्येव निशा तात यन्निमीलति विश्वसृक्

(Srimad Bhagavatam, Canto-Kanda 3, Chapter 11, Text 221)

“Apart from the one thousand [mahâ-] yugas for the three worlds [the heavenly, svarga; earthly, martya and lower, pâtâla ones] in the realm of the Absolute [Brahmaloka] that for sure make one day of Brahmâ [of 4.32 billion years], o dear one, there is also a night just as long wherein the Creator of the universe goes asleep.”

11



12

Endless Cycles of Time

Our ancient Vedic concept of time is cyclical and is reckoned as the continuum of the day and night of *Brahma*, the creator:

- The day is *kalpa* (creation).
- The night is *pralaya* (deluge).

One day of Brahma lasts for 4.32 billion years. Each day has 1000 *Mahayuga* comprising of 4 *Yugas*.

1,728,000 years for the <i>Satya-yuga</i> .	(Summer)
1,296,000 years for the <i>Treta-yuga</i>	(Spring)
864,000 years for the <i>Dvapara-yuga</i>	(Autumn)
432,000 years for the <i>Kali-yuga</i>	(Winter)

Brahma's

1 second = $4,320,000,000 / 12 \times 60 \times 60 = 100,000$ human years

1 hour = 360 million human years

1 complete day (day+night) = 8,640,000,000 years

1 Year = 360 days = 3.1104 trillion years

Brahma's Life (Maha Kalpa) = 100 years of Brahma
= 311.04 trillion years

13

Birth of Brahma

At the end of a "Maha Kalpa" or cycle of creation, Shiva manifests his destructive influence and the universe is dissolved. Actually the entire universe becomes spiritualized.



The ancient texts call this the cosmic dissolution. After a great cosmic rest cycle, another creative cycle begins as a new Brahma emerges out of the navel of Narayana and the universe is created anew.

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- Brahma is regarded as the creator and is periodically reborn in a lotus that grows from the navel of the sleeping Vishnu.
- Life is only manifest on earth during the day of Brahma. With the onset of Brahma's night, the entire universe is devastated and plunged into darkness. When another day of *Brahma* begins, life again becomes manifest.
- We are presently in the kaliyuga of the 28th maha-yuga of the 7th Manvantara of Brahma's day. The Hindus considered the commencement of Kali Yuga in 3102 BC.
- According to *Puranic* accounts, the present day of Brahma started 1,958,853,111 human years before. That is only 45.4% of the day. And if, Brahma's day began at 6 am on a 12 hour clock, then it will show **11:26:35 am** at this time.

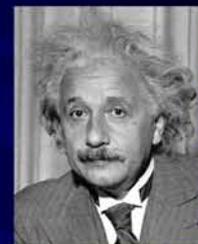
15

Time Dilation

Before Einstein, it was assumed that measurement of time would be the same for anyone, whether the person was moving or not; this belief was known as time being absolute.

The relativity of Time

Einstein introduced his theory of relativity, which contradicted the current belief of time as an absolute. He stated that time "does depend on the observer's motion," such as the example with the train where a passenger and an observer are measuring a path of light and it appears greater to the observer than to the passenger.



Light is an exception to this rule, in that the speed of light is the same for anyone. In the train example, the time interval, not the speed of light is changed, known as **time dilation**.

16

The Twin's Paradox



-  Lets consider a pair of twins, suppose one-twin goes for a long trip in a spaceship at nearly the speed of light. When she returned, she would be much younger than the one who stayed on Earth.
-  This is known as the twins' paradox, but it is a paradox only if one has the idea of absolute time at the back of one's mind.
-  In the theory of relativity, there is no unique absolute time, but instead each individual has his own personal measure of time that depends on where he is and how he is moving.

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Time Dilation and Hindu Mythology

A similar example of the dilation of time is given in the Bhagavatam (9.3.30-32) which is a book written 5,000 years ago. In canto 9, chapter 3, verses 30-32 the Bhagavatam narrates how one spaceman (king) went to the highest planetary system of the universe and stayed there for only 20 minutes but when he returned to Earth 116,640,000 years had passed by. He neither found his friends and relatives nor their sons, grandsons and other descendants.

Furthermore, the Bhagavatam (3.11.4) states:

"Elementary time is measured according to its covering of a particular elementary space. In this verse, it is clearly shown that time and space are two correlative terms.

18

The Arrow of Time

“Imaginary” time is indistinguishable from directions in space. If one can go north, one can turn around and head south; equally, if one can go forward in imaginary time, one ought to be able to turn around and go backward. This means that there can be no important difference between the forward and backward directions of imaginary time.

On the other hand, when one looks at "real" time, there's a very big difference between the forward and backward directions, as we all know. Where does this difference between the past and the future come from?

Why do we remember the past but not the future?

19

Teleportation

Have you ever been in a hurry or you are too lazy? Well, teleportation could be the perfect “means of transportation” as you or any object could move instantaneously from one place to another.



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Chronon: A quanta of time

Time quantization is a hypothetical concept. In the modern established physical theories (the Standard Model of Particles and Interactions and General Relativity) time is not quantized.

1 chronon = 6.97×10^{-24} seconds

Planck time ($\sim 5.4 \times 10^{-44}$ seconds) is the unit of time in the system of natural units known as Planck units. Current established physical theories are believed to fail at this time scale, and the Planck time might be the smallest unit of time that could ever be measured.

So the range of time dimension is from Planck time to the age of Brahma (10^{-44} s to 10^{+22} s) that is about 66 orders of magnitude.

21

Division of a Day

The reckoning of a day as per Vedic system is slightly different from the method of reckoning a day as per the western system. The Hindus reckon a day from the Sunrise to next day's Sunrise as against the reckoning from zero hours midnight to next day's zero hours midnight.

The division of a day is as follows:

1 Day (24 hours) = 60 *ghati* (1 *ghati* = 24 minutes)

1 *Ghati* = 60 *vighati* (1 *vighati* = 24 seconds)

1 *vighati* = 60 *lipta*

1 *lipta* = 60 *vilipta*

1 *vilipta* = 60 *para*

1 *para* = 60 *tatpara* and 1 *tatpara* = 1.85 micro-second

22

Unresolved Questions

- Why Past is not influenced by the future?
- How time links science with religion?
- What has time got to do with soul?
- Is there any correlation between clock time and psychological time?
- How to live happily in NOW without connecting to past or future?
- How to get rid of the problems of past and fears of future?
- What is my time and what is yours and how to give time?
- Do other living species also perceive time?
- What do plants feel about time?
- If time dwells deep in the full mind, how then it relates to Consciousness?
- Time has no colour, no taste, no smell, no shape, no sound, no warmth, no coldness, but still we feel it, why? Isn't it unique?
- and many more

23



I thank all of you

for your inquisitiveness to know about
the most valuable, fascinating and un-
understood entity the

TIME

kkdwivedi@yahoo.com

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मिथ्या विज्ञान की पहचान कैसे करें?

डॉ. अपूर्व पौराणिक

प्रोफेसर ऑफ न्यूरालॉजी
महाराजा यशवन्त राव चिकित्सालय
महात्मा गांधी स्मृति चिकित्सा महाविद्यालय, इन्दौर

मिथ्या विज्ञान की पहचान कैसे करें?

पिछले एक लाख वर्षों में होमोसेपियन्स मनुष्य जब से बुद्धिमान हुआ, उसमें धीरे-धीरे अनेक गुण और आदतें विकसित हुईं (1)

- दुनिया में जो हैं तथा जो घटित हो रहा है, उसे बारीकी से देखना, याद करना, नोट करना और उसमें छुपे हुए अर्थ को निकालना।
- कार्य और कारण के आपसी सम्बन्धों पर गौर करना।
- जो समझ में नहीं आ रहा है उसके बारे में पैसे सटीक सवाल पूछना और फिर
- सवालों का उत्तर पाने के लिये प्रयोग की परिकल्पना करना, उसे अंजाम देना, अवलोकनों के आधार पर निष्कर्ष निकालना

पिछले एक लाख वर्षों में होमोसेपियन्स मनुष्य जब से बुद्धिमान हुआ, उसमें धीरे-धीरे अनेक गुण और आदतें विकसित हुईं (2)

- नये सिद्धान्त या थ्यारी गढ़ना, उनका परीक्षण करना।
- किन्हीं निष्कर्षों के गलत सिद्ध हो जाने पर उन्हें छोड़ देना, संशोधित करना, नये सिद्धान्त गढ़ना।
- प्रयोगों की निष्पक्षता के नियमों का पालन करना।
जैसे:-
 - दो समूहों की तुलनात्मक समानता
 - अवलोकन व मापने की पूर्व निर्धारित विधियाँ
 - सांख्यिकिया गणना
 - अवलोकनकर्ता का अंधाकरण
 - दूसरे वैज्ञानिकों द्वारा प्रयोग पुष्टि या खण्डन।

पिछले एक लाख वर्षों में होमोसेपियन्स मनुष्य जब से बुद्धिमान हुआ, उसमें धीरे-धीरे अनेक गुण और आदतें विकसित हुईं (3)

- ये सारे गुण और आदतें बहुत धीरे-धीरे, इन्सान के अंदर विकसित हुई हैं
- वैज्ञानिकों ने बाहर से नहीं थोपी है।
- लेकिन यह विकास आसानी से नहीं हुआ है। इसके विपरीत
- गुणों वाली आदतें भी इन्सान के स्वभाव व सोच का हिस्सा रही है। जैसे:-
 - चमत्कार, भूत-प्रेत, चुंडैल, उपरी हवा, नजर लगना, पूर्व जन्मों के फल, रहस्यमय ऊर्जाएं, टेलीपेथी, जन्मकुण्डली, हस्तरेखाएं, जादू टोना।

- मिथ्या विज्ञान वाले उत्तर व व्याख्याएं आसान प्रतीत होते हैं।
- असानी से गले उतर जाते हैं। बहुत लोकप्रिय है।
- उन्हें सामाजिक मान्यता प्राप्त है।
- वैज्ञानिक सोच व समझ कुछ कठिन है।
- ज्ञान व शिक्षा का आधार होना चाहिये।
- संदेह करने की आदत होना चाहिये, किसी भी बात को बिना प्रयोग या तथ्य की वैज्ञानिक विधियों के स्वीकार करने के खिलाफ प्रतिरोध होना चाहिये।
- साहस और ईमानदारी होना चाहिये।
- भेड़चाल से अलग होना पड़ता है।

- उक्त दो विपरीत किस्म की सोच व व्यवहार में धीरे-धीरे विज्ञान का पलड़ा भारी होता जा रहा है क्योंकि एक के बाद एक, प्रकृति के अनेक रहस्यों पर से परदा हटता जा रहा है।
- फिर भी यह लड़ाई या संघर्ष या प्रक्रिया लम्बी, कष्टसाह्य और श्रमसाध्य है।
- इसमें लाखों वैज्ञानिकों ने अपनी मेधा, बुद्धि, मेहनत व समय का बलिदान साहस के साथ निःस्वार्थ भावना से किया है।
- गेलीलियो अकेला नहीं था जिसने कहा था कि धरती दुनिया का केंद्र, नहीं है, वह सूर्य का चक्कर लगाती है।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (1)

- क्या कोई दावा किसी सिद्धान्त या थ्योरी की अर्हताओं को पूरा करता है?
 - मिथ्या वैज्ञानिक दावे कभी भी ज्ञात व स्वीकृत वैज्ञानिक थ्योरी पर आधारित नहीं होते।
 - सिद्धान्त के पीछे प्रायोगिक सबूत होना चाहिये। सुनीसुनाई अपुष्ट बातों को आधार नहीं माना जा सकता।
 - प्रायोगिक परीक्षणों द्वारा थ्योरी के गलत सिद्ध हो सकने की पात्रता होना चाहिये।
 - उक्त सिद्धान्त द्वारा अभी तक न देखे गये परिणामों का अनुमान लगाना सम्भव हो, जिनकी पुष्टि या खण्डन किया जा सके।
 - नये अवलोकनों, सबूतों और सिद्धान्तों के कारण जरूरत पड़ने पर थ्योरी में संशोधन करने का लचीलापन होना चाहिये।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (2)

- क्या कोई दावा प्राचीन ज्ञान पर आधारित है?

विज्ञान आधुनिक होता है। सतत परिवर्तनशीलता उसकी सबसे बड़ी ताकत है। पुराने सिद्धान्तों का स्थान नये लेते रहते हैं।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (3)

- क्या कोई दावा प्राचीन वैज्ञानिक शोध पत्रिकाओं के बजाय पहली बार आम जन संचार या मास-मीडिया में प्रसारित किया गया है?

असली वैज्ञानिक प्रगति की घोषणा की एक लम्बी प्रक्रिया होती है। समकालीन वैज्ञानिकों की टिप्पणी तथा सम्मति पर आधारित शोध प्रपत्रों को छापने वाले प्रतिष्ठित जर्नल्स होते हैं।

एचआईवी - एड्स की दवा निकलने की सूचना प्रेस कान्फ्रेंस द्वारा नहीं बल्कि अंतरराष्ट्रीय, पीयर रीव्यूड शोध पत्रिकाओं के माध्यम से दी गई थी।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (4)

- क्या कोई दावा किसी अज्ञान रहस्यमई ऊर्जा या एनर्जी या अन्य परा-प्राकृतिक शक्ति पर आधारित है?

भौतिक शास्त्र में वर्णित ऊर्जा या एनर्जी का अर्थ है। किसी पदार्थ को एक स्थान से दूसरे स्थान तक हिलाना।

पदार्थ गति - ऊर्जा के विभिन्न रूप आपस में परिवर्तनशील हैं। (ऊष्मा, प्रकाश, विद्युत, चुम्बक, ध्वनि) इनके अलावा कोई अन्य रूप नहीं है। पदार्थ और ऊर्जा भी आपस में परिवर्तनशील हैं। $E=MC^2$

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (5)

□ क्या उक्त दावा करने वाले कहते हैं कि उनकी बात को सरकार या अन्य ताकतों द्वारा दबाया जा रहा है?

वैज्ञानिक कभी ऐसे आरोप नहीं लगाते। सच्चाई छुप नहीं सकती। वैज्ञानिक प्रगति को रोकने के लिये कभी षड़यंत्र नहीं रचे जाते।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (6)

□ क्या उक्त दावा जरूरत से अधिक ज्यादा अच्छा प्रतीत होता है?

□ वैज्ञानिक प्रगति में अचानक चमत्कार या क्रान्ति नहीं होती। धीरे-धीरे, इंच दर इंच प्रगति होती है। अनेक दशकों के बाद पीछे मड़कर देखने पर जरूर वे परिवर्तन युगान्तरकारी प्रतीत हो सकते हैं परन्तु साल-दर-साल की प्रगति ऐसी है मानों बाल या नाखून बढ़ रहे हों।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (7)

- क्या उक्त दावे का श्रेय कोई एक महान वैज्ञानिक या विद्वान या संत या मसीहा को दिया जा रहा है?

वैज्ञानिक प्रगति किसी इंसान के बूते पर नहीं होती। पूर्ववर्ती और समकालीन वैज्ञानिकों के योगदान से होती है। आइजक न्यूटन ने कहा था- यदि मैं क्षितिज से कुछ दूर तक देख पाया हूँ तो मेरे पहले के वैज्ञानिकों के कंधों पर चढ़कर ही।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (8)

- क्या दावे के साथ विज्ञापन, विपणन (मार्केटिंग) जुड़ा हुआ है?

वैज्ञानिक खोज के साथ कभी विज्ञापन या मार्केटिंग नहीं की जाती कि हमारी दवा या यंत्र को खरीदने से फलां-फलां लाभ होंगे। वैज्ञानिक व्यापारी नहीं होते केवल पेटेन्ट अधिकार छोड़कर उन्हें अन्य आर्थिक लाभ नहीं प्राप्त होते।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (9)

- क्या उक्त दावा ओक्कम की कसौटी पर खरा उतरता है?

वैज्ञानिक खोजों की व्याख्या करने के लिये किसी जटिल रहस्यमई सुपरनेचुरल शक्ति के बजाय पहले ज्ञात आसान सिद्धान्त पर्याप्त होते हैं। ओक्कम की कसौटी के अनुसार सरल व सहज उत्तर बेहतर है।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (10)

- क्या उक्त दावा सांख्यिकीय गणनाओं पर आधारित है?

विज्ञान में गणित व सांख्यिकी में वर्णित अनेक कसौटियों पर खरा उतरना जरूरी है। संभावनाओं, गलतियों और संयोगो का अपना एक गणित होता है। बड़ी संख्याओं के नियम के अनुसार प्रत्येक व्यक्ति के साथ, महीने में एक बार कोई ऐसी घटना घट सकती है, जिसके होने की सम्भावना दस लाख में से एक हो।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (11)

- क्या उक्त दावा एक ऐसे व्यक्ति या संस्था द्वारा किया जा रहा है जो पहले से घोषित रूप से, उक्त विचारधारा या उद्देश्य के प्रति समर्पित है?

विज्ञान हमेशा नल-हायपोथिसिस (नेति-नेति) से शुरु होता है और फिर सबूत ढुंढता है। मिथ्या विज्ञान पहले से घोषित सिद्धान्त के समर्थन में सबूत देने का दावा करता है। वे ला विपरीत सबूतों को उल्लेख क्यों करेंगे।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (12)

- क्या दावा करने वाले अपने प्रयोग का पुनः परीक्षण दूसरे निष्पक्ष वैज्ञानिकों से करवाने को तैयार है?

कोई भी अच्छा शोधकार्य अपनी कार्य विधि या प्रयोगविधि का खूब विस्तार से वर्णन करता है कि दूसरे लोग उसे दुहरा सकें। यदि प्रयोग के अवलोकन आपकी थ्योरी या सिद्धान्त का समर्थन नहीं करते हैं तो भी उन्हें छिपाया नहीं जावेगा।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (13)

- दावे का समर्थन करने वाले अवलोकनों और तथ्यों की गुणवत्ता कैसी है?

क्या सभी अवलोकनों/डाटा को शामिल किया गया है
क्या तरह-तरह के पूर्वाग्रह से बचने की सावधानियाँ
रखी गई है? सेम्पल साइज (नमूने का आकार)
कहीं बहुत छोटा तो नहीं है? महेज संयोग को
कार्य-कारण सम्बन्ध का प्रमाण नहीं माना जा
सकता है।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (14)

- दावा करने वालों की उक्त वैज्ञानिक विषय में क्या
हैसियत है?

अनेक व्यक्ति और संस्थाएं झूठ-मूठ की साख पर
दिखावा करते हैं। अनेक तथा कथित विश्वविद्यालय
पैसे लेकर फर्जी डाक्टरेट या पी.एच.डी. की डिग्री बांटते
हैं। सफेद कोट एप्रन पहन कर फोटो खिंचवाते हैं।
किसी नामी गिरामी हस्ती के हाथों इनाम या प्रशंसा-
पत्र पाते हैं।

असली वैज्ञानिकों या संस्थाओं को इस प्रकार के नाटक
की जरूरत नहीं पड़ती।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (15)

- क्या दावा करने वाले यह कहते हैं कि अब तक जो चल रहा है, वह सब गलत है? या कि, यह कि चूंकि फला विचार धारा सही है। उसके समर्थन में हमें उनके दावे स्वीकार कर लेना चाहिये।

वैज्ञानिक खोजों किसी तथाकथित गलती को सुधारने की महिम का हिस्सा नहीं होती। वे इस बात की भूमिका नहीं बाधते कि आजकल जो भोजन हम खा रहे हैं वह कितना जहरीला है। हम अपने धरती ग्रह को नष्ट करने पर तुले हुए हैं। बड़ी कम्पनियों का षडयंत्र है कि सौर ऊर्जा पर शोध न होने पाये आदि आदि। वैज्ञानिकों को किसी विचारधारा या इडियोलोजी फिलोसाफी से मतलब नहीं होता। उनका लक्ष्य केवल सत्य है। रंगभेद या नस्लभेद या स्त्री पुरुष भेद पर आपके राजनैतिक, सामाजिक, विचारों में वैज्ञानिक खोज की विश्वसनीयता का सम्बन्ध नहीं होना चाहिये।

मिथ्या विज्ञान की पहचान करने हेतु निम्न कसौटियों पर कसें। (16)

- क्या वह दावा - सब कुछ प्राकृतिक - पर आधारित है?
- यह जरूरी नहीं कि तथाकथित प्राकृतिक उत्पाद सदैव अच्छे हों और मानव निर्मित कृत्रिम उत्पाद खराब हों।

Conference on
"India's Scientific Wisdom: Emerging Worldwide"
A Distinguished Lecture on
GOLD NANOPARTICLES AND AYURVED

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Our Motivators

1. Late Prof. Rajendra Singh (Rajju Bhaiya)
2. Late Honorable Shri Ashok Singhal
3. Late Honorable Shrikant Joshi
4. Late Honorable K.C. Sudarshan
5. Prof. S.K. Joshi – F.N.A., Ex Director General
C.S.I.R, Padma Bhushan
6. Dr. K. Lal – F.N.A., Ex Director N.P.L. New Delhi
7. Dr. Baldev Raj - F.N.A., Ex Director IGCAR
Kalpakkam
6. Prof. Bal Krishna Agrawal - F.N.A., Ex Head Physics
Dept, University of Allahabad
7. Prof. M. S. Sodha- F.N.A., Padma Shri

Hindusthan  **Golden Bird** (सन्ने की चिड़िया)
 **Always Healthy**
 **Smart in Nature to gain the required properties.**

❖ **Nano Science & Technology**

- **Atom** -- **1 Å**
- **Nanometer (nm)** -- **10⁻⁹m collection of few atoms or molecules**
- **Bulk substances of micrometer sizes or larger** -- **Solids**
- **Nanomaterials** -- **Materials on the 1-100 nm scale**

- **Existing spectroscopy and microscopy tools (XRD, SEM, TEM, FTIR, STEM, AFM etc.)**
- **The nanometer scale is interesting in biological systems. Many proteins are ~10's of nm in size.**
- **Since the structures can be accurately designed on the nanometer scale they can be accurately incorporated into biological systems due to the smaller size scale.**
- **The ability to rationally design structures on the same size as biological molecules generates the ability to probe and modify biological systems.**

- Nanostructures are being used as drug delivery agents, sensors, drug delivery, tissue engineering, protein and DNA sensing and detection based diagnostics and biomedical imaging.
- Since 1990, ~ 10,000 articles on Gold and Silver nanoparticles.
- At the nanoscale, materials exhibit unique optical, electronic and magnetic properties not seen at the bulk scale, which makes nanostructures attractive for a wide range of applications.
- Noble Metals Nanoparticles
(Gold, Silver, Copper)

- Cancer is still responsible for 25% of all deaths in the countries.
- There is a pressing need for more sensitive, accurate and cost effective method for detecting and treating cancer.
- With their unique optical, thermal and electromagnetic properties, nanoparticle-biomaterial composites have tremendous potential in novel methods for detection, characterization and therapy of cancer.
- Noble metal nanoparticles and Surface Plasmon Resonance (SPR)
(Interaction of light with spherical particles).

For a spherical nanoparticles much smaller than the wavelength of light ($d \ll \lambda$), an electromagnetic field at a certain frequency (ν) induces a resonant, coherent oscillation of the metal free electrons (plasmons) across the nanoparticles. This oscillation is known as the surface plasmon resonance (SPR). This resonance lies at visible frequencies for the noble metals Au, Ag and Cu.

The surface plasmon oscillation of the metal electrons results in a strong enhancement of absorption and scattering of electromagnetic radiation in resonance with the SPR frequency of the noble metal nanoparticles, giving them intense colors and interesting optical properties.

- The frequency and cross-section of SPR absorption and scattering is dependent on the metal composition, nanoparticle size and shape, dielectric properties of the surrounding medium/substrate and presence of inter-nanoparticle interactions.
- Au and Ag are the plasmonic metals of choice because of their much higher stability as compared to Cu. Further, spherical Au colloids can easily be made in a wide range of sizes (4-80 nm) by facile chemistry involving the reduction of Au ions in solution.
- Other interesting Au nanostructures with modified optical properties, e.g. nanorods,

nanoprisms, triangular nanoparticles, nanocubes and composites silica core-Au shell particles can be fabricated via simple chemical routes.

- **ULTRASONICS and NANOSCIENCE OF Au NANOPARTICLES**



Fig. 1 Photograph of the colour of the sample
3.0 wt% PVA
0.1 wt% Au
0.2 wt% Au
0.5 wt% Au
1.0 wt% Au

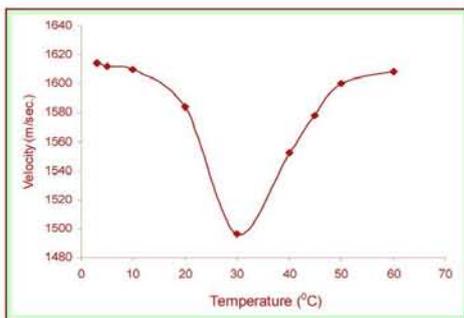


Fig. 2 A plot of ultrasonic velocity in a 0.2 wt% Au-PVA polymer colloid sample as a function of temperature

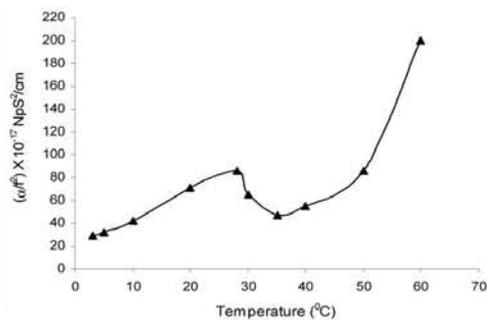


Fig.3 A plot of ultrasonic absorption in a 0.2 wt% Au-PVA polymer colloid sample as a function of temperature

Advantage of Au nanoparticles as contrast agent in biomedicine

- Colloidal Au nanoparticles with strong surface plasmon-enhanced absorption and scattering are an important addition to the toolbox of imaging labels and contrast agents.

Tunable optical properties

Due to the phenomenon of SPR, the absorption and scattering cross sections of Au nanoparticles are significantly superior to the absorbing and fluorescing dyes conventionally used in biological and biomedical imaging.

Mie theory– Scattering cross section 5 orders higher.

- The effectiveness of nanoparticles as contrast agents depends on their optical properties. For instance, a high scattering cross-section is essential for cell and biomedical imaging applications based on light scattering. On the other hand, applications using light absorption require a high nanoparticle absorption cross-section along with low scattering losses.
- Unlike conventional dyes, the optical absorption and scattering properties of Au nanoparticles can be tuned by changing their size and shape.

Cancer Cell imaging using Au nanoparticles bioconjugates

The increase surface plasmon resonance enhanced scattering from Au nanoparticles makes them promising as optical probes and labels for imaging based detection of cancers. Discussed cell can be characterized and differentiated by a range of possible alterations in their DNA, respiratory pathway, cell-surface receptor profile or proteomic profile.

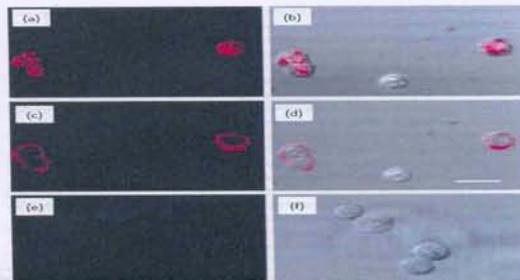


Fig. 4 (a)-(f) Optical images of *SiHa* cells labeled with anti-EGFR/Au conjugates. (a), (b) Nonspecific labeling using anti-EGFR/Au conjugates with BSA. Laser scanning confocal reflectance (a), (c), and (e) and combined confocal reflectance/transmittance (b), (d), and (f) images of the labeled *SiHa* cells obtained with $\times 60$ objective. The scattering from the nanoparticle bioconjugates is false-colored in red. In (a) and (b), the focal plane is at the top of the cells. In (c) and (d), the middle cross-section of the cells is in focus. The combined confocal reflectance/transmittance images were obtained independently and then overlaid. Reflectance images were obtained with 647 nm laser excitation. Scale bar = $\sim 20 \mu\text{m}$. (Reprinted with permission from¹⁵. © 2003 American Association for Cancer Research.)



Fig. 5 Laser scanning confocal reflectance images of (a) precancerous and (b) normal fresh cervical ex vivo tissue labeled with anti-EGFR/Au nanoparticle bioconjugates. The images were obtained with 647 nm excitation wavelength, and are false-colored in red. (Reprinted with permission from¹⁵. © 2003 American Association for Cancer Research.)

The researchers also demonstrated that SPR scattering from the Au nanoparticles is strong enough to allow use of a red laser pointer in lieu of the scanning laser to image the labeled cancer cells¹⁵. Thus the use of Au bioconjugates has potential for cancer diagnosis even in resource-poor settings.

While SPR scattering is intense, as demonstrated by Sokolov *et al.*¹⁵, it is also self-selecting and can therefore be used with a broad

Selective Photothermal cancer thereapy using Au nanoparticle bioconjugates

Mainstream treatments for most forms of cancer (epithelial cancers) include surgical tumor removal, chemotherapy and radiation therapy. However, surgery is limited to tumors that are accessible, chemotherapy suffers from problems arising from side effects and radiotherapy is highly invasive to healthy tissue in the path of the radiation.

In the face of these drawbacks, laser hyperthermia, i.e. use of optical heating for ablation of tumors, offers a gentle alternative for

cancer treatment. By employing strong photoabsorbers such as dyes that are located selectively in the tumor region, the speed and effectiveness of the heat deposition can be greatly enhanced while reducing nonspecific injury to adjacent heating tissue.

The SPR absorption of Au nanoparticles is followed by the rapid conversion (~ 1 p sec.) of the absorbed light into heat. The ability of Au nanoparticles to convert strongly absorbed light efficiently into localized heat can be exploited for the selective photothermal therapy of cancer and bacterial infection.

Near infrared imaging and therapy

The *in vitro* success of cancer therapy/imaging using visible light absorbing nanoparticles can be extended to skin or surface type cancers using Near-infrared imaging (Spectral region 650-900 nm).

Conclusions and future outlook

The strongly enhanced SPR scattering and absorption of gold nanoparticles makes them a novel and highly effective class of contrast agents for biological and cell imaging-based cancer diagnostics

and photothermal cancer therapy. Molecular specific imaging and therapy of cancer is achieved by the synthetic conjugation of the nanoparticles with antibodies targeted to receptors overexpressed on the cancer cells. By employing appropriate targeting strategies, the imaging/therapy scheme can be made generic to a variety of cancers and even extended to other diseases.

Notwithstanding the success of initial demonstrations of the use of immunotargeted Au nanoparticles in cancer imaging/therapy, a number of factors need to be optimized. These include the absorption and scattering cross-sections of the nanoparticles and the binding of

nanoparticles to the targeting antibodies, as well as the binding of the nanoparticle bioconjugates to cellular targets. While most studies have been conducted on cell monolayers, success in physiological environments requires attention to the pharmacokinetics of the nanoparticles, including aspects such as blood flow, permeation, tumor extravasation, physiological reactions, nanoparticle stability, etc. There is a need to study the dependence of these aspects on nanoparticle size, surface chemistry, and mode of delivery. The most effective method for delivering NIR light to the diseased cells of different cancers also need

further research. The mechanism of nanoparticle-assisted photothermal injury of cells are also not very well understood and require further elucidation. Systematic study of all these aspects is a prerequisite for the successful translation of the research promise of plasmonic nanoparticles in cancer detection and selective photothermal therapy to a clinical setting.

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SUSHRUTA **A CURSORY SURGICAL APPRAISAL**

DR K S CHARAK

SUSHRUTA

- Father of ancient Indian surgery
- Existed over 600 years BC
- Foremost among the seekers of instruction in Ayurveda and surgery
- 'Sushruta Samhita' is his magnum opus.

AYURVEDA

- An 'UPANGA' or appendage of Atharva Veda
- In existence since pre-historic times
- Surgery the most exalted of its eight branches
- Dhanwantari brings surgery to the world of mortals.

WHY STUDY AYURVEDA

Reasons given by Sushruta and his team

- To relieve the pain of those in physical distress
- As a means to their own sustenance
- For the general good of the masses.

TRANSMISSION OF AYURVEDA - SURGERY



THREE STAGES OF SURGICAL TREATMENT

- Purva-karma: Pre-operative preparation
- Pradhana-karma: The actual surgical procedure
- Pashchat-karma: Post-operative care.

PRACTICE VS THEORY

- Knowledge of 'Shastra' as important as practical skills
- One without the other is like a one-winged bird
- Sir William Osler: "To study the phenomenon of disease without books is to sail an unchartered sea, while to study books without patients is not to go to sea at all."

URINARY BLADDER STONES

- A common occurrence in olden times
- Medical treatment for early cases, surgical for late ones
- Difficult surgery; even an expert might fail
- Surgery only after legal consent, and explanation to the patient.

URINARY BLADDER STONES (contd.)

- Appropriate position of the patient
- Manual stabilisation of the stone
- Precise site for incision
- Abandon procedure if the patient deteriorates
- Avoid fragmentation of stone.

URINARY BLADDER STONES (contd.)

- Avoid damage to urethra, prostate, seminal vesicles, rectum
- Do not ignore proximity of female organs, to avoid complications
- Follow proper post-operative care
- Remember: Inept surgery can be lethal.

HEMORRHOIDS

- Medical treatment for most cases
- Cautery or application of heat
- Surgery in selected cases
- Inept treatment: Sterility, swelling, burns, loss of consciousness, incontinence, death.

FISTULA-IN-ANO

- Single opening: Simpler to treat
- Multiple openings/multiple tracts: Liable to complications
- Basic principle of treatment: Lay open the tract
- Kshara-sutra or medicated setons
- Complications include fecal or urinary incontinence.

TRAUMA

- Detailed description of wounds and injuries available
- Special wounds require special treatment
- Injury to hollow viscera is specially significant
- A patient whose feces, urine and breath are flowing through their normal passages is safe despite hollow viscus injury.

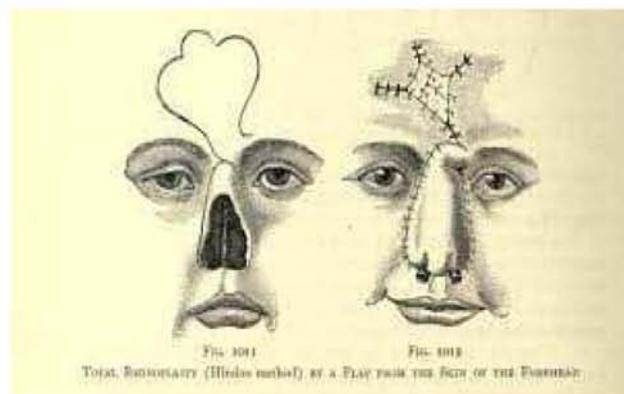
TRAUMA TO BOWEL

- Extruded uninjured loop: Replace
- Perforated loop: Replace after repair
- Soiled loop: Cleanse, lubricate and repose
- Small defect/large loop: Increase defect, repose the loop
- Avoid twists or entanglement of the loop while reposing it in the abdomen.

RHINOPLASTY

- Rhinoplasty: Reconstruction of the (injured or amputated) nose
- Sushruta's method known as Indian method of rhinoplasty
- Involves use of a forehead skin flap to reconstruct an amputated nose
- A marvel of surgical skill and scientific knowledge.

RHINOPLASTY (contd.)



Role of indigenous knowledge in public health care

By

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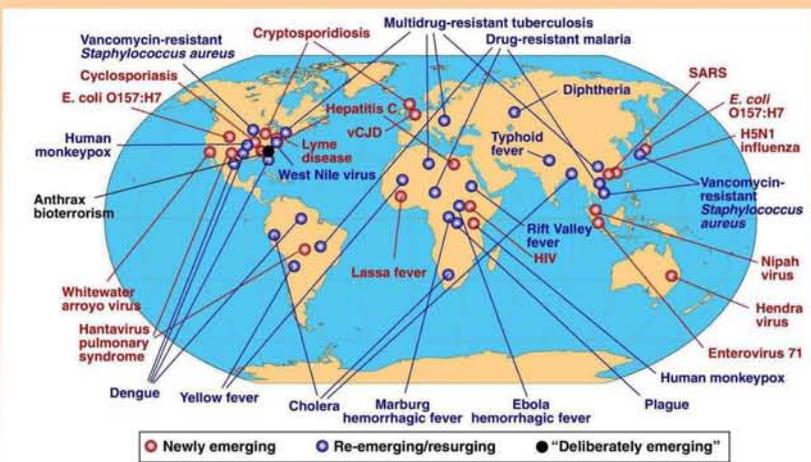
**GAUR BRAHMAN AYURVEDIC COLLEGE &
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What is indigenous medicine

- Indigenous medicine also known as Traditional medicine comprises knowledge systems that developed over generations within various societies before the era of modern medicine. The World Health Organization (WHO) defines traditional medicine as "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness."¹

India is the second largest populous country with a great heritage consisting of many cultures, religions, languages. In the line of many such varieties India is also having a rich plural medical system. With the firm existence of modern allopathic system of medicine, there exists seven other indigenous systems of medicine, and in fact, India is the only country to legalize these seven systems of Indian medicine. These systems of medicine are designated by an acronym called AYUSH. This stands for Ayurveda, Yoga & Naturopathy, Unani, Sidha, and Homoeopathy

Diseases of the new world



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AYURVEDIC APPROACH TO IDIOPATHIC DISEASES

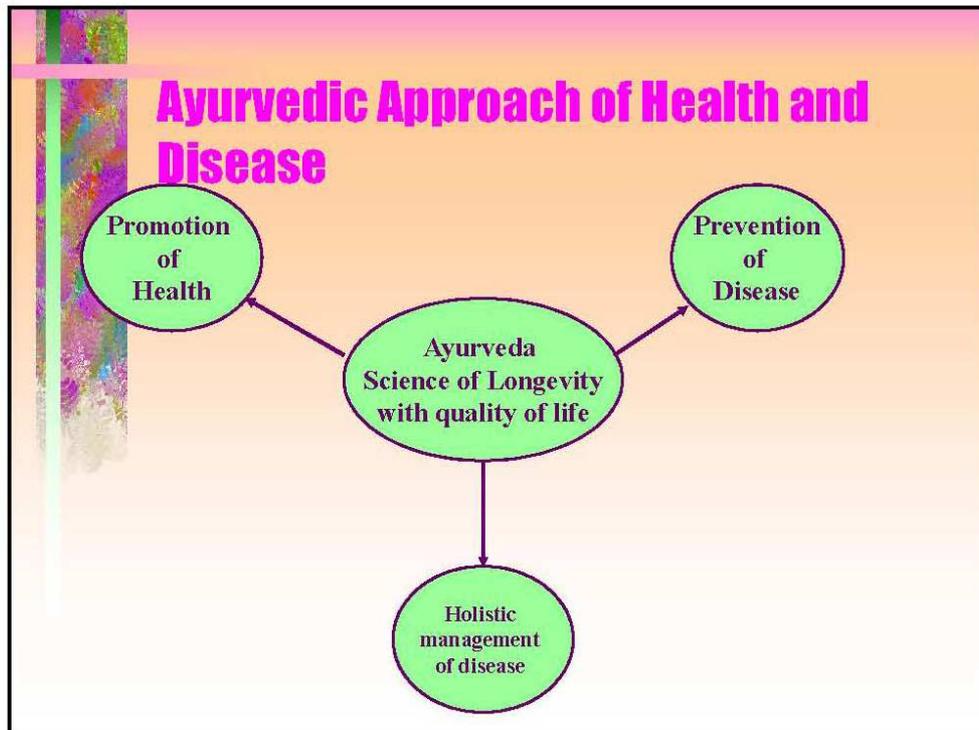
विकारानामाकुशलो नहि जिह्नीयात् कदाचन् ।
नहि सर्व विकारेषु नामतोऽस्ति ध्रुवास्थितिः ॥

— चरक

According to Ayurvedic principles, all diseases can be controlled successfully by knowing agni status, involvement of srotasa and ojobala of an individual. It is not necessary to know the name of each disease for its treatment.

INTRODUCTION

“Ayurveda is a holistic system of natural health care that originated from the vedas, most ancient indian literature of human civilization. It deals with various aspects of life. Hence it is not merely the system of treatment but it is an **ideal way of life.**”



- ### FOUR DIMENSIONAL GOAL OF W.H.O.
1. PREVENTION
 2. PROMOTION
 3. CURE
 4. REHABILITATION

OBJECTIVES OF AYURVEDA

स्वस्थस्य स्वास्थ्यरक्षणम्, आतुरस्य विकार प्रशमनञ्च ।।

"To maintain the health of healthy individuals and cure of ailments."

"स्वस्थस्योर्जस्करंयत्तु तद् वृष्यं तद् रसायनम्"

"Rejuvenation (Rasayana) therapy can be used for promotion of health and Aphrodisiacs (Vajikarana) for enhancing sexual power."

HEALTH

"Health is a state of absence of the diseases or infirmity."

-W.H.O. (Previous definition)

समदोषः समाग्निश्च समधातुमलक्रियाः ।

प्रसन्नात्मेन्द्रिय मनाः स्वस्थइत्यभिधीयते ।।

—सुश्रुत

(The balance of humours, digestive power, vital tissues and proper elimination of waste products, **happiness of soul, sense organs and mind** is the definition of complete Health, according to Sushruta.)

W.H.O. has taken this concept and redefined the Health as-

"Health is a state of complete physical, mental, social and spiritual well being not merely the absence of diseases or infirmity."

-W.H.O. New definition

Ayurveda gives a holistic approach from very bigining.

Definition of Health

समदोषाः समाग्निश्च समाधातुमलक्रियः ।
प्रसन्नात्मेन्द्रियमनाः स्वस्थ्य इतिभिधीयते ॥

Components of health

- Physical & Physiological**
 - Dosha - 3 (Vata, Pitta, Kapha)
 - Agni - 13 (Metabolic fire)
 - Dhatu - 7 (Body tissues)
 - Mala - 3 (Waste products)
- Psychological**
 - Indriya - 5 (Sensory motor organs)
 - Manas - 1 (Mind)
- Spiritual**
 - Atma - Soul

One whose doshas, agni, functions of doshas and malas are in state of equilibrium, who has cheerful atman, mind, intellect and sense organs is designated as healthy.

AN UNIQUE APPROACH

योगमांसां तु यो विद्यात् देशकालोपपादितम् ।
पुरुषं पुरुषं वीक्ष्य स ज्ञेयो भिषगुत्तमः ॥

— चरक

Each patient must be treated with new angle keeping constitution, habitat and time of treatment in the mind. Patient must be thoroughly investigated with Ten fold exam.

“प्रकृतितश्च विकृतितश्च.....”

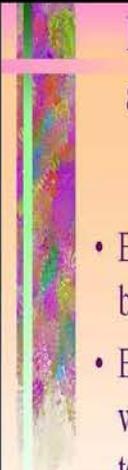
— चरक



Concept of Prakriti

(Body Mind Constitution and Temperament)

- Concept of Prakriti (human constitution) occupies prime position in relation to physiological attributes to health and disease.
- Prakriti is a composite whole of Mind-Body complex. It is determined by relative predominance of dosha in intra-uterine life of a fetus.
- Prakriti is unchangeable throughout the life span, but one can take remedial measures in diet and behavior suitable to his/her prakriti to maintain health and prevention of disease.



Knowing your body type and eating and living accordingly

- Based on dosha predominance, there are 7 body types
- Each body type characteristics are listed with fine details and therefore it is possible to identify every individual's body type.
- If the individual follows the diet, regimen and lifestyle according to one's body type, he or she can keep diseases at bay

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Significance of Prakriti in Clinical Medicine

- For Promotive & Preventive Health
 - Know your prakriti and diseases susceptibility
 - Prakriti will tell the risk factors, course of disease, complications and prognosis
 - Follow your diet, behaviour, profession and life style suitable to your prakriti to lead a healthy life.
- **Curative Health**
 - Select the drugs and dose as per prakriti
 - Drug body interaction and reaction pattern depend upon the prakriti of individual & drug
 - Associated complications of a disease, prognosis and their treatment can be improved as per prakriti of disease & individual

Disease Susceptibility & Prakriti

- Vataj person:
 - Insomnia, Neurological disorders, Joint disorders etc.
- Pittaj person:
 - Peptic ulcer, Bleeding disorders, Liver disorders etc.
- Kaphaj person:
 - Obesity, Diabetes, Heart diseases etc.

SEQUENTIAL KSHAYA IN AGING

बाल्यं वृद्धिं छविर्मेधा त्वक् दृष्टि शुक्र विक्रमौ ।
बुद्धिः कर्मेन्द्रियश्चेतौ जीवितं दशतौहसेत् ॥

— शा. सं.

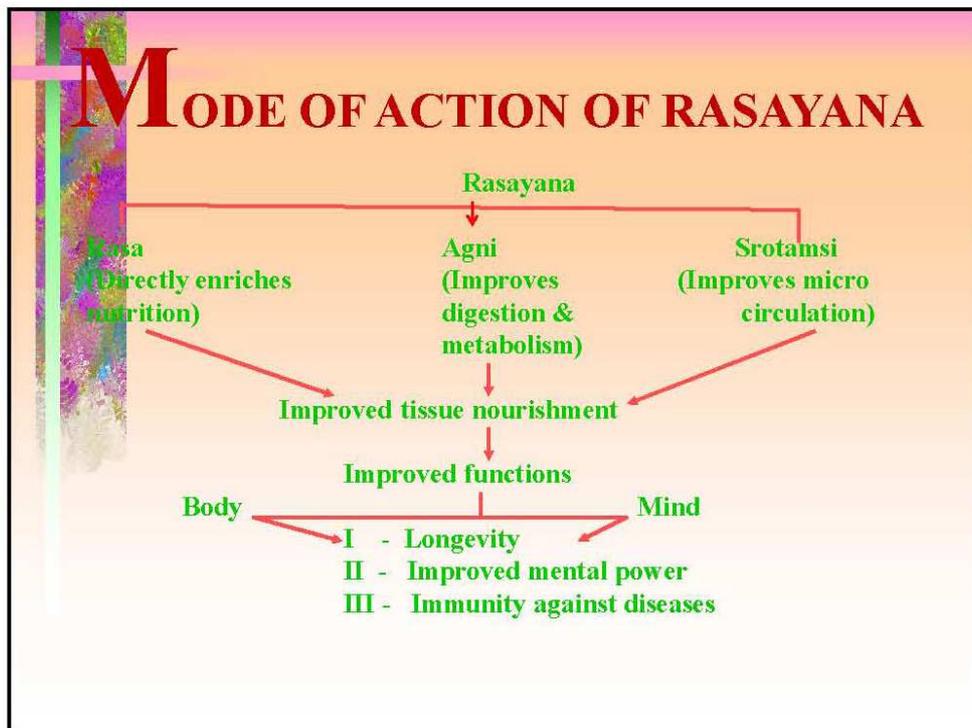
1. First decade of life : *Balya* (childhood)
2. Second decade of life : *Vridhhi* (growth)
3. Third decade of life : *Chhavi* (beauty)
4. Fourth decade of life : *Medha* (intellect)
5. Fifth decade of life : *Tvak* (health of skin)

TEN SPECIFIC FACTORS AND DRUGS

बाल्यं वृद्धिं छविर्मेधा त्वक् दृष्टि शुक्र विक्रमौ ।
बुद्धिः कर्मेन्द्रियश्चेतौ जीवितं दशतौहसेत् ॥

— शाङ्गधर

AGE	FACTOR	DRUGS
1-10	Childhood	Bacha, Kashmari, Gold
11-20	Growth	Ashwagandha, Shatavar
21-30	Complexion	Haldi, Chandana
31-40	Intellect	Brahmi, Shankhpushpi, Guduchi, Mulaiti
41-50	Skin	Bakuchi, Chakvad
51-60	Eye Sight	Jyotishmati, Triphala
61-70	Sexual Power	Kevanch, Bala
71-80	Enthusiasm	Brahmi, Bala
81-90	Decision Power	Brahmi
91-100	Activities	Ashwagandha, Bala Shatavar, Gold salts



- ## Tri pillars of Ayurveda.....
- Three basics of life – **Ahara** (diet), **Nidra** (proper sleep), **Brahamcharya**
 - Each person's metabolism is different
 - Every person digest and assimilates food differently
 - So individual diet concept of nutrition
 - Modern nutritionist based on calories ,ratio of carbohydrate. Protein ,fat and minerals according to disease i.e. H.T, IHD ,DM. etc.
 - Ayurveda advocate diet as per PRAKRATI of patient and disease state means .
 - Uses food as drug i.e. Pathya and Apathya
 - How to take diet is very important.

PATHYA-APATHYA

पथ्यं पथोऽनपेतं यद्यच्चोक्तं मनसः प्रियम्
यच्चाप्रियमपथ्यं च नियतं तन्न लक्षयेत् ४५

- **Food must be chosen according to individual health status and other special requirements**

SIGNIFICANCE-

1. Charaka-Maintains good health
2. Modern-Nutrition and individualized health needs

FOUR FOLD ESSENTIALS

पुरुषार्थ चतुष्टय

धर्मार्थकाम मोक्षाणां आरोग्यं मूलमुत्तमम् ।
रोगास्तस्यापहर्तारः श्रेयसो जीवितस्य च ॥

धर्म (Religion) }
अर्थ (Money) } } आरोग्य
काम (Desires) } } (Health)
मोक्ष (Liberation) }

MAN CUM ENVIRONMENT

“यावन्तः पुरुषः तावन्तो लोको”

—चरक

Human body is the symbolic representation of whole universe.

विसर्गादान विक्षेपैः सोमसूर्यानिलस्तथा ।
धारयन्ते जगद्देहं कफ पित्तानिलस्तथा ॥

MOON - KAPHA

SUN - PITTA

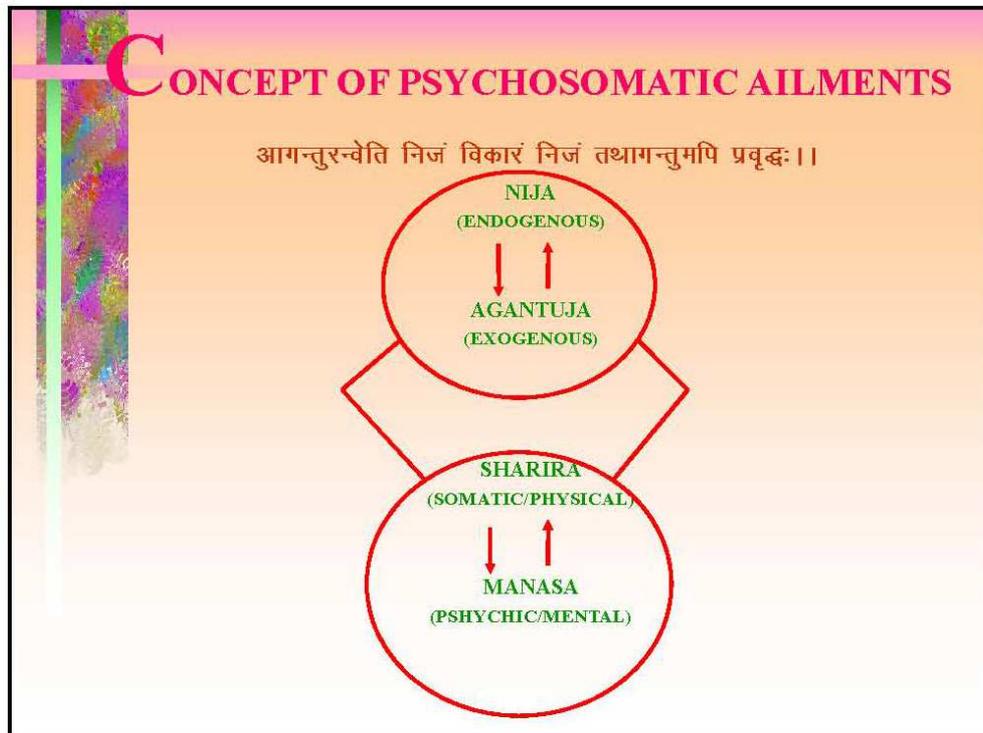
AIR - VATA

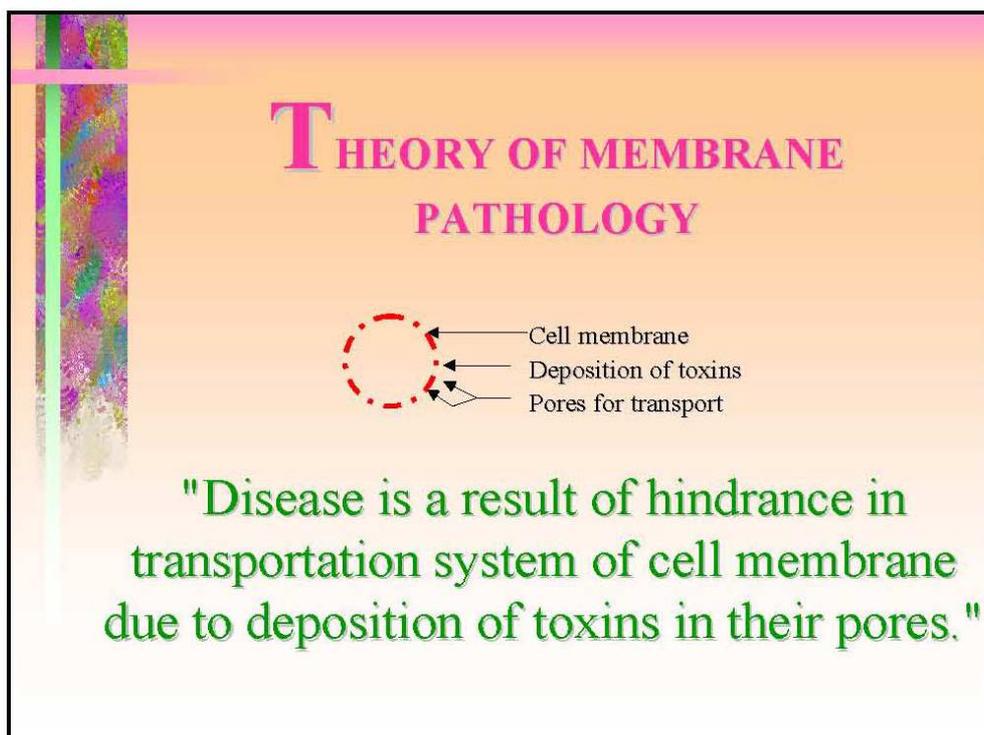
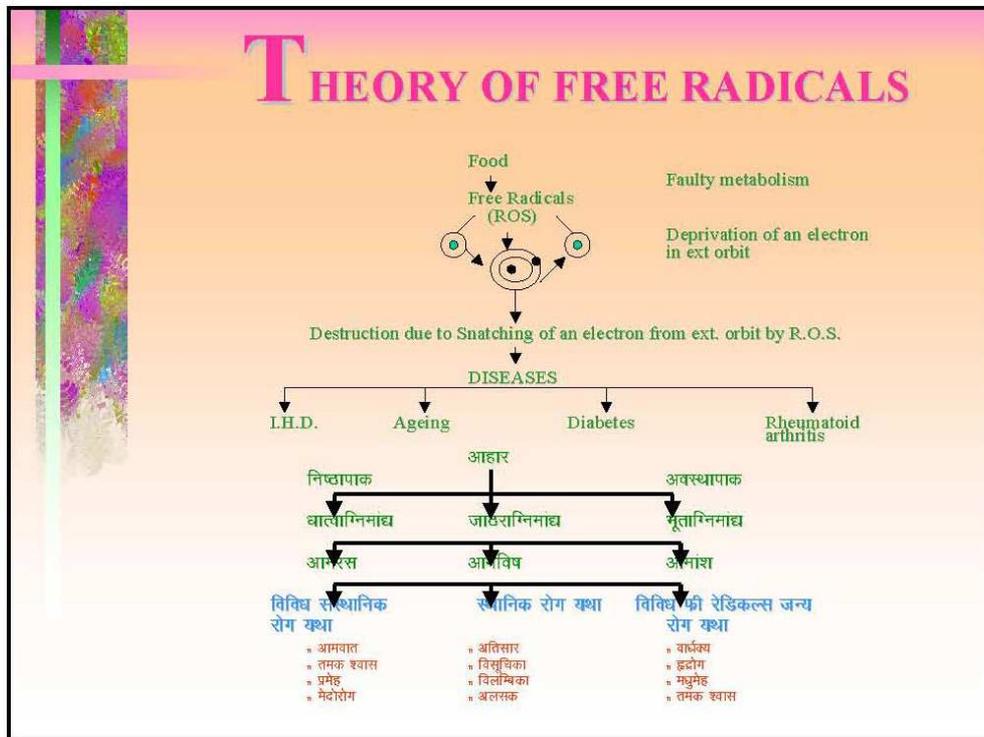
Hence various fractions of cosmic environment directly influences the human constitution. Therefore the theories of Ayurvedic humourology are clearly based on chronobiology. This concept shows the closeness of this system to the environment or the nature as a whole.

THEORY OF KSHETRAVADA & BEEJAVADA

ध्रुव चतुर्णां सानिध्याद् गर्भं स्यादविधपूर्वकः ।
ऋतु क्षेत्राम्बु बीजानां सामग्र्यादंकुरो यथा ॥

- SEASON : SUITABLE TIME
- FIELD : IMMUNITY
- NUTRIENTS : PROPER pH FOR GROWTH
- SEED : PATHOGENS





KHA VAIGUNYA

स्रोतोमयंऽयं शरीरम्
(Structural unit of living beings)

स्रोतांसिऽयनमुखानि
(Similarity with cells)

स्रवणात् स्रोतांसि
(Pathophysiological similarity)

Contd.....

कुपितानां हि दोषाणां शरीरे परिधावताम् ।
यत्र सङ्गः ख वैगुण्यात् व्याधिस्तत्रोपजायते ॥

↓

Structural abnormality
(ख वैगुण्य)
दोष . दूष्य सम्मूर्च्छना
↓
रोग (Disease)

○ A CELL - Solid substrate (कफ)
- Chemical Act (पित्त)
- Energetic dimention (वात)

Khavaigunya has got resemblance with
membrane pathology.

PRINCIPLES OF AYURVEDIC TREATMENT

- ⊗ चतुर्णां भिषगादीनाम् शस्तानां धातुवैकृते ।
प्रवृत्तिर्धातु साम्यार्थाः विकित्स्येत्यभिधीयते ।।
- ⊗ "याभिः क्रियाभिर्जायन्ते शरीरे धातवो समाः"
- ⊗ "स्वभावोपरमवाद"

"Theory of spontaneous healing"

Duty of the physician is to increase the **remainder health**
(अवशिष्ट स्वास्थ्य) of an individual

Because
it is the quantum of remainder health which decides

↓
Prognosis
of diseases

↓
Nature
of therapy

↓
Doses
of drugs

↓
Duration
of treatment

AYURVEDIC MANAGEMENT OF CHRONIC DISEASES A NEW PARADIGM

Chronicity of Diseases
is due to
Immunopathology

OJA-VISHRANSA
(Dislodged immunity)

↓

Restoration of OJA BALA

↓

Rejuvenation therapy
(RASAYANA)

SHROTODUSHTI/RODHA
(Membrane pathology)

↓

Removal of membrane
pathology

↓

Biopurification
(PANCHKARMA)

← CURE ←

(This new paradigm is expected to yield logical results with definite cure potential)

IDEAL THERAPY

प्रयोगः शमयेत् व्याधिं योऽन्यव्याधिमुदीरयेत् ।
नासौ विशुद्ध शुद्धस्तु शमयेत् योनकोपयेत् ॥

The therapy which cures the disease without producing untoward effects or an Iatrogenic disease is called as ideal therapy.

LIMITATIONS OF WESTERN MEDICINE

Western medicine is much advanced in treating infectious diseases but has limitation in treating endogenous diseases like-

- **Bronchial asthma**
- **Heart disease**
- **Diabetes mellitus**
- **Hypertension**
- **Peptic ulcer**
- **Rheumatoid arthritis**
- **Psoriasis & vitiligo**

and provides only palliative treatment as it has to manage only acute symptoms but neither the relief is long lasting nor the disease can be cured. Rather it is likely to induce several side effects.

MERITS OF AYURVEDIC THERAPY

- **Radical removal of the diseases, as it destroys cause rather than symptoms.**
- **It is safe, as it has no side effects.**
- **Crudopathy : Eg : Reserpine**
- **Based on living herbs, hence can be absorbed and accepted by our body more easily due to similarity in their biomorphic constitution.**
- **Economic and Easy to procure.**

GENERAL APPROACH

Rasayana or the science of Rejuvenation, which is one of the eight major branches of Ayurveda deals primarily with geriatric and has been described as a specific measure to improve the physical, physiological and psychological adaptation to various pathological changes related to the problems of aging.

These objectives are achieved by various methods.

6. Sixth decade of life : Dristi (vision)
7. Seventh decade of life : Shukra (sex)
8. Eighth decade of life : Vikrama (physical strength)
9. Ninth decade of life : Buddhi (wisdom)
10. Tenth decade of life : Karmendriya (locomotor activity)

AGING AND THE SAPTA DHATUS

0-16 yrs.	Gradual growth	- Dhatus (Body tissues)
17-70 yrs.	Phase of maturity	- Indriyas (Cognitive powers)
70 - onwards	Gradual decline	- Ojas (Immunity)

AGING AND THE AGNI

AGNI represent the digestive & metabolic fire in the body which consists of the -

- Digestive juices
- Hormones
- Engymes & Co-engymes

* Digestive capacity Highest in young adults - Pitta ↑
&
Metabolic Rate

In old age depleted Agni leads to

↑ed Vigour, Vitality & Growth
↓
↓ed vigour, vitality, decay & atrophy
→ Vata ↑

REJUVENATION AND RASAYANA THERAPY

Rasayana stands as an answer to solve the problem of healthful longevity including mental development and resistance against disease. Sushruta defines rasayana as a measure which prolongs longevity, develops positive health and improves mental faculties and provides resistance and immunity against diseases. It is a specialised type of treatment influencing the fundamental aspects of the body viz., dhatus (body tissues), agni (the metabolic activity) and srotansi (micro circulation) and helps in the prevention of aging.

CLASSIFICATION OF RASAYANA

(A) According to the mode of administration (Charaka) :

1. Kutipravesika rasayana (intensive indoor rejuvenative regimen).
2. Vatatapika rasayana (outdoor rejuvenative regimen).

(B) According to the object (Sushruta) :

1. Kamyasayana for promotion of health of the healthy.
 - (i) Pranakamyasayana (promotes longevity and life span).
 - (ii) Medhakamyasayana (improves mental faculties).
 - (iii) Srikamyasayana (improves beauty and lusture of the body).

2. Naimittikasayana as an adjunct for cure of diseases.
3. Ajasrikasayana for use as daily routine.

(C) Special rasayana drugs and measures :

1. Medhyasayana for rejuvenation of brain and mental health.
2. Acharasayana i.e. rejuvenative life style.

(D) According to prabhava or effect :

1. Samshodhanasayana or bio-purificatory sayana.
2. Sanshamanasayana or palliative sayana.

SPECIAL INDICATIONS			
Age Group (Years)	Desired Effect	Suitable Rasayana Drugs	(in
1-10	Balya (boyishness)	Vacha (<i>Acorus calamus</i> Linn) Kashmari (<i>Gmelina arborea</i> Linn)	
11-20	Vridhhi (growth)	Ashvagandha (<i>Withania somnifera</i>) Bala (<i>Sida cordifolia</i> Linn)	
21-30	Chhavi (beauty)	Amalaki (<i>Emblca officinalis</i> Gaertn)	

31-40	Medha (intellect)	Shankhapushpi (<i>Convolvulus pluricaulis</i> Chois) Jyotishmati (<i>Celastrus panniculatus</i> Willd)	
41-50	Tvak (skin health)	Bhringaraja (<i>Eclipta alba</i> Hassk) Somaraji (<i>Centratherum anthelminticum</i> Kuntze)	
51-60	Drishti (vision)	Chakshusya (<i>Cassia absus</i> Linn) Saptamrita lauha	

61-70	Shukra (sex)	Atmagupta (Mucuna prurita Hook)
71-80	Vikrama (physical strength)	Ashvagandha (Withania somnifera)
81-90	Buddhi (wisdom)	Rasayana therapy
91-100	Karmendriya (locomotor activity)	is not much effective

NAIMITTIKA RASAYANAS FOR SPECIFIC DISEASES

- Eye diseases : Jyotishmati, triphala, shatavari, yashtimadhu.
- Heart diseases : Shalaparni, arjuna, guggulu, pushkaramula.
- Skin diseases : Tugaraka, bhallataka, vidanga, somaraji, gandhaka.
- Yakshma (tuberculosis) : Rasona, nagabala, shilajatu, pippali.
- Pandu (anaemias) : Lauha, makshika, mandura.

• Shvasa (asthma)	: Agastya rasayana, bhallataka, shirisha, haridra.
• Amavata (arthritis)	: Bhallataka, kupilu, rasona.
• Vata vyadhi (neuropathies)	: Rasona, guggulu, bala, nagabala.
• Madhumeha (diabetes)	: Shilajatu, amalaki, haridra, guduchi, jambu, methika.
• Medo roga (lipid disorders)	: Guggulu, haritaki, puskar amula, vacha.
• Raktagata vata (hypertension)	: Rasona, bala, rasna, sarpagandha, ashvagandha.
• Unmada (psychosis)	: Shankhapushpi, brahmi, mandukaparni

RASAYANA DRUGS FOR SPECIFIC DHATU OR TISSUES

- Rasa (plasma) : Kharjura, draksha, kashmari.
- Rakta (blood) : Lauha, amalaki, bhringaraja, palandu.
- Mamsa (muscle) : Bala, nagabala, ashvagandha, shalaparni
- Meda (adepose) : Guggulu, silajatu, amrita, haritaki.
- Asthi (bone) : Laksha, vanshalochana, shukti, shankha.
- Majja (marrow) : Lauha, vasa, majja.
- Shukra (reproductive tissues) : Atmagupta, ashvagandha, shatavari.

RASAYANA SPECIALLY SUITED TO SPECIFIC PRAKRITIS

(a) Deha prakriti (body constitution) :

1. Vata prakriti : Bala, nagabala, ghrita.
2. Pitta prakriti : Amalaki, shatavari.
3. Kapha prakriti : Bhallataka, guggulu, pippali, vacha.

(b) Manasa prakriti (mental constitution) :

Ashvagandha, shankhapuspi and other medhya drugs.

CONCEPT OF VAJIKARANA

Even in remote past, one can find the instinctive desire to extend clan or race.

Putreshana (desired for Progeny) is one of the primary desire of mankind mentioned in Upanishads.

DERIVATION OF VAJIKARANA

Vajah shukram soasyastiti Vajai, Avaji
shukrarahitah, Avaji vaji kriyateaneneti
vajikaranam

(Vaji means Shukra hence Vajikarna
drugs are used to increase the quantity
and quality of Shukra)

DEFINITION OF VAJIKARANA

Yen Narishu samarthyam ,
Vajivallabhate narah I
Vrajechchavhyadhikam yen ,
Vajikaranamev tat II

- Ch. Chi. 2/ 4-5

Vajikarana (Aphrodisiac Therapy)

- **Rasayana and Vajikarana are not absolutely different**
- **But some time Rasayana may act as Vajikarana**
- **Some time Vajikarana may act as Rasayana**
- **Some drugs have both rasayana and Vajikarana properties**

Age for Vajikarana

- **Child and aged are debarred from sexual act**
- **In child is immature as all the Dhatu particularly Shukra is not fully formed**
- **Therefore if child indulges in sexual act he immediately develops many complications**
- **In old age Shukra diminishes naturally therefore sexual act is not advisable in very elders because it may harm him**
- **Therefore Vajikarana are prescribed to young particularly in the Hani stage of Young age or in the beginning of old age may be up to 75 years of age, As Sushruta considers beginning of old age after 70 years**

Vajikarana (Aphrodisiac Therapy)

- **Rasayana and Vajikarana are not absolutely different**
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- **Some time Vajikarana may act as Rasayana**
- **Some drugs have both rasayana and Vajikarana properties**

Vajikarana

- **The drugs, diet and habit having following properties are generally Vajikarana:**
- **Sweet in taste and Vipaka**
- **Unctuous**
- **Promoter of life (Jivaniya)**
- **Brimhana (nourishing)**
- **Heavy (Guru)**
- **Pleasant (Harshana) to mind (Charaka)**

CLASSIFICATION OF VAJIKARANA

1. Dehabalakara (orjanaka) : Promoting physical strength including semen
2. Manobalakara (orpravartaka) : Enhancing mental power (sexual potency)
3. Deha-manobalakara (orjanakapravartaka) : Acting in both ways

Classification of Vajikarana Drugs

- The drugs used for the promotion of sexual health and for treating the male sexual disorders have been classified in different groups.

1. Vajikarana (Aphrodisiac):

- The drugs, which provide sexual satisfaction are Vajikarana e.g. Nagabala (Sida humilis) and seeds of Kapikacchu (Mucuna pruriens).

2. Shukrajanana (Spermatogenesis)

- The drugs, which enhance production of sperms are Shukrajanana e.g.
- Mashaparni (*Teramnus labialis*),
- Shatavari (*Asparagus racemosus*),
- Ashvagandha (*Withania somnifera*),
- Musali (*Asparagus adscendens*)
- Mudgaparni (*Rhaseolus trilobus*),
- Jatamansi (*Nardostachys jatamansi*),
- Sugar.

3. Shukra Pravartaka-Janaka

- The drugs, which enhance the production as well as flow/ejaculation of semen are Shukra Pravartaka e.g.
- Milk,
- Masha (black gram),
- Amalaki (*Embelica officinalis*) and
- Phalamajja (material inside of seed) of Bhallataka (*Semicarpus anacardium*).

4. Shukra Rechana

- **The drugs, which cause evacuation of semen (Shukra) are**
- **Fruits of Brihati (Solanum indicum)**
- **Fruits of Kantakari (Solanum xanthocarpum).**

5. Shukra Stambhaka

- **The drugs, which promote the retention power of a male partner during the sexual act are known as Shukra Stambhaka e.g.**
- **Jatiphala (Myristica fragrans).**
- **Bhanga (cannabis)**
- **Ahiphena (opium)**

6. Shukra Shoshaka

- **The drugs, which dry up the semen e.g.**
- **Haritaki (Terminalia chebula)**
- **Kalinga (water melon).**

Thank You

**AGRICULTURE LOSS THROUGH THE
LENS OF MEDIA: CASE STUDY OF
MEDIA REPORTS ON CROP LOSS IN
INDIA- 2015**

By: Dr. Ruchi Singh Gaur
Assistant Professor At Amity University Jaipur

THEME:

- This paper is inculcating the facts and data how media is portraying the problem and where they are lacking. The problem and its after effects majors how Indian farmers are suffering due to unseasonal rain and storm.

METHOD

- Present study is based on the content analysis method. News reports published in two leading Hindi dailies of the state of Rajasthan, Dainik Bhaskar and Rajasthan Patrika, of March 2015 and April 2015 were analysed to collect the data.
 - Researcher chose regional dailies because these newspapers have deep penetration even in the remote rural areas of Rajasthan and a large number of literate farmers have direct/indirect access to these dailies.
- 

SOME FACTS !

- As per the data of National Dairy Research Institute, Karnal we faced with an annual loss of Rs76,500 crore.
 - National Crime Records Bureau to calculate farming distress in Rajasthan, at least 414 farmers committed suicide on an average every year.
 - MP reported 826 farmer suicides, UP and Gujarat reported 63 and 45 suicides each.
- 

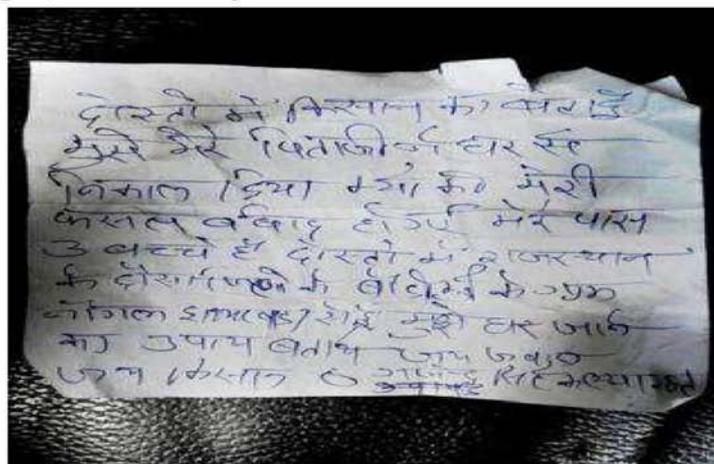
- The study suggests that regional newspapers were missing accurate, detailed and easy to understand reports on weather forecast and scientific agriculture advice for the farmers to educate them on how to avoid crop loss and claim the compensation. Rather the focus was more on political commodification of entire issue.

- Worsening the existing agrarian crisis in Maharashtra, unseasonal rains across the state have ravaged more than 50,000 hectares of rabi crop, mangoes and other horticultural produce (2015).
- Amravati district received a rainfall of about 13-48 mm, Nagpur about 15-20 mm, Nashik about 4-18 mm, and Aurangabad got rainfall of about 15-20 mm in the month of April .

- In Uttar Pradesh and Gujarat, the standing wheat and mustard crop have been damaged with some places reporting rainwater flooding the fields.
- This is the situation just because the farmers are not getting the information before the time. Lack of information creating problem, loss of crops and human .

CONCLUSION :

- Media sometimes shows its inactive mode to people, (A note by farmer –suicide victim)



Kisanvani : An Innovative Approach by All India Radio

Pulugurta Chandra Sekhar
Research Scholar, JJTU



Akashvani



Basic DIFFERENCE OF **Narrowcasting** and **Broadcasting**

- Narrowcasting is directed to a **particular audience** via proprietary equipment and encryption, or by some other discriminatory means.
- Broadcasts are transmitted to the **general public**, available for any general receiver with the capability to capture the signal(s).

NARROWCASTING

• **NARROW**

-synonymous to LIMITED,
CONTRACTED, CONSTRICTED.

• **CASTING**

-ROOT WORD: CAST which
means to EMIT, TRANSMIT,
SPREAD, DIRECT.

NARROWCASTING

- According to Wikipedia,
 - “Narrowcasting has traditionally been understood as the dissemination of information (usually by radio or television) to a **narrow audience, not to the general public.**”
 - Narrowcasting involves aiming media messages at specific segments of the public defined by values, preferences, or demographic attributes. Also called **niche marketing** or **target marketing**. Narrowcasting is based on the idea that **mass audiences** do not exist.
 - A narrowcast “is the **transmission of data to a specific list of recipients.**”

EXAMPLES OF NARROWCASTING

- CABLE TELEVISION
- SATELLITE RADIO
- INTERNET (both broadcast and narrowcast)
 - Mailing Lists
 - Podcasts
 - Video Blogs (VLogs)
- INTERACTIVE NARROWCASTING
- COMMERCIAL APPLICATION/
OUT-OF-HOME ADVERTISING
 - Digital Signage Networks



Kisanvani

- **Kisanvani** the **voice of farmers** - was launched on 15th February 2004.
- 96 FM stations of All India Radio are broadcasting 30-minute programme six days a week from 6.30-7.00 PM in respective dialects/languages.

Scheme

- Narrowcasting using FM Radio transmitters of AIR
- Monitoring & support activities
- Web portal
<http://navkrishi.dacnet.nic.in/>

Objectives

- Special focus on isolated areas and marginalized population.
- Repeat Broadcasts.
- Disseminate in regional languages and local dialects.
- Promote live programming with phone-in feature.
- Undertake capacity building and training programmes to help upgrade the knowledge.

Narrowcasting Approach

- Different in approach and focus.
- Approach being narrowcasting and need-based
- 90% of the programmes are recorded in the field itself.

Programmes

- *Aaj ki Khabrein* (news of the day)
- *Aaj Ka Bazar* (today's market)
- *Aaj ka Mausam* (weather information)
- *Aj Ki Batein* (special mention of the day)
- *Aaj Ke Kisan* (Farmer of today-interview based)
- *Desh Videsh* (news from the country and abroad)

Management of Content Creation

- A two-level management group.
- Level-I – National and State Level groups
- Level-II- District Level

Combating Antibiotic Resistance Through Public Awareness

*International Conference on "India's Scientific
Wisdom: Emerging Worldview" (ICISW-2016)*

Kuldeep Sharma* – B.Tech Biotechnology, VI Sem

Mrs. Vigi Chaudhary – Asst. Professor, AIB

Dr. Ruchi Singh Gaur – Asst. Professor, ASCO

Amity University Rajasthan

Amity Education Valley
Kant Kalwar, NH-11C, Jaipur - Delhi Highway.
Jaipur, Rajasthan



OBJECTIVES

- Antibiotics
- Antibiotic resistance
- Multidrug Resistance
- Causes
- Consequences
- Survey based study
- Solution
- Conclusion

INTRODUCTION

3



What are Antibiotics?

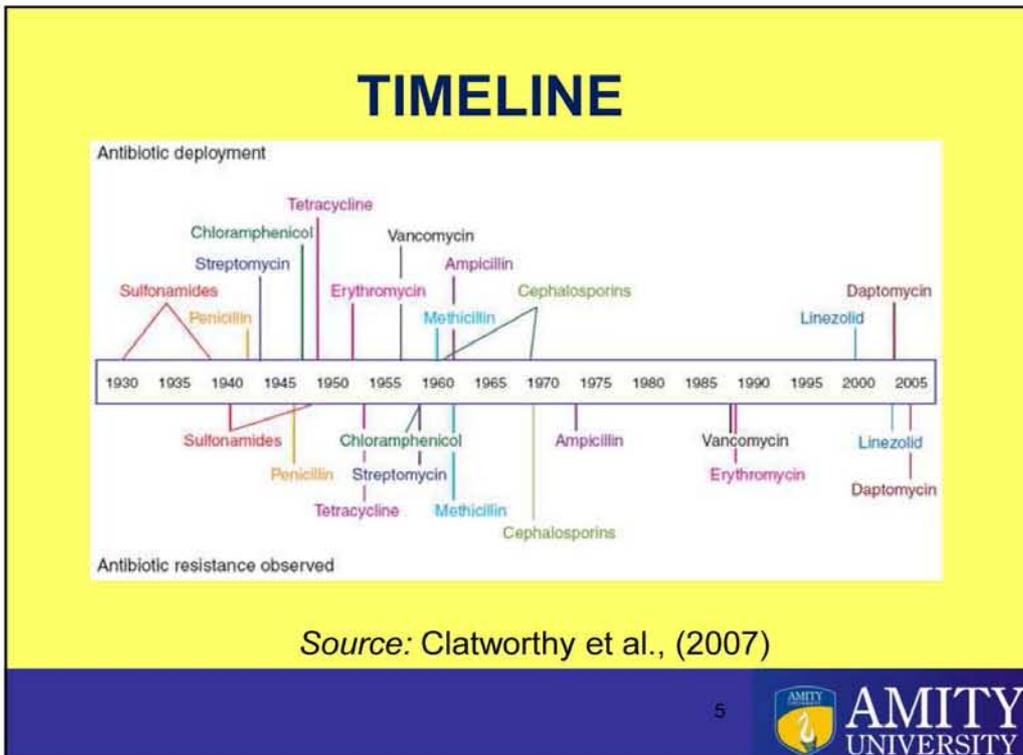
"Antibiotics are antimicrobial agents that inhibits or kills the growth of microorganism such as bacteria.



Source: Pinterest

4





5

Antibiotic Resistance

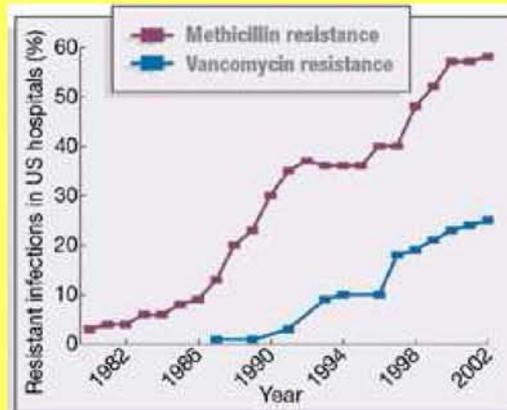
The diagram illustrates the process of antibiotic resistance in a population of bacteria. It shows two scenarios:

- Normal:** A single green snake-like bacterium labeled 'Normal (produces enzyme)' is shown. An arrow points to a pile of dead bacteria labeled 'death'. A text box explains: 'Continues to reproduce and produce offspring that resist antibiotic used to treat it.'
- Mutant:** A single green snake-like bacterium labeled 'Mutant (produces NO enzyme)' is shown. An arrow points to a single surviving bacterium labeled 'survives' with 'HA HA HA HA' above it. A second arrow points to a group of four surviving bacteria.

“Antibiotic resistance is the resistance of a microorganism to an antimicrobial drug that was originally effective for treatment of infections caused by it”

Source: WHO Fact Sheets, April 2014

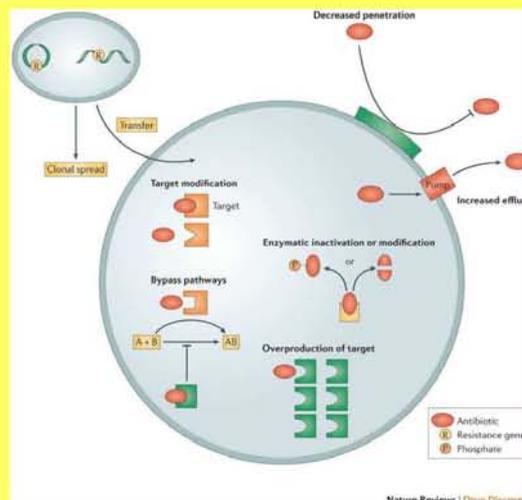
6



Source: Leeb, M. (2004). *Antibiotics: a shot in the arm*. *Nature*, 431(7011), 892-893.

7

Resistance Mechanism



Source: Lewis, K. (2013).

8

Multidrug Resistance (Superbug)



9



"Multidrug resistance organism or superbug are resistant to multiple antibiotics"

10

CAUSES

INDISCRIMINATE USE

11



1. Incomplete dosage
2. Self Medication
3. Limited knowledge of diseases
4. Lack of Regulatory laws
5. Mixed in Animal Feed



12

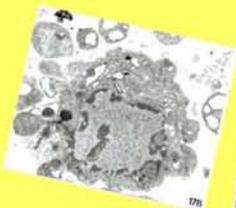


CONSEQUENCES

13



1. MDR related Diseases
2. Higher risk and increased mortality
3. Expensive health care resource
4. High Dosages leads to toxicity issues
5. Surgical and post operative failures
6. Hospital acquired diseases



14



SURVEY METHODOLOGY

The study was conducted among 115 youth attending undergraduate courses to evaluate their awareness regarding antibiotic resistance and the consequences of indiscriminate use of antibiotics.

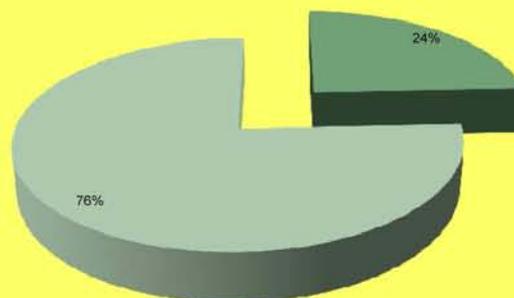
15



Q1. Do you take antibiotics without any doctor's (medical) prescription?

Q1

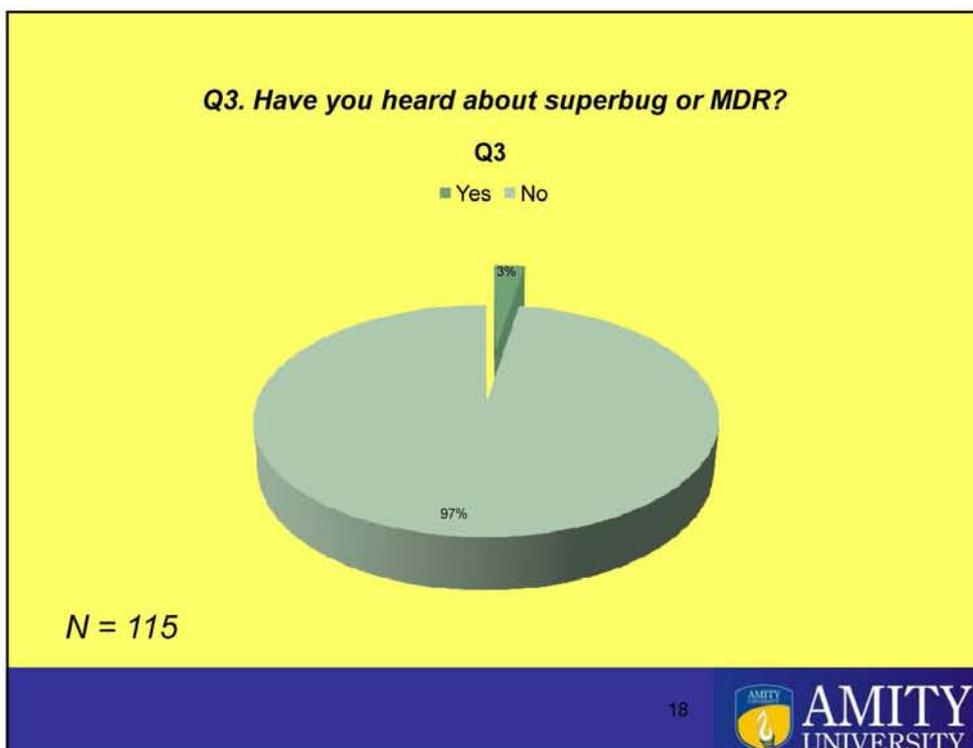
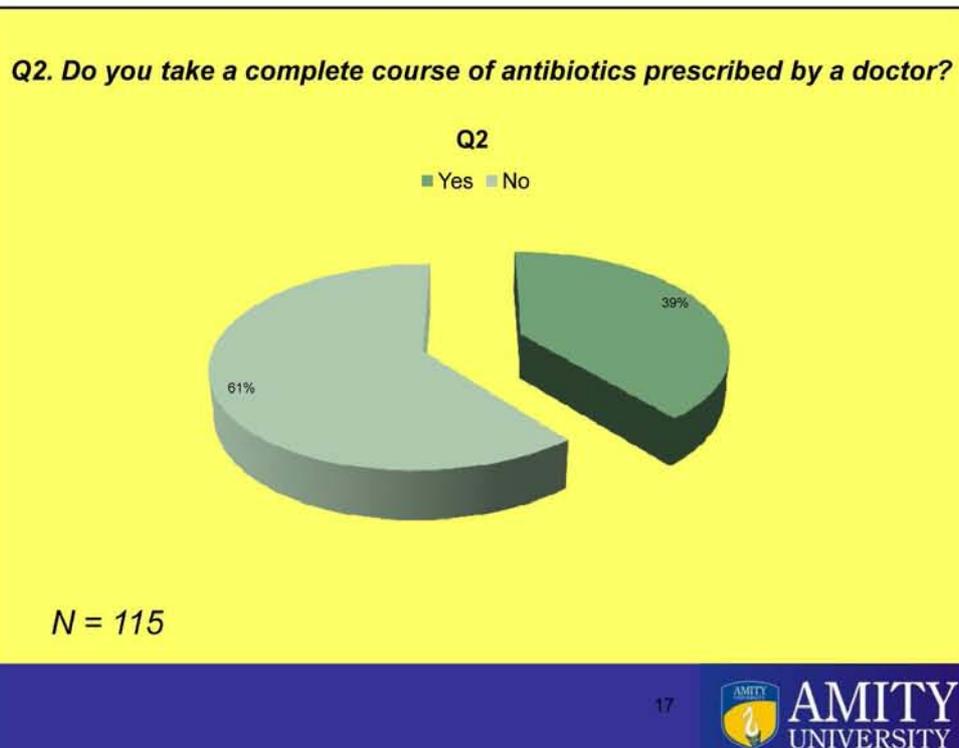
■ Yes ■ No



N = 115

16

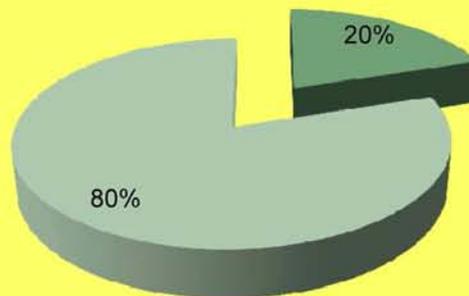




Q3. Do you take antibiotic for common cold?

Q4

■ Yes ■ No



N = 115

19

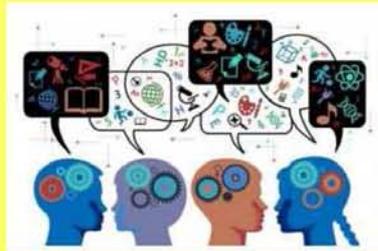
RESULT AND DISCUSSION



20

SOLUTION?

*PUBLIC AWARENESS
THROUGH
SCIENCE COMMUNICATION*



21

1. *Risk Communication*
2. *Social Campaigns*
3. *Antibiotic Sale Regulation*
4. *National Surveillance and Awareness Programs*
5. *Potential Risk Associated Advertisements*

22

CONCLUSION

- ✓ Limited availability of functional drugs and increased rate of resistance is of our great concerns.
- ✓ Therefore, Government & non-government organizations and individuals must raise the awareness and promote the rational use of antibiotics

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**COMBAT
DRUG
RESISTANCE**

**No action today,
no cure tomorrow**

**DRUG
RESISTANCE**

NO COMMITMENT
WEAK SURVEILLANCE
POOR DRUG QUALITY
IRRATIONAL DRUG USE
NO INFECTION CONTROL
LACK OF RESEARCH

24

राष्ट्रीय सम्मेलन
“भारत की वैज्ञानिक समझ - उभरता लोक अवलोकन”

आओ सीखें विज्ञान विधि



LET US LEARN METHOD OF SCIENCE

प्रस्तुति
रमेश कुमार
विज्ञान संचारकेंद्र दिल्ली



विज्ञान क्या है?

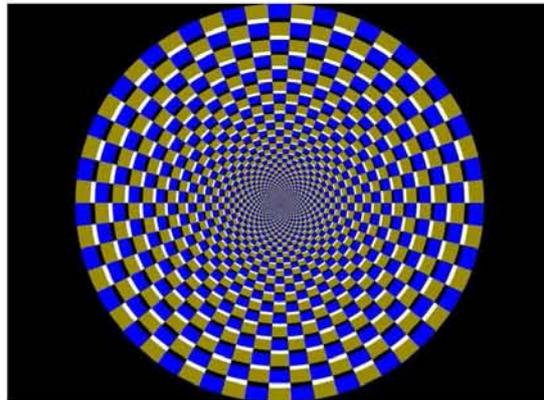
एक प्रक्रिया:
प्रकृति को समझने और उसके महत्वपूर्ण सत्यों
को जानने का एक तरीका

संक्षेप में कहें तो विज्ञान वैज्ञानिक पद्धति है

science n. — A systematic method of continuing investigation that uses observation, hypothesis testing, measurement, experimentation, logical argument and theory building to lead to **more adequate explanations** of natural phenomena.



अवलोकन



OBSERVATION

Problem
↓
Hypothesis
↓
Idea n1 Idea n2 Idea n3

परिकल्पना

कौन हो सकता है ?

HYPOTHESIS

परीक्षण

EXPERIMENT



विश्लेषण



ANALYSIS



निष्कर्ष



CONCLUSION



प्रमाणीकरण



VALIDATION

कर के सीखा



LEARNING BY DOING





मैंने देखा
I SEE

मुझे याद रहा
I REMEMBER

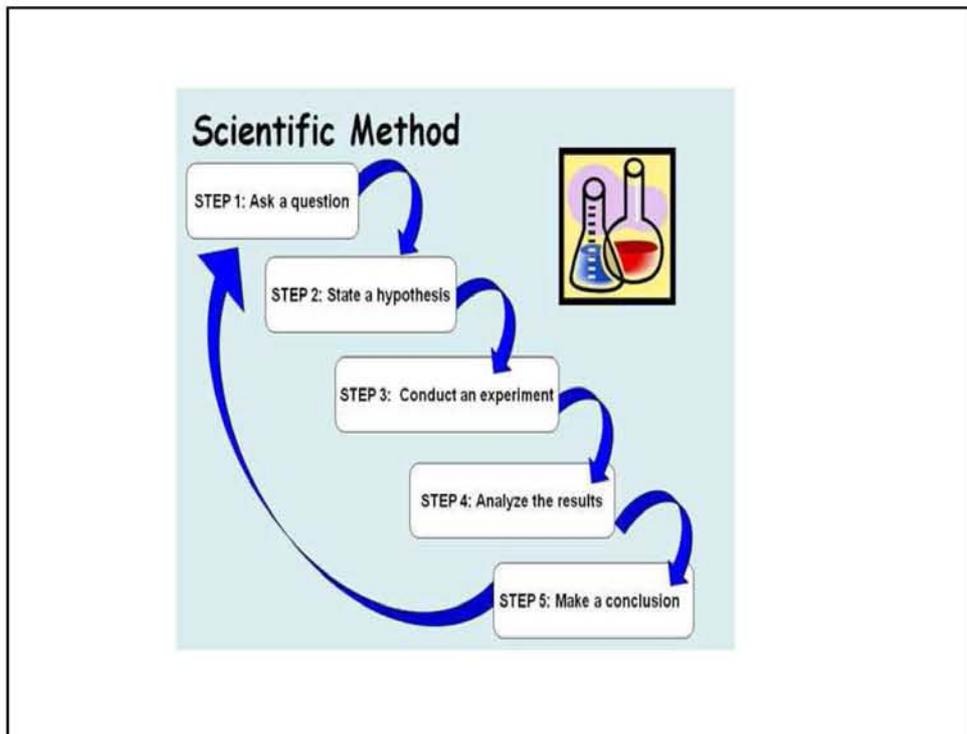


मैंने कर के देखा
I DO



मैं समझ गया
I UNDERSTAND





**Orion or the
Antiquity of the
Vedas.**

**Bal Gangadhar.
Tilak**

Validated by Prof. Jayant Vishnu Narlikar

<http://www.iucaa.ernet.in:8080/jspui/bitstream/11007/1842/1/146E%20Lokamanya%20Tilak%20and%20the%20astronomical%20dating%20of%20the%20Vedas.pdf>

“There is a fundamental difference between religion, which is based on authority, and science, which is based on observation and reason. Science will win because it works.”

– [Stephen Hawking](#)



धन्यवाद

GLIMPSE

International Conference India's Scientific Wisdom: Emerging Worldview (ICISW-2016)



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