2nd National Conference on
"India's Scientific Wisdom: Emerging Worldview"
(CISW-2017)
Indian Science Communication Society (ISCOS)
Indian Science Writers' Association (ISWA)
International Centre for Science Communication (ICSC)
at
Regional Science City, Lucknow, India
September 16-17, 2017
<www.iscos.org/cisw>

NO. ISCOS/CISW-2017/01 Date: 27.03.2017

Dear Sir/ Madam,

On behalf of the Organizing Committee CISW-2017, we are pleased to invite you as distinguished expert to deliver a talk/ present a paper/ participate in conference scheduled for September 16-17, 2017 in Lucknow, India, or nominate your colleague(s) for the same. The announcement, programme and registration form are enclosed herewith and available at: www.iscos.org/cisw

It is requested to kindly send your paper/ abstract/ topic for talk/ presentation/ poster under the main theme or sub theme of conference latest by August 16, 2017. The duly filled in Registration Form may be sent latest by August 16, 2017. You may register or submit your abstract/ paper online at: www.iscos.org/cisw

Kindly intimate your participation at the address given below preferably by email, speed post or courier latest by August 16, 2017.

We look forward for meeting you in Lucknow.

Thanking you and with kind regards.

Yours sincerely,

(V.P. Singh)
Secretary
Indian Science Writers' Association (ISWA)
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Encl.: Announcement, Preliminary Programme, Registration Form

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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 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.

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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 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.

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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 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(*Patairiya, M. 2015).

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

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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

Conference Format:
The scientific sessions will have presentation of contributory research papers, review papers, survey analyses, case studies, posters, and invited talks. Discussions in split groups would offer close exchange of thoughts and ideas. Deliberations will be in English and/ or in Hindi. The prescribed time for paper presentation will be around 10 minutes (7 minute for presentation + 3 minute for discussion). Power Point presentation facility will be available. Best paper awards would be given. Selected papers can be published in ***Indian Journal of Science Communication***<www.iscos.org>.

Who can participate?
Some 200 scientists, technologists, academicians, scholars, Noble Laureates, public representatives, parliamentarians, NGO activists, senior government officials, policymakers and decision makers from India and abroad are likely to participate.

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PRELIMINARY PROGRAMME*

SEPTEMBER 16, SATURDAY

09:00-10:00 AM	ARRIVAL OF DELEGATES/ REGISTRATION/ INTERACTION
10:00-11:30 AM	**INAUGURAL FUNCTION**
11:30-12:00 Noon	TEA/ COFFEE
12.00-01:30 PM	**SCIENTIFIC SESSION I** **Scientific Wisdom: The Genesis**
01:30-02:30 PM	LUNCH
02:30-04:00 PM	**SCIENTIFIC SESSION II** **Scientific Wisdom: Evidence Based Reappraisal**
04:00–04:30 PM	TEA/ COFFEE
04:30–06:00 PM	**SCIENTIFIC SESSION III** **Scientific Wisdom: Connecting links from where we left**
06:00-07:00 PM	CULTURAL PROGRAMME
07:00-09:00 PM	NETWORKING/ DINNER

SEPTEMBER 17, SUNDAY

09:00-10:00 AM	**POSTER SESSION**
10:00–11:30 AM	**SCIENTIFIC SESSION IV** **Scientific Wisdom: Reshaping the Emerging Worldview**
11:30–12:00 Noon	TEA/ COFFEE
12:00–01:30 PM	**SCIENTIFIC SESSION V** **Scientific Wisdom: The Role of Scientific Culture**
01:30–02.30 PM	LUNCH
02:30-04:00 PM	**PANEL DISCUSSION** **Scientific Wisdom: The Way Forward**
04:00–04:30 PM	TEA/ COFFEE
04:30–06:00 PM	**VALEDICTORY FUNCTION** **END OF PROGRAMME**

**Minute-to-minute programme for inaugural and valedictory functions as well as scientific sessions to be given with conference kit.*