

Indian Knowledge Systems

Past, Present & Future



A Calendar for the year 2021

by

**NEHRU MUSEUM OF SCIENCE & TECHNOLOGY
INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR**

Saptarishi

The Seven Sages of India



The Seven Sages are namely Brahmarishis Kasyapa, Jamadagni, Gautama, Bharadvaja, Visvamitra, Vasishtha and Atri, who are the Saptarishis of the present Cycle of Creative flux, known as the Vaivasvata Manvantara.



The Saptarishi or the seven Sages represent a primordial cosmic consortium of ancient Vedic India. They are the forerunners of all Indian Knowledge systems. To name a few, the genesis of

- Cosmology, astral and positional astronomy (*Jyotir tatha Mahajagatik Vidya*) was forwarded by the lineage of *Maharshi Bhrigu*, and *Maharshi Vasistha-Sakti-Parashar*. It is also the foundation of mathematics (*bijaganita*) and geometry (*iyamatra*) that originated in ancient India;
- Health Sciences (*Ayurveda*) goes to *Maharshi Bharadwaj*;
- Earth, terrestrial and built-environmental sciences (*Vasu and Vaastu Vidya*) belong to *Maharshi Vasistha* and other associated Sages.



January

2021

SUN	MON	TUE	WED	THU	FRI	SAT
31					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26 Republic Day	27	28	29	30



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Sanskrit

Sanskrit for Natural Language Processing



“India was the motherland of our race, and Sanskrit the mother of Europe's languages: she was the mother of our philosophy; mother, through the Arabs, of much of our mathematics; mother, through the Buddha, of the ideals embodied in Christianity; mother, through the village community, of self-government and democracy. Mother India is in many ways the mother of us all.”

– Will Durant
World Historian



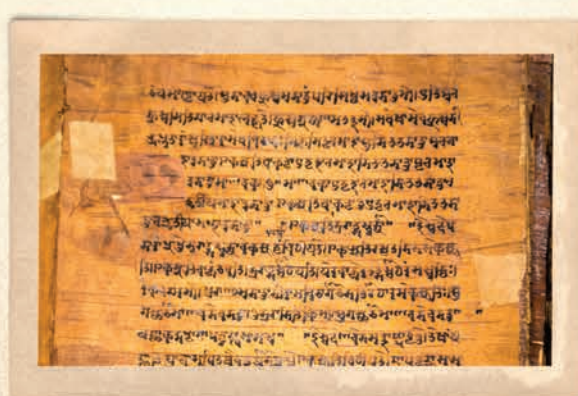
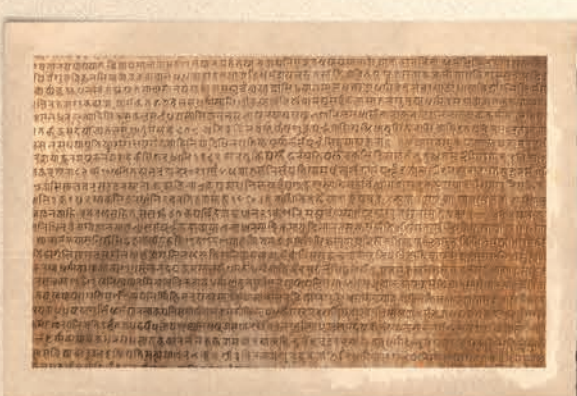
Sanskrit means 'The most perfected and cultured' among languages. It is the root of the entire Indo-Aryan branch in Asia and systems of European languages. The ten *mandalas* of the oldest literature of the world, the Rig Veda, is the basis of 10th or *dasam*, the unit of decimal system of the world. To name a few only, words (*Sabda* or Soft) and their embedded ideas (*Artha* or Worth / Hard) like *takkhana* (to design and sculpture), *jara* (old age), *asthi* (bones), *dhatrī* (child caretaker), *kalasa* (class taxonomy) are the bases of later knowledge systems namely 'Technology', 'Geriatrics', 'Osteopathy', 'Paediatrics' and 'Ecclesia', respectively.



February

2021

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16 Basant Panchami	17	18	19	20
21	22	23	24	25	26	27
28						



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Bijaganita and Jyamiti

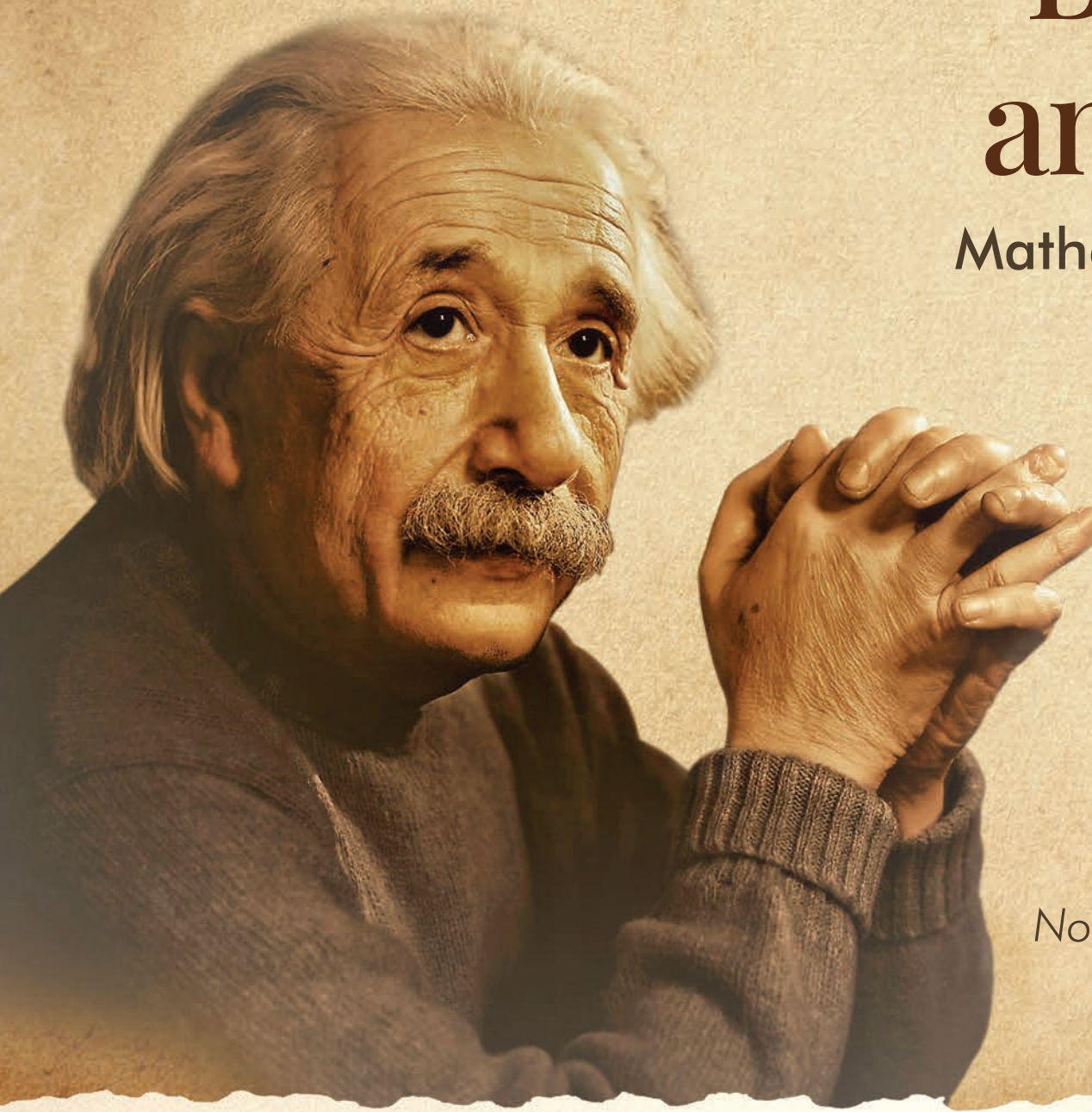
Mathematics and Geometry



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

– *Albert Einstein*

Nobel Laureate & Physicist



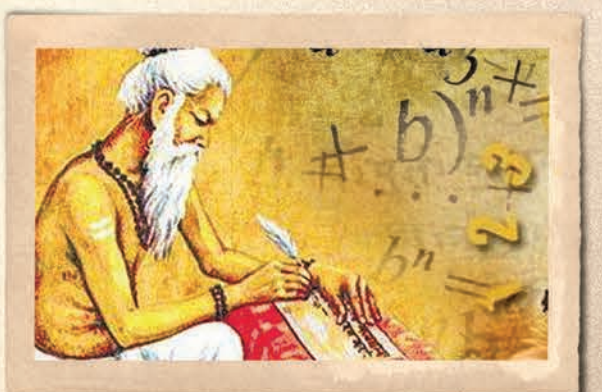
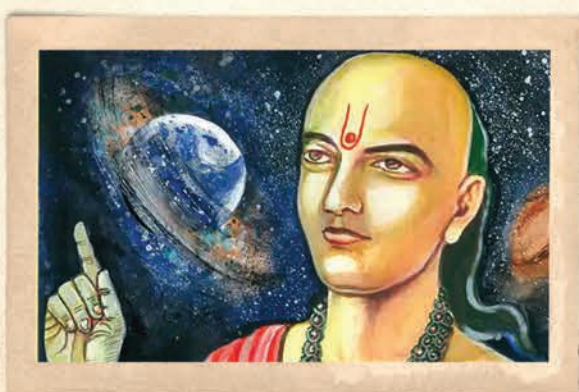
The legacy of Aryabhata, Brahmagupta, Bhaskara II, and Varahamihira of Medieval India can be traced back to older sutras, like the *Baudhyana*, *Manava*, *Apastamba* and *Katyana sutras* (800 – 600 BCE) and the *Sulbasutras*. The sutras forward the details of construction of sacrificial altars (*Yupa* or *Chaitya*) based on astral coordinates in the form of jaw-shaped orbs/arcs/chords (*jya*) footprints. Their origin dates back to the *Taittiriya* branch of the *Krishna Yajurveda School*. The binary units of Indian numeric sciences, i.e., *Sunya* (cipher or zero) and *Adwaita* (unity or one) are the twin basis of computational sciences today.



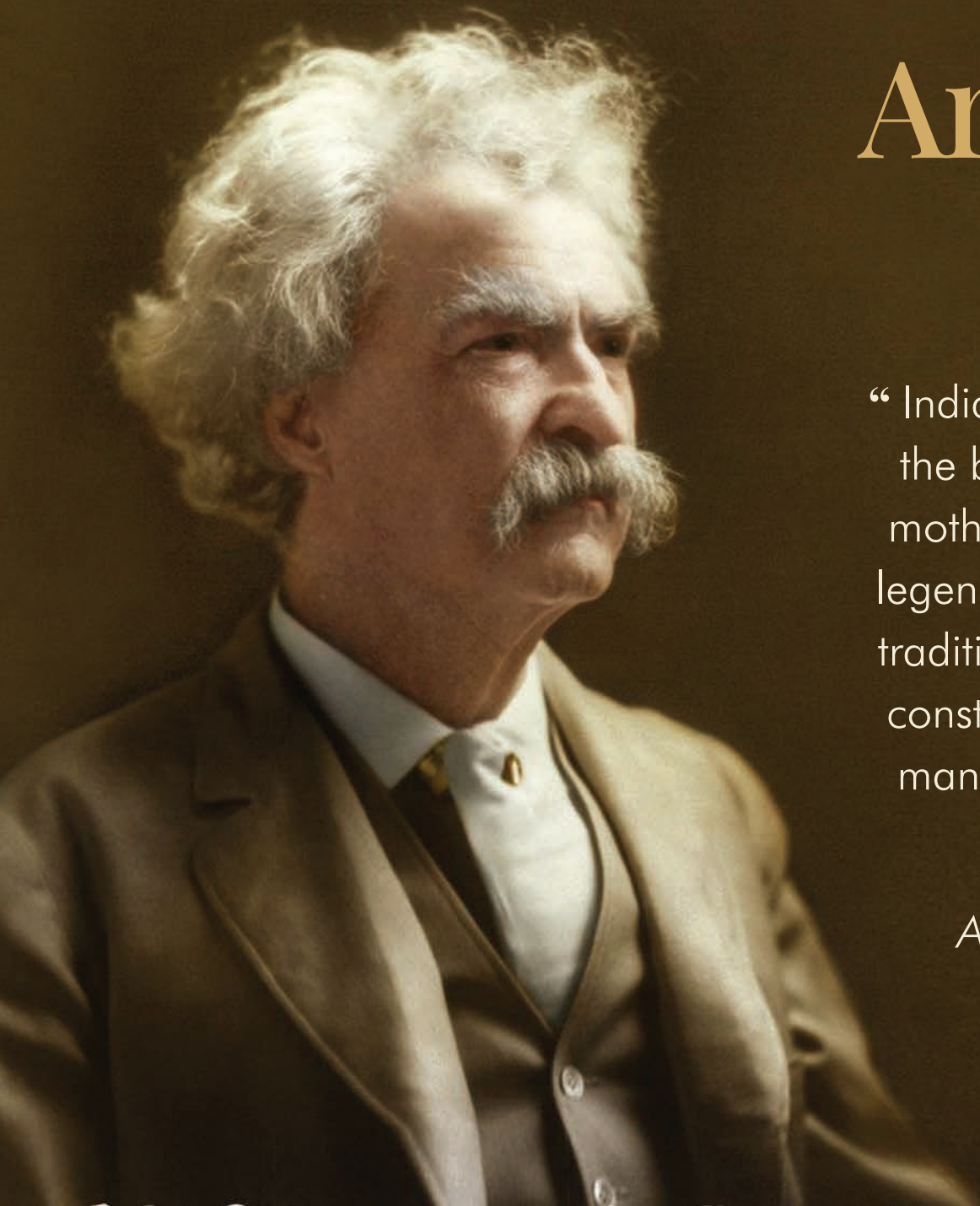
March

2021

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29 Holi	30	31			



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Arthashastra

Economics



“India is the cradle of the human race, the birthplace of human speech, the mother of history, the grandmother of legend, and the great grand mother of tradition. Our most valuable and most constructive materials in the history of man are treasured up in India only.”

– Mark Twain
American Humorist & Writer



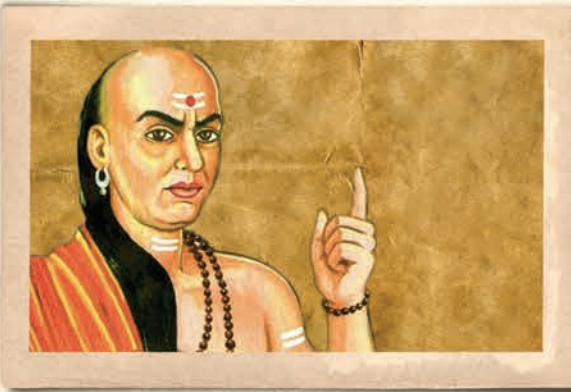
Kautilya (300 BCE) is often identified as Vishnugupta and Chanakya, who is traditionally credited as the author of Arthashastras. But the more ancient source of economic and cultural treatise of community planning, agricultural produce, mineralogy, mining and metals, animal husbandry, medicine, forests and wildlife can be traced back to Manusmriti, which is an older text belonging to the branch of Dharmashastra that is further based on an older discourse between Manu (Svayambhuva) and Maharshi Bhrigu. In the discourse, dharma (Dhamma or Domus) and related artha (worth) domains of environmental and community duties, rights, laws, conduct, and virtues are the stepping stone to higher spiritual goals (param-artha). The Hierarchy of Needs by Abraham Maslow today essentially represents that ancient construct of human evolution.



April

2021

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2 Good Friday	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25 Mahavir Jayanti	26	27	28	29	30	



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Rasayana

Chemical Sciences



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

– James Grant Duff
Scottish Soldier & Historian



In Indian metaphysics, Yoga means to transcend creation and ‘Yoke’ to unity (*Gyana-shakti*), and *Kshem* (Chem) means to sustain the diversity of creation (*Krea-shakti*). The two are polarized (*samavartana*) and they jointly represent the levitating and gravitating systems of human thought. Both are important, as it is said, *yoga-kshemam vahamyaham* (*Gita*, 9.22). *Kshem* represents an inner path (*ayana*) of arriving at the essence (*rasa*) of life by trans-mutating material or mercurial values (*Dhatugarbha*) to spiritual or golden values (*Hiranyagarbha*). The works of Acharya Nagarjunacharya and Acharya Nityanadhiya can be traced to such older texts, and they are revalidated recently by Acharya Prafulla Chandra Roy, who is the author of ‘A History of Hindu Chemistry from the Earliest Times to the Middle of Sixteenth Century’ (1902).



May

2021

SUN	MON	TUE	WED	THU	FRI	SAT
30	31					1
2	3	4	5	6	7	8
9	10	11	12	13	14 Id-ul-Fitr*	15
16	17	18	19	20	21	22
23	24	25	26 Buddha Purnima	27	28	29



*Depending on the appearance of the Moon



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Ayurveda

Biological Sciences



“Indian surgery remained ahead of European until the 18th Century, when the surgeons of the East India Company were not ashamed to learn the art of rhinoplasty from the Indians.”

– A. L. Basham
The Wonder That Was India, 1971



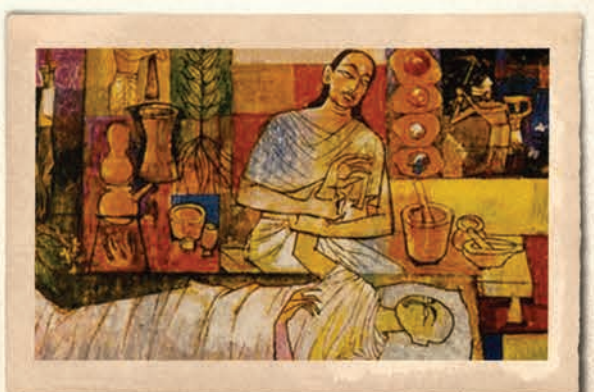
Charaka Samhita, Sushruta Samhita and other schools (100 BCE) of Indian health sciences can be traced back to an ancient lineage of *Dhanvantari*, a forerunning *Acharya* in Varanasi and a proponent of the school of *Bhargavi-samhita*, the *Bhargavi-Atharvaveda* and the *Atreya Samhita*. The eight components of *Kayachikitsa* (medicine), *Kaumara-bhrtya* (pediatrics), *salyatantra* (surgical techniques), *shalakyatantra* (ENT), *Bhutavidya* (material pathology), *Agadatantra* (toxicology), *Rasayantantra* (rejuvenation), and *Vajikaranatantra* (aphrodisiac treatments) represent the later ramification, continuous up to the primary health concerns of contemporary times.



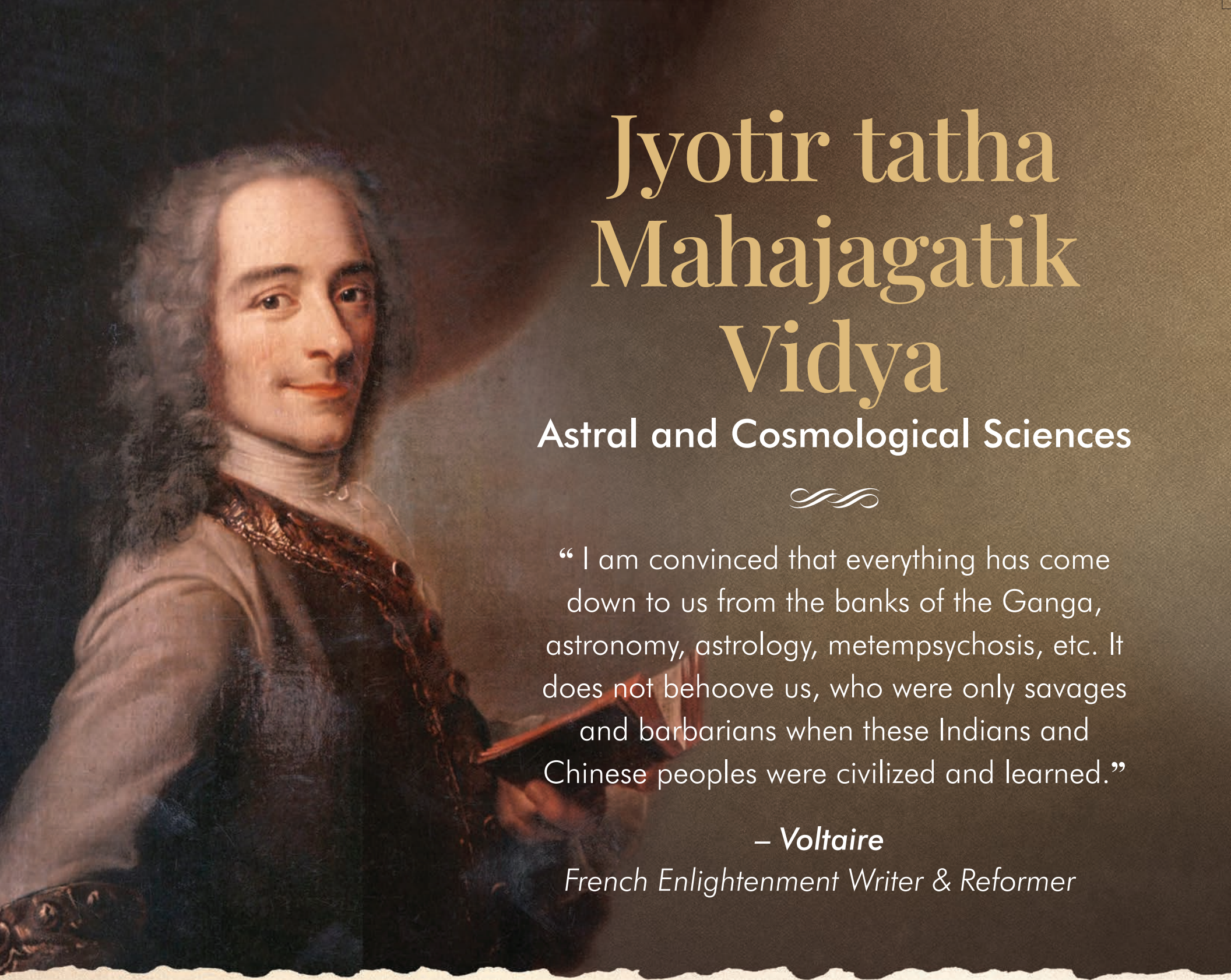
June

2021

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



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Jyotir tatha Mahajagatik Vidya

Astral and Cosmological Sciences



“ I am convinced that everything has come down to us from the banks of the Ganga, astronomy, astrology, metempsychosis, etc. It does not behoove us, who were only savages and barbarians when these Indians and Chinese peoples were civilized and learned.”

– Voltaire

French Enlightenment Writer & Reformer



A thousand years prior to ancient Greeks and Babylonians (3000 BCE), and of course, much prior to Galileo, Kepler, Copernicus and Tycho Brahe (1400 – 1500 AD), Indian cosmology and positional astronomy were fully aware of the geocentric, heliocentric and galactic patterns of the universe based on relationship between matter and energy, non-linearity (*Kalpa* and *Yuga* as cycles within time), and its effects on living entities. Gravitation between the macrocosm (*Brahmanda*) and the microcosm (*pinda*) has been the basis of the Law of Causation. Positional and fixed astronomy (*sayana* and *nirayana*) of heavenly bodies soon became the decisive foundation of the six wings (*Anga*) of Vedas, called the *Vedangas*.



July

2021

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
			Id-ul-Zuha (Bakrid)**			
25	26	27	28	29	30	31



**Depending on the appearance of the Moon



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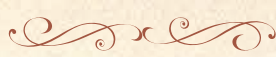
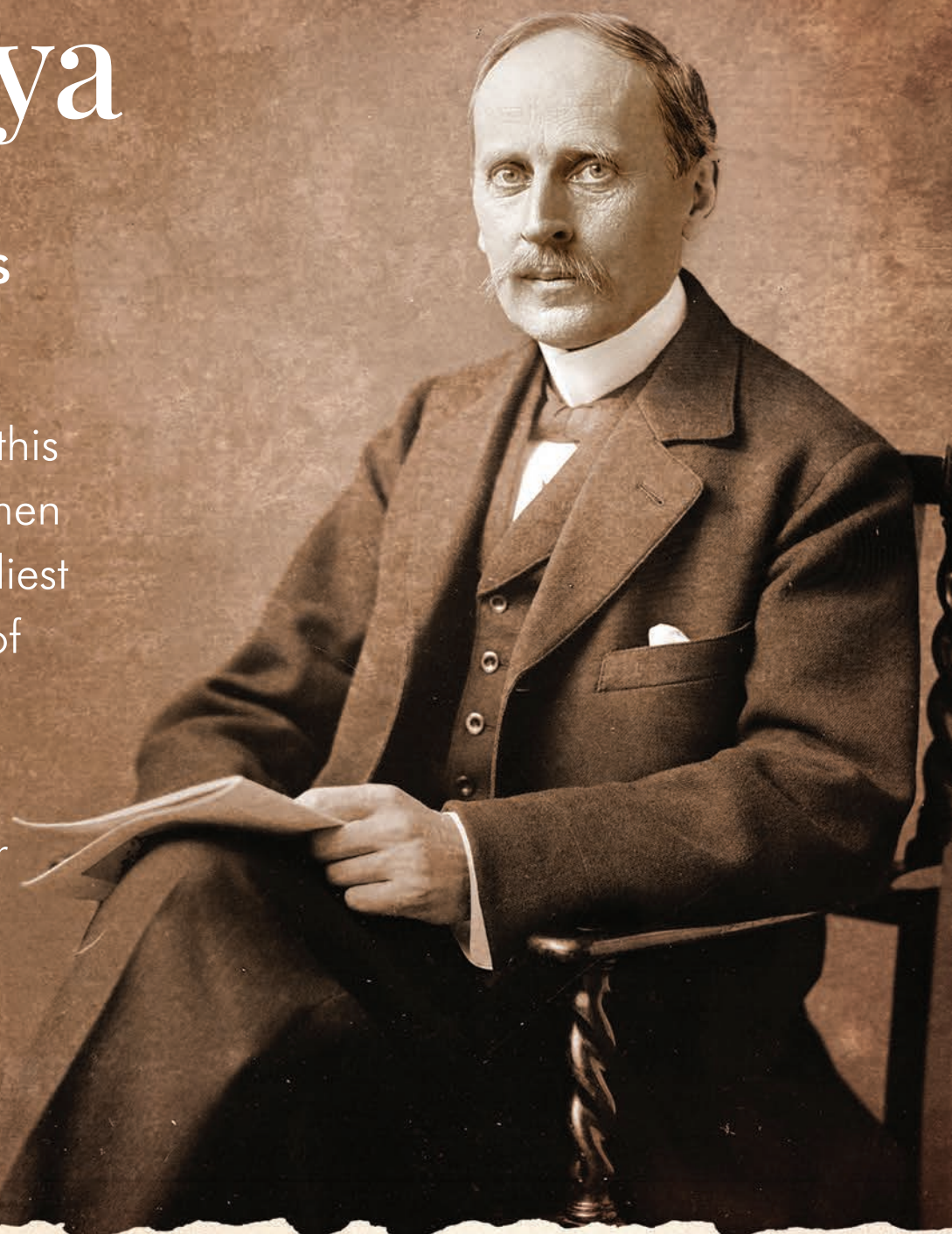
Prakriti Vidya

Ecological and
Environmental Sciences



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

– *Romain Rolland*
Nobel Laureate & French Philosopher



A holistic art of living combining the natural and the artificial is increasingly becoming significant today. The symbiosis of life with nature, her heterogeneity, her natural relationships, formulate life cycles of growth and evolution. Modern sciences call it ‘Deep Ecology’ or ‘Biocentrism’. Indian Ecological and Environmental sciences is increasingly revisited today as reductionism in science and subject to a paradigm shift in patterns of production and consumption, and a replacement of ‘competition’ by ‘cooperation’. Lessons from India’s green Aranyak settlements (forest hermitages) have fostered a vision of sustainable development. The Brundtland Commission of the United Nations (1983), the Kyoto Protocol (1991), the Intergovernmental Panel on Climate Change and the UNFCCC’s Paris Agreement (2015) represent the shift, which are to name a few only.



August

2021

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15 Independence Day	16	17	18	19 Muharram	20	21
22	23	24	25	26	27	28
29	30	31				



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Nandan Tatya and Vaastu Vidya

Aesthetics and
Architectural Sciences



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

– *Dr. Arnold J. Toynbee*
British Historian



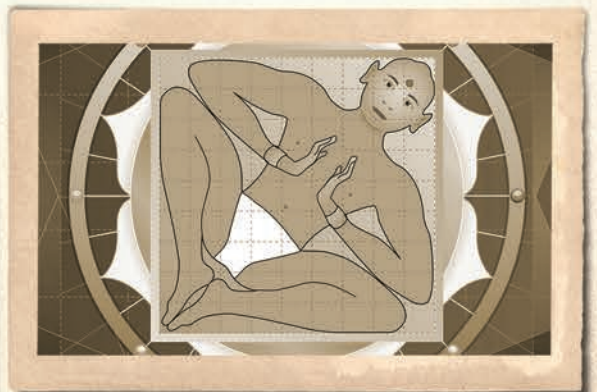
Indian *Shilpa Shastras* is always a holistic system of arts and crafts forwarding human-centric design principles that regard biocentrism and cosmology. One specific branch is *Vaastu Shastras* that deals with small building architecture to large scale country and town planning. Tracing from the 7th *Mandala* of the *Rig Veda*, it is further evident in the *Mamuni Mayan* texts of Tamil Sangam literature. From *Varahamihira's Brihat Samhita* to designs of medieval Jaipur City; the contemporary *Jawahar Kala Kendra*, and layout of the city of Auroville, the ancient traditions are carried down to the contemporary cosmogonic and anthropocentric designs. Similar examples are *Arkosanti* in Arizona and *Esalen Institute* in Big Sur, California.



September

2021

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		



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Nyaya Shastra

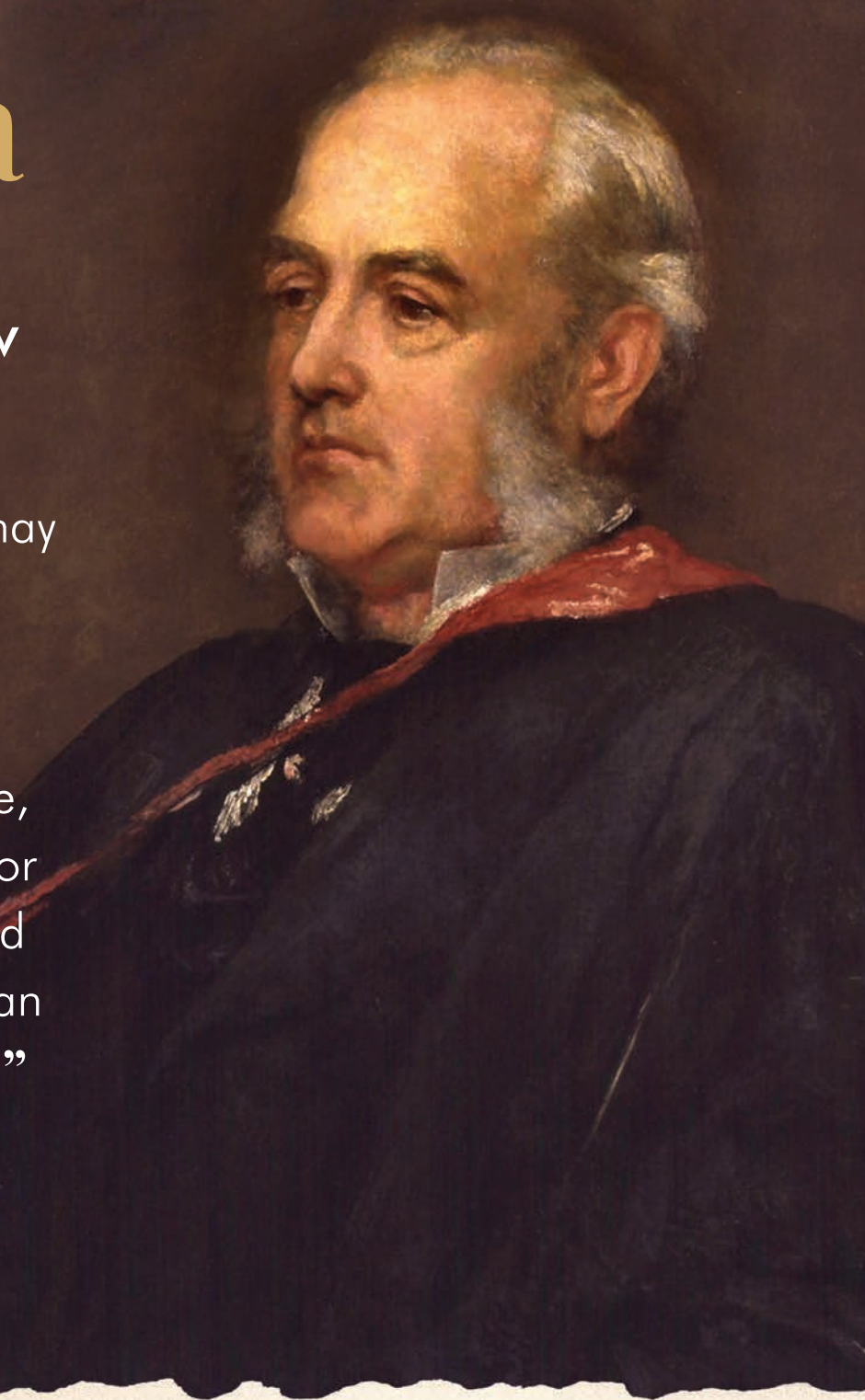
Systems of Social and Ecological Ethics, Logic and Law



“Whatever sphere of the human mind you may select for your special study, whether it be language, or religion, or mythology, or philosophy, whether it be laws or customs, primitive art or primitive science, everywhere, you have to go to India, whether you like it or not, because some of the most valuable and most instructive materials in the history of man are treasured up in India, and in India only.”

– Max Müller

German Philologist & Orientalist



Nyaya is one of the profound schools of Indian philosophy bearing a systematic development of the theory of logic, methodology, and epistemology. The Law of Causation, which is embedded in the ‘Hymn of Creation’, 10th *mandala* of the Rig Veda, is the foundation of principles of individual working ethics, collective welfare and universal knowledge systems. The sequential phases of human pursuit, based on *artha* (means of life), *kama* (pleasure), *dharma* (right conduct), and eventually, *moksa* (liberation) represent the most profound system of hierarchical human evolution. Even desire or pleasure is related to liberation where individual *Kama* expands to collective altruism and philanthropy, which is *Prema*.



October

2021

SUN	MON	TUE	WED	THU	FRI	SAT
31					1	2 Mahatma Gandhi's Birthday
3	4	5	6	7	8	9
10	11	12 Dussehra (Maha Saptami) Additional	13 Dussehra (Maha Ashtami) Additional	14 Dussehra (Maha Navami) Additional	15 Dussehra (Vijaya Dashami)	16
17	18	19 Prophet Mohammad's Birthday (Id-e-Milad)	20	21	22	23
24	25	26	27	28	29	30



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Shilpa tatha Natya Shastra

Classical Arts



“The ancient artist had deep feeling of being himself an integrated part of the cosmos and participating in all its categories and elements, a feeling acquired by innumerable generations in uncounted centuries of meditative experience.”

– Alice Boner
Swiss Art Historian



The *Natya Sastra*, a Sanskrit treatise on the performing arts is often attributed to sage *Bharata Muni* (500 BCE). But its aesthetic foundation, the ‘Rasa theory’, is the quintessence of all performing and fine arts. Here the performer experiences the expansion of his or her own consciousness (*Chid*) as an all-pervading and creative cosmic bliss (*Vilasa*). A certain work named *Abhinavabharati* by *Abhinavagupta* of Kashmir can be traced back to the *Agni Purana*, the *Kalpasutras* of the *Vedanga*, and even to *Rishi Agastya* (Rig Veda I.187.4). The entire tradition of Indian musical instruments, songs, dance and lyrics revolve around the orb of *Rasa* theory. For instance, the iconography of *Nataraj*, a cosmic imagery of Vedic *Purusha* or *Puranic Shiva*, is derived from the *Tandava / Tandya* school of the *Sama Veda*, i.e., the *Chandogya Upanishad*.



November

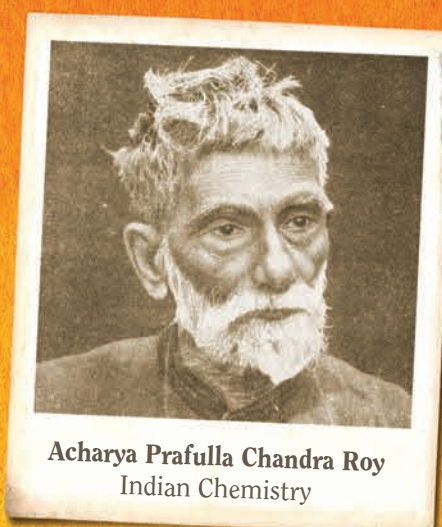
2021

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4 Diwali (Deepavali)	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19 Guru Nanak's Birthday	20
21	22	23	24	25	26	27
28	29	30				

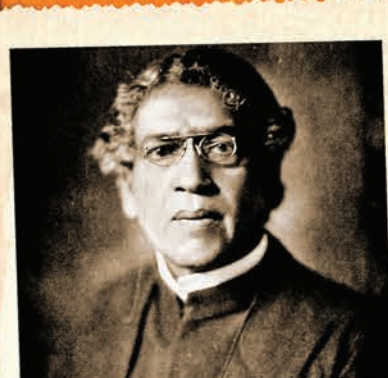


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Sapta Rishi of Modern Indian Science



Acharya Prafulla Chandra Roy
Indian Chemistry



Acharya Jagadish Chandra Bose
Indian Concept of Life Sciences



Acharya Srinivasa Ramanujan
Indian Mathematics



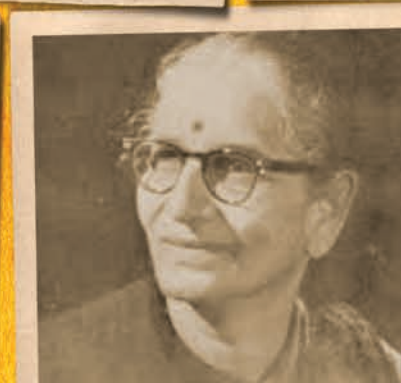
Acharya Satyendra Nath Bose
Indian Concept of Physics



Acharya Asima Chatterjee
Indian Organic Chemistry



Acharya E K Janaki Ammal
Indian Botanist & Plant Cytologist

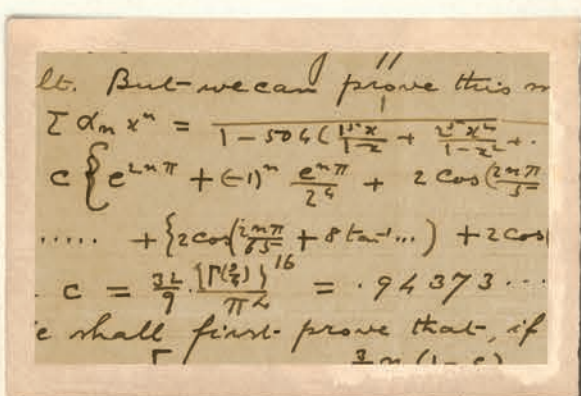


Acharya Irawati Karve
Indian Sociology & Anthropology

Today, India's intellectual, scientific and artistic knowledge traditions are an inseparable whole through which the lineage of classical thoughts, traditions and practices of Indian civilization has become more relevant in the contemporary humanity. From the archaic tradition of *Saptarshis* of times of remote antiquity to an era of modern Indian scientific mind, it is indeed a long historic legacy, which needs to be unlocked, deciphered and recognized. The key to this unlocking can be best attained through a patient revival of respect for green ethos, and a neutral scientific temper that is truly experimental and iterative. The future youth forces of India need to regain this temper, the very skill, or what is called *Kaushalam*. Hence, the motto 'Yogah karmasu kaushalam' (Gita). It stands for the real beginning of a full revival of Indian knowledge systems.

December 2021

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25 Christmas Day
26	27	28	29	30	31	



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A Calendar dedicated to Centre of Excellence for Indian Knowledge Systems (IKS)

Shiksha Mantri Shri Ramesh Pokhriyal Nishank announced the Centre of Excellence for Indian Knowledge Systems to be set up at IIT Kharagpur. Inaugurating the international webinar titled "Bharata Tirtha" organized by the Institute from November 6-8, 2020, Chief Guest Dr. Nishank congratulated the Institute for the continued work in various branches of the Indian Knowledge Systems (IKS). Director Prof. Virendra K Tewari, Director, IIT Kharagpur, expressed the need to acknowledge and incentivize research work on Indian Scientific Heritage through prestigious awards like Shanti Swarup Bhatnagar Prize. The Centre will create a comprehensive knowledge base by involving top international experts from the best universities and institutes of India and the world, who are pioneers in IKS in ten key domains to start with. The ten domains are highlighted in the present Calendar of Year 2021. Nehru Museum of Science and Technology, IIT Kharagpur has the immense pleasure to forward the same, the Centre will mainly focus on:

- ▶ Collation and aggregation of a constructive data base of works already done by experts within India and around the world
- ▶ Promotion of a digital archive of selected texts of IKS for all future research activities
- ▶ Induction of an advanced scientific methods of exploration and investigation – GPR based exploration; Laser induced breakdown spectroscopies and Photo-luminescence dating; Paleo radiology, CT computer tomography and micro-CT scans and Kirlian imagery; Paleo-botany and advanced geo-hydrological exploration studies; Decoding NLP and allied methods of language sciences using Sanskrit based on HMI and Natural language Processing algorithms; Advanced satellite imagery studies in landscape exploration; Image processing and advance visual software driven decoding of Iconographic exploration (semantics and semiotics); Exploration of advanced electrical sciences in health, healing, therapeutic and noetic techniques; and many more.

The Centre will promote all-round pursuit of research, development and application of Indian Knowledge System (IKS) based on:

- ▶ Proper methodological construct of recovery
- ▶ A recovery of interconnectedness of Cosmological, Ecological and Material Sciences of IKS and the modern sciences. It is now time to recover these interconnections and delineate ways and means garnering the application in the contemporary societal framework. Thus a recovery of the ancient Indian way in our contemporary framework is the need of the hour. It will promote:
 - A holistic framework of education based on integration of the Indian value systems and deep ecosystem approach, and the modern sciences
 - A science of holistic living and livelihood integrated with principles of green production, consumption, and near equitable distribution.



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SUPPORT SYSTEM AND LAYOUT DESIGN

Dr. Arnab Kumar Hazra