



Dharampal Centenary Webathon

(July 2021–June 2022)

*Revitalizing India: Celebrating the Birth Centenary of
Shri Dharampal (1922-2006)*

Session 1, 21st August, 11am – 1pm

*India's Historical Achievements in Science and
Their Contemporary Relevance*

ABSTRACTS

THE STUDY OF INDIAN ASTRONOMY AND ITS RELEVANCE TODAY



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Serious work on Indian astronomy has been going on for nearly two centuries, with a view to disseminate it among the modern educated audience in India and elsewhere, though not always with the same vigour, respect or enthusiasm. For some of us, there was a fresh impetus and focus provided by the now-famous book of Dharampala on traditional Indian science and technology in the 18th century. Thanks to scholarly work carried out over a long period of time, including editions of manuscripts, translations and explanations, the concepts and methods of Indian astronomy are now better understood. This is particularly true of the well-formulated *Siddhantic* astronomy. The efforts of the last half century have provided a great deal of understanding of the post-Bhaskara period, especially the important work of the Kerala School. There is still a lot more to be studied and comprehended about the Indian tradition of astronomy, especially in the very ancient period.

It has been noted that the Indian method of doing astronomy is different from the methods in other civilisations. Broadly, it is algorithmic, more flexible, direct and simple. The study of its methods may provide some clues in the search for alternatives to the presently dominant reductionist approach to science. There is another important aspect of its relevance, namely, a large part of the daily lives (both religious and secular) of Indians is governed by the Indian concepts of time, the cardinal directions, the calendar, and other astronomical concepts. Therefore, it is very essential that these Indian astronomical features find a prominent place in our school and college curricula. This is not only for promoting 'Indianness', but also to familiarise students with Indian astronomy's scientific aspects which are distinctive.

THE HISTORIOGRAPHY OF THE KERALA SCHOOL OF MATHEMATICS AND ASTRONOMY



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It is fairly well known that Mādhava (c. 1340) of Saṅgamagrāma discovered the infinite series for π , *sine* and *cosine* functions in a way that is profoundly different from the way it was invented in Europe almost three centuries later. As any other formula in mathematics, all these infinite series were couched in the form of short and beautiful verses in Sanskrit. What is not so well known among the historians is the intellectual atmosphere that was prevalent among the colonisers who were controlling the narratives of history around 1820s when Charles Whish discovered these series in Kerala and tried to communicate it to his counterparts in Europe as inventions of the 'Natives'. It is quite interesting to note the exchanges that took place among the three, George Hyne, John Warren and Charles Whish in 1820s regarding the invention of the series by native Hindu mathematicians.

Although C. M. Whish, a civil servant of the East India Company, had authored his paper in 1820s and communicated it to his seniors, this remarkable paper gets published only in the year 1834—almost a decade later. During the talk, besides the content of this paper, we shall also try to present a flavour of the exchanges that took place with reference to this paper, based primarily on the notes made by John Warren in his *Kālasaṅkalita*. The fact that this historical paper of Whish somehow seems to have gone unnoticed for almost a century till C. T. Rajagopal and others took note of it in the 1940s, is by itself an interesting episode in historiography of science.

THE STATUS OF SCIENCES AND HIGHER LEARNING IN 18TH CENTURY INDIA



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Sri Dharampal's book on *Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts* (1971) showed that Indian sciences and technologies were functional in the eighteenth century and evoked considerable interest among the European observers. The European accounts of Indian sciences given in the first part of that book describe the sophisticated but simple methods of computation that were in use among Indian astronomers and mathematicians. The accounts on the science and art of Medicine describe the widespread practice of inoculation against smallpox (based on a sophisticated theory of germ infection) and the prevalence of skilful surgical practices among various Indian communities.

Sri Dharampal's book *The Beautiful Tree: Indigenous Indian Education in the Eighteenth Century* (1983) offers a fascinating picture of the extent, inclusiveness and the sophistication of the system of education which was prevalent in India in the 1820s and 1830s, based on the extensive surveys conducted in the Madras and Bengal Presidencies. It highlights the fact that there was a large number of 'colleges' where the students were given advanced training in the sciences of Language, Logic, Astronomy, Mathematics, Medicine and other disciplines, based on the various treatises that continued to be composed on these subjects during the 17th and 18th centuries.

The British implanted system of education led to a total neglect of Indian sciences and technologies. We briefly indicate how our institutions of higher learning need to carry forward the seminal work of Dharampalji, so that India can regain its creativity and genius, and our current endeavours in science and technology can be deeply informed by and in continuation with our great tradition of science and technology.