

Knowledge beyond time ...

# इवलवित



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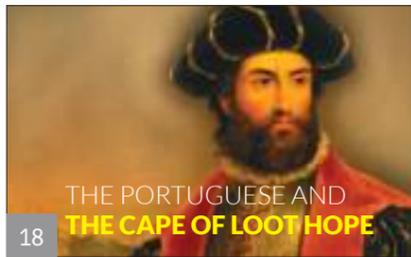
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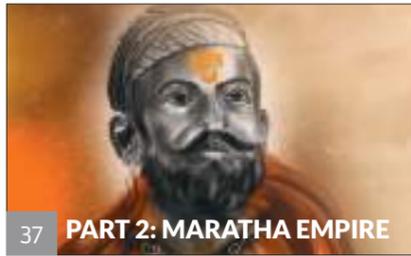
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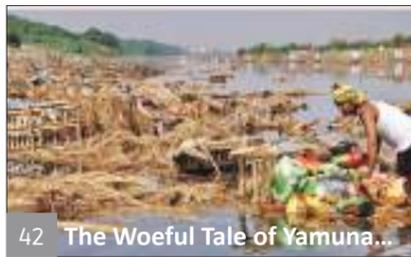
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A classical literary art form that involves multitasking and extempore versification

## EDITORIAL

At the time of independence in 1947, India was home to scholars whose expertise made them peer to any learned man in the world. They were heirs to the longest unbroken multicultural literary tradition in the world, and produced editions and literary and historical studies of texts in Apabhramsha, Assamese, Bangla, Brajbhasha, Gujarati, Kannada, Malayalam, Marathi, Oriya, Persian, Prakrit, Sanskrit, Tamil, Telugu, Urdu—the list could go on because the list of Indian languages goes on—that are still in use widely today. Two generations later their works have not been replaced not because they are irreplaceable but because there is no one capable of replacing them. Indeed, if Indian education and scholarship continue along their current trajectory, the number of citizens capable of reading and understanding the texts and documents of the classical era will very soon approach a statistical zero.

Efforts, however miniscule, must be made to recreate an interest in critical classicism, and with this issue, Samvit takes a definitive step in that direction.

On this issue, we introduce three new article series—“The Why of Ramayana”, “On the meaning of Mahābhārata” and “Introduction of Shastric Treatises”. Along with the series “The Wonder That Is Sanskrit”, they are the creative analysis and introduction to influential epics, Sanskrit literature and Shastric treatises in India. The timeless universal wisdom contained herein has provided guidance to both laymen and the learnt on leading a meaningful life along the path of Dharma for millennia, by capturing millions of hearts and minds through the exquisite and effective use of language. Stanley Rice famously said,

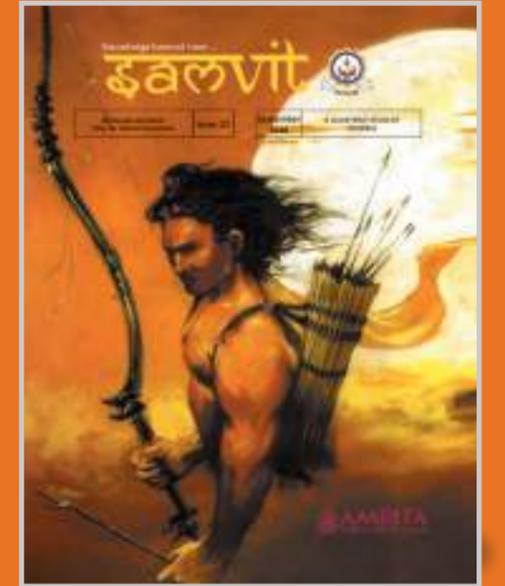
*“[the Indian epics] are living and throbbing in the lives of the people of India, even of those illiterate masses that toil in the fields or maintain a drab existence in the ghettos of the towns. To such as these the famous old stories are the music and color of life. They are the perennial fount from which the oft repeated draughts never quench an insatiable thirst. In the king’s palaces and in the peasant’s huts you may still here the grand legends of the Great War and the pathetic sufferings of Rama...”*

The answers don’t reside in any single space, but through various disciplines. They are manifestations and paths that can direct us back to the origin - the ultimate light within. You’ll also see some insightful articles, as we explore the realms of arts and culture, history, significance of temples, mathematics and environmental issues, together with Amma’s teaching and the insightful interview with Śatāvadhāni Dr. R Ganesh.

We hope you’ll enjoy this issue.

From the Editor’s desk

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SERIES

# Teaching of Mata Amritanandamayi Devi

Every Single Minute...

We all are leading a life which is like a roller-coaster ride. It may rise to such a level that will make us feel as if we are the most happy person in the world, while it may also drop down to such a point that we may start doubting our own existence. Life is a mixture of both victory and failure. We cannot lead a life with only one of these components. So, we must not get overly euphoric when we succeed, nor should we get depressed when we fail.

Facing obstacles is what will make each one of us mentally and emotionally strong. If our life just flows like a river calmly without any interference, one is actually missing out the real adventures of life. There are two ways in which people interpret these obstacles. Most people consider obstacles a disturbance and people with such thoughts, will definitely end up getting annoyed and give up, which shows their lack of ability and self-confidence. Some others will consider it as a challenge to be

overcome in every possible manner, and will happily welcome the obstacle coming in their path to success. A person having this type of mentality, will definitely progress in life, because of the strong self-confidence and determination.

There is a small story in connection to this thought.

One day, a small gap appeared in a cocoon through which a butterfly had to appear. A boy, who accidentally passed by, stopped and watched how the butterfly was trying to get out of the cocoon. The butterfly was trying very hard, and the gap was very small. It seemed that the butterfly would lose its energy soon. The boy decided to help the butterfly. He took a penknife and cut the cocoon. The butterfly immediately got out, but its body was weak and feeble, and the wings were barely moving. The boy continued to watch the butterfly, thinking that now its wings would spread and it would fly. However, that did not happen. For the rest of its life the butterfly had to drag its weak body and wings that weren't spread. It was unable to fly, because the boy did not realize that an effort to enter through the narrow gap of the cocoon was necessary for the butterfly, so that the life-giving fluid would move from the body to the butterfly's wings and that the butterfly could fly. Life forced the butterfly to leave its shell with a lot of effort, so that it would become stronger and would be able to grow and develop. If we were allowed to live without meeting difficulties, we would never become able-minded. Life gives us challenges only to make us stronger.

When we say that life is all about facing new challenges, and learning something new, we should also focus on living in the present moment. Wasting our time and effort by worrying unnecessarily about the coming future will lead us nowhere. Merely thinking about one's family will not benefit them or us. All we have is this very moment. Only if we act intelligently in this moment will our future be safe and secure. It's not that we shouldn't think about the future. However, worrying about what is going to happen is like lying down to sleep under a tree inhabited by a venomous snake.

Here is another small anecdote to illustrate this idea. It is about a normal little snail, which was invited for coffee by the racing snails on a particular day; the only problem was that the

ordinary snail was very slow and it enjoyed doing everything slowly. The meeting point with the faster snails was quite far. Nevertheless, the little snail decided to accept the invitation and to 'hit the road' directly in order to arrive on time two days later. On its way it passed through a field of fresh salad and found that it had never seen such great salad in its life. It hence stopped to eat. Then it got tired and found a perfect place to sleep. At the back of its mind lingered the thought that it would be late for the get-together. But then it simply decided to enjoy the present moment and everything it saw along the way. In the end, the snail got delayed and by the time it reached the venue, all the other snails had already left. The cake was eaten without even a single piece left and the coffee can was empty too. A little bug walking by wondered why the snail was looking so happy and content although there was nobody left at the party and thus questioned it. The snail simply responded that it did not matter as now it would have all the time it needed to enjoy the journey back and do everything slowly as it was used to. It beautifully illustrates how much better it can be to walk mindfully through the path of life, by enjoying each and every single moment of it instead of running without noticing what is happening around us. We should enjoy our journey of life and stop striving for something far away in the future. We have the opportunity to be happy now and it is up to us to decide how to live our lives.

One thing is certain - we really never know what the future holds, and so we should always work hard in order to achieve our dreams and make the most out of any opportunity that comes our way no matter what happens in life. ♦

Ashni manish bhagvandas  
S4 CSE-B

Rationality is a luxury that curious minds seldom afford to miss. The inventions of the world, visible and invisible to the naked human eye, are both indeed results of curiosity's marriage with rationality. All visible achievements of mankind seem byproducts of a higher quest. If there ever was a quest by humankind worth all the life and the very existence of human race, it is the quest of the mysterious human mind and its vibrancies. Perhaps, it can also be said that all outer pursuits eventually lead one to the pursuit of "the one" within. India, formerly known as the nation of bhā-ratas and hence called as Bharatha was a land of such pursuits as the name itself suggests. A nation of men and women with a serious penchant towards the ultimate light-bhā is Bhāratha. This is evident by many achievements inferred from the Vedic texts. The Vedic culture that has for so long stood undeterred, comprising details of all such quests, the intricacies and nuances of human mind still continues to awe and wow the intellects around the globe alike and draws attention of every researcher and enthusiast about its core strength.

The strength of any culture lies in its legacy of tradition and customs. Culture is an abstract which can be comprehended by the customs and traditions that follows it. The Vedas are in fact a comprehensive representation of that abstract. And all that which has followed that exemplary idea in all of its conception to execution came to be known as Vedic culture to which this great land of ours bore space and stood as evidence. It is perhaps the whole idea of beings' beginning and completion as an ultimate light that has enabled the famed oriental culture of the east, i.e., the Vedic culture to survive and thrive over the years.

The pursuit of that absolute light by our ancestors, the sages, can be paraphrased as an attempt to comprehend the rationality behind the existence of mankind which led them to the omnipresent light whence from all forms of knowledge cascaded, and a dedicated pursuit of any of those streams of knowledge will therefore lead one back to their origin, the one absolute light. All arts and all sciences has entirely been a study of the absolute light, its various ways of manifestations and paths that lead the mankind back to it, for that absolute light is all creatures' original form.

Beauty of our Vedas, Epics, śāstra-s and all forms of literature is both description (śamsanam) and discrimination of dos and don'ts (śāsanam). The same text works both ways. Rāmāyaṇa, an epic, has been the cornerstone of Indian nation and its mentality. From Rāmāyaṇa's influence on people's lives to its contribution to the imagination of poets' genius (pratibhā) to political gains to communal clashes, Rāmāyaṇa has been at the center of this nation's evolution. An epic with this magnitude of influence on laymen and scholars alike will most certainly arouse curiosity. Of all the questions one can fathom on a subject, the 'why' of it has the utmost prominence. The question 'why' summarizes and brings the entirety of the subject. Hence the 'why' of Rāmāyaṇa needs to be addressed. It needs to be addressed in two segments: firstly dealing with the broader and generalized notion, the Rāmāyaṇa's literary form of an epic. Secondly, analyzing Rāmāyaṇa as an epic.

Questioning in Vedic texts is predominant with the 'what' part

of the subject. usually it is the one place. While in the form of the uddeśa: critical and of a subject vidheya. In an epic and shall be

The desire phenomenon times, man's effective desires and tools for expressing (actions) and speech. the most convincing form of expression. the only other grammarian as 'bhagavān' by the later alongside Patañjali argues that of speech is for the purpose of

"प्रत्यक्चैतन्येऽन्तःसन्नविशतिस्यपरस थाव्यक्तरिभषियन्दते". On the other concept of abhinaya proposed in is no different from communication.

All scriptures, by and large, discuss the earnestness of speech and its effectiveness in communication. Although Nāṭyaśāstra does emphasize and discuss the effectiveness of various ways of abhinaya, it clearly states that one must concentrate his focus entirely towards mastering the speech as the mode of abhinaya, as the entire nāṭya relies on speech. "वाचयितनस्तुकरतव्योनाट्यस्येयंत नूः स्मृता". Even though the stress seems to be on speech constituting the body of nāṭya, it is but to be understood that speech embodies the entire universe and hence it is the most important and distinguishable medium of expression amongst all species.

Speech as a medium is effective in three phases as it caters to a vibrant array of intellects. Thus, speech was further classified into three by the critics- kingly, friendly and lovely i.e. प्रभुसम्मति, सुहृत्सम्मति, कान्तासम्मतिच. The Vedas and the scriptures order the dos and don'ts for humans in a kingly manner. There is no room for negotiations or reconciliations. Just as a king's words, words spoken in Vedas cannot be challenged or changed. Hence, the inclination towards these is less when

While 'what' and 'how' of a subject determines the course of it, the 'why' of that enables one to get into it at the first the कर्मावयेत्, केनभावयेत्, and कथंभावयेत् वधियांशः, the कमिर्थं and कपिरयोजनं form The uddeśa and vidheya are the most integral part of any subject. The 'Why' is uddeśa and the 'what' of a subject is both assessments of Rāmāyaṇa, first as then as Rāmāyaṇaitself, the 'why' of it dealt.

to express is the most natural of every living being. Since known efforts have been towards communication of his inner emotions. Most used themselves are gestures. Speech is arguably and effective form of expression. Bhartrhari, to be called grammarians the dawn expressing.

म् बो ध ना र् hand, the Nāṭyaśāstra

# the 'Why' of RAMAYANA

**Vishwanath.M.V.**

Assistant Professor, Amrita Darshanam, Amrita Vishwa Vidyapeetham, Mysore Campus.

as medicine but at the same time, it is very welcoming and easy on even the most underdeveloped intellects and commoners. This was our sages' way of social and cultural expansion of Vedic wisdom and making it available to the mass. The core remains the same whereas the way it is represented varies from one another.

The need for such a literature is relevant at all times as the world is filled with people of various levels of intellect. Even so, for higher intellectuals, the same thing does the work with lesser effort. Hence the literature is for one and all. Bhatta Tauta, the guru of Abhinava Gupta argues that everyone is capable of comprehending rasa. "काव्ये रसयति सर्वो न बोद्धा न नयोगभाक्". The core purpose of all Vedic culture is achieved with a certain amount of ease by even ignorant laymen through literature says the author of Sāhitya Darpaṇa, Vishwanatha.

"चतुरवर्गफलपराप्तः सुखादल्पधयामपी काव्यादेवयतस्तेनतत्स्वर्पुनगिद्यते॥".

Literature as

such is neither a hindrance nor a distraction for anyone

from achieving the ultimate purpose of

human life. It is, in fact, the best path provided by the

sages for the wellbeing of the entire world. What may seem for a few as an obsession of our forefathers of heading back to Vedas for everything is a privilege and a luxury that many can seldom afford. The Vedic wisdom has always been all inclusive and literature is the best form to showcase it and reach the mass. Due to its reach into the hearts of people, literature is the most relevant form of knowledge conveyer and thus relevant at all times. Things that stay close to people's hearts are usually those which are experienced by the soul. There is no better vehicle than literary forms like epics to guide people on the path of virtuousness. The purpose of whole literature was thus summed up by Mammata in his magnum opus, Kāvya Prakāśa, "रामादविद्वर्तित्वयं, नरावणादवित्". To educate the people of all classes by the virtue of unparalleled bliss is the purpose of all literature.

To sum up the first part of the 'why' of Rāmāyaṇa, we can say that since literature is a manifestation of the lovely variety of speech and originates from the public life as mentioned by Bharatha muni in Nāṭyaśāstra and is dedicated entirely to the betterment of humankind, all literary forms are relevant and necessary for the world. So, for this world to be a better place and for mankind to walk the path of righteousness, literary forms like epics are essential. ♦

compared to other forms of speech.

The itihāsa-s and purāṇa-s try to deliver the same message albeit with a small difference in approach. They present all the goods and evils, instead of just asking them to do and not. They take the listeners to the next level by developing reasoning. Just as a friend points out pros & cons and lets one to take the decision on his own, the itihāsa-s and purāṇa-s do tell us about the pros and cons. Hence they fall into the category of friendly speech.

Literature works the same requirements but with an approach that is similar to a lover. By constructing stories, literature proposes the right and wrong in a sweet way. As the critics point out, literature, through lovely speech, is like a sugar-coated or honey-dipped medicine. It works as effectively

# Yaksagana

India is abundant with several forms of art. One such performing art is Yakṣagāna which was largely practiced in Karnataka and Andhra Pradesh. In the recent years, however, this form of art is limited only to the Karavali and Malenadu regions (South Canara, North Canara and Udupi districts) of coastal Karnataka.

The word Yakṣagāna means the 'song of the demi-god' ('Yakṣa' is a kind of demi-god and 'Gana' means song). Art forms of Karnataka such as Doddaata, Moodalapaaya, Ghattada Kore, Kelike; those of Andhra Pradesh such as Kuchupudi, Chindu, Torumelam, Maalayakshaganam; the art forms of Tamil Nadu such as Melutturu Bhagavatamelam, Terukuttu; and those of Kerala such as Koodiyattam, Krishnanaattam and Kathakali can be considered siblings of Yakṣagāna. From a broader perspective, Yakṣagāna resembles Kathakali, though the two differ in their subtleties; both give different flavours. Yakṣagāna is a theatrical art form. It is a blend of dance, music, dialogues, costume and stage technique.

In an exclusive interview, the Yakṣagāna artist Prabhakar Joshi has said that the art form hasn't been developed in a day or two. The form we see today, dates back to the 15th century, giving it at least 500 years of history— there is enough historical data to corroborate the same. At the end of the 19th century and in the beginning of the 20th century, the art form started getting popular. Currently, there are more than two thousand choreographies, and a collection of more than five lakh songs. Yakṣagāna is performed mainly in temples, as the story which is performed is mostly related to the deity. Hence, the audience for Yakṣagāna are mostly devotees, who come to see the story of their deities being performed. Devotees even please their deity by sponsoring a performance of Yakṣagāna at their place. As of today, we can see there are thirty to thirty five troupes performing in such places. The artists believe that the Yakṣagāna is one of the most lively theatre arts to be seen. Yakṣagāna has stories from the Hindu Purāṇas. In any art form it is very natural that there will be experiments with new contents, but the diversion of some artist towards more filmy scripts has led to the degradation of the original and classical flavor of the art.



**Ajith Pai,**  
1st BTech – CSE, ASE, Bangalore

Yakṣagāna is performed over several nights, i.e., from dusk to dawn; the length of the performance depends on the story being performed. In the recent days, we have seen performances which are of shorter durations too. Some of the shorter performances, that are 4-5 hours long, have now been shortened to performances of even 45 minutes to 1 hour. The artist needs to wear heavy makeup to get into their character. They need almost 30 to 45 minutes to wear the makeup, once they are used to the regular acts. Ganapathi Hegde, a senior Yakṣagāna artist has said that the dance routines can be tiring in the early days but later, with continuous practice an artist gets used to the routine. He believes that an artist has to be energetic and needs to understand the story. He will then need to understand the nature of each character - this allows the artist to flexibly get into the shoes of any character of the play. Artists are trained for performances in Yakṣagāna schools by gurus, who take up the role of Bhāgavatas. There are exclusive Yakṣagāna schools nowadays but in the past these classes were conducted in temples. This environment was a treat to the artist as they performed the story of the deity from the Purāṇas in front of the deity itself.

The musical ensemble of Yakṣagāna consists of artists called Bhāgavatas (singers), who sit behind the dancers. The Bhāgavatas actually act as the narrators of scene and they do this by singing out the story lines. A typical Yakṣagāna performance consists of background music played by a group of musicians (himmeḷa)

and the dance and dialogue group (mummeḷa), who together enact poetry on stage. The instruments used as a part of the musical ensemble are chande, Talas, Maddale. The recent times have seen involvement of film songs and commercially available popular music, which has tainted the purity of the art form.

All the art forms of India mentioned above have two modes of communication called dharma -Loka-dharmi (realistic) and nāṭya-dharmi (stylized). They also have four modes of Abhinaya (means of communication), namely, āhārya, āṅgika, vācika and sāvika. The dharmis are rooted in the different modes of Abhinaya. We will need to understand the evolution Yakṣagāna by keeping these principles in mind. Āhārya is the communication through costumes used in the art form. A well-known Yakṣagāna artist Ganapathi Hegde exclaims that the costumes weigh about 20 to 30 kg in total – it indeed is a challenge to dance wearing such heavy costume. Artists eventually get used to it with practice. He even interestingly explains how with modern techniques, the costume is made lighter. He mentions the use of thermocol in place of the traditional wooden materials for the head decoration. Yakṣagāna involves more of nritya (expressive dance) to communicate emotions and stories.

There are different regional and sub-regional varieties in the Yakṣagāna of Karnataka. Tenkutittu is the southern coastal variety and the Badagutittu is northern coastal variety. Both these variants are similar to each other in many aspects. The

costumes used in Tenkutittu are similar to those of Kathakkali. Though the Badagutittu has retained its rigour, its classical touch has been lost in some of the professional performing troupes. Chindu-Yakṣagāna, yet another variant has retained its lively āṅgikābhinaya (gesture language). Tenkutittu lacks good footwork, which is due to the employment of unaesthetic rhythm pattern, which in turn has led to poor hand and body movement. Of late, we see that artists tend to resort to more of high speed swirling and somersault like movements that constitute nr̥tta. But thankfully, Tenkutittu uses hastaabhinaya (hand gestures) well and incorporates Loka-dharmi too. Moreover, it is embellished to a certain extent by different sthānakas (stances) and recakas (subtle movements of hip and neck). The Badagatittu Yakṣagāna has more lāliya (gentleness), and ojas (energy) and freedom for movement, as it uses rhythmic patterns which are even. The parikrama (circular movement) make this form more attractive to watch. In Yakṣagāna, once the singing and dancing are over, the actors start conversing on the stage (vācīkābhinaya). The advantage is that as the dialogues are already scripted, it gives the actors more mind-space to develop upon āṅgika (body language), even while speaking. Experienced artists can also come up with dialogues extempore, that adds to the entertainment value of the art. All the characters wear similar costumes and cosmetics, this is something you should bring your attention to. Krishna, Shiva and Vishnu – all these characters have their skin painted blue. The characters are mainly

differentiated by the artist's expressions and his dialogues.

The play usually starts with the Bhāgavatas singing to the music of the instruments being played for some time, until the actors come on stage. The performances can be compared to western traditional operas as well. The collection of Yakṣagāna poems that form a part of the musical drama is called prasaṅga. The male actors portray both masculine and feminine characters. The design of costumes is similar for all characters but they differ in the headgears that are designed differently for portrayal of kings and demons. To lighten up the narrative, humor is introduced by having a character called hāsyagāra, i.e., a clown, and doesn't actually hold any significance to the story of the act. This art is mainly performed in Kannada language, but due to the popularity of this in the recent times they have inculcated many other languages as well.

Yakṣagāna is a seasonal art form and only some troupes perform on the stage throughout the year. This has gradually come to be seen as a drawback for the artist, as they see it as a sort of unemployment, off season. Thus, large number of artists pursue and perform the art as a hobby, rather than a full time profession. This has impacted the seriousness in performances. Artists need to be much disciplined to be prepared for a performance. Ganapathi Hegde sighs saying that it is very painful to see artists taking to drinking and other bad habits. He narrates his life experience where his conservative family made him take an oath before their family deity that he would not be driven by such habits. When



enquired whether it is necessary for an artist to be under the influence of alcohol for the sake of dancing, he assured that it wasn't the case at all, citing his own example. He exclaims that the artists claim that they need to drink to be able to perform well, just as an excuse to justify their addiction to drinking.

The recent times have plays being enacted abroad as well, making the art reach out to the global audience. The art, being an adaptation of the Puranas, is a good means of suggesting values for the betterment of the individual and the society. In essence, Yakṣagāna is a wholesome theatrical treat that can entertain both the layman and the learned alike. It is truly the pride of Karnataka and stands as one of the artistic symbols of the state. ♦

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Thanks to the review by Shashank S, 1st year BTech – CSE, Amrita School of Engineering,

# Sanskrit literature – An Overview

(Under the series "The Wonder That Is Sanskrit")

A search for the earliest works of Sanskrit literature will take us back by at least two thousand years to the great epics, the Rāmāyaṇa and the Mahābhārata, and to the Vedic corpus which predates the epics by a few thousand years. Sanskrit was called 'Deva-bhāṣā' ('Divine Language') even during the Vedic period and this gives us a hint of its antiquity. It is possible that the language came to be called so because of the large corpus of the 'brāhmaṇas' (ritual components of the Vedas) that is considered 'Karma-kāṇḍa' and due to the equally large literature of the Upaniṣads, widely considered the jñāna-kāṇḍa, the former yielding other-worldly fruits and the latter, mokṣa. The Sanskrit of the Vedas was probably not spoken even by the sages who performed the rituals, and they might have spoken the Sanskrit we know today. As with any other living language, Sanskrit underwent dynamic changes through the centuries. The language of the common man that varied with regional tastes was called the Prākṛt. It is hard to say which of the two is older – Sanskrit or the several Prakrits. Even as Sanskrit grammar was taking its shape, several varieties of Prākṛts co-existed with it. It is also likely that Pāṇini wrote the sutras to formalise all the different spoken varieties of the language ('bhāṣā') that existed during his days and thereby gave all such myriad usages a sāstric sanction. It thus took the form of Samskr̥tam, and it is the same language that was referred to as Deva-bhāṣā

ससंसस्कृतसंननामददैववीवनाककअननाखनातना महररर्षरिभभ  
तदभवत्समम ददेशवीत्यनदेकभपनाकस्कृतक्रमभ

Daṇḍī- Kāvyaḍarśa.

Sanskrit has rendered itself well to both creative literature and to the works of different śāstras. The creative literature of Sanskrit can be broadly divided into two extreme genres – one inspired by the epic poems of Vyāsa and Vālmīki and the other that is heavily ornate and full of literary acrobatics, lacking profundity. The former is inspired by the philosophical vision of the sages and its closeness to human life and emotion. The works of this kind are simple in presentation but profound in content. The latter is characterised by play on words and linguistic grandeur, lacking creativity in content. Kālidāsa (of about fourth-fifth century CE) paved the golden mean path, bringing rich content in a well presented language.

The main purpose of the study of classical literature, especially of Sanskrit is two fold

1. A work of poetry is meant to bring aesthetic enjoyment in the hearts of the connoisseurs. Creative usage of language for the delineation of basic human emotions is what constitutes poetry. Sanskrit, due to its flexible nature and its treasure of words can render itself for any kind of artistic expression. This has led to the development of several śabda and artha alaṅkāras (figures of speech of sound and sense, respectively).

The beauty of Sanskrit literature lies in the attention to detail that a poet gives to describe a person or an event, and not much in the construction of complex plots. The styles of Sanskrit poetry is of three kinds – one that has a tight structure full of complex words (samāsa) – Ojo-guṇa; another that is lucid and easily understandable – mādhyama-guṇa and the last that has a melodious construct – the prasāda-guṇa

2. It is also important for all kinds of literary work to provide guidance for making life worth living. While providing a message to the society is not its primary aim, a work of poetry helps man reflect upon his life and thereby provides an opportunity for refinement. Purāṇa and itihāsa (roughly translated as Mythology and History), like a friend, educate man in do's and don't's (called 'suhṛt-samhitā'). A work of creative literature (kāvyā), however, like a beloved, enraptures the human mind and brings self-forgetfulness. The teaching of values happens even without him being consciously aware of it. Thus, without a great moral value as its undercurrent, a literary work cannot be considered a good piece of poetry. Moreover, in poetry, the preaching of values should not be direct and literal as in the Purāṇas.

It is also noteworthy that the world itself has been variously called the poetry of the Divine. ददेवसपश कनावसं, ममनार न जवीरर्षरि रत॥(अथवर्षविदेदभ10-8-32). In addition to this, statements such as 'करवभ क्कनान्तदशर' and 'ननानसक्कररभक्कुरुतदेकनावमक, ऋररभ. रकल दशरर्षनिनातक' point to the fact that to be a poet, one must have philosophical clarity and only a great visionary can be a great poet. ♦

**Arjun Bharadwaj,**  
Assistant Professor,  
Amrita Darshanam, Bengaluru

The current series does a creative analysis of classical Sanskrit literature, spread over a large time-span. This article gives a brief introductory overview of poetry.



The *Mahābhārata* describes itself as *manah sāgara sambhūtam* (1.53.34a) — sprung from the oceanic mind of Vyāsa, and also as his “entire thought” (1.1.23; 1.55.2) captured in a hundred thousand *ślokas* (1.56.13). Aeons ago, seven sages known as the Citraśikhaṇḍins, “having become of a single thought, promulgated a supreme treatise (*tair-ekamatibhir-bhutvā yat-proktam śāstram uttamam*) consisting of a hundred thousand verses, from which proceeds dharma for the entire loom of the worlds (*kṛtam śatasahasram hi ślokaṃ idam uttamam/lokatantrasya kṛtsnasya yasmād dharmah pravartate*)” (12.322.26d and 36). Even grander, it calls itself a *śāstra* by Brahma. In fact, the *Mahābhārata* characterizes itself fourteen times as an *ākhyāna*; eight times as an *itihāsa*, as a work of *purāṇa*, a *kathā*, a *saṃhitā*, a “fifth Veda”, the “Veda that pertains to Kṛṣṇa”, a *mahājñāna*, a *śāstra*, an *upaniṣad*, a *carita*, a *jaya*, and *upākhyāna*. Yet, most often, the *Mahābhārata* is characterized as an *itihāsa*<sup>1</sup>.

*Itihāsa* is often and unfortunately (mis)translated as “history” — but in Indian tradition, “*itihāsa*” is not simply a chronological account of historical occurrences. *Taittirīya Āraṇyaka* states “*śrutiḥ praktyakṣam aitiḥyam anumānaścatusṭayam*” (1.2.1) — Veda, *pratyakṣa*, *anumāna*, and *aitiḥya* (explicated by Sāyaṇa as *itihāsa-purāṇa-mahābhārata-brāhmaṇādīkam*), are the four valid means of knowledge. Sāyaṇa writes “*tadetat smṛtyādi-catusṭayam avagati-kāraṇabhūtam pramāṇam*”. In SB. XIII, 4. 3. 12-13 both *itihāsa* and *purāṇa* are “Veda”. In AB. III. 25 the Suparna saga (obtaining of Soma by the Gāyatri) is called an *itihāsa* and Sāyaṇa on SB. Āi. 5. 6. 8 says that *itihāsa* is an account of primordial events (*purāvṛtta pratipādakam*); or as others express it *itihāsa* means a Brāhmaṇa account of creation (*śṛṣṭi-pratipādakam brāhmaṇam*).

*Itihāsa*, therefore, is a *pramāṇa* — a valid means of knowledge. Coomaraswamy writes,

“the Veda-s, and all their accessory literature and sciences, for example, are contained in the word (*vāc*, *dharmā*, *om*) which having been uttered (*niḥśvasita*, *vyāhṛti*) is then heard (*śruti*) by the *ṛṣis*, that audition depending not on “inspiration”, but upon attention. Vālmīki ... first visualizes in yoga the entire *Rāmāyaṇa*, the characters ‘presenting themselves to his vision living and moving as though in real life... Similar conceptions of the operation of imagination are to be found already in the *Rgveda*, where for example, wisdom (*vāc*) is spoken of as “seen” or “heard”(10.71.4, ideas are “hewn out” *takṣ*) in the heart (*hṛd* 10.71.8) and thought is formulated (*dhi*, cf. *dhyai*, for example in *dhyāna*) as a carpenter shapes wood (3.38.1).”

<sup>1</sup>*Rāmāyaṇa*, on the other hand, characterizes itself (thirteen times) as a *kāvya* (“poetry”). Hildebeitel writes, “[*itihāsa*] is not only unused to describe the *Rāmāyaṇa* but, excepting two interpolations, is absent from its entire Critical Edition text. In this, it is like the absence of *kāvya* in the *Mahābhārata*’s Critical Edition; as if the two texts were in early agreement to yield one of these terms to the other.”



# Mahābhārata Itihāsa? or History?



Coomaraswamy (1934:175)

Unfortunately, modern academia is uninterested in understanding the *Mahābhārata* — instead, it seeks only to identify its “history” — an “epic nucleus”, some one great and complex action — embedded, though transformed, within the ample tapestry of the *Mahābhārata*. Most of their researches, therefore, are attempts to cut away the “fantastic figments”, the “winding disquisitions”, and the complex didactic material — all in order to restore the “original” story. In 1957, V.S. Sukthankar

sarcastically commented on this “research method” called “higher criticism”,

“Modern criticism begins with the assumption that... the “nucleus”... was unfortunately used — or rather misused — by wily priests, tedious moralists and dogmatizing lawyers as a convenient peg on which to hang their didactic discourses and sacerdotal legends ... it is a great pity that a fine heroic poem, which may even be found to contain precious germs of ancient Indian history, should have thus been ruined by its careless custodians. But it is not quite beyond redemption. A skillful surgical operation — technically called “Higher Criticism”— could still disentangle the submerged “epic core” from the adventitious matter...”

Sukthankar (1957: 10)

In Coomaraswamy’s words,

“(today) we can see in the hero only an imperfectly remembered historical figure, around which there have gathered mythical and miraculous accretions; the hero’s manhood interests us more than his divinity, and this applies as much to our conception of Kṛṣṇa or Rāma or Buddha... We treat the mythical elements of the story, which are its essence, as its accidents, and substitute anecdote for meaning. Still later, the form is sentimentalized... the type is completely humanized, and where we began with the shape of humanity as an analogical representation of the idea of God, we end with the portrait of the artist’s mistress posing as Sarasvatī... The vulgarity of humanism appears nakedly and unashamed in all euhemerism”.

Coomaraswamy (2004: 140)

*Itihāsa*’s treatment as “history” is a late and euhemeristic procedure. Friedrich August Wolf (1754-1824) is generally considered to be the first to tread in a definitive direction towards higher criticism. Wolf was deeply skeptical of ancient literary works. In 1795, he published a work, *Prolegomena ad Homerum*, where he challenged the notion that Homer wrote the *Iliad* or the *Odyssey*<sup>2</sup>; these epics, according to Wolf, were gradually built/accumulated in course of time by storytellers and wandering Greek minstrels, and could not be ascribed to any one author. Following the lead of Wolf, Karl Lachmann (1793-1851) dissected the German epic, *Nibelungenlied*, into twenty short “lays”, and the *Iliad* into eighteen “lays” — these lays, he claimed, were variously augmented in the course of time to finally attain epic proportions<sup>3</sup>. In William Wallace Everts’ scathing words,

“Lachmann adopted Wolf’s theory that epics are lays reduced to order, and applied it first to the *Nibelungenlied*.

He restored that long epic into its original form of twenty lays, he exposed to view the fissures that the redactor had vainly sought to hide — fissures whose existence no one had suspected till Lachmann called attention to them, defects such as a childish mind is delighted to have pointed out in a work that appears to be perfect. His keen eye discovered in the poem awkward junctures and apparent discrepancies that revealed to him diversity of origin... He found the glory of the *Iliad* not in the whole epic with its symmetry and unity, but in the separate lays. The parts he accounted greater than the whole, for the lays were spoiled when they were squeezed into the mold of the epic... In his work of disintegration, he drew sweeping conclusions from trivial objections... he did not hesitate to say that the parts were ill adjusted, that connections were senseless, that personages were inserted in the wrong place, that the description of arms, raiment, and feasts were useless, that there were frequent gaps, inequalities, yes contradictions... This tour de force had its admirers, the crowd that counts more than it weighs, that worships a great name and wants to be considered in line with the advanced thought of the hour. The followers of Lachmann carried their master’s method to further extremes, making breaks where they could not find joints, and subdividing his divisions, until by their complications they made his theory ridiculous...”

Everts (1908:540)

<sup>2</sup>See Grafton (1795).

<sup>3</sup>See Grote (1850)

V. S. Sukthankar beautifully writes,

“Notwithstanding the high-sounding phrases in which it is couched, it is easy to see that this critique cannot give absolutely certain and dependable results, it being merely the exploitation of individual opinion, which selects what it pleases and rejects, on insufficient evidence, what is incompatible with a preconceived subjective scheme... the residue no more represents the “original” heroic poem than a mangled cadaver, lacking the vital elements, would represent the organism in its origin or infancy.”

Sukthankar (1957:7,5)

Not by the furthest stretch of imagination can the *Mahābhārata* be considered only a historical event — this is a text that has painted the Indian tradition with intense colors — the temples and art-traditions, the literature and poetry, the festivals and daily-life of India are deeply informed by the *Mahābhārata*. Stanley Rice wrote,

“[the Indian epics] are living and throbbing in the lives of the people of India, even of those illiterate masses that toil in the fields or maintain a drab existence in the ghettos of the towns. To such as these the famous old stories are the music and color of life. They are the perennial fount from which the oft-repeated draughts never quench an insatiable thirst. In the king’s palaces and in the peasant’s huts you may still hear the grand legends of the Great War and the pathetic sufferings of Rāma...”

Rice (1924: 9)

If the *Mahābhārata* was a mere story of jealousy and internecine strife of one family, how could it fascinate, for more than two millennia, the minds of generations of men? In Kuntaka’s words,

*nirantara-rasodgāra-garbha-sandarbha-nirbharāḥ |  
giraḥ kavīnām jīvanti na kathā-mātram āśritāḥ ||*

- (Vakrokti-jīvita, antaraśloka 13 under 4.4)

Those words of poets which describe episodes delineating poetic relish remain [in the hearts of men] — not [merely] plot-driven stories.

What explains its vitality, its universality, its immortality? No, the *Mahābhārata* is not simply a story of a futile war of annihilation; it is, *at the very least*, a struggle between justice and injustice, between *dharma* and *adharma*, between Self and not-Self. In Sukthankar’s words,

“What gives (the *Mahābhārata*) real depth and significance is the projection of the story on to a cosmic background, by its

own interpretation of the Bharata War as a mere incident in the ever recurring struggle between the *Devas* and the *Asuras*; in other words, as a mere phase in cosmic evolution... (the war) is the expression of a state of tension between two ideal order of beings, a moral type ... and an immoral— or rather an unmoral — type which it is the object of the former to destroy. This war is an eternal recurrence, a phenomenon assuming in the time-space continuum the most diverse forms and aspects...”

Sukthankar (1957:66)

Capturing perfectly the true essence of the *Mahābhārata* in his

*magnum opus, Dhvanyāloka*, Ānandavardhana wrote,

*mahābhārate’pi śāstra-rūpa-kāvya-cchāyā’nvayini vṛṣṇi-pāṇḍava-virasā’vasāna-vaimanasya-dāyiniṁ samāptim upanibadhnatā mahā-muninā vairāgya-janana-tātparyā-prādhānyena sva-prabandhasya darśayatā mokṣa-lakṣaṇaḥ puruṣārthaḥ śānto rasaś ca mukhyatayā vivakṣā-viśayatvena sūcitāḥ |*

*Vṛtti on Dhvanyāloka 4.5*

“Again, in the *Mahābhārata*, which has the form of a didactic work although it contains poetic beauty, the great sage who was its author, by his furnishing a conclusion that dismisses our hearts by the miserable end of the Vṛṣnis and Pāndavas, shows that *the primary aim of his work has been to produce a disenchantment with the world* and that he has intended *his primary subject to be liberation (mokṣa) from worldly life and the rasa of peace.*”

[italics ours] [Trans Ingalls et al]

In SB. XL 1. 6. 9. it is expressly stated that it is the conflict of *deva-s* and *asura-s* that is related partly in the *ākhyāna* and partly in the *īthāsa*. The *Mahābhārata* is a rather humanized version of the Vedic conflict of *deva-s* and *asura-s*, now represented by the Pāṇḍava-s and Kaurava-s. To cite only one significant moment, Arjuna’s protest “Even for the sake of empire over the three worlds...I will not fight” ( BG. I. 35 and II. 9) is not merely like but the same as Indra’s “Not for the sake of empire will I slay” (J.I . 202-3) Mitra’s reluctance to slay Soma-Vṛta, “Surely he disliked to slay” ( SB. IV. 1. 4. 8-9), and Indra’s “I

will not slay” (MS. IV. 3. 4). These are not mere analogies, but redactions of one and the same *purāvṛtta*. If, then, we exult, cry, and weep with the epic heroes, it is not because they were so-and-so, or lived at such and such a date, but precisely because of their timeless universality. Coomaraswamy writes,

“It has been sought to show that the [epics, myths] is not concerned with events in time, but with “he entering in of time from the halls of the outer heaven,” that is, *agre*, in the beginning, *in principio*. Nor can that entering in of time be thought of as itself an event in the time; it is “first” and a “beginning” only in logical order of thought. Life is “crossing over” all the time, “out of the everywhere into here” and a motion forward to the “last end” (*puruṣārtha param padam*). *Sicut erat in principio, est nunc, et semper erit, in saecula saeculorum.*”

The *Mahābhārata* needn’t explain itself to us— it seeks to explain us, to us. It is the jury — we must submit ourselves to judgment before it, not vice-versa. ♦

**Manjushree Hegde,**  
Assistant Professor, Amrita  
Darshanam, Coimbatore Campus

# KANNAUJ *perfume*

## Introduction

Kannauj is to India what Grasse is to France: the country's perfume capital. Kannauj, located in Uttar Pradesh (India) is known for its world famous perfumes production, specifically attar & sandalwood based organic essential oils. Kannauj, located near the confluence of the Ganges and Kali river is thought to be right on the routes that brought perfumes, spices, metals, silks and gems from India and China to the Middle East. Kannauj perfume has local and international markets and about 20 companies export to foreign countries.

Mohit Hooda,  
S4

## History

The town has a rich history and it was a capital city during the time of emperor Harshavardhan, known for his kindness & sacrifice. It reached the climax of its glory during the 7th century AD when it was the capital of the empire led by Harshavardhan. It is during this period that Kannauj started to play an important role in Indian perfumery. Later, the perfumers of Kannauj provided the Mughal emperors with scented oils. Kannauj

perfume has a long historical background and Kannauj had perfume trading with Middle East. Some sources state that perfumes were supplied to Mughal emperors during their reign in India. Due to the key role of perfume production in Kannauj, the city is known as "the perfume capital of India". An expert in the region says, "Kannauj has been the perfumery town of the country for thousands of years".

## Making

Making attar & pure organic oils using traditional ways is an art that no modern machinery can beat. Manufacturing of Attar fragrance oils is the practice of extracting scent from flowers, herbs and other botanical sources. Some attar oils are extracted from wood species as well. An attar is the essence of a flower (of a root, or even earth) that is captured in 100% sandalwood oil. Sandalwood oil is used as a base material because it has a strong fixative property and can keep the floral essence over a long period of time. Attar making is a type of hydro distillation, where the plant material is placed in water in a copper still (Deeg). The still is covered by a copper lid (Sarpos) which is sealed to the Deeg with a mixture of cotton and clay. A bamboo pipe (Chonga) insulated with twine connects the still to a

receiver which is placed in a cold water bath. The still sits on a fire and upon heating, the odoriferous molecules from the plant material vaporize along with the water. The fragrant oil and the water condense in the receiver where the oil is trapped in the sandalwood oil as the condensed water sinks to the bottom of the receiver as it is denser than the sandalwood and the floral oil. Once the distillation is over, the odoriferous oil trapped in the sandalwood oil is placed in the sun in a leather bottle. The bottles used to be made out of camel skin, but now, buffalo skin is being used instead. And so the water evaporates through the buffalo skin.

## Conclusion

The scented city of India has been facing troubles in recent years. With the shortage of sandalwood trees in South India, the attar industry in Kannauj is seriously being threatened. The perfumers of Kannauj have sought to find alternatives to sandalwood oil as their base material. Kannauj perfumes are widely protected under the Geographical Indication (GI) of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement. ♦



On 20th May 1498, when Vasco da Gama anchored his ships just north of Calicut on the Malabar coast of India, we extended a warm and cordial welcome as per our customs and tradition of "Athithi Devo Bhava:"- "Treat your guest as God". Little did we know that the "Gods" we had ushered into our land would later shower death, destruction and devastation over us. The merciless marauders and their tale of tyranny is laden with extreme violence and treachery.

### The black gold

India was known across the world for her fabled riches and spices. The trade routes on the Indian Ocean were not unexplored before the arrival of Gama and his Portuguese fleet. Spices from India were much in demand in Europe, especially Pepper.

Pepper has a rich and vibrant history. It was used in ancient Egypt to embalm its rulers. The Mummy of Ramses II, who died in 1213 B.C was stuffed with pepper to preserve the body. Pepper was the most important item imported from South India by the Greeks and the Romans. The famous physician Hippocrates was aware of its medicinal properties and it was used as a cure for various ailments. It was solely used for medicinal purposes until Roman Emperor Augustus started to use it as a condiment. When the Romans annexed Egypt in 30 B.C., that presented them with the opportunity to transform the trade across the Arabian Sea. The intricacies of the Monsoon were well known to the Arabs and they possessed large ships to travel from Egypt to South India. Pliny the Elder states that the journey from Oalis, at the mouth of the Red Sea, to Muziris on the Malabar Coast took one month. The Romans destroyed the principal trading centre of Aden so that they could dominate the spice trade. By the end of the first century, spices were no longer a scarce luxury for the Romans. Alexandria was established as the centre of the spice trades with large pepper warehouses. Thus pepper became popular among the people. The Romans were concerned about the drain of wealth from their empire. It was estimated that the imports from India, principally pepper, cost fifty five million sesteces annually, thus the name "Black Gold". The trade between Romans and the Malabar coast continued for hundreds of years. As the Roman Empire declined, the trade

diminished. In A.D 408, Alaric I, the Visigoth that laid siege to Rome, demanded and received 3000 lbs of pepper as ransom. With the collapse of the Roman Empire,

the spice trade was reverted back to the Arabs. They totally controlled and commanded the trade of the Arabian Sea until the arrival of the Portuguese.

When the celebrated European chronicler Marco Polo reached India, he described in detail about India's pepper, sandalwood and indigo. Other travellers whose writings were well known in medieval Europe was the French Dominican missionary Jordanus and the Italian Fransiscan missionary, Ordonic of Pordenone, both visited Malabar and wrote in great depth and perspective about the spice market there. As the Dark Ages gave way to the Middle

Ages, the demand for spices in Europe increased. In early medieval Europe, the spices were reserved for the crème de la crème of the society owing to the high prices. As the Middle Ages progressed, the price of pepper dropped, opening up consumption to the middle class. It has been said that the phenomenal demand for pepper was due to the putrid food served to the medieval populace. The food was mixed with many salts of repulsive tastes to store up for the winter months; pepper was also added to mask this pervasive taste. The tales of the European merchants such as Afnasy Nikilin and Niccolo di Conti, who travelled to India in the 15th century brought back information about its riches and trade. India was the "El Dorado" or 'The City of Gold' of their dreams and they sought methods to reach India and get their hands on riches.

### Vasco the glorified bandit

Vasco da Gama's vessels left Portugal on 8th July 1497, rounded up the Cape of Good Hope and sailed up the East coast of Africa to Malindi. From there, with the help of a local pilot given to them by a local ruler, they had taken the wind to Southern India. It took only twenty three days to cross from Africa to Malabar.

Vasco da Gama commanded a flotilla of three ships and a store ship, with a total collection of about 170 men. Vasco's own ship Sao Gabriel was the largest. The ship had about twenty cannons, which made it ungainly, yet powerful.

Among the crew, there were few convicts who were dangerous and were brought along for treacherous tasks. Vasco da Gama knew what he wanted and was not afraid to get his hands dirty.

The Portuguese had a non-secular and indifferent attitude towards religious beliefs other than

Christianity. They considered other religions to be rancid and perverted. The Portuguese had a long history of conflict with Islam. The Muslims of North Africa had been driven out of Portugal in 1249. The conquest of Constantinople by the Turks in 1453 deeply alarmed all of Christian Europe.

The Portuguese were devout Catholics and they saw the battle between Christianity and Islam as the battle between good and evil. From the twelfth century onwards, rumours had circulated in Europe upon the existence of Christian empires in the East. An emperor, Prestor John, was said to be the lord of many such Eastern Christian kings. In pursuit of these kingdoms, the King of

# THE PORTUGUESE AND THE CAPE OF LOOT HOPE

Portugal sponsored a series of voyages along the West African coast. Spain and Portugal were the two great naval powers in the world during the time. The King of Portugal hoped to forge an alliance with Preston John and his successors to fight against Islam. He also wanted to explore the prospect of spice trading, as this would bring prosperity to Portugal and simultaneously deprive the Muslims of one of their main sources of revenue.

The Hindu ruler of Calicut, the Zamorin was away from the city when the Portuguese arrived, but agreed to meet Vasco upon his return. The flotilla was taken to a safe anchorage at Pantalayini Kollam, fifteen miles to the North. It was from here that he stepped ashore one

week later. Gama and about a dozen of his companions were taken to the city in a palanquin, watched by hoards of curious onlookers to meet the Zamorin. They were first taken to a temple and to Vasco who was expecting to find Christians, thought the temple to be a church and fell on his knees and prayed. They also took away some of the 'white earth' which the 'Christians of this country' sprinkle on their forehead. Gama and his men were under the impression that they were in a Christian territory under a Christian king for the whole time that they were in India. They would return to affirm this foolish belief to their own King.

Upon meeting with the Zamorin, Gama became aware of his prosperity and opulent lifestyle. He introduced himself as an Ambassador of the King of Portugal, and he was entrusted with the mission of finding the King of Christians. It is entirely possible that the words were corrupted in translation. The hats, honey and fragrant oils that the Portuguese had brought as gifts were deemed unacceptable by the Zamorin who said he would accept gold or nothing. Zamorin was unable to reconcile to Gama's boasts of being from a prosperous country without any gifts. He allowed Gama to unload the goods his ships were carrying and to sell them.

Calicut and its adjacent coasts were predominantly Hindu but they also housed many Muslim merchants. The Muslim traders were extremely hostile to the Portuguese. They were afraid that they might lose their monopoly over the lucrative spice trade. The result of this mutual hostility was that the Portuguese merchandise found no buyers among the trading community.

Upon Gama's

protests, the Zamorin sent some other merchants to view the merchandise. They were critical of the quality of the merchandise and bought nothing. Yet, perhaps mollified by the showers of praise by Gama, the Zamorin agreed to transport the merchandise to Calicut at his own expense to be sold there. Some sales were made and enough money was raised to buy some cloves, cinnamon and precious stones.

On 13th August 1498, nearly three months after his arrival, Gama sent some presents to the Zamorin and expressed his wish to return to Portugal. He wished to take some emissaries with him, and he himself would leave behind some Portuguese men to look after the unsold merchandise. The Zamorin then demanded customary port dues on the goods, and fearful that Gama might abscond, he put guards on the Portuguese men ashore and prohibited any ships from going out to the Portuguese ships. Some merchants who disobeyed the Zamorin and went out to trade with Gama were seized and taken as prisoners, at the end of the negotiations, an exchange of the hostages for the Portuguese goods was agreed upon. But Gama did not honour this agreement. Leaving some merchandise behind, they set sail for Portugal on 29th August 1498 with the hostages still with them. About seventy of the Zamorin's boats came out to attack the Portuguese fleet. The Portuguese kept them at bay with canonfire until a fortuitous storm allowed them to escape. The return journey was rough and unfortunate. The winds were unfavourable and the journey took about three months. Many of the soldiers died of scurvy and the survivors were

debilitated and weak. Only a third of his original sailors managed to reach Portugal.

Vasco and his men returned to

rapturous reception. They had accomplished numerous fantastic feats; of having found Christians and having brought back priceless spices. The King was delighted and he hoped to seize control over the shipping and trade in the Indian Ocean. The sale of spices from India raised a humongous amount of money, said to be sixty times the entire expense of the

expedition. The King of Portugal could smell the money and he immediately commissioned another expedition.

About six months after Gama's return, a Portuguese fleet of thirteen powerfully armed ships captained by Pedro Cabral sailed for India. But this fleet was dogged by misfortune. Four ships sank in a storm and some were blown off course, yet, six of them managed to reach Calicut on 13 September 1500. The Zamorin, successor of the one Gama had met with, allowed the Portuguese to set up their trading port. Again, the conflicts between the Muslims and the Portuguese resurfaced, the Portuguese claimed that they had been given the sole right to buy pepper. The Portuguese seized an Arab ship in the harbour, a riot followed and forty Portuguese were killed. Cabral then ordered his fleet to bombard Calicut. The bombardment of the city went on for two days. Many of the wooden houses were set ablaze, its inhabitants killed. The violent recoil of the guns began to damage Cabral's ships and he was compelled to flee. Cabral then sailed to Cochin. The Raja of Cochin saw the advantages of being amiable to the Portuguese. He allowed them to buy spices and build a factory. Before sailing home, the Portuguese halted at Cannanore and topped up with spices. Another ship was wrecked on the journey back, and Cabral reached Lisbon on 31 July 1501. Although only five of the thirteen ships had returned from India, the spices they carried were valuable enough to compensate for the losses incurred. The Franciscan friars who had been on the expedition discovered the difference between Hindus and Christians. The Cabrals advised the king to come to an agreement with the Hindu rulers of the Malabar Coast.

Cabral had seriously ruptured the relations with the Zamorin of Calicut. However, he made valuable allies in the Raja of Cannanore and the Raja of Cochin. The Cochin harbour was better than the one at Calicut, and it had better communications with the pepper country. Thus, Cochin was set to become Portugal's most important base in Malabar.

Six months after Cabral's return, Vasco da Gama once again set sail for

Malabar with a fleet of twenty armed ships. The motive of the voyage was largely commercial. While sailing down the Malabar Coast, Gama's fleet intercepted the 'Miri', a ship carrying pilgrims returning from Mecca. The Portuguese seized the ship, looted the travellers and set fire to the ship. The crew and the pilgrims managed to put out the flames, but Gama's men returned to torch the ship again without an ounce of mercy for the numerous innocent women and children in the ship. When the ship reached Calicut, the Zamorin sent a message offering peace. In reply, Gama demanded compensation for the goods Cabral's men had lost and the expulsion of all Arabian traders. Gama announced that unless the Zamorin met his demands, he would bombard Calicut the next day. The Portuguese had captured a number of small boats and their crews. On November 1 1502, they began to hang the prisoners. Thirty-four sailors were executed. Their bodies were mutilated and subjected to sick and perverted dismembering. Their hands, heads and feet were cut off and these body parts were piled on a boat and were floated to the harbour. The brutal and savage acts of the Portuguese did not end there. They started to bombard Calicut, wrought great destruction, death and damage in the following two days. Gama then sailed to Cochin.

The Raja of Cannanore had a favour to ask of Gama; an Arab merchant had left the port of Cannanore without paying the port duties. Eager to win the favour of the Raja, Gama sent one of his ships to intercept the absconding merchant. The merchant was brought back with his mouth gagged and filled

with bacon and excreta.

At Cochin, Vasco da Gama wanted to establish a cordial relation with the Raja. While he was at Cochin, a Hindu priest arrived with a message from the Zamorin of Calicut. The priest was sent back to Calicut with his lips cut off and his ears replaced with ears of one of the ship's dogs. At Cochin, the Portuguese managed to buy spices and repair their ships. They also went to Cannanore and came to an agreement with the ruler to use the port. Before Vasco da Gama finally left Cochin, he entered into a formal agreement with the Raja to build a Portuguese factory.

Enroute north to collect ginger at Cannanore, Vasco da Gama's ships were attacked by a large fleet sent by the Zamorin of Calicut.

The fleet had 32 large ships carrying several hundred men and a host of smaller boats. The heavier guns of the Portuguese, once again kept their enemy at bay. Many of Zamorin's ships sank. Gama then sailed to Cannanore, loaded spices, and left behind more men to operate a factory. On December 28 1502, Gama left for Portugal.

Vasco da Gama would return to India in 1524 as Viceroy. After a few years of his arrival, he died and was buried at Cochin. His body was later returned to Portugal in 1539.

The villainous Vasco and his pitiless plundering and killing have been conveniently omitted from the pages of history. Portugal hails him as a hero and the world sees him as a great navigator. They remain oblivious to the venal and virulent side of Vasco. After all, history is a lie agreed upon.

### The ignominious inquisition

After Vasco da Gama's departure from India in 1502, his uncle Vicente Sodre sailed north, hoping to capture rich Arab ships. His fleet was caught in a storm off Arabia and drowned. The Zamorin of Calicut seized this opportunity and ordered his nominal subject, the Raja of Cochin, to surrender the men Gama had left behind at Cochin. The Raja refused and war broke out. The Zamorin's army captured Cochin and set it on fire. The Portuguese and what was left of the Raja's army fled to the nearby island of Vypin. Fortunately for them, a squadron of Portuguese ships under the command of Afonso de Albuquerque came to their relief. The Raja then gave authority to the Portuguese to

build a fort at Cochin. A square fort was constructed which was surrounded by a moat. On 1 October 1503 a Franciscan monk christened the first European fort in India. It was named, in honour of the king of Portugal, Fort Manuel. The fort was the first step towards a Portuguese dominion over the Arabian Sea.

When the Portuguese first arrived in Malabar, neither the Arabs nor the Indians had a powerful navy in the Indian Ocean. The Arabs came only to trade, not to conquer. The Indian rulers had large fleets of small ships, built and used for domestic and commercial purposes.

The arrival of the Portuguese warships soon provoked an Arab

response. The Egyptians had a fleet in the Red Sea. In 1507, it sailed into the Arabian Sea to battle with the Portuguese. It soon joined forces with the ships of the Zamorin of Calicut. The combined fleet then headed to the south to battle the Portuguese. The Portuguese navy was under the command of the Viceroy's son, Lorenzo de Almeida. In the battle, the Portuguese were conquered and the navy fled. The Viceroy's son was put to the sword by the Arabs.

The Viceroy, Francesco de Almeida was the first to be given the title of 'The Viceroy of India'. He had been given total power over the Portuguese affairs east of Africa. He assembled all the ships he could and sailed north. On 3rd February 1509, his ships met with the Egyptian fleet at Diu. The Governor of Diu, secretly sided with the Portuguese and deprived the Egyptian fleet of supplies. The Portuguese artillery devastated the Zamorin's galleys. The Egyptians, realizing that they could not defeat the Portuguese, turned tail and never returned. After this, the Portuguese ruled the high seas.

Francesco de Almeida, although a soldier, was aware that the Portuguese power came from their superior ships and firepower. He was a shrewd tactician and strategist. He had a Hindu privateer Timoja as his advisor. He formed a tactical alliance with the Vijayanagara Empire to divide the forces of the Muslim states to their mutual advantage. This policy was further advanced by Almeida's successor, Albuquerque who assumed the title of Governor of India in 1509. Rather than Vasco da Gama, it is Albuquerque who

is considered as the true architect of the Portuguese conquest in India. Upon taking office, his first campaign was the conquest of Goa. Goa, during that time was under Muslim control and was ruled over by the Sultan of Bijapur, Yusuf Adil Shah.

Yusuf Adil Shah was a legendary figure. He rose from the rank of a slave soldier to the Sultan of Bijapur earning fearful respect of the people. Albuquerque sailed from Cochin to Goa in 1510, with a fleet of twenty ships. In mid-February, the fleet attacked the fort at Panjim. There was negligible resistance. The inhabitants fled to Old Goa where they decided to surrender. Albuquerque arrived in the state with his finest armour. He was met by eight of the leading citizens who knelt before him and offered the city. Two months later, Yusuf Adil Shah arrived with an army of 60,000. The island was quickly taken, and the Portuguese became besieged in the fortress town of old Goa. After a week of fighting, Albuquerque realized that resistance was futile and prepared to leave. But before that, he massacred the Muslims of Old Goa, including women and children.

The Portuguese managed to escape to their ships, but the ferocity of the monsoon made it impossible for them to cross into the open sea. They were stuck and soon ran short of food and were reduced to eating rats. After about two months, the monsoon abated sufficiently for the fleet to sail away. Albuquerque was however, determined to return.

Eighty miles south of Goa, Albuquerque came upon some Portuguese ships. Acquiring control over many of the vessels, he built up a fleet of twenty eight ships, together with 1700 Portuguese soldiers. They returned to Goa in November 1510. Meanwhile, Yusuf Adil Shah had died and had been succeeded by his son, an infant King, Ismail Adil Shah. His huge army had withdrawn from Goa, leaving behind a garrison of 8,000 Persian and Turkish Soldiers.

On 25th November 1510, the Portuguese returned to attack the city. Hundreds of defending troops were put to the sword. Albuquerque gave the order to kill all the remaining Muslims. It took three days to hunt them all down. Men, women and children were burnt alive as they prayed in their mosques. The final death toll was forty Portuguese and 6,000 Muslims. Over the next few months, Albuquerque rebuilt the city walls and started to build a new fort within.

In April, leaving behind a strong garrison of Portuguese troops behind, Albuquerque sailed for the Far East. He captured Malacca and built a fortress there. Albuquerque returned to India in February 1512 to learn that the armies of Adil Shah were once again besieging Goa. Albuquerque arrived from Cochin with sixteen ships. He commandeered a small boat and led five of



his smaller ships under the fort. They anchored beneath the fort and commenced bombardment. Portuguese managed to continue to bombard the fortress for eight days, and eventually silenced the Adil Shah Artillery.

The conquest of Goa was the first European annexation of Indian territory since the invasion of Alexander the Great. It transformed Portuguese influence in the East. Goa was one of the finest harbours in the world, protected from storms and easily defensible. Other ships would be allowed on the high seas only with the permission of the Portuguese. The Portuguese would corner much of the trade in spices and horses. Albuquerque gave instructions that all horses coming from Arabia and Persia should be offloaded at Goa. There was no export duty on horses, but a heavy tax on their export. The Vijayanagara King and Adil Shah sent ambassadors to Goa. Both offered friendship to the Portuguese and tried to secure monopoly over the purchase of horses at Goa. Albuquerque played one off against the other and sold horses to both. Albuquerque was in his fifties but still fired by ambition. He made plans to divert the Nile to starve Egypt, to capture Alexandria and Suez; to burn Mecca. In 1513, he sailed for Aden, hoping to capture the fortress that guarded the entrance to the Red Sea. The operation proved to be a disaster as the Portuguese suffered heavy losses. In 1515, Albuquerque sailed for Ormuz, an island city famous as a bazaar, which commanded the entrance to the Persian Gulf. Here, Albuquerque played the role of the diplomat and gained control over the island. He built a fort there to control the trade between Persia and India. His health however had begun to fail. Wracked with dysentery, he decided to return to Goa.

On his return journey, Albuquerque overhauled a ship carrying a message from the King of Portugal ordering his replacement. Enemies in Lisbon had conspired to arrange his downfall. As his ship came to anchor in Old Goa, he died. The king said that his body should remain in Goa as a talisman. However, the bones were brought back to Portugal in 1566.

Albuquerque's policy of being friendly to the Vijayanagara kings proved extremely beneficial for the Portuguese. The Vijayanagara kings helped drive away the Shahs and helped Portuguese to strengthen their hold over Goa.

The Catholic Church did all it could to aid the Portuguese conquest. In 1542, the first Jesuit arrived at Goa. Francis Xavier was a man of extraordinary charisma. In his ten years in India and the Far East, he converted many inhabitants to Christians. In one month he was said to have converted over 10,000 villagers in South Malabar. Francis Xavier died off the coast of China in 1552. He was first buried in Malacca but following a rumour that his body was

miraculously preserved, it was shipped back to Goa in 1554 and was eventually interned in the Basilica of Bom Jesus. It

became an object of great veneration, particularly after Xavier's canonization in 1622. Before Francis Xavier died, he asked the Pope to establish the Inquisition in Goa. It arrived in 1560.

Hindus had begun to convert to Christianity and mass baptisms became a feature of life in Goa. Some Hindus, especially from the lower classes converted voluntarily. Other Hindus were converted by force. Many of these converts to Christianity kept their old customs and beliefs.

Despite the oppression, Goa remained largely populated by the Indians - Christians and Hindus. Reputedly, 2,000 Portuguese came out to India in a year. For majority of the Portuguese who came out to India, life was far from easy. Great difficulties were faced in finding enough men to crew the ships and man the army. Few respectable people opted for a life where death was common and rewards uncertain. To find enough men for the overseas Empire, the convicts and murderers imprisoned in Portugal were allowed to avoid imprisonment by volunteering for banishment to the East.

The Portuguese were the major power in the Indian Ocean for over a century. The only challenge came in 1538 from a Turkish fleet, which the Portuguese defeated. The Portuguese control of the sea was enforced by the cartaz. This was a written document allowing safe passage. In addition, the cartaz specified which route the ship should follow and what commodities could be carried. The Portuguese kept certain monopolies to themselves such as that of the spices. Any ship without the cartaz was liable to seizure and confiscation. For this purpose, the Portuguese established a number of heavily armed fleets.

The strongest resistance to the Portuguese came from Calicut. After early efforts to effect a truce with the Portuguese, the Zamorins of Calicut became their adversaries. In this, they were helped by a dynasty of able naval commanders, the Kunjali Marakkars. The Kunjali Marakkars were Moplas, local Muslims, who had become rich merchants. Unlike the foreign Muslims, they were keen to resist the Portuguese. They offered their services to the Zamorin, became admirals of his fleet and began to harass the Portuguese shipping.

When the old Zamorin died, his successor was sympathetic to the Portuguese and entered into a treaty with the Portuguese to build a fort at Calicut. Not surprisingly, the Portuguese soon began violating the terms of the treaty. They used force to obtain spice exports. In 1522, the Zamorin who was friendly to the Portuguese died, and the new Zamorin ordered his fleet to attack the Portuguese. The Kunjali Marakkars did this to great effect. To attack the Portuguese warships, the Marakkars built large number of small boats rowed by thirty or more men, to make guerrilla attacks. The large guns of the Portuguese found it difficult to hit these smaller targets. Great battles were fought but, neither side was able to gain ascendancy over the other.

The battles between the Marakkars and the Portuguese went on until the late 16th century. A weak Zamorin tried to make peace with the Portuguese and allowed them to construct a fort near Ponnani where the Marakkars were based. The Marakkars then moved their base to the mouth of River Kotta, where they built a fort and continued attacking the Portuguese. However, the Senior Marikkar declared himself the Raja of Kotta which made the Zamorin his rival. The Portuguese saw this as an opportunity to launch a joint attack against the Marakkars. The Zamorin merely wanted to scare the Marakkars into resuming the alliance while the Portuguese wanted them to end once and for all.

By the end of 1599, the Portuguese and the Zamorin laid siege to Kotta. The fort was relentlessly bombarded. The Zamorin merely wanted the Marakkars to surrender, but the Portuguese wanted blood. The Zamorin promised to spare the life of the Marakkars if they surrendered. The Marakkars surrendered but instead of being pardoned, they were made prisoners of the Portuguese who took them to Goa. In Goa, there were great celebrations. The senior Marakkar was taken to Tronco, the Portuguese prison and was executed publicly by beheading. His body was then quartered and exhibited in beaches.

By combining with the Portuguese to defeat the Marikkars, the Zamorin secured his own eclipse. The last major threat to the Portuguese no longer had an effective navy.

During the sixteenth century, the Portuguese built an extraordinary number of factories and forts in India. After the construction of the small fort in Cochin in 1503, came others in rapid succession, there was a cluster of major forts in Goa, with numerous others in Diu, Daman, Bassein, Chaul, Cannanore and Cranganore.

Despite its control of the high seas, the Portuguese failed to achieve total control over the spice trade. The merchants of Malabar transported them on the backs of animals to Middle East and Europe. The Portuguese however, were still amassing wealth. Not only did they ship huge quantities of spices and other goods back to Portugal, but they also levied a toll on the trade in the Indian Ocean. All this was to change with the arrival of the Dutch and the British.

### The decay

At the beginning of the sixteenth century, Gujarat was probably the most important trading centre in India. When the Portuguese took control of the spice trade in Malabar and the East, and shipped the goods directly to Europe, Gujarat's trade was in decline. Yet, it was still a major business centre. The Gujaratis were considerable ship-owners. They regularly travelled on business to Arabia and sold their goods there.

The Portuguese, having secured domination over Malabar, wanted to control Gujarat too. The first opportunity came in

1533, when the Mughals attacked Gujarat. The ruler of Gujarat entered into a pact with the Portuguese to resist the Mughals. In return for their help, he gave them the district of Bassein and its dependencies. The Portuguese also tried to reclaim Diu in 1538, and again in 1546. The later siege was an epic battle. It needed all the naval and military resources of the Portuguese to raise this siege. The Portuguese heaped up the bodies of those they had killed in the battle in the temples, and then cut off the throats of cows and defiled the temples with the blood. In 1559, again as a result of a temporary alliance with the ruler of Gujarat, the Portuguese acquired the Port of Daman. From here, the Portuguese set

about the subjugation of Gujarat. The slaughter started in the Portuguese territory, where all the Muslims were mercilessly murdered. A Portuguese expedition was sent to Broach, an enemy territory. The Portuguese began the slaughter at night. The Gujarati merchants who were residents of the place, Vanyas, were famously pragmatic. The Gujarati merchants merely took a cartaz for their voyages and meekly paid their dues at Diu.

The Portuguese also opened up trade into the Bay of Bengal. The sea was lawless and full of pirates. Despite the dangers, the lure of the fine textiles of Bengal proved irresistible. When the Portuguese planned to gain control over Bengal, a petition was made by the local authorities to Shah Jahan. The Portuguese were expelled from all of Bengal. They had overreached themselves by opposing the Mughals. The arrival of the Dutch and the British had taken away much of their trade. The drain on their resources by having to maintain so many fortresses in a hostile environment was taking its toll. The Portuguese state in India was running a financial deficit.

As the century progressed, the Portuguese finances became ever more parlous, their soldiers in India were not even paid on time. Many deserted to join the armies of Indian rulers. The onslaught of the Dutch in the middle of the seventeenth century dramatically affected the Portuguese in India. A blockade of Goa brought trade between Portugal and India to a halt. It was only after the marriage of Charles II to a Portuguese princess that things improved, and the English and the French began to put pressure on the Dutch to make peace. In 1670, the Portuguese suffered another humiliating blow. The Arabs gained control over the Portuguese territory of Diu. By this time, the Portuguese state in India had reached its endpoint.

Thus, an endeavour cemented on acts of extreme and brutal violence and betrayal, had crumbled down to almost nothing. The Portuguese persecution existed no more, but the tale of the oppression of India was far from over. ♦

Arjun Anil Bhaskar

# An Introduction to Pañcadaśī



In the vast ocean of Sanskrit literature, *śāstra-s* cover a big part. These *śāstra-s* are then divided into atheist and theist categories. The atheist philosophies here, do not consider their ideas to have derived from the teachings of Vedas, whereas the latter ones subscribe to the same. Even among them, a few of the *śāstra-s* do not directly convey the meanings of the Vedic sentences even when subscribing to them, while a few completely rely upon them and try to put forth the different dimensions of the meanings of the Vedic sentences. Among the six famous *darśana-s*, viz., nyāya, vaiśeṣika, yuga, sāmkhya, mīmāṃsā and vedānta, the initial four do not directly explain or comment on the Vedic sentences, whereas the last two are known for their different view points on the essence of the teachings of the Vedas. *Mīmāṃsā* is a *śāstra* which is very much related to *karmakāṇḍa*, i.e., the ritualistic part of the Vedas, and also explains the different aspects of understanding the meaning of Vedic sentences in different contexts and correlating the ritualistic practices with the meaning. It majorly gives a detailed explanation about the process of deriving the practical applications in rituals from Vedic sentences. In contrast to this, vedānta explains the philosophical aspect of the teachings of

Vedas. Vedānta gives explanation about the true nature of *jīva* the living being, *jagat* the creation, and *Īśvara* the creator.

The word vedānta is derived from two words; veda and anta, where 'anta' stands for both 'end' and 'essence'. Interestingly, vedānta is both, 'the end of Veda' and 'the essence of Veda'. Upaniṣads are called as vedānta. In every branch of Vedas, upaniṣads are at the end, and they contain the philosophical teachings of the Vedas, which is the essence. As said, upaniṣads form the very origin of Vedantic teachings. Vedānta is built on the basis of three major texts called as *prasthānatraya*. They are, (1.) Upaniṣads, (2.) Bhagavadgītā, and (3.) Brahmasūtras. Many scholars have written commentaries on these three major texts. There are many traditions of commentators who follow different ideologies, and thereby differ from each other, and their difference of opinion has resulted in the formation of different schools of vedānta. A few main schools of vedānta are advaita, dvaita, viśiṣṭādvaita and śuddhādvaita etc.

In the tradition of advaita vedānta, though there were many ācāryas before, ācārya Śaṅkara is considered to be the main scholar, whose works give the basis for the further development of the whole śāstra. His commentaries on *prasthānatraya* are

called bhāṣya, and are the key texts which provide a very detailed idea and structure for the development of advaita vedānta. His work is so monumental that all the scholars who have come after ācārya Śaṅkara, refer to his works in some way or the other. The impact of his work is not only within the tradition of *śāstra*, but scholars of other traditions and other śāstras have also referred to him, either by quoting him or by trying to refute him. His works are considered as the core texts of vedānta. In the tradition of *śāstra-s*, the texts can be classified into two, either as being the core text, or as *prakaraṇa* or the subsidiary text. There is a verse which explains what are *prakaraṇa-s*, and what is their role. That is –

ꣳjstraikadꣳasambaddhaꣳ ꣳjstrakjryntarꣳ sthitam |  
ꣳhuꣳ prakaraꣳaꣳ nꣳjma granthabhꣳdaꣳ vipaꣳcitaꣳ ||

The meaning of the verse: A text, which does not explain all the aspects of any *śāstra*, but which covers one of the aspects in detail, which provides the required extra details in support of one of the aspects of the *śāstra* covered in the core text, is called as a *prakaraṇa*. In the current article, let's have an introduction to one such *prakaraṇa* of advaita *vedānta śāstra*.

Pañcadaśī is one of the *prakaraṇa-s* of advaita tradition of vedānta. This treatise is authored by Vidyāraṇya muni. Sage Vidyāraṇya, who is also known as Mādhavācārya, is one of the very famous figures of ancient India. He was a chief pontiff of Śrī Śringerī Śaṅkara maṭha, and he is known as the *kulaguru* (high priest) of Harihara and Bukkarāya, who were the founders of Vijayanagara empire. However, there are different theories about Vidyāraṇya being a different person from Mādhava, who was the priest of Harihara, or both being same. Apart from being a pontiff, guiding the emperors, Vidyāraṇyahas written two major treatises in śāstra-s, and the life story of ācārya Śaṅkara. The books written by him are – (1.) *Sarvadarśanasamgrahaḥ*, (2.) *Pañcadaśī*, and (3.) *Mādhaviyaśaṅkaravijayam*. Among these three, the first two are śāstra related texts, and the last one is the story of ācārya Śaṅkara's life. The first of the śāstra texts, i.e. *Sarvadarśanasamgrahaḥ*, is a unique effort to introduce different branches of śāstras by collectively compiling the salient points of those śāstra-s. Whereas, *Pañcadaśī* is a vedānta related text, which explains some of the aspects of vedānta in a very lucid way with appropriate examples in proper places.

The title of the book, *Pañcadaśī*, means that there are fifteen chapters in this text. The three aspects of Brahman, i.e. sat, cit, and ānanda, are especially concentrated in three sections, each of which contains five chapters. The first five chapters are together called as *vivekapañcakam*. The second five chapters are called as *dīpapañcakam*. The last five chapters are called as *ānandapañcakam*. In every chapter the author explains about the different shades of or the opinions about the concerned

aspect of Brahman in that section. And the name of every chapter also is according to the topics covered in that particular chapter.

## Chapter 1: *Tattvavivekaprakaraṇam*

This chapter explains about the knowledge of the ultimate reality with respect to the aspect of 'sat' (existence), and the proper understanding of the discrimination of it. The word tattva means the ultimate reality, and viveka means discriminative knowledge.

## Chapter 2: *Pañcabhūtavivekaprakaraṇam*

The proper discrimination of the five basic elements, viz. *ākāśa* (space), *vāyu* (air), *agni* (fire), *jala* (water) and *bhūmi* (earth), is explained in this chapter. These five elements form the basic fabric of the whole universe. Their discrimination as a unique element and their combination to form the universe is explained in this chapter.

## Chapter 3: *Pañcakoṣavivekaprakaraṇam*

According to *Taittirīya* upaniṣad, all the *jīva-s* (living beings) have five sheaths. Those sheaths are explained in this chapter with proper discrimination of them, and their coordination

## Chapter 4: *Dvaitavivekaprakaraṇam*

In this chapter, the author explains the discrimination of duality, on the basis of *saptānnabrāhmaṇam* of *Bṛhadāraṇyaka upaniṣad*. According to advaita vedānta, though all the *jīva-s* are forms of the Brahman itself, they have created the difference among themselves. And that difference has to be properly understood before refuting the duality created by *jīva-s*, as an effect of being under the control of *māyā*. That understanding of duality is essential, as stated in the very first sentence of *Advaitasiddhi*, in order to understand what advaita is.

## Chapter 5: *Mahāvākyaivivekaprakaraṇam*

In this chapter, Vidyāraṇya explains the meaning of *mahāvākya-s*. A *mahāvākya* is any sentence from Upaniṣads, which conveys the non-duality of *jīva* from brahman. Though there are many *mahāvākya-s*, four *mahāvākya-s* from four Vedas are very famous. Their meanings are well explained here.

With this, the 'sat' (existence) aspect of Brahman is covered. And, here ends the first section viz., *vivekapañcakam*.

## Chapter 6: *Citrādīpaprakaraṇam*

In the second section viz., *dīpapañcakam*, the cit (*caitanya* or *Consciousness*) aspect of Brahman will be explained. In the sixth chapter, the *dīpa* is compared to a picture. As there are four stages of drawing a picture, there are four stages of understanding Brahman. Those four stages are explained here, with an example of a drawing.

**Chapter 7: *Trptidīpaparakaraṇam***

The state of a person, who has realized the pure consciousness, is well discussed here. According to Bṛhadāraṇyaka upaniṣad, no person will have no desire for the external material objects after realizing the pure consciousness. That aspect is explained in this chapter.

**Chapter 8: *Kūṭasthadīpaparakaraṇam***

Kūṭastha means, that which does not change, that which is eternal. In the eighth chapter, the unchangeable aspect of Brahman is explained. Though Brahman is the consciousness which perceives all the objects, it still remains unchanged. And, this phenomenon is quoted in many places in upaniṣads. That is discussed in the eighth chapter

**Chapter 9: *Dhyānadīpaparakaraṇam***

A person, after having acquired the prerequisites for the initiation in the vedāntaśāstra, will approach a guru and continue as per the guidance of guru. Then the person is supposed to listen to the teachings of guru, and understand the same without any doubt by comparing it with the other *śāstra-s*, and understand it logically. Then, it is a stage of internalizing the understood meaning, by meditating on it. There are several obstacles while meditating. Overcoming those obstacles and thereby achieving the desired state requires some guidance from guru. That aspect is explained in this chapter.

**Chapter 10: *Nāṭakadīpaparakaraṇam***

In this chapter, the author explains the difference between the *jīva*, *īśvara*, *māyā* and Brahman, with an example of the theatre illuminated by a light, *dīpa*. Whether the actors act upon the dais, or not, the light continues to illuminate it. But, when there is some action going on, it creates shadow also. With this example, the nature of *jīva* is explained here.

Here ends the second section, where the cit aspect of Brahman is explained with different examples. The next is, *ānandapañcakam*, where the ānanda (bliss) aspect of Brahman will be discussed.

**Chapter 11: *Brahmānande yogānandaḥ***

As per the explanations of Taittirīya-upaniṣad, the one who has attained oneness with Brahman, will never be afraid of anything, *abhayaṁ pratiṣṭhāṁ vindate*. Not just Taittirīya, every Upaniṣad states the same. So, by yoga, that is being one with Brahman, one will enjoy the bliss of Brahman. Brahman reveals its true nature only to yogis, those who are one with it. That is explained here.

**Chapter 12: *Brahmānande ātmānandaḥ***

In this chapter, the author discusses about the bliss that is experienced by those who are not yogis, that is those who have

not attained oneness with Brahman. According to Upaniṣads, all kinds of happiness in this world are just a glimpse of the complete bliss of Brahman. Therefore, even the material happiness is a small experience of the bliss of Brahman. That aspect is discussed here.

**Chapter 13: *Brahmānande advaitānandaḥ***

In this chapter, the contrast between the explanations by different *śāstra-s* about the creation, the cause and effect is discussed. According to vedānta, the effect is not different from its cause. And, Brahman is the cause of all of this creation. Therefore there exists a non-duality between the cause, Brahman, and the effect, creation. Realizing this non-duality will lead to the ultimate experience of bliss.

**Chapter 14: *Brahmānande vidyānandaḥ***

In this chapter, the importance of the knowledge is shown, and the fact that only knowledge is the key to attain the ultimate bliss is explained. *Jīva* is stuck in this material world because of his avidyā, and that makes him think that he is Body, or Mind etc. This stops him from experiencing the true bliss. That can be achieved by ultimate realisation.

**Chapter 15: *Brahmānande viṣayānandaḥ***

This chapter explains about how external things are perceived by the mind with the help of sensory organs. It also explains about the different opinions of many philosophers about the nature of *jīva*, and finally says that one Brahman resides in all the bodies, and thereby is considered as different *jīva-s*. The one, who understands this true nature of ātmā, will attain the bliss of ātmā, who is not different from Brahman.

Here ends the third section *ānandapañcakam*, and the book. The speciality of *Pañcadaśī* is that it is written in the form of verses, which makes it easy to memorise the *śloka-s*, and the concepts of vedānta very easily. For beginners, this will be very much beneficial. Also, the examples taken here, are easy to relate with the concepts, which makes it very helpful for beginners. Though there are other texts which the beginners can refer, they are not written in metered form. And, that makes this treatise vary unique and easily accessible. ♦

**Ananta Sharma,**  
Assistant Professor, Amrita Darshanam,  
Amrita Vishwa Vidyapeetham,  
Bengaluru Campus

# EAST MEETS WEST BIRTHDAY PARTIES

Birthdays, for our urban children, are almost universally celebrated by their parents. This is a British custom that we have made our own. The central ritual is ‘cutting the cake’ by the birthday boy or girl. After this, it is fun and games and lots of goodies to eat. It is obligatory for the guests to bring gifts - even flowers would do. Some adults too celebrate birthdays in a similar fashion, often just as an excuse for having a bash!

The celebrations start by the guests gathering around the birthday cake in anticipation of the cake cutting ritual. Birthday candles (as many in number as the age of the child) are placed on top of the birthday cake, and lit. It is a pretty sight. The birthday boy or girl stands in front of the cake, flanked by the child’s beaming parents. The child is then instructed to make a wish and blow out the candles in one breath. What could be the significance of this – making a wish and blowing out the candles – be? It could mean – so many years have gone by, forget the past and start the new year on a clean slate and “may my wish come true”. The feat accomplished, the guests applaud and burst into the ‘Happy Birthday’ song. The youngster, often assisted by the parents, now cuts out a wedge of the cake. The parents joyfully feed the first mouthful to the youngster which signals the party to begin.

Fusion music is in vogue; why not fusion birthday parties?

Indians also celebrate birthdays; not only children but adults too. The Indian style of celebrating birthdays has some interesting differences. In the Indian tradition, birthdays are auspicious occasions and the rituals focus on offering prayers as a thanks giving to the ‘Ista Devata’ for past blessings and seeking His Grace for the future. The other major difference is in the significance of lighting a lamp or a candle. For us, lighting a lamp or a candle on an auspicious occasion signifies a prayer seeking knowledge or for God’s guidance along the right path – “lead me from darkness to light”. On auspicious occasions, we do not willfully blow out a lamp or candle. The English custom of blowing out the candles on the cake would signify ‘lead me from light to darkness’! Why not consider “Indianizing” the birthday

party? How about something like this?

- Place a picture of your Ista devata, suitably decorated, on a separate table. Place the cake and a piece of all the other eats in front of the Lord’s picture as an offering; also place an oil lamp ready to be lit.
- Start the proceedings with the birthday boy or girl lighting the lamp assisted by the parents.
- Chant the following three slokas; the guests should be encouraged to join in –

Asatoma sat gamaya,  
tamasoma jyothir gamaya,  
Mrithyoma amritam gamaya,  
Om shanti, shanti, shanti-hi.

Lokaha, samasthaha, sukhino bhavantu  
Lokaha, samasthaha, sukhino bhavantu  
Lokaha, samasthaha, sukhino bhavantu  
Om shanti, shanti, shanti-hi.

Brahmarpanam Brahmahavir Brahmagno  
Brahmanahutam  
Brahmaiva dena gandhavyam  
Brahma-karma samadhinam,  
Om shanti, shanti, shanti-hi.  
Om Sri gurubhyo namaha, Hari Om.

- Prostrate after the prayers and proceed with the ritual of cutting the cake etc.

The proposal is to change the mindset from viewing a birthday party only as an occasion for fun and games and general revelry to one of thanksgiving to God for blessings received and for His Grace in the future too. This would be in keeping with the Indian cultural ethos. Indians belonging to any religion should not find it objectionable to start the proceedings with prayers said in their own religious tradition. This would be a good example of cultural evolution by synthesis and assimilation of cultures in a multi cultural society. ♦

**Lt Col K K Nair (Retd),**  
Amritapuri Campus



# Sri Nellaiappar TEMPLE

## An Epitome of Dravidian Architecture

They say Music melts rocks, but the Indian architects of 7th century melted rocks with their methodical skills, to make music out of them. Their ingenuity is still, standing tall in the form of Musical pillars in Sri Kanthimathi Nellaiappar's temple of Tirunelveli, Tamilnadu. Spread over 14 acres, with Gopurams of 850 feet long and 756 feet wide, this temple compound of Lord Shiva, known as Nellaiappar and his consort Parvathi called Kanthimathi ammai, is one of the biggest temples in south India. It is one of the Panchasabhai (five stages) temples, where Lord Shiva is believed to perform the cosmic dance. The remaining four temples are the Vada Aarayeswarar temple in Chennai, Nataraja temple in Chidambaram, Meenakshi Amma temple in Madurai, Kurthalanathar temple in Courtalam, all built in Dravidian style.

Before 20th century, temples in Southern India were more than just places of worship. They played a significant role in social, cultural, political, artistic, academic, and economic development of the country. This is why rulers did everything to

make the temples look more prosperous and auspicious. Vastu Shashtra (science of architecture) employed by the architects of ancient south India is of the popular Dravidian style, and is highly regarded for its enormity and design. The details of the first temple built in Dravidian style are not evident (the Lord Murugan temple unearthed in 2005 after the tsunami near

Mahabalipuram, is by-far the oldest (3rd century) temple found in south India) but the Dravidian architecture took its full form during the reign of Cholas, Pallavas, Pandyas and Charas. Both rock-cut and built architecture was pioneered and flourished by them, leaving many of the biggest temples on earth today. All these temples are not just symbols of craftsmanship but built thoroughly using mathematical, physical, geological, and astronomical calculations.

All the sciences developed by ancient Indian sages aim at self-realisation. In India, temples serve as a medium to understand the purpose of human life. A traditionally constructed temple in

Dravidian style will consists of Garbha Griha, the womb house (sanctum sanctorum), Pradakshina patha, Sikhara or Vimana, Kalasa and Mukhamandapam . The Garbha Griha is where the main deity is situated. It is generally a small rectangular cell, with no elaborate designs and small entrance. Pradakshina patha is the space for circumambulation. Sikhara or Vimana forms the superstructure on the top of main shrine. Kalasa is a vase with leaves coming out of it, on the top of shikhara. Mukhamandapam refers to the rectangular porch in front of the Sanctum sanctorum, generally a pillared hall allowing the devotees to stand and watch the worship rituals conducted inside the sanctum. When devotees increase, an additional hall Artha mandapam is included to accommodate more devotees in the temple. Mukha Dwaram (Doors) leading to the sanctum are always in the centre of the walls, never at the corners. Sthambha (Pillars) are elaborate structures supporting the ceiling with carvings and designs. Dwaja sthambha – the flag staff – is positioned facing the direction of the deity and is one of the most important structures of a temple. Gopuram is the large pyramidal tower over the entrance gate of a temple precinct and finally, the Teertham, or holy water body associated with the temple.

Along with the towering Gopurams, comprehensive Puranic carvings, meticulous geometric patterns and life size sculptures, Dravidian style made its mark in the world architectural discipline by its signature musical pillars. Pillars, when struck or tapped with fingers make sounds similar to that of a musical instrument. Using the primitive tools available, these experts portrayed astounding craftsmanship that the modern day scientists and engineers are still trying to comprehend. Some of these are found in the Artha Mandapam, of Sri Nellaiappar's temple in Tamilnadu. With 24 cylindrical small pillars of varying girth around a central pillar, that produce sympathetic vibrations when struck, were built by Pandya rulers in the 7th century. Situated in Tirunelveli, a 2000 year old city, this holy abode is comprised of two temples, Nellaiappar and Kanthimathi ammai. Both temples were built side by side in the 7th century, by Muluthukanda Rama Pandiyan and Nindaraseer Nedumaran with space in between them. It was between the 16th and 17th century that the remaining mandapams in the temples were built by the reigning rulers. According to scriptures, Agastya Mahamuni (a great sage from puranas) used to worship Swayambho (self-manifested) Lord Shiva at this place. Later Sri Rama worshipped the lord after killing Mareechi (a demon). Legend says that Lord Shiva, came in the form of a fence to protect the paddy alms of a devoted Brahmin, hence the city is called Tirunelveli (Tirunelveli, Tiru=beautiful, Nel=paddy, Veli=fence) and Lord Shiva is called Nell-ai-appar (God/protector of paddy). Another legend has it that the Lord Shiva once took the form of a Lingam, came to Tirunelveli and resided there. All the four Vedas stood around Him as bamboo trees and provided him shade. So this place is also known as Venu Vanam - Venu means bamboo tree and Vanam means forest and the Lord was regarded as Venuvanathanar.

In 1647 A.D Thiru Vadamalaiappa Pillaiyan, a devotee, linked the two independent temples of the Lord and his consort by

building the Chain mandapam, a long corridor with pillars along its sides decorated with Yali sculptures. Vasantha mandapam, situated to the west of Chain mandapam, is a grand space with 100 pillars, adorned with life-like sculptures in folded hands (Namaste posture). The Nandi mandapam, built by Sivanthiappa Nayak in 1654 A.D. is the corridor of Nandi, Lord Shiva's vehicle. Unlike other sculptures in the temple, it is white in color as it is carved out of lime stone. A flower garden was set up in 1756 A.D. by Thiruvengadakrishna Mudaliar inside the temple compound. The flagstaff near the Nandi was set up in 1155 A.D. There are several sacred Theerthams (holy water bodies) within the temple precincts. Lord Shiva is said to have appeared in the water of the Golden Lotus Tank and Lord Brahma as the lotus. The entire temple complex is decorated with sculptures of puranic characters like Karna, Arjuna, Veerabhadra, Lord Ganesha and many more along with the rulers who developed the temple in the later years. Other mandapams including the 96-pillared Unjal Mandapam, Maha Mandapam, Tamira Sabhai, a stage decorated with fine wood carvings, where Lord Shiva is said to have performed the cosmic dance are fine examples of Dravidian architecture. Within the temple premises, there is a shrine dedicated to Lord Vishnu (Nellai Govindan) where his idol can be seen in a lying posture, similar to the famous Sri Padmanabha Swamy temple in Tiruvananthapuram, Kerala. It was built on the belief that Lord Vishnu had visited Tirunelveli to attend the divine marriage of Lord Shiva and Devi Parvathi. A Lingam called Anwardha Lingam, dedicated to a person of Islamic faith named Anwar, shows the unity among people of different faiths in ancient times.

Housing one of the biggest and ancient temple, the Tirunelveli district was formed officially on 1st September 1790. There are stories around the city that talk about a hidden tunnel in the rear end of the temple that connects Nellaiappar's temple and Madhura Meenakshi Amma's temple. It was supposedly built to conduct secret meetings and war affairs in olden days. The green paddy fields fed by the Tamirabarani River and the tall palm groves add a verdant dimension to the landscape of Tirunelveli District. This district is famous for palm sugar candy and palm leaf handicrafts along with its very own dessert- Tirunelveli Halwa, a sweet pudding with its recipe dating back to more than 300 years.

Gary E Stevens said "You are never lost when you see a temple". For many centuries, temples sheltered the distressed humanity both physically and emotionally. Temples welcome everyone. It is the ego, and ignorance of people that lead them to build walls and barricades in their minds, to ignore and suppress the power of these scientific marvels. It is up to individuals, to develop the ability to understand the wisdom these treasure houses have to offer in realizing the purpose of human life. ♦

Sukeerthi Kakarlapudi

# a brief write-up on the two-day workshop on “Glimpses of Indian Mathematics”

dr.rajath Vasudevamurthy <sup>1</sup>  
(Assistant Professor, Bengaluru Campus)

dr.Suhas B n <sup>2</sup>  
(Assistant Professor, Bengaluru Campus)

Amrita Darshanam, Bengaluru, in collaboration with the Department of Mathematics, Amrita Vishwa Vidyapeetham, Bengaluru, organized a two-day workshop on “Glimpses of Indian Mathematics”, aimed at providing a glimpse of the rich mathematical heritage of India, March 3-4, 2018, at Amrita Vishwa Vidyapeetham, Bengaluru campus. The workshop was headed by Prof. K. Ramasubramanian of IIT Bombay. Here is a brief write-up on the topics that were discussed during the workshop.

## 1. Jyotiś-śāstra

The first session of the workshop was on the basics of Jyotiś-śātra (Indian Astronomy). Jyotiṣa was the basic method of time-keeping in the days of yore. Literally, jyoti means light and therefore jyotiṣa is concerned with heavenly bodies that emit light. The movement of the heavenly bodies were observed and used to keep track of time elapsed. The heavenly bodies that nobody could miss are the Sun and the Moon. Keen observers also notice the hundreds of stars which twinkle in the night; and further sensitive observers can keep track of their motions too. The various units of time were then discussed, namely the nakṣatra, māsa, tithi, karaṇa, yoga, vāra etc.

As observed from the Earth, the Sun takes one year (about 365 days) to complete one revolution around the Earth and the Moon takes about 27.3 days to complete one revolution around the Earth. This means that the Sun covers roughly 1 degree per day and the Moon covers about 13 degrees and 20 minutes per day (13°20′). One nakṣatra is defined as the time taken by the Moon to cover an angle of 13°20′ in its revolution around the Earth. Since the Moon takes 27.3 days to complete one revolution around the Earth, the brightest star in each such 13°20′ segment (Aśvini, Bharāṇi, Kṛittikā etc.) is identified to keep track of the position of the Moon.

The plane in which the Sun is seen to revolve is called the ecliptic. As is well-known, the ecliptic plane is inclined at 23.5 degrees to the equatorial plane. A māsa (lunar month) is defined as the time between two new moons or the time between two full moons. A new moon (amāvāsyā) occurs when the Sun and the Moon are at zero degrees as observed from the Earth, so that the light of the Sun reflected by the Moon does not reach

the Earth. A full moon (paurṇimā) occurs when the Sun and the Moon are diametrically opposite to each other. Since the Sun is also revolving around the Earth, although the Moon completes one revolution in 27.3 days the time interval between two new moons will be 29.5 days on an average. Therefore, thirty tithi-s such as prathamā, dvitīyā up to amāvāsyā or paurṇimā were identified. Technically, a tithi is defined as the time taken by the Moon to lead the Sun by 12 degrees. On an average, one tithi is lesser than a nakṣatra. As is obvious, twelve lunar months of 29.5 days each on average will lag behind a solar year of 365 days. This error builds up over time; and to compensate for it, an intercalary month is added (adhikamāsa) once in three to four years approximately. Quite seldom, one entire lunar month will go missing in the calendar, called ūnamāsa.

Karaṇa is defined as one half of a tithi. Yoga is defined as the sum of the positions of the Sun and the Moon. Although it does not have a direct physical significance, it is useful in providing redundancy for error correction. The concept of the seven-day week (saptāha) with names based on the seven visible (to the naked eye) planets and vāra (the day of the 7-day week) came much later in the development of the Jyotiś-śāstra. It is to be noted however that by looking at the sky, while one can determine the nakṣatra and tithi, the vāra cannot be found that way. The pañcāṅga that is in vogue today includes the five (as the name suggests) – vāra, tithi, nakṣatra, yoga and karaṇa.

The movement of the Sun around the Earth is divided into two parts – uttarāyaṇa (Northward movement of the Sun – from Winter solstice to Summer solstice) and dakṣiṇāyana (Southward movement of the Sun – from Summer solstice to Winter solstice). Each ayana (i.e., ‘journey’) is further divided into three sub-parts – one each for a season. The seasons are named vasanta (spring), grīṣma (summer), varṣa (rainy), śarat (autumn), hemanta (snowy) and śiśira (winter). Each season lasts for two months. To define a month in terms of the Sun’s revolution, twelve constellations of stars (rāśi) in the Zodiac were identified, namely Meṣa, Vṛṣabha, Mithuna and so on up to Mīna. Then, each rāśi consists of two and a quarter nakṣatra-s. A solar month is defined as the time between the entry of the Sun into (two) consecutive rāśi-s. For example, the entry of the Sun into the Makara-rāśi is celebrated as Makara-saṅkrānti and the



Makara month begins from that day. A lunar month as discussed above is taken from one new moon day to the next new moon day. This is again divided into two parts – śuklapakṣa (the bright fortnight, waxing phase of the Moon) and kṛṣṇapakṣa (the dark fortnight, waning phase of the Moon). As mentioned earlier, each pakṣa has fifteen tithi-s. Each tithi has two karaṇa-s.

## 2. Introduction to Indian Mathematics

While India’s contribution in the areas of Yoga, spirituality and the like are well-known, the contributions to Mathematics, Science and Technology is not well studied nor acknowledged. It may come as a surprise to many Indians that many of the famous fundamental results in Mathematics were discovered in India at least couple of centuries prior to their discovery in Europe and other parts of the world. For example, the Pythagoras theorem was well-known in the Bodhāyana śulba-sūtra, which easily pre-dates Pythagoras. The discovery of zero and the place value system that was developed in India spread to other regions later on. The infinite series for pi, today famous as the Gregory-Leibniz series was known to Mādhava and the Kerala school of mathematicians at least couple of centuries earlier than Gregory and Leibniz.

Indian mathematicians often composed their mathematical works in the form of poetry (metrical compositions). History

tells us that the most ancient works involving some mathematics such as the Chandas-śāstra were composed in sūtra (aphorisms) form. But the later-day mathematicians starting from Āryabhaṭa preferred to compose their works in poetry. The exact reason for this transition is unknown (and probably unknowable), but one may guess that the form of poetry forces a certain pattern that helps in error correction (especially in the days of yore when works were composed on palm leaves and had to be copied at least every three hundred years and preserved carefully to be passed on to the next generations). This method of composing in the form of poetry following the rules of prosody helps bring out the poet in the mathematician and also gives a chance for the readers to derive some joy even from the seemingly dry subject of mathematics.

With most Indians not being exposed to ancient Indian mathematics, a question might arise as to what must be our attitude towards ancient Indian mathematics vis-à-vis the so-called modern mathematics. The answer may be found in the following śloka of Kālidāsa:

पुराणमत्तियेव न साधु सर्वं न चापक्रियं नवमत्तियवदयम्।  
सनतः परीक्ष्यान्यतरद्भजन्ते मूढः परप्रत्ययनेयबुद्धिः।।

(By virtue of being ancient, not all is good. And [similarly], by virtue of being new, modern literature should not be condemned. The noble ones having examined, choose either of them; the unintelligent is carried away by the views of others)

### (a) Representation of numbers:

A question might arise as to how numbers, symbols and equations can be represented when any concept, result or riddle is composed as a śloka. Two techniques of representing numbers are as follows:

#### (I) Bhūtasāṅkhyā system:

The word bhūtasāṅkhyā is a compound word comprising of two constituents – bhūta referring to a ‘being’ or an ‘object’ and sāṅkhyā referring to a ‘number’. So, to represent a given number, the name of a physical object is mentioned which evokes that desired number. The said physical object could be a part of the human body; seasons or months of the year; animals such as serpents, horses, elephants etc.; metres in Sanskrit etc. For example, the words netra. hasta, pāda etc. (eye, hand, feet etc.) are used to evoke the number two, nakṣatra for the number twenty-seven (aśvinī, bharaṇī etc.), sindhu for seven (seven famous rivers), Rāma for number three (as there are three famous Rāma-s, i.e., Paraśurāma, Śrī Rāma, Balarāma), agni for number three (tretāgni – āhavanīya, gārhapatya, dakṣiṇa), āditya for the number twelve (dvādaśāditya), rudra

for the number eleven (ekādaśa-rudra), vasu for the number eight (aṣṭavasu) and so on. As can be seen, this bhūtaśaṅkhyā will need one to be familiar with the culture, itihāsa, purāṇa and kāvyā.

### (II) Kaṭapayādi system:

Here the letters ka, ṭa, pa, ya are all associated with the number one; kha, ṭha, pha, ra all with the number two; ga, ḍa, ba, la all with three; and so on. The numbers in Sanskrit are usually read from right to left.

We can now look at some of the interesting mathematical results presented in the form of śloka-s:

1. सैकपदघनपदारधमथैकादयङ्कयुतः कलि सङ्कलतिख्या।

सा द्वयुतेन पदेन वनिधिनी स्यात्तरहिता खलु सङ्कलतिक्यम्।।

This verse gives the relations for (i) saṅkalitā: the summation of the first n natural numbers, and (ii) saṅkalitaikya: the sum of the sums

$$saṅkalitā 1 + 2 + \dots + n = \frac{n(n+1)}{2}$$

$$saṅkalitaikya 1 + (1+2) + \dots + \frac{n(n+1)}{2} = \frac{n(n+1)}{2} \times \frac{n+2}{3} = \frac{n(n+1)(n+2)}{6}$$

2. वृत्तक्षेत्रे परधिगुणितव्यासपादः फलं तत्

कषुण्णं वेदैरुपरिपतिः कन्दुकस्यैव जालम्।

गोलस्येवं तदपि च फलं पृष्टजं व्यासनधिं

षड्भ्रिभक्तं भवति च फलं गोलग्रभे घनाख्यम्।।

– लीलावती (भास्कराचार्यः, 12th century CE)

This verse gives the formulae for the area of a circle, surface area and volume of a sphere in a beautiful manner easily available for singing and committing to memory. According to the verse:

$$Area\ of\ a\ circle = \frac{Circumference \times Diameter}{4}$$

$$Surface\ area\ of\ a\ sphere = Area\ of\ the\ circle \times 4$$

$$Volume\ of\ a\ sphere = \frac{Surface\ area\ of\ the\ sphere \times Diameter}{6}$$

3. अन्योन्यकोटमैरव्या गुणति ये चेष्टचापयोरदोरज्ये।

त्रज्योद्धृते तयोर्यो योगः सा चापयोगज्या।।

(-नित्यानन्दः, 17th century CE)

This verse presents the trigonometric identity: sin(A+B)=sin(A)cos(B)+cos(A)sin(B).

While the sines and cosines of angles are famously connected to

the right-angled triangle, ancient Indians defined the sines and cosines as measurements on a circle. As a result, Sin(A) called jyā in Indian mathematics, is defined as the ratio of a chord to the diameter of the circle.

4. पार्थः कर्णवधाय मार्गणगणं कृद्धो रणे सन्दधे

तस्यार्धेन नविर्य तवछरणं मूलैश्चतुर्भरिहयान्।

शल्यं षड्भिः अथेषुभस्त्रिभिरिच्छित्त्रं ध्वजं कारमुकं

चच्छेदास्य शरिः शरेण कतति यानर्जुनः सन्दधे।।

(Līlavatī, 12th century CE)

This verse presents a puzzle which takes the form of a quadratic equation finally. The question is to find the number of arrows fired by Arjuna in his duel with Karṇa. Let x be the number of arrows fired by Arjuna. Then, by the data given in the verse, we have:

$$\frac{x}{2} + 4\sqrt{x} + 6 + 3 + 1 = x$$

which simplifies to  $x - 8\sqrt{x} - 20 = 0$

Solving for  $\sqrt{x}$ , we get 10 and -2 as the roots. Since, the number of arrows must be a positive integer, we take the value 10 for  $\sqrt{x}$ ; and therefore end up with one hundred arrows as the final solution.

5. प्रतविर्षं गौः सूते वर्षत्रतियेण तर्णकी तस्याः।

वदिवन् वशितविर्षैः गौरैकस्याश्च सन्ततकिथय।।

This verse presents a riddle that there is a cow which gives birth to a female calf every year. Each female calf takes three years to mature and once mature that too gives birth to a female calf each year. This being the case; the author asks the reader to find the total number of cows at the end of twenty years.

In conclusion, we find that the way ancient Indians approached mathematics was very intimately connected with solving problems relevant to daily activities most of the time devoid of abstract proofs. In general, most of the learning was need-based not paying sufficient heed to generalizing the results to be inclusive of all possible cases. However, the Indian texts on mathematics used to present plenty of examples from everyday life in the form of beautiful verses which was easy to be committed to memory besides generating fun. This way of composing verses to present mathematical results also gave a chance for the creative genius of people to flourish. All in all, it probably suffices to say that we must expose ourselves to the various approaches to Science and Mathematics taken by different civilizations which may be beneficial in a complex and rapidly changing world. ♦

# PERSONALIZED MEDICINE: RESEARCH ADVANCES IN AYURVEDA

Personalized medicine refers to the stratification of human population based on their genetic profile to guide decisions made in regard to prevention, diagnosis and treatment of disease. Ayurveda is a holistic science which aims at the personalized approach towards the management of health and disease. The Genomic concept of Ayurveda mandates that every individual is different from other and hence should be considered as a different entity. This inter individual variability confers to the differential susceptibility to common diseases and differential drug responsiveness. Personalized medicine in Ayurveda has embedded in the concept of Prakruti (basic constitution) of an individual.

Prakruti is the innate constitution formed at the time of birth and which determines an individual's susceptibility to disease, diagnosis and prognosis of a disease and it helps in the selection of suitable therapeutics. According to the system every individual has their own basic constitution termed Prakruti which determines the inter individual variability in susceptibility to various diseases. In contemporary science, preventive and curative regime can be adopted only after an individual suffers from a disease. So there is a clear cut gap in the context of personalized medicine in these two streams. There arises the prospect of an integrative approach which leads to the concept of Ayurgenomics.

Ayurgenomics is the gateway for predictive, preventive and personalized aspects of medicine. Personalized aspect is based upon the monitoring of ahara, vihara and oushadhi (medicines) on an individual basis. In personalized diet, the principles of Nutrient-Gene interaction help to understand the effect of food and food constituents on gene expression of a person. The newly evolved branch of Nutrigenomics, provides a new door step to personalized nutrition based on the genetic constitution of an individual. Personalized medicine will enable risk management, diagnosis, prevention and therapy, specifically tailored to the unique characteristics of the individual, thus enhance their quality of life.

Thus prakruti of an individual should be assessed with a view to ascertain the risk, onset and severity of complications in diseases. The various Proclivity factors of disease and their relative significance depend on an individual's prakruti. Genetic determinants of these factors have to be investigated to evoke a new insight in prakruti Genomics. Thus prakruti Genomics forms the door step of personalized medicine.

The major challenges in today's health scenario are identifying the factors that predispose individuals to the disease and predict their progression and designing customized regime. The advanced researches with the aid of omics tool such as Ayurgenomics, Nutrigenomics, Pharmacogenomics etc. paves the way for personalized prediction and prevention. The research advance in Ayurveda in this angle provides a new doorstep in the concept of personalized medicine. ♦

**Dr. Haritha Chandran**  
Assistant Professor  
Department of  
Moulika Siddhanta  
(Basic Principles of Ayurveda)  
Amrita School of Ayurveda




# The Maritime GLORY OF INDIA

## PART 2: MARATHA EMPIRE

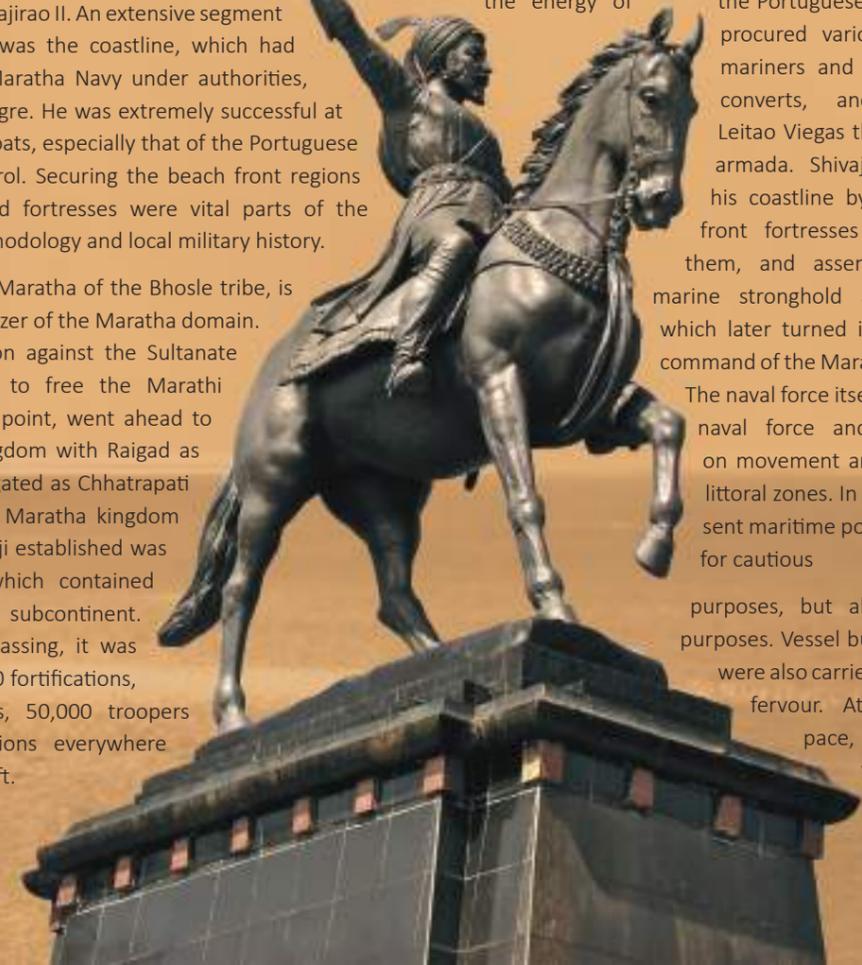
**Aruna Maurya**  
CSE, B.Tech

Flanked by the Arabian Sea, the Maratha ruled the Indian subcontinent for a piece of the seventeenth and the eighteenth century. The topographical zone spanned over 250 million sections of land (1 million km<sup>2</sup>) or 33% of South Asia extending from Tamil Nadu in the south, Peshawar in the north, and Bengal in the east

from 1674 with the delegation of Chhatrapati Shivaji and culminated in 1818 with the annihilation of Peshwa Bajirao II. An extensive segment of the Maratha realm was the coastline, which had been secured by the Maratha Navy under authorities, for example, Kanhoji Angre. He was extremely successful at keeping the maritime boats, especially that of the Portuguese and British, under control. Securing the beach front regions and building land-based fortresses were vital parts of the Maratha's cautious methodology and local military history.

Shivaji (1627– 1680), a Maratha of the Bhosle tribe, is thought to be the organizer of the Maratha domain. He fought for protection against the Sultanate of Bijapur from 1645 to free the Marathi individuals. He, at that point, went ahead to cut a free Maratha kingdom with Raigad as its capital. He was delegated as Chhatrapati (sovereign) of the new Maratha kingdom in 1674. The state Shivaji established was a Maratha kingdom which contained around 4.1% of the subcontinent. At the season of his passing, it was dabbled with around 300 fortifications, around 40,000 rangers, 50,000 troopers and maritime foundations everywhere throughout the west drift.

Empire With military predominance, Shivaji additionally centered around securing a steady and solid naval force. He started to assemble his naval force in 1657 or 1659, with the procurement of twenty galivats from the Portuguese shipyards of Bassein. Marathi accounts express that at its stature his armada checked exactly 400 military boats. In spite of an amazing armed force of troopers, Shivaji broadened his search for a qualified team for his boats, once in a while enrolling lower-rank Hindus of the drift who were long comfortable with maritime activities. Noticing the energy of



the Portuguese naval force, he procured various Portuguese mariners and Goan Christian converts, and made Rui Leitao Viegas the officer of his armada. Shivaji strengthened his coastline by seizing beach front fortresses and restoring them, and assembled his first marine stronghold at Sindhudurg, which later turned into the central command of the Maratha naval force. The naval force itself was a seaside naval force and concentrated on movement and battle in the littoral zones. In addition, Shivaji sent maritime powers not simply for cautious

purposes, but also for trading purposes. Vessel building activities were also carried out with great fervour. At an energetic pace, vessels of various details

and sizes were delivered at various dockyards, for example, Kalyan-Bhiwandi, Jaitapur and so forth. Shivaji was additionally cautious to maintain a constant watch of the ocean in the event that his fundamental base was trespassed by any of the adversaries. Consequently, as ashore, a chain of marine strongholds, both - on the drift and on the seaward islands, were developed. The rationale behind the creation of vessels in extensive numbers could be comprehended with regard to the general procedure and strategic contemplations, the Marathas took after their maritime wars. The Marathas followed a very unique tactic to deal with their foes. At the purpose of contact, the foe vessels were so overpowered by sheer numbers that it was troublesome for the adversary to focus on the Marathas. The Maratha warriors would then board the adversary vessels and enjoy physical duel with the foe team on board. They would then rise victors for the most part as a result of their staggering numbers. This was the most challenging strategy, expected to introduce fear in the hearts of the foes with the goal that they should surrender to the requests of the Marathas. Another technique concocted by the Marathas in their maritime engagements was the guideline of astonishment. The Marathas vessels - having full knowledge of the submerged rocks, sand bars and tidal or wind designs, would bait the European boats to the region of the drift where water would be on the shallower side. Once the trap worked, with the utilization of exceptionally assembled vessels (Ghurabs - towed quickly towards the foe by paddling water crafts or Galvats), the Marathas would de-capacitate the adversary vessels which would have turned out to be languid at that point for need of twist for the sail. Everything would be done so quickly that it would leave little scope for the adversary ships to take any action. In the event that the foe dispatch still stood an opportunity for getting even with the assaulting vessels, the Marathas would make great their get away to the various springs and bays in the shallow water. Big guns was another impediment in the Maratha warfare - both ashore and also on water. The canons and guns could be fitted on the marine posts, yet, they were excessively awkward, making it impossible to deal with. Their precision, range and adequacy involved hypotheses.

Another real limitation which Shivaji confronted was the productivity and accessibility of the maritime tasks. He had made a different military foundation which, similar to some other bureau of the state, required customary funds in order to empower it to play out its capacities. Unlike the land based military powers, which, by battling wars, could catch an area and directly add to the assets, the wars battled by the naval forces, hypothetically, couldn't give any such obvious points of interest (aside from the safeguard of the seaside domain).

To guarantee a consistent supply of ammunition, Shivaji utilized the system of influence and impulse. As a method for influence,

he, in the vast majority of the circumstances, used the strategic channels to get his requests satisfied.

Balaji Vishwanath (Bhat) was naturally born to a Konkanastha Brahmin family and hailed from the waterfront Konkan locale of present-day Maharashtra. He helped the youthful Maratha Emperor Shahu (grandson of Shivaji) to strengthen his hold on a kingdom that had been racked by common war and diligent assault by the Mughals under Aurangzeb. He is otherwise called the second originator of the Maratha State. Balaji Vishwanath was an exceptionally skillful clergyman and hence, was delegated to a senior post of Maratha Administration. He deliberately figured out how to prevail upon Kanhoji Angre, the leader of the west drift and the leader of the Maratha naval force. This fruitful fight resulted in raising Shahu Maharaj to the situation of Peshwa (head administrator) on 27th November, 1711.

Balaji assumed a noteworthy role amid the Maratha Civil War. At the point when Shahu was discharged from detainment, Tarabai was not willing to give due place to Chhatrapati Shahu. She sent Maratha senapati Dhanaji Jadhav to confirm that Shahu was not an imposter. Rather than driving an assault, Dhanaji Jadhav dispatched Balaji Vishwanath to confirm the truth. Shahu was triumphant and Tarabai migrated from south of Krishna to the north.

Baji Rao's child, Balaji Bajirao (Nanasaheb), was named as a Peshwa by Shahu. Nanasaheb encouraged farming, empowered the villagers, and instituted a change in the condition of the region. Balaji Bajirao Peshwa is additionally celebrated for changing the areas of Pune into a major city. He manufactured sanctuaries, scaffolds and water supplies around the city. ♦

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# Weighted arithmetic Mean calculation in Ancient india

In mathematics, the Arithmetic Mean  $\bar{x}$  of  $n$  numbers  $(x_1, x_2, \dots, x_n)$  is formally defined to be the number

$$\bar{x} = (x_1 + x_2 + \dots + x_n) / n$$

It is a mathematical concept, widely applied in the study of approximations. According to practical experiences, numbers in statistical data usually tend to merge to some central value (or average). The Arithmetic Mean (AM in short) of measurements in a recorded data is the sum of all the measurements divided by the number of measurements. Geometrically, the arithmetic mean is like the coordinates of the "centroid" of a polygon. In physics, the weighted A.M. appears in the form of the "center of mass". Apart from being a measure of central tendency, the A.M. is also used to measure features of a given data like the variance or standard deviation.

Several scholars on the history of statistics have been asserting that it is only from the 17th century CE that one comes across the use of the Arithmetic Mean as a representative value for any data comprising more than two observed values. But they completely overlook the clear and precise use of the Arithmetic Mean in the treatises of ancient Indian mathematicians like *Brahmagupta* (628 CE), *Śrīdharācārya* (750 CE), *Mahāvīrācārya* (850 CE), *Prthūdakasvāmī* (864 CE), *Bhāskarācārya* (1150 CE) and other.

**MEAN MEASURES IN EXCAVATION PROBLEMS**

*Brahmagupta's* Formulation of the Statistical Weighted Arithmetic Mean

*Brahmagupta* in Chapter 12, verse 44, of his *Brāhma Sphuṭa Siddhānta* (628 CE) had formulated weighted arithmetic mean to find the mean depth of an excavated region whose top and base have identical rectangular dimensions but whose depth varies. These regions are subdivided into sections of uniform depth after which the principle of the weighted mean is applied on them. The relevant portion of the verse is

*mukhatalatulyabhujaikeyānyekāgrhṭāni samarajjuḥ ||*

The relevant word-meanings are *mukha*: face, the upper side of a figure; *tala*: the base; *tulya*: equal to; *bhujā*: side; *aikya*: aggregate; *ekāgra*: the total of all sections; *hrta*: divided; *samarajju*: mean measure of a line segment or depth here.

*Prthūdakasvāmī* (c. 864 CE), in his commentary on *Brahmagupta's* treatise, explained that *aikya* denotes the sum of the products of the length and depth of the sections into which the excavation has been subdivided along its length. Thus, *bhujā-aikya* is to be read as "the combination of the sections". The quoted phrase of *Brahmagupta* may then be translated as follows:

In an excavation whose face and base have the same measurements, the mean depth is given by the sum of products of the lengths and depths of the sections divided by the total length.

In symbols: If the region comprises  $n$  sections of lengths  $\ell_1, \dots, \ell_n$  and depths  $d_1, \dots, d_n$ , then the mean depth  $d$  of the excavation is defined as:

$$d = (\ell_1 d_1 + \dots + \ell_n d_n) / (\ell_1 + \dots + \ell_n)$$

The mean depth is computed for estimating the volume of the excavation. Brahmagupta also gives a method for estimating the area when the lengths and widths are not uniform.

**Prthūdaka's Illustrative Example**

This is an exercise given in *Prthūdakasvāmī's* commentary to illustrate Brahmagupta's principle quoted above:

*trīṃśaddhastā tu yā vāpī dairghyenaṣṭau prthutvataḥ |  
 tatrāntaḥ pañcakhātāni vedādyairbhujā khaṇḍakaiḥ ||  
 vedhaśca navasaptāgatridvisaṅkhyo yathākramam |  
 khātakānām samā rajjryā'tra syācchighramucyatām ||*

A pool of water 30 cubits in length and 8 cubits in width comprises within it five portions of excavation by which its length is subdivided into five parts measuring 4, 5, 6, 7, 8 cubits, the corresponding depths measuring respectively 9, 7, 7, 3, 2 cubits. What is the mean depth of the excavation?

Solution: The areas of the five portions of excavation are  $(4 \times 9) = 36$ ,  $(5 \times 7) = 35$ ,  $(6 \times 7) = 42$ ,  $(7 \times 3) = 21$ ,  $(8 \times 2) = 16$  with the sum of 150 square cubits. Total length is 30 cubits. Therefore, the mean depth is  $150 \div 30$ , i.e., 5 cubits.

This commentary also gives the estimate of the volume of the excavation as the product of its surface area, i.e.,  $(30 \times 8) = 240$  square cubits, and the mean depth 5 cubits. Thus, the estimated volume is 1200 cubic cubits.

*Śrīdharācārya's* use of *Arithmetic Mean in Excavation Problems*

*Śrīdharācārya* (750 CE) in his text *Trīśatikā* (verse 88) presented the following problem on the mean depth of an excavation of uniform length and depth, but variable width:

*trīcatuḥpañcakahastāḥ pṛthutā viṣamāt tu yasya khātasya | aṣṭau hastā vedho dvādaśa dairghye kathaya phalam ||*

In an excavation of uneven width, whose width at 3 different places are 3, 4 and 5 cubits, the depth is 8 cubits and length is 12 cubits. The volume of the excavation would be?

Solution: The mean width is  $(3+4+5)/3=4$  cubits and the estimated volume  $12 \times 4 \times 8=384$  cubic cubits.

*Śrīdharācārya's* example gives simple arithmetic mean while *Brahmagupta's* gives weighted arithmetic mean.

*Mahāvīrācārya's* Formulation of *Arithmetic Mean in Excavation Problems*

In verse 4 of Chapter 7 of the *Gaṇita-sāra-saṅgraha* (850 CE),

*kṣetraphalaṁ vedhaguṇaṁ samakhāte vyāvahārikam gaṇitam | mukhatalayutidalamathasatsaṅkhyāptaṁ syātsamīkaraṇam ||*

According to this, the excavation (where the horizontal areas are not constant and moreover, even in any horizontal section, the lengths and widths are not constant) has  $n$  vertical sections of the excavation along length. Measure the length of the top and the length of the bottom of each vertical section. Consider the half of the sums of these  $n$  estimates of the lengths of the face and the base. *Mahāvīrācārya* prescribes taking the mean length as the above (halved) number divided by the number  $n$ . Thus, if  $t_1, t_2, \dots, t_n$  and  $b_1, \dots, b_n$  are the corresponding top-lengths and bottom-lengths, then the mean length is given  $((t_1+b_1)+\dots+(t_n+b_n))/2n$ . Similarly, one gets the mean width, area or volume.

*Bhāskarācārya's* Formulation of *Arithmetic Mean in Excavation Problems*

The statistical arithmetical mean is described by *Bhāskarācārya* in his treatise *Līlāvati* in the context of estimating the volume of an excavation when all three dimensions vary:

*gaṇayitvā vistāraṁ bahuṣu sthāneṣu tadyutirbhājyā | sthānakamityā samamītrevaṁ dairghye ca vedhe ca*

*kṣetraphalaṁ vedhaguṇaṁ khāte ghanahastasaṅkhyā syāt ||*

The mean width of the ditch is defined to be the quotient of the sum of the widths divided by the number of places at which the measurements are taken. Likewise, the mean length and depth are determined.

*Gaṇeṣa Daivajña's* Heuristic Version of the Law of Large Numbers

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In his commentary on *Līlāvati* titled *Buddhivilāsinī* (c. 1545 CE), *Gaṇeṣa Daivajña* makes the following remark while explaining *Bhāskarācārya's* verses on measuring irregular shapes quoted above.

*yathā yathā bahuṣu sthāneṣu vistārādīkaṁ gaṇyate*

*tathā tathā samamītiḥ sūkṣmasūkṣmatarā syāditi spaṣṭam |*

The more and more the number of places at which the measurements of width, etc., are taken, the closer and closer will the mean measures be to the true values and [consequently] the computation [of the volume] will be more and more accurate.

*Weighted Arithmetic Mean in Ancient India: Computations on the Purity of Gold in Alligation Problems*

*The Terms varṇa and kṣaya*

The Sanskrit word *varṇa* was used in ancient Indian treatises to denote the “fineness” (or purity) of gold; in a scale of 16 units. Thus, a gold of 1 *varṇa* contains 1 part of pure gold and 15 parts of baser metals and so on. Thus, the term *varṇa* is analogous to the modern term karat, with pure gold being 24 *karats*, i.e., 16 *varṇa* = 24 *karat*. The term *kṣaya*, the opposite of *varṇa*, indicates the deficiency in a piece of gold; a gold of 1 *kṣaya* contains 1 part of impurities and 15 parts of pure gold.

The amount of pure gold in a piece of gold of weight  $w$  units and fineness  $v$  *varṇa* is  $(wv)/16$  units.

*Alligation and Weighted Arithmetic Mean*

*Miśraka-vyavahāra* (alligation, i.e., computations pertaining to mixtures of things) is one of the standard topics in ancient Indian arithmetic treatises. The formula for the weighted arithmetic mean arises very naturally in some of these problems on alligation: if  $n$  pieces of gold of fineness  $v_1, \dots, v_n$  *varṇa* and weights  $w_1, \dots, w_n$  units are combined, then the fineness of gold in the resultant piece is  $V$  *varṇa*, where

$$V = (w_1v_1 + \dots + w_nv_n) / (w_1 + \dots + w_n)$$

Thus,  $V$  is literally the “weighted” arithmetic mean of the fineness of the original pieces, with the literal weight of the gold pieces playing the role of the mathematical weight.

*Weighted Arithmetic Mean in the Bakṣālī Manuscript*

The weighted arithmetic mean is defined in *H1 16 verso (ii)* of the *Bakṣālī Manuscript*, in the context of computing the *kṣaya* of gold in a mixture is:

*kṣayaṁ saṁguṇya kanakāstadyutirbhājayet tataḥ saṁyutaireva kanakaireikaikasya kṣayo hi saḥ*

Having multiplied the [weights of the] pieces of gold with their *kṣaya*, let their sum (i.e., the sum of the products) be divided by the sum of the (weights of the) pieces of gold. The result is the average *kṣaya*. Thus, if  $n$  pieces of gold of weights  $w_1, \dots, w_n$  units have respective *kṣaya*  $k_1, \dots, k_n$ , then the average *kṣaya* is given by

$$k = (w_1k_1 + \dots + w_nk_n) / (w_1 + \dots + w_n)$$

It was observed that within 300 CE, the use of weighted arithmetic mean had arisen in ancient India as an exact mathematical concept, from mixture problems involving computations on gold. From the early the seventh century, the weighted arithmetic mean was conceived in its statistical avatar by *Brahmagupta* and subsequent Indian mathematicians, and applied (somewhat in the spirit of calculus) to problems involving estimation of the dimensions of an excavation.

*Mahāvīrācārya's* Version of *Weighted A.M. in Alligation*

*Mahāvīrācārya* states the above two rules in the first part of verse 169 of *Gaṇita-sāra-saṅgraha* as follows:

*kanakakṣayasamvargo miśrasvarṇāhṛtaḥ kṣayojñeyah |*

*Pṛthūdakasvāmī's* Supplement

In his commentary on the chapter *Gaṇitādhyāyāḥ* of the treatise *Brāhma Sphuṭa Siddhānta* by *Brahmagupta*, *Pṛthūdakasvāmī* points out that the topic of computations on gold does not occur in the chapter and therefore, he introduces a verse of his own on the omitted topic. He says:

*iha gaṇitādhyāye suvarṇagaṇitaṁ nāsti |*

*tadartha śloko'yam*

His rule describes the formulae:

*suvarṇahemasamvargānekīkṛtya vibhājayet |*

*iṣṭavarṇena tatsaṅkhyā hemayogena varṇakah ||*

Take the sum of the products of the fineness and the weight of the several pieces of gold. Dividing it by the fineness of the desired (refined gold) gives the amount (the weight of the refined gold); dividing it by the sum of the weights of the (pieces of) gold gives the fineness (of the refined gold).

*Bhāskarācārya's* Formulation of the *Weighted Arithmetic Mean in Alligation*

In the following verse, *Bhāskarācārya* makes a compact and lucid presentation of the rules in his treatise *Līlāvati*.

*suvarṇavarṇāhatiyogarāśau svarṇaikyabhakte kanakaikyavarṇah |*

*varṇo bhavēcchodhitahemabhakte varṇoddhṛte śodhitahemasāṅkhyā ||*

The sum of the products of the weights and the fineness of the (pieces of) gold, divided by the sum of the weights of the (pieces of) gold, defines the fineness of the mixture of the gold pieces. The sum, divided by the weight of the purified gold, defines the fineness of the purified gold; and (the sum) divided by the fineness of the purified gold, defines the amount (weight) of the purified gold.

A similar statement and exercise on *alligation* as that of

*Bhāskarācārya* are also given by *Nārāyaṇa Paṇḍita* also.

*Influence of Ancient Indian Arithmetic and Algebra*

*The Impact of the Decimal System and the Operation of Division*

The decimal system had originated in India and in spite of the strong advocacy by Fibonacci (1202 CE) and subsequent scholars, it took nearly five centuries for the Indian decimal system to get accepted and standardized in Europe, sometime around the 17th century.

The methods of computation based on the Roman system practiced in Europe were unwieldy. Because of the decimal system, ancient Indians developed systematic and precise methods for fundamental arithmetic operations like addition, subtraction etc. which were slight variants of our current methods. This system brought an enormous simplification in computational arithmetic in Europe.

The computation of Arithmetic Mean involves the operation of division (apart from multiplication and addition) which for a long time was regarded difficult by European scholars. The Indian version of the long division went to Europe through the Arabs and became very popular during the 15th–18th centuries as the galley method. Some modifications were subsequently introduced to make it conducive for the new system of writing with paper-and-ink. Thus, it is perhaps not a coincidence that we see an increasing use of the Arithmetic Mean in Europe after her adaptation of the Indian computational methods based on the decimal system.

**Epilogue**

From at least the 7th-century CE, Indian mathematicians have defined the Arithmetic Mean explicitly, given the concept an appropriate name and also treated it as a representative value. This statistical concept is prevalent in the major texts of prominent astronomer-mathematicians like *Brahmagupta* and *Bhāskarācārya*, whose English translations have been available for the past 200 years. And yet, the abundant occurrence of Arithmetic Mean in ancient Indian mathematics texts gets overlooked in accounts on the history of statistics. It is indeed a matter of great concern that we, as Indians, ignore our ancient Indian Science and accept the Western Ideas. ♦

**REFERENCES:** Weighted Arithmetic Mean in Ancient India, by Amartya Kumar Dutta, Bhāvanā Trust (<http://bhavana.org.in/arithmetic-mean-ancient-india/>)

The flight was cruising over the Gangetic plains, revealing the vast expanse of fields that the fertile North Indian soil was holding in its bosom. From my cosy position up in the bright morning sky, skirting through fluffy clouds, I could see huge stretches of neat squares and rectangles of varying shades of green. For a few seconds, my thoughts lingered on the India of the past – of how, around 300 years back – She was an exceptionally rich agricultural economy, producing millions of tons of grains which could not only feed her children but produced sufficient surplus amounts to export as well. A stark contrast to the India today who, although largely agrarian, is struggling to produce enough grains for various reasons. I shook off the thought, coming back to the present when I noticed black lines bisecting the fields below. I wondered what it could be that was glistening so black in the morning sun, winding its way across the stretches of fields. The fields gave way to small concrete structures, which was slowly replaced by tall high rise buildings. I was easing into the outskirts of Delhi NCR region. And then it struck me! The glistening black thread was the river Yamuna!

Rivers have always played a very significant role in the development and sustenance of life in India. Rivers were never considered as just water bodies or geographical occurrences, rather they were seen as the life-making fundamentals. Most of the old civilizations in the world were established and nurtured in the backdrop of mighty rivers. Our culture, in particular, treated rivers as Mother – because of the very reason that a river could sustain and nourish living beings who depend on it. There are many festivities and rituals that are associated with the rivers too- Durga Puja, Vinayak Chaturthi etc where the ceremonial immersion of the deity's idol is performed. The rivers Saraswathi, Ganga, Yamuna, Sarayu and the seven rivers (Sapta Sindhu) find prominent mention in Vedic hymns.

Most of the rivers are also treated as Goddesses (except Brahmaputra, which is considered as a male deity or God) and are worshipped with a lot of fervour. This

# The Woeful Tale of Yamuna...

Gayathri Narayanan  
Assistant Professor, ECE Department

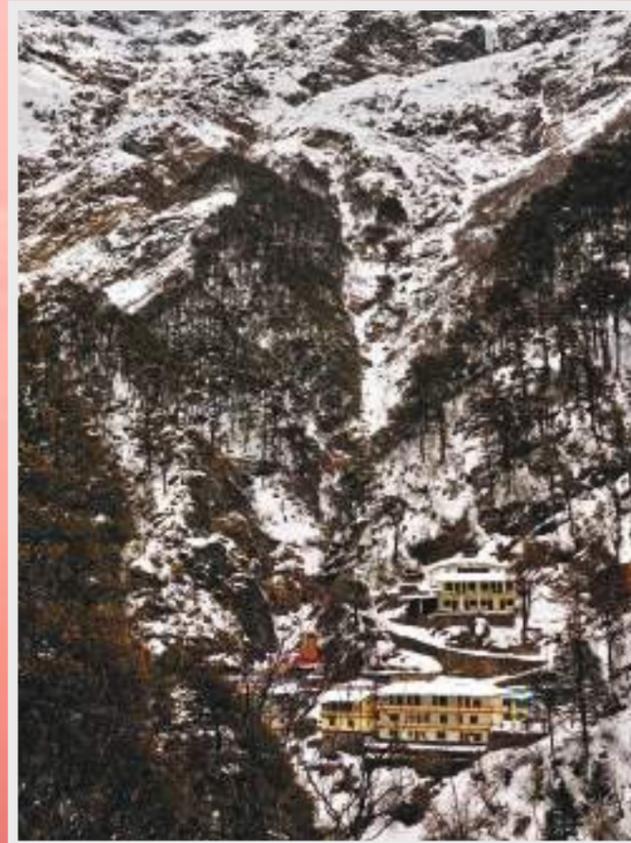
association of the rivers with God lends it an aspect of divinity. In our culture, we believe that the River Ganga descends from the heaven itself, from the matted locks of Lord Shiva. Symbolically, it represents liberating consciousness or divine consciousness that flows from the head of a spiritual teacher (Shiva) and purifies everyone who comes into contact with it. The Yamuna, a tributary of Ganga, is invariably intertwined with the life of Lord Krishna. Lord Rama's birthplace is situated on the banks of the river Sarayu. These are only to name a few associations. Each river has its own unique story to tell.

However, somewhere along the way, we have lost this reverence, this respect.

My mind was uneasy, looking at the widening black thread as we flew into the city. I thought about the river in its entirety. The 1370 km long river has its origins at Yamunotri in the Himalayas and flows through Delhi, Haryana and Uttar Pradesh as she meanders her way down. She flows down as pristine, clear water till she reaches the barrage at Wazirabad. Then onwards, in her

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I THOUGHT ABOUT THE RIVER IN ITS ENTIRETY. THE 1370 KM LONG RIVER HAS ITS ORIGINS AT YAMUNOTRI IN THE HIMALAYAS AND FLOWS THROUGH DELHI, HARYANA AND UTTAR PRADESH AS SHE MEANDERS HER WAY DOWN.”

journey, she undergoes a stark and ugly transformation from the crystal clear water to inky black liquid frothing and bubbling with toxic gases along the way. The magnitude of the waste waters which contributes to this transformation is nothing short of shocking. Delhi's waste water drains pump in a lethal cocktail of domestic waste, industrial effluents and non-biodegradable toxic wastes into the Yamuna. Astonishingly, 70% of the waste



condition of Yamuna is the irresponsible and reckless acts and attitude of human beings. Rivers are to the land, what blood vessels are to the human body. Needless to say, the future generation is in grave danger unless we really rise up to the occasion and take quick action to protect our rivers, the blood vessels of Bharat Mata.

is fed in within a 22 km stretch which constitutes a mere 2% of the river's total length. Of the city's 21 major drains, 18 of it join the Yamuna. Delhi produces nearly 3800 million litres of waste water every day and almost 50% of it flows directly into the Yamuna. Imagine! 1900 million litres of waste water every day! The statistics are unimaginable! Yamuna Mata... You were once our lifeline... But, not anymore...What has become of you...! How did you transform from one of the world's holiest to one of the world's dirtiest? The sole reason for this

Today, Yamuna has found place as one among the top 5 dirtiest rivers in the world and that is indeed not something for us to be proud of. Drinking the "holy" water of Yamuna is unthinkable today. The oxygen content is almost nil and the river has been deemed unfit to support any form of life. In short, Yamuna has been declared ecologically dead.

These pressing environmental issues constantly make its way past our ears. We listen. We forget. It does not really touch

us, since we live in the make-believe bubble of our daily existence. But, what about the millions of people who rely on the rivers for their daily life? What about the millions who cannot afford to buy drinking water? What about the millions who are born with deformities or diseased due to the consumption of this water? My thoughts raced on. As my flight touched down the runway leaving behind the gleaming black threads of Yamuna, a lone drop of tear on my hand lay testimony to my thoughts. ♦



**Śatāvadhāni** Dr. R Ganesh is one of India's foremost Sanskrit scholars and poets. He is an acknowledged authority on Aesthetics and Indological studies. He is a master of the ancient art of avadhāna, a classical literary art form that involves multitasking and extempore versification, where he faces a group of eight (aṣṭāvadhāna) or hundred (śatāvadhāna) questioners. His felicity in classical poetry has helped him revive the art of avadhāna in Kannada and elevate it to hitherto-unknown heights. He is the recipient of several awards and recognitions including the Karnataka state's Rajyotsava Award and the Bādarāyaṇa-Vyāsa Puraskar from the President of India for his contribution to the Sanskrit language.

#### What does the word avadhāna mean?

The literary aesthete Vāmana's statement 'cittakāgryam avadhānam' is the most famous definition of the word avadhāna. Accordingly, it means 'concentration' or 'attention'.

There are several kinds of avadhānas based on classical arts – nṛtyāvadhāna, citrāvadhāna, gītāvadhāna and many more. What I practise is the literary variety, which is called the 'sāhityāvadhāna' (simply put as 'avadhāna', hereafter). Apart from bestowing aesthetic enjoyment, avadhāna creates wonder and amazement in the hearts of the connoisseur.

#### How old is the art? Where does it find its origin?

It is likely that the art of avadhāna took its birth with all other allied forms of art. However, the avadhāna in its current form is of a much later date. This is probably because, though 'avadhāna', i.e., concentration is of utmost importance in the performance of any art, its literary version needs extempore creativity and a good amount of erudition.

The different components of an avadhāna are mentioned in several works, such as the Lalitavistara, a Buddhist text and the Prabandhakoṣa, a Jain text. However, the best source for this is the list of the sixty four arts 'catuṣṣaṣṭikalā' mentioned in Vātsyāyana's 'Kāmasūtra'. A few among these are:

- i. Prahelikā – solving riddles
- ii. Pratimālā – 'last letter first,' based on poems composed by famous poets, or the participant coming up with a verse extempore. This is an earlier version of antyākṣarī, the 'sport of songs' that is immensely popular today.
- iii. Durvācakayoga – tongue-twisters
- iv. Kāvya-kriyā – extempore poetry
- v. Kāvya-samasyā-pūraṇa – solving literary challenges (usually involves bringing sense to a senseless statement)

One will need to have intense focus and concentration at any given time and place to perform any of the above literary sports.

Moreover, he needs to have a highly creative mind to be able to compose poems extempore, without any preparation.

From several inscriptions and also from the oral tradition, we can infer that avadhāna started developing from the early seventh century and crystallised into the form we see today by about eighth-ninth century CE. It gained widespread popularity by eleventh century.

#### Do we have evidence for full-fledged aṣṭāvadhānas and śatāvadhānas performed in the past?

The avadhāna in its complete form was first documented by the Kannada poet Kavikāma in his Śṛṅgāratnākara. It looks like Kavikāma was an aṣṭāvadhāni, i.e., he could take questions from eight (or four) scholars and answer them by composing verses extempore.

We find reference for Śatāvadhāna for the first time in about twelfth-thirteenth century. We have supportive evidence for this: Mallinātha's grandfather (who also bore the same name) performed a Śatāvadhāna in the thirteenth century.

#### What is the kind of training needed to become an avadhāni?

All kinds of art require talent (pratibhā) and erudition (vyutpatti). By regular practice (abhyāsa), the artist will also need to gain perfection over the grammar of his medium of art. In addition to this, most performing arts of India require the artist to create art extempore. Such extempore creation is what makes Indian art always fresh and new and entertains its audience.

With these, a prospective avadhāni will need to have three 'dha's—dhairya, dhārā and dhāraṇa.

Firstly, dhairya (courage) is needed to come on to the stage and take up any kind of questions. The first few attempts at the avadhāna might not result in verses of great quality, but the avadhāni should not lose heart. He will need to overcome stage-fear and face the questions and the audience boldly.

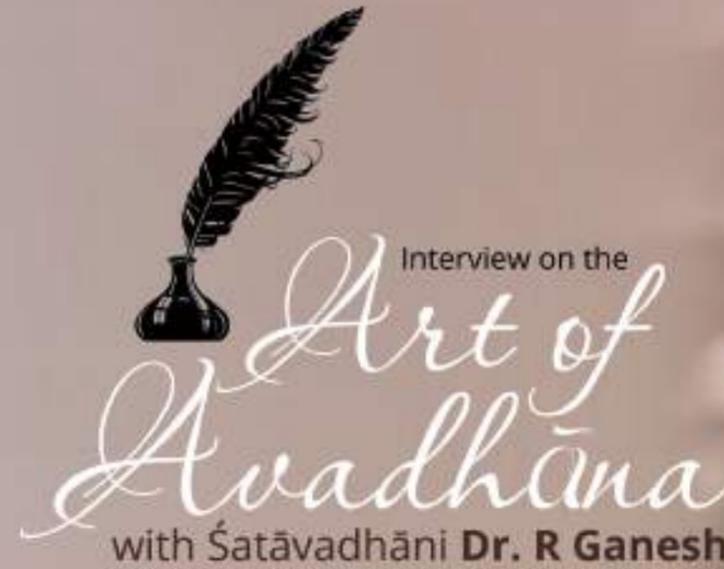
Dhārā means the constant flow of ideas and bringing them out in the form of words, which together form a verse set to a classical meter (chandas).

Dhāraṇa is memory. An avadhāni will need to remember the verses he has composed during the course of the avadhāna. A good memory will also help him recall verses of other poets and will aid in having an active vocabulary.

#### What inspired you to be an avadhāni?

From my very young age, I had great interest in various Indian art forms and literature. By my high school days, I was able to compose verses in Sanskrit, set to different meters.

At the age of nineteenth, I happened to witness a Sanskrit aṣṭāvadhāna organised by Sri. Lanka Krishnamurthi.



Immediately after I saw it, I was confident that I could perform the feat. On the very next day, i.e., 9th November 1981, I performed a full-fledged aṣṭāvadhāna in the company a few scholar-friends. Since then, I have performed over a thousand aṣṭāvadhānas and five śatāvadhānas in Sanskrit, Kannada and Telugu languages.

#### What are the components of an aṣṭāvadhāna?

Eight scholar-poets (called 'pṛcchakas') will need to pose questions to the avadhāni. An avadhāna has four rounds. In each round, one fourth of the problem posed by the pṛcchakas is solved. The avadhāni will need to remember the question posed and the answer he has composed during all the rounds. The avadhāni uses no writing aids and he is not allowed to seek the help of anybody else.

I usually have the following components for an aṣṭāvadhāna.

- i. Niṣedhākṣarī – This is amongst the toughest components of an aṣṭāvadhāna. The pṛcchakas for this division will also need to be great scholars. A topic is given by the pṛcchaka based on



Arjun Bharadwaj,  
Assistant Professor, Amrita Darshanam,  
Amrita Vishwa Vidyapeetham,  
Bengaluru Campus.

which the avadhāni is to compose a poem. The *avadhāni* composes the poem one letter at a time. The *prcchaka*, who can predict the complete word will stop the *avadhāni* at each letter, barring him from using a certain letter, which would have otherwise eased the composition of the poem.

ii. *Samasyāpūraṇa* – The *prcchaka* poses a senseless or seemingly vulgar statement as one of the four lines of a verse. The *avadhāni* will need to complete verse and bring sense to the statement, also freeing it from vulgarity.

Example: “मुहुरमुहश्चुम्बति मातरं पुमान्” – A man kisses his mother repeatedly. My solution:

विकनामा यतरिदत्रविरषिकी  
वदिशयात्रां परपूर्य कातरः।  
प्रवशिय चादौ वरभारतीभुवं  
मुहुरमुहश्चुम्बति मातरं पुमान्॥

A sage, Vivekananda by name, came back to his motherland having toured abroad for three years. Soon as he stepped into India, he repeatedly kissed his homeland, a mother-figure to him, and offered his respect.

iii. Dattapadi – The *prcchaka* gives a topic on which a verse needs to be composed. He also gives four unrelated words that need to be brought into the four lines of the verse, without compromising on grammar and meter.

Example: I was once asked to describe the feelings of Bharata when he was asked to be the king of Ayodhyā while Rāma was in the forest, using the words ‘merā,’ ‘terā,’ ‘sārā,’ and ‘pyārā,’ one in each line of the verse. My solution:

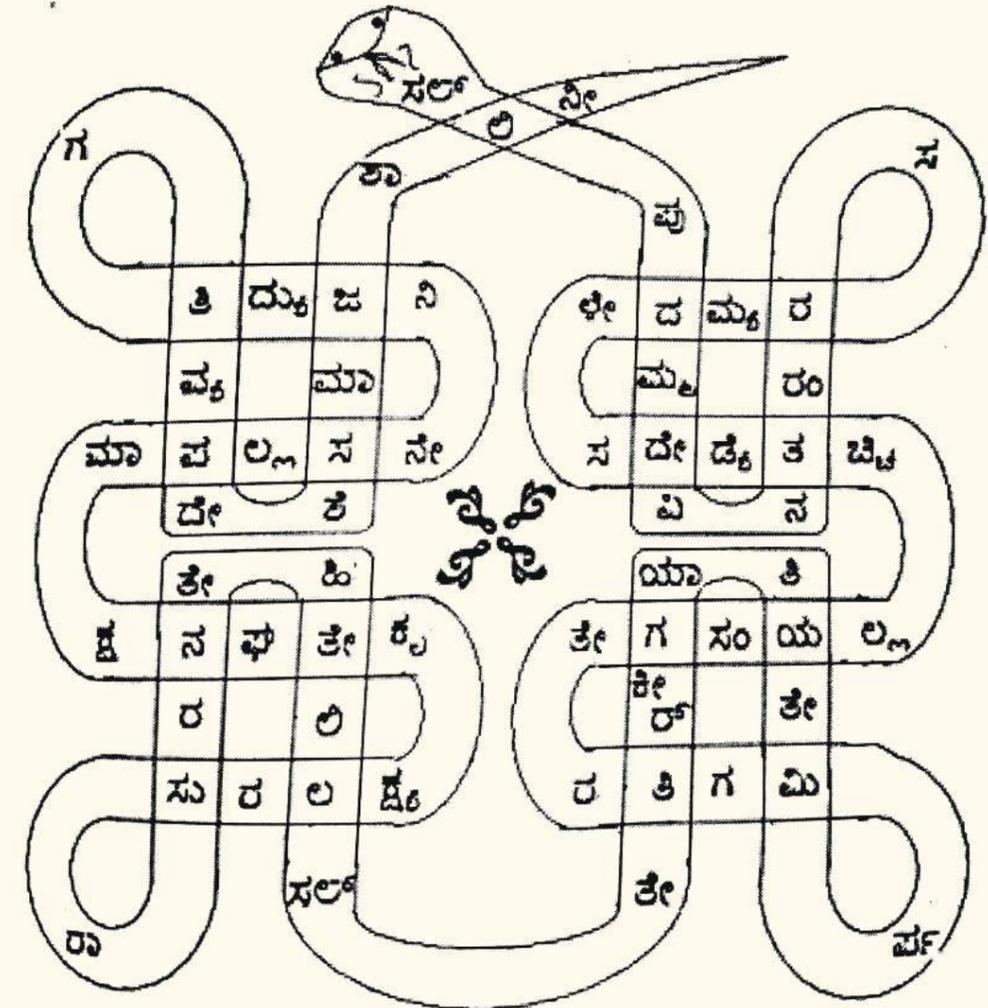
रामे राज्यं समर्प्याहं व्रते रागकषये रमे।  
सारात्मा भरतो ब्रूतेऽप्यारादतिथं सुनसिस्पृहः॥

“I will submit this kingdom to Rāma and take up austerities that curtail desires.” Thus spoke Bharata, the selfless, magnanimous person.

iv. *Citrakāvya* – This is component can be roughly called ‘word acrobatics’ and one of the attractive components of my *avadhānas*. Given a topic, the *avadhāni* will need to compose a verse extempore, such that it fits into one of the *citrabandhas*.

Example: (in Kannada) Topic: Praising the Goddess, *Bandha*: *Ṣaodaśa-kuṇḍala-nāgabandha*, Meter: *Utpalamāla*.

ಸಲಿಪುದಮ್ಮ ದೇವಿ! ನತರಂ ರಸರಮ್ಯದಳೇ! ಸದೇಡ್ಯೆ! ತ-  
ಚ್ಚಿಲ್ಲಯಸಂಗತೇ! ರತಿಗಮಿರ್ಪಮಿತೇ! ಯತಿಯಾಗಕೀರ್ತಿತೇ!  
ಸಲ್ಲಲಿತೇ! ಹಿತೇ! ನರಸುರಾಸುರಲಕ್ಷ್ಯಕೃತೇ! ಘನಕ್ಷಮಾ-  
ಪಲ್ಲಸನೇ! ನಿಜದ್ಯುತಿಗತಿವ್ಯಪದೇಶೆ! ಸಮಾಜಶಾಲಿನೀ!



v. *Kāvyaṅgana* – Four verses that are chosen from the works of poets of different time periods are recited. The *avadhāni* needs to identify the source of the verse and also explain its meaning.

vi. *Aprastutaprasaṅga* – This is mainly to entertain the audience and to disturb the concentration of the *avadhāni*. When the *avadhāni* is in deep thought, the *aprasutaprasaṅgi* asks an irrelevant question to distract his attention.

vii. *Āsukavitā* – The *avadhāni* needs to compose four full poems for the topics posed by the *prcchaka*, one in each round. Here, the *avadhāni* can let his creativity flow and there are no additional constraints.

viii. *Saṅkhyābandha* – Numbers in magic squares in a matrix of 5 x 5 need to add up to the same total along the rows, columns and diagonals. The numbers in the squares should not be repeated. At the beginning of the performance, the *prcchaka* tells the *avadhāni* what the magic number should be and interrupts the *avadhāni* twenty-five times during the *avadhāna* to seek the numbers in a random order.

In addition to this, *ghaṅṭāgaṅana*, *uddiṣṭakṣarī*, *nyastākṣari*, *varṇanā* and several other components are possible.

#### How do we access resource material related to Avadhāna?

My D.Litt thesis “*Kannaḍadalli Avadhānakale*” in Kannada gives a comprehensive overview of the history and development of the art and also describes in detail the different components of an *avadhāna* and their aesthetics.

There are several videos of my *avadhāna* available online.

#### Is the material available in other languages?

I am working with my young friend and poet, Sri Shashi Kiran to bring out a work on *avadhāna* in English. Abhinaya Bharati, founded by the senior Sanskrit scholar Dr. SR Leela also documented one of my Sanskrit *avadhānas* along with explanation and subtitles in English. The DVDs are available in the market.

The Southern Regional Center of IGNC had also organised a seminar on the art of *avadhāna*, about a decade ago.

#### Can an avadhāna be performed in the English language?

Well, an *avadhāna* can be performed in English too. However, the language does not render itself well in different classical meters. The structural flexibility of English is quite poor. Moreover, the possibilities for bringing poetic beauty through figures of speech or suggestions is lesser in English.

I have chosen Sanskrit as it is the most ornate and evolved language. Kannada, my mother tongue comes naturally to me and is also my primary mode of expression. In general, Sanskrit or its derived languages are suited for an *avadhāna*.

#### Who were the famous avadhānis of the past? Are there good ones today too, other than yourself?

The art of *avadhāna*, historically, has been popular in Andhra Pradesh. Stalwarts such as Tirupati Venkata Kavulu (Divakarla Tirupati Shastri and Chellapilla Venkatasastri), Veluri Shivaramashastri, Garikapati Narasimha Rao have contributed immensely to its growth. In Kannada, Bellave Narahari Shastri played a similar role. It is gratifying to witness many people performing *aṣṭāavadhānas* very well in recent times. While Dr. R. Shankar performs in Sanskrit, Ganesh Bhat Koppalotota does in Kannada. Even others such as Ramakrishna Pejattaya and Mahesh Bhat perform in both languages- Sanskrit and Kannada.

#### What is your advice for aspiring avadhānis?

Anybody who can come up with extempore poetry in classical Indianmeters can be an *avadhāni*. I am certain that such a poet, upon reading my thesis will be able to equip himself to perform a full-fledged *avadhāna*. He will of course need to possess the three ‘*dha*’s | ◆

#### Thanks to

Sri Shashi Kiran BN for additional information)

## Two-day Workshop on Mahimabhaṭṭa and his contributions to Indian Poetics

13 - 14 October 2018

Amrita Vishwa Vidyapeetham, Bengaluru

organized by amrita darshanam, IcSS

Through storytelling, the truth has been expressed with all its nuances and exuberance in all three dimensions and four phases of human life. The symposium aims to understand the evolution of story-telling in Sanskrit and to analyze the creativity that propagates truth in the form of stories, and if possible, to find a way forward for this great tradition of story-telling in Sanskrit. Many renowned scholars — including Prof ‘Abhiraj’ Rajendra Mishra, Prof. Prabhunath Dwivedi, Prof. Kaushalendra Pandey, Prof. C Rajendran, Dr. K S Kannan, Shatavadhani Dr. R Ganesh, Dr. Balaram Shukla, Dr. N K Sundareshwaran and Dr. S R Leela, etc — will deliver invited lectures on the different aspects of Sanskrit story-telling tradition.

Mahimabhaṭṭa, the 12th Century Kashmiri aesthete, is famous for his grand work on literary aesthetics, the *Vyaktivivekā*. He is known as the doughty polemic logician who endeavored hard to refute Anandavardhana’s *dhvani* theory. A successor of Anandavardhana and Abhinavagupta in time, though not in thought, Mahimabhaṭṭa has astounding originality and depth. He not only challenges and critiques the giant intellectuals before him but also gives a better and deeper understanding of literary criticism.

This workshop aims at highlighting the contributions of this literary giant and his place in global poetics. It will also touch upon Mahimabhaṭṭa’s orientation towards various philosophical systems, especially medieval Buddhist logic.

## One-day National Symposium on Story-telling Tradition of Sanskrit

20 October 2018

Amrita Vishwa Vidyapeetham, Mysuru

organized by amrita darshanam, IcSS in association with Sahitya academy

## Seven-day Textual Workshop on Madhusūdana Sarasvatī’s Siddhāntabindu

10 - 16 November 2018

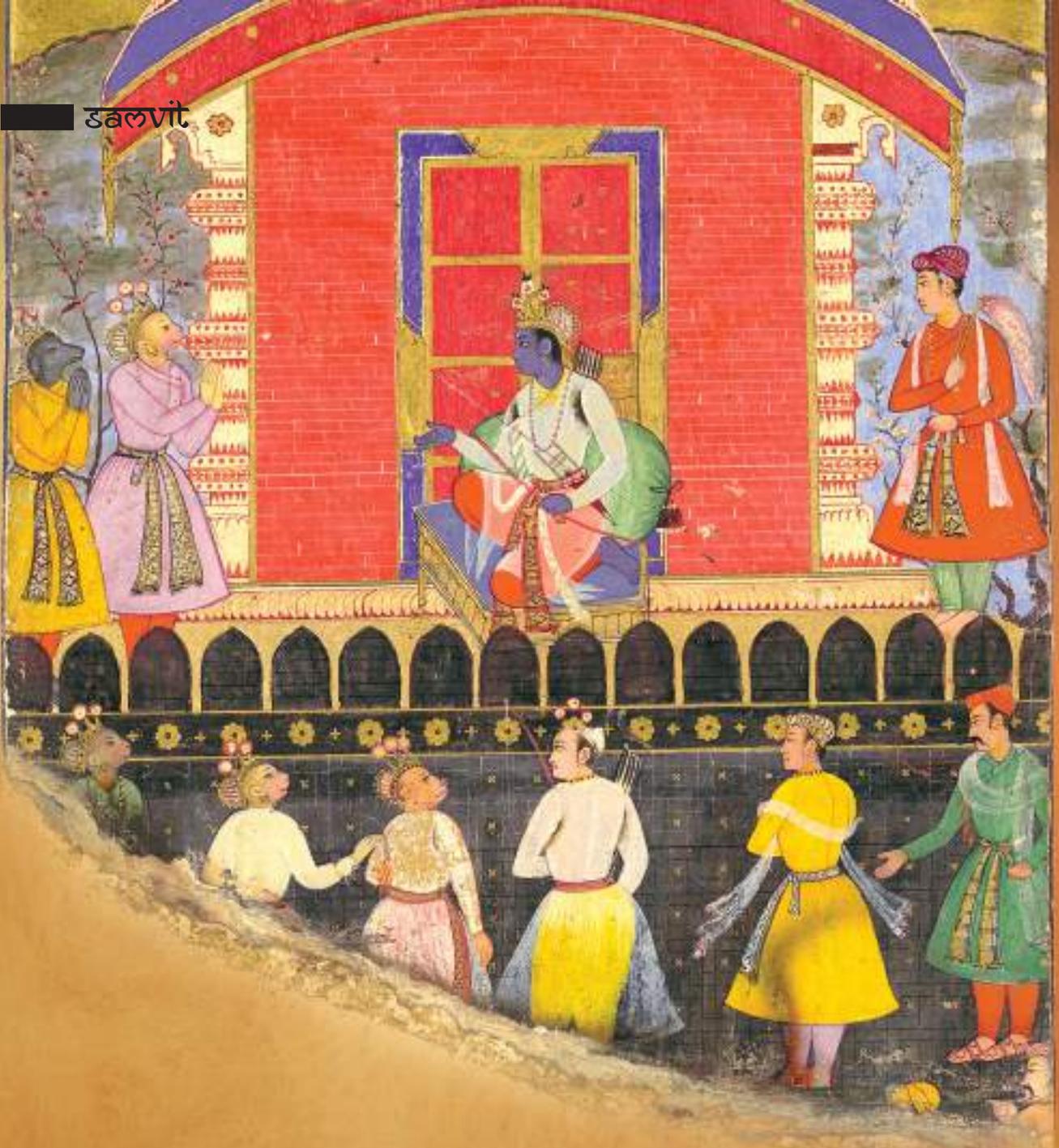
Amrita Vishwa Vidyapeetham, Coimbatore

organized by amrita darshanam, IcSS in association with Indian council of Philosophical research (IcPr)

*Siddhāntabindu* is Madhusūdana Sarasvatī’s commentary on Śrī Śankarācārya’s *Daśaślokī*. It presents all the basic principles of *advaita* in the prima facie views (*pūrva-pakṣa*) and their refutations (*khaṇḍana*), and is a reliable and comprehensive digest of *advaita vedānta*. The very meaning of ‘*Siddhāntabindu*’ suggests that it is a summary or digest of the conclusions of *advaita* philosophy. It defends the basic tenets of *advaita vedānta* through reasoning and brings out in brief the philosophic implications of this short work of Śankarācārya, viz. the *Daśaślokī*.

The workshop will focus on acquiring a general understanding of the worldview, concepts and methods of *advaita vedānta* through *Siddhāntabindu*.

इबलवित



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Amrita Vishwa Vidyapeetham  
Amritapuri Campus  
Clappana P.O., Kollam  
Kerala - 690 525

[samvit@am.amrita.edu](mailto:samvit@am.amrita.edu)