Samskar Bharati

Tamilnadu

Key Note Address and Papers

National Seminar on Temple Architecture and Iconography

25-26 February 2012

Kumbakonam

SANSKARA BHARATI

Tamilnadu

SANSKARA BHARATI endeavors to bring together all the connoisseurs of fine arts and performing arts. It aims at creating awareness among the masses about artistic creations in the past and makes them understand its importance. At the same time it tries to encourage the young artists to enhance their skill in their

chosen-art. It also tries to make available suitable stage for their performances. Sanskara Bharati established some 25 years back now has its branches all over India. And in every state efforts are on to inculcate love towards arts. At many places it holds weakly drawing classes, and monthly performances either of music or dance.

Sanskara Bharati also, attempts to hold seminars on various topics related to the temple architecture and iconography. So far it held two such seminars at Miraj (dist. Kolhapur) one at Pune and recently one such were held at Gwalior. In view of the success in these seminars it is thought to move on towards the South which is very rich in these ancient arts, to enable the scholars there to enlighten the audience and participants.

History, art, and architecture are inseparable and reflect culture and thought. Hence this seminar intends to focus on various aspects of art and architecture with special reference to south India. The seminar hopes to bring together the learned scholars in these fields, on a common platform. It expects the participants to express their opinions on (1) Schools and styles, (2) symbols and forms, (3) socio-economic aspects of art and architecture, (4) traditional literature on these and any other related aspects to the theme.

The two day seminar will be held at, the holy city “Kumbakonam”, which well connected to Chennai and Trichy. Two days are focused on the seminar and one day for visiting temples.

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NATIONAL SEMINAR ON TEMPLE ARCHITECTURE AND ICONOGRAPHY

AT KUMBHOKONAM ON 25TH 26TH February

KEYNOTE ADDRESS BY

Dr.G.B.Deglukar
Chancellor, Deccan Deemed University,
Pune.

Chief Guest, Distinguished Delegates, Eminent Personalities and Respected Colleagues,

I deem it a great honor to have been invited to deliver a keynote address to the gathering of experts, art historians and art lovers. I express my gratitude to the organizers of this meet for inviting me for this job.

For millennia, the people of India have produced works of art in seemingly endless quantity and of virtually infinite diversity. Art does not exist in a vacuum. It is the expression of many things over a span of time, conditioned by social factors, religious thought, political upheavals, economic conditions, etc. Art is a voyage of discovery and expression, a voyage inspired and marked by joy, love, and beauty, a voyage that brings us closest to the inner recesses of consciousness and unites in its expression the inner and the outer in such a way that the formulations lead the artist and the viewer to something that is within us in order to see the invisible and to seize the unseizeable. This is the boon of art and the bounty of this boon we should be able to shower on all the seekers of all ages.

Art is a quest of truth. Just as science is a quest of truth, just as philosophy is a quest of truth, even so art, too, is a quest of truth. But each one of them has its own specific method which distinguishes it from all others. For the study of Indian art requires a fair working knowledge of the history of the surrounding countries- not their entire history, not their dynastic tables, but the broad facts which concerns us is in the development of our own art simply because you can not study Indian art and art history in isolation.

According to Ashok Kelkar there are those for whom art is for delight only. This is hedonism, Anandavad and for didacticist Ashyavada meaning there by art is pure meaning, it communicates a message. He further speaks of vitalism , (Jivanavada), that is to think as to how different ways of life have been embodied in art, how art is influenced by society and its culture, and influences in turn society and its culture. To create and enjoy art are no less than, and no more than, modes of living. Thus, Buddhist art is Buddhist not simply by reason of its Buddhist themes or its creators being Buddhist, but rather by reason of its being an integral part of the Buddhist way of life- elaborates Prof. Kelkar.

There are certain essential elements that are distinguishing features of art and art experience. There is, first, intuition of the artist, ----intuition that marks the awakening in experience that unites the self of the artist and the object on which the artist concentrates.

This experience leads up to identity and is marked by sincerity. The result of the experience is the discovery of the truths of the object and the discovery of the beauty of the object. This beauty vibrates in the consciousness in a state of joy, in a state of feeling, in a state of *rasa* of creation and some kind of inevitability of the expression of form through a technique that is appropriate to the given form of art. Form and technique are interrelated and they demand each other in their road towards perfection. At a given stage of expression and creativity, they assume great importance, and the great masterpieces of art embody these elements and determine their excellence.

There is, I may say, mystery, miracle and magic of form, and the joy of the artist, the creativeness of the artist is in the discovery and expression of this mystery, miracle and magic. The artist arrives at the origin of the form, where the form seems to emerge from the womb of the formless, from the reality that is ineffable, which is yet no monotone and which is not devoid of potency, but is capable of power, and of multiple formations of significant symbolism. Art is thus essentially a journey to the secret where the unseizeable is seized, where significant forms are discovered and expressed. The subtlest experience of art consists in arriving at the subtlety of the relationship between the form and the formless, the finite and the infinite, the qualified and the unqualified, the conditioned and the unconditioned.

Indian art has been able to sustain its intellectual appeal for thousands of years. Thus, the statement of Pablo Picasso, that " if a work of art cannot live always in the present, it may not be considered at all. The art of the Greeks, of the Egyptians, of great painters who lived in other times is not an art of the past; perhaps it is more live today than it ever was." is equally valid for ancient and classical Indian art. (Quoted by Radhakamal Mukherjee in The Cosmic Art Of India, p.32).

It is said that man is not an island and the same is true with art. It is closely associated with life, inseparably related with all aspects of human life, be it social, religious, or spiritual. In the Indian context the art is one of the ways of expressing philosophy though it is often difficult to find out the exact relation between art and philosophy as the former is concrete and the latter is abstract.

Any society can be known comprehensively only when we know culture which has two aspects, material and metaphysical. The material aspect is known from the things material which a society uses and with which a society tries to lead a happy worldly life. The metaphysical side consists of the thoughts that motivate a society, thoughts that culminate in creative outpourings: religious, philosophical, ethical, literary and artistic.
The material culture, one may say, represents the outer casement (body) of a society and the metaphysical, its soul. Society sans culture even if materially rich is like mortal being without a soul and the art is such a medium which subtlely and inextricably links both the material civilization and culture.

ART AND ARCHAEOLOGY:

Archaeology reveals the man's past of millions of years and art is such a media which infuses life in the skeletons dug out by the archaeologist. Thus the strength of art enabling archaeologist visualize life of human beings in the past. Every body from us knows that the excavations at Mohenjodado and Hadappa yielded striking artistic objects for the first time in India. Some of them are sculptures in the round denoting progress of those artists in the plastic art. Moreover the objects of different shapes and sizes found in the excavations show not only material development but are also suggestive of cultural aspects, for example the statuette of a dancing girl presents not only the knowledge of art of dance, but also the aesthetic sense of the artist of that age. Right

from the Hadappa period the Indian artist brought forth passionately artistic productions of both men and animals in a variety of mediums; T.C., bones, ivory, metal, and paintings on the earthen wares. All these represent the rich variety of people that were living in the cities and villages of the Indus civilization.

Again archaeology brings forth bones of males and females while the art provides an idea of their multiple activities, activities related to even love-games, all this is difficult to visualize through the finds unearthed by the archaeologist unless aided by artistic devices. The sacred and revered objects which a spade of an archaeologist digs out speak volumes of the mind of inhabitants who create these. Archaeology alone is not capable to visualize this aspect of human life sans the help of art. To be brief, it can be said that the art enriches archaeology, it gives flesh and forms to the bones the archaeologists dig out and infuses life in it. And thus art and archaeology are interdependent, inseparable and constitute an integral part of each other.

ART AND RELIGIOUS IMAGERY:

Indian art does not express things but sublime ideas, complex meditations, flashing intuitions. The Hindu artist of the ancient and medieval periods has unfailingly expressed his deep faith in transcendental Reality. It is to be noted that art in India assimilates the truth and values of the metaphysical order into all spheres of life-social, moral, artistic. It knows no antithesis between the immediate and the ultimate, the earthly and the heavenly, the sensuous and the transcendental, and enjoyment (bhukti) and liberation (mukti)

The Shilpashastras codified the symbols, motifs and forms of Indian images. Without their depiction in stone, says Havell, the numerous gods of Indian religion would have ceased to exist. (Radhakamal Mukharjee , op.cit., p.32)

In the Indian context art is one of the sources of expressing philosophy and religious predilection of the society. The anthropomorphic forms of the poetic imagination of the Rig-Vedic nature-worshipper took a long time to crystallize into the iconic moulds. As the need to establish a more personal rapport with the divines arose man rather chose to worship them through symbols and rightly so, for how was he to differentiate between

one anthropomorphized divinity and another minus the poetic descriptions. The symbols became the differentiating marks giving shape and form to the various functions and attributes of the gods. Iconography brings forth the ethical values, philosophy and spiritual life. Iconography is the final culmination of the sculptural art; it constitutes the highest achievement of the artist. The earliest icons were modeled after man's own image, but at the folk level of worship. From the yaksha figures of the pre-Maurya or Maurya period it was not long before the Vedic gods too came to be endowed with physical forms characteristic of their natural powers. Man has found his God –*yatha dehe tatha deve.* Even then the search for the perfect physical form of the divinity on one hand and for the metaphysical formless Brahman or Atman, on the other continued their separate but parallel courses for a long time, the Saguna and the Nirguna unable to find a meeting ground. The emergence of the bhakti cult changed the entire scenario. For the ardent devotee the Saguna icon was merely an outer casement, a symbol of the formless Nirguna that permeated the entire universe, the ultimate goal of life being the realization of the intuitive identity of the individual and the universal soul, the Atman and the Brahman or the Jiwatma and the Paramatma (Ishwara).

The pre-eminence of the Saguna worship led to a spate of new gods and goddesses, brought to life through sculpted stone images. The artist-sculptors let their imagination run-riot to create a crowded pantheon of vivid forms and rich symbolism. Gradually the attempts were made to create a form representative of the Avyakta (invisible) Brahma. It was of course the work of the philosophers and the thinkers among the sculptors. I have chosen to call the finest product of their iconic vision Bimba-Brahma, the Bimba , the image symbolizing Brahma was the ultimate in the art of icon making. Neither the sculptor nor the artist could aim to go beyond it.

While personifying the philosophy the artist has to go beyond the usual human form. He has to create images multi-armed and multi-headed. This, of course, was not properly perceived by some writers both Indians and Europeans. They took such images as an unpardonable defect. Vincent Smith does not admit such images as pieces of art and say they lack beauty. He was followed by Maskell and Sir George Birdwood; the latter says "this is possibly why sculpture and paintings are unknown in India. It is easier to prove them totally wrong for they could not catch the concept and significance of this

creation by philosopher-sculptor. While criticizing artistic creations one should try to know its aim.

It is better here to take in consideration Mr. Holmes suggestion that a work of art must posses in some degree the four qualities of unity, vitality, infinity and repose. In other words a work of art is great in so far as it expresses its own theme in a form at once rhythmic and impassioned, through a definite pattern it must express a motif deeply felt. So the work of art has the qualities which Holmes demands, if it is felt, need we further concern ourselves with arithmetic? asks Anand Coomarswamy (The Dance Of Shiva, 1991edn., p.82) The greatness of the Indian artist lies in the fact that he created an image as a masterpiece which is enshrined and worshiped. This can be taken as a work of art which lives always in the present, as says Pablo Picasso.

ARCHITECTURE

Indian architecture, particularly Indian sacred architecture, in its inmost reality is an altar raised to the Divine self, a House of Cosmic Spirit. Art and architecture are considered an important source for understanding the material culture of a society. But they are not sufficient to understand life in its entirety because they do not throw adequate light on the metaphysical life of society. The exception is that of the temples among architecture and icons as far as sculptured stones are concerned. Both of these form a precious source of knowledge of both the material and metaphysical aspects of culture.

> Scholars like Lethaby defines architecture as a matrix of civilization. Others state that it reveals man's mind in terms of wood, bricks and stone. On the basis of these and other definitions one can visualize architecture which enables us to know man's mind and the height of material culture which he has achieved. But the knowledge of the working of the mind does not mean the knowledge of the metaphysical attainments. While this holds good for secular architecture of all kinds, the temples are a marked exception. These religious structures are not simply places of worship and devotional congregation, but they have been conceived conceptually from their very foundations to their finials. The structural concept draws its inspiration from the Vedic tradition and the sacred lore of Brahmanism but their actual shapes and forms are the product of primeval modes of building whose rules are enshrined in the treatise on architecture.

Temple architecture in India was born of the truly Indian concept of a divinity in a spiritualized body. The organic theory cognizing architecture in terms of human organism permeates the entire structure of a Hindu temple and constitutes the primary subject-matter of *Shilpashastras.*

Ancient seers had always conceived of the human body as an abode of god, but it took the *'sthapati-s'* a long time to put forth a structure in the likeness of the human form. When the *Prasada* finally appeared, it was the realization of the dream of centuries of the ancient seers, philosophers and *sthapati-s* alike.

The Indian *sthapati-s,* however, took some centuries to translate into appropriate visual form, the abode to the immanent spirit-the god in the universe. His omnipresence has to be confined within the walls of the shrine in a befitting manner as the soul within the human body. The fundamental purpose of the temple architecture in India was to concretize the prevailing spiritual ethos/ consciousness into rock, brick and stone.

The enunciation by ancient philosophers of the organic theory that god and his temple correspond to the soul and the human body, posed a challenge before the sthapati-s. This was the stage where some sort of a structural shrine was felt necessary to house the anthropomorphic form of a deity. The *sthapati-s* in this respect had to start from naught. There was no model, no structural form to emulate.

A temple according to Brahmanic conception is the visible outer casement (body) of the invisible deity, a visible image of which installed in it. It is regarded, like the human body, as the outer visible form of the formless. And so the *sthapati-s* had to strive hard to endow the shape of the human body to the temple structure which had evolved by then to the sanctum stage.

According to *Mayamata* (xv111.193), the temple contains the whole manifestation in which He is beheld as *Purusha*, the supernal man. The *Agni- purana* , the *Hayashirshapancharatra, the shilparatna*, etc. describe various parts of the temple along with the corresponding limbs of the human body. They describe as the hair, the *Amalaka*

(Anda) the head, etc. and finally the image (*pratima*) is the *Jiva* its life. Temples with all these ingredient parts are full-fledged and can be called *Prasada* according to the *Samaranganasutradhara* and *Vimana* according to the *Ishansivagurudevapaddhati*.

A complete temple in all respects is the achievement of the ancient architect. There is no need to restate that symbolism is the *sine qua non* of Indian architecture.

I would like to draw attention of the scholars in the field to think of temple as social institution. We know that the temples in ancient India were the centers of social activities along with religious ones. This is to be elaborated while discussing the functions of temple and another point is related to the presence of Surasundari-s on the exterior walls of the temples. Their identification, the roles they play, and significance. They are not given their due importance by the scholars in the field.

I am sure that scholars would consider this seriously in future when they write on temple architecture.

Thank you all.

Significance of Agni in South Indian Art

T.Satyamurthy
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In the facets of Indian art, the symbolism of various motifs indicates or reflects inexplicable powers that are hidden behind them. They are not mere attribute or physical objects of worldly nature but carry significance of culmination of religion and art. Indian iconographic art is to be judged from the point of view of themes than mere visuals.
It is the combination of innovation of the artists and the themes behind it. They are the images and not mere idols that are portrayed and worshipped.

In the given frame, the artists could bring out the significant mythology and philosophical backgrounds of the image. Infact the attributes of the deities help them as to tools to bring out these feelings. Thus Chakra and sankhu attributed to Vishnu portrays him as the remover of evils and preserver of benign aspects of entire universe. All the weapons in the icons though look like destructive elements have message of the annihilation of malevolence and victory of good over the evils. There are many such objects which also speak entire mythological set up of the scheme and confer protection to the devotees.
Among them, Agni or fire generally represents a destructive force and the mere depiction of it connotes the fiery power of it over evils. Its association with the ugra forms is justifiable, but depiction of it in transcendent forms poses enigmatic problem for solution. In early forms of Siva it is conspicuously absent, but at a later stage it finds a prominent place in his hands. Mostly it replaces the serpent and in nrtta forms of South Indian sculptures, it becomes an obligatory element.

Its presence in the hand of Tandava Siva foretells or records a great socio religious stage and historical background that happened in Tamil country in the beginning of seventh CE. Chidambaram or Thillai Chittrambalam became the prime centre for all Saiva activities of the Tamil Country. The presence of Agni in the hands of Nataraja works as a unifying symbol of various traditions and cults that were prevalent at that time.
The presentation deals in detail the significance of this attribute to Siva

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Society, aesthetics and science-technology: Indian paradigm.

Exploring whether there is anything called Indian way.

Prof.S.Swaminathan

IIT(New Delhi) Rtd

Chennai

Among the unique features of Indian society from the very early times are its oral tradition and its spiritual art

Art – Sculpture, paintings, temple architecture

Sculpture > identifiable as Indian and their chronology > unique canons and exclusive community, and its unbroken tradition of millennia > composing intuitively, without models and without rough work or trials > novel experiments, cave architecture and structural – reliefs and their composition, explained as balanced, rhythmic and dynamic by later standards > no true arch, only linear arch; stones piled up without binder > danger of break societal fabric and its break in oral tradition affecting in shared memory > interweaving of mythology-history

Orality in art and craft: Hereditary vocation > nuances imbibed and communicated to the next generation; no need for documentation > dignity of trade contributed to secrecy and individuality > resulted in stratification of society on the basis of family vocation, that became caste by birth >

Orallity-driven literature and knowledge body

Oral transmission of spiritual texts required passing to future generations without corruption > sounds identified as alphabet > letters identified as vowel or consonants > they in turn organized according to origin of production and type of sound > various modes of memorizing Vedic texts > refinement through Vedanga-s > Paninian achievement, not only in grammar but in concise aphorism > science amenable to orality > poetical metres aided by orality >

The Architects and Sculptors of Early Chalukyan Art

Dr. Sheelakant Pattar.M.A.,D.Litt.

The Chalukyas of Vatapi (Badami) held political power over northern Deccan for about two centuries from the middle of the sixth century. Under the patronage of the Chalukya rulers, more than hundred temples were built in different places in Karnataka and Andhra Pradesh, the important sites being Badami, Aihole, Mahakut, Pattadakal, Alampur and others. Much has been studied by the modern scholars regarding art and architecture of these ancient monuments but not much significant attempt is made to know about the architects and sculptors who materialized massive and artistic temples, in various plans and styles.

In ancient days the sculptural art and architectural science were handed down from father to son. There are a number of Chalukyan inscriptions in support of this fact. Thus the art was practiced by the members of the same family or caste. These silpis or sculptors believe that they are the descendants of Vishwakarma, the divine Architect in heaven.

The renowned scholar Dr. M. Chidananda Murti, rightly observes that, the seeds of art lie hidden in the blood of the Vishwakarmas.[1] He reaffirms that the names of artists have suffixes 'acharya' (achari) or oja (upadhyaya). In Chalukyan context we find the suffix 'manchi' also. The Vishwakarmas are able to work in different media like stone, wood, gold, iron and copper and they are called sculptor, carpenter, goldsmith, blacksmith, and coppersmith respectively. John Brower, who has done extensive study on Vishwakarmas, calls them 'the makers of the world'. Of these five groups of Vishwakarmas, mainly the names or architects and sculptors appear in the inscriptions or Chalukyas. Here is an account of these artisans.

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1. Kannada Shasanagala Sasnkrutika Adhyana, 2002, p.485

Architects :

Architects are the scientists of engineering knowledge. They are referred to as Sutradharis in Chalukyan inscriptions. The Sutradharis of early Chalukya period are as follows ;

1) Aryamanchi Upadhyaya :

He happens to be the architect of Malegitti Sivalaya at Badami. This temple was originally an Aditya temple. (fig.1) An inscription on the on the eastern wall of the temple reads –

Sri Aryamanchi upadhyaya
prasad nirmmitam

Thus the inscription records that the temple was constructed by Aryamanchi Upadhyaya. [1] It show that, the word upadhayaya is associated with sutradharis or Vishwakarmas. It is interesting to note that he has two suffixes of Vishwakarmas namely Manci and Upadhaya

The very selection of the spot for the construction of the temple speaks of the aesthetic sense of Aryamanchi. It is located on a big boulder and the temple looks as if it is the part of the same rock, on which it stands. The temple is very imposing and impressive with its Vimana type of superstructure. It is a 'Nirandhara' temple belonging to the early seventh century.

Narasobha

Narasobba is the renowned architect and sculptor of Aihole. He is the architect of Huccappayya temple of Aihole (fig.2) An inscription is written in praise of him on a wall of this temple (fig.3) which goes thus[2] _

Swasti Jambudvipantare kaschit
vastu prasada tadgatah
Narasobba samo vidwan
na bhuto na bhavishyati

1. S.1.1. XV.473
2. I.A. Vol. IX, p.74

It is recorded here that in the entire Jambudwipa, none was equal to Narasobba in the art of temple construction in the past and there would be none in future also ! This certainly suggests that he was a master of rare excellence. Another epigraph on a boulder near Jain cave at Aihole delineates the multi faceted personality of Narasobba. He was the disciple of Binjadi. He was well versed in the science of construction. In character he was like the sun. He was the one who chiselled sculptures with accurate proportion. It is evident from these inscriptions that he was both an architect and sculptor of rare caliber. The epigraph[1] eulogizes him as under_

Sri Binjadi [vida] rddhara cattan vimana ranjitan
satra Maheshwaran gunaravi. rupa sanghatan
pramana bharan Narasobban

At Badami, Aryamanchi Upadhyaya built the temple of Malegitti Shivalaya with Dravida vimana while Narasobba built Hucchappaya temple at Aihole with Rekha Nagara super structure. He also sculpted outstanding sculptures of this temple.

It is worth noting here that he was equally proficient in the excavation work. Near the above mentioned inscription, the sketch lines of the façade of an intended cave, are clearly seen. The reason for not completing the project is not known.

Gunda Anivaritachari and Sarvasiddhi Achari.

Today Pattadakal has been recognized as the world heritage site. The most magnificent architectural feat of early Chalukya period is the Virupaksha temple of Pattadakal. (fig. 4) This was patronized by the queen Lokamahadevi to commemorate the triple victory of her husband Vikramaditya II over Kanchi.

1. Dr. Srinivas Padigar, Inscriptions of the Chalukyas of Badami, No.180.

We are fortunate enough to find the details of architects who solidified this imposing huge temple. In fact two master architects were involved in its construction. One was Gunda who was incharge of entire temple construction except the southern part which was supervised by Sarvasiddhi Achari.

Both architects were the recipients of a unique title called 'Perjerepu' . It was the royal honor of the highest order . Gunda Anivaritachari was conferred the title Tribhuvanachari. The important part of the inscription[1] runs thus__

Swasti Vikramaditya Sri
prithivi vallabha Mahadevi
yara degulaman madida sutradhari
Sri Gundan Anivaritacari
ge mume perjjerepu pattamu Tribhuvanachari
y endu pesarittu. . . .

The inscriptions also records exemption of certain taxes to the sculptors.

Sarvasiddhi Achari is mentioned in two inscriptions in the Virupaksha temple. The one engraved on pillar of the southern side of gateway i.e., Pratoli, states that Vikramaditya II made over certain gifts to the Sutradhari (master architect) of Virupaksha temple constructed by his queen Lokamahadevi. (fig.5)

The Sutradhari Sarvasiddhi Achari is praised as the 'Pitamaha of Vastu Silpa' He was the architect of the southern part of this temple[2]. An inscription on the wall of Nandi mantapa of the same temple is the clear evidence of this fact. It may be quoted here.

Sri Sarvasiddhi aca
ryya tenkana diseya
sutradhari

1. I .A. Vol X. p.163-164
2. S.I.I. Vol. XV p.488

Revadi Ovajja.

One more outstanding temple at Pattadakal is that of Papanath.(fig.6) The southern part of this temple was constructed by Revadi Ovajja. He happens to be the disciple of Sarvasiddhi Achari and grandson of Silemuddar. An inscription[1] on the east-wall of the temple runs thus._

Swasti Sri Silemuddara
marman Sarvasiddhi a
carjjyara cattar Reva
di ovajjar ten
kana dise madidor

It is worth noting here that Sarvasiddhi Achari's student Revadi Ovajja built Papanath with Rekha Nagara superstructure which means that, Sarvashiddhi imparted the knowledge of Rekha Nagar style to Revadi. Thus it is clear that, Sarvasiddhi Achari was the master in both styles of Architecture namely Dravida Viman and Rekha Nagar. Because of his mastery over both styles he could experiment blending features of southern and northern styles in Virupaksha temple. As a result the unique temple exhibits the northern features of architecture like 'sukanasi' at the base of superstructure and 'kakshsana' in the porch. These two are the typical architectural elements of Rekha Nagara temple.

Because the temple is basically in Dravidian style and that it was built after the victory of Vikramaditya II over Kanchi, it is believed by some scholars like Cousens that the king being much impressed by the great Rajasimheshwar temple at Kanchi took with him a group of artists to Pattadakal. Cousens could not properly interpret the Kannada inscription and that made him think in this way. By *'tenkana dise Sutradhari'* he meant that Sarvasiddhi Achari came from southern direction, where lies Kanchi. But the inscription and the context suggest clearly that Sarvasiddhi Achari was in charge of southern part of the temple and Tribuvanachari was the 'Sthapati' of

1. I. A. Vol. X. p.170

the rest of the temple. Scholars like Percy Brown and others have rightly turned down the idea of Cousens.

If Sarvasiddhi Achari was a Pallava architect why would he add 'Sukhanasi' and 'Kakshasan' to the Virupaksha? If he was a Pallava architect how could he teach his student Revadi Ovajja the science of Rekha Nagar Prasad? It is worth remembering here that there is no temple with Rekha Nagara superstructure in Pallava region or Tamilunadu.

a. Sculptors of Cave temples.

On the rocks on either side of the cave temples and on the boulders infront can be noticed label inscriptions revealing names of persons. Once it was thought that they were the names of visitors. But meticulous observation makes it clear that most of the names are those of sculptors.

In the first instance, these epigraphs are seen at a height of ten or twenty or even thirty feet! To write or engrave a name are needed a chisel and hammer and other helping tools like a ladder or rope! Even the names suggest that they belong to sculptors as they have suffixes related to Vishwakarmas. For examples there are many names ending with 'manchi' which is a term associated with silpis. As we have seen earlier Aryamanchi was the architect who erected Malegitti Sivalaya at: Badami. The label inscriptions contain the names of Kolimanchi, Pelamanchi, Anattamanchi, Singamanchi and so on.

In 6th and 7th centuries it appears that, it was not the practice to autograph. No sculpture in caves is autographed by artists except Nelavalke who could dare to sign the sculpture he craved. On the right wing of Garuda on eves of Cave III his name Nelavalke is clearly seen. (fig.7)

Based on the proximity of label inscriptions to the nearby cave, we may consider that Ayachasami Kalakutti, Shri Donasvami, Nakeyde, Shri Donamma, Shri Maruti sami, Sri Shopakari, Umabhata, Sri Ajjaka, Sri Ganaswami, Sri Malliswami, Sri Kottimanchi, and others were associated with the excavation of cave I at Badami.

Probably the sculptors in charge of Cave II are Sri Shantimurti, Duttujan, Donan, Gottemurkan, Niddega,Buru, Sri Vachyan, Sri Anant Adarshan Sri Alagereyan, Sri Keshavan, Durvita, Duttujan and others. It is quite interesting to note that the names of Sri Bharatachandra, Sri Bhamachadra, Sri Sivaputra, Sri Yashodeva, Sri Devadas, Sri Gangaswami, Sri Maharathe etc., are carved in Siddhamatrika script, which suggests that they are possibly the artists of north Deccan region. The fact that sculptural representations of cave II is different from Cave I also supports this idea.

On a rock to the right of Cave III, label inscription reads Rupasekharah which literally means 'best among sculptors'. This might have been the title of the artist. The other names of sculptors that appear near Cave III are as follows. Kottalan, Sri Kondimanchi, Sri Vasudeva, Sri Shakula Ayya, Sri Panchanan Chola Devareya Kalkuttiga, Sri Gunapal, Sri Aju, Achar Siddhi, Aryyachatti, Sri Kolimanchi, Sri Pelamnachi, Sri Vimala, Sri Donan, Sri Jayakirthi, Kottila, Sri Kantimanchi, Sri Samichandan, Bijaya, Sri Kannan, Ovaja, Bijaya Ovajan, Shri Prasanna buddhi, Shri Arikke, Shri Bhadukke, Shri Geveyan, Sri Anattamanchin and others.

Some of the artists worked in two caves and therefore the names are seen repeated by the side of other cave. These craftsmen may be listed as Kontimanchi, Sri Polamanchi, Singamanchi, Harike, Bhavaswami Aryya, Udagra, Kesava, Panchana, Vijamma, Sri Prasanna Buddhi, Arikke, Bhadukke, Sirigereya, Kolimanchi, Kadreswami, Srigereya, Margaja. Srinidhideva, Annattamanchi and others. Undoubtedly these sculptors worked in the carving of cave III also.

On the eastern bank of Agastya teertha are boulders that bear a number of images. Sculptors who carved these figures have engraved their names near the sculptures. One such name is Eranda Ganacha who in all probability chiselled the icons of Brahma, Ishwar and Vishnu . (fig.8) The image of Durga devi appears to be the work of Chandrakirti Bhatta. On a rock near Sibara, craftsmen named Kushal Dharmmana and Aghavinasigal have sculpted images of Ganesh and Nagaraj.

At Aihole there are no label inscriptions suggesting the names of sculptors on the rock nearby. But on the pillars of Chaityalaya which is partly excavated and partly structured, we find the names of Binjadi Ovajja, Bina amma, Vaghramantan, Bisatan, Koki(le), Sri Gunapriyan, Sripati Chitradhipa etc.

The names and art styles suggest that in the initial stage of Chalukya art at Badami and Aihole possibly artists from Maharashtra, Andhra, also joined hands with local sculptors.

b. Sculptors of Structural temples.

We are fortunate enough to find at least a few names of sculptors who worked in decorating structural temples. The most outstanding of Chalukyan period is Baladeva who has carved huge icons of Dwarapalas. The one on the southern porch of the Virupaksha is marvelous. The image of Dwarapala is in life size and is chiselled out of the very pilaster. (fig.9) It looks as if it is a round sculpture. Just above the figure there is an inscription which reads '*Sri Duggi acariya magan Baladevakrita'*.[1] It means that the sculpture is prepared by Baladev, the son of Duggi Achari. This suggests that some artisans without the suffix of 'achari' to their names were also Vishwakarmas. Duggi Achari's son Baladeva has a name without the suffix of Achari or Ovajja.

1. Dr. Srinivas Padigar, Inscriptions of the Chalukyas of Badami, p.272

Baladeva has worked for the Papanath temple also. The 'dwarpala' figure on the eastern porch is another amazing piece of art. He has also carved some episodes of Ramayana on the southern wall. His artistic excellence is well displayed in the image of Nataraja on the ceiling of the porch.(fig.10) The panel is autographed by Baladeva. Siva is dancing gracefully with ten arms. He is accompanied by instrumentalists and 'ganas.' Parvati, standing on a lotus, is enjoying the cosmic dance of Shiva.

The panel bearing eight guardians (Ashta Dikpalas) is yet another master piece from the magical hands of Baladeva. Exquisitely carved icon of Naga occupies the centre of the panel while eight guardians are shown in their respective directions around Nagaraj. It is interesting to note that the inscription here describes Baladeva as 'bhaya duran' which means 'devoid of fear'. It is worth noting here that it is in this panel of Ashta Dikpalas that for the first time all the guardians are rightly placed in their respective directions. Thus perfect positioning of the guardians is first exhibited by Baladeva, in Chalukya temples.

He also worked on the 'jalandhras' (latticed windows) of the Papanath. As many as three 'jalandharas' are autographed by Baladeva. Equally efficient artist in the work of 'jalandhra' happens to be Deva Arya. Two of the 'jalandras' flanking Nataraj on the southern wall of the Papanath are the works of Deva Arya.(fig.11) Fascinatingly his name appears in the 'nagari' script, suggesting thereby that he belongs to a different stock.

We know that, Baladeva worked in the construction of both temples of Virupaksha and Papanath. So did Chenamma too. On the southern wall of the Virupaksha, is an imposing image of dancing Shiva. An inscription below the sculpture reads *'Chenagamma pratime kuttidon'* which means Chengamma sculpted this image. (fig.12) The god is shown with three eyes and four arms. His scattered hair has brought a strange but beautiful look. The image of Nataraja is proportionate and there

is life on his face. Chenagamma has sculpted a secular figure of 'minthuna' couple also in the Papanath.

The composition of Surya image on the ceiling of the eastern porch of the Virupaksha is extremely remarkable. The details like chariot, horses, clouds Arun, Usha and Pratyusha capture our attention.(fig.13) This is the work of Devaputra, who was a disciple of Sakaresivadi. This is another example showing *'guru-sishya parampara'* or *'teacher - student tradition'* which was in vogue.

An inscription on the northern wall of the Virupaksha introduces the work of Sri Pullapan which is also an icon of Shiva. (fig.14) Another artisan who worked in the Virupaksha was Damodaran who must have probably carved the pillar in the eastern porch.

Paka appears to be one of the earliest sculptors who worked in Pattadakal. An inscription in Sangameshwara temple, records that Paka prepared two pillars. The temple is possibly the oldest Chalukya structure at Pattadakal. It was built by the king Vijayaditya (696-733 AD.)

Pattadakal pillar inscription of Kirtivarma II deserves special attention. It records that Jnanasivacharya set up a stone pillar. (fig.15) The name seems to be the title of Subhadevarupa. Fleet rightly thought that 'rupa' here means a sculptor. Subhadeva was the son of Shivarupa and grandson of Shivavardhanarupa 'who belonged to *Sandilya gotra.* Dr. Shivanagai Reddy points out that there is no epigraphical reference to the *gotras* of sculptors until 17th century A.D.[1] It may be true as far as Andhra region is concerned. But the above inscription (754 A.D.) clearly mentions the *gotra* of Sivavardhaman rupa as *Shandilya.* Silpis being Brahmins of high order must have *gotras.* Otherwise how could they have performed the holiest rituals

1. Dr. Shivanagi Reddy, Shilpins in early and medieval Andhra, 1997. Tiruvanatapurm, p.10

like installation of the icon of presiding deity in temples? Records pertaining to sculptors highlight the artistic excellence rather than mentioning *gotras*.

The Torana at Ittagi, bears the names of three sculptors namely Sri Gonadeva, Sri Kannappa and Anagam. The lintel is a joint production of these three craftsmen.

At Aihole the names of artisans who were involved in decorating structural temples are a few in number. The famous of them is Binjadi Ovajja and his disciple Narasobba. Ganasobba, who worked with Narasobba, has carved figures for Huchchappayya temple. (fig.16)

One more artist who merits our attention is Krichunga. An icon of Kartikeyan on the ceiling of the porch of Huchchimalli temple is an excellent piece of art . It is the creation of Krichunga. The sculptors like Muddasili, Jinalayan and Surendrapad have contributed in the construction of Durga temple at Aihole.

Interestingly the name of Jinalayan appears on the front wall of Parvati temple at Sandur. This implies that the artists moved from one place to another as per situation or demand. The label inscription of Surendrapada is found in the Siddhamatrika script. This goes to mean that he hailed from northern part as did Deva Arya.

The survey of names of craftsmen reveals that these artisans came from different geographical areas like Andhara region, upper Deccan and possibly Pallava kingdom too. It would not be out of context to refer to Mahendra Pallavachari the engraver of Kannada inscription on stone at *Peddavadagur* (Dt. Anantapur). He was a scribe during the period of Polekeshi II. The name Pallavachari certainly indicates that he was from Pallava region.

We do have some names of craftsmen from Alampur also, though the number is meagre. The master artist by name Srikanthacharya is described as Maheshwara of

envious rivals.[1] His name repeatedly appears in other temples at Alampur. Label inscriptions found in Arka Brahma temple are interesting for the reason that the name of Srikantharyan and Maradi nayan priyan are in Kannada script while that of Sri Trilokya hamsa is in Siddhamatrika.[2] There is Telugu script which reads

Sridevara di [pa]

samsara bhita sislu guru charana pradakshinambu poyyri [3]

This shows how the 'gurus' were honored in the past.

The Chalukyan sites of Badami, Aihole, Pattadakal and Alampur, when viewed meticulously, reveal sculptures of different nature and styles. Therefore it may be concluded that the sculptural art of the Chalukya Period, like that of architecture, is a confluence of many styles.

In the earliest available Kannada literary work entitled. 'Kaviraja Marga' it is described that, Kannada folk have the sense of experimentation in composing poetry. Undoubtedly it is true with craftsmen who exhibited their sense of experimentation in sculptural art and architecture also.

1. Srinivas Padigar, op. cit. p.324 – 325
2. ibid
3. ibid

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(Note : Concerned photos are attached separately)

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ASTRONOMY AND ŚANKUSTHĀPANAM IN TEMPLE CONSTRUCTION

Dr.M.L.Raja, M.B.,B.S.,D.O.,*

In Temple construction, two important things are to be fixed before starting the work. 1. Deriving the auspicious time for Boomi Pooja, Kumbha Abhishekam etc. 2. Fixing the directions exactly (mainly 8, North, East, South, West and the 4 in between). Here Astronomy plays the important role and based on it only the construction proceeds.

Astronomy is the branch of Science that deals with **the study of celestial bodies** (such as stars, planets, satellites, comets, nebulae, star clusters, and galaxies) and phenomena that originate outside the atmosphere of Earth (such as the cosmic background radiation). It is concerned with the evolution, physics, chemistry, meteorology **and the motion of celestial objects,** as well as the formation and the development of the Universe.

The auspicious time is based on the aspects, phenomena and positions of celestial bodies, especially the nine Graha **(not synonym to planets)** and the stars at ecliptic plane of Earth (27 Nakshatra). The positions of Navagraha, with reference to Earth are changing constantly. Hence to assess their positions in the celestial sphere, their motion is to be assessed, with reference to the fixed ecliptic stars. The positions of these ecliptic stars which are constant (fixed, not moving, as for as Earth is concerned) can be ascertained, by creating imaginary celestial co-ordinates, passing through the celestial sphere. These are with reference to the celestial equator which is nothing but the extension of the equator of the Earth. The celestial co-ordinates that pass through the north and south celestial poles, cutting the celestial equator at right angles, are the longitudes and their angle is mentioned as right ascension. They are 360 in total, one for each degree of angle. The celestial co-ordinate that passes exactly at the celestial equator is 0° declination and the co-ordinates that are parallel to this celestial equator are latitudes and their angle is mentioned as declination. That pass through the northern hemisphere are 90 in number (one for each degree) and are denoted with N or +ve sign and the other 90 that pass south to equator are denoted with S or –ve sign. These are celestial co-ordinates of equatorial system. In this system, the declination of the Graha, especially of the Sun, is used in calculating the positions of Graha, relative to the equator of the Earth.

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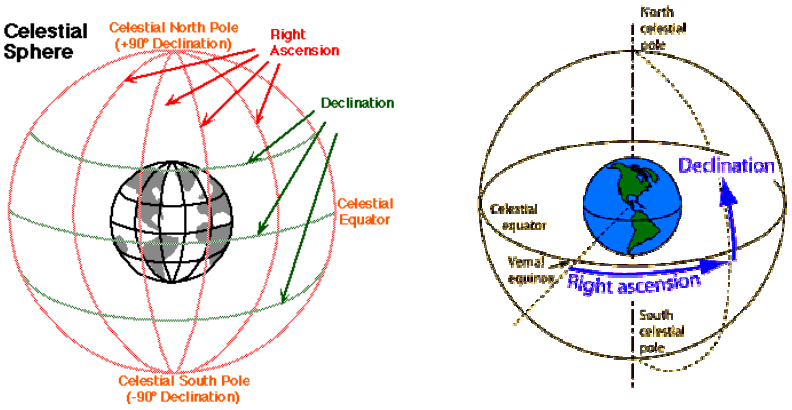
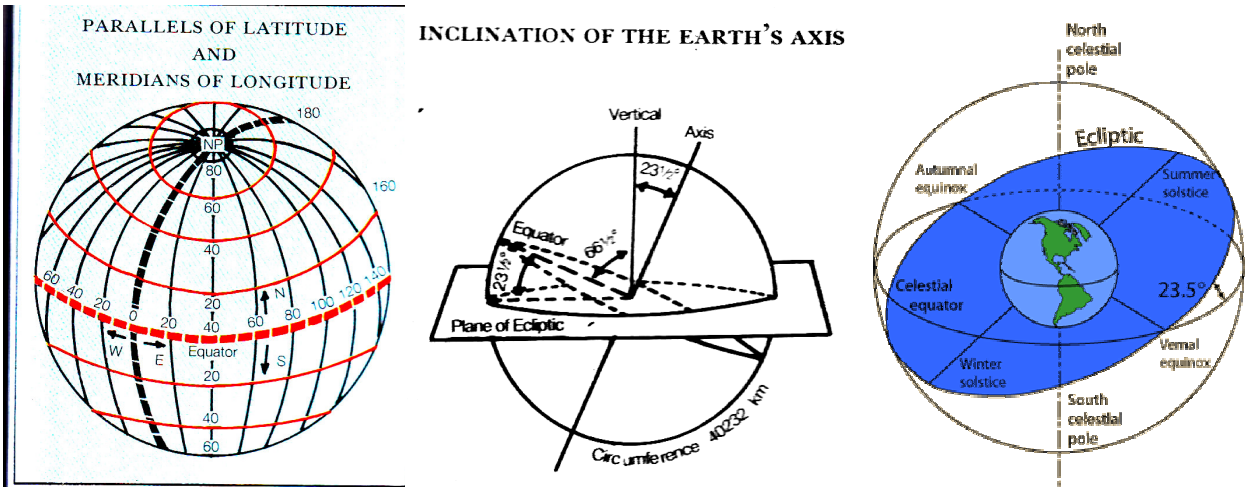
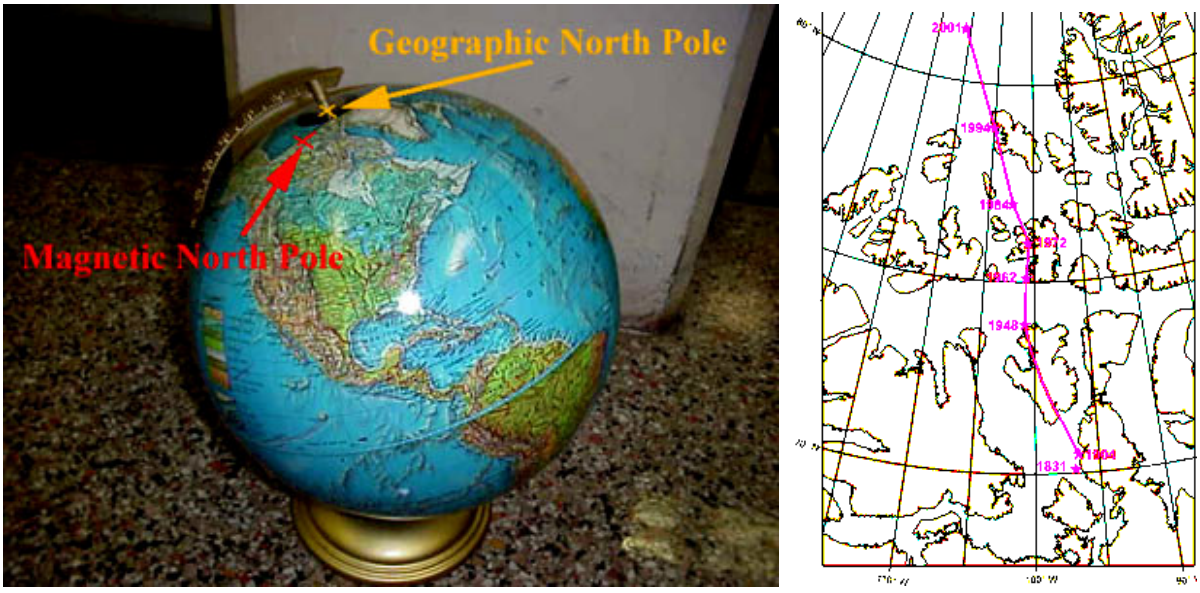


The other system is ecliptic co-ordinates, where the ecliptic of the Earth is the central line and is marked as 0° celestial latitude. The ecliptic is the annual path of the Earth around the Sun. The lines passing parallel to this are the celestial latitudes, 90 northwards and 90 southwards and are marked as N or + and S or –ve sign. The north and south poles of the ecliptic are known as Kadamba in our Nation's astronomy and the longitudinal lines passing through these ecliptic poles, cutting the ecliptic at right angles are the celestial longitudes and are 360 in number, one for each degree. These celestial co-ordinates of ecliptic system are used to fix the positions of the Graha. Thus, the positions of Graha are mentioned relative to the Earth's position in the ecliptic and not with reference to the celestial sphere and this itself proves that these co-ordinates were developed in our Nation and spread to the whole world. This is because, in our astronomy, the positions of Graha are assessed with reference to Earth's position in the ecliptic, there by understanding the effect of Graha on Earth, where as in the western astronomy they are described with reference to the celestial sphere. These co-ordinates are the celestial longitudes and latitudes. The co-ordinates of ecliptic and equatorial systems differ by 23° 27` at the maximum at solstices and 0° at equinoxes, as the Earth is inclined at its axis by 23° 27` to its ecliptic path around the Sun.



The longitudes and latitudes of the Earth are same as that of right ascension and declination of celestial sphere. The longitudes pass through the North and South poles (Dhruva) of Earth, cutting the Equator of the Earth at right angles. They are 360, one for each degree. The prime meridian is 0° longitude and the other longitudes are mentioned as East, if they are east to this prime meridian and west if they are west. The latitudes of the Earth pass parallel to equator of the Earth (0° latitude) and the latitudes (90) in northern hemisphere are denoted as N or +ve sign and the southern latitudes (90) are denoted as S or –ve sign. These are of equatorial system and they are also important in arriving the auspicious time, as the effect of Graha varies at different longitudes and latitudes on the Earth. Besides, these co-ordinates of the Earth and the declination of the Sun are important in fixing the direction, at the place of temple construction.

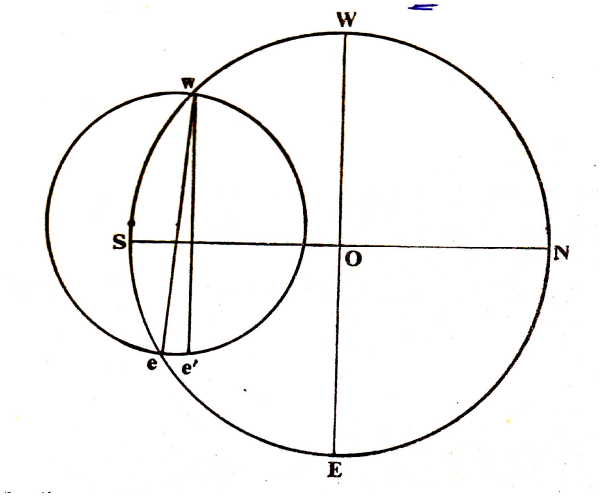
Magnetism is not useful in fixing the directions exactly. This is because, the north magnetic pole is on Ellef Ringnes Island in northern Canada, about 870 miles from the geographic North Pole. The south magnetic pole is off Wilkes Land, Antarctica, about 1,710 miles from the geographic South Pole, as shown in the figure.

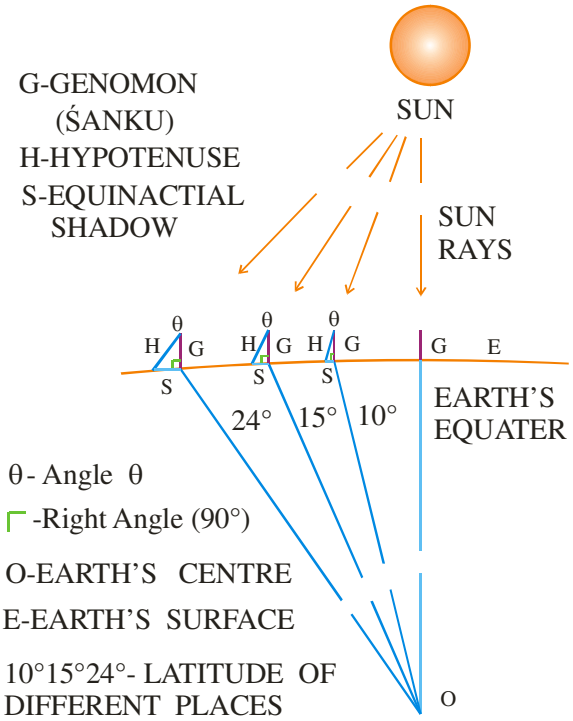


Moreover, their positions vary at different periods of time. For example, the North Magnetic Pole moves slowly over time, due to magnetic changes in the Earth's Core. In 2001, it was determined by the Geological Survey of Canada to lie near Ellesmere Island in northern Canada at 81.3°N, 110.8°W. It was estimated to be at 82.7°N, 114.4°W in 2005. In 2009, it was moving toward Russia at between 34 and 37 miles (55-60 km) per year. The positions of North Magnetic Pole at various periods are 81.3°N, 110.8°W (2001), 82.3° N, 113.4°W (2004 est.), and 82.7°N, 114.4°W (2005 est.) and of the South Magnetic Pole are 64.6 ° S, 138.5 ° E (1998), 63.5 ° S,

138.0 ° E (2004 est.) and 64.487 ° S, 137.684° E (2007). Hence, an alternate method, for the exact fixation of the directions, is required. Fixing the directions is a very essential basic thing, in temple constructions, because the places and front view of various Deities should be exact, as mentioned in temple architecture, Āgama and Veda. For this, our ancestors developed a system and method, using Astronomy and the Śanku. The Śanku is a Gnomon, usually a wooden, cylindrical, massive, straight rod (pillar, pole) of 12 Angula (1/2 cubit) height.

Using this Śanku, the directions are fixed exactly, by the following method. It is carried out on an equinoctial day, when the Sun raises exactly in straight line at Celestial (Earth's) equator (0° declination) . In the following figure, ESWN is a circle on a level ground. O is the centre of circle (Śanku). The 'w' is the point at which the tip of the shadow of Śanku enters into the circle in the forenoon. The 'e' is the point at which the tip of the shadow of Śanku goes out of the circle in the afternoon. Then, 'ew' is the East West line. With fish arcs (Timi or Matsya), north south line is fixed. (Next figure shows that the length of the shadow varies at different latitudes of the Earth).





But, declination of the Sun varies from forenoon to afternoon, as the Sun's Declination (δ) undergoes change continuously. It is due to the inclination of the Earth and is 23° 27 `. So in a year, i.e. during the Uttarāyaṉa (23° 27 ` × 2, from the line of Capricorn to the line of Cancer) and Dakshināyana (23° 27 `× 2, from the line of Cancer to the line of Capricorn) of Sun, it is 23° 27 ` × 4 = 93° 48 ` in 365.256364 days. However, the amount of variation depends on the declination

of the Sun. It is maximum up to 24` when the declination is 0 ° i.e. on equinoctial days and almost zero when the declination is 23° 27 ` i.e. on solstice days. Hence, the directions vary, very slightly from 'ew' to 'e`w' as shown in the figure. The difference between 'e' and 'e`' is 'd' and can be calculated, by the following method. Sun's declination on a particular day of a year is already computed and is available for all the days of a year. Hence, the values of δ and δ` can be calculated. ( δ is the declination of the Sun on the forenoon and δ` is the declination of the Sun in the afternoon, at the time of 'w' and 'e' markings, respectively).

The distance of the shadow-tip from the east-west line is defined as the *chāyā-bhuja* ("*bhuja* or base of shadow"). Let the difference between the *chāyā-bhuja* when the tip of the shadow enters into the circle and the *chāyā-bhuja* when the tip of the shadow passes out of the circle be *d*. Let δ be the Sun's declination when the tip of the shadow enters into the circle in the forenoon and δ′ the Sun's declination when the tip of the shadow passes out of the circle in the afternoon. Then

$$d = \frac{(R\sin\delta' \sim R\sin\delta) \times \text{hypotenuse of shadow}}{R\cos\phi},$$

where ϕ is the local latitude. This *d* denotes the correction which is applied as follows :

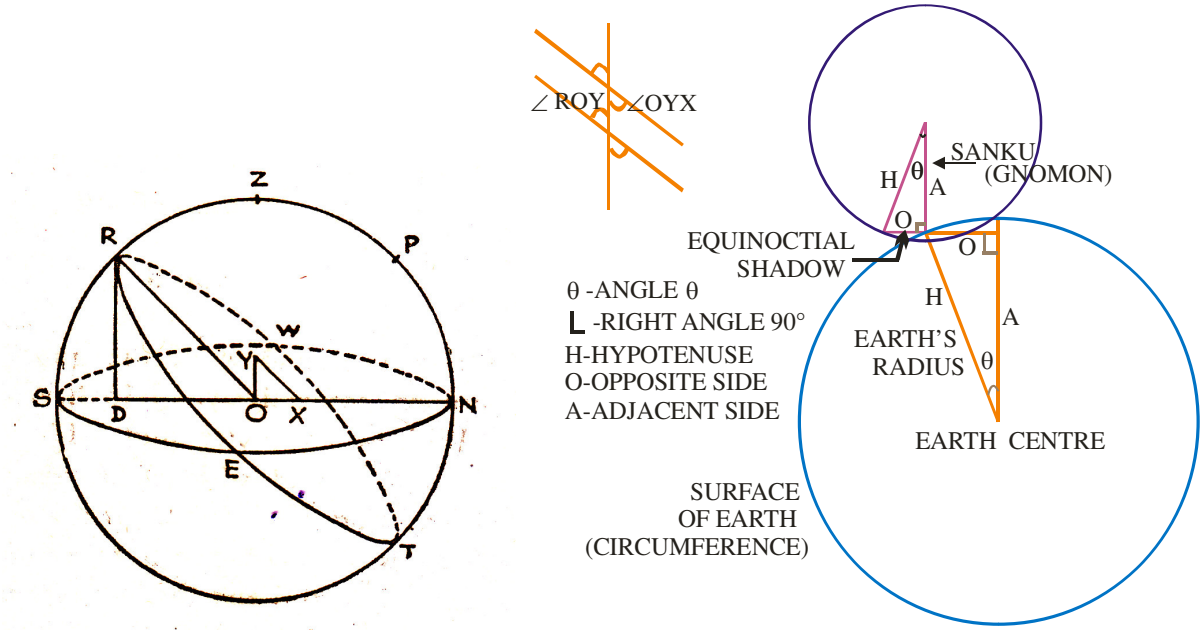
Construct a circle with ew as diameter, and with centre e and radius *d* draw an arc cutting this circle at e′ towards the north if the Sun's *ayana* is north, or towards the south if the Sun's *ayana* is south. Then e′w is the true orientation of the east-west line.

Now, through O, draw a line EW parallel to e′w. Then, relative to the point O, E is the east and W the west. The line NS, drawn through O, at right-angles to EW is the north-south line, N being the north and S the south relative to O.

Here, Rsine θ is local latitude. The value of Rcos θ (local co-latitude) and the local latitude Rsine θ can be calculated by using the Śanku, on the equinoctial day or in any other day by taking into consideration of the Sun's declination on that particular day, as shown in the following figures.

NESW is Horizon, NESW are directions, Z is Zenith of the local place, ZRSTNP is Local Meridian, R is the point of intersection of local meridian and Celestial Equator, RETW is Equator,

O Local Place, RD is perpendicular (⊥) to Horizon, Sun is at R at mid noon and Zenith at equator, OY is Śanku and is perpendicular (⊥) to Horizon, OX is its equinoctial mid shadow, XY is its Hypotenuse, RO is celestial radius, Arc RZ (∠ROY) is Local Latitude.



1. Δ RDO similar to Δ YOX, 2. ∠ROY= ∠OYX = ∠ DRO (RO and YX are Parallels and because the line OY cut these parallels, the opposite angles ∠ROY= ∠OYX are equal in degrees, as shown by the orange lined figure, inserted at the top. In the same way, RD and OY are parallels and the line RO cuts them, hence ∠ROY = ∠ DRO), 3. All these three are angle θ, 4. Rsine θ is local latitude, 5. ∠OYX is angle θ, in Śanku triangle Δ YOX, 6. ∠RDO =∠YOX = 90 °.

Latitude of any place on the surface of the Earth is R sine θ of this Śanku Triangle, where θ is the angle between the Śanku and the hypotenuse. R sine θ is known as Jyā (String) or exactly Ardha Jyā (1/2 String) of a Bow and Arrow, in our Hindu Astronomy. **This Jyā became Sine in Western world, on spread from Bhārat.** R cos θ = R × Adjacent side ÷ Hypotenuse and R sine θ = R × Opposite side ÷ Hypotenuse. Adjacent side is Śanku and opposite side is the shadow of Śanku and from the height and shadow of the Śanku, Hypotenuse is derived. Hypotenuse is equal to $\sqrt{[(\text{Śanku})^2 + (\text{Shadow of Śanku})^2]}$. Hence, Latitude Rsine θ = 3438` × Shadow of Śanku ÷ $\sqrt{[(\text{Śanku})^2 + (\text{Shadow of Śanku})^2]}$. Here Śanku is of 12 Angula in length (we can keep any length) and Shadow of Śanku is at exactly mid noon of the place concerned, on the equinoctial day. So, its termed as equinoctial mid shadow. R is 3438 minutes of angle, because 2πR is 360° (2πR is circumference of circle, which is 360° always). So, R is 3438` (360 ° ÷ 2 π). Thus, by

using the Śanku and the fore detailed calculations, both developed and practiced in our Nation in the remote past, we can fix the directions exactly, at the place of construction of the Temple and it is the very reliable, exact and correct method in fixing the directions. The R sine θ (Ardha Jyā) values, including its computation and derivation for the angles of a circle, from 3° 45 ` to 90 ° at intervals of 3 ° 45 ` (totally 24 values) are given by Āryabhaṭṭa, in 2741 B.C.E. in his Astronomical and Mathematical text Āryabhaṭṭīyam, in 11 and 12 śloka of 2nd Addhyāyaḥ (Ganita Pādaḥ). Sūrya Siddhāntaḥ gave these values in 16 to 23 śloka (including values of versed sine, Utkrama Jyā) of 2nd Adhyāyaḥ (Sputa Gatiḥ). Value of Ardha Jyā for 90 ° is 3438`, where the length of the chord (string of the bow) is equal to the radius of circle.

This method and science of fixing the directions exactly, at any locality on Earth, by using the Śanku and these calculations, are detailed well in the ancient astronomical texts of our Nation, in the remote past itself. 1. Sūrya Siddhāntaḥ of remotest antiquity, in its 1 to 8th śloka of 3rd Adhikāraḥ (Tripraśnādhikāraḥ), 2. Mahāryabhaṭṭa Siddhāntaḥ, written by Āryabhaṭṭa, nearer to the beginning of this Kaliyuga (4700 years before present) in the 1 to 6th śloka of 4th Adhikāraḥ (Tripraśnādhikāraḥ), 3. Pañca Siddhāntikā of Varāhamihira of 123 B.C.E. in 19 to 21st śloka of the 4th Adhyāyaḥ (Karaṉādhyāyaḥ) [21st śloka deals with the method of using the shadow of any day in a year, to fix directions], 4. Brahmasphuṭa Siddhāntaḥ of Brahmagupta (30 B.C.E.) in 1 to 5th śloka of 3rd Adhikāraḥ (Tripraśnādhikāraḥ), 5. Siddhānta Śiromanī of Bhāskarācārya (486 B.C.E.) in 8 and 9th śloka of 3rd Adhikāraḥ (Tripraśnādhikāraḥ) of Golāddhyāyaḥ, 6. Mahābhāskarīyam of Bhāskara (522 /629 C.E.) in 1 to 5th śloka of 3rd Addhyāyaḥ 7. Laghu Bhāskarīyam of Bhāskara 1 to 4th śloka of 3rd Addhyāyaḥ 8.Vateśvara Siddhāntaḥ and Gola in the 2 to 5th śloka of 1st Adhyāyaḥ (Viṣuvachāyāsādhanvidhiḥ) of the 3rd Adhikāraḥ (Tripraśnādhikāraḥ) [It mentions the correction to be done due to variation in declination of the Sun, in a single day], 9. Śiṣyadhīvṛddhita Tantram of Lallācārya in 1 to 7th śloka of 3rd Adhikāraḥ (Tripraśnādhikāraḥ), and 10. Goladīpikā of Parameśvara in 1 to 53rd śloka of 4th Addhyāyaḥ, all these ancient astronomical and mathematical texts of our Nation, described this method.

Even the ancient non-astronomical texts are also describes it, at times. For example, "Neḍunal Vāḍai" a very ancient Sangham Tamil Literature of Patthuppāṭṭu texts, describes it as follows.

"…… māthiram virikathir parappiya viyalvāy maṉḍilam,
Erukol kurinilai vazhukkātha kuḍakkerbu, oruthiram cārā arai nāl amaiyatthu,
Nūlari pulavar nunnithir kayiriṭṭu, Deyem koṉḍu Deiva nokkip
Perum peyar mannarkkoppa manai vakutthu,……'' (72 to 78 lines)

The meaning is "The Sun, rising at east, proceeds towards west. On the day, exactly at mid noon, at which there were no shadows, neither on north or south side of the two Śanku (wooden sticks), the experts of civil engineering, who knew well the texts of civil engineering and architecture (Śilpa Śāstram), fixed the directions, at that place with ropes, after worshiping God and thus started constructing a great palace for the great King."

The two Śanku will not cast their shadows at their northern and southern sides, at exact mid noon only on a day, when the local latitude of that place and the declination of the Sun are exactly equal. That means, on that particular day, the Sun rises in the east exactly in the line of the latitude of that place and the Sun is exactly at the zenith of that place, at exact mid noon, on that day. Thus, our ancestors knew the Sun's declination (and other celestial co-ordinates) and the latitude co-ordinates (and other co-ordinates) of the Earth. This can be proved by the following evidences.

1. The list of 27 ecliptic stars and their co-ordinates

Sūrya Siddhāntaḥ in 2 and 57th śloka of 1st Adhikāraḥ (Madhyamādhikāraḥ) clearly reveals that this text was taught at the end of Kṛta Yuga of the present 28th Mahāyuga i.e. 12,96,000 + 8,64,000 + 5,112 = 21,60,112 years before present. Śloka 8 and 9th of 1st Adhikāraha mentions that it was taught every Yuga to Saints (Ṛṣi) by Bhāskara (Sun God) i.e. even at a period, prior to this. The 8th Adhikāraḥ (Nakṣatragrahayutyadhikāraḥ, 1 to 21st śloka) gave the Polar Longitude (Dhruvaḥ, Dhruvakam) and Latitude (Vikṣepaḥ) of all 28 Ecliptic stars, in the following table. Bhāskara's Mahābhāskarīyam and Laghu Bhāskarīyam, Lallācārya's Śiṣyadhīvṛddhita Tantram, Brahmagupta's Brahmasphuṭa Siddhāntaḥ and Khaṉḍa Khādyaka, Śrīpati's Siddhānta Śekara, Bhāskarācārya's Siddhānta Śiromaṉī also gave the celestial longitudes and celestial latitudes of these 27 ecliptic stars.

Asterisms.	YOGA-TÁRÁS *or principal stars.*	*Apparent longitudes,*			*Apparent latitudes*	
		s	°	′	°	
As'winí,	α Arietis,	0	8	0	10	N.
Bharaṇí,	Musca,	0	20	0	12	N.
Krittiká,	π Tauri, Pleiades,	1	7	30	5	N.
Rohiṇí,	α Tauri, Aldeharan,	1	19	30	5	N.
Mríga,	λ Orionis,	2	3		10	S.
Ardrá,	α Orionis,	2	7	20	9	S.
Punarvasu,	β Geminorum,	3	3		6	N.
Pushya,	δ Cancri,	3	16		0	N.
As'leshá,	α 1 and 2 Cancri,	3	19		7	S.
Maghá,	α Leonis, Regulus,	4	9		0	N.
Purvá-phálguní	δ Leonis,	4	24		12	N.
Uttará-phálguní,	β Leonis,	5	5		13	N.
Hasta,	γ or δ Corvi,	5	20		11	S.
Chitrá,	α Virginis, Spica,	6	0		2	S.
Swátí,	α Bootis; Arcturus,	6	19		37	N.
Vi'sákhá,	α or χ Libra,	7	3		1	30′ S.
Anurádhá,	δ Scorpionis,	7	14		3	S.
Jyeshṭhá,	α Scorpionis, Antares,	7	19		4	S.
Múla,	ν Scorpionis,	8	1		9	S.
Púrváshádhá,	δ Sagittarii,	8	14		5	30′ S.
Uttaráshádhá,	τ Sagittarii,	8	20		5	S.
Abhijit,	α Lyri,	8	26	40′	60	N.
S'ravaṇa,	α Aquilæ,	9	10		30	N.
Dhanishṭhá,	α Delphini,	9	20		36	N.
S'ataṭáraká,	λ Aquarii,	10	20		0	30′ S.
Púrvábhádrapadá,	α Pegasi,	10	26		24	N.
Uttarábhádrapadá,	α Andromedo,	11	3		26	N.
Revatí,	ζ Piscium,	11	29	5	0	0 N.

2. The astronomical terms and the names of these co-ordinates

These are given in these ancient astronomical and mathematical texts, at the remote past itself. This clearly proves that our ancestors had expertise knowledge in astronomy, including co-ordinates and they applied them in their day to day life. The following is the glossary of astronomical terms, though it is not a complete collection.

Agrā – Amplitude; Ahorātravṛtta – Diurnal circle; AkṣaAmsa (Akṣāmsa) – Latitude of a place; Akṣajyā – R sine Latitude; Akṣabhā, Palabhā –Equinoctial Mid Shadow; Akṣakarṇa, Chayākarṇa – Hypotenuse in Śanku triangle; Akṣakoṭi – Co-latitude; Akṣonnati – Inclination of Earth's Axis; Apakrama, Paramakrānti – Greatest Declination; Apakramavṛtta, Apamaṇḍala, Krāntimaṇḍala, Krāntivṛtta – Ecliptic; Ardhajyā – R sine; Avanama – Zenith Distance; Ayanānta – Solstice;

Ayanacalana – **Oscillation** of Equinox; Bhūgola – Earth; Gola – globe, sphere; Candrakarṇa – Distance of Moon from Earth; CandraPāda – Nodes of Moon (Rāhu and Ketu); Dṛgjyā - Rsine of Zenith; Dīrghāmsa, Desāntra – Longitude of a place; Dṛggola – Visible Celestial Sphere; Dṛkṣepa – Ecliptic Zenith Distance; Dṛkṣepamaṇḍala – Vertical circle through central ecliptic point; Dṛkmaṇḍala – Visible vertical circle; Dṛgamascāpa – Zenith Distance; Dhruva – Pole; Dhruvaka – Polar Longitude; Jyā – R sine; Hora – 1/24 th of a day; Kadamba – Pole of Ecliptic; Kakṣa – Orbit; Kapāla – Hemisphere; Koṭijyā – R cosine; Koṭi – Perpendicular Side of Right Angled Triangle; Krānti, Apama – Declination; Krāntijyā – Rsine declination; Krāntipāda – Eqinox; Kṣipti, Śara – Celestial Latitude; **Ksitija, Harija – Horizon (Vateśvara Gola 3-2)**; Lambajyā – Rsine of co-latitude; Lambāmsa – Co-latitude in degrees; Lambana – Parallax of Longitude; Maṇdanīca – Perigee and Perihelion; Maṇdocca – Apogee and Aphelion; Nāḍivalaya, Viśuvadvalaya, Nāḍivṛtta, Viśuvadvṛtta – Celestial Equator ; Natakāla – Hour Angle; Nati, Avanati – Latitudinal Parallax; Nīcocca Vṛtta –Epicycle; Parama Lambana – Horizontal, maximum parallax; Paridhi, Nemi – Circumference; Pūrvāparā – East West Line; Ravikarṇa – Distance of Sun from Earth; **Rekhā, Madhya Rekhā – Prime Meridian, Lańka and Ujjainī (Line of Prime Meridian)**; Samamaṇḍala – Prime Vertical; Sphuṭavikṣepa – Celestial Latitude corrected by Parallax; **Śanku – Gnomon, Rsine Latitude**; **Trijyā – Rsine of an arc of 90 °**; Unnati, Unnata – Altitude; Udvṛtta, Unmaṇḍala – Equinoctial, 6'o clock, east west circle; Vidigvṛtta – Intermediate Cardinal Points; Vikṣepa – Celestial Latitude of a Graha (Polar Latitude); Vimaṇḍala – Orbit of a Graha; Viśuvat – Equator; **Vṛtta – Circle (Vertical)**; Yamayotravṛtta – The Local Meridian passing through North South Cardinal Points. These are all the some of the astronomical terms used in the ancient astronomical texts of our Nation, showing the richness of our ancestor's knowledge in astronomy.

3. Reference of Lańka Ujjianī Prime Meridian in our Nation's ancient astronomical texts

A. Sūrya Siddhāntaḥ 37 to 42, 52, 70 and 71st śloka of 12th Adhyāyaḥ mentioned about Lańka, as a great city situated in the southern part of our Nation Bhārata, on Earth's Circumference

(Equator) [39th śloka]. It mentioned 4 cities, 1. Lańka, 2. Yamakoṭi of Bhadrāśva Nation in East, 3. Romaka in Ketumālā Nation in West and 4. Opposite to Lańka is Siddhapuri of Kuru Nation. These 4 cities situated on Earth's circumference at equal distances (90° apart). In these places there is no equinoctial mid shadow (when Sun rises at Equator (Equinox) with 0° declination). Śloka 1-62 mentions Avantī (Ujjainī) in Prime Meridian (Rekhā). This Lańka was situated south-east of Maldives and is different from the present day Srī Lańka.

B. Āryabhaṭṭīyam of Āryabhaṭṭa (2764 B.C.E.) mentions in the 14th śloka of 4th Addhyāyaḥ (Golapādaḥ) as, from the centre of land and water, at a distance of one quarter of the Earth's circumference lies Lańka and Ujjainī lies exactly northwards of Lańka, at a distance of 1/16 of the Earth's Circumference (360° ÷ 16 = 22.5°),

C. Brahmagupta's (30 B.C.E.) Brahmasphuṭa Siddhāntaḥ (21-9th śloka), mentioned that Ujjainī is at 1/15th part of Earth's circumference (24°),

D. Mahābhaskarīyam of Bhāskara (522 /629 C.E.), in 1 and 2nd śloka of 2nd Addhyāyaḥ mentions that Lańka and Ujjainī are in the same meridian,

E. Karaṉaratnam of Devācārya 30th śloka of 1st Addhyāyaḥ mentioned in the same way,

F. Varāhamihira's (123 B.C.E.) Pañcasiddhāntikā, 13th Addhyāyaḥ (Trilokyasamsthānam), 10, 11,17,19, 26 and 32nd śloka, details Ujjainī and Lańka. (Both in same meridian, 17th śloka).

G. Lallacārya's Śiṣyadhīvr̥ddhita Tantram, 3, 4 and 12th śloka of Bhūgolāddhyāyaḥ (17th Addhyāyaḥ) and 24 and 25 śloka of 19th Addhyāyaḥ (Bhuvanakośa) describes Kanyā (Kumārikā) part of Bhārata Nation. Lańka was situated in this part. 40th śloka describes Ujjainī at Prime Meridian,

H. Vateśvara Siddhāntaḥ and Gola 10th śloka of 5th Addhyāyaḥ of Gola part mentioned the four cities including Lańka in Equator, 1 and 2nd śloka of 8th section of 1st Addhyāyaḥ mentioned that Lańka and Ujjainī in Prime Meridian,

I. Sripati's Siddhānta Sekara in 2nd Addhyāyaḥ 95 to 97th śloka mentioned that Lańka and Ujjainī in Prime Meridian

J. Siddhānta Dharpana of Nīlakaṉḍa Somayāji, 15th śloka mentioned that Ujjainī is north to Lańka by 1/15th part of Earth's Circumference (24°),

K. Bhāskarācārya's (486 C.E.) Karaṉakutūkalam 1-14th śloka mentioned that Ujjainī in Prime Meridian (Madhya Rekhā),

L. Goladīpikā of Parameśvara in 3rd Addhyāyaḥ describes the Earth and its divisions. In 8, 9 and 26 to 29th śloka mentioned the four cities including Lańka. The 77 to 91st śloka describes the Nation Bhārat and 92nd śloka after describing the river Ganga, mentioned that Lańka is situated at the top of the mountain in the Malaya Island, one of the six islands of Kumārī Islands situated at the southern most end of Bhārat (Anga, Yava, Malaya, Sankhaka, Kumuda and Varāha), Rivers flown from Malaya mountain were Kr̥tamālā and Tāmpraparaṉī,

M. Laghumānasam of Mañjulācārya 3rd śloka of 4th Addhyāyaḥ mentioned Avantī (Ujjainī) in Prime Meridian. This proves that initially Lańka Ujjainī was the prime meridian and when the westerners copied these co-ordinates from these texts, they changed it to Greenwich.

4. 360 DEGREES OF A CIRCLE AND VEDA

Ṟg Veda Samhitā 1st Maṉḍalam 164th Sūktam (Hymn) 48th Mantram (verse) reveals,

द्वादश प्रधयश्चक्रमेकं त्रीणि नभ्यानि क उ तच्चिकेत ।
तस्मिन्त्साकं त्रिशता न शङ्कवोऽर्पिताः षष्टिर्न चलाचलासः ।।

Dvādaśa pradhayaś cakram ekam trīṉi nabhyāni ka u tacciketa |
Tasmintsākam triśatā na śańkavo'rpitāḥ ṣaṣṭirna calācalāsaḥ ||

Meaning: Dvādaśa– 12; pradhaya**:** – the arcs of a wheel; cakram ekam – one wheel; trīṉi - three; nabhyāni – axles or hubs or centre part of the wheel; triśatā ṣaṣṭi**:** – 360; śańkava**:** – spokes of the wheel; calācalāsaḥ – movable and immovable.

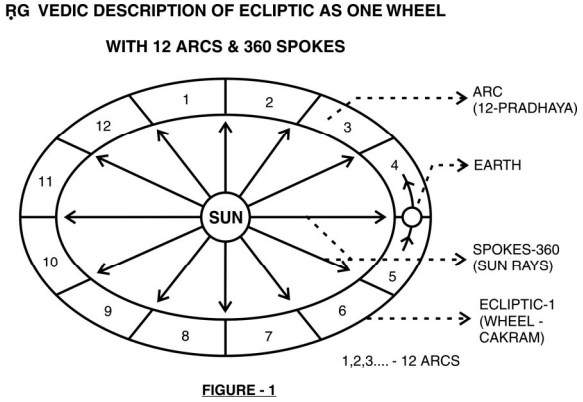


FIGURE - 1

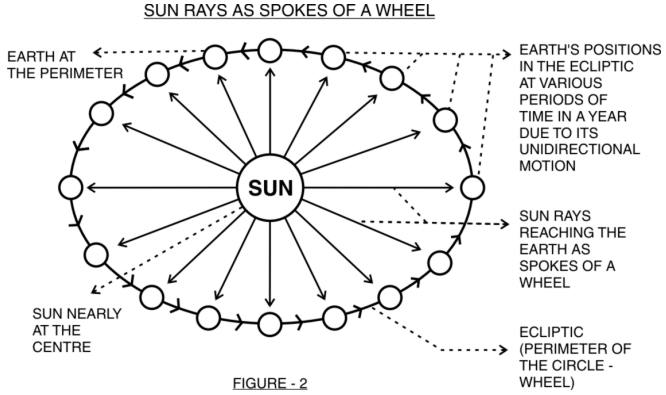


FIGURE - 2

"The arcs are twelve, the wheel is one and three are the axles. Who indeed knows it? Within it are collected three hundred and sixty spokes, which are as it were movable and immovable."

This shows clearly that the time divisions in our Nation, is based on the angular distance covered by the Earth, in its Ecliptic round the Sun, in that particular time. One year is the time required for the Earth to travel 360° (one full circle) of angular distance, in its ecliptic around the Sun. In the same way, one month for 30° (one arc-rāsi-sign), one day for 1° (amsa- spoke), one ghaṭikā (nāḍī-nāḍikā) for one minute (liptā-kalā), one vighaṭikā (vināḍī, vināḍikā) for one second (viliptā, vikalā) and one Gurvakṣara is the time required for the Earth to travel one third (tatparā) of angular distance, in its ecliptic around the Sun. Thus, there is an exact confluence of the spatial distance travelled by the Earth in the Ecliptic in its unidirectional motion and the Time Measurements developed in our Nation. This is completely scientific and is totally based on the angular distance covered by the Earth in the Ecliptic and the time required for that. Thus, the concept of 360° of angles for a circle, is based on Earth's revolution round the Sun in the Ecliptic, as revealed in Ṛg Veda Samhitā verses 1-164-48 and 11. Hence, it is clear that 1. The concept of 360° of angles for a circle and 2. The Time Space and the Direction Concept (Dig Deśa Kāla Vardhamāna) of the most modern science, had been developed scientifically and applied in the day-to-day life, by our Ancestors, in the remotest antiquity itself.

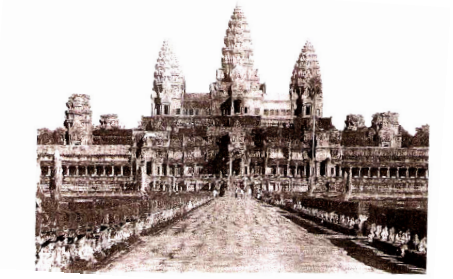
5. The Jantar Mantars, present even to-day at Ujjainī, Delhi, Varanasī, Mathurā and Jaipur and the various instruments like Transit Instrument, Sun-Dial, Rām Yantra etc. constructed there, proves our ancestor's knowledge in astronomy.

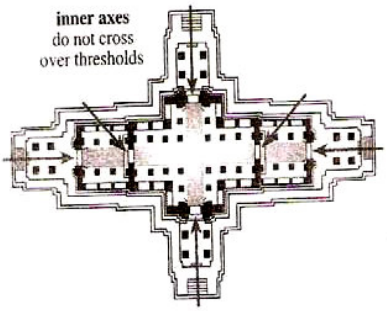
6. ANKGOR WAT OF CAMBODIA

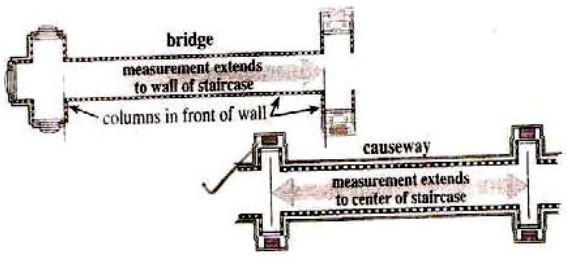
When the units of measurements were changed from meters to cubits, the measurements and meaning of the temple become clearly understandable and the temple demonstrates the ways through which the history of the king, cosmology, astronomy, the calendar and the realm of Gods were all interrelated. All information obtained from inscriptions on culture and architecture of Angkor Wat become suddenly manifest in the temple itself. Both northern and southern corridors of the third gallery are 202**.**14 meters long and the eastern and western corridors are 114**.**22 and 114**.**24 meters respectively. Why and how the circumference was constructed in a remarkably accurate manner? The answer lies in understanding the basic. If we alter the unit of measurement from meters to cubits it will show the answer. Cubit is a length from elbow to outstretched fingertips. Cubits and related units were inherited in Cambodia from Bhārat. Might be the King

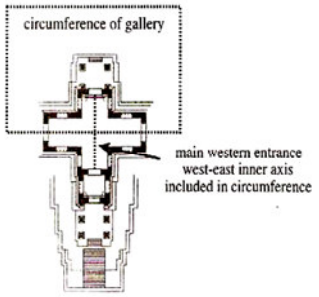
Sūryavarman 2's (Paramaviṣṇuloka, Khmer Empire, 1113 C.E. to 1145-1150 C.E., constructed in his reign) cubit used. One cubit will be about 0.43545 meters. North south axis in the sanctuary is of 13.41 cubits and 13.41 cubits is a basic module in the second gallery, devoted to Brahma. Ankgor Wat is situated 13.43 degrees of Northern Latitude. Thus, the measurements are based on the local latitude and it proves that the temple sthapathy knew astronomy very well. If we estimate the longitude of Ankgor Wat in relation to Ujjainī Lańka Longitude, it may yield better results. Ujjainī Lańka is the prime Meridian in ancient days (0° Logitude). It is 75°46´38´´ and Ankgor Wat is103° 52´ of Greenwich. Hence Ankgor Wat is 28° 5´ 22 ´´ East of Ujjainī Lańka Meridian.

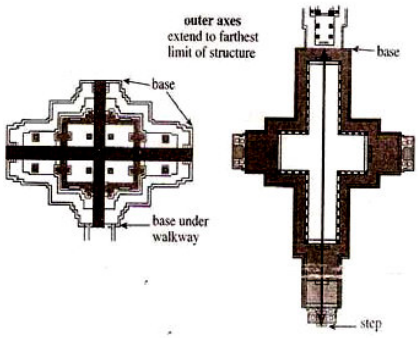
On measuring, we should follow how and in what manner it was constructed, like 1. The outer axial measurements should extend the farthest physical point of the structure, 2. The inner axes should extend from doorway to doorway only and not to cross the thresholds, 3. Raised surface ledges to be included, 4. In bridge and cause way, measurements should extend to wall of staircase and centre of staircase, 5. Balustrades are the boundary of measurements along the causeway, 6. Paths of circumambulations should be included in measurements, 7. The central space also should be included, 8. The circumference of each of the four enclosures is determined by a line along the centre of the circumference corridors. Assess it with constructor's scale and ways and not with the so called 'modern methods' which will not yield results exactly. **We should view the ancient structures with the eyes and mind of the constructors and not with our own.** (Ref. with thanks to 'Angkor Wat**:** Time, Space and Kinship' by Eleanor Mannikka, University of Hawaii Press).

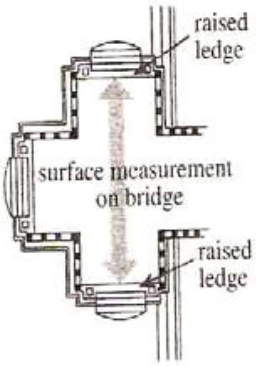


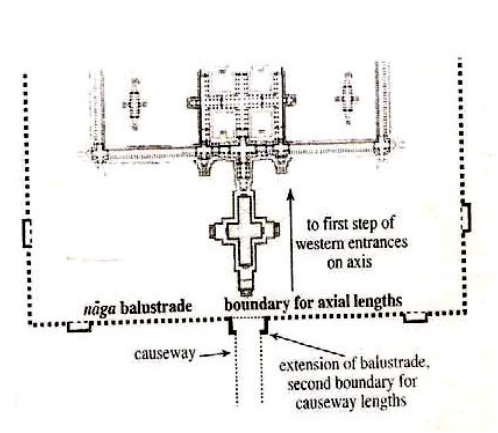


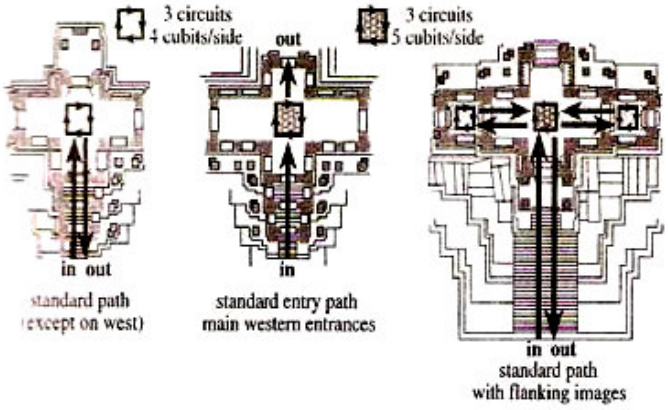












Thus, when we understand and follow the methods and means of the constructors, then only we can understand the basic aspects and the secrecy of the construction correctly, otherwise we will be misled to wrong conclusions. This is the very needed lesson Ankgor Wat teaches us.

7. Dates at which the rays of Sun fall on Śivalińga at various temples

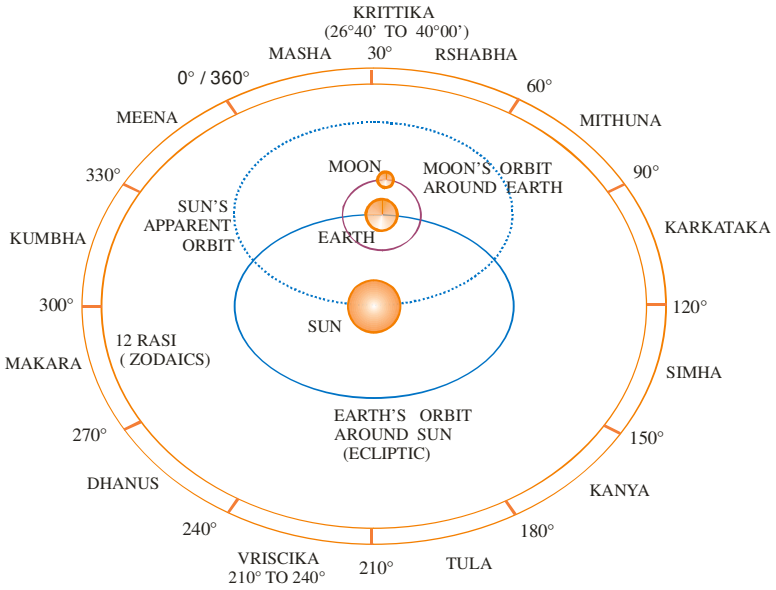
This shows that our ancestors knew astronomy well and with that sound knowledge and wisdom, they have constructed temples in a very scientific way. In the following, the dates and the names of the temples are given, where the Sun rays and or Moon rays are falling on the Main Deity, at a particular time and date in every year.

1. Tamil New Year Day, Chitrai 1 (Souramāna) - Kāṭṭūr Chennai and Śankaran Koil, Thirunelveli (ŚańkaraNārayaṉar, Gomathiamman) on Gomathiamman, 2. Chitrai 2,3,4 - Kālnaṭṭampuliyūr Thiruchirapalli, 3. Chitrai 7 to 18 - Chembaṉār Svarṉapurīśvarar, 4. Chitrai 11,12,13 - Kumbakoṉam Nageśvarar, 5. Chitrai 13,14 - Thiruvāsi, 6. Chitrai 13,14,15 - Thiruchoṭruthurai 7. Chitrai 18,19,20,21 - Paṭṭīśvaram Srī Dhenupurīśvarar, 8. Ādi 1,2,3,4,5 - Thiruneḍunkulathūr Chennai, **9. Āvaṉi 19,20,21, Māsi 19,20,21 -** Thirunaraiyur, **10. Puraṭṭāsi 7,8,9, Pańguni 7,8,9 -**

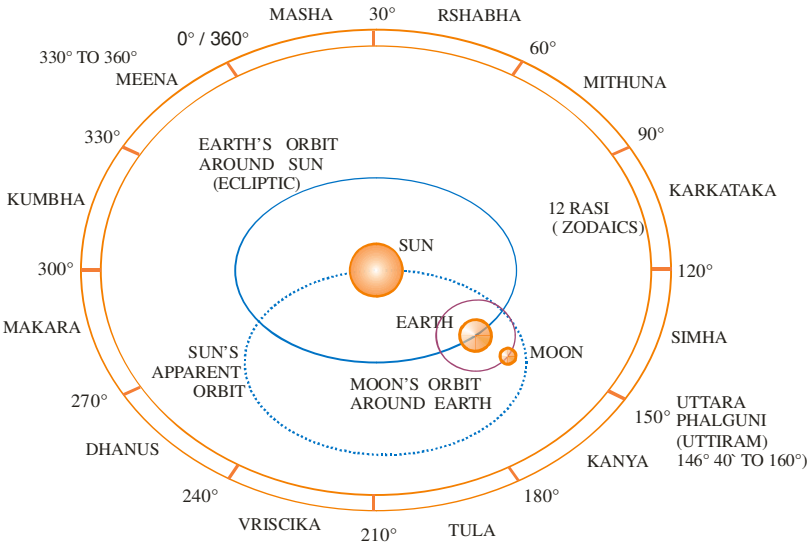
Thirupaiñjīli**, 11. Puraṭṭāsi 8, Pańguni 8 -** Thiruppāṭrurai, 12. Thai Rathasaptami - Kañchipuram Ekāmbaranāthar and Thirucheńkoḍu Erode, 13. Thai Amāvasyai for 1 week - Thirunelveli Srī Nelliayappar, 14. Māsi Śivarātri - Thirumurukanpūṉḍi Avinaśi, 15.Māsi 13,14,15 - Thirucherai, 16. Māsi 18 - Srī ARUṈĀCHALEŚVARAR, 17. Māsi 24,25,26 - Thirukarukāvūr, 18. Māsi 30, for 1 week - Nannilam, 19. Māsi 8,9,10 - Evening Time from 5-30 PM onwards first on Nandiyam Perumān, then at the footstep of Karuvarai (Sanctum Sanctorum), then at the base, middle part and then upper part of Śivalińga, (2 minutes at each part) Thāramańgalam Salem, 20. Pańguni 1,2,3 - Mānthurai, 21. Pańguni 13,14,15 - Thiruvedikudi, 22. Pańguni 26,27,28 - SrīMakuḍeśvarar ThirupāṉḍiKoḍumuḍi Erode and 23. On Equinoctial days - **Modherā (DharmaAraṉya),** Gujarath 102 Kms from Karṉāvati, on the bank of Puṣpavathi River. The temple was constructed during the rule of King Beemdev of Solańki Kingdom, in 1026 C.E. The Light Rays of the Sun fall on God Sūrya (the Main Diety) in the mornings. Sthalapurāṉa says Srī Rāma with Seetha Mātha on return to Ayodhya, after victory at Lańka worshiped here, on the advice of Ṟṣi Vasiṣṭha. In Thirunaraiyūr, Thirupaiñjīli and Thiruppāṭrurai, the temples are constructed in a very special manner, so that the rays of the Sun, worship Śivalińga both during Uttarāyaṉa and Dakṣināyana transits of the Sun, as shown by the dates mentioned above, which are exactly six months apart.

The most interesting will be the temple at Thirunāgeśvaram, near Kumbakoṉam. Here we worship Srī Nāganāthasvāmy (Seṉbaga Āraṉyeśvarar) and Piraiyaṉivānnuthal Umayāmbikai (Ardhacandrabimba Gujāmbikā). On Kārthikai Month Pourṉami (mostly the star of the day is Kṟttikā), at night 8 to 9 PM, the Light Rays of Moon will fall at the feet of Piraiyaṉivānnuthal Umayāmbikai. Chandra is said to perform Pūja and worship Piraiyaṉivānnuthal Umayāmbikai on Kārthikai Pourṉami day. The following diagram shows that with respect to the Sun, the Earth and the Moon are in conjunction with the ecliptic star Kṟttikā. However, with Earth as the reference point, the Moon is in conjunction with the star Kṟttikā and the Sun, at Vṟścika Rāsi, is exactly 180 degrees apart from Moon, and thus it is a full moon day (Pourṉami). Since the Sun is at Vṟścika

Rāsi, it is Kārtikai month. This month is named as Kārtikai, because almost in all Kārtikai months of all years, the full Moon, which is 180 degree apart from the Sun at Vr̥ścika Rāsi, is in conjunction with the star Kr̥ttikā. In our Nation, all the months of the year are named in this way only, i.e. with astronomical basis only. This shows our ancestors' thorough astronomical knowledge. Here, on the Full moon day of Kārthikai month, the Moon rays worship the feet of Piraiyaṉivānnuthal Umayāmbikai.

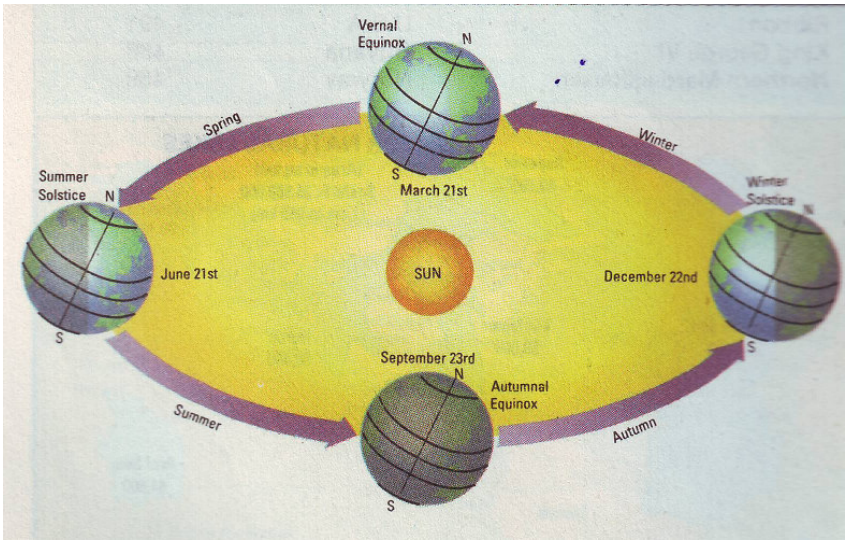


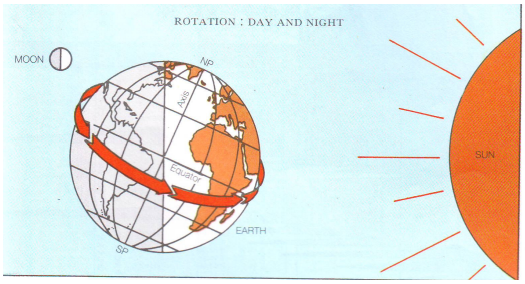
The same thing happens at Thiṅgalūr near Kumbakoṉam. Here we worship Kailāsanāthar and Periyanāyakiambāl. On Pourṉami tithi in Phālguna (Paṅguni) month (mostly the star of the day is

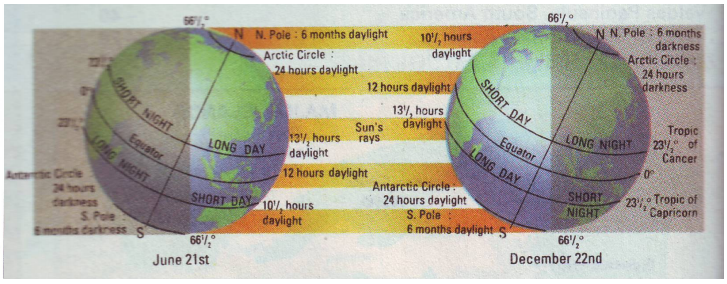


Uttara Phālgunī, Uttiram), at Sun Rise, the Light Rays of the Sun fall on Śivalińga and at Moon Rise, the Light Rays of the Moon fall on the Śivalińga. Here the Moon is in conjunction with the star Uttara Phālgunī (Uttiram) and is 180 degree apart from the Sun, on seen from the Earth. Hence it is a full moon day and the month is named as Phālguna (Pańguni). The Sun is at Mīna Rāsi with reference to Earth.

In these two temples, the rays of Moon worship God, on a particular month's full moon day only and not in all 12 full moon days of a year. This is because, the Earth's axis is inclined at 23° 27` to its ecliptic path around the Sun. Thus, the temples are constructed in a special manner,







that the rays can enter into the Sanctum Sanctorum at a particular angle, calculated according to the declination of the Sun and the Moon, on that particular month's full moon day. This is because, on revolving round the Sun in its Ecliptic, the part of the Earth that is in direct line with the Sun varies constantly, in accordance with Sun's declination. This is shown in the above figures. Here it is shown that the Sun Rays fall straight (90º) at the Equator of the Earth on March 21st and September 23rd (Sun's declination 0º), at the tropic of Cancer on June 21st (Sun's declination 23º 27`N) and at tropic of Capricorn on December 22nd (Sun's declination 23º 27`S). The Moon is

revolving round the Earth in almost in the same plane at which the Earth revolves round the Sun i.e. with a tilt of 5.145º only to the ecliptic. Thus, the plane of Earth, Moon and the Sun is almost same. Thus, the Earth's tilt towards Moon and Sun is unique to that month and date, that means, at that particular angle only, the Moon rays can enter into the Sanctum Sanctorum, in that month, on that particular date and not in other months and other dates. This particular angle is different for each month. Besides, due to inclination of the Earth, the various places of Earth are at various angles towards Sun and Moon, on any day of the year. In the same way, the angle at which the Sun is seen from a particular place varies on every day of the year, due to changing declination of the Sun. This is the basis of constructing a temple with the mechanism that enables the Sun rays to fall on the Deity, only on a particular date in a year.

COCLUSION

These evidences clearly show that astronomy is well developed in our Nation, that too, in the remotest antiquity. The movements of celestial bodies are calculated exactly with the expertise knowledge in astronomy, using the celestial co-ordinates, by our ancestors. This is essential in calculating the auspicious time in temple construction. In the same way, the co-ordinates of the Earth, the declination of the Sun and Śankusthapānam are very essential in fixing the directions exactly, at the place of temple construction. These things prove that our ancestors had a thorough knowledge in Astronomy, Civil Engineering, Architecture and Mathematics including Geometry and this knowledge had spread to the whole world. Thus, in our Nation, the temple construction and architecture are completely based on astronomy and is totally scientific. Hence, temple architecture and construction are Divinity, excellent art, but none the less science.

Later Chalukya Architecture and Sculptors

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The later Chalukya rulers (973-1126 A.D) are also referred to as the Chalukyas of Kalyan as they ruled from Kalyan. The later Chalukyas came to power by setting aside Rastrakutas. After Tail II re-established Chalukya Empire, the family ruled for more than two hundred years. The period of this dynasty forms an important chapter in the cultural history of entire south. Their feudatories like the Silaharas, Kadambas, Rattas, Sindas, Seunas and Hoysalas highly patronized cultural activities. Like Rashtrakutas later Chalukyas also continued the traditions initiated by the Chalukyas of Badami. The later Chalukyas and their feudatories proved to be great builders. Their activity of temple-building received unusual impetus and today large number of surviving monuments in the Deccan including Karnataka, Andhra, and Maharastra are those constructed during this period.

The Chalukyas of Badami laid foundation for architectural feats. During the period of Rashtrakutas not much remarkable progress was achieved in the sphere of structural monuments. The Chalukyas of Kalyan made a room for architectural renaissance as a result; there was a magnificent harvest of glorious monuments.

Highly refined product of temples belonging to this period is seen from Bidar to Harihar. Mention may be made of Saraswati, and Trikuteshwar of Gadag, Kalleshwar at Kukkanur, Brahma-Jinalaya at Lakkundi, Mallikarjuna at Kuravatti, Siddeshwar at Haveri, Bhimeshwar at Nilagund, Doddabasappa at Dambal, Mahadeva at Itagi, Mahakuteshwar at Choudadanapur, Someshwara at Laxmeshwar and others.

The earlier structures by the Chalukyas of Badami and Rastrakutas were built in red sand stone. The architects of Kalyana Chalukya period changed the medium from red sand stone to schist. This provided a lot of opportunity for dedicate curving leading to decorative exuberance. This schist is commonly known as soap stone. Jewellery like curving can be achieved in this medium. That is the reason why so much delicacy is expressed in door frames and other motifs. Unlike sandstone the surface of schist can be well polished. It is not easily subjected to erosion. Hence the selection of medium is a wise act of the sculptors of this period.

Mahadeva temple at Itagi deserves special attention. The twelfth century Mahadeva temple with its well executed sculptures is an exquisite example of decorative detail. The finely crafted cravings on walls and pillars speak volumes about sculptors' taste and skill.

An inscription outside the temple describes the temple as the Emperor of Temples (Devalaya Chakravarti). It is recorded here that the patron was Mahadeva, a Commander in the army of Vikramaditya VI. The Kedareshwar temple (1060 A.D) at Belligavi is an example of transitional Chalukyas Hoysala Architectural style

Architects and Sculptors.

Inscriptions of Kalyana Chalukya period mention names of architects and terms related to architectural science. An architect is known as Sutradhari. On a pillar of Amrateshwar temple at Holalu, there is an important inscription which clarifies the meaning of the term 'Sutradhari' and records different typical styles of temples.

Barmoja, the son of Bokoja, happens to be the disciple of Sutradhari called Padmoja of Soge. He was a crest to the feet of Lord Vishwakarma. He himself was a Vishwakarma of Kaliyuga. He had mastered 64 arts. He was an expert architect in all the architectural styles- namely Nagara, Kalinga, Dravida and Vesara. He was a Sculptor also carving pillars at the rate of 20 gadyanas a pillar, including decorative work.

An inscription on the Sarwaswati temple at Gadag makes a mention of Sutradhari, Kriyashakti Pandita who was a master of architecture and a teacher of art of painting. The inscription reads – 'Chitrashastradi upanyasaka Ruvari Madana'

There was another school of architecture at Belligavi, where new tradition in the sculptural art flowered. Dasoja was a master sculptor of Balligavi who migrated to Beluru and Halebidu later.

The inscription of Kalyana Chalukyas reveals a vast number of names of architect's and sculptors. They are Sangoja Bammoja, machoja, Bolloja, Gulugoja, Masyayoja, Sosagoja, Besayoja, etc. A number of sculptors are identified as Kalamukha Acharis. They are Kalatreya Devarasi Achary, Tejorashi Pandita, Dharmarashi Pandita, Brahmarashi Pandita, Chandrabhushana Pandita, Chavana, Nagoja, Sangoja and Ballaleshwara Acharya son of Brahma Pandita and others.

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TRADITIONAL SYSTEMS IN TEMPLE RENOVATION

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1. INTRODUCTION

Vastuvidya covers within its scope the planning, design, construction and conservation of all types of buildings. Temples forms an important category of symbolic buildings (prasadavastu) among these buildings. They form focal structures in any settlement system. According to a temple survey project by the Census Department, there are more than 20000 temples - large and small in Kerala state. In the Dravida desa, consisting of Maharashtra, Goa, Karnataka, Andhra, Tamilnadu and Kerala, the total number of temples in worship will exceed 5 lakhs. Most of these temples are age old, built between 6th to 16th century. Perhaps temples in ruin, will be more than this in number. The upkeep of temples in worship and the renovation of temples in ruin are challenging tasks for our society. These efforts will have great social, economic and technological impacts.

2. IMPORTANCE OF TEMPLE CONSERVATION OR RENOVATION

The importance of temple arises out of their socio-religious roles in a traditional society. Although the traditional society is fast changing into a modern global association, temples continue to be the focal points where people come together to participate in socio-cultural functions and festivities. The religious importance of temples similarly continue to be a strong force attracting devotees to them in a pan Indian scale for darsan, rituals and penances. The temples in worship thus continue to be living entities. The temples in ruins also continue to attract attention owing to their aesthetic appeal, sculptural wealth, epigraphical records, political importance etc. and often serve as major tourist attractions.

Temples were economic centres of traditional society, managing land and agricultural production on the one hand and promoting artisans, craftsmen, and artists on the other hand. They served as major employers of manpower. Even today this position has not been fully eroded. A scheme of regular maintenance and conservation of temples in worship and renovation of temple relics will serve to regenerate and revive arts, crafts and technology indigenous to this land. In addition to the temples such a renovation effort could be extended to ancillary facilities like temple tanks, lands, gosalas, chaultries, padhasalas, craft centres, theatres etc. These efforts will put to productive uses of temple tanks for water supply and irrigation, lands for the production of fruits and flowers, temple chaultries for accommodations of visitors, padhasalas for revival of Sanskrit studies, gosala for dairy development, craft workshop for temple craftsmen and theatres for temple performance. Such an effort can gather momentum for the development of the society at large.

3. CLASSIC THEORY FOR MAINTENANCE WORK

The building maintenance was explained by an analogous theory that the building has to he compared to a man. This analogous model of Bhavanapurusa, is attributed with the four stages of life, viz. childhood (balyam), adolescence (koumaram), youth (youvanam) and old age (vardhakyam) It is now well known that the first three stages normally covered only one fourth of the full life of a man,

and it is hypothesised that old age sets in gradually depilating the human body with gradual loss of faculties. According to geriatric medicine, the old age of a human being starts at the age of 30, but it can be prolonged technically upto 120 years. This same philosophy was applied to buildings constructed with strong and durable materials. The setting of deterioration (jara) of any structure could be delayed considerably, say 100 years, and then regular maintenance could keep it serviceable for another 300 years, making the life span of the best (uttama) building at least 400 years. Yet it may completely collapse, indicative of a fifth stage of life, viz. death (marana). The whole effort of silpins was to postpone this stage to its ultimate limit by best of design, construction and maintenance practices. A new dimension was added to this life cycle by evolving an approach of renovation (jirnodharana) whereby the Bhavanapurusa practically takes a rebirth in physical (adhibhoudika) and metaphysical (adhyathmika) sense, in form (rupa) and its expression (bhava).

3. AGAMIC PRESCRIPTIONS FOR JIRNODHARANA

The importance attached to this process of renovation is best illustrated by the fact that all Agamic texts contains one chapter (patala) exclusively on this topic (jirnodharana). Invariably this chapter is very brief, as it does not detail the practices of renovation. As renovation is as good as a rebirth one has to fall back on the main technical part for design details and construction techniques. In all Agamic texts this technical part is the 'Kriyapada' which follows the Jnanapada (dealing with knowledge of cosmology) and Yogapada (dealing with the relation of self with cosmic power) and which is followed by Karyapada (covering ritualistic practices). The Kriyapadas of different Agamic literature (Agama, Samhita, Tantra) give extensive and exhaustive details of technical importance such as location, planning and designing of buildings, materials selection, processing and assembly, finishing work like painting sculpture etc. which guide the craftsmen in the construction and/or reconstruction works. To put it in another way the renovation of a derelict structure was to be carried out using materials and techniques, to its original form This clearly is one of the cannons of the present day approach to Heritage Conservation also.

4. FACTORS WARRANTING RENOVATION

Indeed there were situations where, time alone was not the causative factor of building deterioration Agamic texts specially mention cyclone, fire, and action by waves and floods as the important natural forms of disasters and subtly imply human vandalism, wars and desecration as man made forms of disasters. Under the influence of man made disasters, monuments generally get discarded and consequently they are transformed as historic relies. Tragically it is such monuments that are described as "picturesque ruins" in tourist literature. The monuments, which are under the protection of Archaeological Survey of India, are mainly such types of structures. They are the vestiges of a bygone era, the fossils of cultural history to be preserved for posterity without further deterioration. The Archaeological Conservation activities have essentially this goal. The Conservation manual prepared by John Marshall the first Director General of Archaeological India in 1923 remain today as the Code of Practice for such Conservation works.

5. EMPHASIS ON RENOVATION AND NOT ON CONSERVATION

Treatises on Vastuvidya or Silpa do not cover the protection of relics from further decay as conservation at all. The discarded building is assumed as having extended to the stage of death. The emphasis in classical texts is on renovation of buildings damaged by natural disasters or the relocation of buildings submerged or destroyed by erosion under sea waves, floods etc. The Jirnodharana covers mainly

these cases. It is here that the texts prescribe that the renovated structures shall have the same prime dimensions and materials as those of the original buildings.

The prime dimensions of monuments are reckoned as perimeter or lateral dimension. In the case of a temple for example, the width as measured at paduka, jagati or uttara was referred to as the danda, the reference module. All elements of horizontal composition starting from the cella (garbhagrha) to the outermost boundary (prakara) was proportioned from this module. Hence, from the most fragmentary evidence it was possible to work out the entire reconstruction work. The Sthapatis knew this horizontal rhythm (talachanda). The plan also decided the vertical composition (urdwachanda) and the dimension of elements in that. The knowledge of materials and their assembly was zealously guarded by the hereditary silpins. Hence renovation work became a routine affair in this context. It was almost a repetition of original construction.

6. MATERIALS FOR RENOVATION WORK

It will be interesting to know some of the guiding principles in the choice of materials for construction or renovation works. Stone for example was to be quarried from location where site slopes are auspicious. The bricks were to be marked and used in their natural position. The cementation material was lime mortar, specially made by grinding coral shell and sand with admixture of vegetable herbs and insect repellents. The laying of stones was to ensure minimum joint thickness by a process of sliding the blocks over plastic mortar to set them in position. Timber was to be selected based on strength, workability and durability, felled in the evening, seasoned by immersing in oil and worked with accuracy as marked by the master carpenter.

The joinery details were to be selected based on the nature of forces (compression, tension, bearing, flexure etc.) which the member will be subjected to. The framing system was such that it could be strengthened against buckling, distortion or deformation by ties and bracing. Above all the whole structure could be dismantled with ease and reassembled facilitating refinements to be carried out to the ultimate perfection. Consistent with the structural function, the mixing of old and new materials was permitted under compatible condition. Elaborate procedures were also prescribed for decorative treatment by painting, sculpturing, metal cladding etc. such that the renovated building presented the form of a creation or rebirth.

7. RENOVATION TO GRANDEUR

Although the general prescription in renovation was to stick on to the prime dimension and materials of the original structure, it is mentioned that the renovated structure could be built with more grandeur. This Agamic prescription has generated certain controversies among silpins and sthapatis. While many hereditary silpins hold the view that renovation is always to he adhered to the original size and materials, silpins of another school interpret that it is not the size, but the prime dimension such as the width of the shrine, the danda, which is to remain unchanged from the original structure. They argue that by increasing height to width ratio, the building of original prime dimension could be imparted grandeur. Texts specify categorisation of buildings based on five proportions of height to width for symbolic buildings, viz. Santika - peaceful (1.41), Poustika- prosperous (1.50), Jayada- successful (1.75), Adbhuda - wonderful (2.00) and Sarvakamika- all desired (2.25). Hence renovation to additional height adhering to the principles of vertical composition (urdhacchanda) appropriate to each category is a method of imparting grandeur without changing the prime dimension. This is attempted in some cases as in the renovation of Mahadeva temple at Chowallur in Kerala.

Indeed if the renovated temple could be taken to greater height, keeping the original dimension of 'danda', we are really varying its size. Correspondingly the loads imposed by the structure also varies and superior materials and techniques can be used in renovation. Here it appears that the prescription that the temples should be renovated to its original size, has to be interpreted as a prescription to carry out the renovation atleast to its original size. When partial modification and repairs are carried out to any structure, sticking to its original size and materials is necessarily advantageous. However when the structure is completely rebuilt, there need be no restriction regarding both. The general dictum that Vastuvidya shall be 'desochitam' and 'kalochitam' is to be followed in all renovation work. This justifies use of new materials (concrete, steel and composition) and new techniques (mechanical devices, tools and process) in renovation works.

8. RITUALS IN RENOVATION WORKS

Renovation work of religious buildings present problems related to the continuance of rituals unaffected by the work. Three aspects are involved in such cases.

1. If there are major damages to the deity, which demands repairs, metallic covering or replacement of the icon, there are tantric procedures to be followed. The procedures involve

   Transfer of the energies of the deity to another make shift shrine idol (Balabimba) or sacred pots (Kalasa)

   Disposing the original icon by burning, depositing in water or melting in the case of timber stone or metallic icons respectively

   Making new icons and installing it with proper rites, and

   Transferring back the energies to the installed deity.

Generally these functions are independent of civil works connected with conservation.

2. If there is no major damage to the deity and if the renovation work can be carried out within a period of one year, the renovation work is executed with "Sankoca" rites. In this process after each worship, the energies of the main deity as well as the secondary deities in the temple complex are 'shrunk' into the shrine room, with proper rituals. Work is carried out considering the shrine as a closed box, unaffected by what takes place outside. Here there is no major dislocation of facilities. Just prior to the next worship sprinkling holy waters (punyaham) sanctifies the premises and rituals dilate the powers of deities.

3. When there are major damages to the structure which cannot be expected to be finished in a year, or under conditions where the sanctum or deity itself needs renovation, the work is carried with 'Nishkramana' rites. Here an alternate makeshift shrine (balalaya) is constructed and the whole energies are transferred there in. All rituals are carried out in this small shrine' till the original structure is renovated. The work gets completed with the consecration of shrine with elaborate purificatory rites (kumbhabhiseka) as well as reinstallation (punapratistha).

9. CONSERVATION STRATEGIES

Each society has to evolve its own norms and policies for heritage conservation. The classical approach of conservation movement as maintaining a historic vestige as a fossil of a bygone era is valid only in cases where the present society has no cultural affinity to these ruins/monuments. In India, this rule cannot be applied in the case of innumerable monuments reduced to the present state by natural and

human interventions, political and religious aggressions and socio-cultural changes all beyond the control of people at large. In such a scenario the International charter that incorporate within the scope of conservation activities such as renovation, adaptation and relocation becomes quite meaningful and relevant in Indian Culture. The controversy regarding conservation verses renovation had figured significantly in the case of Somanath Temple in Gujarat. This shrine which had a hoary past was looted destroyed and desecrated a number of times and remained a pile of ruins since the 14th century. The socio religious importance of this shrine however remained alive and the scheme of renovation was evolved iii the middle years of this century under the inspiring guidance of Sri. K.M. Munshi while the ASI stood strongly for conservation of the historic ruins, the socio political will was for renovation and consequently from the ruins arose the new shrine. The dormant state of the ruins was just one stage (death) of its life cycle, and it got regenerated as if it had kept the genetic code of life within its fragmentary tissues. The case of Somanath demonstrates that in India no ruin can be treated as dead fossil, unrelated to socio cultural values of the society.

10. RELEVANCE OF CONSERVATION STUDIES IN INDIA

India has innumerable monuments of the past era. Of these only around 5000 monuments have been brought under the domain of the ASI. The need today is to start a massive effort to locate and document monuments and artifacts of heritage value specially using techniques such as remote sensing and GIS, evaluate them for appropriate conservation strategies using criteria relevant to the relic and initiate steps for conservation, renovation, adaptation or translocation as the case may be in a phased manner. Apart from serving as valuable tourist attraction' they will remain as the milestones of Indian history.

A large number of historical monuments could be protected from further deterioration by using conservation strategies. A large number of palaces, forts etc. could be adopted for new uses like hotels or museums. However a much larger number of relics, mostly of religious importance, adored and cherished by the people are to be renovated to their original form as places of worship. What will be the financial outlay for such a mammoth effort? The cost of construction or renovation of the temple has two components - the structural costs and decorative costs. Both are equally important for temple structures. However combining the two as in traditional techniques, will increase the time duration of construction. Hence the approach shall be to separate the two aspects. The structural work shall be carried out using modern materials like concrete and steel and adopting design techniques ensuring strength, durability and serviceability under most adverse conditions like earth quakes. The decoration work of sculpture, painting, embellishments etc. shall be done using traditional methods. This will help to optimise the cost and time of construction. The traditional crafts and modern engineering can be synthesised in this process. The college of temple architecture at Mahabalipuram has adopted this approach and structural design and construction has been well integrated in the syllabus.

The conservation effort will provide impetus to the upgradation of technical skills and create jobs for traditional and modern craftsmen. Above all it will be an inquiry into our own culture and value systems, shrouded in the present day globalisation mist.

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RENNOVATION OF KALPATHY TEMPLE, AT PALAKKAD, KERALA STATE - A CASE STUDY

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Introduction.

The Visalakshee sametha Viswanatha Swamy Temple is situated in Kalpathy at the southern bank of River Nila in Palakkad. The Temple structures are constructed in Kerala styles. As this area is very close to Tamilnadu and people follow Tamil culture, the car procession is a special feature of yearly festival of this temple.

History of Kalpathy Temple.

The Visalakshee sametha Viswanatha Swamy Temple appears to have been constructed during 1420 – 1425 A.D. as seen engraved on a stone pillar near to the Flag post. The Brahmins residing in Kalpathy Agraharam were very rich in Vedas and Aagamas and were patronized by the Palakkat Raja Ittikkombi Achan who had under taken the temple building. In the last century, major repair was took place in 1956 and then minor repairs in 1981 and then the Kumbhabhishekam was performed. Unlike Tamilnadu instead of stones, in Kerala, roofing members are made of jack wood and the Jeernodharanam is essentially done when the timber members deteriorate.

Positions of the Shrines.

The Main shrine of Viswanatha is facing east. A Dakshinamoorthy shrine also was attached with the main shrine. The Ambal shrine facing south is at the N E corner of the Main shrine. It has an attached cell called Sayana Ara. In between the Visalakshi shrine and the Sayana Ara a small cell giving access to an underground passage is located. Ganesa shrine faces east on south of the main shrine. There are many other sub shrines inside and outside the chuttambalam.

Programming of renovation.

The Committee approached Vastuvidyapratisthanam, Calicut to prepare a total scheme for temple renovation. Accordingly we have documented the existing temple structures and carried out detailed measurements and photos. Based on the survey, a few observations were arrived at as follows.

1. The attached cell to the Visalakshy shrine (Sayana Ara) was to be restored to its original use.
2. The Ganesa shrine at south west had axial tilt which required rebuilding.
3. Shrines were installed at various periods without proper planning. This has to be brought under an ordered scheme of priorities.
4. The dimension of temple structure and yard are to be corrected as per Vastu rules.
5. Narrow passages, inconvenient working spaces and obstructions was to be corrected, emphasizing the grandeur of the main shrine, within the canons of Agamas.

After having discussions with the committee, a detailed Project Report for the Punarudharanam was submitted by the Vastuvidyapratisthanam.

Main shrine Lord Viswanatha was to be rebuilt as a Tritala shrine so as to project its superior position. A Dwitala shrine for Ambal, separate Sayana Ara, and a new Ganesa shrine are to be built. Obstructions in front of the Dakshinamurthy are to be removed. Sub shrines of Kalabhairava, Chandikeswara, Gangadhara & Saravanabhava and a Navagraha temple were to be located in modified positions of the Chuttambalam structure. Aagamapadasala, Dharmasala, Recital space, Agrasabha, Repairing of Dwajam, and New Nagathara also were suggested outside the Chuttambalam.

Implementation

Vastuvidyapratisthnam provided structural designs, detailed specifications, estimates, working drawings etc.. Apart from the traditional materials many types of new age materials also were made use of for the reconstruction. Kumbabhishekam of the completed shrine was conducted in May – 2008 with the grace of Lord Viswanatha and Visalakshy Ambal. More details can be obtained from the **“Sthapati”** the journal of Vastuvidyapratisthanam, special issue on Kalpathy Temple Renovation.

OHM NAMAH SHIVAYA - OHM BHAGAVATHYE NAMAH

STATURE OF KUTTAMPALAMS AMONG PANCHAPRASADAS

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1. INTRODUCTION

Kuttampalams, the temple theatres of Kerala, are structures for ritualistic performance of discourses (*kuttu*) and drama (*kutiyattam*) in temple complexes. These building embody the perfection in space design, excellence in construction technology, and knowledge in aesthetics, acoustics, lighting and climatic modulation. In this paper, stature of *kuttampalam* structures among the *panchaprasadas* is analyzed with reference to the planning and architectural aspects of the structure.

2 PANCA PRASADAS

'P*rasada'* denotes settling down (*prasad*), that which has settled down and acquired concrete form , the form of dwelling, a residence and the seat of God.[1] Literally the word '*prasada'* means a place where one becomes pleased.[2] The word is generally used to describe a temple structure where people gets relieved of their sorrows and attains happiness. In temple architecture, five holy seats of God, within the complex are called *'panchaprasadas'*. These are (i) s*reel*

garbha griha, (ii) *mukha-mandapa*, the front pavilion where ritualistic offering is made, (iii*) titappalli*, the *pakasala* where the offerings to the deity *(nivedya*) are prepared, (iv) *balikkal-pura*, the hall of the primordial altar stone and (v) k*uttampalam*, a venue where the ritualistic dances which are considered as sacred as *vedic* sacrifices (*yajnha*) are performed. Scholars[1,3] attribute these sacred structures as symbolic representation of God's many attributes.

The positioning of the *pancaprasadas* in different *prakaras* and their attributes can be visualized as given in Table-1.

Table-1 : The Location and Kosa category of Pancaprasadas

Sl No.	**Prasada**	**Location**	**Kosa**
1	Sreekovil	Within 1st prakara- Inner balivrutta.	Anandamaya
2	Mukha mandapam	Between 1st and 2nd prakaras- (Inner balivrutta and Antahara)	Vijnjanamaya
3	Titappalli	Between 2nd and 3rd prakaras (Antahara and Madhyahara)	Manomaya
4	Balikkal-pura	Between 3rd and 4th prakaras (Madhyahara and Bahyahara)	Pranamaya
5	Kuttampalam	Between 4th and 5th prakaras (Bahyahara and Maryada)	Annamaya

Of these, the first *prasada* viz. *sreekovil(vimana)* is the adobe of the presiding deity. It occupies the central core of the temple and is regarded as in a*nandamayakosa.*

Herein are performed highly systematized and canonized rituals evoking the presence of almighty.

Mukhamandapa, the second *prasada* is positioned in front of the sreekovil facing it and is the place for prostration, chanting of vedic hymns, and offering k*alasa puja* by the priests. This is an open and raised pavilion where the presence of deity is implied by its sacredness with prohibition of prostration by devotees (as at Rajarajeswara temple, Talipparambu) and keeping divine weapon at day time (as in Matayi temple). In Siva temples an idol of Nandi is installed in this *prasada* facing the deity. As a unique case, this pavilion serves as stage where *cakyarkuttu* for the deity as in Trippayar Sreerama temple.

Titappalli is the kitchen for preparing food to be offered to God at the sanctum sanctorum. It occupies the south-east side (*agnikon*) within the *cuttampalam*. Only priests are allowed within this *prasada*.

Balikkal-pura is located along the major axis of the temple in front of the *sreekovil* but outside the inner cloister called *cuttampalam*. It generally forms the entry porch of the *agramandapa.* The large altar stone, *balikkal* is taken as a replica of the *sreekovil* in an abstract form. It is the symbol of the primordial worship of offerings on an elevated platform.

Kuttampalam, the fifth *prasada* is located in the outermost area in the temple precincts. Its position is to the right of the axis of the temple in the front side. It is an independent structure with well defined spaces for performance, make up, waiting and accompaniment at one end and space for spectators at the c

oriented such that the performing artist faces the presiding deity of the temple. The performance inside a *kuttampalam* is regarded as an offering to the deity. It is similar to the *sabhamandapam* of Tamilnadu temples. But, stylistically it has evolved as a theatre with make-up room, side rooms and space for accompanying performers.

3 KUTTAMPALAM- GENERAL DESCRIPTION

Kuttampalam is a well constructed hall-like structure rich with timber elements. The stage of this theatre hall is a wooden pavilion, with or without a structural ceiling. The pavilion has turned and lacquered pillars. Behind the stage, a green room enclosure is provided with two doors to the stage through which the actors can enter and exit, the stage structure is open on the other three sides. The stage is regarded as sacred place owing to the ritualistic importance of the performance. Hence, it is not used for any other purpose and only the hereditary artists are allowed to step into it. The hall proper has elaborate structural roof supported with pillars arranged in two annular array of columns. The whole structure is erected on an elevated platform with independent entries to the hall and backstage.

4 ARCHITECHTURAL PATTERN:

The temple theatre structure is an architectural creation with elegant structural frame work. It caters to various needs of function, serviceability and durability. A theatre structure shall essentially be an enclosure to house spaces for (i) performance, (ii) preparation for performance, (iii) accommodating accompanying artists and musical instruments, (iv)seating audience and (v) passage. The arrangement of these spaces will vary for different art forms depending on th

peculiarities. It appears that the designers of *kuttampalam* who were well aware of the spatial patterns of classical theatres managed to incorporate the essence of these patterns in this structure. Consequently, spatial planning of a *kuttampalam* closely resembles the typical features of a modern arena stage concept.

Fig-1 shows the typical layout of *kuttampalam*. The structure is a place of assembly for enjoying artistic performance. Hence, aesthetics considerations become relevant. Sonic and visual quality of performance shall be flawless. As it is within the temple premises, the sanctity is to be maintained there by calling for the decorative embellishments at par with those in the other components of the temple complex. The structure of *kuttampalam* as a whole follows the general pattern of construction of temple structures of Kerala. The essential features are simplicity of shape and efficient proportioning. The *adhishthana* structure(plinth), its mode of construction vertical division and pattern of subdivisions etc., follows the same pattern of temple sanctum itself . The dimensioning is done in such a way that the perimeter is that required as per the rules of *pratiyoni* for a structure facing the deity of the temple.

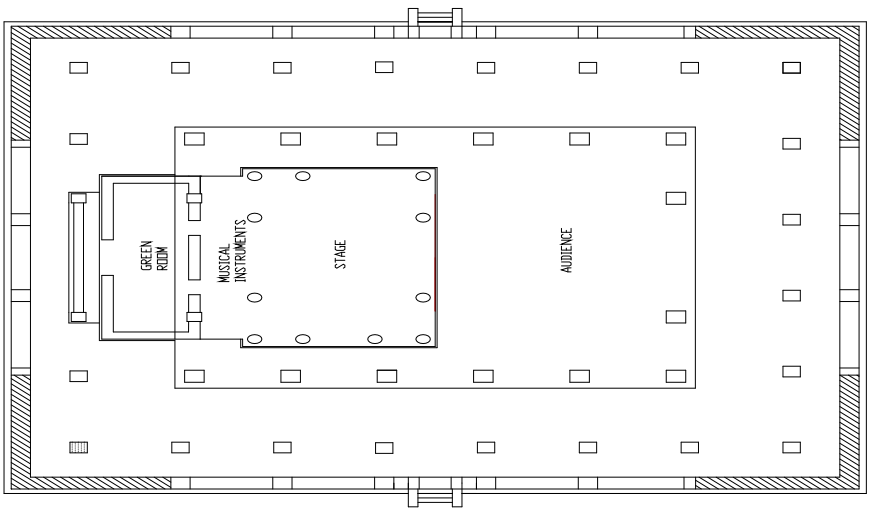

FIG-1: TYPICAL LAYOUT OF KUTTAMPALAM

5 STRUCTURAL LAYOUT:

The earliest forms of free standing structures, described in *vastuvidya* are (i) *samcitam* (wall bearing), (ii) *asamcitam* (framed) and (iii) *upasamcitam* (mixed of both above). The structural form adopted for *kuttampalam* belong to the third category with a skillful blending of both framed and wall bearing structural pattern which encompasses the requirements of strength, durability and serviceability (function) in an effective way. Being an element of the temple complex, *kuttampalams* are to last eternally. Hence, they are to be constructed with the strong and durable construction materials with precise measurements.

The major elements of this structure are: (i) *Adhishthana*(plinth), (ii) pillars, (iii) roof frame, a rich work in timber, (iv) roofing either tiled or metallic sheeted, (v) enclosing walls with L-shaped construction at corners and trellis walls in timber with rectangular or square openings and strengthened with stone or timber columns in between at convenient intervals. The *adhisthana* is the element that elevates the monument from ground level. It lends uniqueness and grandeur to the structure. Often it has socle (*upapeetham).* The socle and the base have the moulding stipulated in texts to give horizontal emphasis. The pillars are of stone or timber. The stone pillars are with rectangular or square cross section, in general. The timber pillars have square, rectangular or circular section with simple ornamental carving works. The roof frame of the *kuttampalam* is a dominating element with a ridge having three finials at top and running down to eaves at an angle of 45°. The eaves are kept low to almost half the height of end pillars with edge flattening to allow smooth flash of the rain water.

The closed form of the building provides the volume for creating sonority and reverberation in the theatre.

6. AESTHETICS OF THE CREATION

Kuttampalam structure follows the model of a semi-closed hall *(sabha)* with a stage (*rangam*). Its layout and proportions are characteristically meant for small audience seated in front of a stage. The stage portion is divided into three spaces-the area for performance (a*bhinayasthanam)*, the space for placing the m*izhavu (*m*ridangapadam)* and the green room (n*epathyam)*. The position of the performer's (*Cakyar's*) feet was to be at the same level ;

feet were placed in the *Srikovil.* A *Kuttampalam* is so built that the performance can be viewed and heard very clearly from space within. The dimensions are proportioned following the rules given in *silparatnam* and *tantrasamuccayam-slpabhagam.* Practically one half of the hall is taken by the stage component. The performer reaches out to the audience, seated in the other half of the hall at a lower level.

The creation, though simple in pattern, is rich with ornamentation at judiciously selected areas with ample scope for interpretation based on philosophic and mythical symbolism. The stage pavilion stands on turned and lacquered pillars. The ornamentation of the pillar ranges from simple to elaborate details (fig-2). The ceiling of the stage is abundant with rich ornamentation by means of sharp carvings in timber. The ceilings are divided

Fig-2 : Stage Pillars at Muzhikkulam and Tiruvegappura Kuttampalams

into nine segments (*navakhandha*). These may be filled with icons of *ashtadikpalakas* with *Brahma* at centre or with simple carving of lotus flower. These may be either finished in clear polish or coloured in lacquer paints (fig-3).

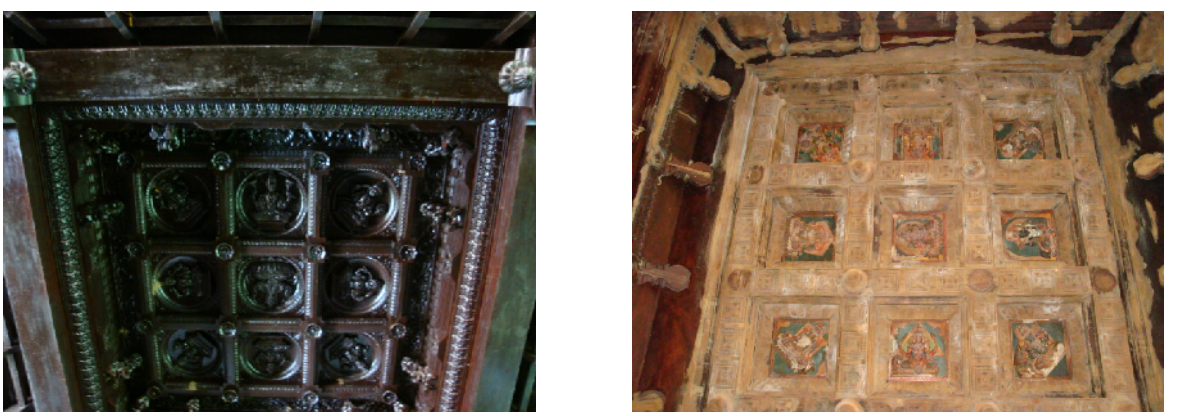

Fig-3 : Ceiling of Stage at Muzhikkulam andTiruvegappura Kuttampalams

The structural elements such as columns, beams, rafters, collars, collar pins, eve boards struts and the joints of these elements are given simple decorative patterns. The ornamental sculptures are integrated with structural need of each element.

7 GENESIS AND EVOLUTION:

All socio-cultural institutions are subject to evolutionary changes over time. The art forms of *kutiyattam* and *kuttu* are no exception to this general trait. They have attained the present form over years with reforms, decadence and revivals. Kerala had a peaceful past, which allowed stabilization of cultural movements. Consequently, the performing arts which originated in folk-culture and flourished in rural society, evolved to suit the urban situations.

Kutiyattam is a total theatre- all genres of word (spoken or written), movement (macro and micro, abstract or imperative), costume, make-up and design are woven together to constitute one integrated whole.[4] Scholars propound different theories on the origin and evolution of the Sanskrit theatre of *kutiyattam.*. The theories are of three streams.

1. Genesis of the ritualistic art form from folk origin and continuous modification for sophistication, through centuries and standardization in the 10th century.[5]
2. Genesis of composition and function of theatre from vedic *sabha* where the king conducted administrative deliberations. [6]
3. Adoption of the prescriptions for *prekshagrha* by Sage Bharata in Natyasastra with appropriate changes in construction practices.

A trans-cultural analysis of the performing arts in India shows that places of performance for theatrical arts, both religious and secular, need not be in enclosed buildings. Theatrical art forms are being performed throughout India even without a specific place demarcated for it. The *'Ramleela'* of North India, the *'Jathra'* performance of eastern areas of India, the *'Natangi'* in western region and *teru kuttu* of Tamilnadu etc., can be cited as typical examples for it. Kerala is also rich with such traditions. In folk festivals of Kerala like *kaliyattam(or theyyam* performance) the entire village becomes the arena of performance which converges towards the end to the village temple yard.

Parallel to these streams it is worth mentioning that performance of art forms within the precincts of temples and allocation of special enc

common in temples all over India. The *Nat mandir* in Jagnath temple of Orissa and *Nritta sabha* in Siva temple at Cidambaram temple-, etc. are supreme examples of this. The *nat mandir* is a prime building facing *sreemandir* on the main temple axis ornate with rich sculptures. The *nritta sabha* at Cidambaram is a graceful *mandapam* of exquisite style, supported on 56 richly carved pillars. [8] The dance of Nataraja is representative of the *pancakrityas*(five duties) of the Lord viz. *srushti* (creation), *sthiti* (preservation), *samhara* (destruction), *tirobhava* (veiling) and *anugraha* (grace). [9] It can be seen that k*uttampalam* erected in the outer shell of the temple is a space for the fifth *kritya* of Lord, that of release, salvation and grace. The meaningful education is imparted directly in *kuttu* and by the articulations made by the *vidushaka* in *kutiyattam*.

A close look at the space utilization arrangement and general allocation of activity areas in *kuttampalam* will reveal that it is not planned strictly following the rules of *natyamandapavidhi* (second chapter of *Natyasastra*) of sage Bharata. The tradition of performing *kuttu* in *valiyampalam* is suggestive of an evolutionary development of the space for this philosophical education. The plan arrangement basically bears resemblance to a *sabha* with a *rangamandapa* at one end described in *vedic* literature where the *'suta'* expounds the puranic lores during the intervals in *yajnas*. The memory of this is still retained in Kottiyur temple festival where there is a temporary shed in which *kuttu* is performed for devotion. Bharata's stipulations would have served as guidelines in formulating the structure with green room etc.

The stature of *kuttampalam* as a divine edifice and one among the five *prasadas* of a temple body arises out of this concept.

7.0 CONCLUSION.

Temples, though regarded and conceived primarily as places of worship are having multi-faceted functions at social , economic, and technological levels. Temples are also cultural centres where education for understanding the philosophy and value system elevating man to higher realm of existence. The design and construction of temple complexes incorporate spaces for such diverse needs viz., for development and enlightenment. These two aspects were given equal importance as the two wings of a bird. Any conservation activity related to temples shall consider these diverse needs in their proper perspective and insight.

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Sthapati: Astanga-Sthapatya that is eight-fold engineering technology.

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Stha is an Indo-European verbal stem meaning 'to stay'. In Sanskrit and derivative Indian languages as well as Latin and its derivative European languages there are several derivations of the verbal stem: Stha in common parlance, such as sthana, sthiti, sthairya, sthanu etc. and state, stability, static etc. All these are common derivatives of common verbal stem,are spread over entire globe.

Stha-pati is the master of stha i.e. e-sta-blishment or foundation. His mission or function is Sthapatya, the derivative abstract noun of Sthapati. Raja Bhoja grasped the basic import of these two terms, in the context of the traditional architectural engineering and allotted one chapter each respectively(48&49) to these two thematic units. The topic of the qualifications, merits-demerits and the rewards and punishment on state-notice is comprehensively treated in standard Silpa-treatises. However, Bhoja has meaningfully employed the term: Astanga-Sthapatya, on the analogy of Astanga-yoga and Astanga-Ayurveda, suggesting eight in-built components. Those components are well known as: Yama-niyama etc. and Sutra, Sarira,Nidana etc. respectively. Bhoja has encompassed Sthapatya under thematic components:

1. Vastu-pumso vikalpana i.e. digrammatisation of anatomical sketching of Vastu-purusa technically termed as: Vastu-Mandala. This is, in architectural engineering, called master-site-plan. In other words, is the pioneer-plan of all global site-plans and the site-plan for colonizing the entire global surface, prepared by Visva-karma and executed by his four sons: Jaya, Vijaya, Siddhartha and Aparajita, sharing colonization of eastern-southern-western &northern sectors. Before this global engineering feat was undertaken by the cosmic architect: Visvakarmaa and master-planner of Indra’s capital -city: Amaravati, Medini, the uneven earth was flattened(prathita) by the first human king and flattener of Medini who was converted into flattened earth(Prthvi).After

the global colonization phase, Prthu allotted shelters to his subjects shelters and assigned them vocational jobs in the earliest rural and urban settlements. Historically, it can be said that the graph of indigenous science and technology showed horizontal and vertical growth from mythological king Prthu to historical king Bhoja. This master-plan has been used by Bhoja to compare architectural and structural engineering notes on the basis of modular infra-structure of township.

2. Pura-nivesa i.e. town-erection. Town-plan, in Bhoja's conception, encompasses palace-complex, surrounding civic residential colonies, temple-complexes, sacrificial fire-pits and pendals and the town-flag named Indra-dhvaja, i.e. four components.

3. Palace-complex. This component houses royal mansion and the mansions royal family-members as well as state-officials: both civil and military. Palace-complex is one sub-set of the aforesaid town-settlement.

4 Town-flag: Indra-dhvaja, located exactly in the central zone of the township. In the Vastu-Mandala-paradigm, Indra-dhvaja occupies the central grid: Brahma-pada.

4. Residential civic colony is the next component. As per medieval social convention, the civic colonization is based on Varna-based pattern. Accordingly, cardinal zones are allotted to Brahmana, Ksatriya, Vaisya & Sudra. Bhoja has planned the residential houses on the cameral pattern: unicameral, bi-cameral, tri-cameral& quadric-cameral i.e. Eka-shala, Dvi-sala, Trisala and Catuh-sala. Bhoja's innovative genius has reached its pinnacle in creating an album of over thirteen lakh plans, by using arithmetic permutations and combinations, and thereby augmenting the numbers by squaring those.

5. Prasada, i.e. Deva-prasada meaning temples. The author has given over three hundred and fifty temple-patterns and four temple-styles: Dravida, Nagara etc.

7. Koti-homa suggesting religious architecture specializing in YAJNA-KUNDAS.
8. Sibira and Durga-vidhana i.e. military-engineering specializing in army camp-erection and building forts. Somehow, Bhoja has summed up aforesaid 7th and 8th topics in small number of verses in the chapter named Astanga-Sthapatya.

Sthapati-laksana i.e. the characteristic qualities of the professional architectural engineer include multi-disciplinary knowledge and twofold professional experience, besides theory and practice Bhoja terms it as: Bhasita-rupita i.e. oral instructions from the teacher and professional job-observations. The norms and professional conventions set by Bhoja are mostly relevant even today. For example, he equates the Sthapati well-versed in theory alone to a lame person always dependent on someone else for activity. Likewise, he equates the Sthapati, expert in practice alone, to a blind person; since, he lacks professional vision to execute the job, efficiently. Having given this eternal truth , he turns to king's duty to punish half-equipped Sthapati with capital punishment .The reason given by Bhoja is that such a person wanders on the earth, like living death for people. This is experienced by us today, when we read daily news of death of several people under collapsing buildings and bridges being built by unqualified engineers. Bhoja gives the positive contribution of Sthapati, in as much as they are the builders of constructions of various types, covered in eightfold engineering technology.

Bhoja has used novel technique in compiling his magnum opeus: Samarangana-Sutradhara by tracing the origin of engineering technology to the earliest phase of geology, when human engineers invoked Vishvakarma for providing shelter to people. Vishvakarma responded to the first king of humanity: Pruthu by undertaking the global colonization. His novel technique lies in the queries put forth by Vishvakarma's eldest son: Jaya whose questionnaire indirectly prepared model syllabus for engineering degree-course. To answer his queries Bhoja, in the guise of Vishvakarma composed eighty chapters (4-83). Because of the third chapter: Prashnadhyaya , Samarangana-Sutradhara deserves the title : Jaya-Pruchha. Jaya's querries were supplemented by the queries of his younger brothers: Vijaya and Siddhartha in the form of Vijaya-Pruchha and Siddhartha-Pruchha. There

queries were supplemented by exhaustive and comprehensive questionnaire by Aparajita, the youngest son. His queries culminated in a bigger treatise by Bhuvanadevacharya, composed after 150 years .From the point of view of the growth of engineering technology, right from Pruthu's time, it can be said that the four Pruchhas assigned to four sons of Vishvakarma together serves as ready reference in the form of medieval encyclopedia comprising four volumes. It is to be noted that the graph of growth of engineering technology was forced to have down-slope due to Muslim invasion.

The perfection of Sthapatya: Vijnana and Tantrajnana bloomed into Ashtanga-sthapatya like Ashtangayoga. Bhoja has given a specific order for these components. However, his allotment of chapters is as per convenience of thematic needs. He has given exhaustive treatment to town-planning and town-settlement. Pura-nivesha happens to be the second component of Sthapatya. He has given intensive and extensive treatment for a township equipped with seventeen roads: major and minor: Rajamarga, Maharathya, Uparathya , Yanamarga etc. A township, as per Bhoja is provided by rampart surrounded by a water trench. Bhoja employs his engineering skill digging a trench and using the dugout material for construction of the rampart. The trench served as protection for the city from enemy attack. The mud which was dug out from the trench served as fencing barrage for overflow of water. Bhoja's engineers used the surplus clay and water to develop an entertainment park where various groves, bowers and flower-plants were grown.

Bhoja's capital city: Rajadhani included palace complex,civic colonies as well as vocational settlements. Bhoja planned the colonies in such a way that all the houses built on four cardinal zones were facing the central plot covering Brahmasthana and hosting Indradhvaja: the town-flag. The town-flag, palace-complex and civic colonies comprised three components of Sthapatya. Those are three sub-sets of the mega-set: Pura-nivesha . One more component which is getting extensive treatment by the author is Prasads-nivesha, i.e. temple-architecture. Bhoja has allotted four chapters for giving divine origin and genealogy of shrines of gods built on earth and allied topics of structural composition of temple –doors etc. (chs 50-53) . Thereafter he has given structural details: horizontal and vertical for culminating into various

temple-patterns numbering over 350 and having individual names. The chapters are also named after patterns: Mervadi-vimshika, Shreedharadi-pancashat etc. (54-60). Bhoja has also taken survey of temple-styles: Dravida, Nagara, and Bhumija (chs 61-65). Bhoja has allotted fourteen chapters for iconography, painting etc. However, he has not given any specific place for it in Ashtanga-scheme.

The proportion of space occupied by different components is glaringly unequal. Indradhvaja extends over two chapters , town-plan one chapter , residential houses six chapters , palace complex , king's personal mansion, mansions of royal officials and horse-stable and elephant-shed together five chapters and temple-patterns and styles sixteen chapters. The seventh and eighth components describing sacrificial fire-pit military encampment and military fort together occupy less than half chapter allotted to Ashtanga-sthapatya. The first and the foremost component is the designing of Vastu-mandala wherein anatomical sketch of Vastu-purusa is super-imposed on geometrical grids of Vastu-mandala. That plan is the master-plan. It serves as a term of reference for tallying the structural composition of all structures spread over all components of Sthaptya. Bhoja's encyclopedic treatise contains several original contributions in civil, mechanical, religious and military engineering ventures.

The use of mercury in aeronautics is being taken note of by foreign research scholars through 2011 Jan. Bhoja's residential architecture and temple-architecture have been topics of monograph writing by foreign authors till today. Pruthu being a legendary king, no monumentary evidence in relic form is available for comparing notes. However, Bhoja's case is unique. The dam built by him, a millennium back is providing drinking water to millions of people and irrigating several thousand acres of land through one thousand years. His capital city: Dhar in Madhya Pradesh is available for comparing notes on select Sthaptya components. The town-plan for his proposed capital city: Bhojpur under archaeological survey alongwith half-finished Shivamandir is also available for comparing notes and the themes: temple-text correlation and township-text-correlation have rich research potential for doctoral degrees.

To sum up, it can be said that the unique theme of Bhoja: Ashtanga-sthapatya is worth paying attention by both engineers and Indologists.

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Vijayanagara Sculptural Art Some New Concepts and Features, A Note.

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As is well known, the most remarkable achievement of the South Indian Hindu art of the Vijayanagara period (1336- 1556) is spectacularly displayed in Hampi, the capital city of the empire. It is undoubtedly a reflection of the major traditions coming down over centuries so grand and brilliant. But it is just not a continuation. The contemporary religious systems of the neighbouring regions gaining prominence as well as the popular beliefs and practices had their tremendous share in the cultural matrix of the period. Consequently, there were new conceptual-developments and features especially in sculptural art of the period found in Hampi and the surrounding regions. But these scarcely attract the attention of even scholars let alone itinerant, art lover and general visitor. I happened to notice some curiously interesting sculptures of the traditional religious sects here and there the types of which are not encountered in the domain of the sculptural art of the preceding periods. These indicate that there may be many more for which intensive and extensive explorations will have to be conducted. Meanwhile it is necessary to account for the appearance of the new forms and for the introduction of new elements in the existing traditional sculptural forms for a proper understanding of the meaning and significance of such forms and appreciation of the Vijayanagara sculptural art. Here therefore just a preliminary attempt is made to

highlight a few of such sculptures in Hampi and the neighbouring regions to draw the attention of scholars in particular for further investigations of such art forms on a large scale. Occasionally, I have discussed previously a few of them [1974 & 1978] elsewhere. In this context it must be noted that in the Vijayanagara art popular folk art forms mundane and cultic also gained a distinct place on a large scale. Whether these had influenced the traditional art is also a matter of further investigation. But Two important factors, inspiring and emotional, were obviously underlying the new trends in the art of the period in the area are : I] the long and sustaining tradition that the place is the 'Kishkindha' of the Ramayana [Sundara; 1995 : 34 - 38], the capital of the Vanara kingdom, on the one hand and ii] the sectarian religious trends gaining prominence, on

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by the other viz. a] Saivism as propounded by the ***Saiva puratanas*** from the deep south ; ii] Srivaishnavism already well established from the period of Hoysala Vishnuvardhana [1103 - 1142 A .D.] from about 1119; and iii] the ***'Madhva sampradaya'*** owing to Sri Vyasaraya, a great saint and profound exponent of the sect and indirect propagation by two of his devotees Sri Kanakadasa and; especially Purandaradasa. What is particularly noteworthy in all these is the striking insistence on *bhakti marga*, easy to follow by any high or low, rich or poor, ignorant or wise to obtain the grace of God, by the Puratanas, the Alvaras and the Dasas. Consequently, the cults of Hanuman, Virabhadra, Ganesha, 63 Puratanas the Saiva saints ; Sri Ranganatha, Vitthala, 12 Alvaras, the Vaishnava saints ; Bharati Ramana Mukhyaprana, Pancha Mukhi Anjaneya ; hardly or less in practice in the preceding periods gained distinct prominence. Relatively, sculptures of these cults and traditions displaying new forms

and developments in their iconographic traits appear for the first time enriching the sculptural art of South India.

Some of the sculptures considered here are: ashtabhuja Ganesha with Sakti from Anegondi, Virabhadra from Salgunda [brought to light by Sharanabasappa Kolkar], Dashavatara panel in Hampi, Vishnu with Lakshmi in the vakshasthala in Kanakagiri, Stambha Narasirnha from Araga, Hale Nagara, Kuravadagadde, Gopalakrishna from Anegondi, Panchamukhi Anjaneya from Hale Nagara, Bharati Ramana Mukhya Prana from Bennur, another form of the same deity from Hire Jantakal and Ramadurga. Sri. Ramanujacharya and the nine Alvaras from Anegondi.

During the period foundation of independent temples dedicated to Ganesha, Virabhadra and Hanuman is a distinctive development. It is in the late Silpagama texts such as ***Kriyakramadhyoti, Mantramaharnva*** or ***Vignesvara Pratishthavidhi*** are the' dhynarmantras' for Sakti Ganesha, Uchchhishta Ganapati, Urdhva Ganapati and of other forms. Worship of Ganesha in these forms would bestow unlimited material prosperity and success upon the devotees, it is exhorted. The growing success and enormous wealth of the Vijayanagra period would explain the congenial and inspiring context for the popularity of such cults that were in the background.

It is too well known that during the Sangama period, there is obviously an upsurge of Virasaivism that was apparently dormant for some time before. Relatively, worship of Virabhadra probably from the Andhra region gains prominence. Further, the Kalamukha Saivas of the preceding periods were the worshippers of Sakti with Virabhadra as kshetrapala. Among those who in course of time embraced Virasaivism, the worship of Virabhadra probably continued as it is found to be appropriate to the

Saiva tradition prevalent among the Virasaivas. The god created by Siva, the Supreme, humiliated and mortified the arrogant and haughty Daksha of the Vedic tradition despising Siva. It is this aspect of Virabhadra that is usually represented in Virabhadra images with goat-headed Daksha by his side during the period under review. The temple of *'uddane'* Virabhadra with the colossal image of the god, is too well known. And there are many independent temples got built during the period as e.g. the Virabhadra temple in Chik-Rampur about 3 or 4 km. northwest of Anegondi. It is interesting to note that in the sculptural form of Virabhadra from Salgunda, Gangavati taluk, Koppala district, some 30 or 40 km from Hampi a new element has been added: the god is depicted as wearing ***sivadara*** carrying the ***ishta linga*** casket the most distinctive feature of the Virasaiva sect unambiguously indicating the deep impact of Virasaivism on the traditional sculptural concepts. The image appears to be of late or post Vijayanagara period. Incidentally speaking, there is of course in Mulgund [Mundargi tk. Gadag dt] a temple enshrining a colossal image of the god of unusual form probably of late 10th cent.[Sundara ;1980 :1-2]. But this appears to be an exception.

The broken sculpture of Mahavishnu originally in one of the shrines of a pond of architectural merit, in Kanakagiri[Gangavati tk. Koppala dt.], later dislocated and broken is noteworthy for the depiction of a miniature figure of Lakshmi on the left part of Vishnu's chest. Though Mahavisnu is described as *Srivatsamka* over centuries in sculptures this characteristic feature is not highlighted. Probably the devotional songs of especially of Purandaradasa glorifying the greatness of Mahavishnu had a strong appeal to the masses and had considerable influence on the sculptural art. This religious atmosphere explains for the introduction of new distinct features in the traditional art forms.

There is another example of this kind. In a zone, mental moral and physical, surcharged with divine or spiritual power instinctive natural base behavior of human or animal will be subdued and refined into pure and noble love. This is indicated by depicting animals that are natural enemies to each other such as tiger-cow etc. side by side under the protection of God in the image of Giridhara Gopalakrishna of the temple in Agumbe. This would certainly indicate the tremendous impact of devotional *stotras* (songs) that were vigorously repeatedly composed emphasizing *bhakti marga* and total surrender to the Supreme and appealingly sung by great devotees such as Kanakadasa, Purandaradasa saints like Vijayadasa, Mahipati raya and others.

The Dashavatara panel of the period on a stone boulder in the open in Hampi and in the individual large wall sculptures of the Dashavatara forms of Vishnu, in a Siva temple in Bhimanakatte [Durvasapura, Tirthahalli tk, Shivamogga dt.], Vidyashankara temple in Sringeri and other places, almost invariably in the place of Buddha represented in *bhumisparshamudra* and in *siddhasana* in the preceding periods, an enlightened saint is depicted nude and in *samabhanga*, probably in accordance with the episode of the *Bauddhavatara* given in the ***Vishnu Purana*** [Gopinatha Rao; 1968 : vol. I, part 1]. It is difficult to identify the saint as Buddha as it is nude or Thirtharnkara. In Bhagavata Purana, in the place of Buddha is Balarama which is generally followed especially by the Srivaishnavas. But in one of the songs of Purandarasa is a reference to the nude saint obviously based on the episode from the ***Vishnu Purana***. Whether this new trend is due to the powerful influence of especially the *Dvaita* school of thought needs to be investigated, This is a distinctive development in the period not to be met with in any of the preceding periods from the Badami Chalukya onwards.

The five (kapi) Monkey-headed god with long tail seated in *savyalalitasana* with his consort on the left lap under the canopy of seven-hooded Sesa [serpent] from Bennur is perhaps Bharati Ramana Mukhyaprana Vayudeva[as suggested by the respected Jalihal acharya,Dharwad well known for his erudition in *Madhva Siddhanta* on seeing the photograph of the image] next to Lakshmi, the goddess and third only to the Supreme god Vishnu in the hierarchy of the pantheon in accordance with the *Madhva Siddhanta* the first of its kind to be noted in the sculptural art of Karnataka in particular. In Ghanadal, a pilgrim centre, is rather similar well known five headed god in *samabhanga*. But the five heads are not uniformly the same. They are Narasimha, Varaha, Garuda, the other two are not visible from the front side. Similar depictions again with some variations occur in an engraving on a rock in Hire Jantakal near Gangavati[Sundara; 2006: 479 -82] and in Ramadurga [Challekere tk. Chitradurga dt.] on one of the ceiling slab of the central bay of the *sabha mandapa* of a rock cut temple. In this form the lower part of the body are apparently two lions[?] facing each other from the head part of which emerges the upper part in human form with three heads lion, Garuda and Varaha. The one in the former is *ashtadasha bhuja* carrying different weapons. All these sculptural forms need to be studied thoroughly.

Independent temples of Hanuman are increasingly numerous especially in and around Anegondi. During Kalyana Chalukyan period, particularly very, very rarely, temples exclusively for the deity were perhaps founded as e. g. at Kune Kumatgi, Kakkalameli [Sindgi tk. Bijapur dt.] and in a village on the bank of the Malaprabha, Belgaum dt.[Sundara ;1977a] which is later submerged. In all these places are sculptures of Hanuman in side profile with the right hand in *chapeta mudra*. The last is with inscription also. With Hampi becoming the capital of the Vijayanagara kingdom, the worship of Hanuman and foundation of temples for the deity gains momentum in

Hampi - Anegondi area obviously for two reasons: the local tradition of identifying Kishkindha with the place that probably goes back to the early centuries of the Current Era[Sundara; 1995 and 1997] and Sri Vyasaraya the sage in particular popularising the worship of the deity. The *Yantroddharaka* Hanuman in Hampi is said to have been consecrated by the sage. The Panchamukhi Anjaneya of the temple in Hale Nagara is (Hosa nagara taluk, Shivamogga dt.) of the Keladi period, probably of c.l7th cent. The episode uderlying the concept is to be vindicated.

The profound influence of the Srivaishnava sect is dominantly visible with the foundation of magnificent Vishnu temples in Hampi such as the temples dedicated to Krishna, Vitthala, Tiruvenkatanatha, Sri Ranganatha. In the lalatabimba of the *dvarabandha* of such temples instead of Garuda, a practice in vogue over centuries, are *shankha, tirunama* and *charka* And in all such temples are usually the idols of Sri Ramanujacharya and of the Alvars. In fact there was a minor temple in the vicinity of the Vitthala temple exclusively for the Alvars One of the Alvar images was found in the conservation work to the Vitthala temple that was wrongly identified as Purandaradasa but in reality of 'Tondaradipudi Alvar' one of the great Vaisnava saints of 6th~7th cent. CE [Rajasekhara; 1979].

The above is only a preliminary case study of the new developments and forms in the sculptural art of the Vijayanagara period shedding welcome light on the dimensions of the religious condition prevailing then. It indicates the need for a thorough survey of art remains of the period obviously enormous in quantity and variety and proper interpretation.

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