

14. Heritage Management: Application of Traditional Methods

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Abstract

Indian Subcontinent possesses innumerable ancient monuments and sites that herald the ancient glory of the region. They are the resources for modern engineers to understand the ancient building technologies. Experts in this faculty conceived, designed and executed with a sole objective of prolonging the structural stability for extensive period of hundreds of years. There were many expert groups headed by a chief architect called as *Sthapati*. Their experience is found to be documented in the form of *Silpa* texts for the guidance of the future generations. These manuals deal from the selection of proper site, materials and the ideal measurements for each and every category. It is also observed that they preferred materials and construction technology that are easily reversible. There are prescriptions for periodical inspections and rectification of stresses due to age and natural calamities.

In fact, the conservation process was initiated much earlier than the western manual was introduced by John Marshall during the early 20th century. It may be recalled that by the time the Conservation manual was introduced by ASI, thousands of structures like Forts, Palaces, Temples, Churches, Buddhist Viharas/monasteries and Mosques had crossed hundreds of years in age. The engineering skills applied in them were time tested technology and the distresses in some of them were due to non-maintenance of the structures.

The western formulae no doubt created awareness for conservation of ancient monuments, but the indigenous methodology was inadvertently forgotten by the conservation scientists. The concept of *Punarudharana* (rejuvenation) prescribed in the ancient texts provide much needed indigenous techniques for preserving the original grandeur of these monuments. The paper deals with these methodologies in detail.

Keywords: Heritage Management; Traditional Conservation; Heritage Conservation; *Silpa* Texts.

Introduction :

Indian subcontinent possesses innumerable ancient monuments and sites that signify the ancient glory of the region. These sites and monuments temporally belong to pre-historic to the modern periods and the varieties of features that they present are unparalleled in terms of their material content and artistic features. In fact, they are the resources for modern scientists and engineers to understand the building technologies adopted by people that protect and preserve them from the natural elements. Experts (*sthapatis*) in the faculty of traditional architecture conceived, designed and executed with the sole objective of prolonging the structural stability for an extensive period of hundreds of years.

It is true that during the pre-historic period they sought materials that were sturdy to bear the external pressure and that could serve as their weapons to protect themselves from wild animals and also find their subsistence. Thus, we have lithic tools and stone axes tools and their manufacturing sites better known as 'industry sites'. Nevertheless, from early historic period they adopted a technology that showcases their skill in execution and selection of materials including the selection of the site for architectural edifices.

Basic Principles

Besides their cultural and traditional affiliation, the ancient monuments reflect the high degree of indigenous engineering skill and technology of the past generations. The modern civil engineers and architects have much to learn from these edifices that have withstood many natural calamities and vandalism through centuries.

By the time India became independent from the colonial rule, people realised that most of their heritage lies in a much-neglected condition. Perhaps the reason is the sudden stoppage of royal patronage that was available for the temples and monuments for many centuries. No doubt our colonial masters evinced keen interest in history, archaeology and heritage and attempted to survey, catalogue and document the

cultural remains. In the 19th century they established the Archaeological Survey of India to document and preserve the heritage remains. But the fact remains that even today a large number of monuments, especially the temples, are in a pathetic condition, due to lack of patronage. On the one hand there exist financial constraints and on the other the traditional technical knowledge had completely disappeared.

In 1923, Sir John Marshall published his *Conservation Manual*, which formed the basis for the conservation policy to be followed by the colonies (Marshall 1923). It is in this context that traditional concept of conservation known as *Jirnnoddhara* becomes relevant. Such magnificent temples or historical monuments are architectural wonders and they reveal the brilliant long-term planning of their creators. At the time of the construction itself due consideration was paid to their upkeep, maintenance, conservation and preservation.

These principles are enshrined in the concept of *Jirnnoddhara*. This is the term we come across in our Sanskrit texts, viz. *agamas*, *vaastu* sastras and inscriptions. The term directly means ‘to repair or restore that which is broken or mutilated’.

The *agama* texts and texts on *vastu* (architecture) not only describe in detail the process of construction beginning with the selection of the site of construction, but also prescribe the action to be taken for preservation and restoration due to age, natural calamities, vandalism due to war and other factors causing damage and destruction.

Ancient Indians had incredible knowledge and foresight on the inevitable repairs that are required for prolonging the life of the structures created by them. Sufficient archaeological evidences are available to show that various experiments were made to provide a permanent solution to the problems by selecting the materials for such buildings that require long life.

In earlier stage, the prototype of hypostyle wooden structures served the purpose of religious buildings meant for ceremonious rites and social gatherings. During the beginning of the Common Era wood was replaced by brick and mortar and after many experiments, stone was selected as a permanent medium for constructions during the end of 6th

century CE.¹ After excavating caves and constructing structural stone temples, formal manuals were made for the benefit of the structural engineers and civil architects.

Vaastu texts define the intricacy of the planning parameters of cities, villages, temples and interiors, including fine art of ‘fitting design’. The fascinating *silpa* texts record these, beginning with Kautilya’s *Arthasastra* of the second century BCE (Kangle 1969) and this tradition extended to the texts, more specifically on planning such as *manjushri vastu vidya sastra* of the 5th century CE, the *Manasara* of the 7th century CE and the *Mayamata* of the 9th century CE (Vidyuta 2017). The *Manasara* clearly states that this compendium was a compilation of material gathered from over 300 other texts, on the architecture and planning in the sub-continent at that time. The 35th chapter of the *Mayamata*, on renovation work, refers to the subject of conservation in a following manner (Bruno 1997):

A temple (may be) ruined, broken down, fallen down, aged as to its material or decrepit. Those (temples) whose characteristics are still perceptible in their principal and secondary elements are to be renovated with their own material. If they are lacking anything or have some similar type of flaw, the sage wishing to restore them, must proceed in such a way that they regain their integrity and they are pleasantly arranged (anew). This is to be done with the dimension – height and width – which were theirs, with decorations consisting of corner elongated and other components without anything being added (to what originally existed) and always in conformity with the advice of the knowledgeable.

Historical Records

Similarly, many valuable notes on the subject of conservation or restoration have been identified in ancient texts, some examples of

1. The inscription of Mahendravarman I at Mandagapattu offers evidence. This inscription mentions about the creation of shrines without the use of wood, brick, metal and mortar.

which are referred here. During 7th century CE, the Chinese visitor to India, Hiuen Tsang, records that in ancient times Sasanka, the enemy and oppressor of Magadha, cut down the Bodhi Tree, destroyed the roots down to the water and burnt what remained (Nagaraja Rao 2001, 2011). A few months afterwards Purnavarma, the last descendent of Asoka on the throne of Magadha, by pious efforts brought the tree back to life and in that one night it grew about 10 feet high.

Although it appears to be an exaggerated account, here is a clear example of restoration after the original was defiled by a non-believer, for the stone wall, which was setup by Purnavarma, was nothing but a reconstruction. The *Silapraakara* (stone wall) was erected in the 1st century BCE by the pious zeal and munificence of Arya Kurangi, the wife of Indragnimitra, perhaps the local chieftain. What Purnavarma did was to use the old materials *thabha* (pillars), *suds* (joining pieces) and *usnisas* (coping stones), all made of greyish sand stone. In rebuilding the wall new material granite was used where the old was not good enough (Nagaraja Rao 2011).

Before probing into the rules for such conservation of reconstruction according to the *Silpa* texts and traditions, it is essential to observe the practices known from some of the lithic and other records. It is warned in the texts that any misconception or transgression of general rules would influence the events in the country and may lead to catastrophe in the state, reflecting the belief system. It would rather directly affect the ruler or the sponsor and hence the approval of the ruler was mandatory for any such major reconstruction or repair works including the dismantling an existing temple and rebuilding it (*Isvara Samhitha* LVII).

Lithic Records

Specific orders of the king were recorded in an inscription of Rajaraja Chola I, datable to 1012 CE. The Siva temple at Tirumalavadi was to be repaired. Probably the original temple was made of bricks and was in need of restoration. Rajaraja Chola accorded permission to dismantle the structure and caused arches (*Adi-mukha*) to be

built at the four gates.² Besides the budgetary allotment of funds for the construction of such shrines, provision was also made for their maintenance (Nagaraja Rao 2011).

An inscription in the temple of Vijayalaya Cholisvaram (the first of the early Chola temples built around 850 CE) at Nartamalai informs us that immediately after the construction, the temple was struck by lightning and torrential rains, and it was damaged. It was restored by Tennavan Tamil Adirayan (Satyamurthy 2010).

An inscription from the Siva temple at Kudimiyanmalai records that the entrance to the second enclosure was found to be a hindrance. A certain Gangeyaran enlarged the enclosure and the entrance. While doing so, he ordered the copying of all the inscriptions found on the wall and got the same re-engraved *verbatim* on the new walls. In Tirupati Tirumalai Devasthanam, all the inscriptions of the earlier period from Pallava period to Vijayanagara were copied and re-written in the outer walls of the sanctum during later period. This was executed to save them from further obliteration due to weather action and the loss of the records (Satyamurthy 2010).

A rock-cliff inscription dated to 543 CE from Badami (Bijapur district, Karnataka) states that the fort of Vatapi was strengthened both at the bottom and top by the king Pulakeshin I.

adhashtad-uparishta-chachadurgam-etadachikarot

Another epigraph of the time of Kalachury king Bijala, dated to 1158 CE, records the renewal of the gift of the village Nagahura (Madhya Pradesh) by the king for various services, including the

2. Editors' Note: The first editor of this volume checked the inscription from Thirumazavadi. M.S. Nagarajao 2001 mentions about the construction of gates on the basis of the order of Rarajaraja I. The inscription from the temple (SII, 5, 652 and 653) in 1012-1013 CE mentions about the copying of the inscriptions existing on the *vimana* before the reconstruction and recording them in the documents (books of Palmleaves). M.S. Nagarajao 2001 does not specify the reference to the inscriptions.

renovation of the temple and the monastery attached to it (Satyamurthy 2012).

On the moulding of the basement of the temple of Huleshvara at Dodda Hullur (Bangalore district, Karnataka) there is a three-line inscription in Tamil granta characters, dated to 1324 CE. The record states that this Siva temple had fallen into complete disuse. Therefore, various officials of the town (*ubhayananadesis*, *adhikaris* and the *nattars*) got the temple reconstructed from *upana* to *stupi*, i.e., from basement to the finial of the *Sikhara* (Satyamurthy 2012).

An inscription dated to mid-19th century in the temple of Lakshmi Narayana, within the Mysore Palace fort, records that the *gopura* superstructure over the main entrance to the temple, built by Raja Wodayar (1610 CE), was dilapidated. Therefore, king Krishnaraja Wodayar III got the superstructure dismantled and rebuilt the same exactly like the original (Satyanarayana 1996: 178-79).

According to Vijayanagara records, the Portuguese destroyed the temple at Mylapore, which included Tiruvallikeni in Madras. Against this, the Vijayanagargeneral Rama Raya dealt a severe blow to the Portuguese in 1558 CE. Further, in 1564 CE, just before the battle of Talikota, on the Krishna River, the Hindu temple at Mylapore was totally reconstructed (Nagaraja Rao 2011).

There are many more records in North India which mention that the temples were conserved based on standard principles prescribed in the old manuals. Similar records are also found in public utility monuments like tanks and parks. The Junagadh inscription of Rudradaman (Gujarat) datable to c. 130 CE describes how the unique type of tank, *Sudarshana Tataka*, was damaged due to the ravages of time and was got repaired by the king Rudradaman, who restored it into reuse. The epigraph says that the tank, after repairs, regained its beauty, thus justifying its appellation *Sudarshana Tataka* (Sompura 1968: 71).

It is clear from the abovementioned examples that conservation in Indian context is an ongoing process, which started from the days of its inception. It is more astounding to note that Indian builders were

very careful in the selection of materials for construction. Their concern was the longevity of the material and their sustainability against natural calamities and time. They always used replaceable material with reversible technology.

Conservation in Ancient India

The conservation mechanism in ancient India can be classified under (a) selection of stones; (b) manufacture of bricks; (c) selection of timber; (d) preservation rules; (e) restoration of sculptures; and (f) maintenance and preservation.

(a) Selection of Stones for Durability of Structures

Before we embark on temple renovation or conservation, it is essential to understand the types of materials that were used for temple building. In the early period, temples and palaces were constructed with brick, timber and bamboo while the stucco designs were also used side by side, for fortification of bigger structures. Dry bond granite stone laying up method was predominantly used in Chola period, which was known as *karrali* and most of the brick temples were converted into stone-built ones. Some of the brick temples of the medieval period are preserved even today as at Veppattur in Thanjavur District of Tamil Nadu (Figs. 1 and 2).



Fig. 1. Veetrirunda Perumal Temple, Veppattur, Thanjavur District, Tamil Nadu, before Conservation (Source : author)



Fig. 2. Veetrirunda Perumal Temple, Veppattur, Thanjavur District, Tamil Nadu, after Conservation (Source : author)

In the earlier temples of the Pallavas, where the transformation of perishable materials was replaced with stones, they first used sand stone, which got abraded due to weathering (Kailasanatha temple in Kanchipuram) but later after the 7th century, stone took a pre-dominant position as the major raw material in building a temple. The stones used as raw materials were of different kind and variety. They depended on what was readily available in the closer vicinity as rocks of various kinds. According to K.V. Soundararajan, a renowned Archaeologist, the vast Indian country has varied geological formations and thus he demarcated the types of rocks or stones as follows:

Selected varieties include gneissic granite (Tamil Nadu and Andhra Pradesh), crystalline granite (charnockite) (Tamil Nadu), sandstone (Central India and Karnataka), Kurnool slates and shales (Andhra Pradesh and Telangana), limestone (Andhra Pradesh and North Karnataka), khondalite gneisses (Orissa), basalt or Deccan trap (Maharashtra), chloritic schist (Karnataka), laterite (Kerala, Goa and Coastal Karnataka) and marine sandstones (Saurashtra and south-east Tamil Nadu) (Soundara Rajan 1972: 13-15).

The characteristics of these stones have their advantages as well as disadvantages. For constructional methods, polish, evenness of joint, softness for sculpturing, they would have preferred relatively soft materials.

On the other hand, crystalline stones, though highly durable, are difficult to quarry for the required size and also difficult for carving. Igneous rocks like basalt and sedimentary rock like sandstones have their bedding planes sometimes highly tilted and they result in the sliding down of the pillar stems and other parts of construction, which are subjected to pressure, thrust and impregnation of water, which dissolved soluble particles in them. They looked for their compressive strength, weathering and workability-bearing capacity, and their hardness against abrasion.

Therefore, varieties of rocks have been used in various types of construction like foundations, walls, pillars, ceilings and for detailed carvings and sculptures, in some cases with dry bonding and some

with mortar, or in some cases with core and in some without core. It is necessary to identify the raw materials used in the construction of a particular building so that the same materials could be used in conserving them.

Majority of the temples in Tamil Nadu have been constructed with charnockite, some with granite and granitic gneiss, few with limestone, sandstone and basalt. Tamil Nadu was subjected to earthquakes and the consequence of this can be seen in many temples, where the beams and load-bearing members have broken or moved in many temples. It is essential for the conservator to keep this in mind while reinforcing any additional features in the ancient temples.

Also, some of the earthquakes either increase the groundwater table or decrease it. These sudden alterations cause change in the pore pressure in the underlying formations that could cause damages to the foundation. The change of water table creates voids in the earth and the boulders or irregular rubbles that bear the weight of the foundation may move and if the movement is more than permissible limit, cracks develop over the superstructure. In fact, such cracks are warning and if proper measures are not taken carefully, catastrophe may happen.

(b) Manufacture of Bricks

Utmost care was taken to manufacture other materials required for construction. No doubt the naturally available clay served as the binding material during the Sangam Age temples and structures in Tamil Nadu. The process of preparation of bricks is described in detail in many *Silpa* texts. It must be without flaw, compact and uniformly baked and should be giving off a harmonious sound. Among the four types of available earth, salty, off-white, black and uniform, red and swollen the last one was preferable. It should be free from gravel, pebbles, roots and bones. It should be mixed with salt-free white sand and will be made homogenous.

Clods of earth are stacked in small heaps with a central pit and soaked in water and the mixture should be crushed by foot at least 40 times consequently. Such paste should be again soaked in the juice of various fruits and vegetable binders. The compound is kneaded three

times and bricks are fashioned with the help of a wooden frame. Generally, 2:8:16 is the standard size prescribed and they are dried and baked in uniform fire. Subsequently, it can be allowed to cool down for a minimum period of one to four months. Such bricks are immersed in water and if found damp free, it should be used for constructions for longevity.

(c) Selection of timber

In the early phase, timber was the primary material used for construction including the side walls and roof. In the selection of timber, ancient Indians considered the green environment as the sole guidance for selection of woods. Trees were not cut without divine sanction and some rituals and permission for cutting trees were sought from various deities. In fact, trees were considered as living beings and enormous ceremonies are prescribed for cutting it.

The chosen trees are prescribed to be perfect, hard and vigorous. They should not be very old or mere saplings. They should not be damaged, crooked and trees grown over mountain, river bank and holy place are preferable. In fine, it should be pleasing to the eye and mind.

In a similar vein, a long list of trees that are rejected for buildings is provided in the texts. Trees close to the temples, struck by lightning, scorched by conflagration that is under cult worship, frequented by birds and animals bent by wind or elephants are forbidden. Trees that are entangled with each other or twisted, affected by white ants, strangled by liana and hollow inside are also listed as prohibited timber. There should be no twigs on their branches. Neither must it be damaged by wild bees nor should they bear fruits out of season. Trees planted on highways or village roads, and found near the tank, well or pond are also not considered for building temples.

Ancient texts caution the builders to re-use the materials from other forbidden buildings and assure that the life of building/temples will prolong if the materials specified are selected properly as per prescriptions.

(d) Preservation Rules

Ancient manuals deal in detail about conservation and preservation process of ancient buildings including temples. Without any incongruity, it divides the renovation into two parts: one for structural repairs and other for maintenance of images that are under worship. Structures that are recommended for conservation are listed as a temple ruined, broken down, fallen down, aged as to its materials or dilapidated. Those temples whose characteristics are no longer perceptible are to be conserved and brought back to its original grandeur.

In such cases they should be conserved with their own materials in fabric and colour. However, better materials than those employed during the initial construction should be used. In any case the dimensions (*Aayadi*) should strictly conform to the original structures. The prime characteristics of the temple with the secondary elements are to be renovated with their own materials, and if not available, must proceed in such a way that they regain their integrity and pleasantly arranged anew with dimensions, height and width without anything to be added to the original measurements and always in conformity with the initial appearance. A knowledgeable expert should monitor such operations.

In case of reconstruction of temples that are completely swept over by flood or earthquake, it can be conjectured with the traces of plinth or the pedestal of the linga (image). The dimensions can be calculated from the dimensions of the pedestal of the image and in ancient temples, there was always a proportion between the image dimensions of the sanctum, wall and superstructure. In fact, we have got much archaeological evidence to establish that the temples were reconstructed after some natural calamities with the same dimensions of the original.

One such practice is found to be documented in Saluvankuppam village in the northern proximity of the Pallava monuments at Mamallapuram. A brick temple dedicated to Muruga (Kartikeya) located on sea shore within 100 metre from high tidal zone, datable to the beginning of Common Era, was destroyed by tidal waves during 4th century CE. It was reconstructed with stone walls during the Pallava

period, but again it was found to be pulled down during the 10th century CE and once again reconstructed. But the temple collapsed during the 12th century CE. All such natural calamities and resurrections are recorded archaeologically, and it is significant that the original dimensions were not found to be altered. Necessary strengthening was made with higher materials. For instance, the brick walls were reinforced with stone veneers and brick lime core (Satyamurty 2017).

(e) Restoration of Sculptures

The earliest reference to a restoration of sculpture is recorded in the introductory part of the Sanskrit composition known as *Avantisundarikatha* by the poet Dandin, who is considered to be the contemporary of Pallava king Rajasimha, in the beginning of the 8th century CE. The reference is to the restoration of the arm near the wrist of the sculpture of *Vishnu Anantasayin* in the Shore Temple complex at Mamallapuram (Mahabalipuram).

Dandin himself was a learned person in architecture and temple arts. He refers in this work to one Lalitalaya, son of Mandhata, a great master in architectural science who could surpass even the Yavanas. As already stated, the *Anantasayai* sculpture was slightly damaged in one of its arms, near the wrist. Lalitalaya restored the broken part.

Visiting the royal court at Kanchi, he invited the poet Dandin to come to Mamallapuram to see the restoration he had done. Dandin went to Mamallapuram with his friends and saw the sculpture by the side of the waves. ‘In the enchanting environment of cool breeze, and the waves almost touching the feet of the image Anantasayin, he saw the extraordinary skill of the sculptor in the restoration work. The work was so perfect that he could not notice the wrist (Manibandha), any traces of restoration. He admired the work of Lalitalaya’ (Ramakrishna Kavi 1924).

This account brings out many important facts: (a) it shows that as early as the 8th century CE the restoration of damaged parts of a sculpture was recognised as a skilled art: (b) that damaged sculptures could be restored: (c) even poets and learned men took keen interest in

examining such restoration work; and (d) that the restored part should be absolutely true to the original. Further this would go against the popular belief that if a stone sculpture is damaged, it should not be worshipped.

There are several *agamic* passages dealing with the specific question of what should be done with broken sculptures.

They treat them under *prayaschittavidhi*. There are minor variations in rules between one text and another.

The deities are classified differently as a self-manifest image (*Svayambhu Murtis*), those consecrated by sages (*Arsha Pratishta*) and humanly made (*Manusha Pratishta*).

In the case of *Svayambhu* and *Arsha Pratishta*, there is no question of replacements. In the case of humanly made, the sculptures beyond repairs should be immersed in deep water or dropped in river or sea. For this purpose, the parts of sculpture are divided into major limbs and minor limbs. Textual authorities give many options with specifications for guidance in all such cases of damages. The *Mariachi Samhita*, an early *Vaikhanasa* text of the Vaishnavites, says that the stone sculpture, if found damaged in parts other than *Mahaangas*, should be repaired and not discarded. Its divine power should be invoked in *balalaya* and after mending it should be re-consecrated.

It is really interesting that conservation and preservation of temples were considered more holy than their construction. The epigraphs, recording the grants for various services of the temples, including restoration, maintenance and upkeep, frequently enjoin, in verses, that a person who preserves this cultural heritage will gain greater merit than the one who donates (Nagaraja Rao 2011; Ganapati Sastri 1925).

A person who preserves an ancient structure is more laudable than the person who constructs and the latter will attain *svarga*, but the former will reach the holy feet of Vishnu.

Various process of conservation is listed as follows:

Khanda-sphutita or Jirnnoddhara: Repairing the portions which are damaged and mutilated, and which have developed various types of accretions.

Khanda-sphutita or Navakarma: Repairing and renovation, as well as renewal.

Sphuta-navikarana: Removing accretions. The term *sphuta* (*sphutita*) may also be taken to mean ‘bulged’ or ‘out of plumb’ portions, which indicates setting right such deformities.

Sudhakarana: Applying new white colour or plastering with white mortar.

Taru-gulma-nirmaalikarana: Removing the over grown vegetation, moss and lichen (Gurukkal 2017).

(f) Maintenance and Preservation

The most significant preservation measure prescribed in ancient Indian texts and practiced are the rituals oriented towards the preservation of the main deities and inner circuits of the temple. Once the temple is consecrated, annual preservation of the main image and the inner circuit is made mandatory by a ritual known as *Samvatasara Abhishekam* (annual maintenance). It is more applicable in Saivaite temples where the main image is constantly kept in many anointments by application of different liquids (Subba Raman 2014).

During this occasion, mostly coinciding with the day of consecration, every year the main image made of stone is covered with a specially prepared paste. This semi-solid herbal product will have mainly rice flour mixed with curd and made to ferment for 12 hours and then applied over the surface and then allowed to dry for at least 10 hours. By chemical action, the herbal paste as it dries, the accretions like oil and dust would stick to the paste and the image will be cleaned. Some rituals are performed as per *agamic* prescriptions as a religious rite.

For keeping the inner sanctum clean and tidy, especially in Siva shrines where the main lingais worshipped by offering water, milk, fruits, honey, sandal paste and many other ingredients, several measures are prescribed as a part of rituals. The very first offering to Siva is ordained to be with *Panchagavya*, an indigenous herbal germicide inside the sanctum. The five products of cow (milk, curd, ghee, dung and urine) are mixed in a particular proportion and offered as the very first *abhisheka* (bath) for Siva.

Panchagavya is an Ayurvedic and Siddha medicine to start the beginning of any treatment in India and it is a very effective anti-germicide product. There are many lithic records to show that the rulers issued many endowments to provide this to the temples by maintaining *goshalas* (cow dwelling) and supply the ingredients to temples. This tradition oriented towards preservation continues till today in many shrines of South India.

Besides, there are prescriptions for monthly preservation measures by performing particular *abhisheka* every full moon day. The materials mentioned for 12 months are *dahavanam* (*artemisia pallens*), sandalpaste, trio-fruits (banana, mango, jackfruit), milk, indigenous sugar paste, fried pancake, cooked rice and lighting with traditional lamps, ghee, sugarcane juice, wool soaked in ghee, and curd. The prescriptions depend upon the season and the compounds undergo chemical and biological reactions and smoothly clean the surface without accretions and preserve it for a longer time (Soma Sethu Dikshitar 1982).

Infact, there are many such rituals and rites that keep the environment and atmosphere also pollution free. One such is the final ritual in any temple where fumigation is done by generating *sambirani* (Perfume similar to Frankincense) smoke. In a similar vein, the weathered and weak parts of soft stones like sandstone are strengthened by the application of tender coconut water. *Agama* texts, e.g. *Kamigama*, set down many such principles for the preservation of temples including the images and structures.

Conclusion

The Western contemporary formulae no doubt created awareness about the conservation of ancient monuments, but the indigenous methodology was not even touched by the conservation scientists. It is also essential that an attempt to scientifically establish the chemical reactions of these indigenous preservation measures for our wider use and preparation of standard charts. The concept of *Punarudharana* (rejuvenation) prescribed in the ancient texts and practiced all these centuries provide much needed native techniques for the preservation of our monuments.

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