

Hindu Mandirs : Architectural Wonders

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Abstract

This paper will try to understand the uniqueness of the architecture and engineering of the ancient *mandirs* and evaluate them on the basis of many criteria, including design, difficulty in building, scientific and other special knowledge used in the construction. An attempt will also be made to understand the science that went into their construction. The paper will attempt to compare how India's *mandirs* differ in their architectural characteristics with the other structures of some other cultures of world.

Full Paper

India and Southeast Asia are full of mandirs. While some are very ancient, dating back a millennia or two, many are medieval, dating back to only a few hundreds of years. Not much discussion is found in popular media and culture about their splendor and grandeur, and the effort that may have gone into their construction.

This paper will discuss the distinctiveness of the planning and engineering of these mandirs and evaluate these mandirs on the basis of various criteria, including design, difficulty in building, scientific and other special knowledge used in their construction, etc.

1) Significance Of Mandirs

A Church is “a building for public and especially Christian worship” per the *Merriam-Webster* dictionary. Whereas a Hindu Temple, also known as a *Mandir* or *Devālaya* or *Devasthāna*, is actually an abode of the *Devatās*. All *Mandirs* go through a *Prāṇapratīṣṭhā* (*Prāṇa*= life force, *Pratīṣṭhā* = installation or consecration) ceremony, where spiritually advanced Atman's accompanied by other pious members of society use special mantras to invoke the *Devatā* to come reside in the *Mūrti*, also known as *Vigraha* or *Pratimā*. Since Hindu theology believes the divine to be transcendent and omnipresent, it prescribes that the *Devatā* herself/himself permanently resides in the *Mūrti*, and the presence of the *Mūrti* thus renders the *Mandir* to be a place for recharging of one's spiritual ‘batteries’.

According to Sanjana Venkatasubramaniam, the Śāstra's have prescribed the design of *Mandirs* to the minutest details, for a reason. This reason she states is “Mandirs are thus a microcosm of the Supreme Reality, so that devotees are able to develop a tranquil mind and understand the true nature of Brahman”. *Mandirs* are designed in such a fashion, that they symbolize the cosmic order found everywhere in the Universe even in each atom. “*Mandirs* as a microcosm are built in congruence with the macrocosm” she elaborates.

Since *Mandirs* are not just a place of congregation or worship for Hindus. We will see later that they put a lot of effort, time, care and resources into building many *Mandirs* in the past. And even though an estimated 40,000 *Mandirs* have been destroyed by foreign invaders who wanted to impose their own religion on Hindus, there are still many *Mandirs* in India and other parts of Asia. In fact, one particular *Mandir* was destroyed 20 times by invaders, and it was rebuilt every time.

2) Earliest Hindu Mandirs

Some *Mandirs* are believed to be built many millennia ago, but there is no archeological evidence left to conclusively prove the historicity of many of the old ones. The Kedarnath Mandir along with 4 other *Mandirs* in the area, high up in the mountains in Uttarakhand in India, is believed to have been built during the times of Mahābhārata, as mentioned in the epic. The Pāṇḍava brothers went up to the mountains in search of Shiva, and upon finding some signs built five temples collectively known as Pañcha Kedar, the first of which was the Kedarnātha Temple.

The original Temple does not exist, but the existing one on the site is believed to have been built in the 10th Century CE. The Mandir-purohits (priests) are believed to be from a long line of Rishis who have been worshipping the *Liṅgam* at this Mandir since the time that their ancestor was given the rights by King Janmejaya, a grandson of the Pāṇḍavas. It is important to mention that Mahābhārata's exact dating is still being discussed, but the 6th millennium BCE date is a strong contender.

The current Dwarkadhīsha Mandir, also called Jagat Mandir, in Gujarat India, has portions of the mandir dated by Archeologists to have been built around 200 BCE. It is believed that the original Temple at this site was built by Vajranabha, a grandson of Krishna, specifically at *Hari-Gr̥ha* (Krishna's actual abode when he lived in Dwarka), which again could have been built in the 6th Millennium BCE. The Mundeshwari Temple in Bihar India, is dated by the Archeological Survey of India to be built around 108 CE.

In Armenia, the current Saint Karapat Monastery is believed to have been built over Hindu Mandirs built by two kings, Kissimeh (Krishna) and his brother Demeter (Balabhadra) and who had fled from Kannauj, around 149 BCE. This is according to Zenob Glak, the disciple of Gregory the Illuminator, who brought Christianity to Armenia and erased the whole community of Hindus living there. According to Zenob they had *mūrtis* made of brass 12 cubits high (18 feet). These princes who fled from Kannauj could well have been from the tail end of the Gupta dynasty, which some current research suggests could have been around when the Greeks starting from Alexander invaded India from the northwest.

Remnants of a *Mandir* have been excavated in Bairat district in Rajasthan, and is being dated to the 3rd Century BCE. An oval brick Temple has been excavated in Besnagar, Vidisha in Madhya Pradesh, and is being dated to the 2nd Century BCE. No physical evidence survives of any *Mandir* built before 300 BCE. *Mandir* construction eventually really took off in India in a large way after 500 CE.

It is apt to mention here that it is uncertain whether *Murti*'s and *Mandirs* existed during the Ṛg-vedic Phase, which could be between 7,000 and 12,000 years ago. Panini mentioned *Acala* and *Cala* and *Devalaka*, words that describe images in a shrine, images that were carried from place to place and custodians of *murti*'s. Keep in mind that the commonly accepted age for Panini is around the 6th Century BCE, but some believe he was around earlier.

3) Mandir Design

There are many *Mandirs* all over the world, but most are built using the same set of general principles as set out in Agama Śāstra, a key text. Some regional and cultural differences do make the *Mandirs* a bit different from each other. Agama Śāstra is a manual that lays down the guidelines for building *Mandirs* in great detail, construction and placement of *murtis* of the Devīs and Devas, which provides the guidelines for proper meditation practices, even specifies the materials to be used to construct the various parts of the *Mandir*. These texts borrowed their mantra portion from the Vedas and the ritual portions from Tantric texts. The architectural and geometric aspects of Hindu *Mandirs* are also drawn from Śāstras such as Vāstu Śāstra and Shilpa Śāstra.

4) Some Noteworthy Mandirs

1. Sri Vidhya Shankra Temple

The Vidyashankara Temple, built in 1338 A.D. is located in Sringeri, Karnataka. This *mandir* showcases Vedic engineering related to astronomy. The *mandapa* of the *mandir* is surrounded by 12 pillars, each of which depict the 12 zodiacs of Hindu astrology. These pillars are known as *rasakambas*. What is truly remarkable about this *mandir* is that each of the 12 pillars have been masterfully engineered so that the sun's first early morning rays fall on the pillar of that month, in order of the Hindu calendar. In addition, the floor with a circle captures/ indicates the converging shadows of the pillars. The *mandir* is composed of a mix of Dravidian, Hoysala, Chalukya, and Vijaynagar styles, showcasing sculptural reliefs all throughout the temple.

2. Kailāsa Temple at Ellora

This *mandir* was not 'built' like other major architectural works around the world. The Kailāsa Temple was carved out of a single mountain, originally called Elapura, which the British later renamed to Ellora. The mountain, carved from top to bottom, had 400,000 tons of solid rocks scooped out of it, using only simple tools like hammers and chisels. The *mandir* features over 30 million Sanskrit inscriptions, many of which when translated could solve many of the unanswered questions about the structure. Measuring up to 100 ft tall and 175 ft wide and 300 ft long, the intricacy and immense size of the *mandir* makes us question how such an advanced structure could be built without modern technology. According to the legends, a local queen vowed to build a Shiva temple if her prayers for her husband's illness were answered by Lord Shiva. Along with this, she vowed that she would not eat until she could see the top of the temple. Although it would have taken years to see the top if the temple had been built ground up, a clever solution to build the temple top down allowed the top to be seen in weeks so the queen could complete her fast.

3. Ramappa Temple

The Ramappa Temple is a Kakatiya style temple located in Telangana. What makes the Ramappa Temple a true architectural wonder is its 'earthquake resistance' due to the *gopuram* of the *mandir*. The bricks are made out of clay, acacia wood, chaff and myrobalan fruit, making the bricks light enough to float on water. One scholar describes "the weight of the specimens" as "1/3 to 1/4 of ordinary bricks of the same size." The lightness and buoyancy of the bricks makes the structure far less susceptible to collapsing during an earthquake. Additionally, the *mandir* uses the sandbox technique, or a foundation pit filled with a mixture of sand-lime, jaggery and black myrobalan fruit. The vibrations caused by the earthquake are absorbed while passing through the sand, minimizing its strength before it reaches the actual foundation. This phenomenon has been verified through Dr Venkata Dilip Kumar Pasupuleti's research which found that almost 60% of impact force vibrations were reduced after passing through a sandbox with dry sand. The sandbox technique, used in 1213 AD, even competes with modern day earthquake proofing technologies such as the Elastomeric Base Isolation technique, being less susceptible to weather and more economically friendly.

4. Brihadisvara Temple at Thanjavur

The Brihadisvara Temple in Thanjavur, built by Raja Chola I, is one of the largest south Indian temples in the world. At the top of the temple, there is a heavy structure known as the *kumbam*. Carved out of pure stone, the *kumbam* weighs over 80 tons. In order to build it, the large granite stone for the *kumbam* had to be transported from the nearest source, which was 60 kilometers away, and then had to be transported from the ground to the top of the *śikhara* which is 60 meters high. They used clever tactics like ramps to transport the rock, yet the engineering and technology required to lift a 80 ton rock is still

very difficult to achieve. In front of the *mandir* sits a 5 meter tall *nandi*, the bull, also carved out of a single stone piece.

5. Angkor Wat In Cambodia

The Angkor Wat in Southeast Asia is the largest religious monument in the world. Situated on a 402 acre site, the construction of this massive *mandir* took 35 years, according to the inscriptions in the temple. In order to make such a large structure, about 5 million tons of sandstone had to be transported from the mountain Phnom Kulen located over 50 kilometers away. Using 300,000 workers and 5,000 elephants, each sandstone block, weighing about 1,500 kilograms, was transported across the river Siem Reap and floated to the construction site using rafts. The French explorer Henri Mouhout described the temple as “a rival to that of Solomon, and erected by some ancient Michelangelo. It is grander than anything left to us by Greece or Rome” The sheer size and difficulty taken upon building it instigates questions about the advancements made by Hindu communities in ancient times.

5) Other Unique Features Of Mandirs

Mandirs are designed to symbolize both the Supreme reality and the human body. ‘*Yathā Pinde Tathā Brahmāṇḍe*’. This phrase signifies that whatever is in the macrocosm (the universe) is also in the microcosm (human body). Or, in other words, all that is outside the human body, is also within the human body. *Mandirs* are designed to replicate both the Supreme reality and the human body. This is true both at the physical and the metaphysical level. The physical body is of course made of the same elements that are in the universe around us. The inner *Ātman*, or the human consciousness, according to Hindu philosophy, is also the same as the Universal Consciousness, or Brahman. *Devālaya- Vāstu*, a treatise on Mandir-*Vāstu* describes the *Mandir* as a cosmic man, the ‘*Puruṣa*’.

The *Vimāna* or a *Śikhara* on top of the *Vimāna*, constitutes the tallest structure in *Mandirs*, and is over the *garbhagrha* or the sanctum sanctorum where the main *devi/devata* resides. The tall height of the *vimāna* is considered to provide a *darshana* of the *devi/devata* to those that can see it from far, without necessarily visiting the inside of the *Mandir*. The *vimāna* symbolizes the connection between humans on earth and the abode of the *devatas* up above, and is also believed to channel the cosmic energy to the *devi/devata* in the *garbhagrha*.

Many *mandirs* are designed such that during sunrise, the very first rays of the sun fall on the main deity’s feet. A temple in Sringeri established by Ādi Śāṅkara, has twelve pillars surrounding the *mandapa*, with figures of the twelve zodiac signs. The rays of the sun fall on each of the twelve pillars in the chronological order of the twelve months of the Hindu calendar. Some Hindu *mandirs* have pillars that have musical columns, which when struck with a thumb, produce notes imitating bell sounds. The Sri Vijaya Vattala mandir, has 56 such musical pillars. In the Nellaiappar Mandir at Trunelveli, a central pillar is surrounded with 48 small cylindrical pillars. When one pillar is tapped to produce a musical note, the neighboring pillars resonate with a musician note of their own.

There are Eight Shiva Mandirs in India that are along the same E79 degree longitude. The total distance between the extreme *mandirs* is 1500 miles. Given their construction a few millennia ago, the fact that they lie on the same longitude is an impressive feat for the designers of these *Mandirs*.

6) Conclusion

Hindu *Mandirs* have been around for at least 2 millennia, and there are mentions of some built way before that, but they have not survived. Most *mandirs* are built based on a manual called *Āgama Shastra*, which is at least two millennia old, and was written just for the purpose of construction of

Mandirs. They symbolize a very important aspect of the divine thought and, therefore are considered the abode of the divine. Hence *Mandirs* hold a place very dear for Hindus. They were always an important center for the society living around it, and a lot of effort went into their construction, as seen by the huge resources that went into their planning and construction. Many surviving *Mandirs* are architectural wonders in themselves, and have some unique features that would have taken a lot of dedication and planning to construct.

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