

LIGHT IN SACRED ARCHITECTURE: BUDDHIST AND HINDU TEMPLES***Ahmet Hadrovic**

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Abstract:

"Light in sacred architecture" is a very complex topic and it can be approached with the same competence by religious interpreters, philosophers, all artistic expressions, designers (especially lighting designers), people of various practical activities. In this paper on the subject of 'Light in sacred architecture', an architect and university professor writes, i.e. a person who educates students of architecture in its various fields and a person who designs himself (who has more than ten architectural realizations of sacred architecture behind him). The paper deals with the historical, philosophical, religious, psychological and aesthetic dimensions of the problem of the presence and use of light in sacred architecture. The immaterial and ubiquitous phenomenon of light builds architecture and fills its spaces, attracting our emotions. Therefore, both natural and artificial lighting serve to introduce special places in architecture, and then give those places a special character. In the descriptions of architectural objects and the circumstances in which these objects are created, we conclude that light is a co-creator of architectural forms and spaces - from the rudimentary way in which it helps identify space to the sophisticated ways in which it participates in the creation of a transcendental atmosphere.

This is the second paper in a row (previously the topic 'the place of light in the design of mosques' was covered) in which the author deals with the complex topic of 'Light in sacred architecture'.

Keywords:

Light, sacred architecture, Buddhism, Hinduism

1. Introduction

With his doctoral dissertation ("Defining architectural space on the example of a town house in Yugoslavia", 1988), the author laid the foundations of the theory of Architecturally Defined Space (architecture) and opened countless paths of 'searching for architecture'. He presented his search for architecture through a series of published books - university textbooks, scientific books, monographs and travelogues [1,2,3,4,5]. In the university textbook 'Architectural Physics', the author dealt with light from a purely physical aspect and the relationship between man and light, establishing 'the definitional area of human comfort from the aspect of the conditions of vision': "Similar to heat and sound, light has its objective dimensions that define it (wavelength, frequency, energy, various types of behavior when spreading through space). From the aspect of Architecturally Defined Space (ADS), light is interesting as a tool that enables not only seeing, that is, collecting information from the environment, but also the mechanism of that seeing, as well as the quality of seeing. This means that man is a special system through which the objective dimensions of light are refracted, forming an image of reality, along with a series of subjective dimensions of each individual" [6]. "The concept of lighting has, on the one hand, purely physical dimensions by which light is treated as a special form of energy, and on the other hand, those dimensions that express man's relationship to the world around him. On the physical plane of consideration, light is treated as part of the spectrum of electromagnetic waves, which is determined by a series of physical quantities: speed of propagation, frequency, wavelength, amount of energy, as well as the lawfulness of their propagation through certain environments. On the subjective plane of consideration, light is treated as a means through which a person acquires information about his environment. From the aspect of architectural physics, this second consideration is interesting" [6]. In the aforementioned book, the Author has only indicated many other dimensions of the human-light relationship: "In architecture, there is a frequent case of reflector lighting of an object for aesthetic reasons. At the same time, with the reflector light, in contrast with the dark background, the desired details of the construction can be highlighted, which is not really possible in the conditions of natural (day) lighting. In addition, the angle of incidence of the reflector's light on the desired object, as well as the color of the light, should be appropriately selected" [6]. In this paper, the main topic will be the 'other dimensions of the human-light relationship': philosophical, religious, psychological and aesthetic dimensions. Lighting plays a vital role in the way people experience and understand architecture. Whether the buildings are illuminated naturally or

artificially, lighting is a medium that allows us to see and appreciate the aesthetics of the buildings around us and the message of the 'illuminated building' that it emits into the space.

2. Main world religions

The main world religions are Judaism, Christianity and Islam, as well as Hinduism and Buddhism. The first three are based on holy books, God's word or revelation: Judaism - the Torah, Christianity - the Gospel, and Islam - the Qur'an. All three are characterized by faith in one God [7,8,9,10]. The most important sacred texts of Hinduism are the Vedas, which contain the Aryan faith in India. The Vedas include hymns, instructions for rituals, and many reflections on various cosmological topics. The Upanishads are commentaries on the texts of the Vedas that offer a wealth of philosophical speculation about the origin of the Universe, the nature of deities, Atman (the human soul) and the relationship of the human soul to the universal soul (the god Brahman). They date from 600 BC. Two epics, the Ramayana and the Mahabharata, are also significant for Hindus. Most Hindus believe in many gods, but in one fundamental Reality. The soul, after death, is reborn in another body. Buddhism is considered a universal teaching that is not determined by the side of the world it comes from. It addresses man and what is fundamental in his life and independent of his geographical, ethnic, cultural or social affiliation. It is a teaching that arose out of the Buddha's direct experience of awakening or insight into the true nature of life and represents a detailed path leading to it. The Four Noble Truths are one of the fundamental teachings of Buddhism: Dukkha (experience of suffering and frustration is inevitable in life), Samudaya (experience of suffering, caused by misdirected desire, conditioned by ignorance), Nirodha (freedom from confused desire, leads to the end of suffering), Marga (the freedom that can be found by following the eightfold path set forth by the Buddha).

3. Light

As a professor of architecture (where, among other things, he teaches the course 'Architectural Physics'), the Author teaches about light from the aspect of its 'objective parameters' that make architecture a purposeful space for humans. Similar to heat and sound, light has its objective dimensions that define it (wavelength, frequency, energy, various types of behavior when spreading through space). From the aspect of architecture, light is interesting as a means that enables not only seeing, that is, collecting information from the environment, but also the mechanism of that seeing, as well as the quality of seeing. This means that man is a special system through which the objective dimensions of light are refracted to form an image of reality, along with a series of subjective dimensions of each individual. An architect must know the mechanism of transformation of the objective dimensions of light into a subjective experience, in order to use the results of this transformation in the creation of architecture in a similar way to the use of building materials, the effects of heating, ventilation, and sound systems. In physics, electromagnetic radiation (EM or EMR) refers to waves (or their quanta, photons) of the electromagnetic field, which spread through the Universe, carrying electromagnetic radiation energy. It includes radio waves, microwaves, infrared, (visible) light, ultraviolet, X-rays and gamma rays. All these waves form part of the electromagnetic spectrum. Electromagnetic radiation consists of electromagnetic waves, which are synchronized oscillations of electric and magnetic fields. Electromagnetic radiation or electromagnetic waves are produced due to periodic changes in the electric or magnetic field. Depending on how this periodic change occurs and the power generated, different wavelengths of the electromagnetic spectrum are produced. In a vacuum, electromagnetic waves travel at the speed of light, usually denoted "c" ($c = 300,000 \text{ km/s}$). In homogeneous, isotropic media, the oscillations of the two fields are perpendicular to each other and perpendicular to the direction of propagation of energy and waves, forming a transverse wave. The wavefront of electromagnetic waves emitted from a point source (such as a light bulb) is a sphere. The position of an electromagnetic wave within the electromagnetic spectrum can be characterized either by its frequency of oscillation or by its wavelength. Electromagnetic waves of different frequencies are called by different names, because they have different sources and effects on matter. In order of increasing frequency and decreasing wavelength, these are: radio waves, microwave ovens, infrared radiation, visible light, ultraviolet radiation, X-rays and gamma rays (Figure 1).

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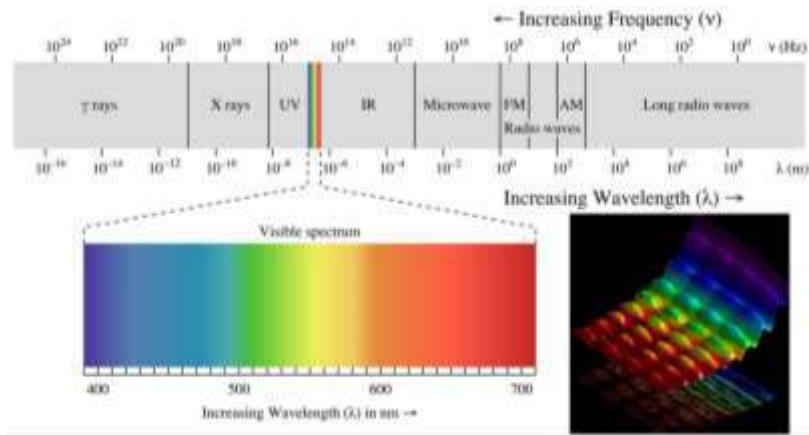


Figure 1. Electromagnetic spectrum with prominent visible light
<https://socratic.org/questions/where-is-visible-light-located-on-the-electromagnetic-spectrum>, Accessed: 10.12.2022.

The language of light is cross-cultural. More than being used as a way to create a place for enjoyment, light in any religion is a special symbol of divinity. Light in holy places creates a contemplative atmosphere for religious meetings. Whether it's churches, mosques, synagogues or temples, accented light helps focus attention on important things. Until the nineteenth century - the eve of the invention of the light bulb - lighting methods remained more or less unchanged from the earliest antiquity. There were three forms of lighting, ordered by their appearance: torches, lamps, and candles, which used animal fat or, in the case of lamps in the most advanced ancient societies, vegetable oil. In the characteristic abode of prehistoric man, the cave, light was necessary at all times, because the sunlight did not penetrate into the rocky depths of those homes. Although popular belief portrays fire and the wheel as more or less simultaneous discoveries - spanning several thousand years - in fact the wheel appeared only in historical times, while man's use of fire stretches back to the earliest times of unwritten history. Once prehistoric man began to use fire to generate heat, it would be a relatively short time before these early ancestors realized the power of fire to banish both darkness and the fierce creatures that came with it. One of the major steps in prehistoric development was the formation of portable lighting technology in the form of torches or rudimentary lamps. Paleolithic people usually used as lamps either stones with natural indentations, or soft rocks (steatite, for example) into which they carved indentations using a harder material. Most of the lamps that archaeologists have found at sites in southwestern France are made of limestone or sandstone. The first was a particularly good choice, because it conducts heat poorly; in contrast, lamps made of sandstone, a good conductor of heat, usually had carved handles to protect the user's hands. In addition to stone lamps, cave art in La Moute, France also shows pear-shaped lamps made from the bones of the heads and horns of the ibex, a large wild goat that was abundant at the time. In this regard, it should be noted that the very existence of prehistoric art, the most famous examples of which can be found in the Lascaux caves in the south of France, illustrates the way in which artificial lighting changed the world even in those early times. The frescoes, deep in the recesses of caves and far from sunlight, would never have existed if prehistoric humans had not developed a reliable means of lighting their caves.

3.1. Light in Buddhism

Gautama Buddha, popularly known as Buddha (also known as Siddhattha Gotama or Siddhārtha Gautama or Buddha Shakyamuni), was a Śramaṇa who lived in ancient India (circa 5th to 4th century BC). He is considered the founder of the world religion of Buddhism, and most Buddhist schools revere him as a 'savior', an 'enlightened one', who rediscovered the ancient path of liberation from craving and escape from the cycle of birth and rebirth. He taught for about 45 years and built a large number of followers, religious and lay. His teaching is based on his own insight into the emergence of duḥkha (dissatisfaction of clinging to impermanent states and things) and the end of duḥkha - Nibbāna or Nirvana (extinguishing the three fires). Buddha was born into an aristocratic family in the Shakya clan, but eventually renounced lay life. According to Buddhist tradition, after several years of mendicancy, meditation and austerity, he awakened to understand the mechanism that keeps

people trapped in the cycle of rebirth. The Buddha then traveled across the Ganges plain teaching and building a religious community. He taught a middle way between sensual indulgence and severe austerities found in the Indian Śramaṇa movement. He devoted himself to mind training that included ethical training, restraint, and meditative practices such as jhana and mindfulness. The Buddha also criticized the practices of the Brahmin priests, such as animal sacrifice and the caste system. A few centuries after his death, Siddhārtha Gautama became known as the Buddha, meaning 'Awakened One' or 'Enlightened One'. Gautama's teachings were compiled by the Buddhist community into the Vinaya, his codes of monastic practice, and the Suttas, texts based on his discourses. They were transmitted in Middle Indo-Aryan dialects by word of mouth. Later generations compiled additional texts, such as systematic treatises known as the Abhidharma, biographies of the Buddha, collections of stories about the Buddha's past lives known as the Jataka stories, and additional discourses - the Mahayana Sutras. In statues, Buddha's eyes are usually closed. Buddha was a psychologist rather than a physicist or a house cleaner. Buddha is called the 'Spiritual Physician'. For the Buddha, the most important light was the 'light of wisdom'. The Buddha, for the most part, enjoyed living in the forest or jungle, so he was not overly concerned about keeping the marble temples clean, similar to how Muhammad s.a.w.s. enjoyed meditating in the cave and wrapped himself in blankets when he received the Revelation. Therefore, the Buddha's eyes are closed, so that the mind can be understood from within, especially how the mind creates suffering and how the mind is freed from suffering. However, the Buddha was also a mystic and taught a meditation called 'light perception' which can be used to develop psychic powers. The Buddha had the 'eye of God' ('dibba-cakkhu'), so he could, from his mind, see, hear and know what people were doing. That's why his eyes are closed. Buddha did not have to open his eyes to know what was happening in the world. There is a case where the monk follows the perception of light and resolves with the perception of day (at any time of the day). For him, day is the same as night, night is the same as day. By means of an open and undisturbed consciousness, he develops a clear mind. This is the development of the mind through concentration which, when developed and followed, leads to the attainment of knowledge and vision. Buddhist schools and texts relating to the Divine Light do so in relation to the Universe. Almighty God (Brahman) resides in all humans as Light, a fact supported by all scriptures. So we can meditate on him and that long search for the Creator is finally over, ending in ourselves. A Zen text poetically describes the experience, suggesting that the inner self, fully realized, reaches cosmic proportions. The mirror of the mind illuminates everything brilliantly. Its penetrating, limitless rays reach everywhere in the Universe. Without exception, everything is reflected in this mirror. The entire Universe is a gem of light. Zen and like-minded schools of Buddhism do not recognize the concept of God as such, so the given example is an attempt to describe pure experience. However, most other Buddhist schools and texts that refer to the Divine Light do so in reference to the cosmic, God-like Buddha. It is often said that the brilliance of the Buddha's light is indescribable. The Buddha of immeasurable life has eighty-four thousand features; each feature has eighty-four thousand secondary attributes; each secondary attribute sends forth eighty-four thousand rays of light; each ray of light illuminates the world for ten quarters and those Buddha-conscious living beings are eternally embraced (by that light).

In the 8th century Mahayana texts - a branch of Buddhism meaning 'Great Vehicle' - the Buddha's light is said to be 'beautiful', 'exceedingly powerful', 'incomparable' and 'endless brilliance'. Buddha's body radiates brilliant rays and is called the 'King of Light'. These images were applied to the mythological account of the Buddha's birth. When he saw the newborn Buddha for the first time, although with such an overwhelming brightness, he attracted everyone's gaze like the moon. With the dazzling brightness of his limbs he extinguished, like the Sun, the brightness of the lamps; with its beautiful shade of precious gold, it illuminated all quarters of the space. Buddhism is a path of practice and spiritual development that leads to Insight into the true nature of reality. Buddhist practices such as meditation are a means of changing a person to develop the qualities of awareness, kindness and wisdom. The experience developed within the Buddhist tradition over thousands of years has created an unparalleled resource for all those who wish to follow the path - a path that ultimately culminates in enlightenment or Buddhism. An enlightened being sees absolutely clearly the nature of reality, as it is, and lives fully and naturally in accordance with that vision. It is the goal of the Buddhist spiritual life, representing the end of suffering to the one who attains it. Because Buddhism does not include the idea of worshiping a creator God, some people do not see it as a religion in the usual, Western sense. The basic tenets of Buddhist teaching are clear and practical: nothing is solid or permanent; actions have consequences; change is possible. Thus, Buddhism addresses all people regardless of race, nationality, class or gender. He teaches practical methods that enable people to understand and use his teachings to transform their experience and take full responsibility for their lives. The 'luminous mind' is a Buddhist term that appears in the Pali Anguttara Nikaya sutta, as well as

numerous Mahayana texts and Buddhist tantras. It is variously translated as 'bright mind', or 'mind of clear light', while the related term radiance is also translated as 'pure light' in Tibetan-Buddhist contexts or 'purity' in East Asian contexts. The term is commonly used to describe the mind or consciousness in various ways. This term has no direct doctrinal explanation in the Pali-discourses, but later Buddhist schools explained it using various concepts developed by them. The Theravada school identifies the 'luminous mind' with bhavanga, a concept first proposed in the Theravāda Abhidhamma. Later schools of Mahayana identify it with the Mahayana concepts of bodhicitta and tathagatagarbha. This concept is of central importance in the philosophy and practice of Dzogchen. In the early Buddhist texts, there are various references to radiance or radiance referring to the development of the mind in meditation. For example, in the Saṅgīti-sutta it refers to the attainment of samadhi, where the perception of light (āloka sañña) leads to a mind endowed with luminescence (sappabhāsa). According to Analayo, the Upakkilesa-sutta and its parallels mention that the presence of impurities 'results in the loss of that inner light or luminescence (obhāsa) experienced during meditation'. The Pali Dhātuvibhaṅga-sutta uses the metaphor of refining gold to describe the equanimity achieved through meditation, which is said to be 'pure, bright, soft, practicable, and brilliant'. The Chinese parallel to this text, however, does not describe calmness as luminous. Analayo sees this difference as the tendency of the reciters of the Theravada canon to prefer images of fire and light.

3.2. Light in Hinduism

During the dark months, Hindus celebrate light with two festivals: Diwali (Deepavali), the Hindu festival of light, and Makara Sankranti, honoring the Sun as it heads north. Light has a special meaning for Hindus: dispelling darkness, giving life, marking the passage of time, bestowing mental clarity and knowledge, and drawing closer to the Divine. Many sacred hymns represent the power and prominence of light. Most Hindus believe that a spark of divinity resides in every soul, signifying a personal connection with the Creator. Prayers ignite that inner light, connecting the shell individually to all other beings, as well as collectively to larger social and cosmological forces. The words of the ancient Gayatri Mantra speak of the power of divine light.

Diwali (Deepavali) marks a time of resplendence, feasting, fellowship and prayer - all designed to spark the light in people as the days grow shorter and colder. Associated with many mythological stories and family traditions, this festival celebrates the triumph of good over evil, light over darkness. Around the world, Hindu families set off firecrackers and lit rows of oil lamps (diya) along the foundations and balconies of their homes. Similarly, at Yale University, the banquet hall is decorated with tables laden with diyas, a service is held, and after that, champagne is lit to celebrate Diwali. Dia herself offers an important allegorical lesson. The wick of diya cotton must stay with one end in the oil and the other in the air, otherwise it will not burn. Similarly, the scriptures suggest that humans will thrive if they are able to exist within the world without being completely submerged. Light signifies absolute truth, an unfettered existential understanding of reality that transcends the mundane material world. Those who acquire such knowledge are 'enlightened' by it, literally filled with divine light. These gurus provide people with wisdom and spiritual lessons; they are 'guiding lights' that banish people's fears and anxieties so that they can see and think clearly.

Sunlight literally dispels the darkness, making the physical landscape safe to traverse, revealing potentially dangerous opportunities otherwise hidden. It lifts people's spirits - literally brightens them up. He is the Son of Aditi (the mother of creation), the Sun God who traverses the heavens, is of a brilliant golden color, possessor of innumerable rays, illuminating all directions, he is the creator of daylight. He is the all-pervading, shining principle, the dispeler of darkness, who displays a beautiful scene with a golden hue. Hail to the dispeler of darkness, destroyer of cold, fog and snow, exterminator of enemies; one whose scope is immeasurable. Salutations to the destroyer of the ungrateful and the Lord of all stellar bodies, who is the first among all the lights of the Universe. Every January, Hindus celebrate Makara Sankranti, a four-day festival in honor of the most prominent light - Surya, the sun god. This festival happens at the same time every year. This is somewhat unusual for Hindu festivals that usually follow the lunar calendar. In the US, Sankranti occurs from January 13 to 16, with the main day on the 14th. The date is based on astronomical calculations and marks the point at which the Sun begins its northward migration from the Tropic of Cancer to the Tropic of Capricorn. Makar is a Capricorn, and Sankranti refers to the movement from one zodiac sign to another. Of further importance is the passage of time; Hindus believe that one human year is equal to one day for the gods. Makara Sankranti marks the end of the night time for the gods and the dawn of a new day; for people, it marks the transition to a more favorable time of coming out of darkness (long nights) into light (longer days). It is also seen as a reawakening

as the warming soil is imagined to give way to early-spring flowering bulbs and asparagus spears. A verse from the Bhagavad Gita (5:16), one of the most sacred Hindu texts, helps summarize the importance of light for Hindus: “But for those whose ignorance is destroyed by divine knowledge, the Supreme Entity is revealed, just as the sun illuminates everything when it rises” [9]. During this period of darkness, the light within each person shines brightly, connecting people more tightly to each other, to all life forms on Earth, to the Cosmos, and to the Light and Transcendent.

4. Buddhist temples

A Buddhist temple or Buddhist monastery is a place of worship for Buddhists, followers of Buddhism. It includes structures called viharas, chaityas, stupas, wats and pagodas in different regions and languages. Temples in Buddhism represent the pure land or pure environment of the Buddha. Traditional Buddhist temples are designed to inspire inner and outer peace. Its architecture and structure varies from region to region. Usually, a temple consists not only of its buildings, but also of its surroundings. Buddhist temples are designed to symbolize the five elements: fire, air, earth, water and wisdom. Temple design in India was influenced by the idea of a place of worship as a representation of the Universe. For Buddhist temple complexes, one high temple is often located in the center and surrounded by smaller temples and walls. This center is surrounded by water, mountains and a huge wall. Chaitya, Chaitya hall or Chaitya-griha refers to a shrine, temple or place of prayer in Indian religions. The term is most common in Buddhism, where it refers to a space with a pillar and a rounded apse at the end, opposite the entrance, and a high roof with a rounded profile. Strictly speaking, a chaitya is a stupa itself, and Indian buildings are chaitya-halls, but this distinction is often not noticed. Many of the early Chaityas were rock-cut, as in the Karla and Ajanta caves [10]. Some of the earliest free-standing temples may have been of the circular type. Emperor Ashoka (304-232 BC) built the Mahabodhi Temple at Bodh Gaya around 250 BC, a circular structure, to protect the Bodhi Tree under which the Buddha found enlightenment. The Bairat Temple is also a round building, which can be seen through the archaeological remains. Representations of this early temple structure are found in a 100 BC relief carved on the stupa enclosure at Bharhut as well as at Sanchi. From this period remains the Diamond Throne, an almost untouched slab of sandstone decorated with reliefs, which Ashoka placed at the foot of the Bodhi-tree. These circular type temples were also found in later rock-hewn caves such as Tulja or Guntupalli.

Mahabodhi Temple (literally: Great Temple of Awakening) or Mahabodhi Mahavihar, is an ancient, but restored, Buddhist temple in Bodh Gaya, marking the site where the Buddha attained enlightenment. Bodh Gaya is about 96 km from Patna, Bihar state, India (Figure 2). The site contains a descendant of the Bodhi-tree under which the Buddha attained enlightenment. It has been a major pilgrimage destination for Hindus and Buddhists for over two thousand years, with some elements possibly dating back to the Ashoka period. What is now visible on the ground basically dates from the 7th century, or perhaps slightly earlier, as well as several major restorations since the 19th century. The structure now includes large parts of earlier works, probably from the 2nd or 3rd century. Many of the oldest sculptural elements have been moved to a museum next to the temple, and some, such as the carved stone wall around the main building, have been replaced with replicas. The survival of the main temple is particularly impressive because it was mostly made of brick covered with stucco, materials that are much less durable than stone. However, it is understood that very little of the original sculptural decoration has been preserved. The temple complex includes two large Shikharas on one side and the other, where the larger one is over 55 meters high. This is a stylistic feature that has continued in Jain and Hindu temples to this day, and has influenced Buddhist architecture in other countries, in forms such as the pagoda.



Figure 2. Mahabodhi Temple or Mahabodhi Mahavihar in Bodh Gaya, India
<https://smarthistory.org/bodh-gaya/>, Accessed: 7.8.2022.

<https://www.tripiwiki.com/bihar/mahabodhi-temple-complex-at-bodh-gaya-Attractions>, Accessed: 7.8.2022.
<https://www.thehistoryhub.com/mahabodhi-temple-gaya-facts-pictures.htm>, Accessed: 7.8.2022.

The Bharhut stupa may have been first built by the Maurya king Ashoka in the 3rd century CE, but many of the artworks, particularly the gates and railings, were apparently added during the Shunga period, with many reliefs from the 2nd century BC or later (Figure 3). Alternatively, the sculptures were added during the reign of the Sughanas, a northern Buddhist kingdom. The central stupa was surrounded by a stone wall and four Torana gates, in an arrangement similar to that of Sanchi. A large part of the fence was found, but only one of the four toran doors remained. An epigraph on the pillar of the stupa gate mentions its erection "during the reign of the Sugas by Vatsiputra Dhanabhuti" [11]. The term used is 'Suganam Raja', it may mean 'during the reign of the Shungas', although it is not without ambiguity as it could also be 'during the reign of the Sughanas', a northern Buddhist kingdom.

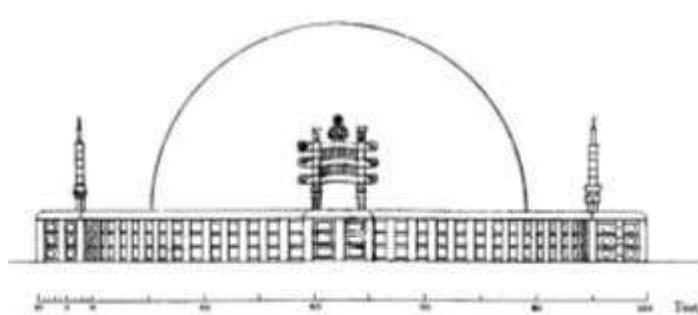


Figure 3. Stupa in Bhārhut

<https://www.britannica.com/art/Bharhut-sculpture>, Accessed: 7.29.2021.

<https://www.britannica.com/place/Bharhut>, Accessed: 7.29.2021.

Sanchi is a Buddhist complex, known for its Great Stupa, on a hilltop in the town of Sanchi in Raisen district, Madhya Pradesh state, India (Figure 4). It is located 46 kilometers northeast of Bhopal, the capital of Madhya Pradesh. The Great Stupa at Sanchi is one of the oldest stone structures in India and an important monument of Indian architecture. It was originally commissioned by the Moorish emperor Ashoka the Great in the 3rd century BC. The core of the building was a simple hemispherical brick building built over the relics of the Buddha. It was crowned by a chhatri, a parasol-like structure that symbolized high rank and was intended to honor and shelter relics. The original construction work of this stupa was supervised by Ashoka, whose wife Devi was the daughter of a merchant from nearby Vidisha. Sanchi was her birthplace as well as her and Ashoka's wedding venue. In the 1st century AD four intricately carved torans (decorative gates) and a fence surrounding the entire structure were added. Sanchi Stupa built of bricks, in the Mauryan era. Composite flourished until the 11th century. Sanchi is the center of a region with many stupas, all within a few kilometers of Sanchi, including Satdhara (9 km west of Sanchi, 40 stupas, Relics of Sariputra and Mahamoggallana, now housed in the new Vihara), Bhojpur (also called Morel Khurd) and Andher (11 km from Sanchi) as well as Sonari (10 km from Sanchi). Further south, about 100 km away, is Saru Maru. Bharhut is 300 km north-east.

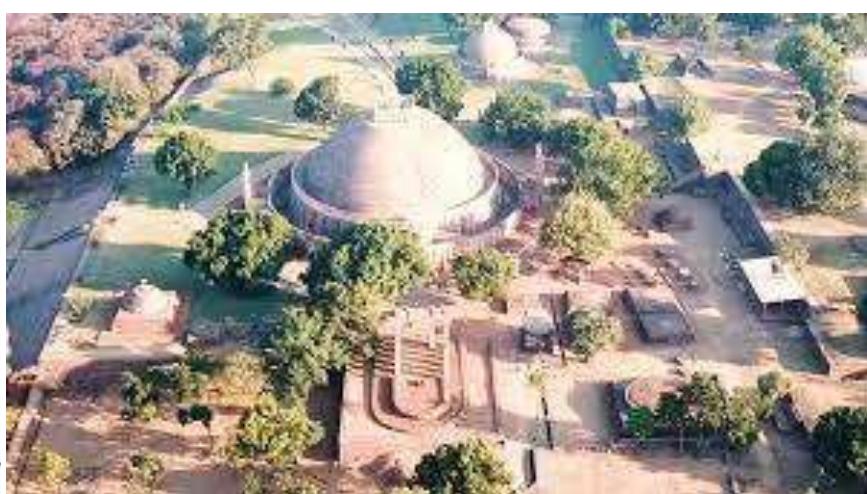
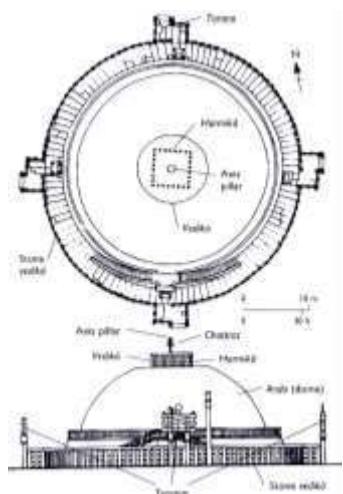




Figure 4. Stupa in Sanchi, India

<https://in.pinterest.com/pin/166422148705248224/>, Accessed: 7.29.2021.

<https://www.facebook.com/MPTourism/videos/sanchi-stupa/713071142463384/>, Accessed: 7.29.2021.

<https://www.facebook.com/visitbuddhistworldheritage/photos/a.956213231386991/1002332073441773/?type=3>, Accessed: 7.29.2021.

Buddhism is the second oldest religion in Indonesia after Hinduism, which arrived from India around the second century. The history of Buddhism in Indonesia is closely related to the history of Hinduism, because at the same time numerous empires were founded under the influence of Indian culture. The oldest Buddhist archaeological site in Indonesia is the Batujaya stupas complex in Karawang, West Java. It is estimated that the oldest relic in Batujaya dates from the 2nd century, while the most recent is from the 12th century. After that, a significant number of Buddhist sites were found in the provinces of Jambi, Palembang and Riau in Sumatra, as well as in Central and East Java. Over the centuries, the Indonesian archipelago has witnessed the rise and fall of powerful Buddhist empires, such as the Sailendra Dynasty, the Mataram Empire, and the Srivijaya Empire. According to some Chinese sources, the Chinese Buddhist monk I-tsing, on his pilgrimage to India, witnessed the powerful maritime empire of Srivijaya based in Sumatra in the 7th century. Numerous Buddhist and historical heritage sites can be found in Indonesia, including the 8th century Borobudur mandala monument and Sewu Temple in Central Java, Batujaya in West Java, Muaro Jambi, Muara Takus and Bahal Temple in Sumatra, and numerous statues or inscriptions from earlier history. Indonesian Hindu empires. During the era of the Kediri, Singhasari and Majapahit empires, Buddhism - identified as Dharma ri Kasogatan - was recognized as one of the official religions of the kingdom along with Hinduism. Although some kings might favor Hinduism over another, nevertheless, harmony, tolerance and even syncretism were promoted as reflected in the national catchphrase Bhinneka Tunggal Ika, derived from Kakawin Sutasoma, written by Mpu Tantular to promote tolerance between Hindus (Shivaite) and Buddhists. The classical period of ancient Java also produced some excellent examples of Buddhist art, such as the statue of Prajnaparamita and the statue of Buddha Vairochana and Bodhisattva Padmapani and Vajrapani in Mendut Temple. In the contemporary Indonesian Buddhist perspective, Candi refers to a shrine, whether ancient or new. For example, several contemporary viharas in Indonesia contain life-size replicas or reconstructions of famous Buddhist temples, such as the replicas of Pawon and Plaosan's perwara (small) temples. In Buddhism, the role of a kandi as a shrine is sometimes interchangeable with a stupa, a domed building for storing Buddhist relics or the ashes of cremated Buddhist priests, patrons or benefactors.

Sewu is an eighth-century Mahayana Buddhist temple located 800 meters north of Prambanan in Central Java, Indonesia (Figure 5). The word for Hindu or Buddhist temple in Indonesian is 'candi', hence the common name is 'Candi Sewu'. Candi Sewu is the second largest Buddhist temple complex in Indonesia; Borobudur is the largest. Sewu is preceded by the nearby temple 'Loro Jonggrang' in Prambanan. Although the complex consists of 249 temples, this Javanese name translates to 'thousand temples', originating from popular local folklore (Legend of Loro Jonggrang). Archaeologists believe that the original name of the temple was Manjusrigha.

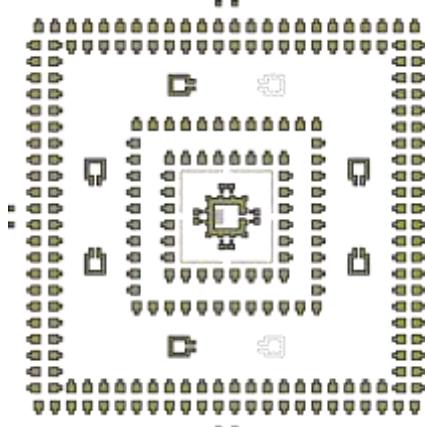


Figure 5. Sewu Temple in Central Java

<https://www.wikiwand.com/en/Sewu>

<https://www.iniono.ga/2017/09/prambanan-temple-largest-hindu-temple.html>

<https://en.wikipedia.org/wiki/Sewu>

<https://myloview.com/sticker-shrine-of-prambanan-hindu-temple-yogyakarta-central-java-indonesia-no-8B30ED7>

Accessed: 7.29.2021.

Borobudur, also known as Barabudur is a 7th century Mahayana Buddhist temple in Magelang, not far from the city of Muntilan, in Central Java, Indonesia (Figure 6). It is the largest Buddhist temple in the world. The temple consists of nine stacked platforms, six square and three circular, with a central dome on top. It is decorated with 2672 relief panels and 504 Buddha statues. The central dome is surrounded by 72 Buddha statues, each placed inside a perforated stupa. Built during the reign of the Sailendra dynasty, the design of the temple follows Javanese Buddhist architecture, which combines the Indonesian indigenous tradition of ancestor worship and the Buddhist concept of achieving Nirvana. The temple demonstrates Gupta art influences that reflect India's influence on the region, yet has enough indigenous scenes and elements to make Borobudur uniquely Indonesian. The monument is a Buddha shrine and a Buddhist pilgrimage site. The pilgrimage begins at the base of the monument and follows the path around the monument, ascending to the top through the three levels of symbolic Buddhist cosmology: Kāmadhātu (world of desire), Rūpadhātu (world of form) and Arūpadhātu (world of formlessness). The monument leads pilgrims through an extensive system of staircases and corridors with 1,460 narrative relief panels on the walls and fences. Borobudur has one of the largest and most complete ensembles of Buddhist reliefs in the world. Evidence indicates that Borobudur was built in the 7th century and later abandoned after the fall of the Hindu kingdoms in Java in the 14th century and the Javanese conversion to Islam. World knowledge of its existence was sparked in 1814 by Sir Thomas Stamford Raffles (1781-1826), then the British ruler of Java, who was alerted to its location by native Indonesians. Since then, Borobudur has been preserved through several restorations. The largest restoration project was undertaken by the Indonesian

government and UNESCO between 1975 and 1982, after which the monument was included in the UNESCO World Heritage List [12]. Borobudur is the largest Buddhist temple in the world and ranks alongside Bagan in Myanmar and Angkor Wat in Cambodia as one of the great archaeological sites of Southeast Asia. Borobudur remains popular for pilgrimage, and Buddhists in Indonesia celebrate the Vesak monument. Borobudur is the single most visited tourist attraction in Indonesia.



Figure 6. Borobudur, Muntilan, Java, Indonesia

<https://townsofusa.com/travels/2013/07/borobudur-temple-in-indonesia/>, Accessed: 7.7.2022.

<https://jakartaglobe.id/culture/thousands-celebrate-buddhas-birthday-borobudur-temple/>, Accessed: 7.7.2022.

Buddhism in Japan coexisted with Shintoism, but in the 8th century Buddhism became the state religion and Buddhist temples were built. A high concentration of important Japanese Buddhist temples can be found in the center of Japanese culture in the Kansai region, especially in Nara and Kyoto.

Tōdai-ji (Eastern Great Temple) is a Buddhist temple complex that was once one of the mighty Seven Great Temples, located in the city of Nara, Japan (Figure 7). Although originally founded in 738, Todai-ji was not opened until 752. In its Great Buddha Hall (Daibutsuden) there is the world's largest bronze statue of Buddha Vairocana, known in Japanese as Daibutsu. The temple also serves as the Japanese headquarters of the Kegon school of Buddhism. The temple is on the UNESCO World Heritage List as one of the 'Historical Monuments of Ancient Nara' [13], along with seven other sites including temples, shrines and sites in the city of Nara. The beginning of the construction of the temple where the Kinshōsen-ji complex is located today can be dated back to 728, when Emperor Shōmu (701-756) established Kinshōsen-ji as a shrine for Prince Motoi, his first son with his wife from the Fujiwara Kōmyōshi clan. Prince Motoi died a year after his birth. During the Tenpyō era, Japan suffered from a series of disasters and epidemics. After experiencing these problems, Emperor Shōmu issued an edict in 741 to promote the construction of provincial temples throughout the nation. Later in 743 during the Tenpyō era, the emperor ordered the Daibutsu to be built in 743. Tōdai-ji (still Kinshōsen-ji at the time) was named the provincial temple of Yamato Province and the head of all provincial temples. A supposed coup by Nagaya in 729, a major smallpox epidemic around 735-737, exacerbated by several consecutive years of poor crops, followed by a rebellion led by Fujiwara no Hirotugu in 740. Emperor Shōmu was forced to move the capital four times, indicating a certain level of instability during this period.

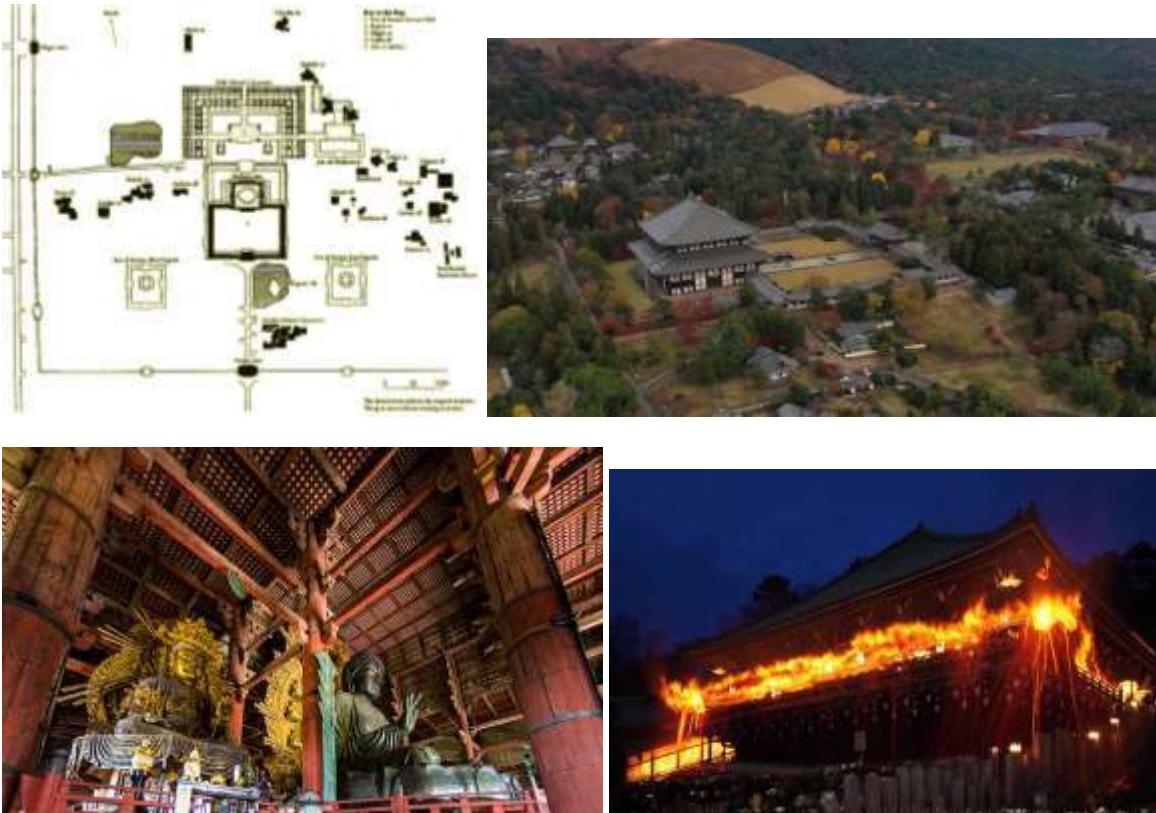


Figure 7. Todaiji Temple Complex

<https://chrisspythoughts.files.wordpress.com/2012/10/untitled1.jpg>

<https://www.shutterstock.com/it/video/clip-1043773693-aerial-view-buddhisttemple-todaiji-t%C5%8Ddai-ji-city>

<https://www.istockphoto.com/search/2/image?phrase=great+buddha+hall+of+todai+ji+temple+in+nara+japan>

<https://www.visitnara.jp/venues/E02017/>, Accessed: 8.6.2021.

Buddhist temples in Thailand are known by the name 'wat', from 'Pāli vāṭa', meaning 'enclosure'. Wat-architecture adheres to consistent principles. Wat, with rare exceptions, consists of two parts - Phutthawat and Sangkhawat. Phutthawat is an area dedicated to the Buddha, while Sangkhawat is an area dedicated to the Sangha Buddhist monastic community.

Wat Arun (Temple of Dawn) is one of the most famous Buddhist temples in Thailand. It is an architectural representation of Mount Meru, the center of the world in Buddhist cosmology (Figure 8). Named after the Hindu god Aruna, this temple was conceived in 1768 by King Taksin. The imposing tower reaches a height of more than 70 meters and is decorated with Chinese porcelain and colored glass. Detailed murals and a golden Buddha image are just a few things to see at Wat Arun.





Figure 8. Wat Arun

<http://www.stonesofhistory.com/tag/wat-arun/>

<https://videohive.net/item/aerial-viewof-wat-arun-temple-in-bangkokthailand-during-lockdown-covidquarantine/26893909>

Accessed: 7.30.2021.

Located in Vientiane, Pha That Luang (The Great Stupa of Laos) is one of the most important monuments in Laos (Figure 9). The stupa has several terraces with each level representing a different stage of Buddhist enlightenment. The lowest level represents the material world; the highest level represents the world of nothingness. Pha That Luang was built in the 16th century on the ruins of an earlier Khmer temple. The temple was destroyed by the invasion of Siam in 1828, and then the French rebuilt it in 1931.



Figure 9. Pha That Luang, Laos

<https://discoverlaos.today/vientiane/thing-to-do/pha-that-luang-stupa>, Accessed: 7.30.2021.

The Jokhang Temple in Lhasa is the most important holy place in Tibetan Buddhism, attracting thousands of pilgrims every year (Figure 10). The temple was built by King Songtsän Gampo in the 7th century. The Mongols looted the Jokhang temple several times, but the building survived. Today, the temple complex covers an area of about 25,000 m².



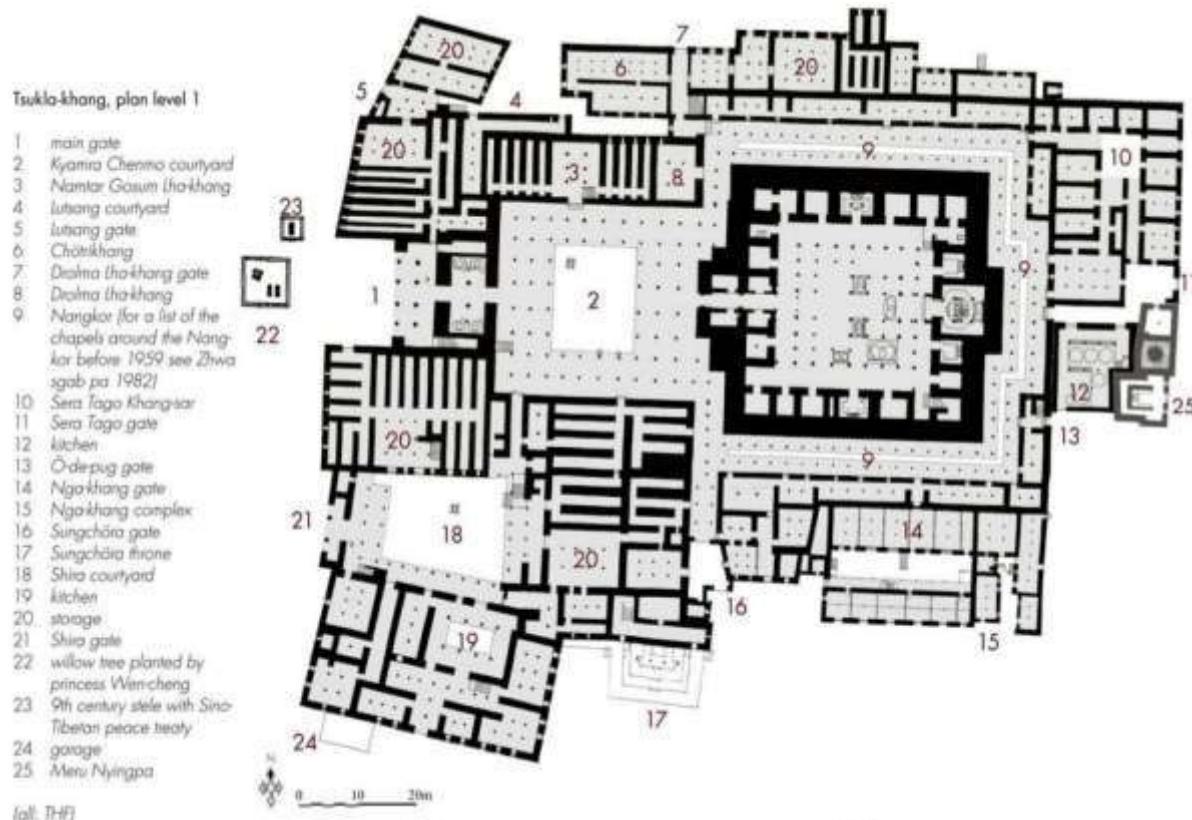


Figure 10. Jokhang Temple in Lhasa, Tibet, China

http://www.xinhuanet.com/english/2019-08/14/c_138309064_3.htm, Accessed: 7.30.2021.

<https://tibetpedia.com/centraltibet/jokhang-temple/>, Accessed: 7.30.2021.

<https://www.christravelblog.com/tibet-lhasa-half-day-jokhang-temple/>, Accessed: 7.30.2021.

The Shwedagon Pagoda (Golden Pagoda) in Yangon is the holiest Buddhist shrine in Burma (Figure 11). The origin of the Shwedagon is lost in antiquity, but it is estimated that the Pagoda was first built by the Mon during the Bagan period, sometime between the 6th and 10th centuries. The temple complex is full of glittering, colorful stupas, but the center of attention is the 99-meter-high stupa that is completely covered in gold.



Figure 11. Shwedagon Pagoda (Golden Pagoda), Yangon, Burma
<http://investvine.com/myanmar-has-8-13-billion-in-foreign-reserves-andgold/shwedagon/ngallery/slideshow>, Accessed: 7.30.2021.

<https://www.pinterest.com/pin/420945896392276195/>, Accessed: 7.30.2021.

<https://www.askideas.com/30-most-amazing-shwedagon-pagoda-interior-pictures-and-photos/>, Accessed: 7.30.2021.

Bagan, also spelled Pagan, on the banks of the Ayerwaddy River, is home to the largest area of Buddhist temples, pagodas, stupas and ruins in the world. It was the capital of several ancient Burmese kings who built perhaps as many as 4,400 temples during the height of the kingdom (between 1000 and 1200 AD). In 1287, the kingdom fell to the Mongols, after refusing to pay tribute to Kublai Khan, and Bagan quickly declined as a political center, but continued to flourish as a place of Buddhist scholarship (Figure 12).

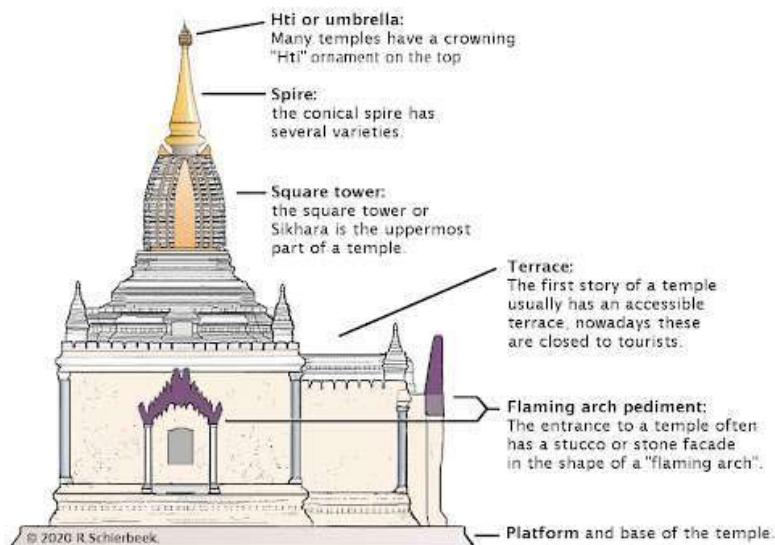
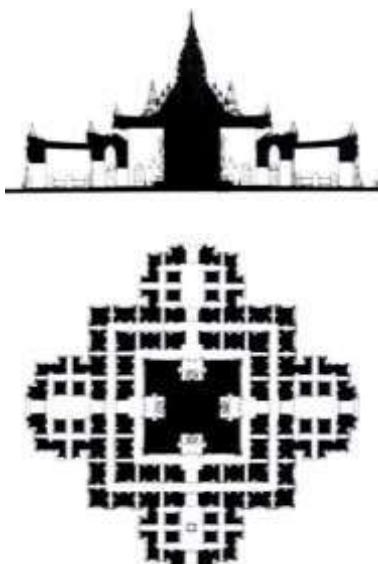


Figure 12. Bagan, Burma

https://livefromalounge.com/myanmar-visa-on-arrival-india/5104226627001_5384074704001_5383835436001-vs/

<http://hiddenarchitecture.net/ananda-temple/>

<http://bytelife.altervista.org/bagan.htm>

Accessed: 7.30.2021.

5. Hindu temples

Mandir or Hindu temple is the symbolic house, seat and body of the deity for Hindus. It is a structure designed to bring together human beings and gods, using symbolism to express the ideas and beliefs of Hinduism. The symbolism and structure of the Hindu temple is rooted in the Vedic tradition, arranging circles and squares. It also represents the recursion and equivalence of macrocosm and microcosm to astronomical numbers and specific alignments related to the geography of the place and the presumed connection of the deity and patron.

The temple includes all elements of the Hindu cosmos - representing good, evil and human, as well as elements of the Hindu sense of cyclical time and the essence of life - symbolically representing dharma, kama, artha, moksha and karma.

The spiritual principles symbolically represented in Hindu temples are given in the ancient Sanskrit texts of India (Vedas and Upanishads), while their structural rules are described in various ancient Sanskrit treatises on architecture (Brhat Samhita, Vastu Sastras). The layout, motifs, plan and construction process speak of ancient rituals, geometric symbolism and reflect the beliefs and values innate within the various schools of Hinduism. A Hindu temple is a spiritual destination for many Hindus, as well as landmarks around which ancient arts, community celebrations and economies flourished. Hindu temples are built in many styles, are located in different locations, employ different construction methods, and are adapted to different deities and regional beliefs, but almost all share certain key ideas, symbolism, and themes. They are found in South Asia, especially in India and Nepal, Pakistan, Sri Lanka, in Southeast Asian countries such as Cambodia, Vietnam, Malaysia and the island of Indonesia, and in countries such as Canada, Fiji, France, Guyana, Kenya, Mauritius, the Netherlands, South Africa, Suriname, Tanzania, Trinidad and Tobago, Uganda, United Kingdom, USA and other countries with significant Hindu population. The current state and exterior of Hindu temples reflect the art, materials and design that have evolved over two millennia; they also reflect the effect of the conflict between Hinduism and Islam since the 12th century. A Hindu temple reflects the synthesis of art, dharma ideals, beliefs, values and lifestyles fostered in Hinduism. It is the connection between man, the deities and the Universal Purusa in the sacred space. It represents the threefold knowledge (trayi-vidya) of the Vedic vision by mapping the relationship between the cosmos (brahmada) and the station (pinda) with a unique plan based on astronomical numbers. The American-Indian computer scientist, Subhash Kak (1947-), sees the temple form and its iconography as a natural expansion of the Vedic ideology associated with recursion, change and equivalence.

The 9 x 9 'Parama Sayika' grid plan (81) is found in large ceremonial Hindu temples (Figure 13). It is one of the many nets used to build Hindu temples. In this structure of symmetry, each concentric layer has significance. The outermost layer, the Paisachika padas, denotes the Asura and evil aspects; while the inner Devika padas denote aspects of Devas and good. Between good and evil is the concentric layer of Manusha padas which signifies human life; all these layers surround the Brahma padas, signifying the creative energy and the place for the temple's primary idol for darsana. Finally, in the very center of the Brahma padas is the Garbhagriha (space of the Purus), which signifies the universal principle present in everything and everyone.

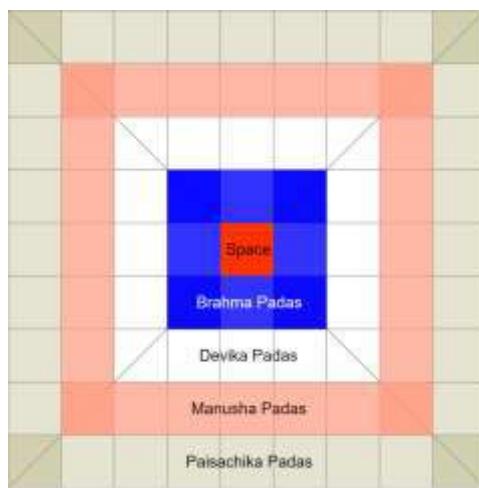


Figure 13. Mandala Parama Sayika - Hindu temple 81 pad

https://upload.wikimedia.org/wikipedia/commons/7/7f/81_grid_Parma_Sayika_design_Hindu_Temple_Floor_Plan_Vastu_Purusa_Mandala_Ancient_Architecture.svg, Accessed: 7.30.2021.

In ancient Indian texts, a temple is a place of Tirtha - pilgrimage. It is a holy place whose ambience and design try to symbolically summarize the ideal principles of the Hindu way of life. All cosmic elements that create and sustain life are present in a Hindu temple - from fire to water, from images of nature to deities, from female to male, from fleeting sounds and smells of incense to eternal nothingness, but also universality at the core of the

temple. Susan Lewandowski states "that the basic principle in the Hindu temple is built around the belief that all things are one, that everything is connected" [14]. The pilgrim is welcomed through mathematically structured spaces with 64 or 81 grids, an artistic grid, pillars with carvings and statues that depict and celebrate the four important and necessary principles of human life - the pursuit of artha (prosperity, wealth), the pursuit of kama (pleasure, sex), the pursuit of dharma (virtues, ethical life) and the pursuit of moksha (liberation, self-realization). In the center of the temple, usually below, and sometimes above or next to the deity, is only a hollow, unadorned space, symbolically representing Purusha, the Supreme Principle, the holy Universal, the one without form, which is present everywhere, connects everything, and is the essence of everyone. The Hindu temple was supposed to stimulate reflection, facilitate the purification of one's mind and initiate the process of inner realization within the devotee. The specific process is left to the devotee's school of faith. The primary deity of different Hindu temples varies to reflect this spiritual spectrum. In the Hindu tradition there is no dividing line between the mundane and the solitary sacred. In the same spirit, Hindu temples are not only sacred spaces, they are also secular spaces. Their meaning and purpose extended beyond spiritual life to social rituals and everyday life, thus offering social meaning. Some temples served as a venue for celebrating festivals, celebrating the arts through dance and music, weddings or commemorating marriages, commemorating the birth of a child, other significant life events, or commemorating the death of a loved one. In political and economic life, Hindu temples served as places of succession within dynasties and landmarks around which economic activity flourished. Almost all Hindu temples have two forms: a house or a palace. A house-themed temple is simply a shelter that serves as the home of a deity. A temple is a place where a devotee visits, just as he would visit a friend or relative. Pāṇini mentions the use of moving and still images. In the Bhakti-school of Hinduism, temples are places for puja, which is a welcoming ritual, where a deity is worshiped and where the devotee invites, attends and connects with the deity. In other schools of Hinduism, a person may simply perform jap, or meditation, or yoga, or introspection in his temple. Temples with a palace theme often include more complex and monumental architecture. A suitable place for a temple, ancient Sanskrit texts suggest, is near water and gardens, where lotus and flowers bloom, where swans, ducks and other birds are heard, where animals rest without fear of injury. These harmonious places are recommended in these texts with the explanation that they are the places where the gods play, and therefore the best place for Hindu temples.

Sri Ranganathaswamy Temple is a Hindu temple dedicated to Ranganatha, a form of the Supreme God, Maha Vishnu, located in Srirangam, Tiruchirapalli, Tamil Nadu, India (Figure 14). Built in the Dravidian architectural style, the temple is celebrated by the Alvaris in its Divya Prabhandi and has the unique distinction of being the most prominent among the 108 Divya Desams dedicated to the Supreme Lord Vishnu. Srirangpatna had the name Srirangapuri in early times. The city is an island surrounded by the river Cauvery. There are temples in this city: Sri Ranganathe, Sri Lakshmi Narasimha, Sri Gangadereshwara, Sri Jyothirmaheshwara and other small temples. Among them is the main temple of Sri Ranganatha. The interior of the Sri Ranganatha temple was built in 817 by a lady named Hambi, of the dancing class. They are the most famous Vaishnava temple in South India, rich in legend and history. The temple has played an important role in the history of Vaishnavism, beginning with the career of Ramanuja in the 11th century and his predecessors Nathamuni and Yamunacharya in Srirangam. Its position, on an island between the rivers Kollidam and Kaveri, made it vulnerable to floods as well as the ravages of invading armies that repeatedly commanded the site for military encampment. The temple was looted and destroyed by the armies of the Delhi Sultanate in a widespread raid on various cities of the Pandyan Kingdom in the early 14th century. The temple was rebuilt at the end of the 14th century, the site was fortified and expanded with many more Gopurams in the 16th and 17th centuries. It was one of the centers of the early Bhakti movement with a devotional tradition of singing and dancing, but this tradition ceased during the 14th century and revived in a limited way much later. The temple occupies an area of 63 ha with 81 sanctuaries, 21 towers, 39 pavilions and many water tanks integrated into the complex making it the largest Hindu temple in the world. The temple is an important archaeological and epigraphic site that provides a historical window into early and medieval South Indian society and culture. Numerous inscriptions say that this Hindu temple served not only as a spiritual center, but also as a large economic and charitable institution that managed educational and hospital facilities, ran a free kitchen and financed regional infrastructure projects from the gifts and donations it received. Some of the buildings of the complex have been renovated and expanded over the centuries as a living temple. The newest addition is an exterior tower approximately 73 meters high, completed in 1987. Srirangam Temple is often cited as one of the largest functioning Hindu temples in the world, and the even larger Angkor Wat is the largest existing temple. The temple is an active Hindu place of worship and

follows the Sri Vaishnavism tradition of the time. The annual 21-day festival held during the Tamil month of Margazhi (December-January) attracts a million visitors.

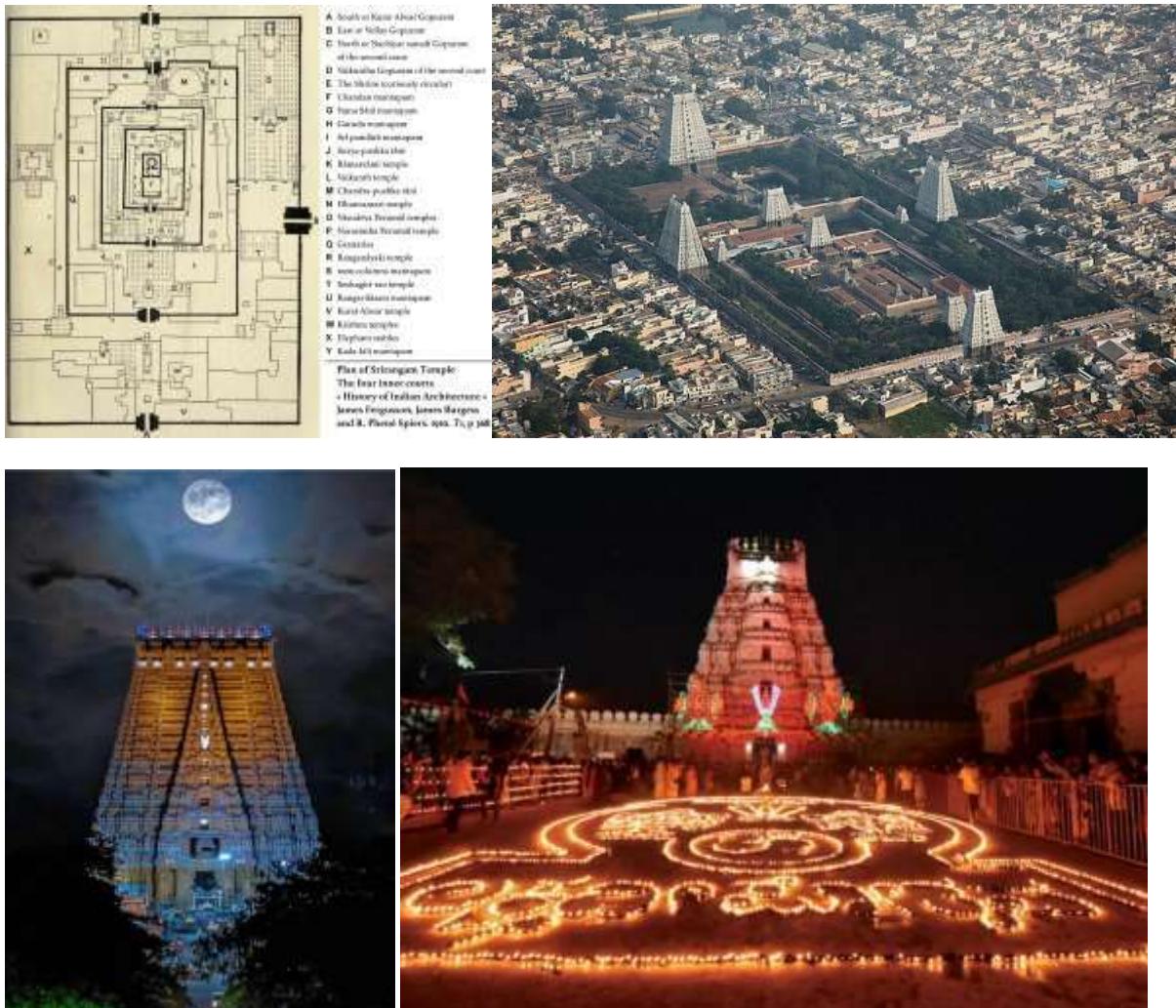


Figure 14. Sri Ranganathaswamy Temple, Tiruchirappalli, India

https://upload.wikimedia.org/wikipedia/commons/7/76/Plan_of_Srirangam_Temple._Burgess%2C1910.jpg

https://ttravelog.com/articles/sri-ranganathaswamy-temple-srirangam-tamilnadu_rmX.html

<http://templetрадition.blogspot.com/2017/04/>

<https://www.quora.com/Which-is-the-first-foremost-and-the-most-important-of-the-108-main-Vishnu-temples-Divyadesams>
Accessed: 7.30.2021.

Swaminarayan Akshardham (New Delhi) is a Hindu temple and spiritual-cultural campus in New Delhi, India (Figure 15). The temple is near the Noida border. It is also called Akshardham Temple or Akshardham Delhi. The complex showcases millennia of traditional and modern Hindu culture, spirituality and architecture. Inspired by Yogiji Maharaj and created by Pramukh Swami Maharaj, it was constructed by BAPS. The temple was officially opened on November 6, 2005. The temple, in the center of the complex, was built according to the Vastu and Pancharatra shastras. There are various exhibition halls that provide information about Swaminarayan's life and work. The designers of the complex have adopted modern means of communication and technology to create different exhibition halls. The complex contains abhishek mandap, Sahaj Anand water show, theme garden and three exhibitions namely Sahajanand Darshan (Hall of Values), Neelkanth Darshan (IMAX film on Swaminarayan's early life as a teenage yogi), Neelkanth and Sanskruti Darshan (cultural boat

ride). According to Swaminarayan Hinduism, the word Akshardham means the abode of Swaminarayan and is believed by followers to be God's temporary home on Earth.



Figure 15. Akshardham, New Delhi, India

<https://www.shutterstock.com/sv/video/clip-1028774129-delhi-india-%22akshardham%22-temple-aerial-4kdrone>

<https://in.pinterest.com/pin/592997475904772978/>

<https://akshardham.com/explore/mandir/mandapams/>

Accessed: 7.30.2021.

Angkor Wat (temple city, city of temples), located in the northwest of Cambodia, is the largest religious building (temple complex) in the world by land area, with an area of 162.6 hectares (Figure 16). In the center of the temple stands a quinix of four towers surrounding a central tower that rises to a height of 65 m above the ground. The temple has three rectangular galleries, each raised above the next. It lies within an outer wall 3.6 kilometers long and a moat more than five kilometers long. The temple was built by order of King Suryavarman II (1094-1150) in the early 12th century in Yaśodharapura (present-day Angkor), the capital of the Khmer Empire, as a state temple for the empire. Originally built as a personal mausoleum for Suryamana, dedicated to the Hindu god Vishnu in the early 12th century, it was converted into a Buddhist temple towards the end of the 12th century. Angkor Wat combines the two basic plans of Khmer temple architecture: the temple-mountain and the later gallery temple. It is designed to represent Mount Meru, the home of the devas in Hindu and Buddhist cosmology. Unlike most Angkor temples, Angkor Wat is oriented towards the west. Scientists are divided as to the significance of this fact. The temple is distinguished by the magnificent harmony of its architecture, the extensive bas-reliefs and statues of Buddha and Devas adorning its walls. As the best-preserved temple on the site, it is the only one that has remained a significant religious center since its foundation. The temple is at the

top of the high classical style of Khmer architecture. It is one of the most important pilgrimage sites for Buddhists in Cambodia and around the world. It has become a symbol of Cambodia, appearing on its national flag, and is the country's main tourist attraction. Angkor Wat played a major role in making Cambodia a Buddhist nation. Angkor Wat is a unique combination of a temple mountain (the standard design for state temples of the empire) and the later plan of concentric galleries. The construction of Angkor Wat also suggests that there was a celestial significance. This is observed in the east and west orientation of the temple, and the lines of sight from the terraces in the temple which show that specific towers are at the exact point of sunrise. The temple is a representation of Mount Meru, the home of the gods: the central quinax tower symbolizes the five peaks of the mountain, and the walls and moat symbolize the surrounding mountain ranges and the ocean. Access to the upper parts of the temple was gradually more exclusive, and lay people were admitted only to the lowest level. The main tower of the Angkor Wat temple aligns with the morning Sun of the vernal equinox. Unlike most Khmer temples, Angkor Wat faces west, not east. This has led many scholars to conclude that Suryavarman intended it to serve as his funerary temple. Further evidence for this view is provided by the reliefs, which run counter-clockwise—prasava in Hindu terminology—because this is the reverse of the normal order. Rituals are performed in reverse order during Brahmic funeral services.

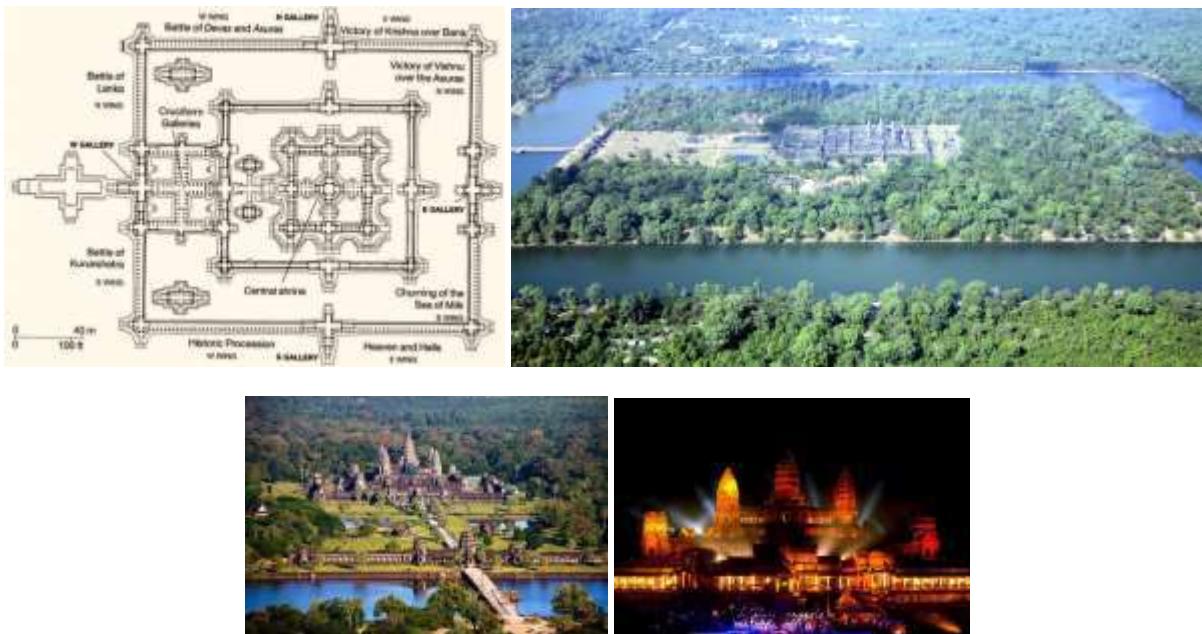


Figure 16. Angkor Wat, Angkor, Cambodia

https://upload.wikimedia.org/wikipedia/commons/8/8f/Angkor_Wat_aerial_view.jpg

<https://www.jacadatravel.com/asia/cambodia/siem-reap-angkor-wat/>

<https://www.mylittleadventure.fr/best-things/krong-siem-reap/tours/private-angkor-wat-tour-from-siem-reap-9yvK47Ni>

<https://www.pinterest.com/pin/204491639310784608/>, Accessed: 7.30.2021.

The Besakih Temple is a pura complex in the village of Besakih on the slopes of Mount Agung in East Bali, Indonesia (Figure 17). It is the most important, largest and holiest temple of Balinese Hinduism and one of a series of Balinese temples. Located almost 1,000 meters up Gunung Agung, it is an extensive complex of 23 separate but connected temples, the largest and most important of which is Pura Penataran Agung. The temple is built on six levels, a terrace along the slope. The entrance is marked candi bentar (split gateway, developed path to the gate), and behind it Kori Agung is the entrance to another courtyard. The exact origins of the temple are not clear, but its importance as a holy place almost certainly dates back to prehistory. The stone bases of Pura Penataran Agung and several other temples resemble megalithic step pyramids, dating back at least 2,000 years. It must have been used as a Hindu place of worship since 1284 when the first Javanese invaders settled in Bali. By the 15th century, Besakih had become the state temple of the powerful Gelgel dynasty. Pura Besakih is a complex consisting of twenty-three temples sitting on parallel ridges. It has stepped terraces and steps that

ascend to numerous courtyards and brick gates that in turn lead to the main tower or Meru structure, called Pura Penataran Agung. All of this is aligned along one axis and designed to lead the spiritual person up and closer to the mountain that is considered sacred. The main shrine of the complex is Pura Penataran Agung. The symbolic center of the main shrine is the lotus throne, or padmasana, which is therefore the ritual focal point of the entire complex. It dates back to around the seventeenth century. A series of Mount Agung eruptions in 1963 that killed approximately 1,700 people also threatened Pura Besakih. The lava flows bypassed the temple complex by only a few meters. The saving of the temple is considered by the Balinese people to be miraculous and a signal from the gods that they want to show their power, but not to destroy the monument erected by the Balinese believers.

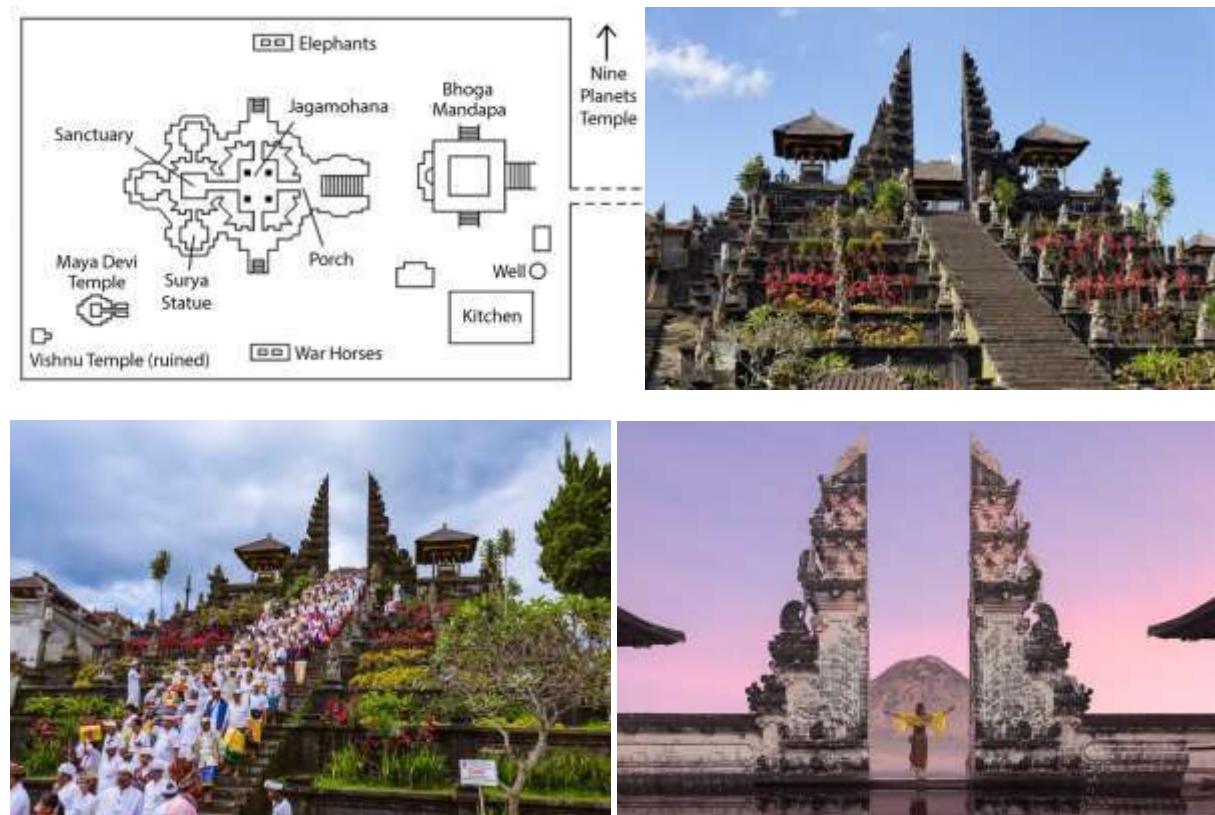


Figure 17. Besakih Temple, Bali, Indonesia

https://www.researchgate.net/figure/Pura-Besakih-temples-complex-Eastern-Bali-Indonesia-morning-view-and-prayers_fig8_320002999

<https://www.tripsavvy.com/visitingpura-besakih-holiest-temple-in-bali-1629099>

<https://www.lavacanza.in/sightseeing-tour/package/ubud/mothers-temple-of-besakih--lempuyang-temple/d5467-130238p12>

Accessed: 7.30.2021.

Prambanan or Rara Jonggrang is an 8th-century Hindu temple complex in the Yogyakarta region of Indonesia, dedicated to the Trimūrti, an expression of God as Creator (Brahma), Preserver (Vishnu), and Destroyer (Shiva). The temple is located about 17 kilometers northeast of the city of Yogyakarta on the border between the provinces of Central Java and Yogyakarta. The temple complex, a UNESCO World Heritage Site [15], is the largest Hindu temple in Indonesia and the second largest in Southeast Asia after Angkor Wat. It is characterized by tall and pointed architecture, typical of Hindu architecture, and a central building 47 meters high within a large complex of individual temples. Prambanan Temple Compounds originally consists of 240 temple buildings that represent the greatness of Hindu art and architecture of ancient Java, which is also considered a masterpiece of the classical period in Indonesia. The construction of the temple was probably started by Rakai Pikatan and opened by his successor King Lokapala. Some historians who adhere to the dual dynasty theory suggest that the construction of Prambanan was probably intended as a response of the Hindu Sanjaya dynasty to the Buddhist

temples of Borobudur and Sewu of the Buddhist Sailendra dynasty. This marked the return of the Hindu Sanjaya dynasty to power in Central Java after nearly a century of dominance by the Buddhist Sailendra dynasty. Nevertheless, the construction of this massive Hindu temple did mark a shift in the patronage of the Medang court, from Mahayana Buddhism to Shaivite Hinduism. The temple was first built on the site around 850 by Rakai Pikatan and greatly expanded by King Lokapala and Balitung Maha Sambu, King Sanjaya of the Mataram Kingdom. A short script in red with the name 'pikatan' was found on one of the finials at the top of the fence of the Shiva temple, confirming that King Pikatan was responsible for starting the construction of the temple. The temple complex is associated with the Shivagrha inscription of 856, issued by King Lokapala, which describes a Shiva temple complex resembling Prambanan. According to this inscription, the Shiva temple was opened on November 12, 856. According to this inscription, the temple was built in honor of Lord Shiva, and its original name was Shiva-grha (house of Shiva) or Shiva-laya (realm of Shiva). According to the Shivagrha inscription, during the construction of the temple, a public water project was undertaken to change the course of the river near the Shivagrha temple. The river, identified as the Opak River, now flows from north to south on the west side of the Prambanan temple complex. Historians suggest that the river originally curved further east and was considered too close to the main temple. Experts suggest that the movement of the river was to protect the temple complex from the overflow of Lahar volcanic materials from the Merapi volcano. The project was carried out by cutting the river along the north-south axis along the outer wall of the Shivagrha temple complex. The former river course was filled and leveled to create a wider space for temple expansion, space for rows of pvervaras (complementary) temples. With the main prasad tower rising up to 47 meters, the large walled temple complex consists of 240 buildings and the Shivagrha Trimurti temple was the largest of its time. Prambanan served as the royal temple of the Mataram Kingdom, where most of the state's religious ceremonies and sacrifices were conducted. At the height of the kingdom, scholars estimate that hundreds of Brahmins and their disciples lived within the outer wall of the temple. The city center and the court of Mataram were located nearby, somewhere in the Prambanan plain (Figure 18).

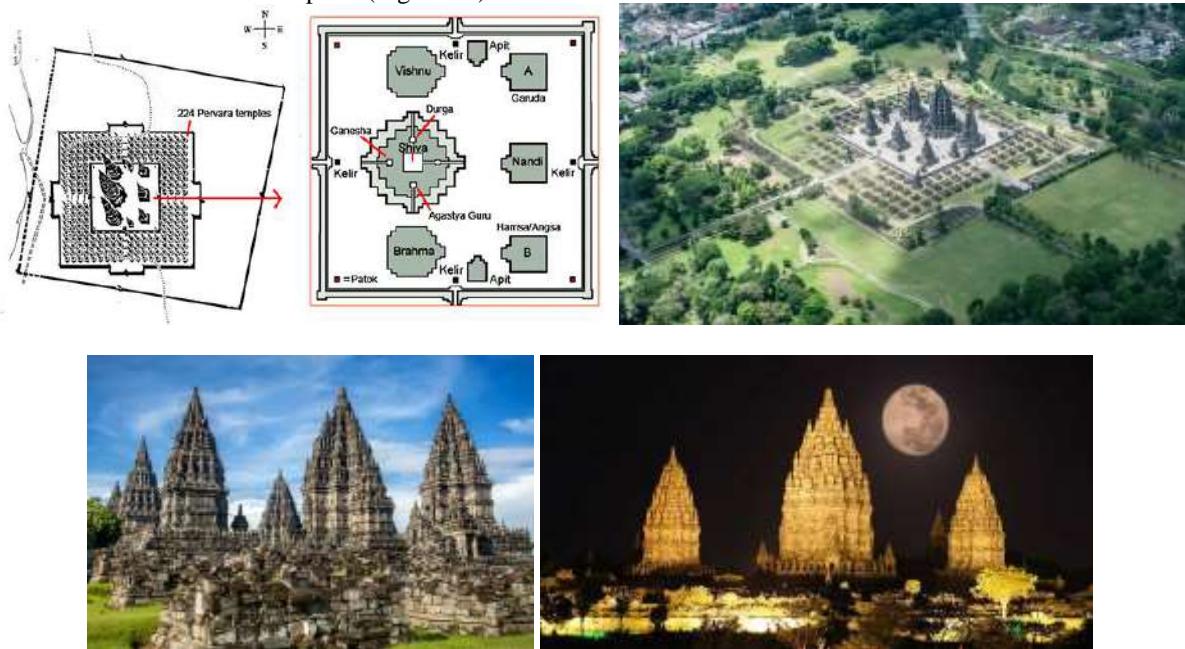


Figure 18. Prambanan or Rara Jonggrang, Yogyakarta, Indonesia

https://sacredsites.com/asia/indonesia/prambanan_temple_yogyakarta_java.html, Accessed: 7.30.2021.
<https://www.lonelyplanet.com/indonesia/prambanan/attractions/prambanantemple/a/poi-sig/1189508/1002221>, Accessed: 7.30.2021.
<https://english.aawsat.com/home/article/2632076/indonesias-prambanan-temple-see-more-visitors-during-holidays>, Accessed: 7.30.2021.

6. Selected examples of artificial lighting of Buddhist and Hindu temples

The Mahabodhi Lighting Project aimed to make one of the largest and most permanent lighting offerings to the historic Mahabodhi Mahavira Temple in Bodh Gaya, India (Figure 19).

This project was guided by the words of the Buddha:

'Appa Deepo Bhava' – 'Be a lamp unto yourself' (Shakyamuni Buddha) [16].

The offering of light (like lighting a candle) since the Buddha's time has symbolized not only an external offering, but the most sacred dawn of inner wisdom, clarity and awareness that awakens all beings from the darkness of ignorance. In addition to this sacred belief, the Mahabodhi Mahavira Temple in the eastern Indian city of Bodh Gaya - a place significantly associated with the Buddha's life as the place where he attained enlightenment, meditating under a fig tree (revered as the Bodhi Tree) - presented a long-lasting light offering through a first-of-its-kind project called Enlightenment Mahabodhi (Lighting the Mahabodhi, LTM). Conceptualized by Siddhartha's Intent India - an educational society working to preserve and propagate the country's rich tradition of classical wisdom, with the active support of the non-profit Vana Foundation and the Khyentse Foundation, LTM intends to illuminate the UNESCO World Heritage site with impressive, quality lighting to enhance the temple's old infrastructure. The current architecture, which consists of a 50-meter-high temple, Vajrasana (the throne that sits on the area where the Buddha attained enlightenment), the sacred Bodhi tree and other six places of worship surrounded by numerous stupas, will receive a powerful illumination, giving thousands of pilgrims, who every year visit the temple, a unique touch of divinity. Illumination of the Mahabodhi (done in 2020) represents a new avatar of the historical monument, which has influenced Buddhist architecture around the world and continues to strengthen the faith of thousands of devotees seeking the elixir of nirvana.



Figure 19. Mahabodhi Mahavira Temple in Bodh Gaya, India

<https://www.stirworld.com/seefeatures-the-site-of-buddhasenlightenment-shines-bright-withlighting-the-mahabodhi>, Accessed: 8.3.2021.

India has a glorious history of temple architecture. The desert state of Rajasthan, where the temple is located, has an equally diverse and refined heritage of buildings located in an unforgiving climate zone. Given this heritage, designing a contemporary Hindu temple set in the sand dunes of Rajasthan was a huge challenge. Lord Shiva, to whom this temple is dedicated, dwells in paradoxes and seeming dualities. In Hindu scriptures and mythology he manifests as both the Preserver and the Destroyer. Together with the goddess Shakti, he transcends the duality of the male and female principles. Like other such perceived dualities, masculinity and femininity are often approached as a continuum rather than a binary in Indian philosophy and mythology. This symbolism had to be translated into evocative spatial traces for the execution of this project. The architecture of the temple combines the heavy materiality of the stone with the lightness of the form, where the solid stone exterior dissolves at dawn and turns into a gentle lantern in the dunes. During the day, light filters into the sanctuary of the temple. At night, the light turns the temple inside out, inviting those outside and rewarding those inside. This gesture also subtly seeks to illuminate the need for inclusion in contemporary religious spaces, which continue to tend to exclude based on age, gender, class, caste or orientation. The state of Rajasthan is known in the world as a source of stone and stonework. The temple project celebrates this heritage. The local Jaisalmer Yellow Sandstone was the stone of choice - its glowing surface reflecting that golden desert Sun strongly associated with Rajasthan. The yellow sandstone gives the temple the appearance of rising from the surrounding sand. The pure compression structure is revealed through every flow and component that forms the superstructure. The design - with its strong form, clear quality and the play of light on the warm stone - seeks to evoke the worshiper's visual and tactile senses. The stainless steel 'shikhara' or pinnacle on golden stone catches the light during sunrise and sunset, and celebrates the heritage of the organization that commissioned this building. At different times of the day, from different directions, the temple is heavy and light, solid and transparent, valid and empty, past and present (Figure 20).





Figure 20. Shiv Temple in Barmer/Temple in Stone and Light (Shiv Temple in Barmer/Temple in Stone and Light), Barmer, Rajasthan, India, 2016. (Architects: Space Matters)

<https://www.spacematters.in/temple-in-stone-and-light>, Accessed: 8.3.2021.

<https://www.archdaily.com/786983/temple-in-stone-and-light-spacematters>, Accessed: 8.3.2021.

Conclusion

The goal of the author's analysis is basically the formation of a historical and practical basis, on the basis of which it is possible to indicate specific approaches to the use of light design in different civilizational structures and certain periods of their creation. When it comes to the evaluation criteria that were applied in the research/presentation of the complete material, in addition to the conditionality of the moment of creation, they mainly refer to the concept, function, forms, and different approaches within the mentioned forms of sacred objects, i.e. the diversity of spiritual identities is dynamized. This author's approach affirms the interculturality of the 'language of light', which represents a specific way of creating a place for a contemplative atmosphere of various forms of religious meetings inside temples. Light in any religion is a special symbol of the presence of divinity. The phenomenon of light is approached as a physical phenomenon that affects the comfort and practical use of space, as well as a symbolic phenomenon rich in social and religious meaning. In addition to artificial light sources, the Sun's (daylight) light was also analyzed, which also contributes to the formation, structure and symbolism of sacred architecture, and plays an important role in ancient mythologies and religions. It conditioned the orientation of the objects, their spaces and contributed to their physical and aesthetic entity.

In general, in architecture light is the starting point; it is not just an opening or a window, that is, a dome, but an element that is thought about at the very beginning of the design. This work suggests the conclusion that the history of architecture is, in fact, a search for light. This is confirmed by the light that dematerializes the surface, becomes more present than the material itself, manipulates the vision and ignites the imagination, depending on the transparency of the material, color, texture, orientation towards the light, quality and quantity of light, the overall arrangement of the space and the position of the observer in it. By manipulating natural and artificially generated light sources, architects over the centuries have made architecture more appropriate and reliable. This paper also suggests the conclusion that light is what enables sacred objects to become architecture, a set of values and their relationships conditioned by the time of creation and spiritual needs/identifications, relationships of existence and consciousness. Light is the anchor that additionally keeps us in the sphere of logical and critical thinking, understanding and reasoning, where not only new or old knowledge is systematized, it gives purpose and enables self-respect. Light understood in this way is – Credo, manifesto and constitution. It could be said that the motif of light in the sacred architecture of all times is an enigma that needs to be solved again and again.

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