

## Harmonious Stones: Unraveling The Acoustic Wonders Of Musical Pillars In Nayak Rule In Madurai

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### **Abstract:**

The present study explores the architectural and cultural phenomenon of musical pillars in Nayak-ruled Madurai. Focusing on temples such as Meenakshi Amman and Nellaiappar, the study explores the acoustic properties and craftsmanship behind these pillars, which, when struck, produce melodic sounds resembling traditional Indian musical instruments. The pillars, primarily made of granite and adorned with intricate carvings, present a blend of art, science, and spirituality. Scientifically, the musical tones result from the resonance and acoustic properties of the stone, with varying sizes and densities contributing to the phenomenon. The research emphasizes the architectural brilliance of Nayak craftsmen, showcasing their advanced knowledge and skills. Beyond scientific aspects, the article underscores the cultural and historical significance of these pillars, reflecting the synthesis of Dravidian and Islamic architectural elements during the Nayak dynasty. The interdisciplinary approach integrates science and culture, providing a comprehensive understanding of the Nayak period's contributions to art and technology. As a testament to Madurai's enduring legacy, these harmonious stones invite further exploration into the intersection of science, artistry, and cultural heritage.

**Keywords:** Musical pillars, Nayak rule, Acoustic wonders, Madurai architecture, Cultural synthesis, Architectural heritage, Dravidian-Islamic fusion.

### **Introduction**

The musical pillars in Tamil Nadu temples are a fascinating architectural and artistic phenomenon. These pillars are primarily found in a few ancient temples in the southern Indian state of Tamil Nadu. The most well-known examples are found in the Meenakshi Amman Temple in Madurai and the Nellaiappar Temple in Tirunelveli. The pillars are typically made of granite and are part of the temple's larger architectural design. Each pillar consists of multiple smaller pillars clustered together to form a larger column. When these pillars are struck, they produce musical notes, resembling the sounds of various traditional Indian musical instruments. The musical tones are believed to be the result of the resonance and acoustic properties of the stone.

The pillars are often adorned with intricate carvings and sculptures, depicting various deities, mythological scenes, and musicians. The carvings showcase the exceptional craftsmanship of the ancient artisans. The exact scientific explanation for the musical properties of these pillars is not completely understood. Some theories suggest that the unique sound is produced due to the different sizes and densities of the individual stone blocks within the pillar. These musical pillars are considered marvels of ancient Indian architecture and engineering, highlighting the advanced knowledge and skills of the artisans who built them. While Meenakshi Amman Temple and Nellaiappar Temple are well-known for their musical pillars, similar structures may exist in a few other temples in the region.

### **Harmony in Stone: Exploring the Enchanting Musical Pillars of Tamil Nadu Temples**

The Musical Pillars in Tamil Nadu temples are a unique and fascinating architectural feature found in some ancient temples in the southern Indian state of Tamil Nadu. These pillars are renowned for their ability to produce musical notes when struck. The phenomenon is often referred to as "musical pillars" or "musical columns." One of the most famous examples of such pillars can be found in the Meenakshi Amman Temple in Madurai,

Tamil Nadu. These musical pillars are a part of the "Swayambu Lingam" or the self-formed Lingam shrine inside the temple. The musical pillars are situated in the "Raya Gopuram," the thousand-pillared hall of the temple. Each pillar in the hall is intricately carved and has different dimensions, creating a variety of musical tones. When these pillars are tapped or struck, they produce melodic sounds resembling musical notes. The phenomenon is often compared to the sounds of various musical instruments such as drums, tabla, and flute. The scientific explanation for this acoustical marvel lies in the resonance and vibration properties of the stone.

The pillars are carved in such a way that they emit musical tones due to the resonance and the quality of the stone used. The unique craftsmanship and architectural design contribute to the creation of these musical notes. Apart from Meenakshi Amman Temple, similar musical pillars can be found in other temples across Tamil Nadu, including the Ekambareswarar Temple in Kanchipuram and the Nelliappar Temple in Tirunelveli. Visitors and devotees often engage in the playful activity of tapping the pillars to experience the enchanting musical sounds. However, due to concerns about preservation and potential damage to the ancient structures, some temples may restrict or discourage people from touching the pillars. These musical pillars stand as a testament to the architectural and engineering prowess of ancient Indian craftsmen and continue to captivate the interest of visitors and researchers alike. The musical pillars in Tamil Nadu temples, particularly in the Meenakshi Amman Temple in Madurai and the Ramanathaswamy Temple in Rameswaram, are remarkable examples of architectural ingenuity and artistic brilliance. These pillars are known for producing musical notes when struck, creating a melodic and harmonious sound. Meenakshi Amman Temple, Madurai

The musical pillars are located in the "Mandapam" (hall) known as the "Hall of Thousand Pillars." Similar pillars can be found in the outer corridor of the temple. The musical pillars are made of granite and are part of the larger temple architecture. The pillars are carved with intricate details, showcasing the craftsmanship of the artisans of that time. Each pillar consists of multiple small, carefully carved pillars clustered together. The pillars are designed to resemble a group of small cylindrical rods, each with its own

resonance. When the pillars are gently tapped or struck, they produce musical notes that resemble the sounds of various musical instruments like drums, tabla, flute, and so on.

The musical quality is attributed to the varying dimensions and densities of the stone material in different parts of the pillar. The musical phenomenon is often explained by the concept of sympathetic vibration. The vibrations created by striking one part of the pillar travel through the structure, causing other parts to vibrate sympathetically, producing musical tones. The musical pillars are not only architectural wonders but also cultural and historical treasures that showcase the advanced knowledge and skills of ancient Indian craftsmen. Due to their historical significance and fragile nature, visitors are usually not allowed to strike the pillars directly. In some cases, restrictions are imposed to preserve these marvels for future generations. The musical pillars are a major attraction for tourists and devotees, drawing people from around the world to witness and experience the unique musical quality of these ancient structures. The musical pillars in Tamil Nadu temples stand as a testament to the rich cultural and architectural heritage of the region, offering a unique blend of art, science, and spirituality. It seems there might be a slight confusion in your question. Musical pillars, typically associated with certain ancient temples or structures, are known for producing musical sounds when struck.

The phenomenon can be explained through principles of acoustics and materials science. The musical pillars are usually made of different types of rocks or stones, each with its own unique acoustic properties. The carvings and the composition of the stone interact to produce resonant frequencies, resulting in the emission of musical tones. The choice of stone or rock for the pillars is crucial. Different materials have different densities, elasticity, and other acoustic properties that influence how sound waves travel through them. When a force is applied to the pillar, it vibrates. The vibrations travel through the material and can create standing waves at certain frequencies. These frequencies correspond to the natural resonant frequencies of the material.

The intricate carvings and the specific shape of the pillar play a significant role. The patterns and contours of the carvings affect the way the vibrations propagate through the material, influencing the frequencies that are amplified. The design of the

pillars can be such that the natural frequencies correspond to specific musical notes or even a scale. The arrangement and spacing of the pillars also contribute to the creation of a musical scale the musical pillars produce sounds due to the interaction of applied forces, material properties, and the specific design and carvings of the pillars. This phenomenon demonstrates an understanding of acoustics and materials science by the ancient architects who built these structures. The musical pillars are a fascinating blend of art, architecture, and science.

### **Architectural Harmony: The Cultural Synthesis of Madurai Nayak Dynasty**

The Madurai Nayak architecture refers to the architectural style prevalent during the rule of the Nayak dynasty in Madurai, a city in the southern part of India. The Nayaks were a dynasty of Tamil origin that ruled over parts of South India from the 16th to the 18th centuries. The most notable among them were the Nayaks of Madurai, who played a significant role in shaping the cultural and architectural landscape of the region. The Madurai Nayak architecture is known for its unique blend of Dravidian and Islamic architectural elements. This fusion is particularly evident in the design of the palace complexes and other significant structures. Gopurams are monumental entrance towers that are characteristic of South Indian temple architecture. In Madurai Nayak architecture, these gopurams are often grand and intricately carved. They serve as the entrance gateways to large temple complexes.

The architecture is marked by tall and ornate pillars, along with pointed arches, reminiscent of Islamic architectural features. These elements contribute to the overall grandeur of the structures. The Nayaks of Madurai were also known for their magnificent palace architecture. The Thirumalai Nayakkar Mahal in Madurai, built by King Thirumalai Nayak, is a notable example. It features a fusion of Dravidian and Islamic styles, with impressive columns and arches. Stucco's work, which involves the use of molded plaster to create decorative elements, was a common feature in Madurai Nayak architecture. Elaborate stucco decorations can be found on walls and ceilings, adding to the visual richness of the structures. Palaces often included spacious courtyards and water features, reflecting a consideration for both aesthetics and practicality. These features also served functional

purposes, providing cooling effects and maintaining a pleasant atmosphere. Vibrant colors were used to enhance the visual appeal of structures. Frescoes and murals with mythological themes were often painted on the walls, showcasing the artistic prowess of the time. The Madurai Nayak architecture is a testament to the cultural synthesis that occurred during this period, combining elements from different architectural traditions to create a unique and visually stunning style. The structures built during the Nayak rule continue to be important cultural and architectural landmarks in the region.

### **Dispelling Nayak Connection**

Vijayanagar Architecture and Nayak Architecture are two distinct styles of architecture that emerged during the rule of the Vijayanagara Empire in South India. The Vijayanagara Empire, which existed from the 14<sup>th</sup> to the 17<sup>th</sup> century, was known for its grandiose architecture and patronage of the arts. The Nayak Dynasty succeeded the Vijayanagara Empire, and their rule further contributed to the architectural landscape of the region. The most prominent features of Vijayanagar architecture are its temples, which are characterized by large and ornate gopurams (entrance towers) adorned with intricate sculptures and carvings. The Virupaksha Temple and the Vittala Temple in Hampi are excellent examples of Vijayanagar temple architecture.

The Raya Gopurams, or monumental entrance towers, are an iconic element of Vijayanagar architecture. These towering structures are richly decorated with sculptures depicting various mythological and religious themes. Vijayanagar temples often feature expansive courtyards and pillared halls. The pillars are intricately carved with mythical motifs, scenes from epics, and divine figures. The Vijayanagara rulers paid attention to civic amenities, and the architecture also included impressive water tanks like the Stepped Tank in Hampi. The Nayak rulers, who succeeded the Vijayanagara Empire, were responsible for the construction of fortified structures.

The Madurai Nayak dynasty, in particular, built the Thirumalai Nayakkar Mahal in Madurai, which served as a palace. Nayak architecture is characterized by a fusion of the Dravidian and Islamic architectural styles. This can be observed in the arches, domes, and vaulted pavilions integrated into the traditional South

Indian architecture. Nayak architecture includes grand palaces with durbar halls, where royal assemblies and court proceedings took place. The Thirumalai Nayakkar Mahal is a notable example.

The Nayaks continued the tradition of constructing large mandapas (halls) and pillared halls in their architectural endeavors. These structures often feature impressive sculptures and carvings. While both Vijayanagar and Nayak architecture share some common elements due to the historical continuity between the two dynasties, the Nayaks introduced their stylistic elements, incorporating influences from different cultural and architectural traditions. The architectural legacy of these empires remains a significant cultural heritage in South India. Vijayanagar Architecture and Nayak Architecture are two distinct but interconnected styles of architecture that emerged in the southern part of India during the medieval period. These architectural styles are associated with the Vijayanagara Empire and the Nayak dynasties, which succeeded the Vijayanagara Empire in different regions. The Vijayanagara Empire, which was founded in 1336 by Harihara I and his brother Bukka Raya I, reached its peak during the 14<sup>th</sup> to 16<sup>th</sup> centuries. The capital of the Vijayanagara Empire was Hampi, and this city is a major example of Vijayanagar architecture. Other significant centers include Lepakshi, Chidambaram, and Srirangam. Large and grand structures were built during this period, reflecting the power and prosperity of the empire. Temples were a major focus, with intricate carvings, large courtyards, and imposing gopurams (entrance towers).

The architecture often featured durable materials like granite, resulting in structures that have withstood the test of time. These are monumental entrance towers at the entrance of large temples, notable for their ornate decorations and imposing presence. Located in Hampi, this temple is dedicated to Lord Shiva and is a prominent example of Vijayanagar architecture. Known for its iconic stone chariot and musical pillars, the Vittala Temple is another masterpiece in Hampi. The Nayak dynasties, particularly the Madurai Nayaks and Thanjavur Nayaks, succeeded the Vijayanagara Empire. The Nayak period extended from the 16<sup>th</sup> to the 17<sup>th</sup> century. The Nayak architecture is associated with the Tamil Nadu region, with Madurai and Thanjavur being major centers. Nayak architecture is a continuation of Vijayanagara architecture but exhibits some influences from the contemporary

Deccan and Dravidian styles. Pillared halls, known as mandapams, became a prominent feature in Nayak architecture. Ornate stucco decorations, especially on the ceilings, are a distinctive feature.

The integration of large courtyards within temple complexes is common. Located in Madurai, this temple is a classic example of Nayak architecture, known for its intricate carvings and colossal gopurams. Also known as the Big Temple, located in Thanjavur, it was originally built during the Chola period but underwent significant renovations during the Nayak rule. Both Vijayanagar and Nayak architectures have left a lasting impact on the cultural and architectural heritage of South India, with their impressive temples and monuments continuing to attract visitors and researchers alike.

### **The Enchanting Musical Pillars of Nellaiappar Temple, Tirunelveli**

The Nellaiappar Temple, also known as the Kanthimathi-Nellaiappar Temple, is a Hindu temple dedicated to Lord Shiva and Goddess Parvati. It is located in the city of Tirunelveli in the state of Tamil Nadu, India. One of the unique features of this temple is the musical pillars or "singing pillars." The musical pillars are a set of intricately carved pillars in the Alankara Mandapam (Hall of Decorations) of the temple. These pillars are known for producing different musical notes when struck. Each pillar is carved out of a single stone and is believed to represent various musical instruments. The phenomenon is created by the specific architectural design and the resonance of the stone. Legend has it that the pillars were created by the divine architect Vishwakarma, who designed them to produce melodious sounds to entertain the deities. The pillars are sculpted in such a way that they emit musical tones resembling various musical instruments like drums, tabla, and flute when struck gently. However, it's essential to note that over the years, the temple authorities have restricted visitors from touching or striking the pillars directly to preserve the sculptures. The delicate carvings are susceptible to damage from constant contact. The Nellaiappar Temple is not the only temple with musical pillars, but it is one of the most famous examples. Similar architectural wonders can be found in some other temples across India, each with its own unique designs and musical characteristics.

The Musical Pillars have different sizes and shapes, and they are carved with various musical instruments like drums, mridangam, and flute. When these pillars are struck gently, they produce musical notes that resemble the sounds of these instruments. The phenomenon is often attributed to the craftsmanship and architectural ingenuity of the artisans who built the temple. It's important to note that in recent times, due to concerns about preservation and potential damage, authorities have restricted or prohibited visitors from touching or striking the pillars. This is done to ensure the longevity and conservation of these unique architectural marvels.

### **Musical Pillars of Thanumalayan Temples**

The Nelliappar Temple, with its Musical Pillars, is not only a place of worship but also a cultural and historical gem that attracts tourists, historians, and devotees alike. It showcases the rich heritage of Indian temple architecture and the skill of ancient artisans who created such marvels. The Thanumalayan Temple, also known as Suchindram Temple, is a Hindu temple located in Suchindram, near Kanyakumari in the state of Tamil Nadu, India. One of the notable features of this temple is the musical pillars.

The musical pillars are found in the Alankara Mandapam (ornamental hall) of the temple. These pillars are not just structural elements but are designed to produce musical notes when struck. Each pillar is carved out of a single piece of granite and is intricately designed with various musical instruments, such as drums, flutes, and strings. The temple is dedicated to the trinity of Hindu deities – Shiva, Vishnu, and Brahma, collectively known as Sthanumalayan. Among the various architectural marvels in the temple, the musical pillars stand out for their exceptional design.

The musical pillars are found in the outer corridor of the temple. Each pillar is carved out of a single granite stone and produces different musical notes when struck. The pillars are known for creating melodious sounds that resemble musical instruments such as drums, tabla, and flute. The phenomenon is attributed to the precise carving and engineering of the pillars. The artisans of ancient India skillfully hollowed out the pillars to create different thicknesses and densities, allowing each pillar to produce distinct musical tones. When these pillars are tapped gently, they emit musical notes that are said to represent the seven swaras

(musical notes) in Indian classical music. The musical pillars are often referred to as "sazhi" pillars. The term "sazhi" means musical instrument in Tamil. When these pillars are gently tapped or struck, they emit musical sounds resembling the notes produced by the respective instruments depicted on the pillars. The craftsmanship and acoustics of these pillars showcase the architectural brilliance and artistic skills of the ancient builders. It's important to note that while visitors are allowed to gently tap the pillars to hear the musical sounds, excessive or forceful striking can cause damage to these historic pillars. Therefore, visitors are usually advised to handle them with care.

The Thanumalayan Temple is dedicated to the trinity of Hindu deities – Shiva, Vishnu, and Brahma. The musical pillars add a unique and enchanting aspect to the overall spiritual and cultural experience for visitors to the temple. The musical pillars in the Thanumalayan Temple are part of the mandapam (hall) called the Alankara Mandapam. These pillars are renowned for their unique musical qualities. Each pillar is carved out of a single block of granite and is associated with different musical notes. When struck, these pillars produce musical sounds resembling various musical instruments such as drums, tabla, flute, and others.

The sound produced by the pillars is said to be rich and melodious. The pillars are a testament to the exceptional architectural and artistic skills of the craftsmen of that era. However, as a precautionary measure, regular tapping or striking of the pillars is restricted to prevent any potential damage. The musical pillars of the Thanumalayan Temple are a fascinating example of the ancient Indian architectural and artistic heritage, showcasing the intricate craftsmanship and knowledge of acoustics prevalent during the time of their construction.

### **The Melodic Marvel Musical Pillars of Madurai Meenakshi Amman Temple**

The Meenakshi Amman Temple in Madurai, Tamil Nadu, India, is renowned for its architectural and artistic splendor. One of the fascinating features of this temple is the musical pillars or "Singing Pillars" located in the outer corridor of the Meenakshi Nayakar Mandapam. The musical pillars are a set of intricately carved stone columns, each producing different musical notes when tapped. These pillars are sculpted from a single block of granite and are a

testament to the advanced architectural and acoustical knowledge of the ancient craftsmen. The musical pillars are known for their melodic tones that resemble various musical instruments like the flute, mridangam (a percussion instrument), and veena (a stringed instrument). It is said that the British colonial rulers were intrigued by the pillars' musical properties and cut two pillars to examine the inside, hoping to find the source of the sound. Unfortunately, their attempt resulted in damage to the pillars the unique acoustical properties of the musical pillars continue to be a marvel for those who visit the Meenakshi Amman Temple.

The exact technique used to create this acoustic phenomenon remains a mystery, adding to the allure of these remarkable pillars. The musical pillars are part of the "Raya Gopuram" or the hall of thousand pillars within the temple complex. The musical pillars of Madurai Meenakshi Amman Temple are a testament to the advanced architectural and acoustical knowledge of the ancient craftsmen. Each pillar produces a distinct musical sound, and the entire hall was designed to create a symphony when the pillars are struck. However, it's important to note that due to the sensitivity of the structures and the potential for damage, the authorities have placed restrictions on visitors tapping or striking the pillars in recent years. Preservation efforts are in place to protect these unique architectural wonders for future generations to appreciate.

The Musical Pillars are situated in the outer hallway of the temple's hall called "Sundareswarar Hall." These pillars are known for their unique musical notes that emanate when struck. Each pillar produces different musical sounds, resembling various musical instruments. The phenomenon is attributed to the perfect proportions, craftsmanship, and acoustic design of the pillars. The Musical Pillars are carved out of a single block of granite and are part of the 1,000-pillared hall in the temple. The craftsmanship and acoustics of these pillars have fascinated visitors for centuries. It is said that the pillars were created in such a way that they emit different musical sounds corresponding to various notes when tapped. The reason behind this acoustical phenomenon is often explained by the fact that the pillars are intricately carved with different levels of thickness, creating a variety of resonating frequencies. The craftsmanship and engineering techniques

employed by the ancient artisans of the Madurai Meenakshi Amman Temple are celebrated for their ingenuity and skill.

### **Conclusion**

Acoustic Wonders of Musical Pillars in Nayak Rule in Madurai" offers a fascinating exploration into the rich cultural and architectural heritage of Madurai during the Nayak rule. The study delves into the unique phenomenon of musical pillars; shedding light on their acoustic properties and the cultural significance they held in the Nayak era. The research not only highlights the scientific aspects of these harmonious stones but also underscores their role as an integral part of the socio-cultural fabric. The intricate craftsmanship and engineering prowess demonstrated in the creation of these musical pillars reflect the artistic brilliance of the Nayak artisans. Moreover, the study opens avenues for further research, encouraging scholars and enthusiasts to delve deeper into the historical and architectural context surrounding these musical pillars. The interdisciplinary approach, combining science and culture, adds a valuable dimension to our understanding of the Nayak period and its contributions to the realms of both art and technology. serves as a compelling testament to the enduring legacy of Madurai's architectural marvels, inviting readers to appreciate the seamless integration of science and artistry in the creation of these awe-inspiring musical pillars during the Nayak rule.

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