

# Sound of Music in Rocks

**S. Subbulakshmi**

Director, School of Music and Fine Arts  
Vels University (Vistas), Chennai, Tamil Nadu, India

 <https://orcid.org/0000-0003-3277-0926>

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## Abstract

In India many Rock Pillars had occupied a distinguished and special place in Architecture. Especially the Musical Pillars, which produce melodic tones when tapped. They can also be called natural singing Rocks. Among the temples in different regions of Tamilnadu with the Musical Pillars are Nellai Appar Temple in Thirunelveli, Meenakshi Amman Temple in Madurai, Thaanaal Ayan Temple in Susindram, Alwaar Thirunagari Temple in Thirunelveli, Shembagaraama Nallur Temple in Thirunelveli, Airavatheshwarar Temple in Dhaaraasuram, Dhaadikkombu Temple in Dindukkal, Varadaraajar Temple in Kanchipuram. In India, there are Three types of Musical stones are seen. According to a Petrological study, Metamorphic Rocks turn into Granites. From these Granites, Musical Pillars are carved out of a single block of Granite. According to a Mineralogical study, the Rocks are Resonants in nature not only because of the metallic ores present but also because of more Silica in them.

**Keywords :** Architecture, Musical Pillars, Echo, Lithophones, Temples in Tamilnadu, Mohs, Granite, Rock Gong, Geology, Conch

The Architects of ancient India have proved their Talent and mettle beyond their caliber of present times. The heritage sites are excellent examples to prove those Atrisan's musical knowledge. Amongst them, the Musical Pillars found in the Temples of South India produce different tunes altogether. The Musical Pillars show the quality of Musical Knowledge of the Architects, other than Shilpa Shastra. We are astonished by the Musical knowledge of Sculptures of the early period through their vision of Musical Pillars. The period of Pandya, Chola, Pallava, Nayaka and Vijaya Nagara had occupied a distinguished and special place in Architecture and Sculptures in the History of Tamilnadu.

## Musical Pillars

The ancient Hindu Temples were well known for their grand architecture and construction. Many majestic sculptures were carved on their interior and exterior walls and pillars.

These pillars are not hollow inside. They are fixed at both ends. Testimony of Hindu Art: Musical Pillars are the testimony of Hindu Art. Musical Pillars are the testimony of Hindu Art. From the 8th to 16th Century, south Indian temples have interesting architectural elements, known as Musical Pillars, made up of Granites. These Musical Pillars are often carved from a single piece of granite stone.

## Echo



If we are in a Mountain Valley and produce a sound, it will be reflected and returned as Echo. This is the first sound referred from Rocks. The Sound travels at high speed, hit the rocks and is thrown back. This phenomenon is called Echo and this is scientifically proven. Depending on the loudness of the sound wave, accordingly, the Rock throws back loud sound as an Echo. As it Hits the surface of many rocks, we get 2, 3 sounds in different intervals. We have an example of this echo type of architect in the Thiruvaiyaaru temple. The Thiruvaiyaaru temple walls are constructed of Granites. When we produce sound loudly in the outer corridor, the sound reflects multiple times in a consecutive echo form.

### Natural Singing Rocks: Litho Phone



Litho phones In Nature, there are rocks that have the property of sounding like a bell when struck. The Musical Instruments made with these rocks or pieces of rocks emit musical notes when they are struck. These Instruments are called Lithophones. By doing experiments on these rocks, we can show the acoustical nature of these rocks. Research Paper by M G. Prasad and B.Rajavel, Stevens Institute of Technology, New Jersey U.S) Like this, some stones can produce melodious notes like musical Instruments and they would be probably release these sounds when they are tapped. South India has many such fascinating musical stones which produce Musical Notes when tapped. But South India, especially Tamilnadu, however, does not boast of such exquisite Musical Arts.

### Musical Pillars in South India

#### Tamil Nadu

- Nellaiappar Temple in Tirunelveli,
- Meenakshi Amman Temple in Madurai,
- Thaanumaal Ayan Temple in Susindram,
- Alwar Thirunagari Temple in Tirunelveli District,
- Shembajarama Nallur Temple in Tirunelveli District,

- Aairavatheswarar Temple in Dhaarasuram,
- Thaadikombu Temple in Dindukkal,
- Kalakkaadu – Tirunelveli District
- Courtaalam – Near Tenkasi
- Varadaraajar Temple in Kanchipuram.
- Alagar Koil – Madurai
- Thirumayam Temple – Pudukottai District

#### Andhra Pradesh

- Venkateswara Temple - Tirupathi
- Veerabadra Temple - Lepakshi

#### Karantaka

- Vittala Temple - Hampi

#### Kerala

- Padmanabaswamy Temple – Tiruvananthapuram

### Structure and Kinds of Musical Pillars

They are carved out of a single block of stone bereft of carving. They are usually arranged in groups ( between 3 to 56 ) surrounding a central pillar that supports the roof of the structures. In General, there are three kinds of Musical Pillars found in South India.

1. Beating or Tapping Pillars: They produce sounds when they are tapped. The striking can be either by finger or by wooden sticks. They are solid Pillars.
2. Blowing Pillars: These Pillars have holes in them. They are carved and hollow inside. When the air is blown inside the Pillar hole, the sound is produced.
3. Sound by Air Pressure: Some stone structures where the external air by pressure makes melodic sounds.

### Rocks and Sculptures

It is an amazing work, especially the way the Musical stones are carved into pillars and how they have been arranged shows not only the talent and superior quality of the sculptures but also their skill and knowledge about the stones. Musical stones are naturally formed. Stones that emanate musical sounds are of natural formation and hard to source. The sculptures displayed remarkable skill and ingenuity in crafting these pillars. A rock is made up of two or

more minerals. The hardest stone frequently carved is Granite which is about eight on the Mohs scale said to be the most durable of sculptured stones. According to a Mineralogical study, granite rocks are formed due to magnetic action. Older Igneous rocks were transformed into Granite during the later period. The crystalline structure of certain minerals in rocks has naturally resonant properties.

### Rock Gong

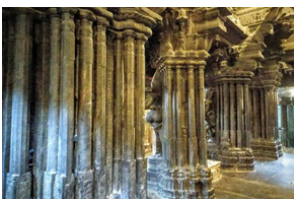


It is a natural rock formation adapted to produce musical tones. Though they look like plain rock, they have a hollow metallic sound due to their different natural composition. The Rock Gongs belong to the Neolithic and Megalithic periods evolved into Lithophones in later periods. So a rock of the early period has a crystalline structure of certain minerals that emit Musical sounds.

### Classical Indian Literature

Indian classical Literature of different periods speaks about temples, building materials and the methods used. These works give us an in-depth technical knowledge of the sculptures (Shilpi), specifically rocks. These texts are 1) Vaayu Purana (35 Bc), 2) Vishwakshena Samhita and 3) Narada Samhita. They elaborate on how to select and choose appropriate stones based on desired Qualities. It looks like Indian stone Sculptures are well versed in the sound-emitting properties of rocks and their different shapes and effects of sound tonality.

### Musical Pillars: Tapping Type Nellaippar Temple – Tirunelveli



Musical Pillars are seen in the Mani Mandapa, opposite Ardha Mandapam of the temple. It belongs to the 7th Century. It is the earliest Musical Pillar found in South India. It was built in the period of Pandiya King Nindraser Nedumaaran. Each Pillar is carved out of a single Rock or Stone. It has a strong central Pillar around it 48 small cylindrical tubes are surrounded. Each Pillar, when tapped, produces sound. These Pillars are proof of the superior craftsmanship of those days. The architecture here is of such high standards and caliber That from a single stone, a cluster of 48 pillars was carved. There are a total of 161 Pillars that can produce Musical Sounds. It is quite interesting when one of them is tapped; all the surrounding pillars vibrate and produce sound. This is called Sympathetic Vibration; that is, all the neighboring pillars will vibrate without tapping .

### Meenakshi Amman Temple: Madurai



There are 5 Musical Pillars seen in Meenakshi Amman Temple, Madurai. They are Monoliths; that is, they are carved from a single stone. It has a large Central Pillar, which is surrounded by 22 small Pillars. These small Pillars are cylindrical. These five musical Pillars are located just outside the thousand pillar hall near the north Tower corridor. The upper and lower portions of the pillars are square and the middle Musical Pillars are Circular and cylindrical type. These pillars are plain without any carvings. Musical Research on this pillar says one of these pillars, when tapped gives out 5 Swaras of Mohana Raaga that is S R2 G2 P D2 S R2 G2. Another pillar, when tapped gives sounds of Navroj Raaga that is S R2 G2 M1 P and P M1 G2 R2 S N2. This is a Panchamanthia Raaga which has only 5 Swaras in use. These pillars were built during the Nayaka period. The upper and lower portions of these musical pillars are beautifully carved.

### Musical Stone Statues

In the thousand pillar Hall at Meenakshi Amman Temple, there are only 985 pillars. Added to it, there are many statues inside this hall carved out of Single stone, and some of these ornate statues, when tapped produce melodious sounds, Especially the statue of Rathi on a swan and Veerabhdhar statues emit different melodic sounds when they are tapped at different places on the statue. Thus the sculptures display a remarkable skill and ingenuity by Crafting these statues which when struck at the right spot produce mellifluous sounds.

### Thaanumaalayan Temple: Suchindram



This temple is known for its quality of artistry in stone. This is built by Chera King Marthanda Kulasekara Perumal of 1410. There are 4 Musical Pillars carved out of a single stone that stands 18 feet (5.5 m ) in height. They are the architectural highlights of this temple. The Musical Pillars are seen opposite to the Bhairava Mandapa. There is one Musical Pillar with a strong Central Pillar surrounded by 24 Pillars on the northern side. There is another Musical pillar with a central Pillar surrounded by 35 Pillars on the southern side. The shape of each Pillar is octagonal at the top, which is attached to the ceiling and square at the bottom attached to the floor. These Pillars, when tapped, produce metallic sounds and sympathetic vibrations also. An amazing feature is that all the pillars of each Group are chiseled out of a single rock Granite. Each group, when tapped, produces different sounds.

### Alwarthirunagari Temple

This is one of the famous Vaishnava Temple of Tamilnadu. The main attractive element of this temple is the Musical Pillars. To our surprise, here in this temple, we see both tapping and blowing Musical Pillars. In Vasantha mandapa, Blowing Pillars have

2 Holes on both sides of the column. When we blow through each hole, they produce different sounds. If two people blow from both ends, it produces two sounds of wind instruments.



The Tapping and Blowing Pillars of Alwarthirunagari Temple

### Stone Nagaswaram



Another interesting blowing stone seen in Alwarthirunagari Temple is Stone Nagaswaram. The stone Nagaswaram is similar in size to that of a Timiri Nagaswaram which is a shorter version of present-day Nagaswaram. The middle part or main part of the body is the Stone. We can play with this Nadaswaram even today. Unless, like normal Nagaswaram, it has only six finger holes. This Nagaswaram is played during some of the Festivals (Raapathu and Pagal pathu) of Alwarthirunagari Temple. The same type of Stone Nagaswaram is seen in the Kumbeshwarar Temple of Kumbakonam. It is also in use even today.

### Shenbagarama Nallur Temple

In this temple, blowing type is seen. It is a Vishnu Temple present in the Nanguneri District of Tamilnadu. These blowing pillars have a cylindrical shape with the conical bore in the center, about 1 foot long. This pillar has a hole about 1 inch diameter on one side and a slightly smaller hole on the other side. When we blow through the big hole, we can hear a conch-like sound, while on the smaller hole Ekkaalam like sound. This shows that the big hole



gives a bass sound and the smaller hole gives a shrill sound. To our surprise, in Alwarthirunagari Temple, below at the bottom of Musical Pillars, there is a small channel-like space of 2-inch diameter. This acts as a Resonator like a Kudam in Veena. There are 4 Musical pillars in Mirror Mandapa.

### **Aairaavatheswarar Temple - Dhaaraasuram**



“This Temple is in Tanjore District. Here the rock stones are in the form of STEPS. It is called “Musicalsteps.” It was built by Rajaraja Chola II in the 12th Century. In front of the Temple, there is a small Mandapa that leads to these Musical Steps. Behind the Nandi mandapa is a small structure with a flight of stairs. These stairs are called the singing stairs. The seven steps of this balustrade staircase correspond to the seven Musical Notes. It is said that walking up and down the stairs or even tapping them produces melodious sounds. These singing steps are one of the melodious stonework and wonders of the world. The Musical steps are ornately carved steps that go from east to west. It is seen as an attached square porch of 7 meters side to Ardhamandapa of Aairaavatheswarar Temple.

### **Soundararaja Perumal Temple; Thaadikkombu – Dindukkal**



This is a vaishnavite temple. It was built by Achyuta Deva Raya during 16 th century A.D. The

Kalyana mandapa has musical pillars, each producing different musical sounds. There are 3 Musical stone Pillars seen in this Temple. This Temple is in Dindukkal District. These Three Pillars emit the three main sounds of Veda Chanting. Udatha, (Rishapam, note), Anudatha (Nishaadam Note), Svaritha (basic note Satjam). It is said that the Vedic hymns were recited along with the accompaniments of these pillars. The three notes can be explained through Karnatic music svaras. One is the basic note (Sa) and the second is a single note above the basic note (R). The third one is a single note below the basic note (N) Kasi Vishwanada Temple - Thenkasi Thenkasi Kasi Vishwanadar temple was built by Parakrama Pandiyan during 13 th century later additions by Madurai Nayakas. This temple boasts beautiful sculptures and musical pillars. These pillars can produce melodious sounds when tapped with fingers.

### **Varadaharaja Perumal Temple - Kanchipuram**

Here in this Temple, the sculptures will produce sounds when tapped. This Temple is well known for its 100 Pillars Hall with sculptures depicting Ramayana and Mahabharatha. It is said that the sculptures of this Gallery can produce sounds of metals such as copper, silver, and the sound of Tambura when tapped. These Musical sculptures are monolithic in Nature.

### **Types of Melodic Sounds**

#### **Melodic Sounds from Stones by AIR**

There are some stone structures that can emit melodious sounds even when they are not blown or Tapped. Just by the Air pressure outside, they will produce sounds with their unique architectural beauty and structure.

#### **Chanting Notes from Stones**

The Pranav Mantra note heard at Tiruchendur Temple is the best example of this one. We can observe a hole or an air passage at the exterior corridor wall of this temple on the seashore side. This small air passage connects the shoreside to the inner dwajasthamba hall. We can hear the Chanting sound of “OHM” through this hole when we place our ears on this hole, inside the dwajasthamba hall. The sea’s air enters through this hole, and by resonance, we

can hear the chanting sound inside the Temple. (Near the Dwajasthambam ) This can be called a sruthi or drone hole, producing only one sound ( OHM). The air passage may be one foot long that is the width of the stone wall.

### **The Chanku Stone Mandapa at River Taamiraparani - Tiruunelveli**



This is another example of the melodic sound produced by AIR. The Unique stone structure on the top of the Mandapa produces sound by Air pressure:

At the center of river Taamiraparani, there is a stone Mandapa. This stone Mandapa is open on three sides and closed on one side. The side opposite the direction of the river path is closed with stones. A stone tower structure is constructed above the Mandapa, and on top of the tower, there is CONCH ( Sangu ) like structures, and that's why it is called Chanku Stone Mandapa by name. During floods, when the water level raises automatically, the air pressure above the water level increases, which in turn produces a syron like sound to alert the people about Floods. A Conch small tubular structure out of stone is carved above the mandapa. This produces Conch like sound when the water level raises. This is also one of the Drone Sound produced by the Unique stone pipe. Depending on the Air pressure, the sound increases like Syron . In wind Instruments, we will we blow pressure to produce high notes. This Mandapa also proves the Craftmanship of our Indian Architects in particular.

### **Author Details**

**S. Subbulakshmi**, Director, School of Music and Fine Arts, Vels University (Vistas), Chennai, Tamil Nadu, India,  
*Email ID:* kavinthree@gmail.com

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