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Pottery And Its Importance:

Pottery plays an important role in studying culture and reconstructing the past. Historically with distinct culture, the style of pottery changed. It reflects the social, economic and environmental conditions a culture thrived in, which helps the archaeologists and historians in understanding our past..

Pottery is the process and the products of forming vessels and other objects with clay and other **ceramic** materials, which are fired at high temperatures to give them a hard, durable form. Major types include **earthenware**, **stoneware** and porcelain. The place where such wares are made by a *potter* is also called a *pottery* (plural "potteries"). The definition of *pottery* used by the American Society for Testing and Materials (ASTM), is "all fired ceramic wares that contain clay when formed, except technical, structural, and refractory products. In archaeology, especially of ancient and prehistoric periods, "pottery" often means vessels only, and figures of the same material are called "terracottas." Clay as a part of the materials used is required by some definitions of pottery, but this is dubious.

Pottery is one of the oldest human inventions, originating before the Neolithic period, with ceramic objects like the Gravettian culture Venus of Dolní Věstonice figurine discovered in the Czech Republic dating back to 29,000–25,000 BC,[2] and pottery vessels that were discovered in Jiangxi, China, which date back to 18,000 BC. Early Neolithic and pre-Neolithic pottery artifacts have been found, in Jōmon Japan (10,500 BC),[3] the Russian Far East (14,000 BC),[4] Sub-Saharan Africa (9,400 BC),[5] South America (9,000s-7,000s BC),[6] and the Middle East (7,000s-6,000s BC).

Pottery is made by forming a ceramic (often clay) body into objects of a desired shape and heating them to high temperatures (600-1600 °C) in a bonfire, pit or kiln and induces reactions that lead to permanent changes including increasing the strength and rigidity of the object. Much pottery is purely utilitarian, but much can also be regarded as ceramic art. A clay body can be decorated before or after firing.

Clay-based pottery can be divided into three main groups: earthenware, stoneware and porcelain. These require increasingly more specific clay material, and increasingly higher firing temperatures. All three are made in glazed and unglazed varieties, for different purposes. All may also be decorated by various techniques. In many examples the group a piece belongs to is immediately visually apparent, but this is not always the case. The fritware of the Islamic world does not use clay, so technically falls outside these groups. Historic pottery of all these types is often grouped as either "fine" wares, relatively expensive and well-made, and following the aesthetic taste of the culture concerned, or alternatively "coarse", "popular", "folk" or "village" wares, mostly undecorated, or simply so, and often less well-made.

Earthenware:

All the earliest forms of pottery were made from clays that were fired at low temperatures, initially in pit-fires or in open bonfires. They were hand formed and undecorated. Earthenware can be fired as low as 600 °C, and is normally fired below 1200 °C.[7] Because unglazed biscuit earthenware is porous, it has limited utility for the storage of liquids or as tableware. However, earthenware has had a continuous history from the Neolithic period to today. It can be made from a wide variety of clays, some of which fire to a buff, brown or black colour, with iron in the constituent minerals resulting in a reddish-brown. Reddish coloured varieties are called terracotta, especially when unglazed or used for sculpture. The development of ceramic glaze made impermeable pottery possible, improving the popularity and practicality of pottery vessels. The addition of decoration has evolved throughout its history.

Stoneware:

Stoneware is pottery that has been fired in a kiln at a relatively high temperature, from about 1,100 °C to 1,200 °C, and is stronger and non-porous to liquids.[8] The Chinese, who developed stoneware very early on, classify this together with porcelain as high-fired wares. In contrast, stoneware could only be produced in Europe from the late Middle Ages, as European kilns were less efficient, and the right type of clay less common. It remained a speciality of Germany until the Renaissance.[9]

Porcelain:

Porcelain is made by heating materials, generally including kaolin, in a kiln to temperatures between 1,200 and 1,400 °C (2,200 and 2,600 °F). This is higher than used for the other types, and achieving these temperatures was a long struggle, as well as realizing what materials were needed. The toughness, strength and translucence of porcelain, relative to other types of pottery, arises mainly from vitrification and the formation of the mineral mullite within the body at these high temperatures.

Production stages:

Before being shaped, clay must be prepared. Kneading helps to ensure an even moisture content throughout the body. Air trapped within the clay body needs to be removed. This is called de-airing and can be accomplished either by a machine called a vacuum pug or manually by wedging. Wedging can also help produce an even moisture content. Once a clay body has been kneaded and de-aired or wedged, it is shaped by a variety of techniques. After it has been shaped, it is dried and then fired.

Clay bodies and mineral contents[edit]

Preparation of clay for pottery in India

Body is a term for the main pottery form of a piece, underneath any glaze or decoration. The main ingredient of the body is clay. There are several materials that are referred to as clay. The properties which make them different include: Plasticity, the malleability of the body; the extent to which they will absorb water after firing; and shrinkage, the extent of reduction in size of a body as water is removed. Different clay bodies also differ in the way in which they respond when fired in the kiln. A clay body can be decorated before or after firing. Prior to some shaping processes, clay must be prepared. Each of these different clays is composed of different types and amounts of minerals that determine the characteristics of resulting pottery. There can be regional variations in the properties of raw materials used for the production of pottery, and these can lead to wares that are unique in character to a locality. It is common for clays and other materials to be mixed to produce clay bodies suited to specific purposes. A common component of clay bodies is the mineral kaolinite. Other minerals in the clay, such as feldspar, act as fluxes which lower the vitrification temperature of bodies. Following is a list of different types of clay used for pottery.[14]

Methods of shaping[edit]

A potter shapes a piece of pottery on an electric-powered potter's wheel

Pottery can be shaped by a range of methods that include:

- Hand-building. This is the earliest forming method. Wares can be constructed by hand from coils of clay, combining flat slabs of clay, or pinching solid balls of clay or some combination of these. Parts of hand-built vessels are often joined together with the aid of slip, an aqueous suspension of clay body and water.

- The potter's wheel. In a process called "throwing" (coming from the Old English word *thrown* □□ which means to twist or turn,[16]) a ball of clay is placed in the center of a turntable, called the wheel-head, which the potter rotates with a stick, with foot power or with a variable-speed electric motor.

  Granulate pressing: As the name suggests, this is the operation of shaping pottery by pressing clay in a semi-dry and granulated condition in a mould. The clay is pressed into the mould by a porous die through which water is pumped at high pressure.
  The granulated clay is prepared by spray-drying to produce a fine and free-flowing material having a moisture content of between about 5 and 6 per cent

  - Injection moulding: This is a shape-forming process adapted for the tableware industry from the method long established for the forming of thermoplastic and some metal components.[17] It has

been called *Porcelain Injection Moulding*, or *PIM*.[18] Suited to the mass production of complex-shaped articles, one significant advantage of the technique is that it allows the production of a cup, including the handle, in a single process, and thereby eliminates the handle-fixing operation and produces a stronger bond between cup and handle.[19]

- Jiggering and jolleying: These operations are carried out on the potter's wheel and allow the time taken to bring wares to a standardized form to be reduced. *Jiggering* is the operation of bringing a shaped tool into contact with the plastic clay of a piece under construction, the piece itself being set on a rotating plaster mould on the wheel. The jigger tool shapes one face while the mould shapes the other. Jiggering is used only in the production of flat wares, such as plates, but a similar operation, *jolleying*, is used in the production of hollow-wares such as cups.
- Roller-head machine: This machine is for shaping wares on a rotating mould, as in jiggering and jolleying, but with a rotary shaping tool replacing the fixed profile. The rotary shaping tool is a shallow cone having the same diameter as the ware being formed and shaped to the desired form of the back of the article being made. Wares may in this way be shaped, using relatively unskilled labour, in one operation at a rate of about twelve pieces per minute, though this varies with the size of the articles being produced. Developed in the UK just after World War II by the company *Service Engineers*, roller-heads were quickly adopted by manufacturers around the world; they remain the dominant method for producing flatware.[21]
- Pressure casting: Specially developed polymeric materials allow a mould to be subject to application external pressures of up to 4.0 MPa – so much higher than slip casting in plaster moulds where the capillary forces correspond to a pressure of around 0.1–0.2 MPa. The high pressure leads to much faster casting rates and, hence, faster production cycles.
- RAM pressing: This is used to shape ware by pressing a bat of prepared clay body into a required shape between two porous

moulding plates. After pressing, compressed air is blown through the porous mould plates to release the shaped wares.

- Slipcasting: This is suited to the making of shapes that cannot be formed by other methods. A liquid slip, made by mixing clay body with water, is poured into a highly absorbent plaster mould. Water from the slip is absorbed into the mould leaving a layer of clay body covering its internal surfaces and taking its internal shape. Excess slip is poured out of the mould, which is then split open and the moulded object removed. Slipcasting is widely used in the production of sanitaryware and is also used for making other complex shaped ware such as teapots and figurines.

- 3D printing: This is the latest advance in forming ceramic objects. There are two methods. One involves the layered deposition of soft clay similar to FDM printing the other and powder binding techniques where dry clay powder is fused together layer upon layer with a liquid.

Decorating and glazing[edit]

Decoration[edit]

- Painting has been used since early prehistoric times, and can be very elaborate. The painting is often applied to pottery that has been fired once, and may then be overlaid with a glaze afterwards. Many pigments change colour when fired, and the painter must allow for this.
- Glaze Perhaps the most common form of decoration, that also serves as protection to the pottery, by being tougher and keeping liquid from penetrating the pottery. Glaze may be clear, especially over painting, or coloured and opaque. There is more detail in the section below.
- Carving Pottery vessels may be decorated by shallow carving of the clay body, typically with a knife or similar instrument used on the wheel. This is common in Chinese porcelain of the classic periods.

- Burnishing the surface of pottery wares may be *burnished* prior to firing by rubbing with a suitable instrument of wood, steel or stone to produce a polished finish that survives firing. It is possible to produce very highly polished wares when fine clays are used or when the polishing is carried out on wares that have been partially dried and contain little water, though wares in this condition are extremely fragile and the risk of breakage is high.
- Terra Sigillata is an ancient form of decorating ceramics that was first developed in Ancient Greece.
- Agateware is named after its resemblance to the quartz mineral agate which has bands or layers of colour that are blended together, agatewares are made by blending clays of differing colours together but not mixing them to the extent that they lose their individual identities. The wares have a distinctive veined or mottled appearance. The term "agateware" is used to describe such wares in the United Kingdom; in Japan the term "*neriage*" is used and in China, where such things have been made since at least the Tang Dynasty, they are called "*marbled*" wares. Great care is required in the selection of clays to be used for making agatewares as the clays used must have matching thermal movement characteristics.

Some specialised glazing techniques include:

- Salt-glazing, where common salt is introduced to the kiln during the firing process. The high temperatures cause the salt to volatize, depositing it on the surface of the ware to react with the body to form a sodium aluminosilicate glaze. In the 17th and 18th centuries, salt-glazing was used in the manufacture of domestic pottery. Now, except for use by some studio potters, the process is obsolete. The last large-scale application before its demise in the face of environmental clean air restrictions was in the production of salt-glazed sewer-pipes.[26][27]

- Ash glazing – ash from the combustion of plant matter has been used as the flux component of glazes. The source of the ash was generally the combustion waste from the fuelling of kilns although the potential of ash derived from arable crop wastes has been investigated.[28] Ash glazes are of historical interest in the Far East although there are reports of small-scale use in other locations such as the Catawba Valley Pottery in the United States. They are now limited to small numbers of studio potters who value the unpredictability arising from the variable nature of the raw material.[29]
- Underglaze decoration (in the manner of many blue and white wares). Underglaze may be applied by brush strokes, air brush, or by pouring the underglaze into the mould, covering the inside, creating a swirling effect, then the mould is filled with slip.
- In-glaze decoration
- On-glaze decoration
- Enamel

ii)Archaeological Sites in Tamilnadu:

A) Kodumanal:

Kodumanal is a village located in the Erode district in the southern Indian state of Tamil Nadu. It was once a flourishing ancient trade city known as **Kodumanam**, as inscribed in *Patittrupathu* of Sangam Literature.[1] The place is an important archaeological site, under the control of State Archaeological Department of Tamil Nadu. It is located on the northern banks of Noyyal River, a tributary of the Cauvery.[2]

The ancient city[edit]

The inhabitants of this destroyed ancient city of Chera dynasty were highly skilled craftsmen, who were specialized in making beads and high-quality iron. The place is referred to in Sangam literature as an important industrial centre that had links with the Chola port city of Kaveripoompattinam, now called Poompuhar.

Roman trade route[edit]

The city played a major role in Indo-Roman trade and relations, as the ancient city is located on the mid-way of a Roman trade route, linking Muziris port on the Malabar Coast with the Kaveripoompattinam (Puhar) Port in the Coromandel Coast.[3][4][5]

Megalithic tombs[edit]

Excavations have been carried out and it came out with the layers of a megalithic-cum-early tombs of historic period. Also there were two female and one male human skeleton were recovered from a pit burial in this site. A set of 300 megalithic tombs of different types and sizes were observed and recorded in this area. The ancient city has been destroyed in time and now the area is available with the remains of a megalithic settlement dating back to the 2nd century BC

Iron and metal[edit]

The iron and steel furnaces and iron artefacts produced in these places revealed the technical advancement made by the iron smelters around 500 BC. The excavated sword bit contained spheroidal graphite phase and forge welding of high-carbon cutting edge.[6][7] This place was once celebrated for its trade in precious stones like garnet, carnelian, lapis lazuli, sapphire and quartz. The people of this city were experts in manufacturing the finest iron.

Collections[edit]

Excavations uncovered ancient iron objects such as arrow heads and swords.[8] They also produced Roman artefacts, iron melting furnaces, beads, shell bangles and pottery with the Tamizhi scripts (from the habitation deposits and burials). Other artifacts uncovered during the excavation of this site include roulette pottery, Roman silver coins, and gold and silver spirals. A bronze statue of a lion and the iron melting furnaces were important to deciphering the site's history.[9][10][11][12][13]

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4. ^ Indian Journal of History & Science,34(4),1999 (through "Digital Library of India") Archived 2015-09-23 at the Wayback Machine
5. ^ *"Excavations at Kodumanal village unearth more ancient objects". The Hindu. 10 May 2018. ISSN 0971-751X. Retrieved 24 June 2019.*

B)Arikamedu

Arikamedu is an archaeological site in Southern India, in Kakkayanthope, Ariyankuppam Commune, Puducherry. It is 4 kilometres (2.5 mi) from the capital, Pondicherry of the Indian territory of Puducherry.

Sir Mortimer Wheeler 1945, and Jean-Marie Casal conducted archaeological excavations there in 1947–1950. The site was identified as the port of Podouke, known as an "emporium" in the Periplus of the Erythraean Sea and Ptolemy. Digs have found Amphorae, Arretine ware, Roman lamps, glassware, glass and stone beads, and gems at the site. Based on these excavations, Wheeler concluded that the Arikamedu was a Greek (Yavana) trading post that traded with Rome, starting during the reign of Augustus Caesar, and lasted about two hundred years—from the late first century BCE to the first and second centuries CE. Subsequent investigation by Vimala Begley from 1989 to 1992 modified this assessment, and now place the period of settlement from the 2nd century BCE to the 8th century CE.

Location:

Arikamedu is a coastal fishing village, under the Ariankuppam Panchayat, on the southeastern coast of India, 4 kilometres (2.5 mi) from Pondicherry, on the Pondicherry-Cuddalore road; it was originally a French colonial town. It is located on the bank of the Ariyankuppam River (for most part of the year the river is considered a lagoon), also known as Virampattinam River, which forms the northern outlet of the Gingee River as it joins the Bay of Bengal. As the site is located at the bend of the river it provides protection to sea-going vessels that dock there. The site has been subject to extensive archaeological excavations.[1][2][3][4][5][6] The archaeological site is spread over an area of 34.57 acres (13.99 ha) and has been under the control of the Archaeological Survey of India since 1982.[1]

History[edit]

The first mention about Arikamedu was in 1734, in a communication from the Consul of the Indo-French colony of Pondicherry. It informed the French East India Company that villagers were extracting old bricks from the Virampattinam. The earliest mention of the Arikamedu archaeological site was by Le Gentil of France, who the King of France had assigned to observe notable astronomical occurrences in the world. Gentil, after visiting Arikamedu, confirmed the earlier report of the Consul of the Indo-French colony.

In 1765, when he visited the ruins at the site, he found the people of the village collecting large ancient bricks exposed at the river bank.[7][2] The villagers told him that they had retrieved the bricks from an old fort of the king the Vira-Raguen.[7] In 1937, Jouveau Dubreuil, an Indologist, also from France, purchased gem stone antiquities from local children, and also gathered some exposed on the site's surface. In particular, he found an intaglio carved with the picture of a man. As a numismatist, he identified the intaglio as Augustus Caesar. He also found fine beads and gems. He concluded that these antiquities belonged to the Roman Empire. Dubreuil informed the local Governor of Pondicherry about his find, and called

Arikamedu "a true Roman city." He published a short note about his findings.[8][5][6][7]

Sir R.E.M.Wheeler, the Director General of the Archaeological Survey of India, in the 1940s saw a few potsherds of Arikamedu site displayed in the Madras Museum, which he identified as *"terra sigillata"*, or Arrentine ware, an expensive ceramic made until 50 CE in Arezzo, Italy.[9] Thereafter, when he visited the Pondicherry Museum and saw more of the findings from the Arikamedu site, he was impressed and thought that he had found the links between the Classical Mediterranean and Ancient India.[7] Soon thereafter in 1945, the penultimate year of World War II, he mounted excavations in a scientific manner. He was looking for an archaeological site in India that could establish its cultural link, a datum of the Indian antiquities to the Greco-Roman period, and this quest led him to the Arikamedu site. These excavations also involved Indian archaeologists, who were trained on the site.

Wheeler published his findings in 1946. He noted that, for the local fishermen of the village, the antiquities were strange—as they consisted of lamps, glass items, gemstones, cutlery and crockery, wine containers, etc. He also observed that traders traveled from west coast and from Ceylon, Kolchoi (Colchi) and the Ganges area to trade goods such as gems, pearls and spices, and silk.[10][6] He carried out excavations carefully, so that none of the antiquities were damaged. This was followed by investigations after the war, from 1947–1950 by Jean-Marie Casal. His report of excavations was not as fully published as Wheeler's. His report was not well known in India, as it was not written in English. However, his important conclusion was that the site belonged to an early megalithic period, as he had located megalithic burials marked by stones, locally known in Tamil as *Pandukal* close to the site.[10][5][7][11]

The extensive findings of glass and stone beads at the site provided Begley the link to Arikamedu's history. She identified the beads as *Indo-Pacific* beads crafted at Arikamedu.[7] Based on the antiquities and structural features from the excavations, Begley and Raman established a revised sequence of six major periods of occupation of the site. Finds of new variety of Roman Amphorae

ware also facilitated revision of the dates of occupancy.[3] They have also inferred that the site has been in continuous occupation since at least 2nd or 3rd century BCE to much more recent times.[12]

Excavations:

According to Wheeler the finds from the northern and southern part of the mound belong to the period from the later part of the 1st century BCE to the 1st and 2nd centuries CE. Identified structures include:

- A brick and lime mortar plaster structure of oblong shape 45 metres (148 ft) in length, with a divide wall, used as a storehouse in the southern part[3][4]
- Two walled enclosures with ponds and drainage systems in the northern part of the mound that could indicate of dyeing operations that used vats to dye muslin for export
- Pottery, both local and Mediterranean, such as amphorae and Arrentine ware[4] that belonged to the Terra Sigillata (stamped pottery) of the 1st century BCE, which went out of use by 50 CE[3]
- Pink amphorae jars used to store wine or oil with two handles and a yellow slip, found in all layers of excavations[3][4]

Conservation[edit]

An international conference that the Government of Pondicherry and the Italian Ministry of Foreign Affairs held in October 2004 decided to investigate the Arikamedu site jointly for conservation, as its ancient commercial link with the Romans has been established. During this conference, the Government of Pondicherry also decided to propose the site for status as a World Heritage Site of UNESCO.[1] The Archaeological Survey of India also proposed the site for UNESCO Cultural Heritage Site status, under the title *Silk Road Sites in India*.[14]

References:

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C)Gudiyam Caves: These are rock shelters in South India and known for prehistoric stone tools and culture. They were first identified by British geologist Robert Bruce Foote. This ancient site is situated in the Thiruvallur district near the Poondi reservoir, 60 km (37.3 mi) from Chennai, Tamil Nadu.

Archaeological evidence suggests that the caves were used by Paleolithic Man. The site has been excavated by the Archaeological Survey of India in 1963 and 1964.[1] Systematic paleolithic studies in this region indicate these sites suggest extensive movement of early hominids across the landscape about **200,000 years** ago. Sixteen such shelters have been identified by the Archaeological Survey of India in Allikulli Hill ranges near Poondi.

External links[edit]

- Archaeological Survey of India
- Tamilnadu Archaeological department
- Documentary Movie

D)Puhar :(also known as **Poompuhar**) is a town in the Mayiladuthurai district in the southern Indian state of Tamil Nadu.[2] It was once a flourishing ancient port city known as **Kaveri Poompattinam**, which for a while served as the capital of the Early Chola kings in Tamilakam. Puhar is located near the end point of the Kaveri river, aside the sea coast. It is mentioned in the Periplus of the Erythraean Sea.

It has now been established by marine archaeological research (conducted by the National institute of marine archaeology, Goa) that much of the town was washed away by progressive erosion and floods. In the 1960s and 1970s, archaeological researches were conducted under the leadership of the noted archaeologist K. V. Soundararajan. Submerged wharves and several meter lengths of pier walls excavated in recent times have corroborated the literary references to Poompuhar. It was rebuilt several times after that. Ancient Pottery dating back to the 4th century BCE have been discovered off shore by marine archaeologists east of this town.

The general plan of the city of Puhar is described in considerable detail in the fifth book of *Silapathikaram*. The town was built on the north banks of the river Kaveri. The town had two distinct districts, **Maruvurpakkam** near the sea and **Pattinappakkam** to its west. These two villages were separated by a stretch of gardens and orchards where daily markets were held under the shades of the trees. The market place was known as *Naalangadi* during the day and as *allangadi* by night.

Maruvurpakkam[edit]

The district of Maruvurpakkam was near the beach and had several terraced mansions and warehoused with windows shaped like the eyes of the deer. Maruvurpakkam being close to the shore and hence to the shipyard was naturally preferred by the many overseas travellers, merchants and *yavanas* (Greeks).[*citation needed*] Maruvurpakkam was inhabited by the fisher folk. The town had several warehouses. Weavers, silk merchants, vendors, fish and meat sellers, potters, grain merchants, jewellers and diamond makers lived in Maruvurppakkam.

Pattinappakkam[edit]

The King and nobles, rich traders, physicians, astrologers, members of the king's army and court dancers occupied Pattinappakkam. The five Manrams - Vellidai Manram, Elanchi Manram, Nedankal manram, Poothachathukkam and Pavaimanram were located in Pattinappakkam. Gardens like Elavanthikaicholai, Uyyanam, Chanpathivanam, Uvavanam, and Kaveravanam added beauty to the town.

iii) Palaeography (UK) or **paleography** (US; ultimately from Greek: παλαιός, *palaiós*, "old", and γράφειν, *gráphein*, "to write") is the study of historic writing systems and the deciphering and dating of historical manuscripts, including the analysis of historic handwriting. It is concerned with the forms and processes of writing; not the textual content of documents. Included in the discipline is the practice of deciphering, reading, and dating manuscripts,[2] and the cultural context of writing, including the methods with which writing and books were produced, and the history of scriptoria.[3]

Brahmi (/ˈbrɑːmi/; IAST: *Brāhmī*) is the modern name[2] for a writing system of ancient India.[3] The Brahmi writing system, or script, appeared as a fully developed universal one in South Asia at least by the third century BCE,[3] and is a forerunner of all writing systems that have found use in South Asia with the exception of the Indus script of the third millennium BCE, the Kharosthi script, which originated in what today is northwestern Pakistan in the fourth or possibly fifth century BCE,[4] the Perso-Arabic scripts since the medieval period, and the Latin scripts of the modern period.[3] Its descendants, the Brahmic scripts, continue to be in use today not only in South Asia, but also Southeast Asia.[5][6][7] Brahmi is an abugida which uses a system of diacritical marks to associate vowels with consonant symbols.

Several divergent accounts of the origin of the name "Brahmi" appear in history and legend. Several Sutras of Jainism such as the *Vyakhya Pragyapti Sutra*, the *Samvayanga Sutra* and the *Pragyapna Sutra* of the Jain Agamas include a list of 18 writing scripts known to teachers before the Mahavira was born, with the Brahmi script (*bambhī* in the original Prakrit) leading all these lists. The Brahmi script is missing from the 18 script list in the surviving versions of two later Jaina Sutras, namely the *Vishesha Avashyaka* and the *Kalpa Sutra*. Jain legend recounts that 18 writing scripts were taught by their first Tirthankara Rishabhanatha to his

daughter Brahmi, she emphasized Brahmi as the main script as she taught others, and therefore the name Brahmi for the script comes after her name.[8]

The earliest (indisputably dated) and best-known Brahmi inscriptions are the rock-cut edicts of Ashoka in north-central India, dating to 250–232 BCE. Brahmi only went through relatively minor evolutionary changes from the Mauryan period (3rd century BCE) down to the early Gupta period (4th century CE), and it is thought that as late as the 4th century CE, a literate person could still read and understand Mauryan inscriptions.[9]

Later the script underwent important changes, and the capability to read the original Brahmi script was lost. The first successful attempts at deciphering Brahmi were made in 1836 by Norwegian scholar Christian Lassen, who used the bilingual Greek-Brahmi coins of Indo-Greek kings Agathocles and Pantaleon to correctly identify several Brahmi letters.[10] The script was then fully deciphered in 1837 by James Prinsep, an archaeologist, philologist, and official of the East India Company, with the help of Alexander Cunningham.[11][10][12] The origin of the script is still much debated, with most scholars stating that Brahmi was derived from or at least influenced by one or more contemporary Semitic scripts, while others favor the idea of an indigenous origin or connection to the much older and as yet undeciphered Indus script of the Indus Valley Civilization.[13][14]

Brahmi was at one time referred to in English as the "pin-man" script,[15] that is "stick figure" script. It was known by a variety of other names, including "lath", "Laṭ", "Southern Aśokan", "Indian Pali" or "Mauryan" (Salomon 1998, p. 17), until the 1880s when Albert Étienne Jean Baptiste Terrien de Lacouperie, based on an observation by Gabriel Devéria, associated it with the Brahmi script, the first in a list of scripts mentioned in the *Lalitavistara Sūtra*. Thence the name was adopted in the influential work of Georg Bühler, albeit in the variant form "Brahma".[16] The Gupta script of the fifth century is sometimes called "Late Brahmi".

Vaṭṭeḻuttu: It also spelled **Vattezhutthu** (literally "Round Script", Tamil: வட்டெழுத்து, *vaṭṭeḻuttu*; Malayalam: വട്ടെഴു ത്ത് *vaṭṭeḻuttŭ*) was an abugida writing system in South India and Sri Lanka that emerged from the Tamil Brahmi script. It is marked by rounded alphabet letters and cursive appearance, and the earliest forms of this script are traceable on memorial stone inscriptions of the 4th-century CE. The script had fully developed and was in broader use to write the Tamil language by about the 6th-century. By about the 7th- and 8th-century, under the Pallava rulers, a more developed and distintive Tamil script replaced it in what is now Tamil Nadu. Vatteluttu continued to be used in region that is now Kerala till about the 14th-century, and over time it contributed to the evolution of the Grantha script into the modern Malayalam script.

The 19th-century language scholar Arthur Coke Burnell, relying on two Vatteluttu script inscriptions, had proposed that Vatteluttu did not originate from Tamil Brahmi, and was possibly borrowed by Tamils from another foreign land. As numerous more inscriptions and manuscripts in Kerala and Tamil Nadu were discovered, scholars such as Iravatham Mahadevan have proven the Burnell hypothesis to be incorrect, and shown how Vatteluttu emerged and evolved from Tamil Brahmi.
Vatteluttu script is read left to right, as with almost all Indic scripts. Like the Tamil script, it omits the *virama* muting device. Vatteluttu was particularly prominent during the Kodungallur Cheras rule (from 9th century) and their successor-states in Kerala. Chera era copper plate grants, stone inscriptions and memorial epigraphy are composed mostly in Vatteluttu. After the Kodungallur Chera period (12th century) the Vatteluttu went on evolving and gradually developed into Kolezhuthu in Kerala, according to Burnell. Some of the historic immigration rights and land grants to Syrian Christians and Jewish traders by Hindu kings of Chera dynasty were recorded in Vatteluttu script on copper plates.

Vatteluttu use is also attested in northeastern Sri Lanka rock inscriptions, such as in the area near Trincomalee, between the 5th and 8th centuries CE.

Samples

The following image shows the divergent evolution of the Tamil script and the Vatteluttu script. The Vatteluttu script is shown on the left, and the Tamil script is shown on the right.

Here are the characters used in Vatteluttu:

See also

- Tamil copper-plate inscriptions
- Indian copper plate inscriptions
- Laguna Copperplate Inscription
- Pallava script
- Tamil script

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iv)Hindu temple architecture

Hindu temple architecture as the main form of Hindu architecture has many varieties of style, though the basic nature of the Hindu temple remains the same, with the essential feature an inner sanctum, the *garbha griha* or womb-chamber, where the primary *Murti* or the image of a deity is housed in a simple bare cell. Around this chamber there are often other structures and buildings, in the largest cases covering several acres. On the exterior, the garbhagriha is crowned by a tower-like *shikhara*, also called the *vimana* in the south. The shrine building often includes an circumambulatory passage for parikrama, a mandapa congregation hall, and sometimes an antarala antechamber and porch between garbhagriha and mandapa. There may further mandapas or other buildings, connected or detached, in large temples, together with other small temples in the compound.[1]

Temple Architecture and Sculpture

- The basic elements that comprise a Hindu Temple are given below:
- Garbhagriha: Literally means womb-house. It is a cave-like sanctum which houses the main icon of the temple. In earlier times, it was a small cubicle with one entrance. In later periods, it grew into a larger chamber.
- Mandapa: The entrance to the temple. It could be a portico or a collonaded hall where worshippers stand.
- Shikhara/Vimana: Noticed from the 5th century CE. It is a mountain-like spire on top. In north India, it is called Shikhara and is curving in shape. In the south, it is like a pyramidal tower and is called Vimana.
- Amalaka: Stone-like disc seen at the top of the temple. Mostly in north Indian temples.
- Kalasha: It is the topmost part of the temple. Mainly seen in north Indian styles.
- Antarala: It is a vestibule between the Garbhagriha and the Mandapa.

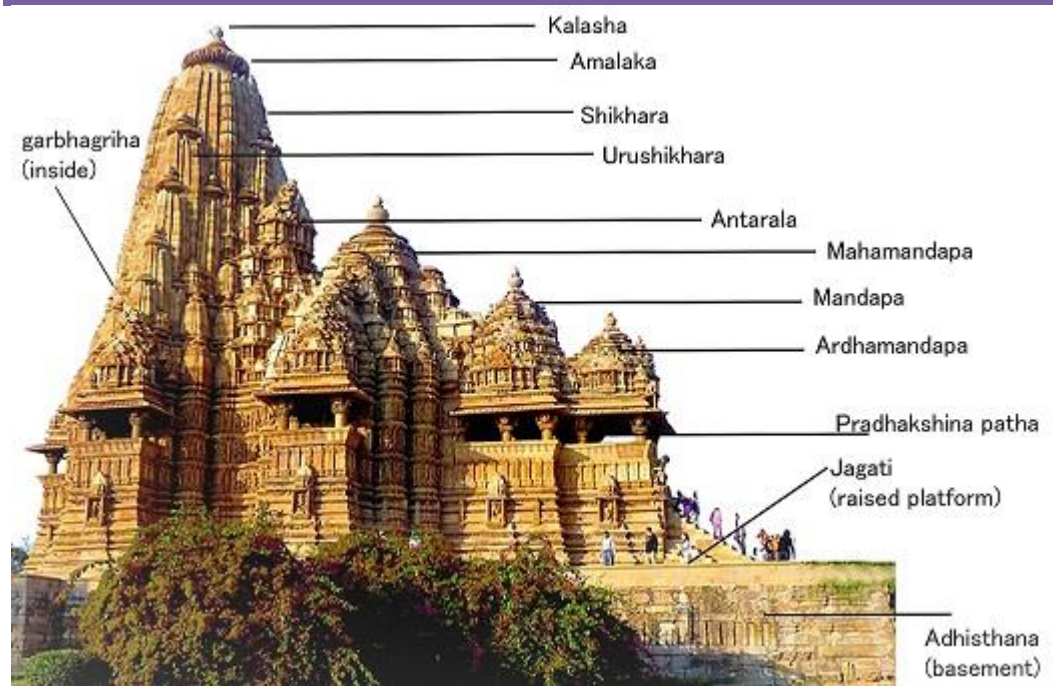
- Jagati: This is common in north Indian temples and is a raised platform where devotees can sit and pray.
- Vahana: It is the vehicle of the main deity which along with the standard pillar or Dhvaj which are placed axialy

Types of Indian Temple Architecture/Styles

Basically there are 3 kinds of temple architecture:

1. Nagara Style
2. Dravida Style
3. Vesara Style

The Nagara or North Indian temple style



- Became popular in northern India.
- Entire temple is generally built on a stone platform with steps leading to it.
- No grand boundary walls or gateways (unlike the Dravida style).
- Earlier temples had one shikhara whereas latter temples had many.
- The garbhagriha is located directly beneath the tallest shikhara.

Subdivisions of Nagara Style

- Based on Style:-

- **Rekha-prasada/Latina:**
    - Simple shikhara with square base and whose walls slope inwards to a point on top.
    - Most common.
    - In later periods, latina type became more complex with several towers clustered together.
    - The tallest tower was at the centre and the garbhagriha was directly beneath it.

Phamsana:

- Roofs composed of many slabs that gently rise to a single point over the building's centre.
- Roofs do not curve inwards like the latina type, but they slope upwards on a straight incline.

- Phamsana structures are generally broader and shorter than latina ones.
- In many temples, the latina type is used to house the garbhagriha whereas the mandapa has a Phamsana style of architecture.

Valabhi:

- Rectangular buildings with a roof that rises into a vaulted chamber.
- Also called wagon-vaulted buildings.

Nagara Style in Various Regions:-

Central India

- Uttar Pradesh, Madhya Pradesh, Rajasthan.
- Made of sandstone.
- Oldest surviving structural temples from the Gupta period are in MP. They are small shrines with four pillars to support a small mandapa. The mandapas are basically small porch-like structures before the garbhagriha which are also rather small. Examples: temple at Udaigiri – part of a larger Hindu complex of cave shrines (outskirts of Vidisha); temple at Sanchi (which was a Buddhist site).
- This shows how similar architectural developments were incorporated in both religions.

Dashavatara Vishnu Temple, Deogarh, UP

- Classic example of the late Gupta period temple architecture.
- Patrons are unknown.
- From the architecture and imagery, it is known that the temple was built in early 6th century CE.
- **Panchayatana** Style of architecture.
    - Main shrine is built on a rectangular plinth with four subsidiary shrines that are smaller and at the 4 corners.
    - Hence, there are a total of five shrines and hence the name, Panchayatana.

This temple has a rekha-prasada type of shikhara.

It is a west-facing temple. Most temples are north or east facing.

Has a grand doorway with figures of Ganga and Yamuna on the left and right side respectively.

Depicts Vishnu in various forms. 3 main Vishnu reliefs on the temple walls: Sheshashayana on the south; Nara-Narayan on the east; and Gajendramoksha on the west.

Since it was assumed that the subsidiary shrines had avatars of Vishnu in them, the temple was mistaken to be Dashavatara temple.

Khajuraho Temples (MP)

- Built in the 10th century CE.
- It is a UNESCO World Heritage Site.

- Patronised by Chandela Kings.
- All temples made of sandstone.
- From the temple at Deogarh (built about 400 years before Khajuraho temples), the development of the Nagara architectural style is visible here.
- These temples are known for their extensive erotic sculptures. Mostly Hindu, though some Jain temples are also present.
- There are also temples dedicated to Yoginis which form part of Tantric worship indicating the rise and spread of tantric cult after the 7th century. E.g. Chausanth Yogini temple.
- Important temples in Khajuraho: Kandariya Mahadeo (dedicated to Lord Shiva) and Lakshmana temple.
- **Lakshmana temple**
- 
    - Grandest of the Khajuraho temples.
    - Dedicated to Vishnu.
    - Built by the Chandela King Dhanga in 954 CE.
    - Structure is placed on a high platform that is accessed by stairs.
    - Has small temples in four corners.
    - Has high shikharas, amalak and kalash. Also has projecting balconies and verandas.

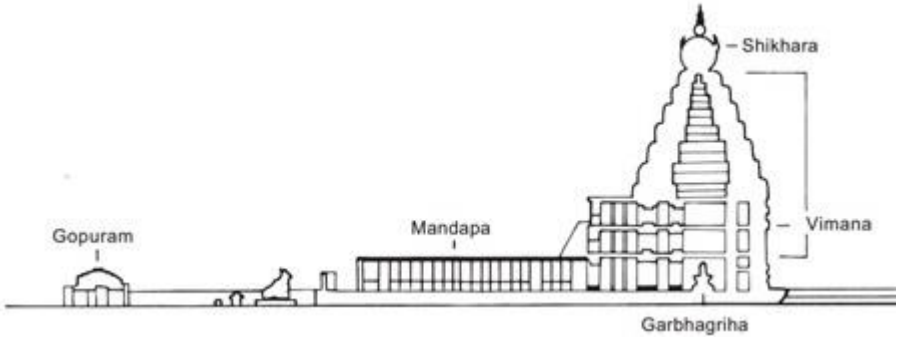
West India

- Gujarat, Rajasthan and western MP.
- Sandstone is most common, grey to black basalt is also seen in some 10 – 12th century temples.

- Also seen is soft white marble in 10 – 12th century Jain Temples at Mount Abu and a 15th century temple at Ranakpur.
- Samlaji in Gujarat is an important art historical site. Many sculptures made of grey schist are found here.
- **Sun Temple, Modhera, Gujarat**
- 
    - Built by Raja Bhimdev I of the Solanki dynasty in 1026 CE.
    - Temple complex features a huge rectangular stepped tank known as the ‘Surya Kund’ in the front. This is a noticeable feature from earlier times – proximity of a sacred water body. By the early 11th century, this was a common feature of many temples.
    - The Surya Kund is a 100 sq.m pond – one of the grandest of its kind in the country. 108 miniature shrines are carved in between the steps inside the tank.
    - A large ornamental torana (gateway) leads to the sabha mandapa or assembly hall that is open on all sides.
    - Lavish carving and sculpture work is present.
    - The central shrine walls are plain. The temple is east-facing and every year at the time of equinoxes, the sun shines directly onto the central shrine.

Dravidian Style of Architecture – South Indian Style

The features of the Dravidian Style of Architecture are mentioned below:

- 

- The temple is enclosed within a compound wall.
- **Gopuram**: The entrance gateway in the centre of the front wall.
- **Vimana**: The shape of the main temple tower. It is a stepped pyramid that rises up geometrically (unlike the Nagara style Shikhara that is curving).
- In the Dravida style, **shikhara** is the word used for the crowning element at the top of the temple (which is shaped like a stupika or octagonal cupola).
- At the entrance to the garbhagriha, there would be sculptures of fierce **dvarapalas** guarding the temple.
- Generally, there is a **temple tank** within the compound.
- **Subsidiary shrines** could be found wither within the main tower or beside the main tower.
- In many temples, the garbhagriha is located in the smallest tower. It is also the oldest. With the passage of time and the rise of the population of the temple-town, additional boundary walls were added. The newest structure would mostly have the tallest gopuram.
- Example in the **Sriranganathar Temple** at Srirangam, Tiruchirappally, there are 7 concentric rectangular enclosure walls each having gopurams. The tower at the centre has the garbhagriha.
- **Famous temple towns of Tamil Nadu**: Kanchipuram, Thanjavur (Tanjore), Madurai and Kumbakonam.

- In the 8th to 12th centuries – temples were not confined to being religious centres but became administrative centres as well with large swathes of land.

Dravidian Architecture – Subdivisions of Dravida Style

1. Kuta or Caturasra: square-shaped
2. Shala or Ayatasra: rectangular-shaped
3. Gaja-prishta or vrittayata or elephant-backed: elliptical
4. Vritta: circular
5. Ashtasra: octagonal

Pallava Architecture

- The Pallava dynasty was ruling in the Andhra region from the 2nd century AD onwards. They then moved southwards to Tamil Nadu.
- They built many monuments and temples during the 6th to the 8th centuries.
- Although they were mostly Shaivite, some Vaishnava monuments are also seen. Their architecture was also influenced by the Buddhist heritage of the Deccan.
- Their early buildings were rock-cut whereas the later were structural.
- The early buildings were built during the reign of Mahendravarman I, a contemporary of the Chalukya king Pulakeshin II of Karnataka.
- His son **Narasimhavarman I**, also known as Mamalla, was a great patron of the arts. Most buildings in Mahabalipuram (also called Mamallapuram in his honour) are attributed to him.
- In Mahabalipuram, there are exquisite monolithic rathas and mandapas. The five rathas are known as Panchapandava Rathas.

Dravidian Temple Architecture – Shore Temple – Mahabalipuram

- Built during the reign of Pallava king Narasimhavarman II, also known as Rajasimha (700 – 728 AD).
- It has three shrines – one Shiva shrine facing east, one Shiva shrine facing west, a middle shrine to Vishnu in Anantashayana pose. The presence of three main shrines is unique.
- It is probable that the shrines were not all built at the same time but were added later.
- There is evidence of a water reservoir and a gopuram.
- There are sculptures of Nandi the bull (Shiva's mount) along the walls of the temple. There are several carvings as well.

Dravidian Temple Architecture – Brihadiswara Temple – Tanjore

- Shiva temple, also called Rajarajeswara Temple.
- Completed around 1009 AD. Built by Rajaraja Chola.
- It is the largest and tallest of all Indian temples. This Chola temple is bigger than any of the previous Pallava, Chalukya or Pandya structures.
- More than 100 temples of the Chola Period are preserved. A lot of temples were constructed during the Chola period.

- Its pyramidal multi-storied vimana is almost 70 metres high.
- There is a monolithic shikhara atop the vimana.
- The shikhara is a dome-shaped octagonal stupika. It has two large elaborately sculptured gopuras. On the shikhara, there are large Nandi images.
- The kalasha on top of the shikhara is 3m and 8cm tall.
- There are hundreds of stucco figures on the vimana. Many might have been added later on in the Maratha period.
- The main deity of Shiva is portrayed as a huge lingam set in a double-storied sanctum.
- The surrounding walls of the sanctum are adorned with painted murals and sculptures of mythological stories.

Architecture in the Deccan

- A hybridised style mixing elements from both Nagara and Dravida styles emerge as a distinct style during the middle of the 7th century in regions like Karnataka.
- This is referred to as Vesara in some ancient texts.
- Some of the temples are either completely nagara or dravida. Not all temples in the Deccan are in vesara style.
- **Kailashnath Temple, Ellora**
- 
    - Completely in Dravida style.
    - Main deity is Lord Shiva.
    - There is also a Nandi shrine.
    - Vimana rises 30 m.
    - This temple was carved out of a portion of a hill.

- The temple is grand and imposing.
- Built during the Rashtrakuta phase at Ellora.

Chalukya Architecture

- Western Chalukya kingdom was established by Pulakesin I when he took control of the land around Badami in 543 AD.
- Early western Chalukyas ruled the region till around the mid-8th century.
- Early activities are rock-cut caves while structural temples were built later on.
- **Ravana Phadi cave** at Aihole
    - Important structure at this site: Nataraja
    - This image is surrounded on the right by four large saptamatrikas and on the left by three large ones.
    - The figures have slim, graceful bodies. They have long oval faces. They wear short pleated dhotis and tall cylindrical crowns.

Distinct feature of Chalukya architecture: mixing and incorporation of several styles.

Temples at **Pattadakkal**, Karnataka

- Pattadakkal is a UNESCO World Heritage Site.
- There are 10 temples. Four are in Dravida style, four are in Nagara style, one (Papanatha Temple) is a fusion of both and one is a Jain temple.
- Jain Narayana temple – built by Rashtrakutas in the 9th century.
- Virupaksha Temple – built by the chief queen of Chalukya king Vikramaditya II (733 – 44), Loka Mahadevi. Best example of Dravida style.

Durga Temple, Aihole

- Apsidal shrine resembling a Buddhist Chaitya hall.
- Surrounded by a veranda.
- Shikhara is like a nagara one.

The Lad Khan temple at Aihole

- Located south of the Durga temple. Built in the 5th century.
- Inspired by the wooden-roofed temples of the hills, but is made out of stone.
- Built in the Panchayatana style.
- So named because a person named Lad Khan had used it as his residence for some time.

Hoysalas Temple Architecture

- Hoysalas grew into prominence in South India after the Chola and the Pandya power declined.
- Centred at Mysore.
- Chief temples are at Belur, Somnathapuram and Halebid.
- These temples have a plan called the **stellate plan**. This is because the plan which emerged from being a straightforward

square to a complex one with many projecting angles began to resemble a star.

- The star-like ground plan is a distinct feature of Hoysala architecture.
- Style is Vesara.
- Made of soapstone which is relatively soft. This enabled artists to carve intricate details like jewellery.
- Hoysaleshvara Temple, Halebid
- 
    - Made of dark schist stone in 1150.
    - Dedicated to Nataraja (Shiva).
    - It is a double building with a large hall for the mandapa.
    - A Nandi pavilion is in front of each building.
    - The temple's tower fell a long time back. The structure of the temple is evident from the detailed miniature ones at the temple's entrance.
    - Very intricate and detailed carvings.

Vijayanagara Architecture

- City of Vijayanagara (City of victory) founded in 1336.
- Visited by international travellers like Niccolo di Conti, Domingo Paes, Duarte Barbosa, Abd, al-Razzaq, etc. who have given vivid accounts of the place.
- Synthesizes the Dravida style with Islamic styles of the neighbouring sultanates.
- The sculpture tries to recreate the Chola tradition but the foreign influence is also seen.

Vesara style of Architecture:

1. VESARA STYLE OF ARCHITECTURE 1.Vesara (vEsara) (ವೇಸರ ಶೈಲಿ) is the name given to a particular architectural style which was prevalent in Karnataka for a number of centuries during the medieval era. 2. It is essentially a combination of the ‘nAgara’ and ‘drAviDa’ styles which are typical of North India and the far South respectively. 3.The geographical position of Karnataka, the wide spread activities of the important royal dynasties and an attitude which is not unduly stubborn might have prompted this amalgamation of styles.
2. 2. SPECIALITIES OF VESARA ARCHITECTURE 1.The VESARA style temples were influenced by the Buddhist apsidal chapels and evolved during the period the Later CHALUKYAS. 2.This is also in conformity with the prevalence of Vesara style of architecture in the Deccan and central parts of South Asia vis-à-vis Nagara style prevalent in North India and Dravida style prevalent in South India.The Vesara style is also described in some texts as the 'Central Indian temple architecture style' or 'Deccan architecture'. 3.However many historian agree that the vesara style originated in what is today Karnataka.
3. Examples of vesara temples 1. Many temples in Central India and the Deccan have used the Vesara style with regional modifications. The Papanatha temple (680 A.D.) in particular and some other temples to a lesser extent located at Pattadakal demonstrate panache for this stylistic overlap. The Svargabrahma temple at Alampur in the state of Andhrapradesh, has similar characteristics. 2. This trend of merging two styles was started by the Chalukyas of Badami (500-753AD) who built temples in a style that was essentially a mixture of the nagara and the dravida styles, further refined by the Rashtrakutas of Manyakheta (750-983AD) in Ellora, Chalukyas of Kalyani (983-1195 AD) in Lakkundi, Dambal, Gadag etc. and epitomized by the Hoysalas (1000-1330 AD). 3.Most of the temples built in Halebid, Belur and Somanathapura are classified under this style. “The surfaces in these Hoysala temples are carved in high-relief with detailed repeating patterns of miniature shrine models, distinguishing them also from contemporary temples in other parts of India that have an elaborate use of human and animal figures on their decorative exterior.”
4. 4. There are many ancient texts laying down the formal architectural styles prevalent in the various regions so that the comprehensive text called the Vastu Sastra has its sources in the Sutras, Puranas and Agamas besides Tantric literature and the Brhat Samhita. But all of them are agreed that basically styles can be divided into nagara, dravida and vesara. They employ respectively the square, octagon and the apse or circle in their plan. In its

later evolution when the vesara style adopted the square for the sanctum. The circular or stellar plan was retained for the vimana. These three styles do not pertain strictly to three different regions but as indicating only the temple groups.

5. 5. CHARECTERSTICS 1.The common feature of the Vesara style of temples was that they had a spire shaped structure on the top called the 'SHIKARA'. 2. The North Indian shikhara is basically of two types: (A) the latina, curvilinear in outline, the type most usually found above the sanctuary; and (B) the phamsana, rectilinear in outline and capped by a bell-shaped member, the form more usually found above the mandapa.

Similarities and differences of three styles:

Nagara	Dravida	Vesara
Northern region	Southern region	Deccan region(Between the Vindhyas and Krishna river)
Ground Plan: Mostly Square shaped	Ground Plan: Mostly Square shaped	increasingly complex, including start like plan
Curvilinear tower (Shikhara built over garbhagriha) gradually curving inward	Pyramidical Tower (Vimana) with several stories in receding dimension	The shape of tower was Pyramidical but height was reduced (Miniature Vimanas)
Multiple Shikharas	Subsidiary shrines are either incorporated within the main temple tower, or located as distinct, separate small shrines beside the main	Multiple shrines are present side by side

	temple.	
Squared hall	Squared hall	Squared hall
Sanctum Garbhagriha	Sanctum Garbhagriha	Sanctum Garbhagriha
Gopurams are absent	Gopurams are present	Gopurams may or may not be present
A water tank may or may not be present	A water tank is present at the front of temple from where water is drawn for sacred purposes	A water tank may or may not be present
Compound walls are absent	enclosed within a compound wall	Compound walls may or may not be present
Examples – Dashavatara temple (Deogarh), Vishwanatha temple(Khajuraho), Lakshman Temple (Khajuraho), Jagannath temple (Puri)	Examples – Shore temple (Mahabalipuram), Brihadiswara temple (Thanjavur), Meenakshi Temple (Madurai)	Examples – Badami temple, Durga Temple (Aihole), Virupaksh Temple (Pattadkal), Keshava Temple (Somnathpur

Conclusion:

From above tabular observations it can be seen that, Vesara temple architecture, besides its own features, is mixture of Dravidian and Nagara temple architectures.