

Terracotta Temples of Bishnupur: Transformation through Time and Technology

Priyanka Mangaonkar



Introduction

Clay can be considered as one of the oldest building materials in the history of man after stone. Clay was and is being used for all conceivable purposes due to its abundance and universal supply. The discovery of baking clay provided the permanence to the clay objects. This baked clay is called as Terracotta. All over the world, across the ages people have transformed this heavy, dark and formless material into a lighter building material. They created their living spaces and they adapted their architectural and constructive answers according to the behavior and properties of the soil.

The use of Terracotta as a material evolved from making objects of daily needs like vessels, pottery, toys, seals etc in ancient times to its use in temples in the 15th-16th century AD in West Bengal. Until this period Stone was the main material used for building temples. This was due to unavailability of the stone and availability of good alluvial soil, and the need to create pseudo effect, e.g. in West Bengal terracotta was used to depict stone carvings and sometimes to resemble the articulation on wooden door. In the same period, from 15th to early 20th century terracotta was used as cheaper and easily available option for marble in some parts of Europe.

Chitrolekha International Magazine on Art and Design, (ISSN 2231 – 4822), Vol. 1, No. 2, August, 2011

URL of the Issue: www.chitrolekha.com/v1n2.php

Available at www.chitrolekha.com/V1/n2/04_terracotta_Architecture_of_Bankura_technology.pdf
Kolkata, India. © *Chitrolekha International Magazine on Art and Design*

Terracotta as a material till now has taken different influences to reach the urban scale. From a material predominantly used for household and domestic use, it has been slowly shifting to building and construction industry. Nowadays with the help of technology terracotta has been experimented to its fullest considering its qualities and has been used in construction in certain parts of India. This paper attempts to understand one stage of its transformation where terracotta was explored and modified according to the need of that time in West Bengal.

Historical Background of temple architecture of Bengal

In Bengal art sometimes was expressed mainly through the medium of temples. Brick temples of Bengal were built between the sixteenth and nineteenth centuries. These temples form one of the most distinctive groups of sacred monuments in India. Due to the multiple artistic influences acting upon the region, Bengali temples show a wide range of forms and techniques. "The Bengali temples nevertheless constitute a coherent series in both their architecture and sculpture, characteristically expressed in brick and terracotta."ⁱ The geographical distribution of the temples is majorly confined to the alluvial delta of Ganges River, which explains the popularity of clay as material for all conceivable purposes. "Hence, Bengali temples can be viewed as important manifestation of this region's culture, closely associated with contemporary movements in religion, literature, arts as well as political, social and economic development."ⁱⁱ



Figure 1. Map of Bankura Districtⁱⁱⁱ

The map above (Fig.1) shows the different regions of Bankura district. Out of all the regions Bishnupur flourished as a great monumental expression of Hindu terracotta art in Bengal. Temple facades in Bishnupur are majorly covered with figurative sculptures, often on four sides and sometimes even extending in the interior.

Bishnupur literally means city of lord Vishnu. This may be derived from the fact



Shavmrai Temple, Bishnupur

that the kings of Bishnupur were followers of Vaisnavism. "During the 15th and 16th centuries, Bengal underwent a profound political, social, religious and cultural revolution, the chief result of which was the formation of a distinct regional identity."^{iv} Mallabhum being politically stable could concentrate on developing a social

system based on Hindu (*Vaisnava*) philosophy. The Malla kings have invited higher castes and Brahmins to Bishnupur. Their presence was necessary to support such wide spread religious activity. Besides this, Malla kings had brought in numbers of selected master craftsmen, best weavers, expert masons, skilled potters etc to the city to provide for the best of amenities. Trade had assumed an important occupation. Bishnupur had several specialized markets. Because of all these a wide range of excellence in craft tradition had been achieved in Bishnupur.^v Over a period of time Bishnupur town has evolved incorporating various social concepts, planning philosophies, strategic decisions which were deeply rooted in Bengali traditions.

The few temples preserved in Bengal built before 14th century indicates that Bengali architecture was closely associated with contemporary traditions that flourished throughout northern and eastern India. The history of religious architecture in Bengal can be divided into three periods:

- 1) Early Hindu (up to the end of 12th century)
- 2) Sultanate period (14th to early 16th century)
- 3) Hindu revival (16th to 19th century) ^{vi}

In primitive stage that is during early Hindu period, it takes the character of Mayuryan and Pre-Mayuryan art of India. In this early stage, the terracottas consist of stray cult pieces of small sizes. In later stages 14th–16th centuries, terracotta plaques appeared with new designs which were different from the primitive illustration of the same theme. In the next stage terracottas appeared in larger sizes and related to architectural structures, as decorations of the facades of the temples. Popularization of Sanskrit scriptures in Bengali translation, have built up the Hindu revival which gave rise to most popular cults like Krishna, Kali, Durga. These were the main inspiration behind the revival of Hindu art and architecture. Almost all the richly decorated temples of 16th century which still exist are mainly Radha-Krishna temples. These temples have terracotta decoration which is of Vaishnava origin. Compared to the brick structures, the result is not just constructional but also decorative.

These temples have elaborate representation of themes which are borrowed from the *Puranas*. Hence these temple decorations were also acting as a medium to educate common people about our culture and traditions. Most of the decorations are typically Gupta in style. "Largeness of conception, the dramatic vigor, and the liveliness of the pictures depicted on bricks and plaques stand for the vividness of wall paintings and frescoes, the dearth of which is compensated by these pictures on bricks and plaques".^{vii}



Shaymrai Temple,

One of the most remarkable features of the history of this monumental architecture in Bengal is the sharp break in tradition that coincided with the Muslim conquest. Architects working for Muslim patrons developed a preference for covering entire wall surface with finely worked terracotta plaques that incorporated traditional decorative motifs such as the lotus. By the end of the 16th century, a uniquely Bengali style of temples architecture and sculpture had established itself as the Hindu artistic expression of the new social, religious and cultural revolution.^{viii} The wide range of temple styles embraced elements of both change and continuity, typical in the dynamic but traditionally based Bengali society. Furthermore, the temple decoration depicted the aspects of everyday life of the contemporary society, particularly the ambitions of the temple builders. This shows that temple building was the result of an intense concentration of economic and artistic resources, as well as public means of expressing power.

The temple builders

The plaques of terracotta give us a glimpse of the early culture of the people of the Bengal which is not available in Bengal literature. This proves that this plastic art supports the literary art of Bengal. In Bengal only two caste forms can be traced – the *Acharyas* and *Sutradharas*. The role of the *Acharyas* and *Sutradharas* indicates an age old relationship of working together that existed in India. These terracotta reliefs are noteworthy contribution of these artists. These artists derived their inspiration not only from the standard rules and regulations of the *Shilpa Sashttras*, but also from the keen observations of the daily lives of the people around. In course of time *Sutradharas* became capable of using materials like stone, ivory, metal etc. and became skilful artists. They accordingly developed into four different directions namely – *Kastha* (wood), *Mrttika* (clay), *Chitra* (painting), *Pasan* (stone) and divided themselves into several regional groups. The *Sutradharas* worked as a group and each consisting of several families and having their hereditary knowledge used to live and work under *Acharyas* who were responsible for planning and supervision. These teams used to travel from one place to another. The heads of these groups had readymade master plans of temples of varied size and shapes and they use to carry these plans with them. Then according to donor's choice and even details regarding arrangements of terracotta bricks, according to the theme and pattern used to be completed and necessary instructions were issued by the leader before the commencement of the construction. ^{ix}



'As the majority of Bengalis during this period were illiterate, terracotta artists had little opportunity to acquaint themselves with the Sanskrit *Puranas*, epics, and other source books of mythologies. For these artists' knowledge of the epics and myths was mainly derived from the works of local Bengali poets particularly in the form of popular dramas and songs. These poets translated and retold the stories for the benefit of villagers and also introduced new episodes and their own interpretation in it without any hesitation. This brought atmosphere of contemporary society in their stories and poetries bringing their works nearer to the hearts of Bengalis and profoundly influenced the artists who decorated the temples of the period.' ^x For example, the influence on contemporary society is seen in *Mangal Kavyas* as well as in the portrayals of the marriage of Shiva and *Parvati* in temple art. In the depiction of this popular scene, temple artists didn't follow the standard iconographic texts but preferred to represent

Parvati as a small girl, and *Shiva* as a half naked old man. While describing the marriages between the poor and homeless *Shiva* and the beautiful *Parvati*, poet drew upon scenes of ordinary Bengali life in which girls of tender age were sometimes given in marriage to old men. In their descriptions of such scenes poets did not hesitate to emphasize the pain and regret of the young girl. And this was true in 18th and 19th century when marriage between old men and young girls was a common practice. Hence this way the different epics of *Puranas* were recited by storytellers at village gatherings and undoubtedly influenced terracotta artists of that time.

Temple planning^{xi}

The overall form and arrangement is different from the other Indian temple typologies. The popular sequence of *Bhogmandapa*, *Natmandapa*, *Garbhagriha* is absent here. There are limited number of architectural elements used in temple plan - square, rectangular, octagonal chambers and long rectangular corridors and porches. These spaces are vaulted or domed and are limited in size. Walls are generally slender in size (75cm to 125 cm) except certain exceptions like massive brickwork at *Kodla* (almost 3m thick) which is obvious imitation of stonework. The axuality present in the other Indian typologies towards certain preferred direction is quite subdued. Characteristic of Bengali brick architecture is the pointed vault on the rectangular plan with curved base and spine, producing the interior

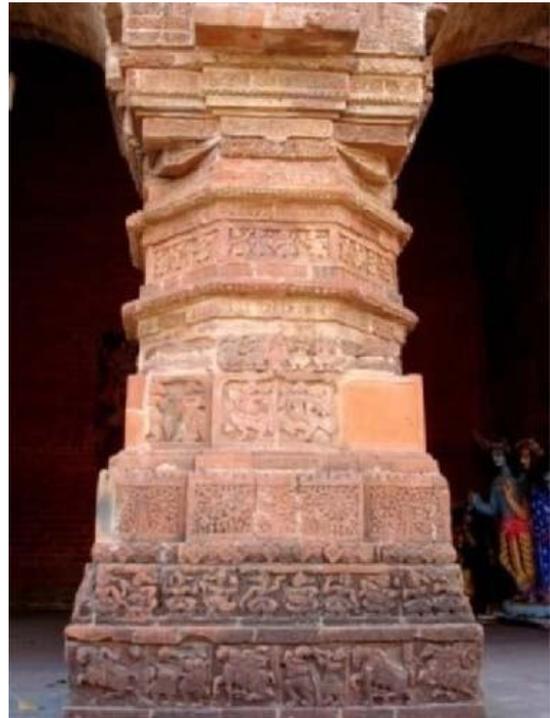


Figure 2. Multifaceted octagonal shaft of a pillar in one of the temples at Bishnupur, West Bengal.

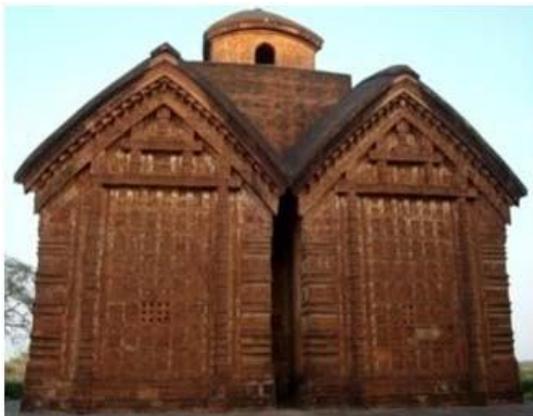


Figure 3. Keshta-Raya Temple, Bishnupur

of a Bangla roof form.

The pillars used in these temples with triple arches were essentially based on pillars built in stone during Pala-Sena period. When used in brick temples, some changes were introduced in these pillars. Since the pillars used on the facades of these temples became main feature, and were decorated with terracotta panels of smaller sizes, the square bases and square capitals were changed to

octagonal and the shaft became multifaceted. (Fig.2) The shafts were further divided by two to five mouldings into smaller parts to afford decoration by the terracotta panels. Stone doorways of the earlier elaborate design were not used in these temples but their patterns were copied. The walls of these temples were generally flat and any articulation was provided by the framing of the panels on the wall.

Style and ornamentation

Sculptures on the temple façade of Bengal are carefully organized with respect to their architectural setting. Islamic builders imitated the earlier patterns carved in stone and also introduced a great variety of strip motifs. Also there is more preference for large scale figurative art, than the earlier nonfigurative themes. One significant

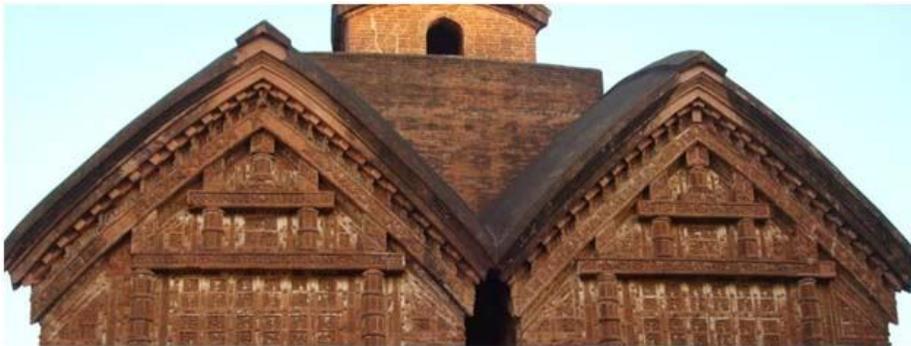


Figure 4 Facade is divided in panels in such a way that a system of beam like elements is created giving an effect of a corbelled timber construction.

omission on any late medieval temples is the use of the glazed tiles which were so frequently used on the Islamic structures of the Sultanate period in the late 15th century. Generally facades of these temples were divided into panels by vertical, horizontal and curved bands. (Fig. 3, 4) On certain

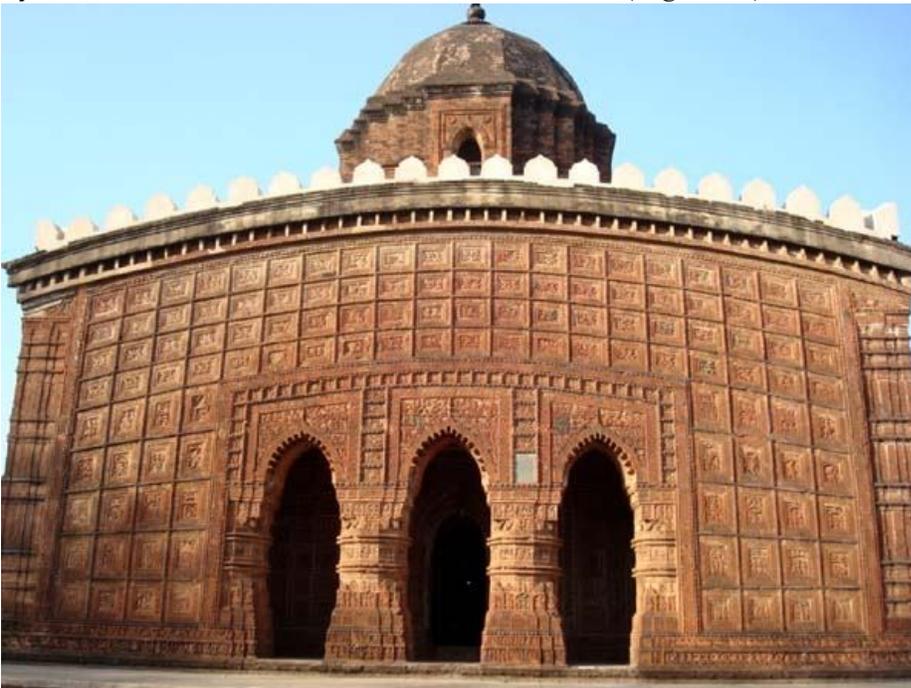


Figure 5. In Madan Mohana temple rhythmic effect is created by frequent repetitions of band framing panels in which scenes from Ramayana and Mahabharata are depicted.

One significant omission on any late medieval temples is the use of the glazed tiles which were so frequently used on the Islamic structures of the Sultanate period in the late 15th century. Generally facades of these temples were divided into panels by vertical, horizontal and curved bands. (Fig. 3, 4) On certain temples like Keshta-Raya temples, Kala-Chand temple these panels are uniformly distributed over the facades, gently growing over the entrance. Sculptural characteristic of these temples are not only crowded compositions within individual panels but also on overall facades of the temple.

Compositions above the arches, friezes and panels have a distinct

rhythmic effect created by frequent repetition of identical panels. In case of Keshta-Raya temple, above the regular square panels depicting *Ramayana* and *Krishnalila* episodes is a system of beam like elements suggesting a corbelled timber construction. In Madan-Mohana temple, façade derives its essential rhythm from the manipulation of the bands framing panels in which active dramatic scenes take place. (Fig. 5) The description of the sculptures in these different parts indicates the development of decorative elements from simple vegetal ornamentation to figurative schemes till later period.

Some of the Nineteenth century Bankura temples show clear European influence in their articulation. These panels have large scale composition in high relief above their triple arched porches. (Fig.6)



Material and construction technique

The temples of Bengal form one of the most distinctive groups of sacred monuments in India, Incorporating a wide range of forms and techniques that testify to the multiple artistic influences acting upon the region. The terracotta here expresses a faithful picture of the lives of the people through a dynamic natural quality of technique. During this period for the first time local building forms were translated into permanent materials. Hut shapes were recreated in brick vaulting, together with curved cornices and terracotta façade decoration. Typical Islamic techniques of arches, vaults and domes construction were used to create this type of architecture, and the material adopted was brick which was locally available. The Bengali temples

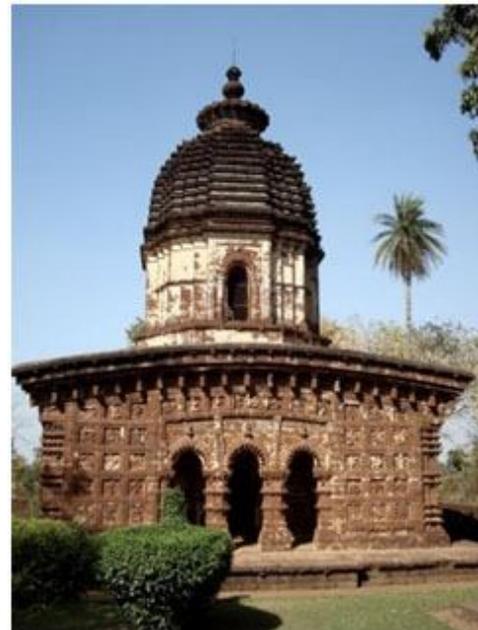


Figure 7 Kalachand Temple, Bishnupur made of laterite stone and plastered with stucco.

constitute a coherent series in both their architecture and sculpture, characteristically expressed in brick and terracotta. Even though stone was mainly used for construction till this period, there are rarely any stone temples in this province due to scarcity of stone. Very rarely temples were built or even faced with stone. (Fig.7) These temples are found majorly in southwestern periphery of Bengal where coarse grained laterite is available. Throughout the rest of Bengal, temples are almost invariably built of bricks. Also yellow sandstone is available in northern Burdwan and adjacent Purulia. Except these places throughout the rest of the Bengal, temples are invariably built of bricks. The early brick temples of Gupta, Pala and Sena period used stone as door jambs, lintels and pillars. But brick temples of Bengal have wooden doors which are decorated with terracotta depicting human and animal figure compositions as well as floral and geometrical designs in panels.

Studying from the numerous ruined temples it can be observed that the brick core of the temples generally consist of well laid horizontal brick courses. Vaults and domes are also created with bricks laid as stretchers. In arches, bricks are cut to form tapering voussoirs. (Fig.15) Curved layers of brickwork are employed to create vaults as well as swelling contours of temple cornices and roofs. Sometimes bricks are laid diagonally to decorate supporting arches and pendentives. In 18th and 19th century many temple facades were plaster coated in combination with terracotta sculptures.

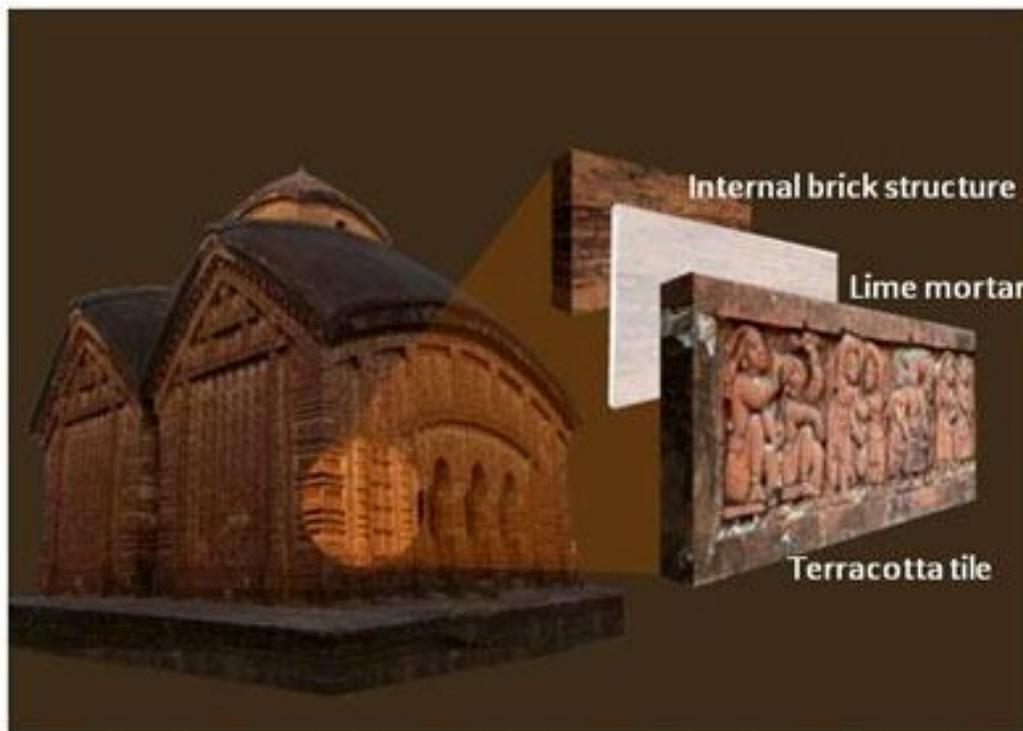


Figure 8. Image showing the construction detail of the terracotta temples of Bishnupur.



Figure 9. The internal structure of the temples consist of well laid horizontal brick courses.

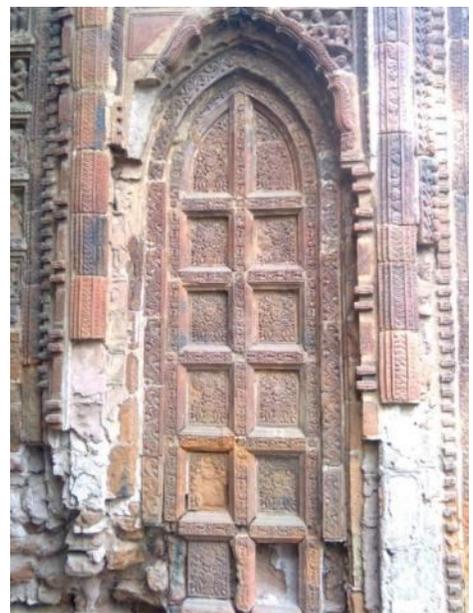


Figure10. False door of a ruined Temple near Illambazar, West Bengal.

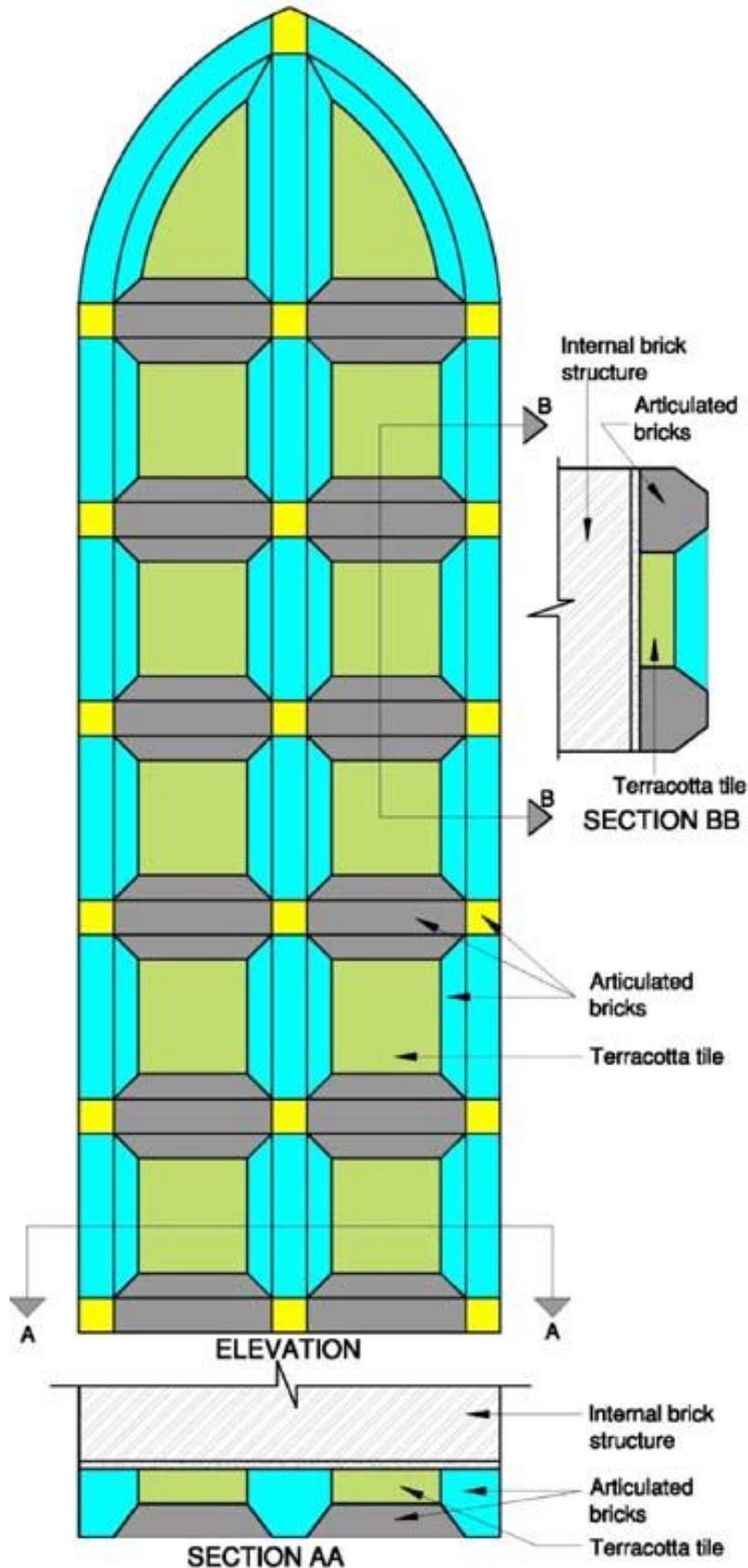


Figure 11. Construction detail of false door.

Fired Bricks were laid in mortar composed of powdered brick and lime. Lime was obtained by processing snail's shells. Fine but very hard *pankha* plaster was used to coat roofs, vaults and walls of temples. The surface skin of the terracotta plaques is carefully knitted into the brick core of the building. (Fig.8, 9, 10, 11)

Non-standardization in construction^{xii}

Well fired brick is the basic building material for temple making in Bengal. Brick

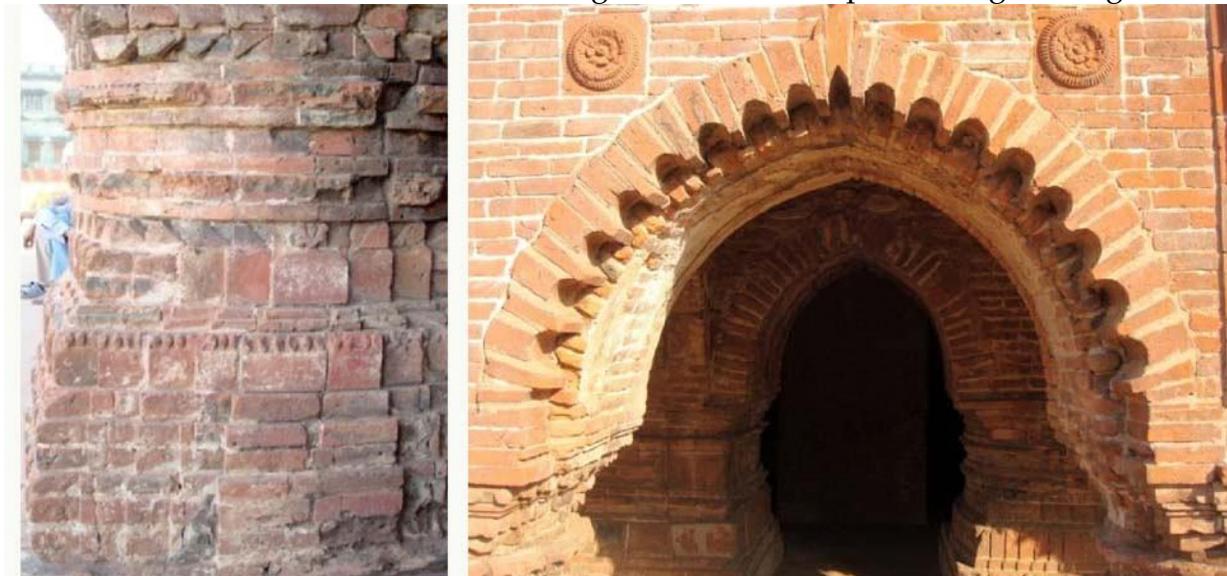


Figure 12. Façade showing use of stretcher bond for brick construction.

sizes vary, not only from region to region and from century to century but also within the same building. Following drawing will help to understand how different sizes of bricks were used to get required effect or to create pseudo effect of stone construction. (Figs.13, 14) Bricks are generally laid as stretchers, with half bricks to fill the gaps and avoid successive vertical joints. (Fig.12) Surface brickwork when covered with terracotta sculptures organized into overall façade schemes, displays considerable skill of the craftsman. Different shapes of bricks are used such as long thin bricks laid edgewise as framing bands, triangular bricks as filling pieces and flat plaques coordinated in large scale sculptural compositions, these all carefully interlock.

(Dimensions shown are indicative to show non-standardization of bricks.)

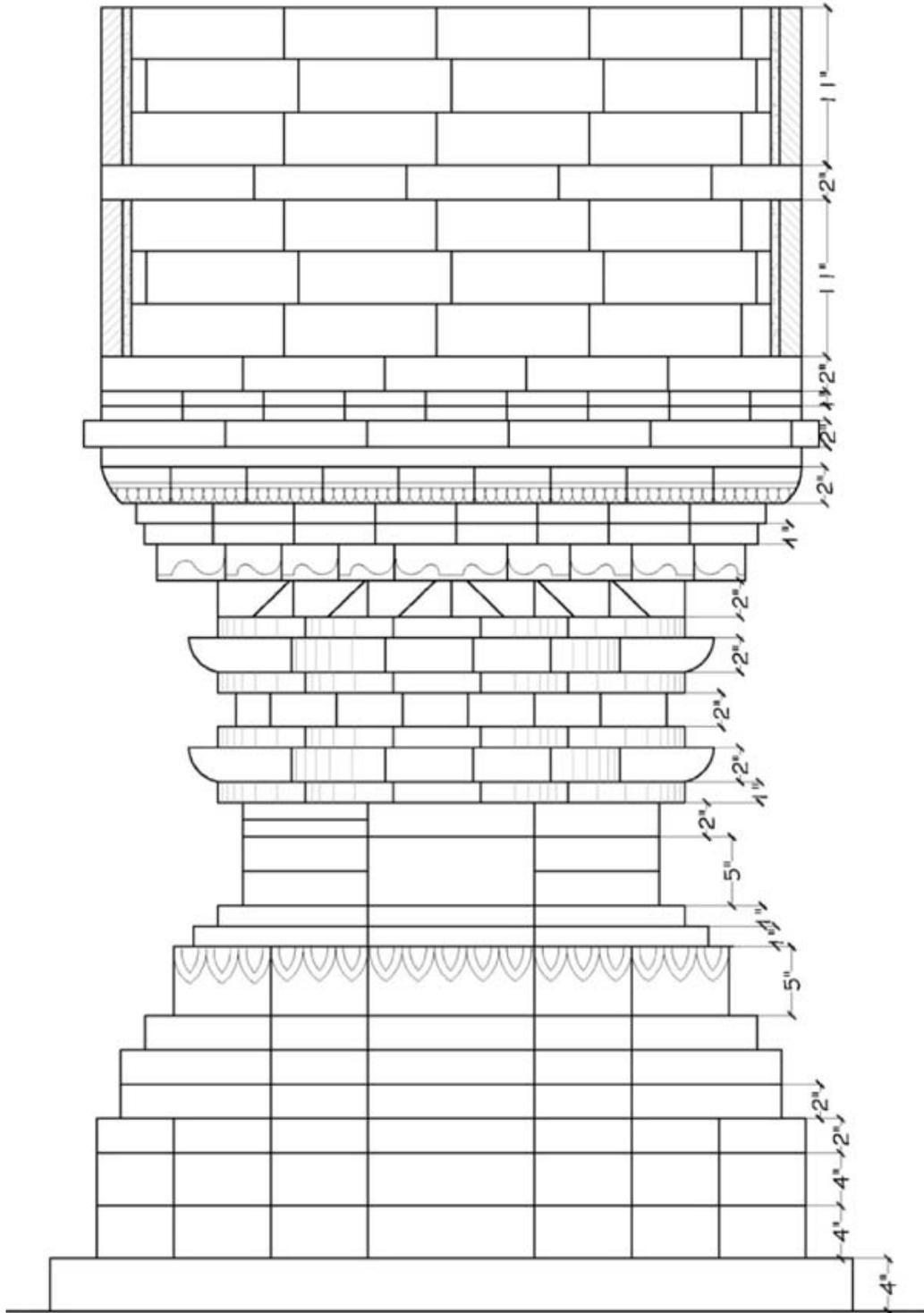


Figure 13 Varying brick sizes are used to create Pseudo effect at Rasamancha, Bishnupur



Figure 14 Different shapes of bricks used in construction.



Figure 15 In case of arch, bricks are cut to form tapering voussoirs.

Deterioration of temples

These temple builders were active up to the middle of the 19th century and numerous temples of different sizes and shapes were built with excellent terracotta work till this period. From the early 19th century, Western influence on styles and themes and features became stronger and due to several socio-economic factors the

quality and quantity of temple building as well as of terracotta work rapidly declined. Architects and artisans, who were dependant on local patronage found themselves without work and were forced to turn to other crafts such as wood carving, scroll painting and had to give up their own craft. The others who were less ambitious and more home loving were turned, neglected group of society and were known as *chutar* or wood carvers. By the middle of nineteenth century, terracotta sculptures were being replaced by stuccowork but art stayed until 1930s. Further in twentieth century, temple building continued in traditional and neo-classical style, by adopting modern building materials like steel, concrete replacing brick and terracotta. Today these brick temples are frequently disfigured or even concealed by ugly concrete additions and new concrete temples coming up everywhere.

Modern terracotta

From the above study we can say that terracotta as a material tried to fulfill the need of that time. It was modified, explored to its fullest during 15th - 19th century in West Bengal. Nowadays with the help of technology terracotta is been explored as a structural material and it's no more a material only for Surface embellishment. At every stage of its transformation this material tried to fulfill the need of time and human need to explore, evolve and grow with time and technology.

We can also say that over a period of time Terracotta has been transformed over following parameters:

From DOMESTIC USE to INDUSTRIAL USE,
 Form NON-STANDARDIZED to STANDARDIZED,
 From COMPOSITION to SPECIFICATION,
 From NON-STRUCTURAL to STRUCTURAL,

By exploring the properties of clay with the help of technology.

About terracotta hollow blocks

In India solid bricks are so extensively used in construction. But they have certain disadvantages like:

These are more expensive to lay,
 Heat insulation property is poor,
 Water absorption is high,
 Consumes more energy and soil and due to this depleting topsoil.

These problems have been overcome by using perforated bricks with 50 to 60 per cent perforations. These perforations act as a sound and heat insulators. Also due to better manufacturing techniques water absorption is low. They effectively save clay, dry faster and require less fuel for burning as compared to solid bricks. Also these large size

bricks help increase the mason's output. Below are certain images showing how these terracotta clay hollow blocks have been explored in architecture as well as in interiors mostly in Southern part of India.

Product range of clay hollow blocks



Figure 16. Raheja Pebble Bay, Bangalore



Figure 19. Column block



Figure 17. IIPM, Bangalore



Figure 18 load bearing structure at Kerala



Figure 20. Beam block



Figure 21. Wall block



Figure 22. Roof block



Figure 23. Wall and column junction



Figure 24. Bungalow in Bangalore



Figure 25. Building in Bangalore



Figure 26. IIPM, Bangalore



Figure 27. IIPM, Bangalore

Exploration in interiors



Figure 28. Explorations of these blocks in interior done by architect Jaisim, Bangalore



Figure 30. R.C.C and clay hollow blocks construction



Figure 30 R.C.C and clay hollow blocks construction

End Notes

- ⁱ (Ed.) Michell, George, *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983, page no. 3.
- ⁱⁱ *ibid*
- ⁱⁱⁱ Searched through <http://www.calcuttaweb.com/maps/bankura.shtml>, 20th June 2011, 11.30 am
- ^{iv} Michell, George. *Opsit*, page no. 3
- ^v Above paragraph is based on understanding from (Ed.) Michell, George, *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983,
- ^{vi} (Ed.) Michell, George. *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983, page no. 15.
- ^{vii} Datta, Bimal. *Bengal Temples*, Munshiram Manoharlal pub. Pvt. Ltd, page no. 46
- ^{viii} *Opsit*, page no. 6
- ^{ix} Understanding for Temple builders is based on (Ed.) Michell, George. *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983,
- ^x Haque, Zulekha in George Michell's *Brick Temple of Bengal - From the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983
- ^{xi} Understanding for temple planning is based on Khare, Ajay. *Temple Architecture of Eastern India*, Shubhi Pub. Gurgaon, page no. 186-190.
- ^{xii} Understanding for Non standardization in construction is based on (Ed.) Michell, George. *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983.

Bibliographic references:

- Michell, George (Ed.). *Brick Temples of Bengal - from the Archives of David McCutcheon*, Princeton University Press, New Jersey, 1983.
- Khare, Ajay, *Temple Architecture of Eastern India*, Shubhi publications, Gurgaon, 2005.
- Dasgupta, Pradosh, *Temple Terracotta of Bengal*, Crafts Museum, New Delhi, 1971.
- Dey, Mukul, *Birbhum Temples*, Lalit Kala Academi, new Delhi, 1959

Interviews

- Mr. Chittranjan Dasgupta, Bishnupur (West Bengal), 3rd March 2010
- Prof. Shoumik Nandi Mujumdar, Shantiniketan (West Bengal), 4th March 2010
- Dr. Sanjoy Kumar Mallik, Shantiniketan (West Bengal), 4th March 2010

Illustration Credits

Figure 1: <http://www.calcuttaweb.com/maps/bankura.shtml>, 20th June, 11.30am

Figure 2 - figure 15: self taken and self drawn.

Figure 16: From presentation done by VanReeth, Rudy, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 17: Self taken

Figure 18: From presentation done by VanReeth, Rudy, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 19-20: From presentation done by K, Remesh, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 21-23: From presentation done by K, Remesh, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 24, 25: From presentation done by K, Remesh, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 26, 27: self taken

Figure 28: : From presentation done by VanReeth, Rudy, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009

Figure 29, 30: From presentation done by K, Remesh, at TERI workshop on Energy Efficiency Improvements in Indian Brick industry, at New Delhi on 20th Dec 2009



Priyanka Mangaonkar is an architect with a Masters in Interior Architecture and Design, with specialization in Craft and Technology from Centre for Environmental planning and Technology, Ahmedabad. She has Worked as a project coordinator with Centre for Sustainable Environment and Energy (CSEE), Ahmedabad for a project titled 'Energy efficiency improvements in Indian brick Industry' for promoting energy efficiency in the Indian brick sector with The Energy and Resources Institute (TERI) and United Nations Development Programme (UNDP).