From Basel Mission to Mangalore Tiles

Production, transport, and use of 19th century ceramic building material in India

Sophie Hueglin,
Priya Joseph
& Sila Tripati

From the mid-19th century onwards, industrialization had a profound impact on architecture and people's lives across the world. For South Asia, historical sources provide a lot of information about this chapter of the recent past but mostly from a Western and missionary perspective. To know more about the actual process, the real places, the very people, their products and their customers, many open questions remain. Archaeological, anthropological and architectural research into materials and monuments of this period in Southwestern India could not only help to answer some of these caveats but would add a potentially contrasting and conflicting inside and local perspective. This case study will look at the production, transport and use of terracotta construction elements from Mangalore in Karnataka across South Asia and beyond. Georg Plebst, a Protestant priest from Basel Mission played a crucial role in the introduction of mass production of tiles, bricks and other ceramic objects, but he drew on the knowledge of local experts and the workforce of converts. Within a few decades, many more factories were established by other investors concurring with each other on a fast-expanding market. Working with machines and producing large quantities of identical objects profoundly changed the way people worked. The standardization of products led to the formation of construction industry and altered architecture and building materials as well as methods profoundly. Today, the material remains in the places of production, transportation and usage of "Mangalore Tiles" have a unique potential to bring the local and the global as well as history and heritage together and show their complex entanglement. At the same time, these sites can provide ideas and training grounds for the new use of old construction materials and methods – such as clay and adobe – that could make building more sustainable in the future.

Introduction

In India, "Mangalore Tiles" is a generic brand name for a type of machine-made interlocking roof tile that still dominates the houses in the old city centres and the countryside villages, especially along the Malabar and Konkan coasts of the Arabian Sea and the Western Ghats, the dominating mountain range of southwestern India. In 1860, this machine-made tile type was introduced by Georg Plebst, a priest of the Basel Evangelical Mission. Together with local workers, later mostly converts, he set up a factory in Mangalore, Karnataka. When industrial tile making turned out to be very profitable, Basel Mission Company (BMC) itself and also competitors soon established many more sites to manufacture terracotta building materials. Basel Mission Company ran the production site at Mangalore until 1914, when – at the beginning of World War I – the property was given to the Commonwealth Tile Factory which until today is fabricating bricks there very much in the way it was done in the 19th century.[1]

Originally, these tiles were transported with dhows – the traditional sailing vessel used for trading in the Red Sea and Indian Ocean region – along the Indian coast and up major rivers even as far as Pakistan, Africa, Indonesia and Australia. In 1998 maritime archaeologists from the CSIR-National Institute of Oceanography, Goa, India discovered a shipwreck just off Goa that carried terracotta artefacts from Basel Mission Company.[2] The wide range of objects found shows the potential of underwater archaeology to illuminate the main transportation mode of the 19th century – the ship – which today has been replaced first by the train and then by trucks.

1 Sumra/Chatterjee 2019.
2 Tripati u. a. 2003.

Tiles with "Basel Mission" impressed on the rear can still be found all over buildings in India. In 1887, they were used to cover Victoria Station, today Chhatrapati Shivaji Maharaj Terminus, Mumbai's railway station that is now a UNESCO World Heritage site. Also, they can still be found in famous historic buildings such as the Dutch Palace in Kochi, Kerala.[3]

Christian conversion in India and its influence on architecture

Today, almost 80% of India's population is of Hindu belief and 15% are Muslims;[4] only a bit more than 2% or about 30 million Indians call themselves Christians. The highest density of Christians can be found in Northeast-India, in the so-called "Seven Sisters", the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura and one brother state – Sikkim. Especially in Meghalaya, Nagaland and Mizoram, the percentage of Christians can reach between 80–90%. This Christian conversion in Northeast India is the consequence of 19th-century protestant missionary activity among the local tribal community, but will not be the focus of this article.

The other concentration of Christians – which we will look at in more detail here – can be found in South India, in the Indian states of Kerala, Karnataka, southern Karnataka and Goa. Here the history of Christianity has at least three historical layers that are mirrored in specific Christian communities still active today.

The first layer – the Saint Thomas Christians or Syrian Christians – can be traced back to the time of Apostle Thomas, who is said to have landed in 52 CE in Kodungallur near today Kochi in Kerala and established there the Ezharappallikal – seven plus one kingly Christian communities.[5] Today, Kodungallur is thought to be the site of the famous ancient port of Muziris depicted on the Tabula Peuteringiana.[6] Because of its important role in the maritime spice trade in antiquity, Muziris was home to many different religious groups and also had an influential Jewish community.[7] This Jewish community – the Cochin Jews[8] – might have been the reason that made Apostle Thomas come to India. According to Syrian Christian tradition, Saint Thomas had also a strong connection with the opposite South Indian coast at the Bay of Bengal. He is said to have been killed by a spear on St Thomas Mount, Chennai, Tamil Nadu and interred in Mylapore – both important centres of Christian and Muslim veneration today.[9] Only from the 4th century CE onwards there are written records about the Syrian Christians in India. Due to a lack of archaeological research or survey of standing buildings, there are no finds or architectural features that could prove dates earlier than the 13th–14th century for any of the eight churches that belonged to the Ezharappallikal. St Mary's Church at Niranam is believed to be one of the first churches founded by Saint Thomas in 54 CE, but the oldest now visible remains date to a reconstruction in 1259. Other churches such as the one at Kallooppara are currently under investigation.[10] As we don't know what the earliest churches in South India might have looked like, it is not possible to evaluate the extent to which their architectural form and construction materials resembled that of Hindu temples or vernacular houses.

The second Christian conversion was the one of Catholicism and it took place in the context of the Portuguese long-distance trade in the 15th century. With the fall of Constantinople to the Sunni Islamic Ottoman Caliphate in 1453 the Byzantine or Eastern Roman Empire ended and through this European trade routes on land with Asia were severed. As part of the Portuguese maritime ventures Vasco da Gama explored a maritime route around Africa to Asia. In 1498 he reached Calicut and Goa and brought missionaries with him. During the 16th century, missionaries from different orders including Franciscans, Dominicans, Jesuits and Augustinians arrived in the Portuguese colonies. The relationship with the Saint Thomas Christians was friendly at first but then led to considerable persecution as Portuguese evangelists made efforts to catholicize the

3 The Dutch or Mattancherry Palace was built during Portuguese Empire for the Rajas of Kochi. It houses world famous murals of the 16–18th centuries and is managed today be the Archaeological Service of India. See also https://en.wikipedia.org/wiki/Mattancherry_Palace

4 Census of 2011 (https://en.wikipedia.org/wiki/India#Demographics,_languages,_and_religion).

5 Thomas 2018, 24–28; https://en.wikipedia.org/wiki/Christianity_in_India; https://en.wikipedia.org/wiki/Saint_Thomas_Christians.

6 For the depiction of Muziris on the Tabula Peuteringiana see https://en.wikipedia.org/wiki/Muziris

7 Some of these Jewish communities were active until the 1950ies and their former synagogues and living quarters still can be seen and visited for example at Paravur (https://www.muzirisheritage.org/kerala-jews-historical-museum.php).

8 Also called „Malabar Jews" or „Kochinim" are the oldest group of Jews in India; see also https://en.wikipedia.org/wiki/Cochin_Jews

9 Syrian Christian tradition also has it that Saint Thomas went to China and back to India before he died (Bays 2012; https://en.wikipedia.org/wiki/Thomas_the_Apostle).

10 See the PhD-project by Julia Vidal Alvelette or the Archaeological Survey mentioned here: https://www.onmanorama.com/lifestyle/decor/2020/01/27/spanish-researcher-temple-architecture-church-pathanamthitta.html

1 Curved tiles on a restored a building of Reis Magos Fort, Goa. It was built in 1541 by the Portuguese on a headland jutting out from the northern bank of river Mandovi opposite the capital city of Panjim to control the shipping traffic.

Saint Thomas Christians under the Holy See and into Portuguese colonial structures. The Eastern Syriac Christians wanted to remain under the jurisdiction of the Church of the East which also meant to hold mass in Aramaic and not change to Latin.[11] This time we have reports and remains of standing monuments to bear witness to the shape and materials that the Portuguese used to build the first churches. In 1505 and 1506, the Portuguese obtained permission from the Raja of Kochi to build Santa Cruz Basilica and St Francis Church in Kochi. They were using stones and mortar, materials which until then were reserved for temples and royal palaces.[12] Together with the new building material for the walls the roof construction and covering material changed. Still today preserved in some places on churches and secular buildings from the Portuguese era, we can observe the use of curved tiles,[13] often in many layers on top of each other. They form a substantial but also quite heavy protection against rain and winds during the monsoon (Fig. 1). Originally these tiles were handmade by local potters and formed using simple moulds from wood.[14] The Portuguese missionary work progressed on a large scale along the western and eastern coasts but didn't reach much of the interior lands, especially in North India.

The third but likely not last wave of Christianization in India began around 1700 with the decline of the Portuguese power. Especially the Dutch and British gained influence and paved the way for Protestant missionaries from many different European countries. The first missionaries to begin their work in India were two Lutherans from Germany – Bartholomäus Ziegenbalg and Heinrich Plütschau. From 1705 onwards they were based in the Danish settlement of Tranquebar south of Chennai and practised what would become the most successful method of Protestant conversion: they translated the Bible into the local language – in this case, Tamil. Their successors from now on well through the 19th century would learn the local vernacular to enable the individual to study the Bible for him- and herself. This follows the main Protestant doctrines namely "sola scriptura" – to place the Bible highest as the source of authority in the church – and "sola fide" – that the belief in Christ is at the same time necessary and sufficient for eternal salvation and justification.[15] This also meant that no longer whole groups could be converted together with their political or priestly leader but that rather every candidate must be able to read the Bible and confess his or her belief in Christ individually before being baptized. In parallel to their missionary work, many of the

11 The Eastern Syriac Christians continued this practice until very recently before they included Malayalam as formal language into their services (https://en.wikipedia.org/wiki/Syro-Malabar_Catholic_Church).

12 Axelrod/Fuerch 1996; https://en.wikipedia.org/wiki/Christianity_in_India#Portuguese_efforts_to_Catholicize_Saint_Thomas_Christians.

13 For this type of roof tile also the term "half-cylindrical country tile" is used (Joseph 2021, 106–116). Other less defined terms are mission or barrel tiles.

14 In India and Portugal one often can hear that curved tiles were formed over the "thighs of Indian women" but that seems to be an unproven legend (https://sbthp.wordpress.com/2012/07/06/tile-production-at-the-santa-barbara-presidio-part-2-forming-roof-and-floor-tiles/). See Joseph 2021, 106 f. for contemporary roof tile production with molds respectively on the potter's wheel in the Konkan region and in Gujarat. Also compare the film "Mud Tile Making" by Gaatha from 2004 (https://www.youtube.com/watch?v=zfD2ej_fw9U).

15 "Sola fidne" replaces the Catholic understanding that it is a combination of faith and good deeds that is needed to be pardoned for sin not just the faith in Christ (https://en.wikipedia.org/wiki/Protestantism).

Protestant missionaries acted as linguists and ethnographers by publishing dictionaries and documenting rituals. While a printing press reached India in 1556, it was not before the 1780s that print made itself felt in Indian society.[16] The Protestant missions played an important role in developing printable letters especially, for the south Indian Dravidian languages like Tamil, Malayalam and Kannada. These letters were not only used to print the Bible or religious literature but also to publish the first newspapers in these languages. The technology needed to run a printing press on a small scale resembles what is needed to mass-produce other goods such as terracotta construction elements. A second requirement to be able to use or rather a consequence of using prefabricated materials from a mechanized production were standardized measures and materials. What we see in this period is a somehow contradictional movement: while the candidates for conversion were being more and more seen as individuals and addressed in their local languages, the material world of script or objects of daily use underwent a process of rigorous standardization and massive multiplication.

From Basel Mission to Basel Mission Company

Basel Mission was a Christian missionary society founded in 1815 in Basel, Switzerland, as a Protestant but non-denominational undertaking. Protestants from Basel and Lutherans from Württemberg – influenced by the Swabian pietist and revival movement – had made a vow to establish the seminary if the city of Basel would be spared in the Napoleonic Wars which it was. Consequently, from 1816 onwards German and Swiss along with Dutch and British missionaries were trained in Basel. Originally, missionary activities in India had been banned by the British East India Company (EIC); a policy of non-interference in questions of belief had been followed to avoid political unrest. Only after fierce controversies, the Charter Act of 1813 legalized Christian missions in India; in 1834, this allowance was revised to include non-British missionary societies. Until 1833, Basel Mission absolvents for India were solely placed through the British sister organization, the Church Missionary Society (CMS).[17]

The three – later four – year training in Basel offered ordination without an expensive theological university education and aimed at young men from artisanal and peasant backgrounds. This pragmatic orientation led to friction especially in India because the British demanded candidates of higher education with a knowledge of the Bible languages Latin, Greek and Hebrew.[18] With the revised Charter of 1833 Basel Mission was able to open its own station. The first three missionaries went to London to agree on their region of activity – which had to be well away from stations of British missionary societies; the choice fell on the region of today's Indian states of Karnataka and Kerala. In 1834, the first Basel mission station was opened in Mangalore, then part of the Madras Presidency.[19]

Before Basel Mission engaged in India, it had sent missionaries to Russia and the Gold Coast in Africa – today Ghana; later also to China, Cameroon, Borneo, Nigeria, Latin America, Sudan and Australia. Mangalore remained the main seat in India; 25 more sub-seats and 128 outposts were erected in other districts Basel Mission was allowed to be active. In 1914, with World War I the Basel Mission personnel were either detained or expelled and in 1947 – immediately after Indian independence – all the protestant institutions and communities were integrated into the Church of South India (CSI).[20]

Some of the Basel Mission missionaries are well remembered – often in India more than back home – for their pioneering work on the local languages. In Thalassery near Kannur in Kerala Hermann Hesse's grandfather Hermann Gundert was active from 1839 to 1859 and did studied Malayalam.[21] Similarly famous became Ferdinand Kittel for his dictionary and grammar of Kannada.[22] Basel Mission operated schools in which the children – after initially being taught in English – learned to

16 https://scroll.in/article/1002083/indias-printing-history-is-five-centuries-old-it-needs-printing-museums-to-preserve-this-heritage

17 Schmid 2015, 145. For more details from a British perspective see Chancey 1998.

18 http://missionaries.griffith.edu.au/missionary-training/basel-mission-society-1815

19 Schlatter 1916, 7–9; Binder 2006, 203; Kumar 2006, 84; Stenzl 2010; Schmid 2015, 150; Bozsa/Lovász 2019, 85; Crain Merz 2019/2021.

20 https://en.wikipedia.org/wiki/Basel_Mission

21 His bungalow is a museum today (https://en.wikipedia.org/wiki/Gundert_Museum) and his collection of historical documents is part of the Tuebingen University library (https://www.gundert-portal.de). Regarding the relation between Hermann Gundert and Tuebingen University see Moser/Binder 2006.

22 Wendt 2006, 7. For more details on individual missionaries see also Binder 2006, 204–206.

read and write in their local language which could be Malayalam, Kannada, or one of the languages of smaller ethnic communities like Tulu. Besides, a printing press – the first in coastal Karnataka – was opened at Balmatta Mangalore in 1841 to print pamphlets, religious books and the first newspaper in Kannada.[23]

Strategies of economic sustainability were as important for the success of the Basel Mission as questions of religious belief. Back home Basel Mission received donations from its members and developed the "Halbbatzen-Kollekte" as a kind of fundraising with small monthly amounts from the many friends of the mission activity.[24] On the other hand, Basel Mission divested a part of its activities in India as a self-financing unit or public limited company such as the Missions-Handlungs-Gesellschaft in 1859.[25]

Many converts came from a socially powerless low-caste background like the ethnic group of the Billavas[26] and the Mogaveera,[27] a sub-caste of the Koli caste – both from the Hindu belief spectrum – as well as members of the Mappila community, a Muslim group.[28] Before converting to Christianity, they were mostly palm winemakers, fishermen and small farmers.[29] While from the perspective of the missionaries, individual souls were saved, the converts saw a chance to improve their social status and quality of life under the challenging circumstances of British colonialism and the capitalist ways of revenue generation.[30] Basel Mission expected the converts to break not only with their former belief but also with the caste system. This followed a theological definition of freedom which meant that the converts should be free from worldly powers and depend alone on God. Neither in the schools nor in the church or at the table caste segregation was tolerated. Consequently, many of the new converts lost their traditional place in society and their source of income. Basel Mission reacted to this by creating boarding schools, training facilities and industrial production sites.[31] This is where the dual education system of Basel Mission priests proved very useful; each of the absolvents had not only a theological academic education but also vocational training in a craft or trade. At the same time, these manufacturing sites relied heavily on the cooperation with local experts and on the skill and dedication of the workers employed in them. From Basel Mission's perspective, the work in the mission's businesses also served the purpose to convey Protestant values like diligence, discipline, punctuality and thrift. From within Basel Mission critique only arose when non-Christians were employed.[32]

In contrast to the egalitarian claim of being one Christian community and the rejection of the caste system in India, the differences between Indians and Europeans were never forgotten. That was on the one hand the idea that civilizations developed in stages with Europe and thus people of European descent being far ahead of other cultures of the time. In this ideology Protestant mission was part of a civilizing pursuit as part of an imperial world-improving agenda.[33] On the other hand – while race hardly featured in missionary reports – it was referred to as 'black' and 'white' congregations and a strict separation was maintained. This meant for example that marriages between Europeans and Indians or more clearly between people of different skin colours were not permitted. Also, the use of Indian music in hymns was not encouraged.[34]

In the South Indian Basel Mission sites, several entrepreneurial efforts were made to produce market goods; they were launched with different success. In the beginning, the rather small artisanal businesses comprised weaving, carpentry, clock-making[35] and bookbinding. They were followed by brickworks, joineries, mechanical workshops and weaving mills. In the weaving mills, the different working steps and methods copied the European model; in Mangalore, the first weaving mill with flying shuttles went into operation in 1852. Johannes Haller, an artisan himself developed the khaki fabric, a dense cotton cloth dyed with mulberry

23 Kumar 2006, 87 f.; Sumra/Chatterjee 2020; https://en.wikipedia.org/wiki/Basel_Mission_Press

24 A "Halbbatzen" was the equivalent of 5 Rappen; Kittel u. a. 2015, 23–25; https://de.wikipedia.org/wiki/Halbbatzen-Kollekte

25 Christ 2015, 93; Crain Merz 2019/2021. The Missions-Handlungs-Gesellschaft became known in India as Basel Mission Company (BMC).

26 The Billava live in "Tulu Nadu" in South Canara which is a historical area comprising parts of southern Karnataka and northern Kerala.

27 https://en.wikipedia.org/wiki/Mogaveera

28 Bozsa/Lovász 2019, 86.

29 Compare Basu Roy 2019 about Basel Mission and further groups like the Thiyyas and Badagas.

30 Kumar (in preparation); https://en.wikipedia.org/wiki/Billava

31 Binder 2006, 209.

32 Bozsa/Lovász 2019, 87.

33 Osterhammel 2005, 371.

34 Stenzl 2010, 34; Stenzl 2012.

35 The clock and watch production turned into a commercial failure (Stenzl 2010, 33).

△ **2** Georg Plebst, 1851.

▷ **3** Basel Mission Tile Works at Jeppu, Mangalore, Karnataka in an early phase.

bark, which later was used for British uniforms. By opening more factories in Cannanore (today Kannur), Calicut (today Kozhikode) and Tellicherry (today Thalassery) textiles were manufactured for the European market. After its foundation in 1859, the Basel Mission Trading Company was involved in the wholesale of commodities such as palm oil, cacao and cotton. Over the next decades – also helped by the opening of the Suez Canal in 1869 – the trading network expanded globally, and the Basel Mission became one of the most important economic factors in the South Indian textile industry of the 19th century.[36]

From a personal and technological view, the Basel Mission tile and brick production – which is the focus here – had a closely related branch, and that was the printing press. Georg Plebst (Fig. 2) was one of the first of the so-called "Industriebrüder"; in 1846, he had been sent as a lay brother to Mangalore to specifically supervise the production of printed materials.[37] Previously he had been trained and worked in the workshop of Georg von Cotta – a leading publisher in Southern Germany at that time – and had adopted the most recent technologies. In 1852/53 he replaced the lithographic press with a typographic one, which meant that individually cast reusable letters – called types – were arranged in a frame for a page. With this technology it was not only possible to fulfil Basel Mission's own demands much faster and cheaper but also to process paid orders for the British colonial government.[38]

Basel Mission brick and tile production

After health reasons had forced Georg Plebst to return to Europe, he convinced Basel Mission to try to produce glazed and unglazed earthenware in India, as the traditional tiles there were never glazed and were quite brittle. When Plebst returned to India in 1863, he built an oven with the help of an Indian master potter and started experimenting to establish the right mixture of clay and sand. In December 1865 he started to produce roof tiles – 360 per day – with just two workers and a few bullocks (Fig. 3). The products quickly became a great success because they were lighter and more waterproof than traditional Indian tiles. The tile works were to become the most rapidly developing and largest mission industry. But in the first years, they depended almost entirely on Plebst's skills and equipment. The operation of a new machine, for example, was delayed because Plebst, the only one who could have installed it, had to go to a hill station for his health. Despite such setbacks, improvements and expansion continued and in 1880, just before steam power replaced the bullocks, production in Jeppu near Mangalore reached a million tiles per year.[39]

In parallel to Plebst's early experiments in Mangalore, the use of country tiles was already dwindling, and they were being replaced by many versions of factory-produced tiles. Among these were the Goodwyn tiles – first manufactured in 1850 – and the Atkinson tile developed by British engineers. Both British types took up the Roman method of com-

36 Bozsa/Lovász 2019, 87.

37 Plebst actually had been unable to complete the course in Basel and become an ordained missionary (Stenzl 2010, 35).

38 Shaw 1977; Raghaviah 1990; Binder 2006, 219; Kumar 2006, 87; Raghaviah 2018; Ranganathan 2021; https://en.wikipedia.org/wiki/Basel_Mission_Press

39 Schlatter 1916, 162–164; Stenzl 2010, 35 f.; Thomas/Schürer-Ries 2012, 31.

4 Early handmade flat tile produced at Mangalore from the rear.

5 Still to be found at Jeppu, Mangalore: used and broken remainder of a standard interlocking tile of the type produced form 1865 onwards in the Basel Mission Tile Works at Mangalore.

bining flat imbrices with half-cylindrical tegulae. The flat tiles with raised edges would be made in the factory to standardized sizes and could be combined with traditional handmade country tiles which played the role of the tegulae. The Public Works Department (PWD) strongly supported the tendency towards standardized formats of elements of architecture

6 Range of products from Basel Mission tile works.

through its manuals from 1850 onwards. The first roof tiles produced by Basel Mission at Jeppu in 1865 would also be flat (Fig. 4); only later, the design would change to the machine-made interlocking pan-type tile which would become typical for the Basel Mission resp. Mangalore tiles (Fig. 5).[40] It is very likely that Plebst was also in contact with the Gilardoni Brothers who – in 1837 – had opened a tile manufacture at Altkirch in Alsace close to Basel. In 1841 they acquired a patent for the first mechanically produced roof tiles and presented them at the Exposition Universelle in Paris in 1855.[41]

At Mangalore, the clay came from the banks of the river Netravathi, at first from the production site at Jeppu itself, later also from across the river and was then brought by boat. Different clay and sand qualities had to be mixed. By 1870, part of the production became mechanized and Plebst describes practical problems like getting the freshly formed tile out of the negative. At that time between 50 and 60 day-labourers were working at Jeppu but there were hardly any converts. Basel Mission addressed this by erecting a house on the premises, employing a European site manager and introducing a daily morning prayer.[42]

In 1874, a copy of the small tile works at Jeppu was erected in a riverbed at Arakallu near Calicut, the "Arakallu Tiling Establishment". A third site – Kudroli in Mangalore – was the first tile factory on a much larger scale. It was opened in 1883 and employed 300 people from the beginning. In present-day Kerala establishments of tile factories followed in Feroke, Puthiyara and Olavakkode. The tiles were not only non-porous and less prone to breakage than their traditional counterparts but they were also much lighter in weight and suited for light-roof constructions. Through this, the new type of tiles not only saved wood in the firing process but also timber in the construction sector itself. This was counterbalanced by the many more – especially public buildings – that were erected with mechanically produced ceramics like brick, tiles and decorative terracotta objects. The success of the Basel Mission tile works did not go unnoticed. Despite patent protection many others entered the competition; in Mangalore alone, there were four non-Basel Mission factories by 1881 and more than 30 in 1910, mostly owned and operated by local entrepeneurs.[43]

Apart from interlocking flat tiles, the factories offered more and more a whole range of terracotta elements for the construction sector. On offer were ridge tiles both plain and ornamental, skylights and ventilators, ridge and hip terminals, grooved spire tiles, hanging wall tiles, ceiling tiles of many different designs, hourdis[44] or ceiling slabs, common or ornamental clay flooring tiles, Victoria cement flooring tiles, and earthenware, drainage

40 Joseph 2021, 110–116.

41 Vaidyanathan 2021, 89; https://fr.wikipedia.org/wiki/Gilardoni_Frères

42 Schlatter 1916, 162 f. (here Jeppu is spelled "Dscheppu"); Fischer 2009, 206 f.; Dias 2021.

43 Kumar 2006, 95, 106, 116 and 199 f.; Fischer 2009, 206 (Fischer calls the site in Calicut (today Kozhikode) "Putyarakal"); Schlatter 1916, 162 f. (calls the same site near Calicut "Arakallu"; both are on modern maps).

44 Hourdis or hourd (from Old Frankish '*hurd*') describes a hollow-core slab that serves as flooring block.

7 Basel Mission Tile Works at Jeppu, Mangalore, Karnataka in a later phase.

pipes, terracotta vases flowerpots, and architectural terracotta ware like parts of fluted columns (Fig. 6).[45]

The Basel Mission tile works operated until 1914. With the outbreak of World War I not only the Seminary in Basel was temporarily closed, but also German missionaries in India were being interred and Swiss nationals expelled. The industrial works in India were taken over by the British Colonial government. They are partly still producing today. The present-day tile works at Jeppu are run by the Commonwealth Tile Factory.

Transport of the terracotta products

The ship was the prevalent means of transport not only for bringing the missionaries to India but also for moving heavy commodities like building materials. In the case of the Basel Mission tile works this meant that they always had to be located at major rivers but also close to the sea. The tile works at Jeppu were situated on the Northern estuary of the river Netravathi, close to where it reached the Arabian Sea (Fig. 7). It had its own harbour for the many ships that brought the raw materials, – mainly clay and wood – but also for the distribution of the finished products to the customers. The ships were rather small and could be either rowed or sailed by a small crew. They are called dhow and were used widely in the Indian Ocean trade.[46] They mostly sailed along the coast and would use the tide to travel upstream and reach inland harbour sites along rivers.

When travelling north along the Malabar coast, Goa with its harbour at Panaji was one of the important destinations of these ships that transported Basel Mission and other products. Many of them would anchor just south of Aguada Fort and either replenish their supply of sweet water before carrying on along the coast or wait for the right moment to travel inland with the tide on the river Mandovi.[47] Coming from Mangalore, the ships would have to pass dangerous reefs just before reaching the mouth of river Mandovi. One of these underwater obstacles is St Georges Reef situated next to Grande Island; this passage is especially difficult when during high tide the reef is covered by water and strong winds blow from the Arabian Sea. In recent decades, many shipwrecks have been found and documented in this area. In 1998, maritime archaeologists from CSIR-National Institute of Oceanography (NIO) discovered a shipwreck just off Goa that held terracotta objects from Basel Mission Company. They were able to document the remains of the boat and rescue some of its cargo; it contained exclusively a range of terracotta objects of Basel Mission production. Among the artefacts scattered over a large area were hollow column drum and chimney bricks, roof, ridge and floor tiles as well as a

45 Kumar 2006, 92–94; Joseph 2021, 94 f., Figure 27; Joseph 2023, 35, Figure 12.

46 Sheriff 2010, 65–73.

47 Oral information on the situation "when he was young" from a seller of building materials (specialist shop: Pereira Pimenta, Rua 31 de Janeiro, Panaji, Goa – 20.2.2020).

8 Selection of finds from the St George's reef shipwreck near Goa.

column capital and drainage pipes (Fig. 8). A metal detector survey did not reveal any anomalies around the timber from the ship, therefore it seems to have been a small country craft built entirely from wood.[48] Today the finds are exhibited in the entrance hall of the CSIR-National Institute of Oceanography at Dona Paula, Goa.

Basel Mission terracotta products were traded not only along the Indian coast, but with oceangoing vessels as far as today Pakistan,[49] Africa, Borneo, Sumatra and even Australia. The overseas stations of Basel Mission itself were customers; in India, the British colonial government would order Basel Mission products for public building projects such as Victoria Station – today the Chhatrapati Shivaji Terminus – in Mumbai which started in 1878 and lasted until 1887.

With the many competitors in Mangalore alone – there were 25 factories around 1900 and about 75 in 1994[50] – "Mangalore tiles" became a generic brand name for interlocking roof tiles from the general region. In the 20th century – when the former Basel Mission tile works continued under new ownership as Commonwealth Tile Factory – new markets mainly

48 Tripati u. a. 2003, 112 f.; Tripati 2015; Tripati online.
49 Mazhar 2016.
50 Mani 1990; Giriappa 1994, 61.

for machine-made roof tiles and bricks from Mangalore were developed in the Gulf States such as Bahrain, Dubai and Kuwait.

Usage of Basel Mission products and Mangalore tiles

While Basel Mission production stopped in 1914, still many tiles with the Basel Mission-mark can be found when travelling South India.[51] This is not only proof of their longevity but also of the many cycles of reuse some of them must have gone through. This of course is true for most "Mangalore tiles". Today they can be found on roofs of villages all over Maharashtra quite far inland but still west of the Sahyadris, the north-south mountain range that is part of the Western Ghats and is responsible for the much higher rates of rainfall that the westerly Monsoon winds bring the Western coast of India. This distribution of course is more influenced by transport along the railway tracks – from 1907 onwards – and with lorries that took over from about mid of the 20th century.[52]

Basel Mission tiles were used on churches, public buildings and profane architecture alike. While tiles and bricks would account for 80% of the amount produced and used, specific types were developed for particular uses. While at the roof overhang, one layer of roof tiles would suffice, inside the building on the top floor, the roof would have two layers: one lower with a decorative panel pointing inside and a second layer of ordinary roof tiles on top. Between these two layers would be an insulating layer of air that separated the inside of the house or the church to a certain extent from external temperatures or direct insolation. In some buildings – especially in churches and schools – one can see still today that a large percentage of the interior fittings – from the floor and wall tiles to the pillars of the portico, the pedestal of the stoup or the altar itself – has been built using terracotta elements from Basel Mission origin (Fig. 9).[53]

Historical Archaeology in South Asia and its possible contribution to the history of Basel Mission and Mangalore tiles

B. C. Wilson and M. W. Hauser rightfully criticize the limiting and somehow colonial use of the term "historical" in an archaeology of South Asia in the 19th and 20th centuries.[54] Indeed, South Asia has had an abundance of historical sources almost since the 3rd century BCE and not only since Europeans arrived at the turn of the 15th century CE. Anglo-American research has discovered world or global archaeology of the "historical" periods for quite a while. From a German or Swiss perspective, very little archaeological research has been done on other continents and even less on the historical – or maybe let us call it better the modern – period. When listing the above historical facts, one could get the impression that everything is clear about Basel Mission's tile production in South India. But when looking at the material remains – for example, the remaining buildings in Jeppu or objects kept there – it quickly becomes clear that there are many open questions. A focus on materiality could give rise to a new conversation on methods, minds and mentalities of all the people involved, not only the missionaries. The following research questions are a few examples of aspects that would ask for a historical archaeological approach:

- What is left of older buildings on the Commonwealth Tile Factory plot at Jeppu when comparing historical plans with today's layout of the premises?
- Where about in Mangalore were the concurring tile factories and what is left of them?
- What types of tiles (and other products) were produced at the different Basel Mission tile works and how do they differ in shape and material from products of the other tile works?
- What groups of people were involved in the water transport – traditionally a realm of Muslims – of raw materials and products?
- In the use of terracotta products from Mangalore can there be observed a certain prevalence of specific religious or social groups? Was using tiles of a specific brand an expression of belief or rather showing a commitment to specific material values like hardness and precision?

51 Just recently – in March 2023 – S. Hüglin documented Basel Mission tiles on the Dutch palace in Kochi as well as on the Gundert bungalow, a museum building in Thalassery.

52 As example one could name the villages in Raigad district, 50 km upstream of the mouth of Kundalika River at Murud.

53 Vaidyanathan 2021, 93–98; Hüglin 2021; https://www.stadtgeschichtebasel.ch/index/geschichten/2019-2022/01/ziegelproduktion_basler_mission.html esp (Abb. 6 [of Kanthi Church, Mangalore]).

54 Wilson/Hauser 2016.

9 Inside CSI Kanthi church Jeppu in Mangalore not only part of the floor, wall and roof tiles but also the baptismal font, the altar and the chancel were made using Basel Mission terracotta elements.

The topic would lend itself readily to comparisons on a global scale because the development of machine-made tiles in Europe is – certainly from a historical-archaeological perspective – with a few exceptions rather under-researched.[55] A better understanding of processes in the quite recent past should not be an end in itself but should help to anticipate and shape changes that answer pressing questions of today. Such questions could be:

- What construction materials should we use today to build houses that keep cool in the rising temperatures of climate change?
- What role can terracotta elements play in this, or should we rather use clay unburnt – at least in places where the architecture is not exposed to water?
- What role can or should Basel Mission and Mangalore tiles play in creating a shared heritage between locals, Indians from further away and tourists from Europe?

The history of Basel Mission and Mangalore tile production in India in the 19th and 20th centuries are well recognized from a European perspective of Protestant missionaries as well as from an Indian point of view that focuses more on the history of industrialization and the economy. In recent years, underwater archaeology exploration undertaken by Indian researchers from the CSIR-National Institute of Oceanography and analysis of historical architecture in India has shown the potential of research that starts from a material and methodological perspective.

55 Goll 1990, 199.

Dr Sophie Hueglin
SFB 1070 ResourceCultures
University of Tuebingen
Gartenstraße 29, D-72074 Tübingen
sophie.hueglin@uni-tuebingen.de

Dr Priya Joseph
Director at The Living Studio Architects
Bengaluru, India
priyajoseph.tls@gmail.com

Dr Sila Tripati
CSIR-National Institute of Oceanography (Retd.)
Dona Paula, Goa, India
silatripati1962@gmail.com

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Abbildungsnachweis

Figure 1: S. Hueglin, 22.1.2020

Figure 2: Basel Mission Archives QS-30.001.0243.01

Figure 3: Basel Mission Archives C-30.54.15

Figure 4: P. Joseph; original kept in the collection of the library archive at Karnataka Theological College, Mangalore

Figure 5: S. Hueglin, 6.8.2019

Figure 6: Basel Mission Archives QU-30.016.0024

Figure 7: Basel Mission Archives QU-30.016.0074

Figure 8: S. Tripati; drawing by S. B. Chitari

Figure 9: S. Hueglin, 7.8.2019