BRICK AND TILE INDUSTRIES IN KERALA

A. Karunakaran

It is more than a century since the 1st Tile Factory in India was started in Mangalore and so these tiles, having 2 water channels, are known as Mangalore pattern tiles. From Mangalore the industry began to spread over to other areas of the West Coast and that was due to the fact that the main raw material i.e. suitable clay is available in those areas, on the sides of the rivers flowing from the western ghats to the Arabian Sea. To-day we find tile factories sprinkled throughout the West Coast from Mangalore to Trivandrum, with concentrations at certain places like Quilon, Trichur, Alwaye, Calicut and Mangalore.

In Kerala the location of this industry can be said to be in three main regions. In Calicut region we find big and well mechanised factories with Hoffman Type Kilns. There are small and medium size factories also there. In Trichur area, though there are large number of factories, most of them are medium size ones. We find many semi continuous type kilns in this region. The next region is Quilon where there are a few large factories and the rest are medium size units. Here the large units are having Hoffman type kilns and small onces downdraught kilns. All these factories are also manufacturing wirecut bricks. But as the market for wirecut bricks is not encouraging, mainly because of the availability of laterite stone and the competition from country non-mechanised brick manufactories, only very few factory owners take keen interest in the development of brick manufacture.

For the last 2 decades roofing tile industry in Kerala was doing successful business except for the years 1964 and 1965. As soon as the Chinese aggression started, the Government slackened all the building construction programmes which affected this industry very much. Then the draught in South India which affected the agriculturists very badly affected this industry. It is a common feature that if the agriculture proves successful, it will have its effect in the building industry also. More buildings will be constructed. Now-a-days there is tendency forthe architects to design buildings with terrace tops instead of tiled roofs. Though this may be better and suitable for appearance, for a certain sectionof the people whocan afford to meet the high cost, it is not suitable for our general condition of heavy rains. After one or two rains these terrace buildings become shabby and perhaps leaky too. The annual maintenance of terrace roofs is a problem with the high cost of paints and other

materials for the purpose and the labour cost. But with tile roofs, the annual maintenance is much less when compared to terrace roofs and it is better to protect during rains.

With these general remarks on Bricks and Tiles now I shall deal on other aspects of the same.

Soil composition.

In Kerala soil composition is different in different places. In certain places, for eg. (Trichur area) the clay taken from clay fields can be used as such for making tiles without any change in the composition. In Feroke area the clay is mixed - with fine sand to reduce the plasticity. In Quilon area two types of clay are mixed - one is called yellow clay which is less plastic and the other blue. No scientific analysis has been made to ascertain the quality of clay. There are about 280 factories in Kerala and most of the producers are not bothered about the specific quality of the clay because what they produce with the available raw material is easily sold-out. As this industry has to face keen competition in future with other roofing materials, a scientific approach has to be attempted to improve the quality and reduce the price. Hence I would suggest that a soil map of Kerala be prepared locating the different regions having clay suitable for the manufacture of tile and bricks. This map is to be prepared with the collaboration of the Geological Department , Universities and Research Institutions. In this connection I may mention the very good work done by the Central Building Research Institute at Roorkee in testing the soil for manufacture of the bricks.

In India roofing tiles are manufacturing mainly in West Coast and nobody here seems to be interested to get the help of C.B.R.I. for the soil test that may perhaps be due to the fact that Institute is far distant. If an extension cell of the C.B.R.I. can be located anywhere in our region tests like those now done at Roorke can be easily got done by the manufacturers in this region also. It is my earnest recuest that this move should come from the Government level. Because of the researches conducted in Roorke there is good improvement of the brick industry in North. Now there are different types of bricks manufactured such as acid resistance bricks, Engineering Bricks , Paving Bricks, Perforated Bricks etc. In the developing plans of our country the requirement of brick is enormous. Without bricks there can be no construction and without construction there can be no development.

Manufacturing Process:

There are well mechanised, semi-mechanised and non-mechanised factories in our State. I could even see sometime back, a bullock-driven pug mill. The need for mechanisation depends on several factors, two main ones being the desire for quick production and improved quality. Since there is a market for products manufactured in the traditional methods, no manufacturer will willingly switch on to mechanisation unless its advantages are properly stressed and the process demonstrated. Clay preparation, moulding and burning are the three processes in the manufacture of bricks and tiles. Partial mechanisation could be introduced at the mixing and moulding stages. For mixing, double shafted mixers, panmills and high speed rollers are used. Any or all of these can be used depending on the type of clay required. De-aired pugmills are used for improving the quality further. For moulding also there are different types of presses - Power presses, Crank shaft presses and hand presses worked by manual labour. Now-a-days power presses are becoming more popular as the quality and production are better in them than in the other types.

Burning:

As I stated earlier there are different types of Kilns for burning the tiles. Each manufacturer selects the type of kiln according to the capacity of his plant and the investment involved. In North India the Bulls' Kiln is very popular. The manufacturers there even claim historicity for those Kilns from the very olden days, of Mohanjadaro and Harrappa, about 5000 years ago. The bricks manufactured in those days are found tobe quite strong. The ancient methods of manufacturing brickshave stood the test of time. Only research centres can find out the comparative merits and demerits, of bricks made in mechanised plants and the country bricks burnt in Bulls' Kilns and open air Kilns, which are commonly used in our parts.

Fuel is an important factor in the Brick and Tile Industry. Coal is ordinarily used in other parts of India, but it is not available in Kerala at Competitive price. We in Kerala use firewood. But day by day the value of this commodity is going up. The forest area is rapidly being denuded. As the population rapidly increases the use of firewood also increases, not only as fuel but for other purposes also. Hence we have to goin for other items of fuel. Certain factories having Hoffmans' Kiln are using cashew shells as fuel. Cashew shells also have begun to loose its fuel value because its oil is being extracted and used for other purposes.

For the waste cakes of the cashew shells there is great demand for house consumption. Certail tile factories are experimenting with furnace oil. The results have not been conclusively proved acceptable. Only very recently the brick and tile manufacturers thought of going for Furnace oil as fuel. Some tried the dripping method and I understand that it has not been suc cessful. Definitely there will be some wastage in this process. Suitable burners are to be used to atomise the oil and to use it for the required varying temperature i.e. for smoking and for fast firing. Research and Development is the only possible means for this kind of improvements. Here again I stress the need for an extension cell of the C.B.R.I. in our State to help the Manufacturers.

I.S.I. and Brick and Tile Industry.

The Indian Standards Institution has a wing for building materials and a Sub-committee to specify the quality for clay products where in the quality of Bricks & Tiles are determined. This committee consists of manufacturers, Scientists who are working in Laboratories on these materials, consumers and Government officials. From Kerala there are a few members in this Committee. There are two ISI specifications for roofing tiles. These specifications are fixed after conducting the necessary tests in laboratories. The two tests are breaking strength and water absorbtion. Though there is no difference in the manufacturing process the quali of the products is different in different places, because of the difference in the quality of the raw materials. Whether the quality can be improved by any other mode of manufacture or by addin any chemica l is to be investigated. Though both these specificatio have been a-pproved by ISI, the Governmen. officials in charge of construction do not encourage both these specifications. And thus this categorisation has become a factor detrimental to certain a reas. The result is that the manufacturers of such areas do not have any interest in the ISI specification. For bricks also ISI has done very useful work. The bricks are classified into different categories and they have indicated the uses of these different categories for different types of works. If the improved types with the required s pecifications are manufactured, they can easily fetch very good prices. Some such bricks as were till recently imported are now being made indigenously with the technical know-how from C.B.R.I. The Indian Standards Institution has specified the size of the bricks also in the metric system. More than fifteen sizes of bricks are available in India now. The need for a uniform size of brick throughout India is felt and hence the moduler co-ordinatio system is thought of to increase the speed of construction, reduce the wastage and facilitates the introduction of prefabrication in structural units and standardisation of brick sizes. Thus the

ISI has proposed the modular sizes of 20 x 10 cm and 20 x 10 x 5 cm including joints. As there is controversy on this specification it has not been finally accepted.

C.B.R.I and the Industry.

In Europia n countries perforated bricks are very popularly used. It has been found at the CBRI that even if 30% clay is removed by the perforation it will have the same strength as that of a solid brick. At Roorkee in the Central Building Research Institute, there is a separate branch for bricks and tiles manned by well qualified scientists. They collect soil from differrent places, test them for the quality and advise the manufacturers about the same and result of bricks manufactured with such clays. They analyse the clay and find out the salts in the clay and advise how such impurities can be removed. At CBRI there is a smallbrick making plant and a Bull's Kiln. They manufacture the bricks for their own consumption. The other manufacturers in upper India take advantage of the results that is achieved in this Laboratory. But we in the South are not fully aware of the works that are being carried out there. So far as r oofing tiles are concerned they have made some experimental studies at a tile factory in Madras and I understand that this research could achieve some fruitful results. The study was mainly on war-ping and cracking of tiles in the green stage. I doubt whether the scientists at CBRI have even seen a tile factory in this p art of the country. Development in the Industrial field can be achieved only if research and industry work in c-lose-co-ordination. There are about 300 tile factories as I said above in the West Coast and the researches are carried out near the Himalayas. If a branch of the CBRI is arranged to be opened in a central place in Kerala, through that Institution we can get the details of the activities that are taking place at Roorkee. Gradually we can also get this branch improved as a developed laboratory.

There are different salts in the clay which when burnt gives certain changes in the body. We find a whitish colour in tiles and bricks made of certain type of clay. This is due to the presence of certain salts in the clay. The laboratory at CBRI examined this and has given very valuable reports on this subject. Certain clay contains lime, which when baked gets oxid ised and causes cracks. Remedial measures for such defects can be taken only with the help of a labora-tory.

Some time back we had very good export market for our tiles. But now it has diminished very much. Some of those importing

countries have started factories of their own, others get this or other type of roofing commodities from other countries. Our high price and shipping difficulties are the problems that discourage the export business. If by better methods of production the quality can be so improved as would avoid breakages in transport and also reduce the price, we can improve the froeign business with the nearby Asian countries. The export promotion council should investigate the possibilities on this line.

The State Government can also help this industry a lot. A lot of money is spent on constructions. There is a fancy for our Officers to go in for terrace buildings. It is heard that a good number of N.G.O. Quarters is going to be constructed immediately. Government can decide to have all these buildings with tiled roofs - with good quality tiles and not cheaper quality tiles. If so the scarce material such as cement and iron can be utilised for other development works (such as bridges and roads etc.).

It is a pith that though there are such a large number of tile factories in Kerala, the Government or the University is not taking any steps to train the people on the technique of this industry. The quality of clay, the impurities contained in the clay, or the firing effect of the clay in different temperatures etc. are subjects for technical studies. So also the construction of a modern type of kiln and the characteristics of the fuel which are to be usedin such kilns. Our young men are to be trained in these lines. Silicate Technology or Heavy clay Technology should be made a subject in our Technical Institutions. In Madras State though there are only a few industrial units of this nature, there is a training centre at Vridhachalam to train their young men on clay Technology. I take this opportunity to request our Government and the University to think on these lines.
