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A MONOGRAPH ON THE CLAY BUILDING MATERIALS INDUSTRY IN GHANA 1/

by

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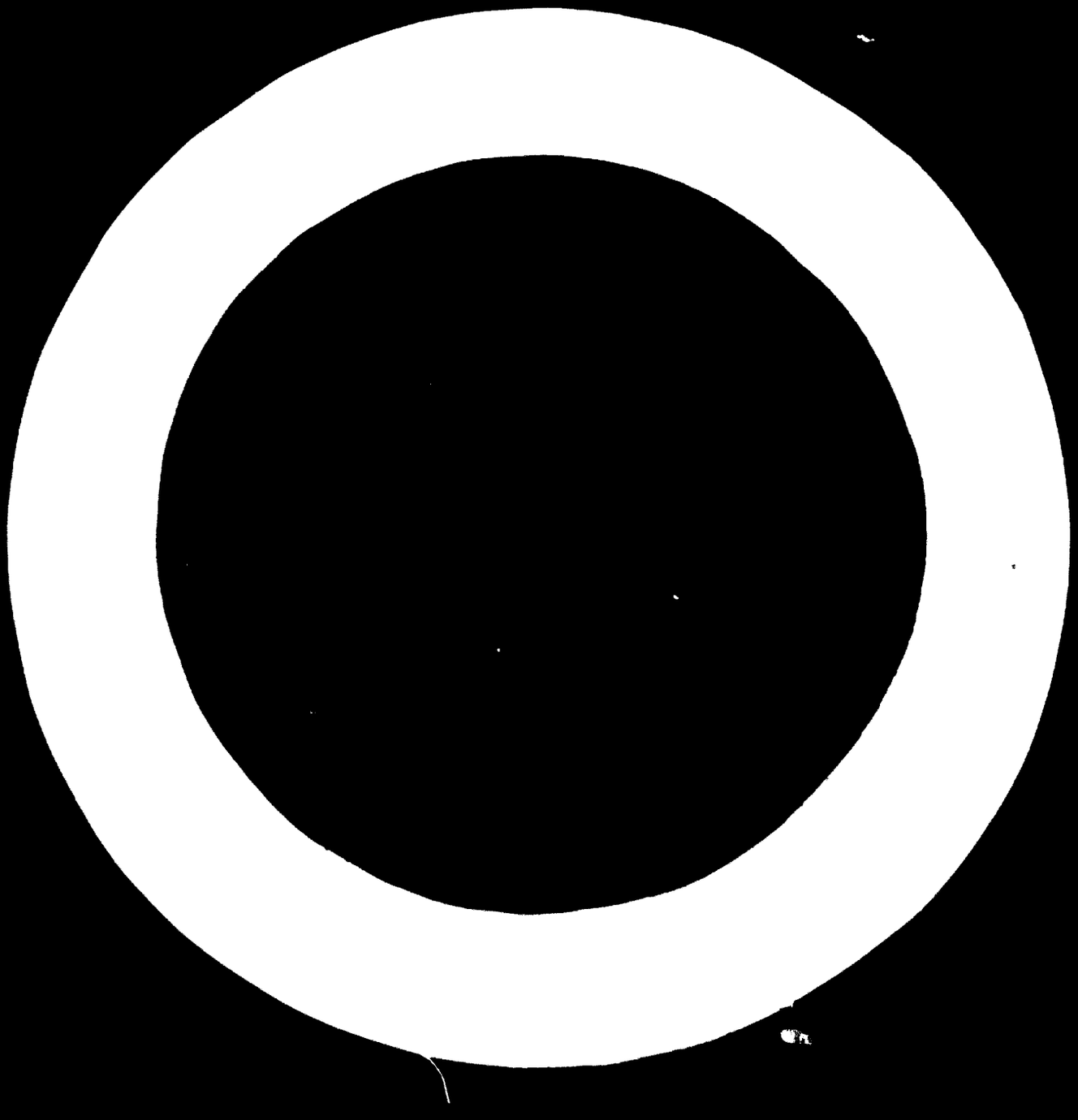

My experience is based on the taking over of a going concern in 1966 when I was appointed the General Manager of the Brick and Tile Division of the Ghana Industrial Holding Corporation.

The main basis for the establishment of the Brick factory in Ghana was primarily to cut down on the high cost of foreign building materials and to conserve foreign exchange. The factory was originally charged with the responsibility for the production of roofing tiles, but recent developments in the building materials industry have made it necessary to lay emphasis on the production of bricks and hollow clay bocks including land drain pipes.

The Brick & Tile Division (GIHOC) situated in ACCRA on the Winneba Road is incidentally the only brick factory in Ghana; presently plans are on the way to boost up the use of bricks in the construction of Low Cost Housing in the country and with it will go the establishment of other brick factories in the country.

Our machinery was supplied by Messrs M. Steenbrugge in 1953 but these machines or rather most of it are rusty and worn-out due to lack of maintenance when the factory closed down in 1956. In 1964 it was prepared to rehabilitate the machinery, five years after re-activation. However, about the same time the state had other arrangements for the establishment of bricks factories in the regions, therefore some Hungarian transportable brickmaking factories were ordered into the country; we have installed and are using two of these plants in our factory.

The mixing cum de-airing and screw type extruder are from East Germany type P/VA 35 producing 2000 - 2500 bricks an hour. The other train of machines from Hungary are clay feeding grate, Nos. 1 and 2 rubber conveyors, kibler and smooth rolls; the Keller automatic cutter, a four sided elevator and a transfer electric train are part of our original machinery.

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CLAY WINNING, PREPARATION & SHAPING

We employ a Priestman Tiger excavator for the winning of the clay which forms part of the factory grounds. The dug clay is loaded on a dumper and transported to the storage sheds near the brick plant.

The feeding end of the plant is fed with clay by a tramcavator; the clay is then fed to the machines manually through metal grates in the floor on to a conveyor and transported through a kibler and smooth rolls for crushing and preparation it is further conveyed into a single shaft mixer where water is added as and when necessary. After mixing, the clay is gradually propelled through slotted plates into the de-airing chamber and then to the pug where the clay is extruded in the form of a brick or hollow block depending on the die in use on the cutting table. The extruded clay column is then cut to sizes by the cutting bow and are lifted and placed on pallets arranged in the elevator. When the elevator is fully loaded with the wet bricks it is then turned round and loading continued. The loaded bricks are taken away by finger cars and are transferred by train to the dryers; the dryers are Keller open air dryers with capacity for holding approximately 60,000 bricks each, we have seven of such dryers, the eighth dryer has never been commissioned. Hollow blocks and solid bricks take two and three weeks respectively to dry in good weather. In the rainy season drying time is prolonged and production is sometimes held up for long periods.

The train on its return brings out loads of dried bricks for setting in the kiln; the kiln is a 32 chamber Hoffmann Barrel Arch continous kiln built in 1953/54 and burned with firewood at 960° to 1000° centigrade.

KILN SETTING:

The wheelers discharge the bricks from the elevator or their kiln cars and wheel them to the kiln for setting. The bricks are set with the usual finger spaces between them. Our chambers hold 7000 bricks each and in the case of hollow blocks 1200 per chamber. The wickets are bricked up when the setting is completed and the cones put in their proper places; the setting is papered at every third chamber.

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KILN BURNING:

The preliminary heating is a gradual process carried out in specially built wickets and when a good heat had been built up the feeding is resumed through the feed-holes at the top of the kiln with the necessary dampers opened at various sizes. The practice here is to open the main damper 9" high at three chambers away from the main firing zone (preheating) the following two chambers are opened 6" and 3" alternatively, (drying). Feeding of wood to the fire-lines are carried out at thirty minutes interval depending of course on the quality of wood and the change of fire-lines at six hourly interval when conditions permit. We carry six to seven chambers behind the firing zone; cooling is by radiation and the drawing is carried out by loading the kiln-cars/wheel-barrows with the fired bricks and transported to the stocking area near the kiln while sorting them into grades A and N at the same time.

FIREWOOD:

In Accra its becoming extremely difficult to get wood in sufficient quantities and at reasonable prices to enable us to burn continously without shutting down the fires for shortage of firewood; the problem is one of transportation difficulties. We are getting wood from eighty to hundred miles away and this has not made the prices stable, we are paying N¢ 140.00 for a stack of wood (1260 cubic feet) and the contractors continually demanding an increase; this has made our cost of production rather high. The snag about firewood is that the calorific value is so varied that you utilise a lot more in order to maintain a steady temperature growth.

Kiln burning has still got to be improved, it is a bottle-neck especially at the weekends; we are therefore considering working all sections of kiln operation (setting and drawing) at the weekends so as to maintain a good firing circuit which has been to some extent the cause of breakages in the kiln. Kiln wastage are between 10% to 15% and this is a marked improvement over the past years.

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MARKETING:

In Accra it is interesting to note that considering our very low annual output we still are unable to sell all that we produce. The fact is that the utilisation of bricks for house construction has not made much impact on the people.

Our people have used cement blocks for a rather long time and the mason/brick layers have become accustomed to building with cement blocks than bricks therefore the expertise required of a brick layer is hard to find; we have chosen to maintain a small team of trained brick layers who have been helping to solve the situation by working side by side with other brick layers on customers job sites in order to help improve their skills. This is helping the local brick-layers tremendously and we hope with time we might achieve our aim.

Another aspect of the lack of demand is attributed to the high cost of building with bricks as against cement blocks. Therefore you would hardly see brick buildings in Ghana. In order to improve the situation we introduced a perforated brick measuring 3" x 6" x 9" this brick makes it less expensive to put up a 6" streactoher course wall building as required by the building regulations in the country as against the 9" wall in the case of bricks.

However our best selling lines are hollow blocks 6" x 9" x 12" and 4" x 9" x 12" these are more popular and cheaper than common brick for building purposes, but there is still a demand from the public for us to produce hollow blocks with the same dimensions of 6" x 9" x 18" as in the case of cement blocks. My view here is that such a hollow block will be too clumsy to handle and will defeat the problem of weight which is one advantage we have over cement blocks.

Brick clays abount in large quantities in the north and southern parts of the country, the clay is plastic and requires in some cases additions of up to 10% of opening material eg. sand or grog to make them workable.

Unfortunately the development of the brick industry in Ghana has been slow indeed; until 1964 we had altogether 2 brick factories in Accra operating side and using the same type of clay but the West African Brick Company had to close down in 1964 due among other things to lack of patronage.

The colours of our range of products are attractive bright red, streng durable and not too porous.

On the question of standards we have been guided by the U.K. Standards but with the establishment of The National Standards Board in Ghana it is hoped we might have our own standards.

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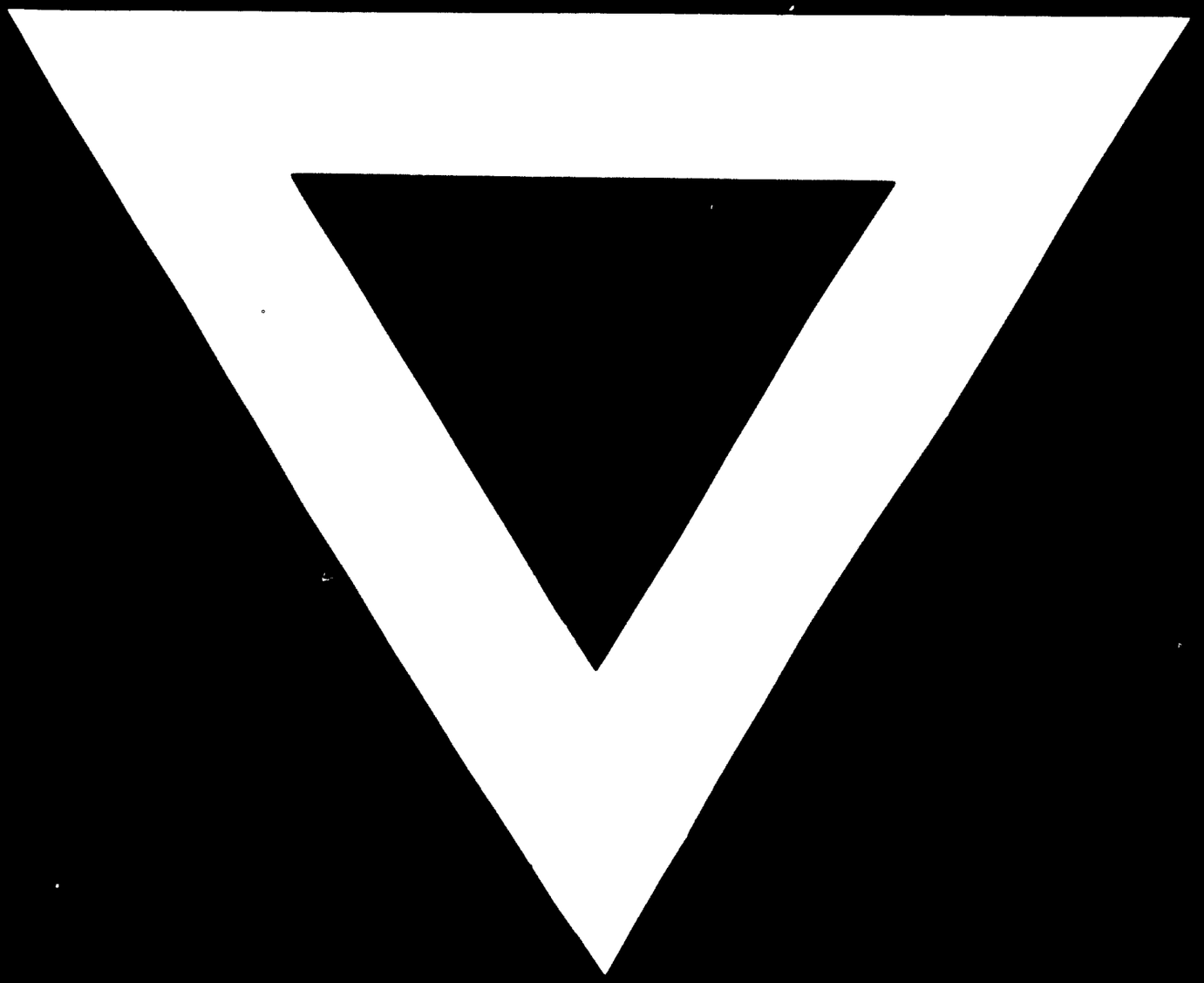

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