

Multi-coloured Bricks.—The diverse range of colours of these bricks is very largely due to (b) and (c)—see p. 12; the bricks are generally produced in a down-draught kiln (p. 6), as the temperature and smoking are best controlled in this type. The bricks are carefully stacked on *bed* to avoid damage, and so arranged that one end and one face of each is exposed. The kiln is fired as already described until the bricks have been subjected to the maximum temperature for a sufficient period, which varies according to the nature of the clay or shale. A *reducing atmosphere* is then produced in the kiln by restricting the admission of air to the kiln and heavily charging it with smoke. Thus the flue is partially closed by lowering the damper, and dense smoke is caused by charging the fireboxes with coal. Immediately the smoke has abated, more fuel is added to produce a dense smoky condition and, after these operations have been repeated over a period of approximately ten hours, the fireboxes and flue are closed for about four hours. The flue is then opened and the bricks are allowed to cool. Many variations in colour can be obtained in this manner, much depending upon the skill of the operator.

TEXTURE OF BRICKS

There is considerable variation in the texture (or surface finish) of bricks. Thus, machine-made commons and certain facings have smooth faces, whilst hand-made facings cannot be equalled for the richness of their texture; many machine-made bricks are characterized by roughened surfaces which have been purposely exaggerated. The pleasing texture of hand-made bricks is produced during the moulding operation, the hand-pressing of the clay or shale into the mould and the sand from the sides of the mould, which is stamped into the material, giving an irregular creasing or unevenness to the side and end surfaces. The fine colouring of a mass of brickwork constructed of such bricks, particularly after it has weathered for some time, is enhanced by the light and shade effect produced by the uneven surfaces. Such bricks are expensive, and therefore attempts have been made to imitate this texture and apply it to mechanically made bricks. Some of these attempts have been quite successful, even if the resulting texture is of less quality (chiefly because of the uniformity which results when the depressions or roughness are similar on every brick) than that of hand-made bricks.

The following are some of the means which are adapted to produce a mechanical texture :—

Wire-cut bricks are given a roughened appearance on three faces by a frame containing a horizontal and two vertical wires which is fixed about 1-in. in front of the mouthpiece of the auger (see p. 3). The horizontal wire is stretched across and just slightly below the top of the opening, and the distance between the two taut vertical wires is slightly less than the width of the die. These wires cut the band of clay as it is extruded from the machine, leaving roughened surfaces on the top and sides.

Rustication may also be obtained by plates containing fine projecting wires, one plate being fixed above and two at the sides of the clay column as it issues from the mouthpiece. The points of these wires slightly penetrate at varying depths the moving clay band and scratch the surfaces. Felt covered rollers partly smooth the excessive roughness as the column proceeds to the cutting table.

Hand or mechanical *stippling* is resorted to as an alternative. This consists of scrubbing or dabbing the top and sides of the clay band with brushes having metal bristles. Some of the irregularities are smoothed down by rollers.

A rustic effect can also be produced by *sand-blasting*. Specially selected sand is forced by compressed air through the nozzle of a pipe on to the top and sides of the

extruded clay. This produces small depressions on the surface. Rustic pressed bricks can be treated in this manner.

Pressed bricks can be rusticated by using a mould or metal press-box having hinged sides. Relief (raised) patterns are engraved on the internal surfaces of these sides. Probably the most effective design is that resembling the bark of a tree. The collapsible sides are necessary to permit of the removal of the brick after the plunger has impressed the pattern on one or more faces as it consolidates the clay. The appearance of a wall is made more effective if bricks of several selected textures are built at random during its construction.

Rough sand-faced bricks, when wire-cut, are made by sprinkling sand (specially selected) through a sanding machine on to the clay band as it is being extruded. The sand is then pressed in by top and side rollers.

Pressed sand-faced bricks are made by sanding the internal faces of the mould before being charged. Hand-made bricks are sand-faced during the normal process (see p. 4).

DEFECTS IN BRICKS

The following are the principal defects to which bricks are subjected :—

Black Core or Hearting.—This is fairly common in bricks made of red clays (p. 1) which have been heated too rapidly in the kiln, causing the surface to vitrify and the interior to remain black.

Bloating or Swelling.—This is attributed to the presence in the clay of an excess of carbonaceous matter and to bad burning.

Burring or Clinkering.—Clamp-burnt bricks, usually adjacent to the flues, which have been fused together by excessive heat are called *burrs* or *clinkers*. Such are only suitable for breaking up for coarse aggregate (see p. 28).

Chuffs or Shuffs.—These are badly cracked and mis-shapen bricks produced by rain falling on them when hot. They are useless.

Crazing is a defect common in glazed bricks (see p. 16) characterized by fine cracks. These are due to the glaze and the body (clay) not expanding and shrinking to the same extent.

Crozzling.—Excessive heating in the kiln may produce mis-shapen bricks known as *crozzles*. If not too badly shaped they may be used for brickwork below ground level, otherwise they are only suitable for aggregates.

Efflorescence.—Bricks made from clay containing a relatively large proportion of soluble salts, particularly calcium sulphate, are liable to become discoloured by the formation of a whitish deposit. Whilst this efflorescence or *salting* is particularly common to new brickwork, it may also form on the faces of old external walls which are subjected to excessive dampness. It is formed as follows: The salts are dissolved when water is absorbed, and as the bricks become dry the salt solution is brought to the surface by capillarity, evaporation takes place and the salts remain on the face. In mild cases the efflorescence gradually disappears as the brickwork is subjected to alternate wet and dry periods, the rain removing the deposit until the salts are gradually eliminated. If the bricks contain a high percentage of salts the efflorescence may persist over a long period, and where dampness is caused from defective rain-water pipes or the omission of a damp proof course, the unsightly appearance may continue until the defect or omission has been remedied. Crystallization of the