approximately 2-ft. wide by 3-ft. long. These blocks are broken and dressed by the wallers to the size and shape required as the work proceeds. The amount of dressing done depends upon the desired face appearance of the wall. There are two types of this masonry, *i.e., rough-faced random walling, built to courses*, and *best-faced random walling*.

Rough-faced Random Walling, Built to Courses (E, Fig. 23).—The face of the stones are roughly dressed and the stones are irregular in shape. The blocks are closely fitted together, spalls being used to pack up the larger of them, and at vertical intervals of from 12 to 18-in. they are levelled up to the *watershot* (see below) to form a continuous joint which is more or less horizontal. The through stones form continuous courses at from 2 to 3-ft. intervals. The quoins are of limestone (usually obtained from Kendal or Grange-over-Sands) and these are hammer-dressed and angle-drafted.

Best-faced Random Walling (F, Fig. 23).—This resembles square snecked rubble (Fig. 22), the stones being squared on face with the hammer. The faces are naturally smooth and the stones are referred to as being *self-faced*. Some of the snecks are very thin (*e.g.*, that at M is only $\frac{3}{4}$-in. thick). Unlike the last mentioned, the throughs are staggered, and on an average two throughs per square yard of face are allowed. The quoins are of limestone.

The walling is constructed in a manner which is unique and much skill is demanded of the wallers. As shown in the sections, the wall in effect consists of three portions, *i.e.*, inner and outer faces with an intermediate " hearting." Particular attention is drawn to the through stones which are tilted downwards towards the external face. This is known as " watershot," and the amount of watershot is 2 to $2\frac{1}{2}$-in. per ft. thickness of wall. Thus if the watershot is 2-in., the back edge of the bed in a 24-in. thick wall will be 4-in. above the corresponding front edge. The remaining face stones are given a similar watershot. The characteristic colour and rich texture of the stone give a delightful appearance to this class of work.

External walls vary in thickness from 21 to 30-in. The top bed of stone window and door heads and the bottom bed of window sills are watershot. As mentioned on p. 18, the damp-proof course consists of two courses of slates in cement.

An external wall is constructed in the following manner: Two layers of flat through stones, each approximately 4-in. thick, are bedded to form the foundation which is adequate for a two-storeyed house. These stones are about 6-in. wider than the thickness of the wall to be supported. Although it is not necessary, the wall is often started with the stones watershot, as the natural face of the stone is not square but canted to the bed.[1] The wallers work in pairs, the more experienced man working on the outside and the other inside to assist in the packing up of the face stones with small pieces of stone or spalls. Both faces are partially bedded in mortar which is set back from each face some 2 or 3-in., and the width of each layer of mortar after it has been spread and squeezed out by the weight of the stone is about 5-in. Mortar is not usually applied to the side joints as sufficient is squeezed up when the stone is bedded. The maximum overlap in the centre is given to the stones in both faces of the wall. The hearting between the two-faced portions consists of small stones *packed dry*. The object of this is to ensure that any water penetrating the outer face will pass down the dry filling to the throughs below, which, on account of the watershot, will not penetrate and cause dampness on the internal face. If any of the mortar joints were continuous from front to back, dampness would be caused by capillary attraction.

This form of construction has been proved to be most effective in resisting dampness in a district with a notoriously high rainfall, and it is for this reason that it is still largely employed in that area.[1]

[1] This is due to the cleavage planes being inclined to the bedding planes (see A, Fig. 68).

ASHLAR

2. *Ashlar*.—This class of masonry consists of blocks of accurately dressed stone with extremely fine bed and end joints. The thickness of these joints is often only $\frac{1}{8}$-in. and rarely exceeds $\frac{3}{16}$-in.[2] Such accurate work is only possible when the blocks are cut perfectly true to the required shape, and therefore the beds and joints at least are sawn. The backs are usually sawn, except when the ashlar is to be backed with rubble, when they may be given a rougher dressing. The surface finish is usually that left by the carborundum saw or it may be rubbed ; several of the more elaborate dressings described on pp. 36-38 may also be applied.

The face arrangement of ashlar may resemble either of the three varieties shown in Fig. 22, the regular coursed being common with the courses of varying height, depending upon the size and character of the building. *Great care must be exercised when determining the sizes and proportions of the blocks of stone to ensure that they will conform with the general scale of the building.* Badly proportioned stones, which may be either too small or too large for the purpose, will completely mar the appearance of the work.

An adequate bond of blocks of uniform size is obtained if the length of each stone is from twice to thrice the height and if the courses break joint as shown in Fig. 24. There is a risk of the stone being fractured if unequal settlement occurs and if the length exceeds three times the height, although this length may be increased to five times the height if the stone is exceptionally strong.

Ashlar is sometimes given a face appearance resembling that of Flemish bond in brickwork. Occasionally it is arranged in courses which diminish in thickness from the base upwards, or alternately the courses are arranged with comparatively thick courses alternating with thinner courses.

COMPOUND WALLS.—Ashlar is the best grade of masonry and it is also the most expensive. In order to reduce the cost, it is the practice to construct walls faced with blocks of ashlar having a minimum thickness on bed combined with a backing of a cheaper material. Such are called compound walls. In " stone "

[1] In addition, this style harmonizes best with an exceptionally beautiful landscape.

[2] There are exceptions to fine jointed work, for example, at the Anglican Cathedral, Liverpool, where the large sandstone (Woolton) blocks are constructed in cement mortar and pointed with a mixture of 1 part white cement to 3 parts Leighton Buzzard sand, and the thickness of the joints is about $\frac{1}{2}$-in.