sand, 3 parts coarse aggregate (graded from ¾-in. down to ¼-in.) and 3-lb. of waterproofer to 100-lb. of cement. The reinforcement is placed at 1-in. from the upper surface, the thickness of the floor and amount of reinforcement depending upon the span and water pressure to be resisted. The concrete is at once covered with a ¾-in. mixture composed of 1 part Portland cement, 2 parts sand and 5-lb. of waterproofer to 100-lb. of cement. The vertical rendering is of similar composition, but is 1-in. thick in three coats.

To cure dampness in an existing basement, it is recommended that a 6-in. layer of waterproofed reinforced concrete, composed as above, be formed on the old concrete floor; this is rendered with a ¾-in. layer of waterproofed cement mortar, as above, and continued as a 1-in. thick vertical layer on the inner face of the walls.

The following is the sequence of operations: (1) Chases are formed in the walls to receive the edges of the waterproofed concrete floor; (2) any plaster, limewash or paint is removed from the walls, the joints are raked out or the brickwork (or stonework) is hacked over by using a hammer and punch to give a key for the rendering, the walls are brushed down with a stiff broom to remove dust and afterwards copiously watered to prevent excessive absorption of moisture from the rendering; (3) the surface of the existing floor is well hacked, brushed and washed; (4) a 5 per cent. grout of waterproofed cement is brushed over the cleaned surface to effect a bond between it and the waterproofed concrete layer which is at once laid before the grout sets; (5) this is rendered without delay; (6) each prepared internal face of the wall is grouted, and after the fillet has been carefully formed at the bottom corner (this is important, as the intersection is vulnerable) and before the grout has set, the first coat of the wall rendering is applied, followed by the subsequent coats.

Defects in this form of damp proofing may occur through cracks which may develop in the rendering coats through which water may penetrate.

In modern construction, basements are frequently constructed of solid reinforced concrete walls, the concrete being waterproofed.

A double course of slates, bedded in cement (as described on p. 18, Vol. I), may be used as a cheap, but less effective, alternative vertical damp proof course to those described above.

Finally, the practice adopted in cheap work of rendering the *inside* faces of basement walls with two coats of cement mortar to a finished thickness of ¾-in. is highly undesirable, as dampness will ultimately appear through this thin unwaterproofed layer. The covering of damp walls with wood *cleading* or panelling should also be discouraged, as this only hides the defects, and, whilst the unhealthy conditions still remain, the wood is likely to be attacked by dry rot.

The provision made for damp proofing walls built on sloping sites is described on p. 60.

Dry or Open Areas.—Fig. 21 shows a section through a typical open area. Such provision is necessary to afford natural lighting and direct access to a basement.

The ground is supported by a *retaining wall* some distance from the outer wall of the building. The area must be paved and drained, gullies (see p. 72) being placed as required and connected by drains to the public sewer. The retaining wall must be built in cement mortar, and is usually surmounted by a metal railing or balustrade, as this obstructs little light; either small *weep-holes* must be formed, or pipes, as shown, provided near the base of the wall to allow the escape of subsoil water, otherwise the pressure may overturn it, especially if the water becomes frozen. The floor of the basement is an alternative to those shown in Fig. 20; if the ground is waterlogged the concrete must be waterproofed and reinforced as described on p. 56.

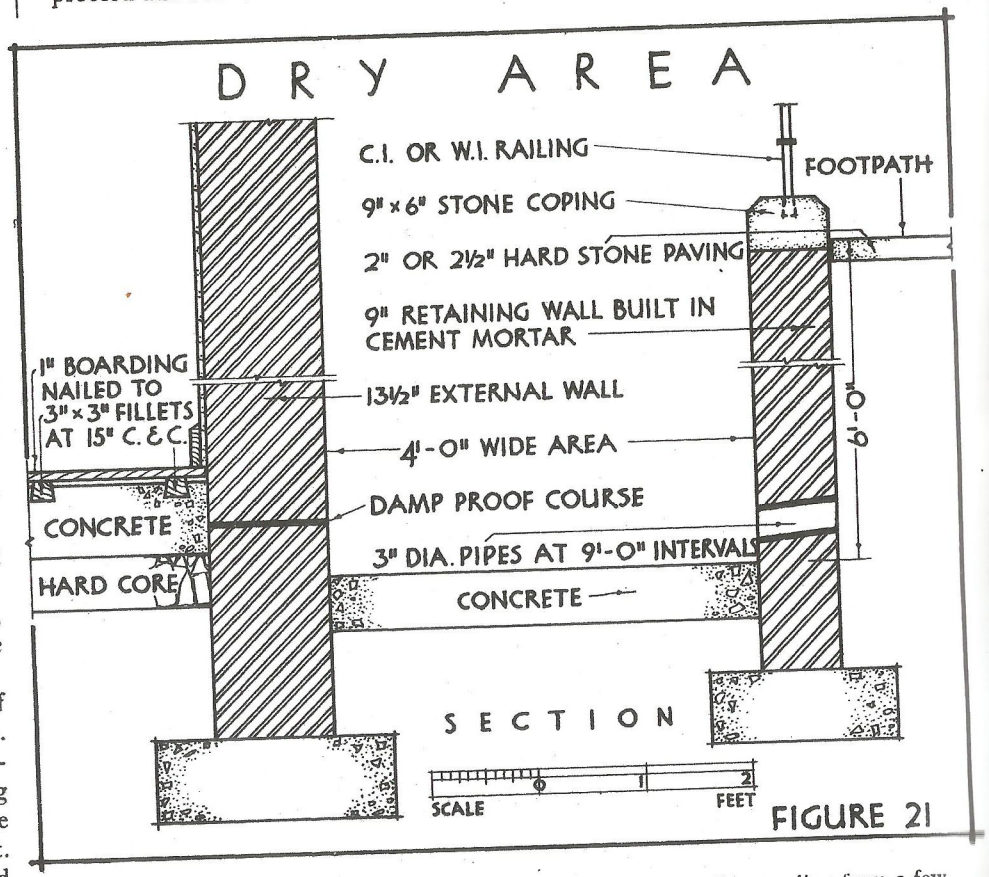

FIGURE 21

A *closed dry area* may consist of a 4½-in. independent wall, extending from a few inches below the basement floor to the ground level, 2¼ to 4½-in. from the main wall and finished at the ground level with a brick-on-edge coping which closes the cavity; the latter may be ventilated by vertical shafts formed in the main wall, similar to that shown at C, Fig. 20. This is an undesirable form of construction, as water may gain access through the thin retaining wall and cause dampness as it accumulates. To overcome this defect the closed cavity is sometimes increased in width, the bottom is concreted and a gully provided which is connected to the sewer by a drain. This gully will, however, become unsealed (see Chapter Two) in dry weather owing to the evaporation of the water in the trap, and thus gases from the sewer will escape into the inaccessible cavity. Such provision cannot be too strongly condemned.