An important matter affecting the heat insulating value of a cavity wall is the extent to which the cavity should be ventilated. Formerly, it was generally considered desirable to ventilate the cavity by means of air bricks fixed just above the ground level and also near the top. Whilst this circulation of air ensured a dry cavity and reduced the risk of defects arising in floor timbers, it also destroyed the insulating value of the wall to such an extent that an 11-in. cavity wall so ventilated afforded less heat insulation than a 9-in. solid wall. Therefore the only ventilation of the cavity which is now advocated is that provided by the weep-holes near the base of the cavity and at the head of door and window openings, as described on pp. 40 and 42. Of course the usual ventilation must be provided to ground floors of timber construction.

The sound insulating value of an 11-in. cavity wall is also higher than that of a 9-in. solid wall, and the former is therefore more effective in excluding external noises (see p. 49, Vol. III).

3. *Economy.*—An 11-in. cavity wall costs less to construct than a 13½-in. solid wall (which is the minimum thickness if dampness is to be avoided). Comparative figures show that the approximate cost of an 11-in. wall is at least 20 per cent. less than a 13½-in. solid wall.

SUMMARY OF SPECIAL PRECAUTIONS.—1. Wherever possible, contact between the two leaves should be avoided.

2. The cavity should be kept clear of droppings, and any on ties should be removed.
3. The main horizontal damp proof course must be in two separate widths, and the bottom of the cavity must be at least 3-in. below this.
4. Heads of openings must be properly protected by lead or similar damp proof material. Jambs must not be solid unless slate, etc., damp proof courses are provided. Projecting ends of stone or terra-cotta sills should be notched back from the inner leaf. Cover flashings at intersections of lower buildings adjoining cavity walls must extend to at least 1-in. beyond the inner face of the outer leaf.
5. Weep-holes should be formed immediately below the main horizontal damp proof course and above the damp proof courses over openings. No other ventilation to the cavity should be provided.
6. Built-in floor timbers should be sound and well-seasoned and their ends should be treated with a preservative (see pp. 12-14, Vol. III).
7. The cavity should be continued up a parapet wall to the coping.
8. Ties must be rust-proof, capable of preventing rain-transmission and easily cleaned of droppings.

At certain Bath stone mines (see p. 101) small pieces of waste but sound stone are sawn into blocks which are 6¼-in. high (or equal to two courses of brickwork) by 4½-in. wide by 9-in. to 2-ft. long. These are used as facings of 11-in. cavity walls, the stone being in regular courses, a type of walling known locally as *range-work.*

Another type of cavity wall, suitable for public buildings, is shown at A, B and P, Fig. 16, Vol. III. This consists of an external leaf of ashlar, backed at alternate courses with brickwork, and an inner leaf of brickwork.

CIRCULAR WORK

Curved work is occasionally required as for segmental and semicircular bay windows, wells of staircases, apsed ends, and circular (on plan) factory, etc., chimney stacks. The plan of a portion of a room with a semicircular bay window is shown at A, Fig. 15, that on the left being above the sill level and that on the right below it. A sketch of this wall is shown at H, Fig. 27.

It will be seen at E and F, Fig. 15, that uncut standard bricks are quite unsuitable for circular work if normal bonding is to be maintained, as the stretcher faces of the bricks only conform approximately to the curve, and very wide joints on the convex surface are produced. The width of the joints can only be reduced by cutting each brick to a wedge-shape to form radial side joints. Not only is this an expensive procedure but the appearance is not satisfactory (especially if the curve is to a small radius), as the " curve " is made up of a succession of straight stretcher faces. In order to conform more closely to the curve, and when ordinary standard bricks only are available, heading bond (see p. 7, Vol. I) may be adopted. But such a wall, where each course consists of headers, is unattractive in appearance and deficient in strength.

It is now the general practice, even in cheap speculative work, to use only purpose-made bricks for the exposed faces of circular walling. Such bricks are moulded to the required shape either by hand (see p. 4) or by the machine-pressure process (see p. 3).

Many of the larger manufacturers keep stocks of circular stretchers and headers, machine-pressed in dies shaped to curves of radii varying from 2 to 8-ft., as shown at L and M, Fig. 5. The contractor states the radius of the curve when ordering the bricks. If these do not conform to a stock radius, the plan of the wall is chalked out on the setting-out board and the position of the bricks marked after due allowance has been made for shrinkage in drying and burning. Two zinc templets are cut to the shape of a header and stretcher. Wood moulds (see p. 4) are prepared from these and handed to the moulder who proceeds to shape the bricks by hand.

Alternative plans of a portion of a 13½-in. wall in English bond are shown at C, and of an 11-in. cavity wall at D. Unless both faces of a curved wall are to be exposed, and as purpose-made circular bricks are relatively expensive (especially if hand-made), it is customary to back the curved facings with common bricks which are axed to give radial joints as sown at C. If the internal surface of a cavity wall is to be plastered, the inner leaf is usually built of common bricks (see D), and unless the curvature is too sharp these commons are not cut to give radial joints.

The setting-out of circular work is described on pp. 68 and 70.