

plete, though more costly, protection. Asphalt used in substantially the same way, if in connexion with a solid course of slate or North River blue stone in the foundation wall, above the ground level, will prevent the soaking into the structure of the moisture of a heavy soil."

Before the interior of the cellar is completed the waste-pipes and the drains for the plumbing fixtures and catch basins should be laid. The pipes should be of cast iron pipe, varying in size from 4 inches to 6 inches, provided with the necessary traps, clean-outs, and vents. A cheaper method is to use No. 1 salt-glazed sewer pipe, care being taken to see that the tile pipes are laid on a hard surface with a proper fall, and that all joints are well cemented. As a general rule, moderately hard, well-burned brick is the most serviceable material for outside walls. Sometimes, in exposed situations, it becomes necessary to cover an entire brick wall with a protective coating of paint, or even with a sheathing of tin-plate, owing to the fact that an unprotected brick wall becomes wet through by driving rain and does not quickly become dry again. For protection against dampness and cold, external walls should be built with an intervening air space, which acts like a double window. The outer and inner faces of the wall are joined at intervals by bonding bricks or ties of various materials, including hard, non-porous bricks, glazed bricks, and iron. A superstructure made of painted clapboard is often drier than one of brick, in an exposed situation. During hot weather clapboard walls are advantageous, because they cool rapidly after sunset. On account of the numerous joints and fissures in a frame wall, natural ventilation goes on through it very readily and to a considerable extent. The application of paint to walls of brick or wood, either with or without, completely checks the passage of air through the walls and limits natural ventilation. On the other hand, calcimine offers little obstruction to the passage of air. Wall papers are almost midway between paint and lime coating in their obstructive effect on the passage of air through walls. In northern climates, it will always be necessary to pay attention to the thorough construction of the walls of houses, so as not to permit a too large amount of natural ventilation taking place through the walls and a too great waste of heat.

The inside of the walls of a house should be of lath and plaster, thus providing a dead air space, which is a non-conductor of heat or cold.

All door and window spaces should be made tight, by means of felt strips and strips of zinc nailed and interlocked into the sheathing. The roof should be constructed so as to give a dead air space; it should be covered with felt preparatory to receiving the weathering material, whether it be shingle, slate, tile or metal.