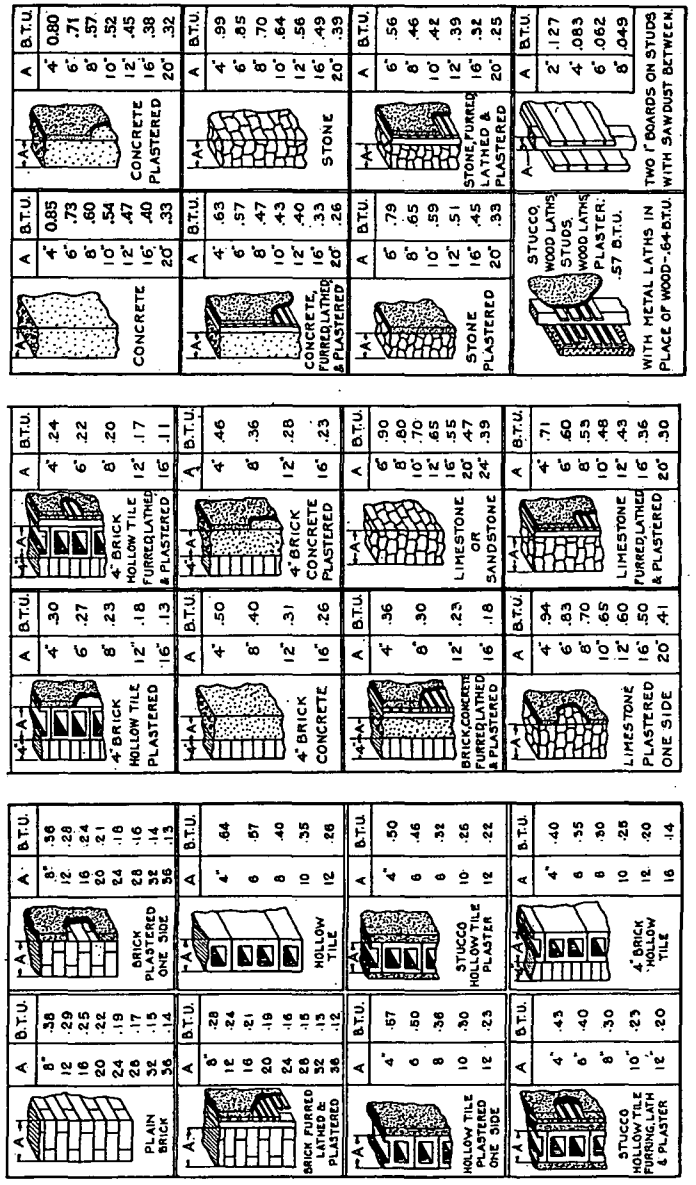
TABLE 12. HEAT TRANSMISSION FROM VARIOUS TYPES OF WALL CONSTRUCTION



CALCULATING HEAT LOSSES

If air within a room is maintained at a higher temperature than air surrounding the room, there will be a loss of heat through the walls, partitions, ceiling or floor to air of lower temperature. This heat loss may be to the outside, an adjoining room or space above or below.

To heat and maintain a predetermined temperature in a room, an equal amount of heat must be supplied at the rate at which it is lost. In practice heat losses are figured on an hourly basis and the unit of measure is the B.t.u.

Warm air rises, hence the temperature in a room at various levels will differ according to conditions. For rooms not over 12 ft. high this difference can be taken at 1 deg. per ft. and the average can be taken at the temperature to be maintained at the breathing line (5 ft. from the floor) and 5 ft. from the wall.

There is a greater temperature difference at or near the ceiling than at the breathing line or at the floor but in actual practice this is usually neglected in calculating the heat losses.

In computing glass surface, figure the entire window opening. It is customary to figure outside doors as all glass, taking the entire door opening.

In order to accurately calculate the transmission heat loss from a room or building multiply the number of square feet of each kind of surface by its constant and then by the difference in temperature between the air in the room or building and the outside air and add together to obtain the total.

Compute the heat losses for a zero to 70 deg. fahr. condition as follows:

A room 10 x 10 x 8 ft. with two windows 3 x 5 ft. has two sides exposed, is heated above and below and walls are of clapboard, paper, sheathing, studs, lath and plaster. One and one-half air changes should be allowed. Then,

Cubical contents	$= 10 \times 10 \times 8$	$= 800$ cu. ft.
Windows	$= 3 \times 5 + 3 \times 5$	$= 30$ sq. ft.
Gross wall	$= 10 + 10 \times 8$	$= 160$ sq. ft.
Net wall	$= 160 - 30$	$= 130$ sq. ft.

Refer to Table 11 and find heat loss per square foot per degree for walls of clapboard, paper, sheathing, studs, lath and plaster to be 0.3 B.t.u. per hr.

Do not give consideration to inside partition, ceiling or floor if the surrounding space is also to be heated. Then,

*Cubical contents	$800 \times 1\frac{1}{2} \times 0.02 \times 70$	$= 1480$ B.t.u.
Glass	$30 \times 1.1 \times 70$	$= 2310$ B.t.u.
Net wall	$130 \times 0.3 \times 70$	$= 2730$ B.t.u.
Total heat loss from room		$= 6520$ B.t.u.

**Cubical Contents.*—There is no heat loss due to cubical contents. In this particular case, it has been assumed that the infiltration of air is equal to 1½ times the cubical contents of the room or 1200 cu. ft. of air per min. For explanation see Heat Losses by Infiltration, p. 5.