

between the effective temperature for still air and for moving air, of any velocity, represents the cooling resulting from that air velocity. These charts apply to average normal and healthy persons adapted to American living and working conditions. They are limited to sedentary or light muscular activity, and to rooms heated by the usual American convection methods (warm air, central fan and direct hot water and steam heating

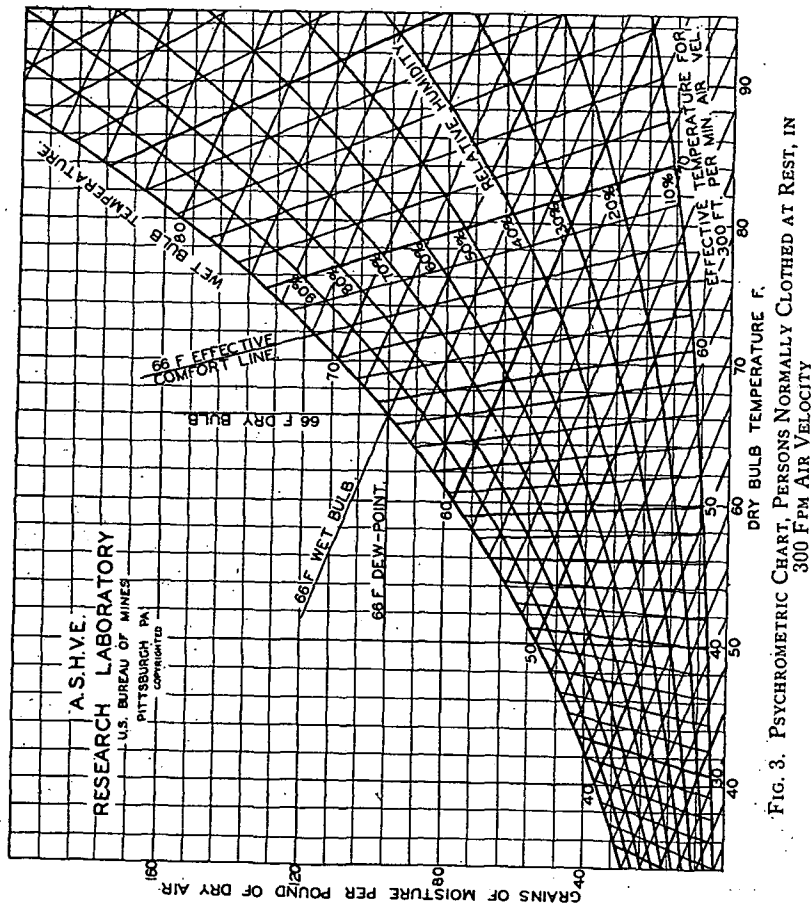


FIG. 3. PSYCHROMETRIC CHART. PERSONS NORMALLY CLOTHED AT REST, IN 300 FPM AIR VELOCITY

systems) in which the difference between the air and wall surface temperatures may not be great. The charts do not apply to rooms heated by radiant methods such as the British panel system, open coal fires, and the like. They will probably not apply with adequate accuracy to races other than the white or perhaps to inhabitants of other countries where the living conditions, climate, heating methods, and clothing are materially different from those of the subjects employed in experiments at the Research Laboratory.

If an occupant of a room loses heat by radiation to large wall or glass surfaces at lower temperatures, the air within the room must be maintained at a higher temperature to compensate for this effect in order to give the same feeling of warmth. The results of a recent study¹⁸ by the A.S.H.V.E. Laboratory, shown in Fig. 4, indicate that in poorly insulated buildings this effect may become of considerable importance. Thus an occupant of a room having inside wall surface temperatures of 55 F on three sides will require an air temperature of 74 F to have the same feeling of warmth he would experience in a warm-wall room with air at 70 F. A

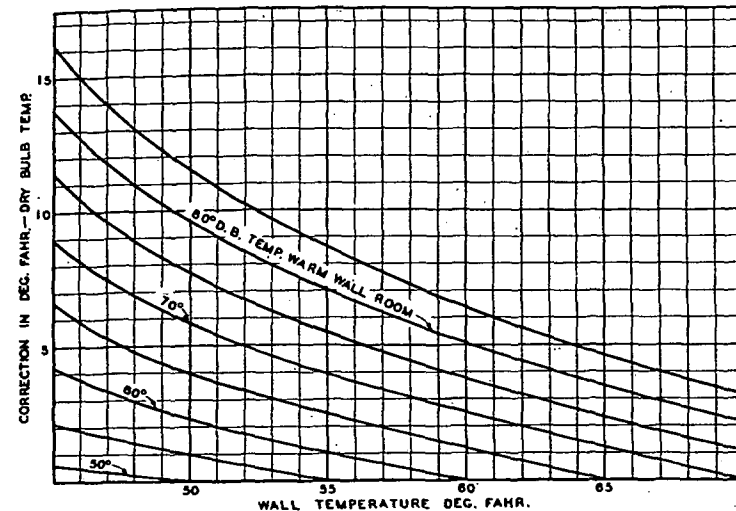


FIG. 4. CORRECTION TO VARIOUS DRY-BULB TEMPERATURES IN A WARM-WALL ROOM FOR THE SAME FEELING OF WARMTH IN ROOMS HAVING THREE COLD WALLS. TEMPERATURES INDICATED BY SHIELDED THERMOMETERS 30 IN. ABOVE THE FLOOR

wall consisting of 8-in. brick and plaster, with 16 F outside air temperature and 70 F inside air temperature, will have an inside surface temperature of 55 F. The reverse effect will be experienced by occupants of rooms having extensive high-temperature surfaces in them. In such cases, a lower air temperature is required to compensate for heat radiated to the occupant.

The effective temperature index for persons doing medium or heavy muscular work, in still air, has also been determined at the A.S.H.V.E. Research Laboratory¹⁹.

OPTIMUM AIR CONDITIONS

No single comfort standard can be laid down which would meet every need. There is an inherent individual variation in the sensation of

¹⁸Cold Walls and Their Relation to the Feeling of Warmth, by F. C. Houghten and Paul McDermott (A.S.H.V.E. Journal Section, Heating, Piping and Air Conditioning, January, 1933, p. 53).

¹⁹Effective Temperature for Persons Lightly Clothed and Working in Still Air, by F. C. Houghten, W. W. Teague and W. E. Miller (A.S.H.V.E. TRANSACTIONS, Vol. 32, 1926).