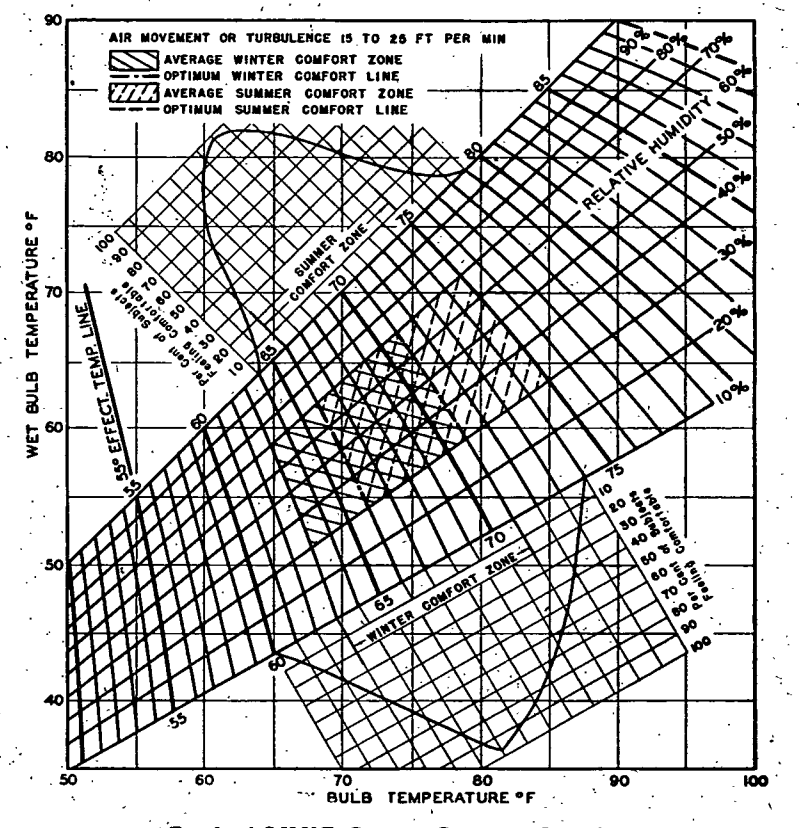

FIG. 6. A.S.H.V.E. COMFORT CHART FOR STILL AIR

Note.—Both summer and winter comfort zones apply to inhabitants of the United States only. Application of winter comfort line is further limited to rooms heated by central station systems of the convection type. The line does not apply to rooms heated by radiant methods. Application of summer comfort line is limited to homes, offices and the like, where the occupants become fully adapted to the artificial air conditions. The line does not apply to theaters, department stores, and the like where the exposure is less than 3 hours. The optimum summer comfort line shown pertains to Pittsburgh and to other cities in the northern portion of the United States and Southern Canada, and at elevations not in excess of 1000 ft above sea level. An increase of one deg ET should be made approximately per 5 deg reduction in north latitude.

people uncomfortable would not be acceptable. Systems should be designed to assure comfort for the maximum possible number.

The results of recent tests [25] made at the A.S.H.V.E. Research Laboratory in very hot conditions with subjects doing light work were in very close agreement with the effective temperature chart. Other recent work [21] under similar environmental conditions, but with subjects walking 3 mph and carrying 20 lb packs indicated that the effective temperature lines should be more nearly horizontal. It therefore appears that the slope of the ET lines may vary depending upon the rate of work being performed.

Radiation between the occupant of an enclosure and the surfaces of the

room itself and objects within the room, including windows, heating and cooling equipment, and other occupants, has an important bearing on the feeling of warmth and may alter to some measurable degree the optimum conditions for comfort previously indicated. Fig. 7 [29] shows the elevation in the dry-bulb temperature of the air necessary to compensate for the lower temperature of three of four side-wall surfaces, and indicates that for this condition each degree reduction in the average of the three wall surface temperatures requires an elevation of 0.3 deg in the dry-bulb temperature of the air. Studies by the A.S.H.V.E. Research Laboratory [28] on the effect of radiation within an enclosure, including the effect of panel heating, indicate that each degree elevation or depression of the mean

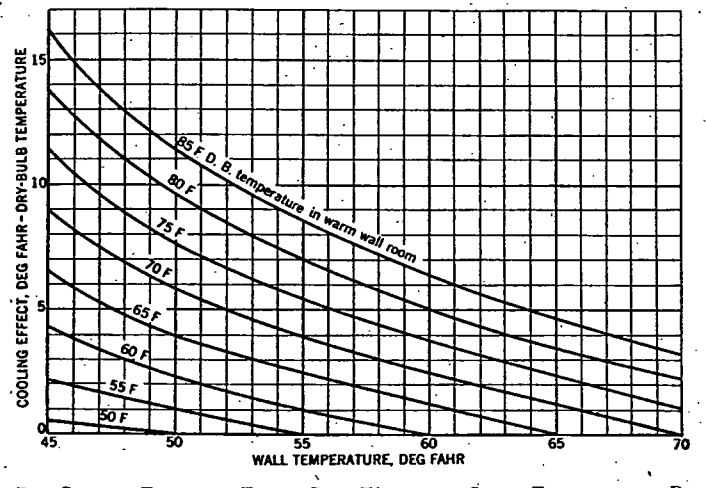

FIG. 7. COOLING EFFECT OF THREE COLD WALLS IN A SMALL EXPERIMENTAL ROOM, AS DETERMINED BY COMPARISON WITH SENSATIONS IN A ROOM OF UNIFORM WALL AND AIR TEMPERATURE

radiant temperature above or below the air temperature requires about 0.5 deg counterchange in effective temperature of the air. Since the mean radiant temperature of a space is affected by cold walls and windows, as well as by the warm surfaces of heating units placed within the room or imbedded in the walls, these factors must be compensated. Likewise, in densely occupied spaces, such as classrooms, theaters and auditoriums, temperatures somewhat lower than those indicated by the comfort line may be desirable because of counter-radiation between the bodies of occupants in close proximity to each other. Such radiation will also elevate the mean radiant temperature of the room.

More recent tests [25] made at the A.S.H.V.E. Research Laboratory indicate that for high effective temperatures the correction in ET necessary per degree rise in mean radiant temperature is not a constant, but varies with the values of effective temperature and mean radiant temperature. At effective temperatures near the upper limit of human endurance, the effect of radiant heat is very small. Additional studies on the physiological effects of radiant heating are contemplated.