measurable degree the optimum conditions for comfort previously indicated. 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

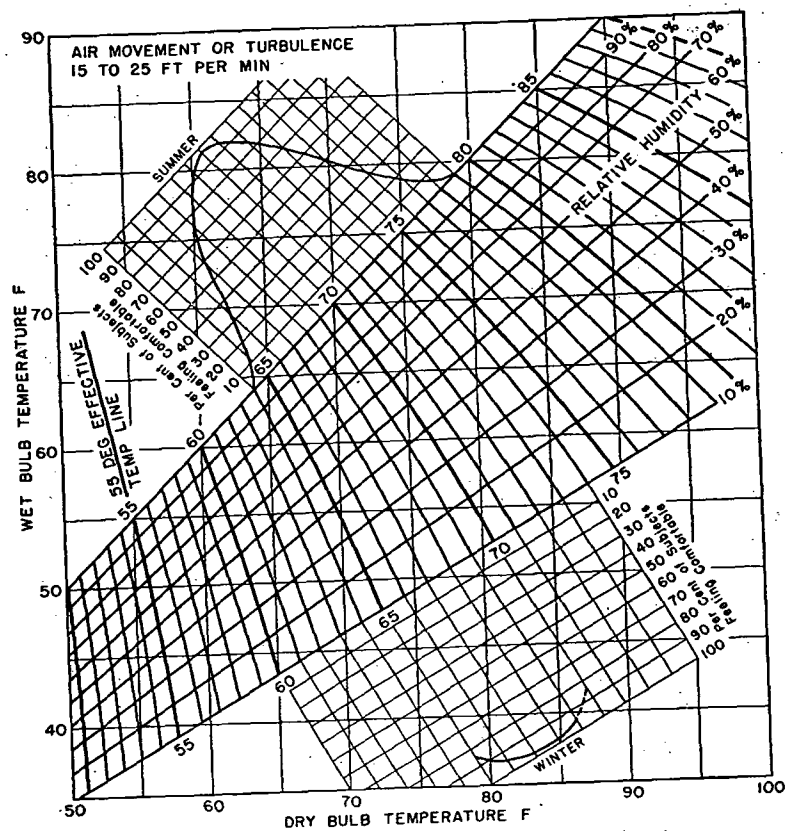


FIG. 10. A.S.H.A.E. COMFORT CHART FOR STILL AIR[a,b]

[a] *Note.*—Both summer and winter comfort lines apply to inhabitants of the United States only. Application of winter comfort line is further limited to rooms heated by central 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 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.

[b] Dotted portion of winter comfort line was extrapolated beyond test data.

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.

Many field studies[23] have been made to determine the optimum indoor effective temperature for both winter and summer in several metropolitan districts of the United States and Canada, in cooperation with the managements of offices employing large numbers of workers (Fig. 11). On the whole, women of all age groups studied prefer an effective temperature for comfort, 1.0 deg higher than men. All men and women over 40 years of age prefer a temperature 1 deg ET higher than that desired by persons below this age. The persons serving in all of these studies were representative of office workers dressed for air conditioned spaces in the summer season, and engaged in the customary office activity.

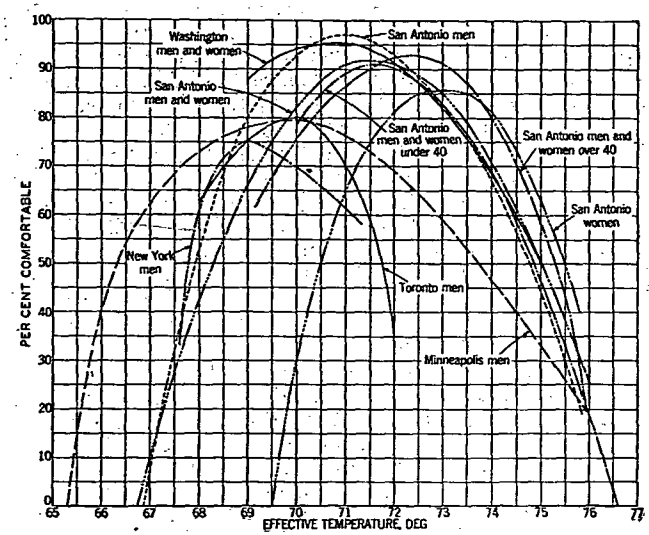


FIG. 11. RELATION BETWEEN EFFECTIVE TEMPERATURE AND PERCENTAGE OBSERVATIONS INDICATING COMFORT

On the basis of present knowledge, for different geographical regions and age groups, the most popular temperature varies from a low of 66 ET in winter to a high of 73 ET in summer. The spread for summer comfort is 69 to 73 ET.

A spread of 3 deg in the optimum effective temperature for summer cooling is ascribed to geographical location. However, variations in sensation of comfort among individuals may be greater for any given location than variations due to a difference in geographical location. The available information indicates that changes in weather conditions over a period of a few days do not alter the optimum indoor temperature.

Sudden chilling of persons entering a cooled and air conditioned space during the summer months, may at times be important. It is due to the rapid evaporation of perspiration which accumulated on the skin and in the clothing during previous subjection to hot and humid outside conditions and increased heat loss by radiation. While studies[25] have shown that for healthy individuals this chilling is not harmful, under some condi-