

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 warmth or comfort felt by persons when exposed to an identical atmospheric condition. The state of health, age, sex, clothing, activity, and

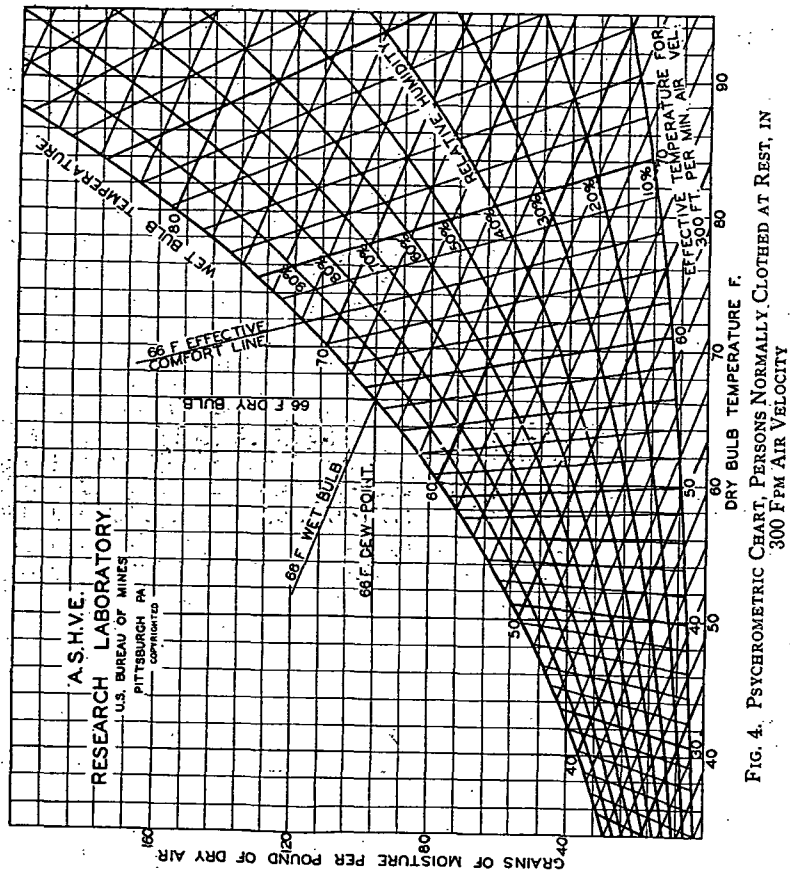


FIG. 4. PSYCHROMETRIC CHART, PERSONS NORMALLY CLOTHED AT REST, IN 300 FPM AIR VELOCITY

the degree of acquired adaptation seem to be the important factors affecting the comfort standards.

Since the prolonged effects of temperature, humidity and air movement on health are not known to the same extent as their effects on comfort, the optimum conditions for health may not be identical with those for comfort. On general physiologic grounds, however, the two do not differ greatly since this is in accordance with the efficient operation of the

CHAPTER 3. PHYSICAL & PHYSIOLOGICAL PRINCIPLES OF AIR CONDITIONING

heat regulating mechanism of the body. This belief is strengthened by results of studies on premature infants over a four-year period²⁴. By adjusting the temperature and humidity so as to stabilize the body temperature of these infants, the incidence of diarrhoea and mortality was decreased, gains in body weight increased and infections were reduced to a minimum.

Winter Comfort Zone and Comfort Line

In Fig. 6 is shown the A.S.H.V.E. winter comfort zone which was determined experimentally with large groups of men and women subjects wearing customary indoor winter clothing. The extreme comfort zone includes conditions between 60 and 74 deg ET in which one or more of the experimental subjects were comfortable. The average comfort zone

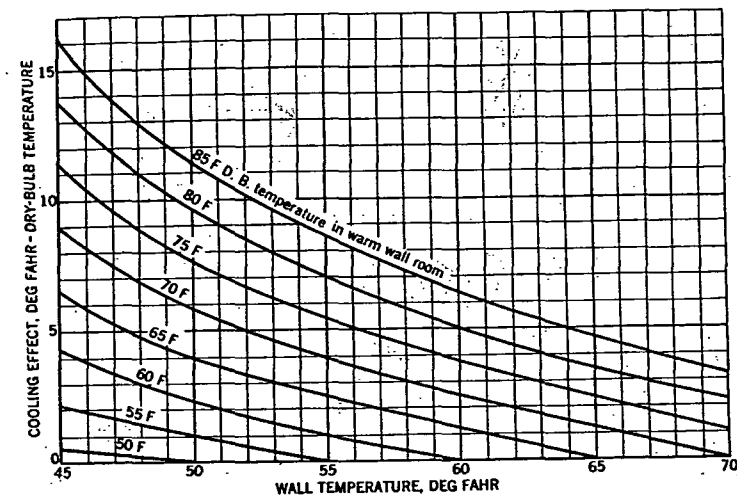


FIG. 5. COOLING EFFECT OF THREE COLD WALLS IN A SMALL EXPERIMENTAL ROOM, AS DETERMINED BY COMPARISON WITH SENSATIONS IN A ROOM OF UNIFORM WALL AND AIR TEMPERATURE

includes conditions between 63 and 71 deg ET conducive to comfort in 50 per cent or more of the experimental subjects. The most popular effective temperature was found to be 66 deg, and was adopted by the Society²⁵ as the *winter comfort line* for individuals at rest wearing customary winter clothing.

The comfort line separates the cool air conditions to its left from the warm air conditions to its right. Under the air conditions existing along or defined by the comfort line, the body is able to maintain thermal

²⁴Application of Air Conditioning to Premature Nurseries in Hospitals, by C. P. Yaglou, Philip Drinker and K. D. Blackfan (A.S.H.V.E. TRANSACTIONS, Vol. 36, 1930, p. 383).

²⁵How to Use the Effective Temperature Index and Comfort Charts (A.S.H.V.E. TRANSACTIONS, Vol. 38, 1932, p. 410).