THE COMFORT ZONE

That range of effective temperatures over which 50 per cent of people feel comfortable, namely 62 deg. effective temperature to 69 deg. effective temperature, is called the Comfort Zone.

That particular effective temperature at which a maximum number of people feel comfortable is 64 deg. effective temperature and is called the comfort line. While at rest in still air, 97 per cent of all people are comfortable at this temperature.

Tables 93 to 99 give the relation between dry and wet bulb temperatures, and effective temperature for still air, and various air velocities up to 700 ft. per min. for persons normally clothed.

The data given in the chart, Fig. 75, and Tables 93 to 99 are for persons normally clothed and differ somewhat from the data contained in previous editions of the Guide for person's stripped to the waist. The tables are divided into zones with correction factors in black face at the side which subtracted from the "normally clothed effective temperatures" will give the "stripped to the waist effective temperatures" with sufficient accuracy for all practical purposes.

There are four fundamental ways of producing effective cooling: (1) The dry bulb temperature may be lowered by direct cooling or removal of heat. (2) The moisture content of the air may be reduced. (3) Air motion will produce effective cooling except for extremely severe conditions. (4) Evaporation of water without addition or subtraction of heat is accompanied by an increase in moisture content and a fall in dry bulb temperature along the wet bulb line resulting in effective cooling.

Take as an example a condition of 95 deg. dry bulb and 40 per cent relative humidity having a wet bulb temperature of 75.2 deg. and effective temperature of 83.1 deg. This condition can be made equivalent to 80 deg. effective temperature or it can be made to feel 3.1 deg. cooler by any one of the four fundamental changes mentioned.

(1) By the removal of heat the dry bulb may be made to fall to 88.2 deg. (see Fig. 75) along the "100 grain moisture per pound of dry air" line when the effective temperature will be 80 deg.

(2) Without removal of sensible heat or lowering of the dry bulb the moisture content may be reduced from 100 to 54 grains per pound of dry air, when the effective temperature will be 80 deg.

(3) Upon inspection of Tables 98 and 99 it will be found that 95 deg. dry bulb and 75.2 deg. wet bulb will give 80.2 deg. effective temperature with 500 ft. air velocity and 79.6 deg. effective temperature with 700 ft. air velocity. Interpolation between these two velocities will give 567 as the velocity necessary to make this condition equivalent to 80 deg. effective temperature.

(4) Evaporation of water at room temperature without addition or removal of heat will cause the point on the chart Fig. 75, indicated by our condition, to move along the wet bulb line to the left thereby lowering the dry bulb temperature and increasing the moisture content. The wet bulb temperature will remain the same but the effective temperature will be lowered. By adding 14 grains of moisture without heat, the dry bulb will fall to 86.2 deg. and the effective temperature will fall to 80 deg.