TABLE 99. RELATION BETWEEN DRY AND WET BULB TEMPERATURES AND EFFECTIVE TEMPERATURE FOR 700 FT. AIR VELOCITY

Dry Bulb Temp.	Wet Bulb Temperature																						
	25	30	35	40	45	49	52	54	56	58	60	62	64	66	68	70	72	74	77	80	85	90	95	100
	Effective Temperature																							
30																								
35																								
40																								
45																								
50																								
54																								
57				31.4	29.2	27.3	26.0	25.0																
60				37.5	35.4	33.8	32.5	31.8	31.0	29.4														
62				39.2	38.3	37.3	36.1	35.3	34.3	32.8	30.5	27.5												
64				41.5	41.2	40.5	39.7	39.0	38.0	37.0	36.2	35.4	34.5											
66					43.2	43.0	42.7	42.3	41.6	41.0	40.4	39.7	39.0	38.3										
68					45.7	46.0	45.7	45.4	44.9	44.3	43.7	43.3	43.0	42.5	42.0									
70					47.6	47.9	48.0	47.7	47.6	47.4	47.2	46.9	46.5	46.3	46.0	45.9								
72						50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.9	49.9	49.9	49.9	49.9							
74						52.0	52.2	52.3	52.4	52.5	52.5	52.6	52.7	52.8	53.0	53.1	53.3	53.5						
76						53.9	54.2	54.3	54.5	54.6	54.7	54.9	55.1	55.3	55.4	55.6	56.1	56.4	57.0					
78						56.2	56.3	56.4	56.5	56.7	56.8	57.0	57.4	57.6	58.0	58.3	58.5	59.0	59.6					
80						57.8	58.2	58.4	58.6	58.8	59.0	59.3	59.6	59.8	60.3	60.4	60.8	61.5	62.1	64.0				
83							61.0	61.3	61.5	61.6	61.7	62.1	62.4	62.6	63.0	63.3	63.6	64.3	65.4	67.1				
86							63.4	63.7	64.0	64.3	64.5	64.6	65.0	65.4	65.7	66.4	66.7	67.0	68.9	70.3	73.7			
90								67.7	67.7	67.7	68.0	68.2	68.4	68.7	69.3	69.8	70.4	71.0	72.0	73.3	76.5	82.0		
95									72.0	72.2	72.3	72.5	72.7	73.0	73.3	73.6	74.2	74.6	75.6	77.2	81.2	85.7	91.5	
100										76.0	76.3	76.6	76.8	77.0	77.4	77.6	78.0	78.5	79.4	80.5	83.7	87.3	92.5	100.7
105											78.7	79.2	79.5	80.0	80.5	81.0	81.4	81.7	82.6	83.5	86.1	89.3	93.7	101.5
110												81.7	82.0	82.3	82.6	83.2	83.7	84.3	85.2	86.4	88.4	91.0	95.0	102.6
120														85.0	85.6	86.0	86.5	87.3	88.3	89.4	91.4	94.3	97.7	103.7

70.8 deg. effective temperature. It is therefore 0.3 deg. effective temperature cooler than the first condition.

Example 2.—Given 76 deg. dry bulb and 61 deg. wet bulb how many degrees difference between this condition and the comfort line or 64 deg. effective temperature?

Answer.—The effective temperature of this condition is given by the intersection of the 76 deg. dry bulb and 61 deg. wet bulb lines and is 68.2 deg. effective temperature or 4.2 deg. effective temperature warmer than the comfort line.

Example 3.—Given the dry and wet bulb temperatures in a room of 78 and 64 deg. respectively, what air velocity will be necessary to make this condition ideally comfortable, that is, 64 deg. effective temperature?

Answer.—From Table 93 for still air it will be seen that this condition has an effective temperature of 70.4 deg. in still air. Looking through the various Tables 94 to 99 for moving air it will be found that with a 300 ft. velocity this condition will have an effective temperature of 63 deg., and with a velocity of 200 ft. (Table 96) it will have an effective temperature of 64.8 deg. Interpolating between these two velocities the desired velocity is found to be 244 ft. per min.

Example 4.—Given a condition having dry and wet bulb temperatures of 90 and 85 deg. respectively, how much cooler will this condition feel if 300 ft. air velocity is supplied instead of still air?

Answer.—From Table 93 it will be found that this condition in still air has an effective temperature of 86.4 deg., while if the air has 300 ft. velocity it will be found from Table 97 that it will have an effective temperature of 81.9 deg. Cooling of 4.5 deg. will be produced by the 300 ft. air velocity.

There are many applications for this data. In cases where air motion will produce a cooling effect it is a simple and inexpensive method. At high temperatures, however, the benefit is small and the effective temperature should be reduced in other ways before setting the air in motion.

In warm weather it is especially desirable to have greater comfort in school rooms, theaters, auditoriums, also factories, foundries, iron, steel and glass works, mines and other places where workers are subjected to extreme temperature conditions. Maintaining comfortable conditions indoors in summer when the thermometer registers about 95 deg. is a more complicated problem than maintaining the proper condition in winter. Incoming air diffusing into the rooms takes up heat from the bodies of occupants, and the heat liberated by operating machinery so that the temperature is increased considerably.

The cooling effect produced by the evaporation of water has been helpful in air conditioning work particularly where air is quite dry. When it comes in contact with water in passing through a humidifier an appreciable amount of heat is lost resulting in a considerable lowering of the air temperature. As an illustration of the value of saturation and air movement take the following average summer condition of 96 deg. dry bulb, 80 deg. wet bulb in practically still air, which corresponds to an effective temperature of 84.7 deg. A 300 ft. air velocity will improve conditions by only 3.5 deg. effective temperature. Saturating the air will reduce the dry bulb temperature to 80 deg. and with a 300 ft. air velocity applied the resulting condition will theoretically be 72 deg. effective temperature so that the improvement will be 84.7 deg.—72 deg. = 12.7 deg. effective temperature.

In practice these theoretical values will not be fully achieved. Therefore an allowance should be made for an increase in temperature and a decrease in humidity of the diffusing air before it strikes the occupants. The cloth-