



tically up to the curve; from the point of intersection with the curve tranverse to the vertical scale which will show that 2,000 cu. ft. of air per hr. per person is being supplied to the room.

**Distribution.**—The distribution of the air in a room shall be determined from the CO<sub>2</sub> readings taken in the various parts of the room. The

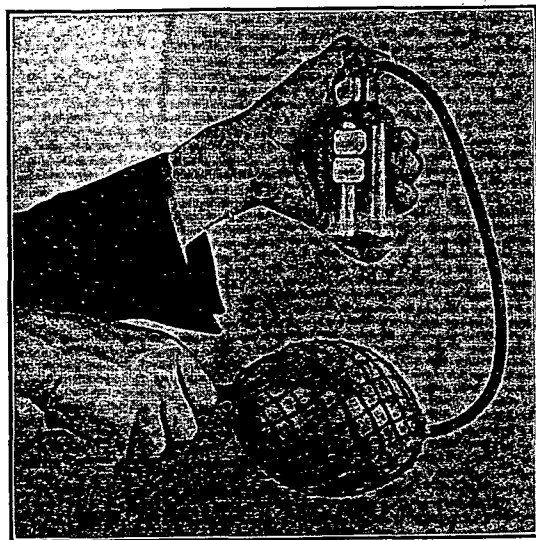


FIG. 57. TAKING AN AIR SAMPLE

following example illustrates the method of calculating the result. Assume four samples taken resulting in the following analysis:

| Station | Parts of CO <sub>2</sub> per 10,000 |
|---------|-------------------------------------|
| 1       | 6.4                                 |
| 2       | 7.4                                 |
| 3       | 9.2                                 |
| 4       | 5.0                                 |

Average 7.0

The variation at the various stations above or below the average is as follows:

| Station |                 |
|---------|-----------------|
| 1       | 7.0 - 6.4 = 0.6 |
| 2       | 7.4 - 7.0 = 0.4 |
| 3       | 9.2 - 7.0 = 2.2 |
| 4       | 7.0 - 5.0 = 2.0 |

Then the average variation from the average CO<sub>2</sub> is determined as follows:

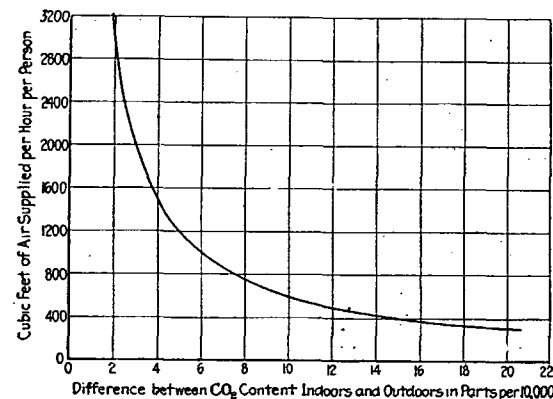
$$\frac{0.6 + 0.4 + 2.2 + 2.0}{4} = 1.3$$



The percentage of variation is therefore equal to  $1.3 \div 7.0 = 18.6$  per cent. Therefore the percentage distribution =  $100 - 18.6 = 81.4$  per cent.

**Other Injurious Substances.**—This column is used only in special cases where, owing to the nature of the processes carried on, some particularly injurious substance is being given off to the air. The column is then graduated, consistent with the nature of the substance.

For example, suppose that the contaminating substance is carbon monoxide. Grubner states that symptoms of poisoning are distinct when the air contains 0.02 of one per cent of this gas, and that death ensues in a short time when the air contains 0.05 of one per cent. Whitthaus

FIG. 58. CURVE TO DETERMINE AIR SUPPLY FROM CO<sub>2</sub> READINGS.

states that when air containing carbon monoxide is breathed, the body retains about one-half of the gas inhaled. The poison therefore accumulates in the blood, and small amounts in the air may produce death if inhaled over a sufficient period of time. It is apparent therefore for our purpose that the lethal dose of 0.05 of one per cent is too high, and that 0.02 of one per cent, considering the time factor, would be nearer the truth. In arranging our scale in the column headed Other Injurious Substances, we would therefore consider air free from CO as 100 per cent and air containing two parts in 10,000 as 0 per cent, or air containing one part of CO would be 50 per cent, one-half parts, 25 per cent, etc.

For example, if a test is made of the air in a garage or other place where CO is found, and the result shows two parts of CO in 100,000 parts of air, the penalization factor would be 10 per cent, and this amount would be added to the other minus percentages or penalization factors, and the total subtracted from 100 to obtain the final Percentage of Perfect.

**The Comfort Chart.**—The inter-relation of temperature, humidity, and air motion is shown in the lower portion of the chart. The inter-section of the Air Motion line and the Physical State line determines the proper wet bulb temperature. This point should be indicated on the chart by a small angle (thus  $\angle$ ) the apex of the angle coinciding with the point