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_2 is determined as follows:

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

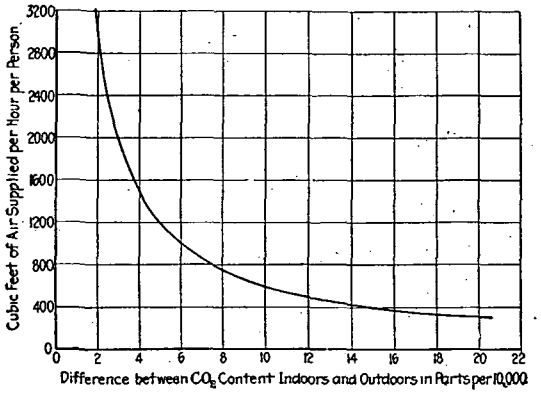

FIG. 5. CURVE TO DETERMINE AIR SUPPLY FROM CO_2 READINGS.

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 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, ½ 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 intersection 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 ⌝) the apex of the angle coinciding with the point of intersection of the lines. The observed dry bulb and wet bulb is also indicated by an angle (thus ⌞). The difference between the *desirable* wet bulb and the *observed* wet bulb is plotted in the first column of the air chart marked Wet Bulb Difference.

Number and Location of Stations. The number of stations where samples are to be taken shall be determined from the floor area in the room. One station should be allowed for each 200 sq. ft. of floor space. In no case shall less than four samples be taken. The room should be divided equally into imaginary areas and a station located in the center of each area. All samples are to be taken in the breathing zone which is from 2 to 6 ft. from the floor.

RECORDING THE RESULTS

To illustrate the method of determining the Percentage of Perfect ventilation, consider the results of a test as given below. The average results in a room are found as follows:

Dry Bulb temperature	72°
Wet Bulb temperature	58°
Air Motion	20 ft. per min.
Physical State	Light work
Dust	10,000 particles per cu. ft.
Bacteria	*10 colonies on a 2-minute plate*
Odors	90% free from
CO_2	7 parts per 10,000
Other injurious substances	None
Distribution	81.4

These values are now represented on the chart by a ⅛ in. vertical line drawn in the center of each of the respective columns. The proper wet-bulb temperature is determined by noting the point of intersection of the "light work line" and the 20 ft. air motion line; this is 55 deg. wet bulb. Since the actual wet-bulb temperature as determined by the test is 58 deg. then the wet bulb difference is 3