

- A = the Effective Temperature Difference, or the amount of variation from the ideal effective temperature.
 B = Dust Particles per Cu. Ft.
 C = Bacteria.
 D = Percentage of freedom from objectionable odors.
 E = Carbon Dioxide, parts per 10,000.
 F = the Distribution Percent.

The last column is the Percent of Perfect column used for plotting the final percentage.

Each of these main columns is further divided into three smaller columns, the center one of which is left blank for recording the test data. To the left of this is the scale for the individual factor, effective temperatures in degrees, dust in particles per cubic foot, carbon dioxide in parts per 10,000, etc. On the right of each central column is the

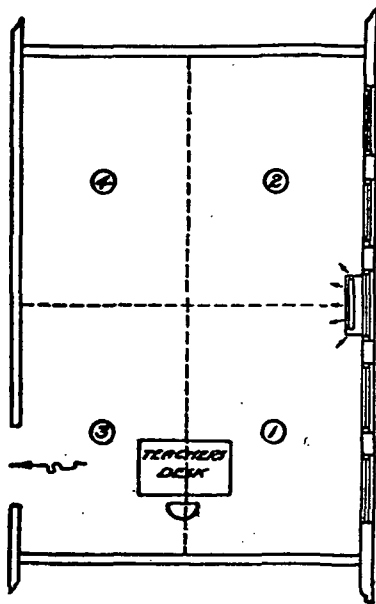


FIG. 11. STATIONS FOR MAKING TEST

penalization scale. This is arranged with main graduations of 1 per cent which are numbered. Each graduation is further subdivided into fifths so that the scale may be read to 0.2 of 1 per cent on the scale, or by interpolation to 0.1 per cent.

The chart gives not only final percentage of the test as a whole, but also indicates at a glance which factors are satisfactory and which at fault. In this way it is a convenient guide in correcting bad conditions, and bringing the final percentage up to the point desired.

Making the Test

In making a Synthetic Air Chart test the observer first divides the room by imaginary lines into small sections, each section having an area of approximately 200 sq. ft. of floor space. He locates an observation station in the center of each section. Taking a school classroom for example, the room should first be divided into four equal rectangular areas by imaginary lines bisecting at right angles through the center of the room. (See Fig. 11.) Four stations are now selected, one at the center of each rectangle. These stations are numbered 1, 2, 3 and 4. It is always well to use a standard method of numbering stations, so that whoever reads the report can visualize each location.

Standing at the rear of the room facing the teacher's desk No. 1 is the station nearest the teacher at her right. No. 2 is the one directly back of No. 1. No. 3 is the station nearest the teacher at her left, and No. 4 the remaining station.

The tests are conducted in the following manner:

Column A.—A Psychrometer reading is taken at each station beginning with 1, following with 2, 3 and 4. The wet and dry bulb readings are separately recorded on the data sheet (Fig. 12) for each station.

Column B.—Dust determinations are next made at stations 1, 2, 3 and 4, and the count of particles per cubic foot recorded from each station. The scale of the chart is arranged for a direct reading dust counter. If some other type of instrument is used, a correction factor is, of course, necessary.

Column C.—Culture plates are next exposed to determine the bacterial content of the air. One plate is exposed at each station for two minutes, incubated, and the colonies that develop are counted and recorded for each plate. The average of all plates is plotted on the chart.

TEST DATA										DATE				
BUILDING		FLOOR		TIME		TO								
STATION	TEMPERATURE		RH %	AIR MOTION	DUST	BAC. TERN	ODORS	CO ₂	SUPPLY REGISTERS			EXHAUST REGISTERS		
	DRY BULB	WET BULB							AREA	VELOCITY	G.F.M.	AREA	VELOCITY	G.F.M.
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														

PRIMARY SENSE IMPRESSION				NOTES			
NO. OCCUPANTS				WINDOWS NO.			
PHYSICAL STATE				TYPE			
AIR SPACE PER OCCUPANT				AREA			
TOTAL AIR SUPPLY BY CO ₂				LEAKAGE			
AIR SUPPLY PER OCCUPANT BY CO ₂				ENTRANCE - OUTLET			
AIR DISTRIBUTION %				FLOOR AREA PER PERSON			
TEST BY				CHECKED BY			
APPROVED							

FIG. 12. DATA SHEET FOR SYNTHETIC AIR CHART TEST

Column D.—Odor determinations are made of the room as a whole.

The observer should go outside of the room or preferably outside of the building for a few moments previous to making the test. He then enters the room quickly, and makes his determinations of the air in the classroom by means of the olfactory sense, recording the results whether perfect, very faint, noticeable, etc., in accordance with the following table.

Freedom from Odors						
100%	95%	90%	85%	80%	75%	70%
Perfect	Very Faint	Faint	Noticeable	Distinct	Decided	Strong

An Odorometer consists of a case of six vials each containing an odor substance in varying strength. It adds materially in classifying and standardizing odor perception. Its use, however, is not imperative.