fortable drafts

When people occupying space are sedentary and the only heat produced is that from the occupants themselves, the American Society of Heating, Refrigerating and Air-Conditioning Engineers publish ventilation standards that call for an air motion of not more than 50 fpm The amount of fresh air provided per person for good ventilation varies with the crowding in the space

Total free air space per person and total ventilation required have been subjects of legislation in many places and of local laws, ordinances, and rules of building departments, but such codes do not get at the heart of the matter—to assure comfort.

The object of a heating, cooling, and ventilating system is to provide comfort to the occupants, and the feeling of comfort is affected by temperature, humidity, air movement, and bodily activity, among other things. To express these ideas in a single index of comfort, the "effective temperature" (ET) has been defined empirically as a measure of comfort conditions in a single number. It is most applicable to warm atmospheres where radiation effects are not significant In addition to requiring skilled measurement of air flow, the index makes too much allowance for humidity at low temperatures and not enough at high temperatures

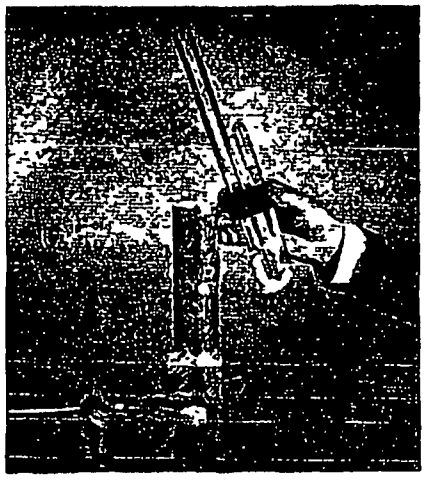

Fig. 28-18. Shielded wet-and-dry bulb thermometer for determining air temperatures unaffected by radiation.

Courtesy Owens Illinois Glass Company

It is fallacious to say categorically that the ideal condition is 70 to 72 F with 50 per cent relative humidity. Actually, ideal values vary from an effective temperature of about 71 for sedentary work to an effective temperature somewhere in the high forties for men doing hard manual labor

It was demonstrated* many years ago that men not only work more efficiently at close to the optimum comfort temperature, but also that the accident rate rises rapidly when temperatures either rise or fall from this level

The comfort chart (Fig 28-19) shows the proportion of people who feel comfortable at various effective temperatures It is based on much specialized research and has a number of qualifications The latest ASHRAE *Guide and Data Book* should be consulted.

Humidity The ratio (expressed in per cent) between the amount of moisture present in the air to the maximum amount that can be held in vapor form at the same temperature and pressure is known as the relative humidity.

Air may be at the proper temperature and still be uncomfortable because it is too dry or too moist If outside air in the winter is heated to ordinary room temperature, it may feel uncomfortable, dry, and cold. The reason is that too little moisture in the air causes excessive dryness of the mucous membranes of the nose and throat and rapid evaporation of moisture from the body Thus a cooler feeling is experienced than would be expected from the temperature indicated by the thermometer (This is shown by the curving dashed lines in Fig. 28-18.)

On hot, humid days the air is high in relative humidity, the evaporation of mois-

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*Osborne, E E and H. M Vernon *The Influence of Temperature and Other Conditions on the Frequency of Industrial Accidents.* Industrial Fatigue Research Board Report No 19 London, H R M.'s Stationery Office, 1922