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TO DETERMINE ATMOSPHERIC TEMPERATURE WITH THE HELP OF INSTRUMENTS

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ABSTRACT

The weather denotes the atmospheric phenomena at a particular point of time at a particular place. The climate, on the other hand, refers to an enduring regime of the atmosphere over a longer period of ::me and a larger territory; it represents the mean values of the weather conditions, say over a period of 30-50 years. The chief elements of weather are temperature, pressure, wind direction and velocity, cloudiness, precipitation, humidity and visibility, etc. Each of the climatic elements solar energy, humidity, precipitator and winds, etc., also functions as a climatic control and influences each of the other elements.

KEYWORDS:*Temperature , atmos pheric phenomena, Thermometer.*

INTRODUCTION:

A Zoologist Reiter was the first man to propose the term ecology, it is concerned with the relationship between living beings and their surroundings.

Ecosystem is a functional unit of ecology. It consists of both biotic and abiotic components constantly interchanging and exchanging materials between them. The different abiotic components are temperature, light, humidity, rain fall, wind etc. These abiotic factors (components) influence the different physiological processes of plants and animals (biotic components). Different instruments are used to measure these factors.

TEMPERATURE

Temperature is measured by a thermometer. The two most common thermo¬meters are the Celsius or Centigrade Thermometer (°C) and the Fahrenheit Thermometer (°F). The Absolute Thermometer is used for scientific purposes. There is also the Reamer Thermometer used for general purposes. The thermometers carry the following conversion values :

$$\frac{^0F - 32}{180} = \frac{^0C}{100} = \frac{^0R}{180} \quad \text{and } ^0C = A\text{-}273$$

All thermometers are sheltered in Stevenson's Screen so that the thermometer remains under shade, free from the influence of sunshine which may raise the temperature.

Temperature is also recorded on a Thermograph on the mounted paper continuously for 24 hours.

Tele-thermometer is an instrument by means of which the temperature outside a building can be measured. It is used for maintaining a continuous record.

Wet-bulb and Dry-bulb Thermometer (Vide Fig. A) provides a means of measuring humidity. In the Wet Bulb Thermometer the bulb is kept wet by a piece of muslin and a wick that dips into a vessel of pure water. When the dry air touches the bulb its energy is used in

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evaporation of water which lowers its temperature. On the other hand, the dry bulb is kept uncovered exposed to the air. Its readings are not influenced by water vapour and hence remain higher than those in the wet bulb thermometer. The drier the air the greater will be the difference between the readings of the two thermometers; the greater the humidity in the air, the less will be the difference in their readings. An arrangement of these two thermometers that are used to measure relative humidity is called a Sling Psycho-meter (Vide Fig. B).

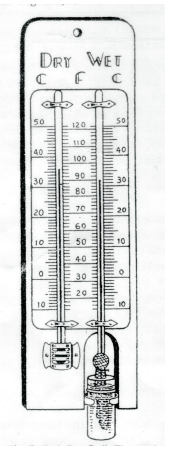

Fig. A. Wet Bulb & Dry Bulb Thermometer.

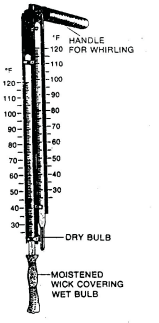

Fig. B. Shing Psychometer

Maximum and Minimum Thermometer (Fig. C) records maximum and minimum temperature during the last 24 hours. It gives the diurnal range of temperature of a place.

It should be noted that all temperatures are reduced to sea level before plotting because they vary with altitude at an average rate of 1°C for 160m.

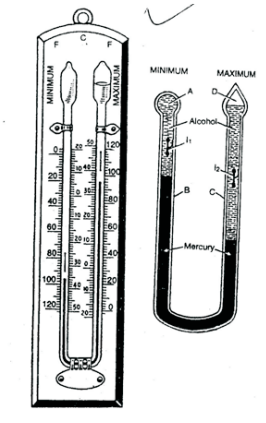

Fig.C: Maximum & Minimum Thermometer

The effect of temperature on vegetation becomes obvious when we compare plants in tropics and at arctic regions. In fact all physiological activities including reproduction are greatly influenced by the temperature. Following instruments are used to determine temperature.

l) Maximum and Minimum Thermometer: (Figure C)

It is often necessary to know the highest and the lowest temperature in a given interval of time. This instrument records the highest and the lowest temperature during 24 hours. It consists of 'U' shaped tube with a bulb at each end. The bulbs are filled with alcohol and the tube, with the mercury. In each arm of the U tube there is an index pin or rider.

Working: As the temperature rises, alcohol in the right limb / arm expands pushing the mercury down in the right limb. Mercury level goes up in the left arm. This movement continues till the highest temperature is reached. Thus the position of the lower end of the rider in ihe left arm indicates maximum or highest temperature.

Alcohol in the glass tube contracts when temperature decreases. Mercury moves up in the right arm. This

causes the rider in the right arm-to move up. Thus, the position of the lower end of the rider in i'ae right arm indicates minimum or lowest temperature in the day.

After recording the maximum and minimum temperatures, the riders by using magnet are brought down in contact with the mercury.

2) Soil Thermometer:

Soil may be defined as the weathered superficial covering of Earth curst. Primarily the heat, frost, wind and water act on the rock continuously and create soil. The soil primarily serves as a dwelling for microflora, as source of organic mater as anchoring medium for terrestrial plants and as source of water and minerals. Soil temperature is also equally important to the soil microflora as well as the underground parts of the plants.

Thermometer: It has a distinct pointed can be measured by using soil the thermometer. The remaining part of thermometer has a wooden gasket with handle and a glass window.

Working: The instrument can be pushed down at the desired depth in the soil. The temperature can then be recorded.

CONCLUSIONS

We used a multimodel archive to obtain fingerprints of atmospheric temperature change. These fingerprints are estimates of the climate responses to external forcing by the combined effects of anthropogenic factors, volcanoes, and solar irradiance. The primary components of external forcing over the past century are humancaused increases in well-mixed greenhouse gases, depletion of stratospheric ozone, and changes in atmospheric burdens of various aerosol particles (20, 57). Our fingerprints, therefore, mainly reflect human influences on climate (7, 19, 29).

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