

METEOROLOGY

Measure Cloud Droplets

New instrument that uses infrared light to measure the size of droplets as they form in clouds is expected to lead to a better understanding of how and why it rains.

► CLOUDS MAY yield their life histories to a new cloud spectrograph developed by meteorologists at the Massachusetts Institute of Technology.

Dr. Delbar P. Keily, Dr. John C. Johnson, now at Tufts College, and Ralph G. Eldridge reported a one-month successful trial operation of their new equipment for measuring cloud drop sizes on Mount Washington this fall to the American Association for the Advancement of Science meeting in Boston.

The new equipment, developed under sponsorship of the Geophysical Research Directorate of the Air Force Cambridge Research Center, determines the size and number of drops "smaller than have been measured before," Dr. Keily said.

It estimates the size and number of droplets as small as four ten-thousandths of an inch in diameter. A cubic inch of ordinary cloud may contain 500,000 such tiny droplets, each less than one-hundredth the size of the smallest drops in a drizzly rain.

Clouds are formed when invisible water vapor collects into visible droplets of water, at first very small. These tiny droplets, Dr. Keily said, "contain the key to the

mystery of how clouds grow—they are the critical stage in the process by which water in the atmosphere goes from invisible vapor to drops large enough to be rain."

Such tiny drops are believed to exist for a short time; they must either grow larger or evaporate. The new instrument will allow meteorologists to study the behavior of extremely small droplets, closer than ever to the critical sizes that are the true forerunners of raindrops.

The device is called a "variable frequency infrared cloud transmissometer." An electric eye peers through a part of the cloud toward a light source about four feet away, measuring the changes in brightness caused by intervening droplets of the cloud. The light source is invisible "infrared" radiation, since it undergoes large changes on passing through a cloud of very small droplets.

To find the actual sizes of drops, observations of brightness made with the cloud spectrograph must be compared to intensities derived from theoretical data. These theoretical computations were made on M.I.T.'s large electronic computer, Whirlwind I, under Dr. Johnson's direction.

Science News Letter, January 9, 1954

MEDICINE

Sex Mystery in Obesity

► A DIFFERENCE between the sexes in relation to heart disease, high blood pressure and overweight is giving medical scientists a new mystery to solve.

The mystery appears in a report by Drs. Arthur M. Master, Harry L. Jaffe and Kenneth Chesky of New York to the *Journal of the American Medical Association* (Dec. 26, 1953).

The doctors do not call it a mystery, but refer to it as a "surprising finding," the reason for which is "not obvious."

The mystery, briefly, is this: Overweight occurs more often in men with high blood pressure and with three kinds of heart disease than among the general population. In women, on the other hand, obesity is not more frequent in patients with high blood pressure and the three kinds of heart disease than in the general population. But after the age of 40, women in the general population are definitely more obese than men.

The New York doctors used new limits for normal blood pressure and new weight tables in their study. They classify as obese persons 25% or more above average weight,

while those 10% to 24% above average are classed as overweight.

The three kinds of heart disease they investigated are angina pectoris, acute coronary insufficiency that occurs when the flow of blood to the heart muscle is not enough to meet the demands, and coronary occlusion, which is a blockage of one or more of the arteries supplying the heart.

The ratio of overweight among 100 men with angina pectoris to the general population was 39 to 20. The proportion of overweight men among 113 with coronary insufficiency was again almost double that in the control group, 39% to 20%. Men with coronary occlusion also showed, before the attack, a definite increase in frequency of overweight (33% to 14.8%) and of obesity (16% to 5.3%) compared to the controls.

Among 118 men with essential hypertension, or high blood pressure, the ratio of overweights to those in the general population was 32.2% to 14.8%. The proportion of distinctly obese men, 25% or more over average weight, was, however, the same in the high blood pressure and control groups, 6% to 5.8%.

Obesity, the doctors point out, is a strain on the heart and can aggravate heart disease, making the patient likely to have anginal pain and congestive failure. However, no definite conclusion can be drawn as to whether there is a cause and effect relation between obesity and high blood pressure or heart disease. Patients with either disease who are overweight have twice the mortality of average or underweight patients.

So, even though it is not clear that being overweight causes heart disease or high blood pressure, it is, the doctors warn, "clearly" important to avoid obesity in heart and blood vessel diseases.

Science News Letter, January 9, 1954

MEDICINE

Warns of Appendicitis Danger with Measles

► IF A child with measles develops pain in the abdomen or any other sign or symptom that might mean appendicitis, he should be watched closely and operated on as soon as the diagnosis is definite.

This advice is given by Dr. W. H. Galloway of the University of Aberdeen and consultant pediatrician to the City Hospital, Aberdeen, Scotland, in the *British Medical Journal* (Dec. 26, 1953).

He bases his warning advice on the cases of seven children who developed measles and appendicitis within the same day or two. One of these children was not operated on for 72 hours after appendicitis developed because he had the measles. The delay was what gave the chance for an abscess to form and peritonitis to set in, the surgeons and Dr. Galloway think.

Measles and appendicitis are both common childhood diseases, but when they come together it is not just a matter of chance. The measles, in Dr. Galloway's opinion, probably starts the infection of the appendix.

Sometimes the appendicitis develops before the typical measles rash. Sometimes it comes after. Either way, it is dangerous, Dr. Galloway warns, to delay operation.

Science News Letter, January 9, 1954

ICHTHYOLOGY

Blood-Sucking Blonde Exhibited to Scientists

► A FATAL blood-sucking blonde swished into the American Association for the Advancement of Science meeting in Boston, billed as the only albino lamprey in existence, alive or dead.

Exhibited by Prof. Francis H. Wilson of Lebanon Valley College, Pa., this creature was discovered Aug. 12 in Lake Champlain as a larva of the land-locked form of the sea lamprey. It metamorphosed into an adult with no pigment in its skin and with pink eyes. Like famous Moby Dick, the albino whale, it is extremely rare.

Science News Letter, January 9, 1954