

GEOPHYSICS

To Study Earth's Heat

Scientists seek answer to why the Earth has warmed up 2.2 degrees during the past 50 years. Man himself may be cause of climate change.

► WHY THE world is warming up is an unsolved mystery that scientists will attack during the world-wide probe of the earth, its seas and skies, to be made during the International Geophysical Year in 1957-58.

The cause of this warming, which amounts to 2.2 degrees Fahrenheit in the last 50 years, is not known. But what is happening to the ice in the Antarctic holds the clue as to whether temperature increases are world-wide or limited to the Northern Hemisphere.

If this vast continent, the world's biggest icebox, is defrosting inland as it is near the coast, then scientists will know the warm-up covers the entire world. If higher temperatures for the world continue, economic and political effects of great magnitude would be expected.

Not only thermometer readings but receding glaciers indicate the warm-up. A slight change in the amount of carbon dioxide in the atmosphere could have caused this change, many meteorologists believe.

Carbon dioxide comes into the air with the breath of animals and man, with the decay of organic matter, from volcanoes and from burning fuels. It is taken out of the air by plants and by the weathering of rocks and metals.

Although carbon dioxide makes up only a few hundredths of one percent of the atmosphere, it has been calculated that half again as much as is now present would raise the surface temperature of the earth two degrees.

By burning up about 100 billion tons of coal and oil since 1900, man himself may be changing the climate, since carbon dioxide and water vapor above the earth's surface act like a greenhouse, trapping heat.

This is one theory of why the earth is warming up.

Retreat of the Arctic ice pack also indicates that temperatures are increasing. No one knows, however, how much ice is in

the Antarctic, and whether it is also melting on a gigantic scale. Estimates of Antarctic ice amounts range from 6,000,000 to 12,000,000 cubic miles. If only one percent of this ice shelf should melt, the sea level around the world would rise from eight to 30 inches.

Slow-growing lichens found next to the ice at the foot of glaciers in Queen Maud Land in the Antarctic indicate that there has not been a recession there in many years. But a thorough study of the whole continent, still mostly unexplored, will be needed to determine if this is true for the entire 5,500,000 square miles.

Such a study is planned for the International Geophysical Year, a cooperative effort of more than 38 nations to make the most comprehensive study ever undertaken of the earth.

GEOLOGY

Discover Hot Spot On Pacific Floor

► THE EARTH'S inner fires make the Pacific Ocean floor off the west coasts of Central and South America hotter than any place yet known.

This discovery was made by the University of California's Scripps Institution of Oceanography. The earth's crust varies in thickness from four miles beneath the Pacific to 20 miles beneath the adjacent continents. It is warmed by heat rising from the molten core.

Despite the uneven thickness, most measurements of the amount of heat flowing through the outer crust give the same values for continents and oceans. Now readings taken on the Albatross Rise, a vast undersea plateau of the eastern tropical Pacific Ocean, show the heat flow there is three times that of the average oceanic or continental value.

The actual amount of heat from the core warming a small area of the crust is so minute it would not be perceptible to human touch.

Arthur E. Maxwell, a geophysicist at Scripps Institution at La Jolla, Calif., who was in charge of the heat-flow measurements, obtained from bottom sediment in the Acapulco Trench the deepest heat reading yet made. The value there is about one-half that of the average oceanic value, although measurements on either side of the trench approached average.

Mr. Maxwell believes that this may indicate a giant convection cell in the earth's crust.

GENERAL SCIENCE

Honey Kept Fresh By Ultrasonic Waves

► HONEY CAN now be kept from spoiling by subjecting it to ultrasonic waves.

Crystallization, the first step in honey deterioration, is prevented by ultrasonic waves, Dr. Socrates A. Kaloyereas of Louisiana State University's agricultural experiment station, Baton Rouge, La., reported.

It was found that ultrasonically treated honey, stored from one to four weeks at temperatures ranging from 40 degrees below zero Fahrenheit to 102 degrees Fahrenheit, showed no signs of crystallizing. Untreated control samples, on the other hand, did show signs of spoiling.

"These results," the Louisiana scientist stated in *Science* (March 4), "are not only important from the practical standpoint of preserving honey, but they also have theoretical significance in view of the fact that treatment with ultrasonic waves has hitherto been supposed to promote crystallization in general."

In addition to keeping the honey fresh, ultrasonic waves also improve its taste, giving it a slightly tart flavor, which Dr. Kaloyereas describes as "superior" to untreated honey.

The experiments also showed that yeast cell growth is retarded by the ultrasonic wave treatment.

Further experiments are being conducted to study the chemical effects caused in honey by the action of the ultrasonic waves.

Science News Letter, March 26, 1955

AERONAUTICS

Wing Flap Scheme Tested For Vertical Take-Off

► A NEW type of experimental wing flap that would allow vertical take-off for conventional looking planes has been tested by the National Advisory Committee for Aeronautics at Langley Air Force Base, Va.

In the new scheme, fast moving, triple-bladed propellers with a somewhat larger than usual diameter are mounted on the wings in conventional position. They thrust back high velocity winds that are deflected downward by movable wing flaps to achieve the lift.

Once the plane is in the air the flaps could be set in horizontal position for normal flight. A report on the flaps stated that the laboratory experiments were designed only to test vertical take-off. No provision was made for forward flight.

The tests showed that the propeller backwash would be deflected 67 degrees downward with the system. The scientists pointed out that it is not necessary to bend the winds a full 90 degrees. The nose of the plane could be tilted upward at take-off.

Results of the experiments were reported by Richard E. Kuhn and John W. Draper, NACA scientists.

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