

METEOROLOGY

Arctic Cold 14,000 Years

► THE NORTH POLE and surrounding Arctic areas have been in the grip of a cold climate for at least the past 14,000 years.

Actually, the weather of this region now must be regarded as relatively "mild" compared to thousands of years ago, Dr. Paul A. Colinvaux of Yale University, New Haven, Conn., believes. On the basis of plant pollen from Alaska, he has found that the climate there was colder 14,000 years ago than it is now.

Since then, there has been progressive warming to today's cold climate, he reported in *Science*, 145:707, 1964.

The Arctic Ocean is ice-covered now, so it must have been ice-covered then, Dr. Colinvaux concluded.

This finding contradicts a theory on the origin of the ice ages put forth in

1956 by Drs. Maurice Ewing and William Donn of Columbia University's Lamont Geological Observatory, Palisades, N. Y. Drs. Ewing and Donn suggested that an ice-free Arctic Ocean caused the ice ages, and that Arctic waters were open until about 11,000 years ago.

Since climatic changes take time to produce their effects on vegetation, Dr. Colinvaux reported, "there can be no doubt that conditions cold enough for the Arctic Ocean to have been ice-covered existed well before the 14,000-year date," probably to 18,000 years.

The age of the pollen grains Dr. Colinvaux studied was found by measuring the radioactivity of carbon-14 in the samples of buried peat and other materials in which the pollen was embedded.

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RADIOLOGY

Changes in Crystals 'Seen' With X-Rays

► A NEW X-RAY SYSTEM that will be used to study structural changes in crystal-line materials, like diamonds, placed under high temperatures and pressures has been developed.

A major part of the new system is a high-intensity X-ray tube that is designed to fit into a press able to exert 1.5 million pounds per square inch. The system was developed for the U.S. Air Force's Cambridge Research Laboratories, Lexington, Mass., by the Westinghouse Research Laboratories, Pittsburgh.

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ASTRONOMY

Solar System Has Some Two Million Comets

► THE SUN'S SYSTEM of nine planets also contains some two million comets, although few of them ever become bright enough to be seen by the naked eye, and fewer are as bright as Halley's Comet.

The paths comets take are disturbed by Jupiter and the other planets. Eventually, more than one out of five comets will leave the solar system, Dr. R. A. Lyttleton of St. John's College, Cambridge University, has calculated.

He told the Royal Astronomical Society in London that most comets return close to the sun only every thousand years or longer. Dr. Lyttleton's theory takes into account the energy changes comets undergo at each return.

His theory shows that no more than one in 20 comets has a lifetime as long as 10 million years, and less than one in 1,000 is the age of the solar system itself, about four billion years old.

Dr. Lyttleton therefore concludes that comets were not born at the same time as the planets, as has been suggested.

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U.S. Navy

STREAMLINED HULL—Trieste II, the record-holding vessel that can dive to 35,800 feet, is shown being lowered into San Diego Bay off California. The gondola for the two-man crew of the U.S. Navy bathyscaphe protrudes below.

ENGINEERING

Deep-Diving Sonar Built To Scan Ocean's Floor

► A HIGH-FREQUENCY sonar system capable of withstanding the tremendous pressures found nearly four and a half miles below the ocean's surface has been developed to scan the floor of the sea.

The system is transistorized and battery powered, and works by generating a beam of high-frequency sound waves that bounce off the ocean floor and are reflected back to the device's receivers. These reflected waves are converted into a picture on a screen in the control room of the "parent ship."

The new system, which can operate under pressures of 10,000 pounds per square inch, can be used for both long-range and closeup work, and yields detailed pictures with a 3-D appearance, like those from a TV camera.

It was developed by Westinghouse's Defense and Space Center, Baltimore, Md., for use by the U.S. Navy attached to their new bathyscaphe, Trieste II, a manned depth probe.

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SPACE

No Life or Hydrocarbons Likely on Planet Venus

► VENUS, the earth's sister planet, has neither life forms of the usual hydrogen, carbon and nitrogen compounds, nor hydrocarbons.

This is the view of Dr. Robert F. Mueller of the University of Chicago, reported in *Nature*, 145:625, 1964. It is based on the high temperature, about 800 degrees Fahrenheit, found for the planet by instruments on the Mariner II space probe.

Dr. Mueller analyzed the stability of possible hydrocarbon compounds on Venus at such temperatures.

He found it "unlikely that any significant quantities of hydrocarbons could occur on the surface or in the lower atmosphere," thus precluding occurrence at higher atmospheric levels.

These conditions thus make it unlikely that earth-like life would exist on Venus.

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METEOROLOGY

Probe Planned on Changing the Weather

► THE GOVERNMENT is launching a searching probe on the chances of doing something about the weather—changing it. How this would affect everyone, if it can be done, will also be investigated.

Ever since seeding clouds with chemicals in an attempt to make them break up or drop their rain was started about 20 years ago, weather modification has been a controversial subject. Even now, there is considerable question as to whether cloud-seeding accomplishes anything.

So the Federal Council on Science and Technology, connected with the White House, aims to find out. An 11-member special commission on weather modification has been set up by the National Science Foundation to investigate cloud-seeding and other weather-changing schemes.

Along with projects designed to increase rain or snow, the commission will also investigate long-range climate control ideas and the uses of computers in weather modification.

On the basis of these studies, it will then make recommendations to the National Science Board. These recommendations may someday make the difference between a sunny and a rainy vacation, or between a long and short winter.

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