

OCEANOGRAPHY

Measure Sea's Heat

Tiny sea animals that coil to the left or to the right may provide oceanographers with a new way to estimate the temperatures of the ancient oceans.

MICROSCOPIC sea animals, whose empty shells make up a large part of ooze at the ocean bottom, are helping scientists tell how cold it was—and where—during the last ice age.

Some of the animals, known scientifically as *Globigerina pachyderma*, are coiled snail-fashion to the left while others coil to the right. Samples of bottom mud taken from various ocean bottoms had shown that there is a relationship between coil direction and surface water temperature. (When alive the tiny sea animals live near the water's surface).

Now, a geologist reports in *Science* (July 24), it appears that a "reduction in total radiation from the sun" may have caused the last ice age. Core samples taken from the Arctic Ocean, the North Atlantic and connecting seas support this theory, says David B. Ericson of the Lamont Geological Observatory in Palisades, N. Y. Such causes as a change in the circulation pattern of the ocean have been proposed as an explanation of the "Pleistocene refrigeration," he says.

By plotting the whereabouts of left-coiling and right-coiling *Globigerina*, Mr. Ericson found left coiling was dominant near Antarctica, while right coiling was dominant in more northerly samples. "Left-handed" animals are associated with colder temperatures and "right-handed" with warmer temperatures.

The distribution of the two forms of

Globigerina in relationship to one isotherm, an imaginary line along which the temperature is the same, has been established. With more sample cores from the ocean floor, Mr. Ericson believes it will be possible to estimate how far south this isotherm of close to 45 degrees Fahrenheit went at the peak of the last ice age. Then, he predicts, scientists can estimate how low the North Atlantic temperature went.

The boundary between the two animals was farther south during the last ice age, supporting the conclusion that the land glaciers were accompanied by general cooling of the North Atlantic.

Sample cores from more southerly stations are needed before the researchers are able to fix temperature changes more definitely.

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ZOOLOGY

Animals of Iraq Victims Of Years of Slaughter

IRAQ, THE LEGENDARY Garden of Eden, was once the home where the bison, and elephant, rhinoceros and lion, roamed. Man, however, has played a bloody role in destroying the rich animal-life of the country.

An inventory of Iraq animals is now available that identifies local animals as far

back as 25,000 years ago. How man has virtually exterminated the animal population in Iraq is told by Dr. Robert T. Hatt, director of the Cranbrook Institute of Science, Bloomfield Hills, Mich.

Royal hunts, "great game drives with enormous slaughter," were characteristic of the earlier years. There are ancient documents reporting hunts in which hundreds of lions and wild bulls were taken along with elephants by the dozen, ostriches, giraffes and onagers or wild asses. The development of the great city-states and the introduction of riding horses and chariots further influenced the decline in wildlife, Dr. Hatt points out.

Today automobiles and hunters equipped with guns, even machine guns are used, give gazelles and other desert animals little chance for survival, he warns. Species now threatened with extinction include the bear, leopard, cheetah, wild sheep and goat, roe deer, gazelle, badger, marten and squirrel.

"At present in Iraq all game is hard put to find food or refuge," Dr. Hatt says. . . "Public opinion in Iraq is not yet ready to support effective protection and indeed, where the human population pressure is so great, there is little chance to give adequate protection through establishment of preserves. Neither the mountains nor the open deserts can be effectively patrolled."

Approximately 100 species, living and extinct, are described by Dr. Hatt in his report "The Mammals of Iraq" published by the Museum of Zoology, University of Michigan. He spent several months in the country, studying its wildlife.

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ENGINEERING

Standards for Screws To Aid Missile Repair

THE AMERICAN Standards Association has written standards for screw threads so fine they cannot be seen with the naked eye.

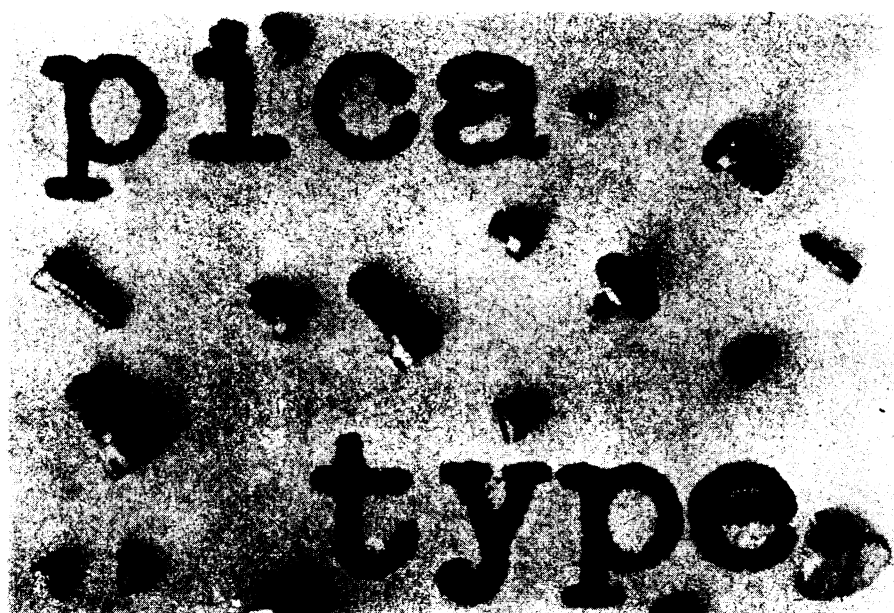
Lilliputian screws used in delicate instruments and controls for missiles and rockets are so tiny the smallest can be hidden in the dot of a typewritten "i". About 75,000 of these are required to fill a thimble. Their diameters range in size from 0.01 inch, about three times the diameter of a human hair, to 0.06 inch.

No standards for such screws have been available until now. Thus in the absence of standard screws, even in the watch industry, it became necessary for engineers to design special screws for their new missile instruments and controls.

Not only was this a waste of time, but the mounting complexity of stocking spare screws for maintenance of the instruments was rapidly producing headaches around the country.

In time, said the ASA, it may be possible to limit production and inventories to several lengths of screw in each of 14 standard diameters. The standards were drawn up by an ASA committee with backing of the American Society of Mechanical Engineers and the Society of Automotive Engineers.

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SMALL SCREWS—The small size of these screws can be judged by comparing them with the enlarged letters of the word "pica." The new American Standard fixing their sizes will insure interchangeability among these small screws.