

X-RAY OF COESITE—Reflections of X-rays show the stacking of planes of atoms in a sample of coesite from Meteor Crater, Ariz. Black spot shows where X-ray nozzle was inserted through the film.

GEOLOGY

Coesite From A-Bomb

► A MINERAL usually created when a huge meteorite crashes into the earth has been found in the depths of an atomic bomb crater.

The mineral, coesite, was discovered buried in the debris of a nuclear crater gouged out of the Yucca Flats at the Nevada test site. The tremendous energies unleashed by the atomic blast rearranged some of the atoms in the desert rocks to form the new mineral.

This is the first time coesite was identified in an atomic-bomb crater, Dr. E. C. T. Chao of the U. S. Geological Survey reported. Natural coesite, which was discovered last year (1960), is found in only three other localities throughout the world, all in meteorite craters.

The atomic bomb producing the coesite shocked and seared the rock layers when it exploded in 1955. A high pressure shock wave with energies of at least 1,200 tons of TNT rippled momentarily through the

surrounding rock, changing embedded quartz grains into the new mineral.

The exact pressure needed to form the coesite is uncertain, because some of the energy was converted into heat by the explosion.

Coesite was identified in the Survey laboratories by Dr. Chao, Joseph J. Fahey and Janet Littler as part of the astrogeologic program, sponsored partly by the National Aeronautics and Space Administration. Dr. Chao discovered natural coesite in Meteor Crater, in Arizona. Since then it has been

PALEONTOLOGY

Mammoths Died Naturally

► THE WOOLLY mammoths discovered frozen in northern glaciers did not die from a catastrophic glacier sweeping down from the north, as popularly believed.

found in the Ries Crater in southern Germany and just recently in Wabar (Al Hadida) meteor crater in Saudi Arabia.

Coesite was first produced artificially in a laboratory in 1953.

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PALEONTOLOGY

Giant Ice-Age Sloth Bones for Museum

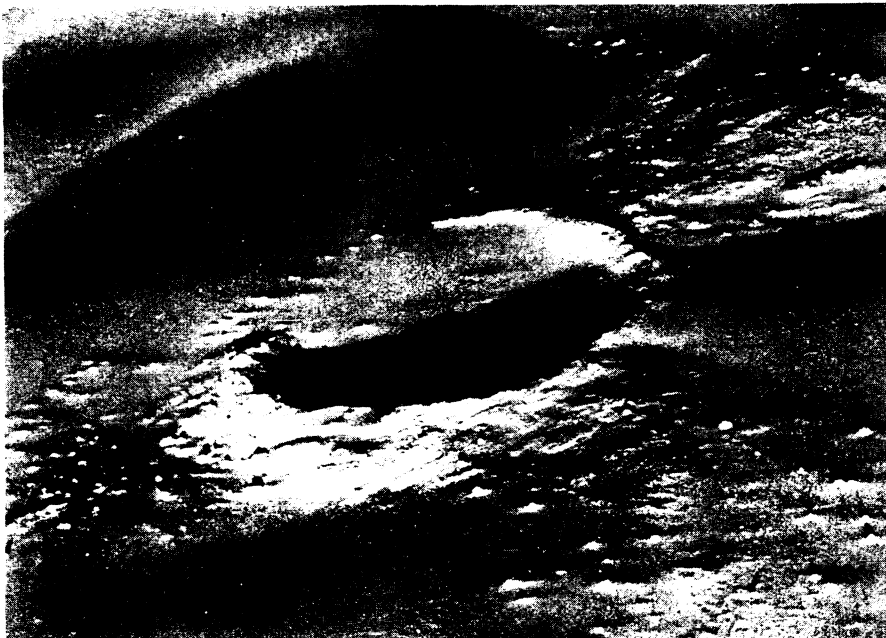
► BONES OF a giant, ice-age sloth, first for the Pacific Northwest, will be placed in a new Washington State Museum being planned for the University of Washington campus in Seattle, Wash.

The perfectly preserved pelvic bone measured 45 inches across. The animal, about 11 feet tall, lived nearly 10,000 years ago. The bones were described as the "best preserved specimens" turned up yet in the state.

Dr. V. Standish Mallory, geologist at the University of Washington, said they were the first from a giant sloth found in the Pacific Northwest, to his knowledge.

The ice-age sloth was a relative of the present South American tree sloth. The giant sloth probably was a ground dweller, Dr. Mallory said.

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SITE OF COESITE—The fourth location in the world known to contain the rare mineral coesite is meteor crater Wabar (Al Hadida) in Saudi Arabia. Other locations are Meteor Crater, Arizona, Ries Crater, Germany, and an atomic bomb site at Yucca Flats, Nev.

The hulking mammoths that roamed Siberian tundras during a recent ice age probably died by accidental drowning and were later frozen, Columbia University geologist William R. Farrand reports in *Science*, 133:729, 1961. The poor condition of most of the frozen giants shows that death did not occur quickly.

The popular myth that the woolly mammoths were frozen within a few hours by a huge glacier disregards all scientific facts, Dr. Farrand charges. The number of frozen mammoths found, 39, compared to the probable total population of more than 50,000, is about what scientists would expect from accidental burial.

Only four nearly complete frozen mammoth remains have been found despite many scientific explorations into the northern wastelands.

The preserved animals probably drowned in a lake or bog or were buried alive by a river bank caving in when the mammoths strayed too close to the edge. Only the heavy-footed giants, the mammoth and the woolly rhinoceros, have been found in a frozen state, indicating a "normal and expected circumstance of life on the tundra," Dr. Farrand reports.

The mammoths roamed the tundras in Siberia 10,000 to 30,000 years ago. The thick woolly skin protected them from the cold winds and storms that swept across the barren wasteland. Mammoths belonged to the same family as present day elephants, but differed considerably in appearance.

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