

Meteorites: Coming and going

A meteorite appears to have blasted a mile-wide hole in the middle of Nebraska as little as 3,000 years ago.

While examining new topographic maps, researchers at the University of Kansas in Lawrence discovered a circular, 25-meter-deep depression that they suspect represents the weathered remains of an impact crater. Most of the apparent crater lies beneath farmland about 12 miles west of Broken Bow.

Weathering has eroded and filled in this feature, which the team believes was originally 75 to 100 meters deep. When new, the purported crater would have rivaled the better known Meteor Crater of Arizona, says team member Wakefield Dort Jr.

Scientists believe the 50,000-year-old Meteor Crater was formed by a meteorite approximately 40 meters across. While an impact of this magnitude would not have greatly affected global climate, local fallout may have been significant. The Kansas researchers found buried fragments of glass, which they believe represent material melted and ejected by the impact, more than a mile from the crater rim's edge.

The depression lies in loose silt that accumulated between 20,000 and 12,000 years ago. The researchers believe the impact occurred more recently, however, because they discovered the glass fragments resting in a soil layer about 3,000 years old.

The team plans to continue its investigation of this feature, searching in particular for direct evidence of an impact: namely, pieces of the actual meteorite.

Other researchers presented these findings about craters:

- Approximately 80 miles east of Atlantic City, N.J., scientists have located the site of a larger impact that occurred approximately 35 million years ago, reports geologist C. Wylie Poag of the U.S. Geological Survey in Woods Hole, Mass. The 9-mile by 15-mile crater is believed to have resulted from the impact of a meteorite that sent a giant wave crashing over coastal areas from New Jersey to North Carolina (SN: 11/02/91, p.286).

- Possible craters elsewhere were called into question. Elongated depressions in Argentina, formerly considered the result of a glancing meteorite blow (SN: 1/25/92, p.55), may in fact have resulted from wind erosion, says Arthur L. Bloom, a geomorphologist at Cornell University.

Bleaching damage spreads beyond corals

Tiny marine organisms known as foraminifera exhibit damage similar to that observed in bleached coral reefs, reports Pamela Hallock, an oceanographer at the University of South Florida in St. Petersburg.

Both foraminifera and coral play an important role in the global ecosystem. As these organisms "are very important sources of organic matter and calcium carbonate production . . . such [bleaching] phenomena could affect the global carbon cycle and the oceanic food chain," Hallock says. Foraminifera and coral filter carbon dioxide out of the atmosphere. If their numbers decline, then atmospheric concentrations of this greenhouse gas could potentially increase.

Many foraminifera, like many coral, live in a symbiotic relationship with microorganisms that provide their hosts with not only nourishment, but also color (SN: 12/8/90, p.364). A host organism that has lost its symbiotic companion turns white, or bleaches, and its health declines.

In the first documented study of bleaching in foraminifera, Hallock examined four species of the genus *Amphistegina* collected from Florida reefs. These species live on the loose rubble bottom in water approximately 20 meters deep.

Hallock found that while most of the population appeared normal throughout the winter months, bleaching began to occur and then increase during spring 1992. Bleaching peaked in June and July, with 85 percent of the population showing total or partial loss of color.

While damaged foraminifera began to regain color as fall approached, the bleaching appears to have had severe effects on reproduction and adult mortality. "There were very few juveniles in the population at a time when you would expect them to be [abundant]," Hallock says.

In the laboratory, bleached foraminifera produce significantly fewer young, and up to 30 percent of these may be deformed or nonviable, the study shows.

Laboratory studies indicate that bleaching can be induced by increasing the organisms' exposure to ultraviolet light. Hallock speculates that the bleaching she observed may have resulted from a minute increase in ultraviolet exposure related to Mt. Pinatubo's eruption in 1991.

Baby dinosaur found near ancient sea

Seventy-four million years ago, young dinosaurs may have frolicked beside an ancient sea in what is now the landlocked state of New Mexico, according to Donald L. Wolberg, a paleontologist with the New Mexico Bureau of Mines and Mineral Resources in Socorro.

Wolberg and his colleagues found pieces of the lower jaw and teeth of a baby duckbilled dinosaur in the Cretaceous rocks of northwestern New Mexico. "The teeth showed no wear or breakage," indicating that the animal died within a few weeks of its hatching, Wolberg says. He discovered the jaw, which stretches less than 3 inches long, buried beneath the larger rib of an adult dinosaur.

This infant dinosaur, the first reported from the region, probably hatched nearby. Previous excavations in the area have unearthed dinosaur eggshells and structures thought to be dinosaur nests.

These rocks formed along the shore of an inland sea that covered the middle part of the continent in the Cretaceous period, Wolberg says. Fossils such as marine clams and sharks' teeth have been found within a few meters of dinosaur remains, indicating that these duckbilled dinosaurs "lived and bred right next to the seashore," says Wolberg.

He calls these findings "surprising," noting that previous reports of dinosaur nests come from drier, inland habitats: "We never expected to find dinosaurs nesting in this setting." The new results suggest, however, that dinosaurs were more adaptable to a broader range of environments than previously thought, Wolberg says.

Antiquity of oldest American confirmed

An ancient skeleton, known as Midland Woman for the Texas town near which she was found, "represents the oldest dated human in the Americas," says Curtis R. McKinney, a geochronologist with Southern Methodist University in Dallas.

"Midland Woman was related to the earliest ancestors of every Indian who lives today, and she is very likely the only [known] representative of those who created the Clovis culture" of the earliest Americans, McKinney contends. He dated the remains to 11,600 years ago, plus or minus 800 years.

McKinney's findings support earlier researchers, who argued that the skeleton, discovered by an amateur archaeologist in 1953, represents one of the oldest Americans. Until recently, however, the imprecision of dating techniques made an exact determination of age difficult.

Using an improved process based on the decay of small amounts of radioactive uranium trapped in bones, McKinney dated a 0.5 gram fragment of the skeleton's skull. He also reanalyzed earlier studies to confirm his dates.

While other sites have yielded artifacts that have been attributed to the Clovis culture, Midland Woman represents the first confirmed human remains of this age, McKinney says.