Arctic dinosaurs raise questions

The 65-million-year-old bones of at least three dinosaur species and two prehistoric reptiles have been recovered from a site in the Alaskan tundra by a team of researchers from the University of California at Berkeley and the University of Alaska at Fairbanks.

Although the magnetic orientation of rock in the area indicates that the site, near Prudhoe Bay, was at least as far north when the dinosaurs lived as it is today (70° N latitude), fossils and other geologic evidence suggest that the site was a coastal swamp with a subtropical to temperate climate. Temperature rarely, if ever, dropped below freezing, says William Clemens, the Berkeley paleontologist who led the expedition. Such a mild climate was possible in spite of annual periods of darkness because the earth's climate was much more "equable" — or uniform — in those days, explains Fairbanks paleontologist Carol Allison.

Clemens says the dinosaurs' presence at such high latitudes challenges a recent theory that all dinosaurs became extinct after asteroids smashed into the earth and raised dust clouds that darkened the planet for weeks (SN: 4/21/84, p. 250). According to the theory, the darkness and subsequent falling temperatures caused plants to die, leaving the warm-blooded dinosaurs chilled and starving. Since fossil findings indicate that both young and old dinosaurs were at the Alaska site in great numbers and over a long period of time, says Allison, "you have to consider the possibility that, unless they engaged in some huge mass migration every year, they were dark-adapted."

Last week, Clemens took the bones back to Berkeley, where he hopes to determine whether the dinosaurs belong to previously unidentified species. If they are different from dinosaurs already known from lower latitudes, that would support the idea that they did not migrate and were dark-adapted. In the unlikely event that they did migrate, he says, "it's a little mind-boggling the distances they'd have had to move, but we just don't know what their biology was like."

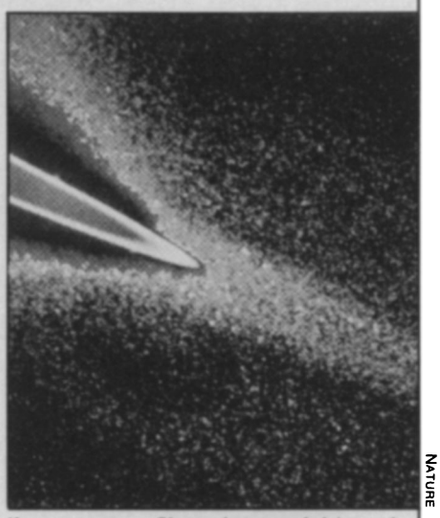
The most common dinosaur at the site is the plant-eating duck-billed dinosaur, or hadrosaur, which walked on its hind legs and stood as tall as 15 feet. The paleontologists also found two carnivorous dinosaurs — a small birdlike one and the teeth of something like *Tyrannosaurus rex* — as well as the bones of a large crocodile-like reptile and an aquatic reptile known as the plesiosaur.

Although the dinosaur bones were first discovered at the site by a Shell Oil Co. employee in 1961, Shell did not reveal the find until last year, say the researchers.

— J. Dusheck

Jupiter's gossamer ring: A refined look

It was only a single photo among the thousands taken by the Voyager 1 spacecraft in 1979 that unexpectedly revealed the presence of the faint ring system of Jupiter (SN: 3/17/79, p. 172). So subtle is it that even in a series of photos deliberately taken by Voyager 2 a few months later, a major portion of the system went undetected until refined computer processing suggested its presence four years later (SN: 11/5/83, p. 295). This was Jupiter's "gossamer" ring, the outermost portion of the system, and now a group of researchers has published a version of the photo that most clearly confirms its presence.



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The gossamer ring at first went unnoticed because of its faintness in early versions of images made with Voyager's vidicon camera system. With a vidicon, even a photo of the plain dark sky — or one made with the camera's shutter completely closed — never produces an evenly black image, because of variations in the vidicon's response. A standard part of the processing of spacecraft vidicon images is therefore to subtract this variation, called a "dark current." The change is often a small one, making little difference except to images of extremely faint features. And Jupiter's gossamer ring, says Mark Showalter of Cornell University, is about 95 percent fainter than the also rarefied "bright" ring just inside it.

Using a refined dark-current value, however, makes the gossamer ring readily apparent, Showalter and his colleagues report in the Aug. 8 NATURE. From the outer edge of the "bright" ring, about 129,000 kilometers from Jupiter's center, the gossamer ring extends to about 210,000 km, though its outer edge is unclear.

The clarified view of the gossamer ring has already affected NASA's next Jupiter mission, called Galileo, which will not arrive until 1988. Galileo will send a probe into the Jovian atmosphere, but the possibility of damage to the probe's heat shield has prompted officials to double the distance from Jupiter at which it penetrates the plane of the rings.

— J. Eberhart

Dial-a-spacecraft during comet mission

On Sept. 11, while a spacecraft called the International Cometary Explorer (ICE) is paying the first-ever visit to a comet by a man-made object (see p. 138), the public will be able to listen in by phone to the actual sounds of the probe as they are transmitted to earth. In addition, callers will hear periodically updated reports on the progress of the mission, in which ICE will head through the tail of Comet Giacobini-Zinner.

Arranged by a Redlands, Calif., organization called the Sounds of Space Group, the service will operate from 2 a.m. EDT to midnight on the 11th. (The center of the encounter is expected to occur at about 7 a.m.) Each call will cost 50¢ — plus an international charge for calls originating in the 16 other countries that are also carrying the service — and will provide a 60-second response, including the live spacecraft sounds and a recorded status bulletin.

The phone number is 1-900-976-COMET. That is one character too many for a 900 number, but AT&T, according to a Sounds of Space official, says the additional character will not affect the dialed number, while it allows the group to include COMET in its listing. (The actual working number thus ends with "COME," or 2663.)

The spacecraft sounds, picked up directly from NASA's Deep Space Tracking Network, will represent all of ICE's telemetry at once, since separating it into data from individual sensors will require additional computer processing. The "live" sounds, therefore, will not provide immediate indications of changes in ICE's environment as it enters the comet's tail — with one exception. The dust in the tail is not expected to destroy the spacecraft, but if it darkens the craft's solar panels until their reduced current output trips a built-in switch that turns off everything but the receiver, some callers may find themselves listening in on a single stark datum, as ICE's message abruptly ends. If that happens, NASA will try to reactivate the spacecraft using only three of its experiments, in the hope that the smaller current drain will not re-trip the switch.

—J. Eberhart