A Dinosaur Regurgitite From the Paleocene Ojo Alamo Sandstone, San Juan Basin, New Mexico

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The San Juan Basin (SJB) is a Laramide structural basin in northwest New Mexico and southwest Colorado. The rocks outcropping in the central basin comprise Late Cretaceous through Paleogene strata. The Cretaceous-Paleogene (K-Pg) boundary is well exposed and lies between the Cretaceous Fruitland-Kirtland Formations (FK) and the Paleocene Ojo Alamo Sandstone (OA). The OA rests on an unconformable erosion surface that truncated underlying Cretaceous strata. The basal OA hiatus is about 7 m.y. in the south-central part of the basin with the entire Maastrichtian absent. Dinosaur fossils are present in both the Cretaceous FK and the Paleocene OA strata in the SJB. The presence of dinosaur fossils in the Paleocene OA was once thought to possibly be due to reworking of K fossils into Pg strata, but that possibility was proved untrue by the discovery of multiple fossils of a single animal in a small group in the OA. In addition, chemical fingerprinting of K and Pg fossils shows that K and Pg fossils have distinctly different chemical compositions. Field work near the multiple-fossil site above resulted in the discovery in the OA of an assemblage of dinosaur bone fragments concentrated within an envelope of iron cemented sandstone. This site is at the top of the lower of two beds of OA about 5 m above the base of the OA. The sandstone envelope is elliptical, measuring 28 x 35 cm. The larger bone fragments are about 10 cm in size and are in the upper central part of the assemblage. Frill bones and a single limb-bone end are identifiable; the other bone fragments are not diagnostic. There are about 50 bone fragments in this assemblage with most of the largest ones within the outline of the envelope and some of the smaller ones outside the envelope. It is apparent that all the bone fragments were originally within the envelope, but recent erosion has moved the smaller, lighter fragments a short distance outside their original position. The only logical explanation for this bone-fragment assemblage is that it represents the regurgitated remains (regurgitite) of the meal of a carnivorous dinosaur. Based on the presence of frill bone fragments, this meal could have been of a juvenile ceratopsian. All the fragments have sharp broken edges making it unlikely that they moved all the way through the digestive system of a carnivore, thus the most obvious solution is that they were regurgitated. The sandstone envelope containing the bone fragments is red-brown sandstone that must have resulted from the iron-rich mucous of the host causing the bone-containing package to cement the sandstone in its present compact shape. Owl pellets are a modern analog of regurgitate produced by an animal carnivore containing the undigestible bones of prey. This bone assemblage is another example of Paleocene dinosaur bones from the OA that could not have been reworked from underlying Cretaceous strata.

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