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## Extinct sloth recovered from Lechuguilla Cave, Carlsbad Caverns National Park

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EXTINCT SLOTH RECOVERED  
FROM  
LECHUGUILLA CAVE  
CARLSBAD CAVERNS NATIONAL PARK

**July of 1993, a paleontological salvage operation was conducted in Lechuguilla Cave to recover the partial remains of an extinct ground sloth, Northrotheriops shastensis.\***

The Shasta ground sloth was a common inhabitant of the region during the Late Pleistocene Epoch (approximately 25,000 to 10,000 BP). Preliminary analysis of the recovered specimen from Lechuguilla Cave, suggest that the sloth died above ground and was washed into the cave.

The excavation site is near survey station A-3, just beyond the first climb down after the culvert and is located on the right side of the trail. The bones were situated in a shallow depression filled with relatively soft sediments. Eight bones (nearly complete), dentition materials, skull fragments, and other miscellaneous bones fragments were recovered in various states of preservation.

The sloth recovered from Lechuguilla Cave is a juvenile as determined by the lack of fusion of the epiphysis at the ends of the bones recovered. Unfortunately, none of the bones were in good enough condition to provide a <sup>14</sup> Carbon dating. This was due to the leaching of the bones from intermittent water standing in the shallow depression. Small pieces of charcoal were recovered from the soil layer just above the sloth bones, but have not been analyzed for possible dating either.

Nothrotheriops was a medium-sized (weighing approximately 300-400 pounds) North American sloth with a range that extended from northern Mexico to southern Alberta, Canada. The ancestry of both Nothrotheriops and Nothrotherium can probably traced back to Hapalops, a South American Miocene Nothrothere. Several well-preserved specimens have been found in caves of the U.S. Southwest. In the early 1920's, at Aden Crater, near Las Cruces, New Mexico, a complete and articulated skeleton was found. The skeleton was still held together by tendons and sinews and included several patches of skin and hair. Stomach contents were recovered as well as sloth dung.

Nothrotheriops shastensis had a somewhat long and coarse, pale yellowish hair, a relatively small head, prehensile lips, and a long flexible neck. The forelimbs were long and slender, and the hindquarters were massive by comparison to the forelimbs, and it walked on its knuckles with its toes partly flexed. The dental formula for the Shasta sloth was 4/3 with no canines present (Kurtèn and Anderson, 1980). It is thought that sloths wintered in cave entrances and moved to higher elevations in the summer months (Martin L.D., 1975).

The crew excavating the Lechuguilla Cave sloth consisted of Pat Jablonsky, principal investigator, Jon Bennet of the Denver Museum of Natural History (now Denver Museum of Nature and Science), Carol Belski of Carlsbad, NM, Richard Knapp of Lubbock, TX, Bob and Anita Pape of Tucson, AZ, and Julia Cronk, staff member with Carlsbad Caverns National Park.

The sloth is presently stored in National Park Service (NPS) collections. Dr. Greg McDonald, NPS staff and sloth expert has examined the specimen and concurs with initial findings and reports. Also collected were sediments surrounding the sloth. The sediments were carefully sifted and numerous small rodent, bat, reptile, bird and invertebrates materials were collected.

For Carlsbad Caverns National Park information: \*Regarding the previously used name of Nothrotherium shastense: Nothrotheriops shastensis was previously known as Nothrotherium shastense but recent studies show that this name should be restricted to the South American ground sloths ( which are ½ the size of the North American sloths (Kurtèn and Anderson, 1980).

**The following is a list of Sloth skeletal parts recovered during the July, 1993 expedition:**

Right Humerus  
Left Humerus – distal end, foramen is whole  
Right Tibia, missing epiphysis  
Left Tibia, missing epiphysis  
Left Femur, epiphysis present  
Right Femur,  
Right Femur head (in foil )  
Thin and flat bone (in foil) segments of innominates ( 2 )  
Dentition (five teeth) – all upper teeth, plus a small fragment of the maxilla  
Small pieces of the brain case  
Sacral vertebrae fragments  
Rib fragments.

**Micro fauna materials collected during the 1993 expedition:**

AVES: miscellaneous fragments including femurs, sternums, sacrum and furculas and ribs. Note: *many of the Aves bones appeared to have been burned.*  
AVES: Passeriformes (perching birds) mandibles (2 specimens) and carpo/metacarpus (at least two different species).  
AVES: Passeriformes, coracoid, tibiotarsus, synsacrum (fused sacral vertebrae supporting the pelvis girdle of the bird), scapula, ulna, tarso-metatarsus.  
AVES: Cave Swallow (Petrochelidon fulva), humerus  
AVES: radius and vertebrae, femur, species unknown.  
SERPENTES: ribs and vertebrae  
RODENTIA: innominates, ulna, tibia  
ANURA: (frog/toad) vertebrae (sacral), ilium (innominate)  
CHIROPTERAN: metacarpal/phalanges, Myotis, mandible (right) humerus  
RODENTIA: Possibly Peromyscus (mouse) lower jaw  
Various, unidentifiable fragments of bone.  
Plant seed pod, Mulberry (?)

Preliminary identifications were made by Anita Pape, Pat Jablonsky and Dr. Gary Morgan, New Mexico Museum of Natural History (NMMNH), Albuquerque, NM

**Invertebrate materials included land snails:**

Mollusca, Gastropoda, Pulmonata, Stylommatophora, Discidae (Discus cronkhitei (Newcomb) 1985 and Sonitidae, Nesovitrina electrina (Gould) 1841. In general, both species have a very wide distribution and neither species has a biostratigraphic significance. Both land snails live in moist habitats, typically not far from perennial waters. Identification made by Dr. Emmett Evanoff, University of Colorado, Boulder, CO.

This report submitted by Pat Jablonsky, Principal Investigator