

## AMPHIBIANS AND REPTILES FROM GYPSUM CAVE, NEVADA

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Gypsum Cave, Nevada is one of the more interesting of the Late Pleistocene-Recent deposits. This is because of the association of ground sloth (*Nothrotherium*) and camel (*Camelops*) with human artifacts (Harrington, 1933), indicating another case of the coexistence of man and extinct mammals.

The cave was excavated by the Southwest Museum and the California Institute of Technology. Most of the fossil material is now in the California Institute of Technology collection. While examining the fossil material in this collection, I came across some reptiles and amphibians from Gypsum Cave, and these are discussed herein.

### LOCATION

Gypsum Cave is located in a limestone spur of the Frenchman Mountains about 15 miles east of Las Vegas, Clark County, Nevada, and about 15 miles north of the Colorado River and Boulder Dam.

### FAUNA AND FLORA

The mammalian fauna of the Gypsum Cave deposits includes ground sloth (*Nothrotherium*), several species of camel (*Camelops* and others), horse (*Equus occidentalis*), mountain sheep (*Ovis*), deer (*Odocoileus*), and dire wolf (*Canis dirus*) (Storer, 1930, 1931).

The plants identified from the sloth dung by Laudermilk and Munz (1934) include as the dominant plant eaten, the Joshua Tree (*Yucca brevifolia*). This plant does not occur in the vicinity of the cave today (the mouth of the cave is at about 2,000 feet above sea level) but it does occur at elevations above 4,000 feet in nearby mountains. This suggests dryer conditions subsequent to the time of the sloth. Other plants from the sloth dung include *Yucca schidigera*, *Acacia greggii*, *Larrea divaricata*, and *Atriplex confertifolia*.

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## AGE

Gypsum Cave is one of the few Quaternary deposits in western North America with radiocarbon dating. This is apparently due to the fact that materials from the various asphalt deposits give false readings because of the infiltration of the tar. Radiocarbon dating of the dung of *Nothrotherium* found in Gypsum Cave indicate ages of from 8,000 to 10,000 years for this material (Arnold and Libby, 1951).

## HERPETOFAUNA

In Harrington's report (1933) the only identified reptiles from Gypsum Cave was *Crotalus* sp. and *Gopherus agassizi*. The herpetofauna presented herein consists of 15 species. Most of these occur in the area of the cave today. The exceptions to this are *Crotalus viridis* (found today in northern Nevada), *Crotalus atrox* (occurs today in adjacent Arizona plus one Nevada record at its southernmost tip, Linsdale, 1940), and *Masticophis tæniata* (found today at higher elevations in northern Nevada, Idaho, Utah, and eastward). These three forms are usually associated today with Upper Sonoran conditions or higher. These conditions apparently existed about the cave during its deposition (Laudermilk and Munz, 1934), with the flora including the Upper Sonoran desert form, *Yucca brevifolia*. Lower Sonoran plants dominate at the cave site today and the Upper Sonoran forms have been pushed higher into the neighboring mountains or adjacent areas. Such an increasing aridity (and/or higher temperatures) which caused the change in the vegetation probably also explains the withdrawal (or elimination) of these three Upper Sonoran reptiles from the area into more suitable areas to the north and east.

The reptiles and amphibians came from various depths in the deposits and from various rooms. Most of the material, however, came from room 2 at a depth of two feet (See Harrington, 1933, for details of diggings and locality sites).

## SYSTEMATIC LIST

*Rana pipiens* Schreber

Three thoracic vertebræ of Leopard frogs are in the Gypsum Cave Material from the California Institute of Technology collection.

*Sauromalus obesus* (Baird)

Six dentaries, 3 parietals, 11 vertebræ, several bits of skin, foot bones, and two skulls (one with a lower jaw) of chuckwallas were found in Gypsum Cave. The largest chuckwalla skull measured 42 mm. long compared to 34 to 50 mm. long for a series of medium to large recent *S. obesus* in the U.C.L.A. herpetological collection.

*Crotaphytus collaris* Say

Six dentaries, one maxilla, two frontals, and 14 vertebræ of this species have been found. The two largest and complete dentaries measure 15.2 and 16.4 mm. long.

*Phrynosoma platyrhinos* Girard

One frontal, one left occipital spine, one left and one right set of three temporal spines do not differ in size and shape from recent individuals of *P. platyrhinos*.

*Cnemidophorus tigris* Baird and Girard

Four fragmentary maxilla, 6 dentaries, 4 vertebræ, and one basisphenoid are all within the variation of *Cnemidophorus tigris*. The greatest length and width of three of the four dentaries is 11.5-2.4, 13-0-2.2, and 10.0-1.8 mm. The distance from the most posterior tooth to the last mental foramen and the distance between the last two mental foramen of these same three dentaries is 3.8-1.9, 4.6-1.5, and 4.1-1.5 mm. respectively.

*Heloderma suspectum* Cope

Fragments of the beady skin and osteoderms of Gila Monsters were found two feet below the surface of room 2. No skeletal material of Gila Monsters was found.

*Lampropeltis getulus* (Linnæus)

Eleven vertebræ of this king snake were found at a depth of two feet in room 2.

*Lampropeltis pyromelana* (Cope)

One vertebra of this king snake was found under one foot of breccia on the north side of room 2.

*Masticophis flagellum* (Shaw)

One badly damaged parietal from Gypsum Cave is probably that of *M. flagellum*. It differs from recent skulls of *M. flagellum* in that it is not as wide.

*Masticophis tæniata* (Hallowell)

One vertebra from two feet below the surface of room 2 does not differ from recent skeletons of *M. tæniata*. It is not as elongate as in *Coluber* and is not as large or as robust as those of *M. flagellum*. Based on one vertebra, however, this identification is quite tentative.

*Pituophis catenifer* (Blainville)

A fragment of the lower jaw of a snake consisting only of the angulare and articulare is determined as *P. catenifer* by the fact

that the Meckel's foramen is open one-fourth laterally and lateral to this there is a depression in the lateral wall of Meckel's foramen for muscle attachment.

### *Crotalus viridis* (Rafinesque)

Sixteen vertebræ found about four feet below the surface at the back of room 3 and one vertebra from under one foot of breccia on the north side of room 2 are identified as *C. viridis*. This species does not occur in the area of Gypsum Cave today, but is found farther north in central and northern Nevada. The vertebræ found under four feet of material in room three probably indicates older material (Harrington, 1933).

### *Crotalus mitchelli* (Cope)

*C. mitchelli* material from Gypsum Cave comes from 14 inches in breccia back of room 3 (55 vertebræ), 2 feet below the surface back of room 2 (3 vertebrae, 1 parietal, one lower jaw minus the dentary) and locality 108 R-4 (an entire skeleton with dried skin around it). This material does not differ from recent *C. mitchelli* and especially skeletons of *C. m. stephensi*. Though the skin on the one skeleton is quite dry and tight, it is possible to determine that the scale rows at midbody are 23 in number. This is typical for *C. m. stephensi* (Klauber, 1936).

### *Crotalus atrox* Baird and Girard

*Crotalus atrox* material comes from under one foot of breccia on the north side of room 2 (12 vertebræ), three feet from the surface in room 4 (2 vertebræ), and locality 109 R-4 (80 vertebræ representing almost an entire skeleton). The vertebræ are all typical of *C. atrox* which, however, occurs in Nevada today only at the southernmost tip. It is common in the Upper Sonoran regions of adjacent Arizona and California.

Bones of the other species of *Crotalus* (*C. cerastes* and *C. scutulatus*) that occur in the vicinity of Gypsum Cave, today have not been found in the vertebræ examined. It is possible that these

are recent arrivals in the area and did not get into the cave in time for preservation. It is also possible that the arenicolous *C. cerastes* has avoided the Gypsum Cave area because of the rocky terrain (See Harrington, 1933; and Laudermilk and Munz, 1934, for photographs of the area).

### *Gopherus agassizi* (Cooper)

Desert tortoises were first reported by Harrington (1933) in his discussion of the cave. These tortoises were apparently fairly common in the diggings as four complete shells and many fragments of shells, limb bones, and skulls are present in the California Institute of Technology collections. Carapace lengths of the four complete shells are 24, 32, 18.5, and 13.4 cm. long. The skeletons do not differ from recent *G. agassizi* which occurs in the area today.

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