

THE PREHISTORIC AVIFAUNA OF SMITH CREEK CAVE, NEVADA, WITH A DESCRIPTION OF A NEW GIGANTIC RAPTOR

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In an earlier paper (Howard, 1935, *Condor* 37:206-209), I discussed briefly the occurrence of extinct birds in a cave deposit in Smith Creek Canyon, White Pine County, Nevada. A new species of eagle, *Spizaëtus willetti*, was described, and *Breagyps clarki* and *Coragyps occidentalis* were recorded. Later, Stock (1936, *Bull. Southern Calif. Acad. Sci.*, 35:149-153) described an extinct goat, *Oreamnos americanus*, from this cave, and recorded the occurrence of *Camelops*, *Equus* and *Ovis*.

Smith Creek Cave was originally investigated by the Southwest Museum in the hope of finding evidence of early man. Two expeditions, sponsored by the Carnegie Institution of Washington, were made in 1934 and 1936. Harrington (1934, *Master Key*, 8:165-169) reports that traces of fairly recent Indians were found in the upper 12 inches of the dust which covered the cave floor. In the older deposits, of lower levels, however, in which the interest of the expeditions centered, the only suggestions of human habitation were occasional bits of charcoal and the fact that many of the mammal bones were split as if broken to obtain the marrow. The cave site as described by Harrington lies in a rugged desert canyon about 1000 feet above Smith Creek, at an elevation of approximately 6200 feet. At the mouth of the canyon, less than a mile from the cave, lies the great desert valley of Utah filled at one time by an arm of Lake Bonneville. In the opposite direction rises Mount Moriah, topped with pines. Like many discoveries of prehistoric bone deposits made within the past several years, the question of age has not been definitely determined. Harrington suggests that the presence of fish bones in the deposits may indicate that the accumulation took place at the time when the lake bed to the east was filled, presumably late in the last period of glaciation.

The deposits in Smith Creek Cave were composed of exceedingly loose dust, very difficult to excavate and maintain data on depth. Bird and mammal bones were found at all levels from 1 to 12 feet. The bird bones were turned over to me for study several years ago, but, as further expeditions were planned, publication of a complete list of species identified was postponed. In February of this year (1952) I discovered among the mammal bones collected on the expeditions, and now housed at the California Institute of Technology, a very large carpal bone (cuneiform) of a raptor. The bone had obviously been overlooked when the other bird bones were sorted, owing to the large size.

Compared with the cuneiforms of various known raptors, the cave bone most closely resembles that of vultures, especially *Teratornis*. It is not, however, identical in structural characters with any species with which it was compared, and it is very much larger than the largest, measuring 43.2 mm. in greatest breadth, with a height at the ulnar end of 32.8 mm. and a depth of 22.8 mm. The same dimensions of the cuneiforms of Recent California Condor (*Gymnogyps californianus*) and of *Teratornis merriami* (Pleistocene of Rancho La Brea) are: Condor (L. A. Mus. no. 269), 21.0, 17.0 and 12.7 mm. respectively; *Teratornis* (L. A. Mus. no. B414), 30.0, 24.5 and 15.6 mm. respectively. Although the paleontologist would ordinarily hesitate to describe a new species on the basis of a single cuneiform bone, in this instance the distinctiveness of the specimen is so marked that it seems justifiable. I do not consider it advisable, however, to name a new genus without further knowledge of the bird. Allocation to the genus *Teratornis* is therefore made on the basis of general similarity to *Teratornis merriami* as indicated below.

***Teratornis incredibilis* new species**

TYPE. — Cuneiform bone, California Institute of Technology no. 5067.

LOCALITY AND AGE. — Section 7-F-310 of Locality 251, Smith Creek Cave, Snake Range, 34 miles north of Baker, White Pine County, Nevada. Quaternary.

DESCRIPTION. — Resembling *Teratornis* (family Teratornithidæ) as contrasted with *Gymnogyps* and other members of the family Cathartidæ, in (1) long, diagonal, ridgelike ligamental attachment on the side of the bone adjacent to the ulna, and (2) close proximity of this diagonal ridge to the external prominence; the ligamental attachment is short, almost papilla-like in the Cathartidæ, with a broad space between it and the external prominence. Differing from *Teratornis merriami* in (1) 43 per cent greater size; (2) greater pneumaticity; (3) longer and relatively less peaked external prominence; (4) more prominent ligamental attachment adjacent to the ulna; (5) relatively greater breadth of posterior (distal) end.

Obviously the bird was a flier. The cuneiform receives the attachment of part of the flexor carpi ulnaris muscle (affecting manipulation of the manus in flight) and provides a groove for passage of its tendon. The areas concerned with attachment and passage of this muscle are well developed in the type of the new species. The implications of the specimen as to the size of this flying bird justify the specific name applied — *incredibilis*. The breadth of the bone suggests a breadth of trochlea of carpometacarpus of 24-25 mm.; the size of the ulnar articulation indicates a height of carpal condyle of the ulna of 33 mm. By comparison

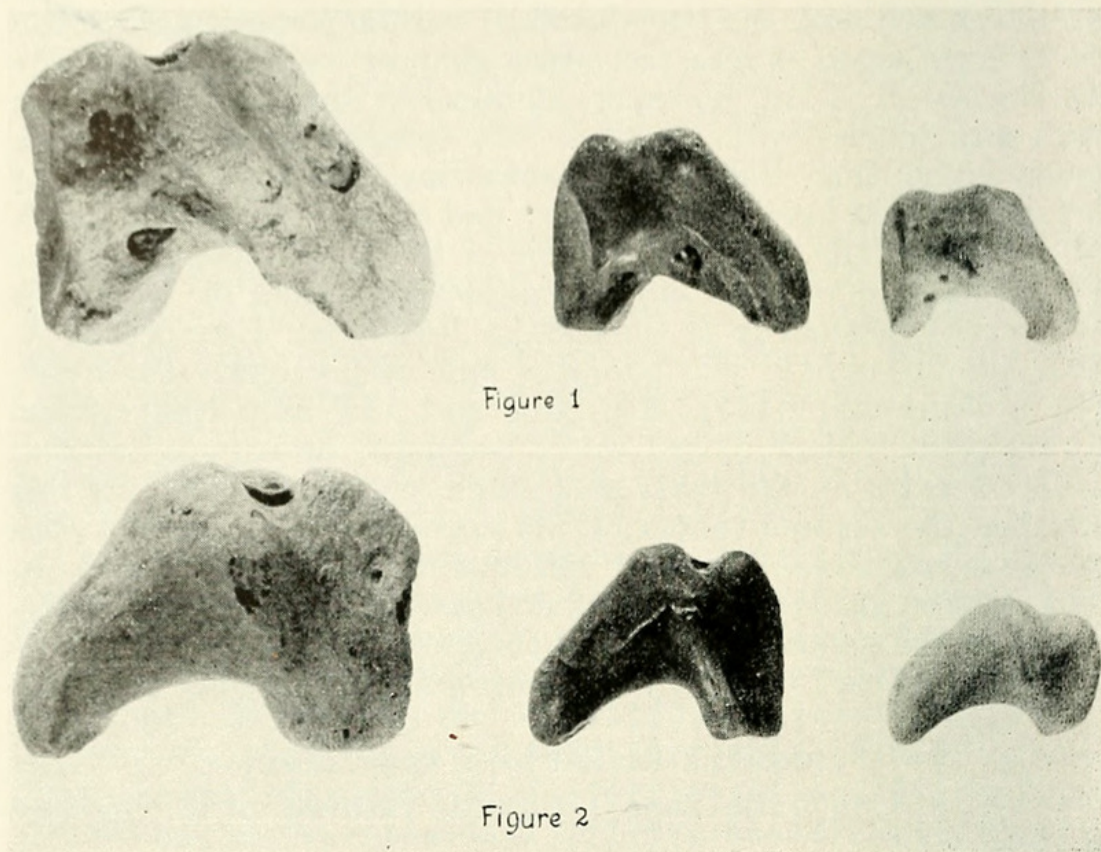


Plate 10

Figures 1 and 2. Left to right: Cuneiform bones of *Teratornis incredibilis* (Type); *Teratornis merriami*; and *Gymnogyps californianus*. Fig. 1 ulnar face; fig. 2 metacarpal face. X approx. 6/7.

with *Gymnogyps* the wingspread may have been as much as 16-17 feet, if the wing length was proportionate to the size of this one wing element. The California Condor today has a maximum spread of 9-10 feet; that of *Teratornis merriami* is estimated at 11-12 feet.

Although over 648 bird bones from Smith Creek Cave have now been examined, no other specimens of *Teratornis incredibilis* have been found. A thorough search has been made of all osteological material collected from the cave, mammal as well as bird.

Fifty species of birds have been identified from the avian material collected from the old deposits of the cave. Possibly still other species are represented among the bones of ducks and shorebirds. These forms are not readily separated, and detailed identifications were not possible on all bones. With the exception of extinct species, only two of the forms identified do not occur in Nevada today, *Gymnogyps californianus* and *Strix occidentalis*. *Gymnogyps* has been recorded, however, from Gypsum Cave,

Nevada, dated at 8,000 to 10,000 years old. The identification of the Spotted Owl is based on a single coracoid. The most abundant species represented are the Sage Grouse, *Centrocercus urophasianus* (122 specimens), Prairie Falcon, *Falco mexicanus* (117 specimens) and the extinct condor, *Breagyps clarki*. *Breagyps* is represented without doubt by 58 bones; another 32 fragments, plus 34 vertebræ and 22 phalanges, probably are of this condor rather than *Gymnogyps*. Five fragments are tentatively classified as *Gymnogyps*. More than half of the Prairie Falcon bones are of young birds. Obviously the cave represents the natural breeding habitat of this species. At least six individual condors (*Breagyps*) are represented, one of which was immature. Possibly *Breagyps*, too, used the cave as a nesting site at intervals.

Over fifty per cent of the bones represent raptorial species (353 bones of 16 species, including 8 specimens of 4 species of owls); 22 per cent are water birds (140 bones of 20 or more species, the surface-feeding ducks being the most abundant with 104 specimens); and 19 per cent are grouse (125 bones of two species). The remainder are of passerines (26 bones, of which 17 represent the Raven), swift, nighthawk, and dove (one each).

The good representation of water birds adds credence to Harrington's suggestion (above mentioned), based on the fish bones found in the cave, that the old lake bed to the east may have contained water at the time the cave deposits were accumulating. Presumably the water birds, as well as many of the other species of birds, were carried to the cave by predators. The abundant Sage Grouse and Prairie Falcons, as well as the formerly reported (Stock, loc. cit) horse, sheep, goat and camel all indicate that the immediate area in the past was much as it is now, a relatively bare, open land — perhaps then bordering on an interior lake.

Six extinct species occur, represented by at least 67 bones. Possibly there are more, if the unidentified condor bones are of *Breagyps* rather than *Gymnogyps*. Two of the six species, *Spizaetus willetti*, and *Teratornis incredibilis*, are peculiar to Smith Creek Cave. *Coragyps occidentalis* (2 specimens) has been recorded from other cave deposits in California, New Mexico and Mexico, as well as from the three asphalt deposits of California. *Breagyps clarki* has been reported elsewhere only from the Rancho La Brea deposits of California (its type locality). *Neogyps errans* (2 specimens) and *Anabernicula minuscula* (3 specimens) are also now recognized from the Smith Creek Cave deposits. *Neogyps* is known from the Mexico and California Pleistocene; *Anabernicula* was first described from Arizona (early Pleistocene) and later reported from the late Pleistocene asphalt beds of California and from Fossil Lake, Oregon. Of these extinct forms, only *Breagyps* occurs in sufficient abundance to indicate that it was common in the cave.

It is worthy of note that in addition to the two bones of *Coragyps* found in the deeper levels, two bones of *Cathartes aura* (evidently of the same individual bird) were found near the surface in the cave floor. Both show a state of preservation different from the majority of bones found and appear to be of much more recent deposition. It has been previously indicated by studies of deposits of different ages at Rancho La Brea (Howard and Miller, 1939, Carnegie Inst. Wash. Pub. 514, p. 44) that *Coragyps* was the dominant form of small vulture in the Pleistocene of California, but was supplanted by *Cathartes* in more recent time. It is now suggested that the same condition existed in the Nevada area and that the occurrence of *Coragyps* without *Cathartes* in the deeper levels of Smith Creek Cave bears some significance with regard to the age of the older fauna.

A complete list of the avian species now identified from Smith Creek Cave follows. Extinct species are marked with an asterisk. The species represented by a single specimen are so indicated. Exact numbers of bones of the anseriform species cannot be determined, although the total of all duck bones is 109, of which at least 30 represent the teals, and only 5 are of the Aythyini. *Aquila chrysaetos*, *Corvus corax* and *Fulica americana* are represented by 30, 17 and 9 bones respectively. Other species vary in number from 2 to 5 (with the exception of the Sage Grouse, Prairie Falcon and extinct condor previously discussed). The passerines were kindly identified by Dr. Alden H. Miller.

LIST OF SPECIES

Podilymbus podiceps (1)	Falco sparverius
Colymbus caspicus	Fulica americana
Branta canadensis	Rallus, sp. (1)
*Anabernicula minuscula	Centrocercus urophasianus
Anas platyrhynchos	Pedioecetes phasianellus?
Anas acuta	Catoptrophorus semipalmatus
Anas carolinensis	Recurvirostra americana (1)
Anas discors?	Phalarope, sp. (1)
Mareca americana	Capella gallinago? (1)
Spatula clypeata (1)	Himantopus mexicanus?
Aythya marila	Zenaidura macroura (1)
Aythya, sp.	Bubo virginianus
Melanitta perspicillata (1)	Asio flammeus
*Teratornis incredibilis (1)	Strix occidentalis? (1)
*Breagyps clarki	Aegolius acadica (1)
Gymnogyps californianus?	Chordeiles minor (1)
*Coragyps occidentalis	Aeronautes saxatilis (1)
*Neogyps errans	Nucifraga columbiana? (1)
*Spizaetus willetti (1?)	Corvus corax
Aquila chrysaetos	Corvus brachyrhynchos
Buteo jamaicensis	Pica pica (1)
Buteo swainsoni	Turdus migratorius (1)
Buteo lagopus	Agelaius, sp. (1)
Circus hudsonius	Jay, sp. (1)
Falco mexicanus	Fringillidae, sp. (1)

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