

GRAND CANYON NATURE NOTES



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June 1934.

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Volume 9, Number 3.
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Grand Canyon Natural
History Association

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Illustration by "Don" Louis Schellbach 3rd.

A Beaver Home in Bright Angel Creek

By Ranger Robert Satterwhite.

DURING March, 1933, while working on the cross-canyon telephone line, I noticed a fresh beaver cutting, one mile above Cottonwood Camp. Nearby in Bright Angel Creek was a newly made dam and house. These structures were interesting to me because in all my previous trips up and down Bright Angel Creek I had never found anything but old cuttings and an occasional limb or two in the creek.

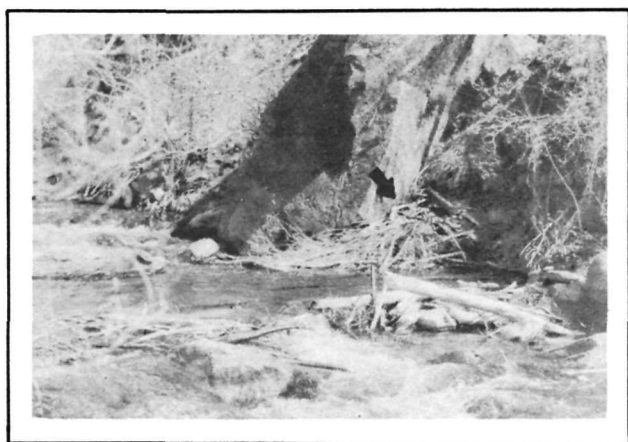


FIG. 1. BEAVER DAM AND HOUSE ON BRIGHT ANGEL CREEK.

The particular dam and house just mentioned is illustrated in figure 1. The house is seen on the right of the

picture against a large rock. After examining it very closely I decided that the attempt to build a regular mud and stick house was merely a camouflage to cover or to hide the entrance to a cave under the large rock. On the opposite side of the creek and downstream from the dam there was another entrance to a cave-like dwelling. It was also covered with sticks and reeds to hide it. The dam itself was made of interwoven sticks and small logs. There did not appear to be any evidence of mud mixed with the sticks, and all bark had been removed. On the west side of the creek a pathway led out of the stream near the dam, over to a freshly cut cottonwood tree (See Figure 2) which was about fifty feet from the water. A log about ten inches in diameter lying parallel with the creek and some ten feet from it had a section cut out of it so that the pathway led straight to the tree. One piece that had been carried from the tree had become wedged in the opening made in the log so it had evidently been abandoned for other pieces, more easily carried.

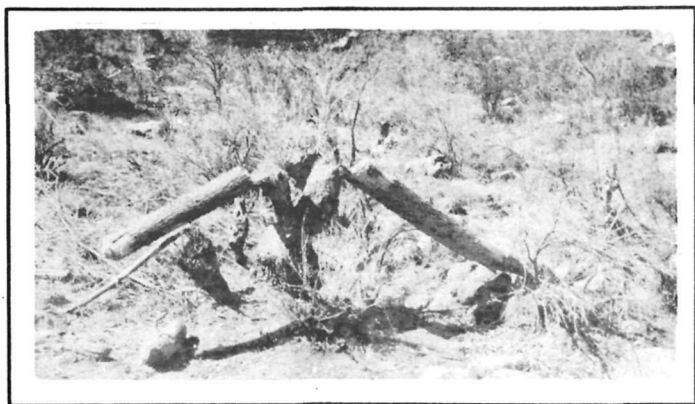


FIG.2. BEAVER CUTTINGS ALONG BRIGHT ANGEL CREEK

Markley,¹ in discussing the Sonora Beaver, states that "The force of the rushing waters tears down the dams he builds

in an attempt to calm them. He is unable to find a suitable place to build his lodge." My observations were made at the season of low water. The beaver here had had time to carry out to a certain extent their age-old instinct to build and to colonize. So far as I can determine, however, this dam and lodge was not observed again after the time of my visit. It, too, probably suffered the fate of other beaver structures in the region when the high water occurred a month or two later. Thus the beaver must have been left stranded with only a dreary hole under some rock for refuge.

1. Markley, Chester, "The Sonora Beaver". Grand Canyon Nature Notes, Volume 5, No. 8, July 1931.



Lizard Eat Lizard

By Donald Edward McHenry, Junior Naturalist.

ON occasion, visitors absorbed in viewing the almost unbelievable, unreal spectacle of the Grand Canyon will have their attention diverted for a moment from this sublime scene to a micro-drama being enacted at their very feet.

One such drama took place at Yavapai Point just outside the Observation Station at noon on April 27. The arena was the crevice of a rock. Upon the occasion about a dozen people forgot such an important thing as lunch. One can eat lunch any day, but it is not every day that the average person is privileged to watch a Striped Swift (*Sceloporus c. consobrinus*) gulping down an Arizona Tree Uta (*Uta ornata symmetrica*). So great was the strain upon the sympathies of one of the female members of the group of observers that she tried her best to discourage further descent of the Uta into the interior of the Swift. But the Swift was so intent upon the engulfing that it paid not the least attention to the

nervous advances and kept right on gulping and gulping.

Gulp is the exact word, too. Furthermore, gulping was the only practical procedure, for the jaws of the lizard are better adapted to use in obtaining its regular diet of insects than to swallowing other lizards. Yet in spite of the usual habit of this lizard of snapping for its prey, it was now forced to employ a method of swallowing which had a certain similarity to that used by snakes. This comparison is especially worthy of note when one remembers that the lower jaw of the snake, divided in half lengthwise, is loosely hinged so that it can work on the two sides quite independently. Such movement permits the snake to reach out first one side and then the other, and by means of its recurved teeth to literally pull the victim into it, or shall we say, to pull itself about its intended meal.

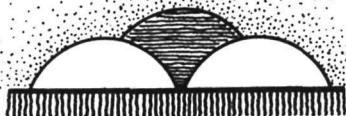


A STRIPED SWIFT SWALLOWING UTA

Now the lizard could not do this, for in its lower jaw the halves are fastened rigidly together so that the sides are not hinged or able to work separately. Hence our Swift was forced through necessity to swallow the Uta by a series of forward jerks, each vigorous jump enabling him to gain an advanced grip on his victim. This was sometimes accompanied by vigorous shaking of the head to aid in getting the proper hold, and although this method was very clumsy and apparently quite exhausting, the Swift did a rather complete job of swallowing the other lizard. The Uta went down head first and bottom side up.

The legs of the Uta evidently presented a more or less difficult problem. After more than usual head shaking, however, the Swift was able to work these into a position straight to the rear, which facilitated the passage of the unfortunate lizard. All of this seemed to be real work for the Swift, for apparently so great was his exhaustion after each gulp that he had to rest four or five minutes before he undertook the next one. It took him practically the entire noon hour to swallow the Uta to a point at which only the tip of the tail extended from his mouth.

At this point the writer decided to collect the specimens as they were. The Swift was rather easily captured because of the encumbrance of the other lizard in his interior. All went well until the specimens were placed in the formaldehyde. This relaxed the jaws of the Swift and then the Uta inside him quietly slipped out to float about by itself, thus spoiling a good exhibit, much to the regret of the collector. At least we now know that lizard ate lizard as shown in the accompanying illustration, and also that for the moment this diminutive episode was even more interesting than all the witchery and enchantment of the Grand Canyon.



Miscellany

Naturalist Staff.

I N recognition of his work on the algae of the Bass limestone, Algonkian age, in Grand Canyon, Dr. David White of the U. S. Geological Survey has received the first of the Charles Doolittle Walcott Medals. This award was offered some years ago by Mrs. Walcott as a memorial to her husband, emi-



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ment paleontologist of the Smithsonian Institution, who specialized in studies of the earliest form of life, found in Cambrian and pre-Cambrian rocks. The Walcott medals are given in recognition of outstanding contributions to the knowledge of pre-Cambrian rocks.

Dr. David White is well known to students of the Grand Canyon, not only for his work on the 'oldest traces of life',

but also for his detailed studies and reports on the Permian flora as found in the Hermit shale and Supai formation. Dr. White spent several field seasons prior to and including 1929 carrying on his investigations in the Grand Canyon.

* * * * *

The exact status of the coyote found commonly on the South Rim of Grand Canyon has for some years been in doubt. Recently a specimen collected from the Berry ranch, bordering on the south boundary of the park, was sent to the Bureau of Biological Survey where subspecific determination was made. Dr. W. B. Bell writes that this specimen proves to be Canis latrans mearnsi, the Mearns Coyote.

* * * * *

The Great Basin Rattlesnake, Crotalus c. lutosus, was collected by the writer on the east wall of Toroweap Valley about four miles above the Colorado River on April 10. Two days later another specimen was found dead on the east base of Mt. Trumbull. These specimens are of especial interest since they represent the first records of this species from the vicinity of Grand Canyon. They may possibly also represent the first definite records from the state of Arizona, although a juvenile specimen, possibly of this species, but of uncertain identity, has been collected at Jacobs Lake, and Klauber (personal communication, April, 1934) states that he has seen specimens of the Great Basin Rattler from Kanab, Utah, some of which were probably collected across the border in Arizona.

The Toroweap specimen was sent to Mr. L. M. Klauber of the San Diego Museum, who kindly verified the identification with the following statement: "As stated in your letter, this is undoubtedly the subspecies Crotalus c. lutosus, the color and pattern being quite characteristic of specimens from southern Utah. The dorsal blotches, which are almost black, are especially different from the pattern of C. c. abyssus (Grand Canyon rattler). This is a most interesting

find, verifying the supposition that C. c. abyssus is almost entirely restricted to the Canyon itself."

E. D. McKee.

* * * * *

The Western Belted Kingfisher, Megaceryle alcyon caurina, was seen at a tank near Pasture Wash Ranger Station, South Rim, on April 28. This is the first record of this species from the South Rim, and was a decided surprise to the observer.



E. D. McKee

* * * * *

The first fawn Mule Deer to be reported this year from the South Rim was seen by Mr. Julius Gaustad, electrician working on the telephone line, on May 23. Mr. Gaustad stated, "The fawn appeared to be about a day old and was not very lively." It was seen just east of the south entrance road, a few miles from the village.

* * * * *

On March 26 & 27, 1934, I obtained some accurate measurements of the growth of a Century Plant (Agave utahensis) on the Tonto Platform along the Clear Creek Trail about four miles from Phantom Ranch, the results of which are given herewith.

March 26th.	9:00 AM.	32-7/8 inches	above the ground.
March 26th.	3:30 PM.	37-1/4 inches	above the ground.
March 27th.	8:00 AM.	43 inches	above the ground.
March 27th.	4:00 PM.	49-1/4 inches	above the ground.

H. A. Montgomery,
Park Engineer.

Long Period Rain Gauges.

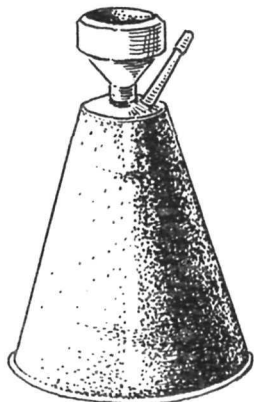
By Park Naturalist Edwin D. McKee.

DEFINITE knowledge concerning deserts - their geography, climatology and biology - is as yet very meager. Compared with the information which has been accumulated about marine processes and also that pertaining to humid, continental areas, the data available on desert conditions are strikingly scanty. Yet, as pointed out by Dr. Forrest Shreve¹ in his illuminating article on "The Problems of the Desert", the extreme conditions of geography and climate, and the resulting unusual adaptations of the biological world, should offer exceptional opportunities for learning many of the secrets of the processes involved in the various fields of natural history. Those more regular and uniform factors which influence other areas undoubtedly offer more equable conditions under which to make certain investigations, yet the very irregularity of the desert at once gives it definite advantages.

In the lower part of Grand Canyon are represented true desert conditions. Above is an imperceptible gradation into those of a semi-arid type. As a whole, therefore, the canyon is characterized by the irregularity of natural processes, which is typical of arid regions. Scientific investigations of the processes in Grand Canyon has involved several fields, but has been largely of a taxonomic nature. Although actually the various fields are intimately related, sufficient work has not been done in most cases to furnish a full understanding of the relationships. Especially is there a lack of information concerning climatology, so the futility of attempting to fully interpret processes involving any of the other fields is obvious.

Daily temperature and precipitation records have been kept at one place only on both the north and south rims of Grand Canyon within recent years. This winter attempts have also been made to obtain daily temperature records from the Canyon bottom and from an additional locality on the South Rim. These data represent all that are available at the present time, and their inadequacy for giving a proper interpretation of natural features is apparent when one considers the many conditions which are obviously represented in an area involving over a thousand square miles and more than a vertical mile in altitude extremes.

In order to partially compensate for the present lack of meteorological data at Grand Canyon, the staff of the division of research and education has recently installed a group of long period rain gauges, such as have been in use in the desert areas of southern Arizona for the past five years. These gauges, developed at the Desert Laboratory of the Carnegie Institution at Tucson, consist of truncated conical vessels about $9\frac{1}{2}$ inches in height and the same in diameter at the base. They are made of sheet copper because of its durability, and have well soldered seams. The vessels are surmounted by vertical-sided but conical-bottomed measuring bowls, each three inches in diameter and fastened to the upper end of a connecting tube which passes into the body of the container.



A detailed description of the long period rain gauge and of results obtained from its use has been published by Dr. Godfrey Sykes.² He states concerning it that the conical form was adopted because it makes the instrument less easily dug up by animals, that the short stem is to raise the measuring bowl a few inches above the ground surface when the in-

strument is buried, and that the small spout is to facilitate emptying and measuring the contents. A hundred cubic centimeters of light mineral oil have been found sufficient to protect the surface of contained water from evaporation for at least a year, even under extreme desert conditions, and the container will hold the equivalent of 40 inches of rainfall which is far more than obtained annually in any part of Grand Canyon.

Since in a desert region annual rainfall means but little, and seasonal rainfall, or that of concentration periods, is the vital and controlling factor, these gauges serve their purpose admirably. At Grand Canyon six gauges were installed on the first of May, and it is planned to read these every three months. They will then record precipitation for the winter snow season, the spring and early summer dry season, the summer rainy season and the fall dry season. These gauges have been placed at various altitudes, on the rims and within the canyon, as indicated below, so should do much to increase our actual knowledge of this important influence on the natural history of Grand Canyon.

North Rim, Checking Station	9,000 feet.
North Rim, Bright Angel Point	8,250 feet.
South Rim, Grandview Point	7,500 feet.
South Rim, Pasture Wash	6,300 feet.
Canyon Interior, Tonto Platform	4,000 feet.
Canyon Interior, Mouth of Bright Angel Creek	2,500 feet.

1. Shreve, Forrest, "The Problems of the Desert" The Scientific Monthly, March, 1934, pp. 99-209.
2. Sykes, Godfrey, "Rainfall Investigations in Arizona and Sonora by Means of Long Period Rain Gauges." The Geographical Review, Vol XXI, No. 2, April 1931. pp.229-233.

