

Nature Notes  
Grand of Canyon



The Grand Canyon of Arizona with its nearly mile deep chasm invites you to the worlds most sublime spectacle — where one may see the greatest example of stream erosion — where the Canyon walls are a barrier to migration — where isolation has brought about the development of new species — where one may experience a climate ranging from that of southern Mexico to that of middle Canada, and — where a great story of extinct life is recorded in the rock walls.

Vol. 3 - No. 7

U. S. DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
GRAND CANYON NATIONAL PARK

VOL. 3.  
GRAND CANYON NATURE NOTES

NO. 7.  
JANUARY 15, 1929.

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This bulletin is issued monthly for the purpose of giving information to those interested in the natural history and scientific features of the Grand Canyon National Park. Additional copies of these bulletins may be obtained free of charge by those who can make use of them, by addressing the Superintendent, Grand Canyon National Park, Grand Canyon, Arizona.  
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M. R. Tillotson, Superintendent. By - G. E. Sturdevant, Park Naturalist.  
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ADDITIONAL INDIAN RUINS OF CLEAR CREEK REGION.

By - A. L. Brown, Park Ranger.

Recently the chief park ranger and I made a trip to the Clear Creek region for the purpose of taking water temperatures and to see if the stream contained sufficient water at the low stage to make it suitable for trout. Six months prior to this time we had made somewhat of an exploring trip into this same region but were unable to do the job in a satisfactory manner, owing to lack of time and provisions. After spending two days in moving our provisions and bedding to a camp on the banks of Clear Creek and taking water temperatures, we used a third day to explore the unknown portion of the region.

Since we had found so many interesting Indian ruins on our first trip into the region we fully expected to find other portions to contain additional antiquities. We found but few ruins in this unexplored area but those that we discovered were of unusual interest. We found one "mesal" pit that had been abandoned un-opened. Near the pit was a nearly perfect specimen of an ancient sandal partly exposed in the debris. The sandal was complete with the exception of the loop that arches over the instep and the small loop that fits over the inner or big toe. The sandal is made of the woven fibers of "ooze" or yucca plant (*Yucca harrimaniae*) that is very common within the Grand Canyon. I have seen several of these sandals in the ruins not far distant from Kanab, Utah, but none has shown better workmanship or endured the destructive elements like the specimen we brought back.

In one of the structures we found several corn stalks in a perfect state of preservation. In another structure we found some "mesal" (*Agave Utahensis*) that had been through the "mesal" roast and had probably been stored away for future rations.

The above structures are poorly preserved owing to the fact that they have been subjected more or less to the elements.

LESSONS FROM THE GRAND CANYON.

By - G. E. Sturdevant.

Infrequently one is asked "what are the outstanding features of Grand Canyon National Park?" It is quite apparent to many park visitors that as they look at the Grand Canyon they are viewing the most illustrious example of erosion in the world - where running water as the motive power with sediment as its rasp or saw has scoured a remarkable gash in the earth's crust through unceasing effort. To many this story is plain, but is there not more to be told? Without hesitancy the question can be answered in the affirmative.

In the ancient strata exposed in the Canyon walls are remains of extinct life forms - some buried in mud now turned to shales, some in sands now solid rock, and some in limestones deposited in ancient seas. From top to bottom the exposed strata present a most interesting story of life, a story of changing conditions, changing climates, changing groups or assemblages of forms but always a progress where new forms replaced the old and where the new adapted themselves to the conditions unsuitable for the old.

As one views the living assemblages of plants and animals at the Canyon depths and compares them especially with the plateaus above, another story is slowly revealed to his eyes - a story of present-day adaption of individual plants and animals to suitable climates. At the bottom of the Grand Canyon one sees a climate typical of southern Mexico. The cats claw, the mesquite, and the warmth-loving lizards abound in this more-heated portion of the Canyon for it is their home - they have never accustomed themselves to any other. Gradually climbing the Canyon walls certain living forms drop out - they have reached their most northern outpost. Other plants and animals appear for it is the climate of their own choosing - one which they have found most suitable for perpetuation of their kind. In time the firs, spruces, and quaken aspens of the Kaibab Plateau are reached. Here one finds plants and animals typical of middle Canada associated together. Thus by passing from the Canyon depths to the Kaibab Plateau one travels in reality, as far as plant and animal groups are concerned, all the way from southern Mexico to middle Canada.

The study of the fauna and flora on the Kaibab Plateau to the north and on the Coconino Plateau to the south of the Grand Canyon, reveals marked differences. Certain forms are unable to cross the chasm, thereby making the Grand Canyon a barrier to migration. By studying the effects of this barrier one notes the isolation of certain forms. Particularly is this true of the Kaibab or "white-tailed" squirrel found only on the Kaibab Plateau on the north rim of Grand Canyon. The squirrel is so closely related to the Abert squirrel on the Coconino Plateau south of the Grand Canyon that presents a concrete example in which isolation has brought about the development of a new species.

The immensity of the Grand Canyon quite belittles man's activities, yet in each side canyon where there is water and on the plateaus above are to be found evidences of a vanquished race. The ruins include cliff dwellings, pueblo types, food caches or storerooms, ancient gardens, and pictographs.

The last chapter of the outstanding features of the park might well be termed modern history. This deals with the discovery of the Grand Canyon in 1540, the advent of beaver trappers into the region in 1826, Powell's famous passage by boat through the rapids of the Colorado River in 1869, the setting aside of the Grand Canyon as a National monument in 1908, and its final creation as a national park in 1919.

#### CLEAR CREEK IS STOCKED WITH TROUT.

From the U. S. Fish Hatchery at Leadville, Colorado to the icy waters of Clear Creek - one of the most secluded side canyons in Grand Canyon National Park is the record travel of 50,000 eastern brook trout eyed-eggs. Three modes of travel were necessary for the eggs to reach their destination.

The first lap of the journey from Leadville to Grand Canyon reveals that they travelled 1252 miles by rail. From the railhead the eggs were packed ten miles on the backs of mules to the mouth of Bright Angel Creek at the depths of the Canyon.

The last lap of the journey was by far the most strenuous for no trail connects Bright Angel Creek with Clear Creek. This part of the itinerary required a climb of about 1200 feet up the precipitous walls of the Inner Gorge to the Tonto platform, a tedious hike along the plateau, heading intervening side canyons, down a game trail to Clear Creek, and finally along the banks of Clear Creek to the headwaters.

Four park employees were required on this last part of the journey. Two men each carried 25,000 eggs in trays inside of improvised carriers while the other two men carried bedding and supplies. The eggs were in excellent condition when planted and in a few years time the park visitor will be able to testify regarding the success of the plant.

Some idea as to the isolation of Clear Creek may be gained from the fact that until last spring when a party visited the region to see if it was suitable for trout, only three parties had ever been there before.

Along the banks of the stream are numerous Indian ruins comprising "moscal" pits, food caches or storehouses, forts, and dwellings, which will make it intensely interesting when it is once made accessible to the park visitor.

#### IN TIME FOR REFRESHMENTS.

Recently the Grand Canyon Study Club, composed of ladies of the community, held a meeting during the afternoon at our home. The business part of the meeting was finished and refreshments were being served when a loud clatter was heard on the front porch. Presently a small buck deer pressed his face against the pane of the door and peered in. As the party was exclusively for members, the door remained unopened. After the freshments the pet buck turned on his heels and seemingly with a last hungry look, clattered off the porch leaving

nose and mouth prints on the window pane.

We of the Canyon will miss a friend in Prof. H. V. Hibbard who passed away at his home in Tucson during December. Prof. Hibbard spent his summers at the Grand Canyon taking a great interest in the nature study work and especially the geology and botany. He often made talks at the camp fire lectures and contributed one article for the August 1928 issue of Nature Notes.