

Grand Canyon

nature notes



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This Bulletin is issued 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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THE HOPI SNAKE DANCE

By Barbara H. McKee

One of the strangest rituals practiced today in the United States is the Snake Dance, a sacred ceremony of the Hopi Indians who live east of Grand Canyon in the heart of the Painted Desert. This dance takes place every year in two of the Hopi Villages sometime during the latter part of August. The date on which it is to be held is announced sixteen days before its actual performance. At the end of that period the Snake Dance is held just before sunset.

In the plaza of the village a kisi - a bower of cottonwood boughs (in certain pueblos corn stalks are also used) is erected. A cloth or blanket closes the entrance. Between this kisi and the central shrine a board with a hole in it has been placed in the ground. This plank symbolizes the sipapu or entrance to the underworld.

At the proper time the Antelope priests file from their kiva led by the Antelope chief. They circle the plaza four times and as each man passes the plank he throws a pinch of sacred cornmeal and then violently stamps on it. After the fourth circuit the priests form in a line with their backs to the kisi and stand there shaking their rattles.

In a short time the Snake priests come from their kiva and follow the same procedure as the Antelope priests. After making the circuit of the plaza four times they line up facing the waiting Antelope priests.

Both Antelope and Snake priests are costumed and painted for the dance. The upper part of the face is blackened while the chin is painted white. The upper part of the body is painted as are the arms. Each man wears a ceremonial kilt with embroidered ends and a fox skin hanging from the waist behind; he has a turtle shell fastened in back of the knee, and wears quantities of shell and turquoise necklaces, turquoise rings and bracclets.

After the Snake priests are all in place the Antelope priests begin a low chant to the accompaniment of their rattles. Then one of the Snake priests kneels down in front of the kisi and receives a snake from the man inside. The snakes are of common species - rattlesnakes, gopher snakes and racers being the usual ones. Upon receiving the snake the priest puts it in his mouth, another snake priest places his right arm across the carrier's shoulders and they begin a circuit of the plaza. Following them is a third Snake priest. When the plaza has been circled the snake is dropped on the ground and the third priest or "gatherer" picks it up. As the dance progresses several priests are dancing at once and the "gatherers" have their hands full of snakes.

Finally when all the snakes have been danced with they are thrown in a writhing heap inside a circle of sacred cornmeal and sprinkled with more of the meal by the women. At a signal the priests seize as many snakes as they can and race down to the foot of the mesa where the reptiles are set at liberty.

This ends the public dance which is witnessed by so many visitors each August.

The Snake dance is a ceremony primarily asking the gods for rain and a good corn crop. Several legends, all of which are similar in the main part, tell of how one of the Hopi youths long ago went to a distant country and returned with a wife whose prayers were always efficacious in bringing an abundance of rain and food. After a period of time this girl gave birth to snakes and then disappeared. The Hopis believe that the members of the Snake clan have all descended from these reptiles, and so their prayers and especially the ceremonies with live snakes are very powerful in bringing the needed rain for their crops.

THE CLEAR CREEK EXPEDITION

By Ranger-naturalist Russell Hastings

Early on July 25 a party of four left Phantom Ranch for Clear Creek. The principal object of the expedition was to make a collection of the archaeological remains in Clear Creek Canyon, although our observations were by no means limited to that field.

The 1200 foot climb out of Bright Angel Canyon was finished just as the sun rose above one of the arms of Zoroaster Temple but soon the sky became overcast and for the remainder of the trip we were not hindered by heat. The eight miles of the Tonto Plateau which we crossed were cut by canyon after canyon. The smaller ones we crossed, while we went around the heads of the larger ones. The steepness of the slopes and the roughness and broken character of the country between the canyons made each of us wonder why this had been made a plateau.

In one of the side canyons we found a rock shelter, probably of Pueblo II horizon. The pot sherds were scarce and we had considerable difficulty in finding twenty five.

The 800 foot drop from the Tonto Plateau into Clear Creek Canyon was made over an old rock slide, all other places along the canyon having such precipitous sides that descent was impossible.

We divided into two groups to explore the canyon; two of us going up the canyon and the other two going down.

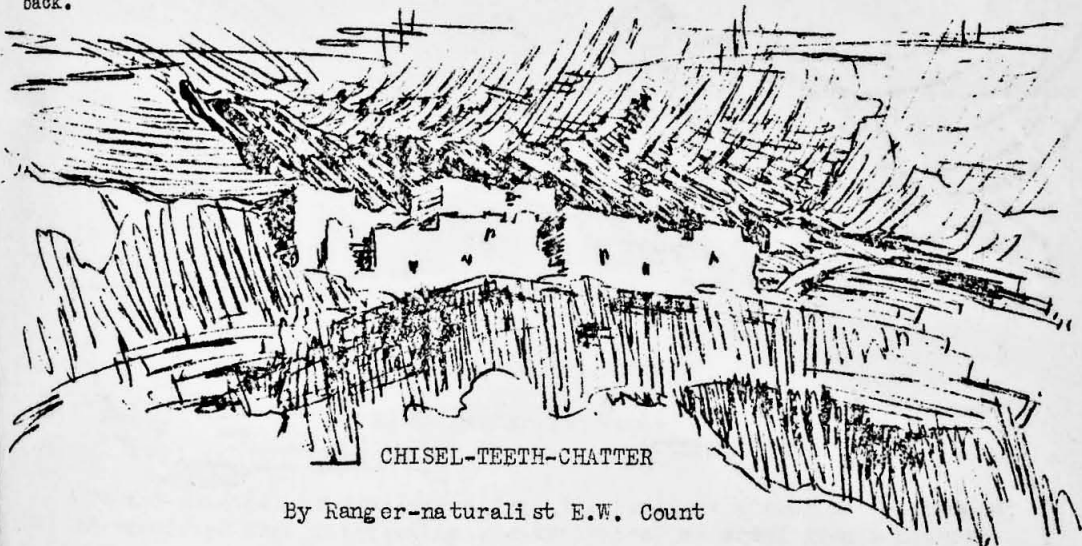
Above the place where we entered the canyon we found three groups of prehistoric houses (probably of Pueblo II horizon) built on ledges near the base of the canyon walls.

They each had an eastern exposure. One basket maker site was found and it showed the usual characteristics - north exposure, no pottery; a shallow, circular depression with the butts of small saplings and bows stuck in the ground around its circumference. We found several mounds of small stones on the floor of the canyon which we decided must have been used for roasting mescal or agave plants. These were probably made by Indians of historic times.

In Clear Creek Canyon below the point where we entered, we could find no evidence of prehistoric occupancy.

Except for several species of birds, one Grand Canyon Rattlesnake about 40 inches long, was practically the only animal life that we found. The remains of three deer, rather recently killed, probably by a mountain lion, and the skeletons of a bob-cat showed that there had been more animal life there. Despite continued observation, we were able to find no indications of the trout planted in the Creek three years ago.

The return trip across the Tonto Plateau proved much easier than the trip over, probably because we kept closer to the Redwall where the canyons are neither so deep or so numerous. One small rattlesnake was seen on the way back.



CHISEL-TEETH-CHATTER

By Ranger-naturalist E.W. Count

The "Cox-Markley Chipmunk" seems to have the type of fever that afflicts some of his human relatives. Rangers Cox and Markley are depleting the pinyon nut supply of Arizona by placing some of these seeds on the window-sill of the Information Office where their chipmunk absconds with them as long as the supply lasts. He has the repeated record of storing eleven nuts in his chops at a trip. Often he licks a nut all over before storing it in his mouth, perhaps to "lubricate" it.

He was very suspicious the first time I rested my hand on the sill and placed some nuts on the back of it. He repeatedly approached and retreated until cupidity conquered. Then he crouched, stretched his neck and timidly sniffed the tips of my fingers. Finally, he said "what are those fool things, anyway?" - and essayed nibbling them. Reassured, he proceeded to remove the pinyons.

Rangers Cox and Markley also report the visits of a white-footed mouse to the same conucopia. The chipmunk, small as he is, can bully away this smaller chisler. Just for fun, both rangers have repeatedly tried to race the mouse to his hole when he is a longer distance off, but the mouse always wins. When you stop to reflect, you have to respect the quality of reaction that will cause that little chap to take a chance of racing towards you in the hope of reaching that hole ahead of you.

An Abert Squirrel dealt more harshly with my fingers the other day than did the above-mentioned Cox-Markley pet. After picking a few nuts from my hand and "tasting" my finger-tips, he grabbed each finger in turn with his chisel-teeth, and yanked them so that the nuts all spilled.

This squirrel has the Long-crested Jays put in their place. They approach very gingerly when Abert is around, and prefer not to remain if he is actually squatted among the piñon nuts.

The timid little Gila Chipmunk hovers around the outskirts when you dole out the nuts to Abert. When Abert buries them (and the shaggy juniper bark will do sometimes as well as the ground) Gila Chipmunk digs them up again; but Abert does not seem to mind.



AN ARCHAEOLOGICAL FIND

By Ranger Arthur Soper

A report came out of the Canyon that the trail-caretaker at Cottonwood camp had unearthed some interesting archaeological material from a nearby cliff-ruin. And so the superintendent, knowing my great interest in such things, instructed me to go down and pack out whatever had been found.

On Monday, August 11th, Davis and I walked up to the cliff-ruin at which he had found all this material. This particular site is half a mile above Cottonwood, within sight of the trail, and at the base of a large cliff on the opposite side of Bright Angel Canyon.

The ruin was at one time a dwelling of possibly 12 or 14 rooms. Only the walls of three of these still protrude above the thick talus that has covered and crushed the rest.

While hunting about for a good position from which I would take a picture I stumbled upon a bronze marker in the center of the ruin. This read "Sherd Survey by Gila Pueblo," with a number for reference. Immediately I lost all interest in that cliff-ruin, the archaeologists had already visited the place.

We next decided that we would walk further up along the cliff-base to see if there were any more ruins or food caches in sight. We had proceeded scarcely more than a couple of hundred yards when our search was rewarded. I was in the lead and, just by chance, happened to glance up at the great cliff above us. There my eyes became rivetted upon one spot and I cried out in my surprise for Davis to hurry on. When he had panted up the hill to my side and had glanced upward his astonishment and delight equaled mine. There

perhaps 30 feet almost directly above us, was a food-cache formed of rock slabs laid so as to form a wall on a ledge. And just discernable from where we stood, was the rounded outline of a huge food-jar or olla.

Davis said that the 'honor' of scaling the cliff to get at that olla belonged entirely to me, since I had been the fortunate one who had seen it first. Then we started hunting for the easiest way to get up. After several minutes I decided that the cliff was unscalable without a ladder, but Davis thought he could help me up the first part. While I inched my way slowly upward, he held a long stick against me to help preserve my balance. If it hadn't been for that, I never could have reached the cache.

When I clambered over the wall into the cache I was greeted with another surprise. Besides the first pot I had seen there was another, smaller one in a corner, surrounded by slabs for protection.



While Davis returned to camp for two sacks and some rope, I examined the two ollas. The big one proved to have a small piece missing, and while in search of that, I found under one of the rocks in the wall a small black-on-white ware ladle with a black geometric design on the bowl and on the inner curve of the handle. The protected olla was found to be of corrugated ware and blackened on the bottom by age-old fire.

The two of us got the pots down out of the cache by slowly lowering them one by one, on the end of a rope, each being placed in a gunnysack so as to prevent losing any parts if an accident occurred. The next day, the pots were packed out of the Canyon - half the distance on the writer's back, and the other half upon mule back. They arrived safely at the park office and in the same condition as that in which they had been found.

The archaeological materials from Bright Angel Creek are now stored with the Grand Canyon National Park collections to be exhibited at a future date.

By Ranger-naturalist Clyde Searl

Perhaps no place in the world has a greater attraction for people of scientific bent than has Grand Canyon. No matter what the science may be it has a large and interesting field in Grand Canyon and the surrounding region. It is known the world over as the greatest open text book of geology, with formations and structure opened up as plainly as the leaves of a primer. Other sciences are finding it as a new field. Ecologists and botanists and entomologists are rapidly increasing as visitors and students.

The canyon is undoubtedly the greatest attraction of the region, its formation and geological history being the finest field of all for the geologist. Life in the canyon is the field of other sciences, each science having an equally interesting place. In no place is ecology the science which deals with the relationships of plants and animals to their environments - better explained than in the life zones of Grand Canyon. In few places can a greater number of climatic belts be found in such a small area, and for this reason the ecologist finds himself in a paradise.

Four of the seven life zones are found within the park boundaries, starting at the bottom of the canyon with the Lower Sonoran zone, leading through the Upper Sonoran and Transition zones, and ending on the highest elevation on the Kaibab Plateau with the Canadian Zone. The Hudsonian, Arctic and Tropical Zones are the only ones lacking.

In a place built of sheer walls and plateaus such as in Grand Canyon and the surrounding country, the ecologist finds many irregularities in the climatic belts. There is not the simple blending of life zones that one would expect in a country gradually lifting from sea level to high mountains. It is the presence of irregularities that makes the problems of the ecologist intensely interesting. There are several reasons worthy of note accounting for the irregular and jagged local boundaries of the zones.

Steepness of slope undoubtedly holds first place as a factor in the irregularity of zones inasmuch as it causes marked local changes in drainage, temperature and insolation. The walls of Coconino sandstone and Redwall limestone are as steep as formations could possibly be. These cliffs often actually overhang. Plant growth is permitted only to the clinging forms - lichens and mosses - and to those plants which accidentally grow in crevices. The perpendicular cliffs allow the maximum amount of drainage, the effect of which is easily understood. Steepness of slope gives second place to exposure.

Exposure is directly affected by steepness of slope. This is plainly seen in all areas at the base of cliffs. The cliffs either allow the maximum amount of sunlight, or they hide and shade the areas beneath. The west and south slopes of the canyon receive a greater amount of direct heat from the sun, and forest and plant formations will run higher on such slopes. The cooler areas are the north and east slopes because of their protection from the rays of the sun; beneath these, forest and plant groups will naturally grow much lower than the average boundary of their life zones in the region. Examples of exposure are clearly shown where cactus, manzanita, agave, yucca and other plants characteristic of lower zones are actually growing at elevations hundreds of feet higher than fir, spruce and aspen trees of characteristic Canadian zones.

Insolation naturally follows exposure. Normal temperatures fall with increase in altitude about one degree fahrenheit for each rise of 350 feet. Such being the case, one should expect an decrease of at least 18 degrees in ~~temperature~~ going from Phantom Ranch to Grand Canyon Lodge on the North Rim. However, the range in temperature is usually greater due to the deep and narrow features of the canyon and the characteristic of the rock masses to hold heat.

The fourth reason for the irregularity of the zones would naturally follow as the accumulations of blocks of hot air at the lower levels. Hot air rises along definite slopes or air lanes, avoiding others on account of the topography. Examples of air currents are often shown in the formation of clouds and fogs in the canyon.

In contrast to the flow of air currents is the flow of cold water and air down a canyon. In all such cases, plants extend to a lower level than the average limit of a zone. Examples are known to everyone. Wherever a mountain stream flows into a desert the banks are lined with plant growths of higher regions. All streams in the Grand Canyon bear out the facts of the last statement. Nowhere is irregularity in life zones more easily pointed out than along the courses and streams.

Physiological islands are often pointed out as irregularities. In Grand Canyon the islands do not conform to the usual definition; a physiological island being commonly recognized as an isolated area by reason of local topography, moisture, and temperature conditions. In Grand Canyon, the islands would conform to the regions at the base of sheltered cliffs where plants of a higher zone would be growing at a level below the average boundary limits.

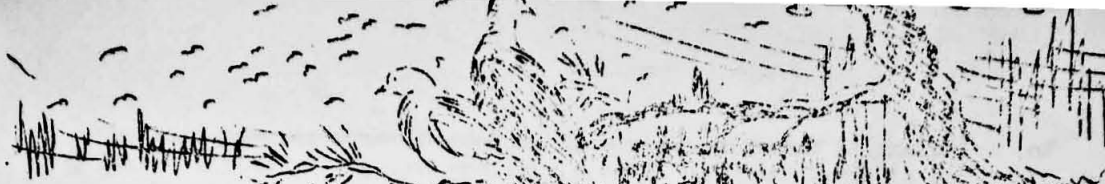
Islands are often mistaken for areas having been burned over by fire. The role of fire is very important as a factor in the irregularity of zones. A high zone once burned over may be regrown with the less resistant growth of the zone below and often the second growth remains as a permanent growth. The Transition Zone is the one most often burned over, and usually the second growth is one of brush and growth of the lower zones. This secondary growth may be seen in the burned over region several miles east of El Tovar on the rim road.

ODDS AND ENDS


The Big Scaly Lizard (*Sceloporus magister*) which ordinarily is seldom seen above the hot Inner Gorge of the Grand Canyon has been reported three times this summer from within a thousand feet of the South Rim. All of these records were from the Hermit Basin - one in June and two in August.




A large flock of Band-tailed Pigeons has been seen several times during August near the Community Field, South Rim. These birds are considered rather unusual at Grand Canyon.



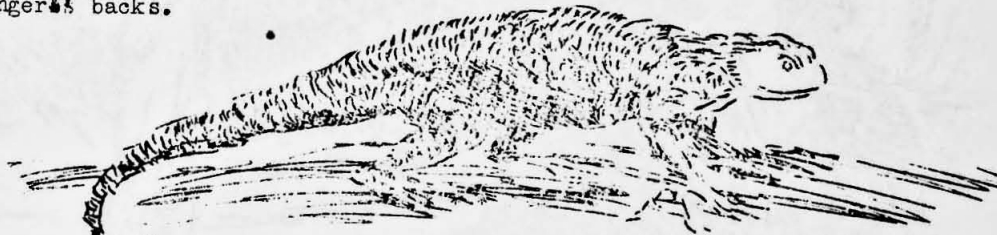
Since the disappearance of James Lewis from the National Park, chipmunks have greatly increased in number and according to some people they are becoming a great nuisance. Evidently, however, a new crusader has come to carry on the work of the cat, for numerous gopher snakes have been reported recently from the South Rim. Quite a number of people witnessed one of these recently in the interesting procedure of capturing and swallowing a chipmunk, Grand Canyon Village, 15 August.



Prairie Falcons have been seen and heard almost daily during August below Yavapai and Yaki Points in the Canyon. A pair of these marauders have been reported on several occasions as being dangerously near the bird feeding stations at Grand Canyon Village.

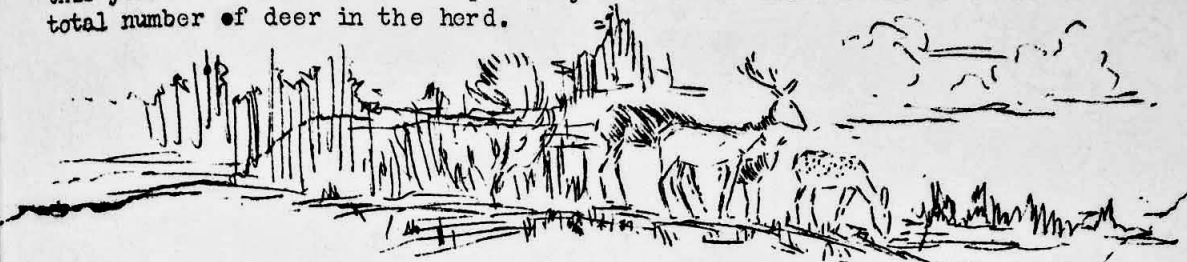


On August 13 Chief Ranger Brooks and Rangers Art Brown and Ed Laws planted 50,000 Black-spotted Trout eggs in Shinumo Creek. These eggs were brought in from the Yellowstone. They travelled to Cedar City, Utah, by railroad, thence by automobile some 200 miles to Powell Saddle on the North Rim of Grand Canyon. The trip down into the Canyon was over a trail which had been previously cut out and prepared for this purpose - eight miles by pack animal, one mile on the ranger's backs.



After a survey of the deer country on the North Rim of Grand Canyon, Chief Ranger Brooks reports that the summer range is in good shape and that mushrooms are plentiful. The intermediate and winter ranges are probably as good or better than usual due to the heavy rainfall. Fawns appear to be numerous and to be normal or above. The general condition of the deer is very good.

The semi-tame deer on the South Rim now number about 27 exclusive of this years' fawns. There are probably 8 to 12 of these fawns to swell the total number of deer in the herd.



A live specimen of the Rattlesnake - probably Grand Canyon Rattler - was recently collected on the rim of Grand Canyon at Desert View Point.

