GRAND CANYON Nature Notes

A BIT OF THE INNER GORGE WHICH THE COLORADO RIVER HAS CUT TO AN AVERAGE DEPTH OF 1000 FEET

September
Vol. 5 — No. 11

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GRAND CANYON NATIONAL PARK, GRAND CANYON
ARIZONA.

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Grand Canyon Nature Notes September, 1931

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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 Edwin D. McKee, Park Naturalist

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The COLORADO RIVER

By Ranger Naturalist Ralph A. Redburn

ASIDE from the Grand Canyon itself, the Colorado River is the feature of greatest interest at Grand Canyon National Park. It can be seen from both rims in many places, although for the greater part of its length, through the Grand Canyon, it is very snugly hidden. The Colorado is different from our other great rivers in that it has not yielded to the power of man. Unlike many other rivers it is not open to commerce or navigation but defies man throughout most of its course.

Excluding the rocks seen in the walls of Grand Canyon, the river is the oldest feature of this region. It is much older than the canyon through which it flows. The river is old, but the canyon is young.

The ancestral Colorado River was flowing across this region at a time long preceding that suggested by the earliest evidences of man in America, and also, according to many geologists, at a time during which this plateau area, which we now inhabit, was only a flat plains country, slightly above sea level. It was this river that began the cutting of the Grand Canyon, as well as the numerous canyons of its course above and below here. It has been some millions of years in producing the beautiful relief these canyons now have. The Grand Canyon as we see it today is the result of the cutting power of this stream aided by other erosive agents, combined with the uplift of the region. As the river cut its way downward with its many tools of sand and gravel, it has been working against great odds. There has been a conflict between the river and the uprising land. That great law of nature, "The Survival of the Fittest", has been in evidence here. Which has succeeded, the river or the land? We do not know, although we believe the river has lost the battle to a certain extent, because it is probably now at a higher elevation than at the time of the beginning of the battle. But the conflict is not over and will probably continue for other millions of years. The River has about 2,500 feet of rock to cut through here in the Grand Canyon area to succeed in reaching sea level which is the ultimate goal of all rivers. But should the uplift of the region continue, the distance will be increased.

During certain periods of the life of this stream, it presumably carried much more water than it does today. Undoubtedly a great quantity of water was added to the river by the melting glaciers which existed in the areas of Wyoming, Colorado, and Utah many thousands of years ago. Yet the river never was ten miles wide, as might be suggested by the width of the canyon.

As we continue on through time and arrive at a more modern period, we find that early man has come into this region, and begun to wander around, seeking new obstacles to conquer.

Showing the Colorado River Drainage Basin

*The mouth of the Colorado of the West was first successfully explored by white man in 1540. Alarcon, a member of Coronado's Expedition accomplished the feat. The river was first seen in the bottom of the Grand Canyon by Cardenas in the autumn of 1540. Just when the term "Colorado" was first applied is not known. It undoubtedly was given by a Spaniard, who named the river from the color of its water. Often the river is quite red. The river bore several other names such as the "Rio de Tizon" (firebrand river), "Rio de los Martiers","Rio de Buea Guia" (good guidance), and the "Esperanza" (river of good hope), before the name "Colorado" finally stuck.

Man continued to explore and to conquer. He found that this river has one source, the longest, known as the Green River, in west-central Wyoming, and another, the Upper Colorado, in north-western Colorado. The Green River, named after a trapper, flows down the western slope of the Wind River Mountains of Wyoming, southward into Utah. The latter was once known as the Grand, because of its origin in Grand Lake, in Rocky Mountain National Park, Colorado.

The waters of these two streams come together with a good deal of force, the commingling being plainly visible. Neither overwhelms the other. The union is quite a perfect one, and in some respects it is very appropriate that the combined waters should have a special name to represent them. After these two streams unite, the body of water thus formed is known as the "Colorado".

The Green and the Colorado, from Wyoming to the Gulf of Lower California, where the Colorado empties into the Pacific, a distance of nearly 2,000 miles, drain an area of about 300,000 square miles, but most of the country through which they flow is a barren desert in which they have cut a series of some eighteen canyons. Approach is difficult or impossible for the greater part of the distance.

The drainage area furnishes a great catchment basin for rain water. The better known tributaries other than the Green and the Upper Colorado, which feed the Colorado, are the San Juan, Fremont, Little Colorado, Paria, Virgin and the Gila. Each adds its volume to the mass and thus we have a great accumulation of water.

Still man has the conquering instinct, and he tries to use the river for material purposes; navigation, irrigation, and domestic use. He at present is trying to harness the Colorado and use its water and the power therefrom for irrigation and to generate power. The United States Reclamation Service, which has worked wonders with other streams, even where there seems to be no chance for achievement, is now beginning the construction of the famous Hoover Dam (Boulder Dam), which is located two canyons below Grand Canyon, in what is known as Black Canyon. The intervening canyon is known as Boulder Canyon.

*Taken from Frederick S. Dellenbaugh - "The Romance of the Colorado River".

Investigations have proved that no ordinary boat could float down the stream, to say nothing of stemming the flood, so therefore the Colorado is of very little use for navigation.

Then aside from the tentative irrigation project, to which the river will serve water - What is the good of the Colorado River? Its chief merit is not utility but grandeur. For practically one-half their length the Green and the Colorado are hidden in between great walls of canyons.

As we view the Colorado from the rims of the Grand Canyon, it appears as a mere thread of dirty sluggish water, with very little movement whatever, although it thunders swiftly along in search of a passage out of the prison of its own making. And in that lies the justification for the question, "Is that muddy stream down there the Silvery Colorado?". The Colorado is a muddy stream, but it, as well as the Grand Canyon, is a motion picture of changing colors.

Under ordinary conditions the river is a dirty-brown, but during variations in volume of water in the tributary streams the color of the water often changes to red, bluish-green, yellow, and even black. The commonest color - the dirty-brown - prevails throughout the winter months and especially in the spring during periods of increased volume from the melting snows in Wyoming, Colorado, and New Mexico.

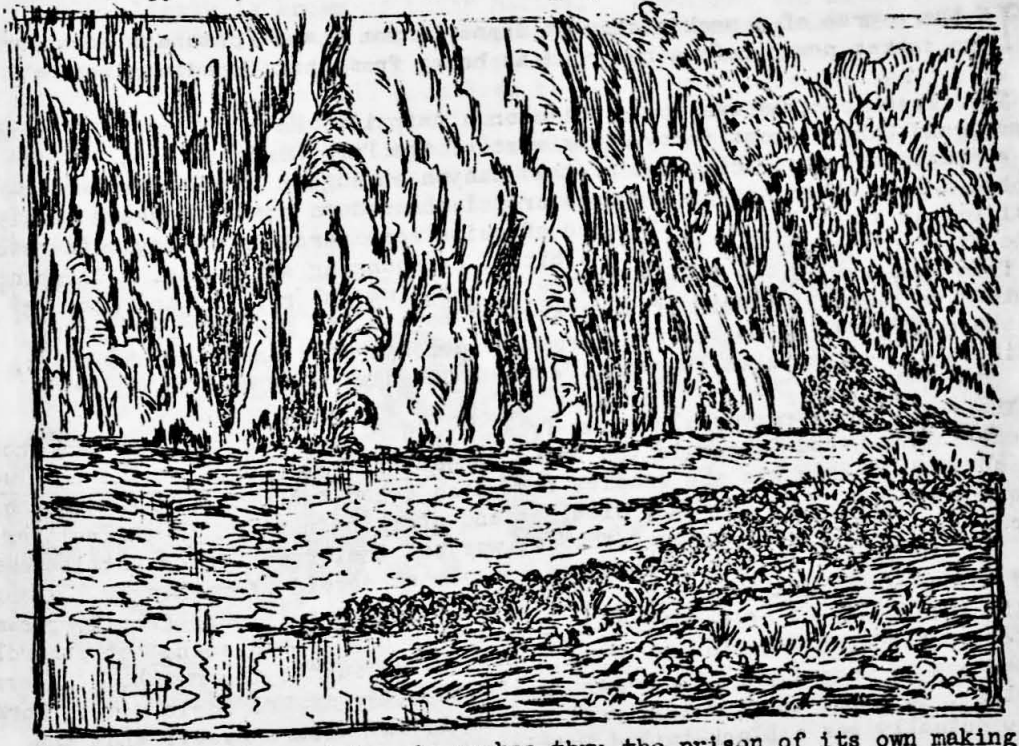
Most of the material in the stream, which is responsible for its red color, is derived from the San Juan and Little Colorado drainage areas. The San Juan drains a high plateau region in what is known as the "Four great Corners", where Utah, Colorado, New Mexico, and Arizona all join at one point. As it flows westward through Utah where it joins the Colorado, it gathers a large amount of red sand and shale from that area. The Little Colorado flows from the White Mountains of east-central Arizona, northwest through the Painted Desert region and empties into the Colorado at the head of the Grand Canyon. Much red material is collected by this stream as it flows through the red sands and shales of that area.

The blue-green color is also due to a certain extent to the blue-green sands and shales collected from the Painted Desert by the Little Colorado. Whenever the river appears yellow it is usually clearer - that is, it contains less solid material than during any other period. The black color of the stream is due to dark silt in it and also to the effect of light. Nearly every evening between five and six o'clock, the light rays hitting the water at a steep angle from the west make the water appear black, regardless of what the actual color of the water may be.

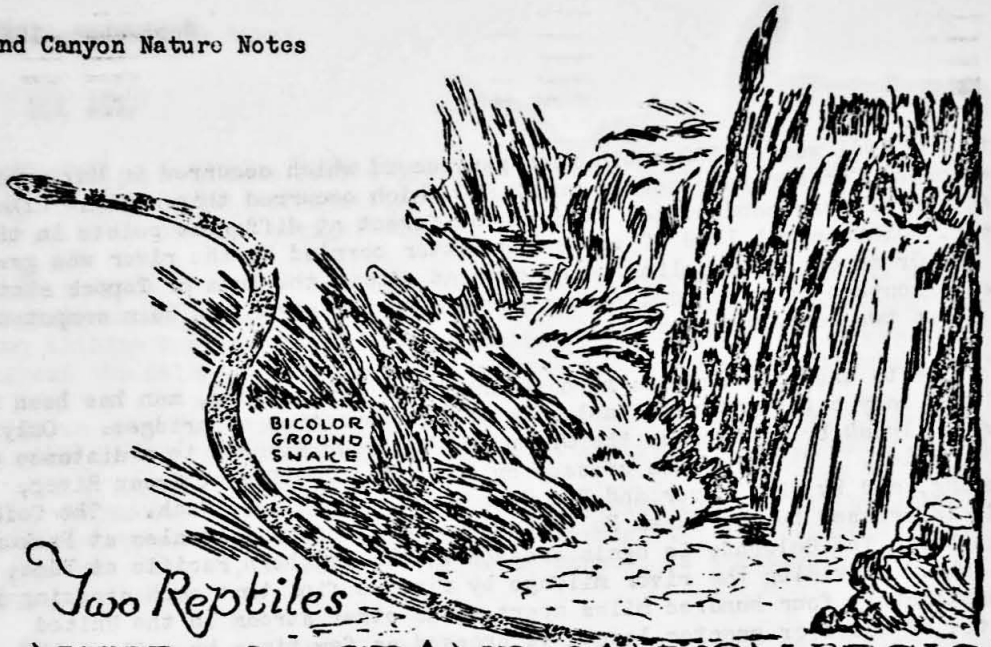
Since the water of the river is to be used for mankind's purposes, it is necessary to determine the amount of discharge and also the amount of solid material in the river. This work has been carried out by the United States Geological Survey. Daily tests are made concerning the amount of discharge, stage, and amount of solid material in the river. The highest discharge to

date for 1931 was 33,200 cubic feet per second which occurred in May, while the lowest for the same period was 2,610 which occurred this month. The quantity of suspended matter is quite different at different points in the river. The annual load of suspended matter carried by the river was greater at the Grand Canyon sampling point than at either the Yuma or Topock stations. The percentage of suspended matter carried by the river has been computed to be about two percent by volume.

Due to the many canyons through which the river flows, man has been able to find only a few sites suitable for the construction of bridges. Only five railroad bridges cross the Green and Colorado Rivers, in a distance of 2,000 miles. The Green is crossed by the Union Pacific at Green River, Wyoming, and by the Denver and Rio Grande at Green River, Utah. The Colorado is crossed by the Santa Fe at Needles, California, and also at Parker, Arizona. The Colorado is again crossed by the Southern Pacific at Yuma, Arizona. Dividing the river mileage by five we find that each crossing is approximately four hundred miles apart. No other stream in the United States of equal or greater length is crossed as few times by rail as the two just mentioned. The greatest distance between any two of the crossings is found between Green River, Utah, and Needles, California, a distance of nearly nine hundred miles, in which the unbroken canyons - Marble and Grand - occupy a space of two hundred eighty-three miles.



The fierce, restless Colorado rushes thru the prison of its own making.



Two Reptiles NEW to the GRAND CANYON REGION

By Charles M. Bogart, Los Angeles Society of Natural History.

IN the course of a week's stay at Grand Canyon I was fortunate in securing two snakes never before recorded as being from that immediate region.

The first specimen was found while on a trip into Havasu Canyon, a branch of the Grand Canyon about forty miles west of the Park Headquarters. With five companions I was riding out of that canyon on August 13 when, as we approached a fork where the pictographs are, I chanced to notice a snake easily identified as a rattler at a distance of quite some yards as it lay outstretched on the floor of the canyon beneath a bit of overhanging sandstone. Climbing down from my horse, I had no difficulty in catching the reptile and getting it into a sack, with the aid of a stick used to pin its head until a grasp could be gotten on its neck. The creature demonstrated no desire to fight, but like many rattlesnakes sought only to escape down a hole.

The rattlesnake previously known from Havasu Canyon and the only one known to occur in the Grand Canyon is the Grand Canyon Rattlesnake, Crotalus confluentus abyssus. This was the species for which I had had my weather-eye open. Consequently, when I noticed the distinct and striking pattern on the rattler just collected I knew immediately that it was not the Grand Canyon Rattlesnake, which is salmon-pink in the adult phase and almost devoid of markings. I suggested to Ranger Naturalist Count, who was with me, that it more greatly resembled the few specimens of the Black-tailed Rattlesnake I had seen, but I hardly expected to find any individuals of this species so far to the north. However, on my return to camp I was able, through the courtesy of Mr. Edwin McKee, Park Naturalist, to check the specimen more carefully and assure myself that the reptile actually was a Black-tailed Rattlesnake, Crotalus molossus. Its occurrence in Havasu Canyon extends its known range somewhat to the north of pre-

vious records, which indicated its range to be from Texas, west to Arizona and southward into northern Mexico. VanDenburgh states that "The most northern record seems to be that of a specimen secured at Cave Creek, Maricopa County". This is in central Arizona. However, Mr. L. M. Klauber informs me that he has specimens from north of the Cave Creek locality.

The second snake collected was one of the rather uncommon Bicolor Ground Snakes, Sonora semiannulata semiannulata which I found near the mouth of Garden Creek on August 15. Returning from the river about four o'clock in the afternoon I essayed to follow Garden Creek for a short distance when I caught sight of a little ground snake attempting to climb up a joint in some smoothly worn granite of the sub-canyon carved by Garden Creek.

These snakes are not commonly met with, probably owing to their nocturnal propensities. This particular specimen was marked with bands of slatey-black and dull yellow and to the casual observer not differing greatly from the young of Boyle's King Snake, a specimen of which was collected in Havasu Canyon.

Ground snakes are among the smallest of ophidians and attain a size of only five inches to a little more than half a foot.

Very little is known of their habits. Specimens are known from southern Arizona, Utah, Nevada and Idaho, so it is not unexpected to find it occurring in Grand Canyon where in time many of the snakes from the Lower Sonoran or Desert Zone will doubtless be collected. But the small size and nocturnal or crepuscular habits of many of these desert species render their collection to be contingent largely upon luck, for hunting at night by means of a light in the Grand Canyon is not the simple matter it is upon the open desert where nocturnal snakes can be collected on the highway with the aid of automobile headlights.

A QUARREL AMONG BIRD FAMILIES

By Edwin D. McKee, Park Naturalist.

IN the soft dirt and undergrowth beneath the tall evergreens of the Kaibab Forest a pair of small Red-backed Juncos decided to build their home. It was in late June when I first saw the nest and already it was filled with four pretty greenish white eggs, The mother bird covered them with her protecting body much of the time, and so fearless or so confident of the power of her protective coloration was she that one could approach within two or three feet before she would seem even slightly alarmed.

One day when both parent birds happened to be away, a young Audubon Warbler whose tail was not yet fully grown came hopping along the forest floor and quite innocently approached very close to the nest. About the same time, however, the adult Juncos returned and, fearing for their eggs, made a vicious attack on the bewildered warbler. Complications and a family feud then arose for the parent warblers apparently saw the plight of their offspring and came to the rescue. A battle royal ensued, but as if by mutual agfeement it ended just as suddenly as it had begun with no harm to either family.

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BRIGHT Angel Point juts out as a wedge pointing southeastward to Bright Angel Canyon. One slope faces northeast, the other southwest. As you stand on the very apex of this wedge and look to your left, you behold white firs and Douglas firs covering the slope immediately below. But on the other side of this wedge, and just a few yards from these firs, the slope is held by pinyon pines and junipers. Canada is on your left, the highlands of Sonora, Mexico, on your right.

The condition, by and large, is not unique, since similar situations exist elsewhere on both rims. But for the fisitor to Grand Canyon, here is an accessible and startling illustration of the radical difference in climate made possible where the mere facing of the slope means difference in light, temperature, and moisture, and consequent contrast in plant life.

--- Ranger Naturalist E. W. Count ---

Forest Fire

Yes, burn, you red tongued devil!
And dance for all you're worth-----
Each bush and tree,
Aye, all you see-----
Burn them down to earth!

Yes, burn, and leap your highest!
And sear to fiendish pain-----
But ashes grey
Will blow away,
And trees will grow again.

Yes, roar, and mock, and plunder-----
Make every twig a flame!
When all is gone
You must move on,
And leave behind, your shame.

So burn, and have your hour,
Make every moment last!
When green returns
to heal the burns-----
Your day of days is past.

--- Ciwa Lynch.