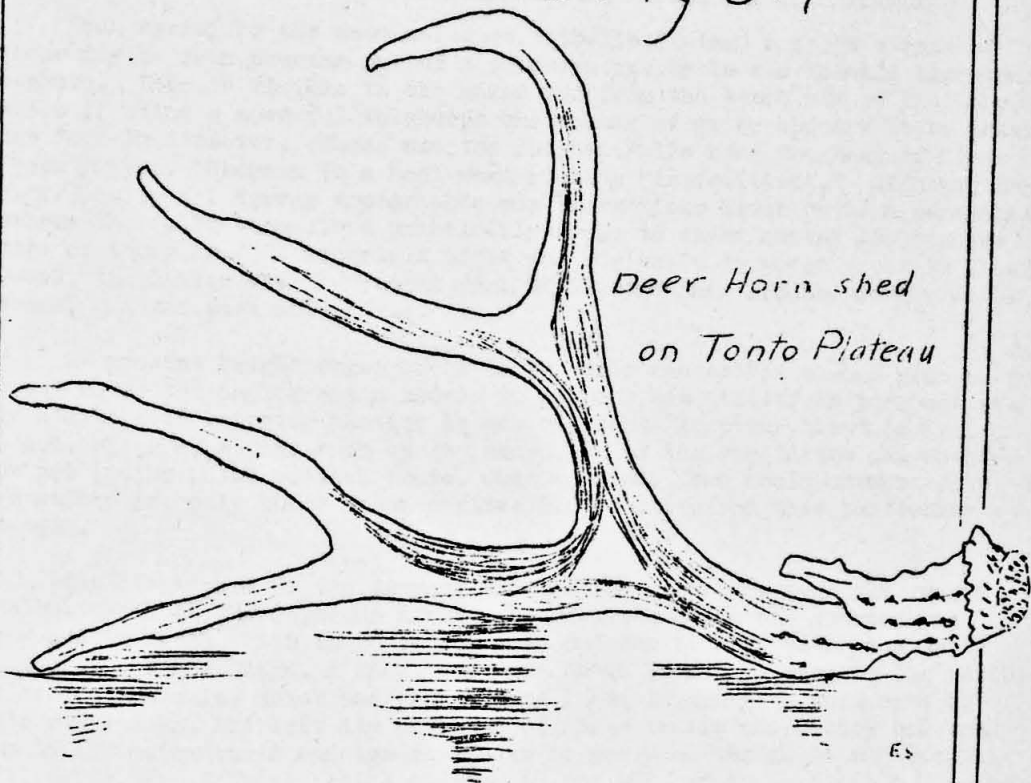


Nature Notes of Grand Canyon

Deer Horn shed
on Tonto Plateau



Vol. 2 - No. 11.

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

VOL. 2.

GRAND CANYON NATURE NOTES

NO. 11.

APRIL 30, 1928.

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.

M. R. Tillotson, Superintendent. By - G. E. Sturdevant, Park Naturalist.

INSPECTING A POSSIBLE TROUT STREAM OF GRAND CANYON

Each spring as the snow melts on Walhalla Plateau a large stream of water may be seen pouring out of a solution cavity in the Redwall limestone beneath. This is visible to the naked eye from the south rim of the Canyon while if using a powerful telescope the volume of water appears to be nearly one foot in diameter. These are the Cheyava Falls near the head of Clear Creek Canyon. Cheyava is a Hopi word meaning "intermittent." Although the U. S. Geological Survey topographic map shows Clear Creek to be a permanent stream the falls themselves practically cease to exist during the greater part of the year. To ascertain if it was advisable to place trout in Clear Creek, the latter was the recent goal of Chief Ranger Brooks, Ranger A. L. Brown, and the park naturalist.

At present Bright Angel Creek is the only accessible stream planted to trout where the angler has a chance to display his ability in park waters. In addition to learning whether it was advisable to place trout in Clear Creek, other questions such as the character of the vegetation and whether or not Indian ruins existed there, came to mind. Few could answer these questions for only three known parties had ever visited this particular canyon.

The first part of the journey was made by horseback over the famous Kaibab trail to the Colorado River. The following day the journey was resumed on foot. With food for two days and one blanket each we climbed out of the Inner Gorge, a short distance above Phantom Ranch, to the Tonto Plateau. Animals, which had been turned loose to graze in this area in the early days, had left dim outlines of their trails where they had gone up in the metamorphic and igneous rocks to graze on the scant vegetation. Following one of these trails we came to the base of the resistant Tapeats sandstone which forms the broad Tonto platform and presents an abrupt bluff practically everywhere in the Canyon. At the upper terminus of the trail we found a "chimney" through which we climbed until we gained the plateau. Several species of grasses are abundant on the plateau north of the river in contrast to the deficient vegetation south of the river.

As we followed east on the plateau innumerable deer tracks were visible suggesting that a large number of mule deer winter within the Canyon. Two

large deer were seen in a draw about one-fourth mile away. They presented a beautiful picture as they bounded up the side of the draw and across the plateau. It was impossible to distinguish bucks from does at a distance, as the bucks have shed their horns and the new ones are not yet perceptible. A large number of horns were found on the plateau. The Bucks must heave a sigh of relief each year when they drop off, for a single horn of a four-point buck which was brought back weighed forty-one ounces. To carry over five pounds of bony material on his head the greater part of the year must be a task in itself. Some of the horns were recently dropped while others were bleached, sun-cracked, gnawed by rodents, or partially disintegrated by combined destructive agencies.

A short distance east of Bright Angel Canyon we were surprised to find a large pegmatite dike extending above the level of the Tonto Plateau. This is one of the few places in the park where igneous rock occupies such an elevated position. Large crystals of quartz, feldspar, and large sheets of black mica (biotite) presented a sparkling appearance to the surface beneath the hot sun rays.

Trails made by deer were the only ones present in this area. Without these trails we would have found it difficult to pick our way across this section of the plateau. At last we arrived at the edge of the plateau and could see the green vegetation along the lower portion of Clear Creek. Following north along the edge of the plateau facing Clear Creek we believed, would eventually find a game trail leading down to water. Several long lateral canyons impeded our progress. Arriving at the side of each of these canyons it was necessary to follow it to the head where a good deer trail would generally be found leading around it. At the head of one draw we discovered an abandoned mining claim staked out by some prospector before he learned that the Canyon walls were not lined with gold.

Near the head of one draw we observed a well-beaten trail leading down into the canyon. Evidently it is used extensively by deer in dropping below the plateau for water. The trail went through a break in the hard Tapeats sandstone and along the base of the cliff for about one hundred yards. From there the trail continued down a steep ridge of deep red Hakatai shale of Algonkian age. At last the trail stopped at the edge of Clear Creek - a swift ice-cold brook shrouded in dense vegetation of cottonwood, willow, and arrowweed. As our canteens had been drained in coming along the plateau in the burning sun, we made haste in availing ourselves of the crystal waters of the stream.

A dry stream bed about two hundred yards up the canyon appeared to be an ideal camp-site. Numerous cottonwood logs were accessible for firewood while the tall grass around the spot made an excellent mattress. Except for the butter, which had become soft and part of which had leaked down the back of Chief Ranger Brooks in the hot tramp across the plateau, all of our supplies arrived in excellent condition.

While the chief ranger and the park naturalist arranged camp, Ranger Brown took out his fishing tackle to see if trout might have found their way up this swift cold stream which seemed so admirably suited for them. Although Ranger Brown had no luck fishing, nevertheless, we had two species of fish during our stop at Clear Creek. Chief Ranger Brooks "fished" in his haversack and pulled out both salmon and sardines.

After an early dinner we became interested in the large number of grasses in the immediate vicinity of camp. Anxious to discover how many species were present and probably indigenous to the region we started to collect the various kinds. When we had finished we were amazed to find sixteen species in our collection.

With the approach of sundown the air took on a distinct sharpness. In order to provide for lack of blankets we built two piles of rock, wide enough apart to permit the three of us to lie between the walls. Grass was gathered and placed between the walls to form a most comfortable mattress. Logs were piled on the outside of the walls with the supposition that the heated rocks would help keep us warm during the night. Fires were started at the approach of darkness. Almost simultaneously a breeze seemed to sweep the flames through the rock wall and across the grass mattress but before the fire had actually ignited the grass we rushed in and each man rescued an armful. After the fires had died down we replaced our sixteen varieties of grasses and made a most comfortable family bed between the heated rocks. Except for Chief Ranger Brooks who lost out in the blanket pull ^{that} set in when the rocks cooled off, all had a comfortable night of it. As for the Chief, he evidently tired of pulling on a blanket to keep covered and morning found him rolled up in a poncho next to the warm rocks. The next morning it was decided that each man should use his own blanket exclusively in the future.

After an early breakfast we started up the canyon to ascertain the advisability of planting the stream to trout. Tall cottonwoods were along both sides of the stream. Unlike Bright Angel Canyon where practically all of the trees show signs of gnawings or have been felled by beaver, we failed to note a single sign of beaver. Since no fish nor beaver were present we arrived at the conclusion that a falls must block the stream near the river. We were later informed by Mr. Emory Kolb, who had been one of the few parties to visit the region, that our supposition was correct as a falls of about twenty feet near the Colorado River prevents fish and beaver from finding their way up the canyon.

With our progress up the canyon the scenic beauty of the region increased. Arizona red-bud was in bloom, dense growths of arrow wood bordered the stream, while box-elder, wild grape, and manzanita all added to the primeval appearance of the valley. At least ten acres of meadow land occurred on a fertile flat above the stream. In fact the valley appeared to be such a contrast to other side canyons that one would not know he was in the Grand Canyon if he did not look above and see the towering spires of some of the familiar temples. Ranger Brown remarked "if we could find an ancient Indian city this canyon would in time be the most popular in the park." Shortly after this statement we saw a "moscal" pit, showing that the red man had preceded all white parties into this secluded canyon. Glancing up in a pegmatite dike, a small opening was observed in the rocks. This proved to be a cache or food store house used by Indians. The cache measured about two feet square, walled up with rock and plastered with mud, and with a small opening in front. Other moscal pits were noticed in the meadow land. In one or two places we could even see traces of charcoal.

A little over a mile above camp it was noticed that the main stream comes out of a canyon to the west. We decided to follow up Clear Creek Canyon to Cheyava Falls. The stream wound in and out in the narrow canyon. Turning up some of the stones in the creek bottom we found the surfaces

contained numerous fresh water insects. This branch of Clear Creek evidently diminishes somewhat in volume but undoubtedly some water flows throughout the year. About mid-day we arrived at the falls. The water gushes out of a solution cavity near the upper part of the Redwall limestone and drops about four hundred feet at the first fall and then pours over a series of ledges until it has reached the creek some eight hundred feet below.

Scanning the surrounding ledges we espied a series of caches in the Bright Angel shale near the falls. As we arrived at the base of the cliff it was found that the caches occurred in an eroded layer of the cliff fully twenty feet above. The remains of an old tree near the base of the cliff gave us an idea how the Indian found access to his store house. A cottonwood pole was bound near by which was leaned against the cliff. Ranger Brown managed to climb the pole to the caches. Twelve of these small structures were reposing on the cliff. Eleven of them were open while the twelfth was sealed and we left it undisturbed. Wood rats had found the store houses years before as nothing remains in them except corn cobs. Indians who had used such caches for granaries were probably expert farmers of their time. One of the corn cobs collected and brought back measured nearly eight inches in length. After a brief visit at the falls we returned to camp late in the afternoon.

We decided to stay an additional day in order to go up the branch stream of Clear Creek which appeared colder, swifter, and looked more favorable for trout. Rations were sufficient to last one more day but in order to make sure of having enough food, Ranger Brown suggested that we roast some mescal (*Agave utahensis*). Brown had explicit directions how the Havasupai Indians roast the mescal and assured us that it would be a success. Two specimens, about to bloom, were found near camp. These we collected and trimmed of their saw-toothed leaves. A pit was dug in the dry stream bottom until we struck some large boulders. Rather than dig deeper a wall was built around the pit. Wood was piled in the pit and a fire started. One bad mistake was made in starting the fire, however, for according to the Havasupais' the mescal will never roast if the fire is started by someone whose birthday is in winter. Ranger Brown, whose birthday is in December, started the fire. The fire was maintained until the rocks were red hot. The two specimens of mescal were then placed in the pit, bottom side up according to the manner used by the Indians. Brush, grass, rocks, and dirt were then piled on until not a trace of smoke escaped from the pit. It takes the Havasupai Indians from thirty six to forty eight hours to roast the mescal but Ranger Brown assured us that since our rocks were so much hotter the mescal would be ready to eat in twenty four hours.

That night each member of the party rolled up in his own blanket. The two members who had positions next to the heated rocks slept quite warm, whereas, Ranger Brown, in the center position, did not sleep so well.

The following morning we started up Clear Creek Canyon to explore the west branch. Although the main canyon was fascinating, the west branch was even more so. The rather dense vegetation in the narrow canyon was disturbed only by a much-used deer trail. Recently shed deer horns were frequently found. The deer trail would follow one side of the canyon for a ways and then cross the stream to the opposite side. Many beautiful cascades are present in the canyon. At their bases occur deep pools fringed with heavy growths of maiden hair ferns. The water ouzel, probably the most

interesting bird of the park, was particularly common along the stream. As we arrived at one large cascade a single water ouzel was seen to rise and fly up stream. Although we surmised that a nest was hidden behind the falls we failed to find positive evidence.

Near the upper end of the canyon the vegetation became greatly diversified. Tall cottonwoods, willow, arrow weed, box elder, and wild grape, surrounded shrubs of the colorful Arizona red-bud. Four species of ferns appeared native to the canyon. In addition we found the agave in bud and the yucca in bloom. Besides the wide variety of grasses, mallow, thistles, red-stem filaree, larkspur, two species of cactus (in bloom), all added to the colorful scene. Stunted junipers and pinons, and patches of cliff rose and Apache plume also appeared at home in this isolated canyon. Several species of lizards startled us as they made rustling noises in the tall grass at our feet, and even one non-poisonous snake was seen moving swiftly out of the way. A gray ground squirrel and the rock wren were both seen. At last the upper stretches of the stream were reached and the vegetation appeared more like a jungle. The area was marshy with young cottonwoods and monarch cottonwoods standing, while others which had fallen years before, were now covered with moss and ferns. Finally the source of water was found issuing in a series of springs from the Bright Angel shale.

The stream does not appear dependent upon melting snows for its volume. Instead it is probably the swiftest and coldest permanent flow in the park and admirably suited to trout.

As we returned to camp considerable time was spent in looking for Indian ruins. Several caches were seen on the south side of the stream at two different places. Although some are in an excellent state of preservation, practically all of them have tiny openings where wood rats have found access and plundered the stores untold years before.

At the base of one cliff nearly one hundred feet high, we climbed to a bench about twenty feet above the level of the stream. We were quite surprised to find a trail of the raccoon on the bench. The trail is most distinct and shows that the animal walked on the surface when the sand and mud were moist. At present the material on the bench appears almost as hard as solid rock and the tracks are beautifully preserved. Except in Havasupai Canyon, the raccoon was unknown in the park previous to our visit.

The cliff itself presented a beautiful picture, for the face contained clumps of rock rose (*Petrophytum caespitosum*), *Laphamia bisetosa*, and maiden hair ferns. Each clump appeared to be growing in tiny niches in the cliff and moistened only by the small amount of water seeping out.

At the junction with the main canyon Ranger Brown discovered the first dwellings we had seen in this canyon. They are probably some of the best preserved within the park. Outlines of at least eight dwellings and possibly one or two kivas have the walls remarkably distinct around them. Some of the walls are nearly four feet high. Worn out, as well as, almost unused metate stones were found. One of the worn out metate stones was seen in one of the walls - probably indicating that Indians had lived in this area for a long period of time. Rooms varied from six feet by eight up to sixteen by forty feet, depending upon the over-hang of the cliff. Four kinds of pottery,

plain, finger nail, and two kinds of tinted were found around the dwellings. Corn husks and a short, narrow, pointed stick were also preserved beneath the cliff. Stone steps led up to the largest chamber. This is probably the only place in the park where stone steps are found around an Indian ruin. The large room had a commanding view of the fine meadow below which was probably cultivated by the former residents of Clear Creek. Beneath an overhanging rock we found where a "trade rat" had stored up broken pieces of pottery, bones, sticks, corn cobs, and numerous pieces of vegetation, with a wide variety of other things.

Continuing along the base of the cliff we noticed eleven caches in the cliff. The fronts of most of them had broken off and appeared like so many hen's nests. Outlines of five dwellings were found at the base of the cliff. Except for an occasional cache no more ruins were found.

After dinner at camp we decided to open the mescal pit. Two votes said it would be charred while one maintained that it would be just right. Upon opening the pit and lifting the mescal out, we found that it was not yet done. It had a sweet taste but was very tough and did not compare at all with a specimen roasted by the Havasupais and which was waiting to be sampled when we should arrive back at the south rim of the Canyon.

With the approach of darkness the air seemed to be colder than at any time since our arrival. Chief Ranger Brooks remained in his position next to the rock wall. Ranger Brown decided to sleep next to the large rock that had been heated by the fire in the mescal pit. The park naturalist selected a position between the mescal pit and a rock wall. A strong wind sprung up and seemed to come across the snow-clad Kaibab Plateau and down the canyon. At midnight Ranger Brown "froze out" and built two fires. At one A. M. the park naturalist got up and built three fires. From then until morning it was necessary to hug warm rocks or pull them against the blanket for warmth. At daylight Ranger Brown called us for breakfast which we ate and started on the return journey.

Considerable distance was saved on the return trip by remaining high on the plateau and avoiding the numerous side canyons. By 11 A. M. we arrived at Phantom Ranch and returned to the south rim the same day.