

GRAND CANYON NATURE NOTES



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WIND RIVERS of the GRAND CANYON

By Assistant Chief Ranger George L. Collins

ALL Grand Canyon waterways, including not only the Colorado River, but several tributary streams as well, are characterized by their extremely unusual surroundings. They become immediate centers of interest wherever seen because they are practically the only animating features disclosed to view. There is an absorbing interest for anyone in watching the Colorado River's wild rush through its narrow channel deep down within the Grand Canyon. One cannot help but be deeply stirred in such a setting by the strange personality of power, mystery and loneliness the river manifests.

Almost all visitors are caused to reflect on the story of relentless wearing away expressed by the Grand Canyon streams, with its many ramifications in thought of beauty and size and power. Such reflection is brought about primarily because people are able actually to see the streams at work. Observational evidence of such things always seems most impressive as is attested by the idea that although there are other streams flowing within the Grand Canyon - mighty streams, in fact, covering the whole area - they are nevertheless quite ignored by the average visitor simply because he cannot see them. Yet there they are; working more gently and with less concentration than the rivers of water perhaps, but as ceaselessly contributing their share in the general scheme of things. You have guessed by now that the reference is to those other great streams - streams of air which twist and swirl so sleekly in and about the Canyon.

On some cool day you may have witnessed the smoke from Grand Canyon Village flowing along close to the ground and then over the Canyon rim to tumble down and down into the depths, perhaps for some hundreds of feet or more before it disperses.

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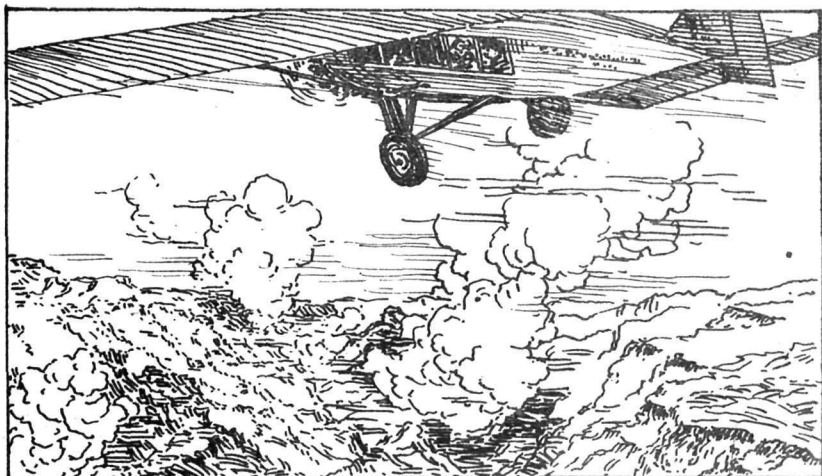
This sight occurs frequently during periods of cool or cold weather when smoke hangs heavily and the prevailing wind, in flowing up from the south over gradually elevating land surfaces, becomes steadily colder and heavier until, on reaching the rim, a giant air cascade occurs just as would a waterfall. If the village chimneys are smoking in any volume at that time, the course of air in its fall will be indicated somewhat as the smoke is carried along.

Grand Canyon Airlines pilots tell us that the prevailing southwest wind averages some 800 feet in depth or thickness. At times it may be much greater, depending, of course, on temperatures and the accompanying fluctuations in density. Above it are other air currents in succession reaching up through the troposphere and tropopause to those frigid and vaporless levels of the stratosphere.

As the air stream tumbles down into the Canyon it expands swiftly due to higher temperatures encountered. (The difference from rim to bottom being about 15 degrees normally with a far broader change at times.) The action here is the same as occurs when cold air is admitted into a heated room. It settles toward the floor until lightened by warmth and expansion. Then it rises toward the ceiling. So does the stream of air we are following settle into the Grand Canyon to join with other local circulations in forming a great up-draft or vertical column which, if visible, would certainly appear as a gigantic fountain rising generally over the central portion of the Canyon.

This fountain is ceaseless in its activity since the Canyon is so deep that air at rim temperature never reaches the bottom. Quite infrequently, however, during periods of especially cold weather, it may not rise more than a short distance before being equalized and largely dispersed, by refrigeration penetrating from rim areas for a considerable distance down into the gorge.

In addition to the stream of air we have been tracing, there are many other local air currents to complete the picture. For instance, there are drafts coursing up and down the inner gorge, and also the smaller side canyons.



Apparently the air rolls and twists in a continuous side play attendant on the general trend. But in all the mysterious tumult of convection currents which one would see if air were visible, the great up-draft would no doubt be the most imposing feature. Just as a symphony is built around a central theme so does our fountain "carry the air" in the magnificent symphony of inner-canyon winds.

Sometimes there is immense force shown by this fountain of air. Aviators have passed over the Canyon edge at a thousand feet or more above ground and after entering the zone of upward flowing air found their planes steadily elevated for hundreds of feet simply through the lifting power of this current. One pilot told us that a glider could probably ride the canyon winds for days at a time with no particular struggle for elevation - perhaps sometime it may be tried.

Since the air is thus able to support such large bodies as air-crafts, it is not hard to imagine how easily it carries its mass of fine sand-particles, sometimes accompanied by rain, as cutting tools with which to grind away at canyon walls in the usual manner of wind erosion.

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Aircraft not of man's design sometimes ride the Canyon air streams and by their presence disclose more evidence of interest to our story. These are masses of vapor, the state-ly cloud formations which sail upward in vast squadrons so quietly and beautifully after some local storms.

We find that during a storm period the air is unusually heavy laden with moisture and it is probably somewhat colder. After the air stream has tumbled down into the Canyon and expansion has taken place, it rises in the up-draft to the upper levels where refrigeration and cloud creation follow quickly; just as the hot, damp air gushes out of your tea-kettle spout to vaporize almost immediately as it comes in contact with the cold air. Sometimes this action occurs far below the Canyon rims and the clouds bore upward, seemingly as ships on a vertical ocean.

Perhaps during such a period conditions will cause rain to fall from these clouds of vapor - again, just as condensation from your tea-kettle is so great at times that drops of water fall and splutter out upon the stove. Not always, by any means, but occasionally, rain will fall into the Canyon and be absorbed by the warmer and dryer air near the lowest levels to such degree that only a few drops ever reach the bottom. Inner-canyon trail parties have thus actually passed with no discomfort directly under showers of rain which have given higher reaches of the Canyon a good soaking.

Probably there is nothing so unusual about air streams of the Grand Canyon, at least to the average visitor, that any special effort need be made to point them out to him. They are, however, vastly important as an indication of those many forces of nature which are ceaselessly at work in the never-ending process of creation going on about us, not only at Grand Canyon, but wherever else we are as well.

Not long before this issue of Nature Notes went to press the writer was one morning sweeping from the parapet of Yavapai Station a few hours' accumulation of fine sand particles deposited there by the wind. Only a light breeze was blowing that morning. Through its gentle pulsing could occasionally be heard a muted bass from the Colorado River far below. Wisps of clouds, like fairy fingers light entwined, were forming in the sea of sky which fills our mighty gorge.

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As I paused for a moment to absorb something of the glorious spectacle disclosed, the whine of a powerful airplane motor came into hearing. Soon the machine appeared like a lazy bumble-bee singing dolefully along its course. There was the river, the Canyon, the clouds, the wind and the airplane. At my feet was a handful of sand. How closely related they were; how closely interrelated with the forces of nature is man's mastery of his environment.

It seemed, as sweeping was resumed with measured swish in full attune, that something might be said to correlate the many interesting thoughts about the scene at hand. And so, in time, wind rivers of the Grand Canyon reflect themselves in Nature Notes.



The parapet
Yavapai Station

IS THERE GOLD IN THE CANYON?

By Park Ranger H. R. Lauzon

A great many visitors, as they stand on the rim, ask if there have ever been any valuable minerals such as gold, copper, or the like, found in the Grand Canyon.

The "Old Timers" who invaded the Canyon Country in the early nineties asked the same question and then proceeded to answer the question for themselves with the help of pack burros and a side of bacon.

Two men of that day who had visions of immense veins of rich ore in the Canyon were W. W. Bass and John Waltenburg. These men found a way to get into the Canyon at a point that is now known as Bass Trail. This is twenty-five miles west of El Tovar Hotel. Mr. Bass was in the Canyon one winter with Chickapanage, a Supai Indian. (Chickapanage in the Havasupai language means Bat-Face.)

While prospecting in a side canyon which is now recorded as Copper Canyon on the United States Geological Survey map of Grand Canyon, they discovered a fair showing of copper ore in a well defined fissure vein. Later Mr. Bass opened the vein by driving in a tunnel over one hundred feet in length and also sinking a shaft on the vein to the depth of fifty feet.

This development work was in a good grade of sulphide ore⁽¹⁾ all the way. The copper values were carried in ores such as bornite, calcocite, calcopyrite, with some galema carrying silver values. This ore occurs in fissure veins in the Vishnu schist eight hundred feet above the Colorado River.

- (1) See Noble, L. F., "The Shinumo Quadrangle", U.S.G.S. Bulletin 549, pp 94-96, 1914.

About 1908, Mr. Bass packed out twenty-five tons of this ore on burros to Bass Camp at the head of the trail. He then hauled it twenty miles in wagons to the railway for shipment.

Across the river and three miles down from Bass Trail in Hakatai Canyon, Bass and Waltenburg discovered and opened a deposit of asbestos⁽²⁾. This asbestos was found in serpentine between layers of limestone, and near diabase. It is a fine grade of chrysotile. The fiber is from one inch to four inches in length and is of great tensile strength. From tests made it was found that one strand three hundredths of an inch in diameter would sustain fifteen and a half pounds. In 1917 several tons of this asbestos were packed out of the Canyon, hauled to the railway and sold to eastern buyers at fifteen hundred dollars per ton.

Miners say, "Silver lies in veins and gold is where you find it". In answer to the question about the finding of gold in Grand Canyon, let me say that the sand along the Colorado River will show a few colors of flour gold when washed with a gold pan. Between Pipe Creek and Horn Creek and about one hundred feet above the high water mark of the Colorado lies an ancient gravel bar. One time I spent several hours panning gravel from this deposit. Each pan produced a string of fine gold. The panning effort netted enough gold and black sand, the sand and the gold being about equally divided, to fill a very small perfume bottle. A prospector would say, "Yes, there is placer gold along the Colorado but there is too much sand mixed with it to make it worth recovering".

- (2) See Diller, J. S., U. S. Geol. Survey Mineral Resources, 1907, pt. 2, pp. 720-721, 1908. Also idem. 1908, pt. 2, p. 705, 1909.



ANCIENT POTTERY REBUILT

by C.C.C.'s

By Acting Park Naturalist Donald E. McHenry

I N these days when the Grand Canyon National Park is a beehive of activity at the hands of the Civilian Conservation Corps, National Industrial Recovery Act Workers and Civil Works Administration Workers, it is worth while noting that some of this industry has found its way into the Educational and Research Division. Four of the C.C.C. boys were assigned to museum detail.

Their first job was to assist Ranger Naturalist Louis Schellbaeh in the reorganization of the archaeological exhibits at Wayside Museum of Archaeology. Part of the work consisted of assembling and restoring a number of ancient Indian pottery specimens. The remarkable skill they displayed in doing this work can be appreciated somewhat by an examination of the accompanying photograph showing the boys actually at work in the office of the Park Naturalist. Most of the pots shown were in a number of broken bits before the work commenced. In some cases plaster of paris substituted for the missing pieces as can be seen in the hands of the boy on the right. They rebuilt completely seven pots and cleaned some miscellaneous fragments.

In addition the boys cleaned and catalogued about 2,500 pot sherds from about 100 surface collections at Indian Pueblo ruin sites in Grand Canyon; three Indian baskets of the Colonial Period; a pair of Indian weaving sticks; about 30 bones of various descriptions and uses; a dozen basket fragments; two pairs of fiber sandals and 250 arrowhead specimens. A large cross-section of Western Yellow Pine, exhibited at Wayside Museum, showing dated tree rings was polished in order to bring out the rings more distinctly. Some archaeological materials from the Wayside Museum were re-catalogued.

After the archaeological work, these C.C.C. boys gathered together about 350 plant specimens which had been collected in the Canyon in the past few years. These plants had been stored away because of lack of time and means for properly arranging them. This will make a valuable additional display to aid visitors to understand the floral structure of the Canyon. Much of the value of this scientific material lies in the information about it. This information has been carefully classified and catalogued by the boys. Certainly one very necessary qualification for these workers is versatility and the boys on the museum detail are well supplied with it.



Many of our readers will find it difficult to realize the amount of careful, painstaking work all this has involved. Add to this the fact that none of these boys had had any previous experience in this kind of work. But a very valuable asset has been their decided interest in this project and their willingness and ability to learn. Such work as these C.C.C. boys are doing can be classed as the highest type of conservation work. They are to be congratulated upon such a splendid spirit of cooperation which alone makes possible the execution of this valuable work.

Miscellany

THE morning of November 23, 1933, as Miss Earlene Shirley was driving along the East Rim Road just beyond the Yavapai Point branch she saw a coyote chasing a young deer. She tried to run the coyote away, but it hid from her and she soon gave up the hunt. She had not gone far before she heard the deer cry out two or three times and then - Silence. Doubtlessly the coyote had a good deer steak for its morning meal that day.

Robert R. Williamson

A male Shufeldt Junco, Junco oreganus shufeldti, killed itself on November 17, 1933, by flying against the large plate glass window at Yavapai Observation Station. This bird proved to be banded and from the band number was discovered the fact that it had visited the exact locality almost a year previously - November 16, 1932. It also had appeared at Yavapai on the 19th of December, 1932.

Geo. L. Collins

A tourist reported having seen a Rocky Mountain Cougar crossing the road on the East Rim Drive near Desert View, November 14, 1933.

On several occasions during the last month some of the C.C.C. boys stationed in the bottom of the Canyon, near Phantom Ranch, have reported being eye-witnesses to deer swimming the Colorado River. On one of these occasions they were surprised at the manner by which a doe and her two fawns estimated the flow of the stream so that with the speed of the current and their swimming they were able to land on the opposite side at the only possible place from which they could have climbed out of the water. This is just another proof that deer, at least, do not find the Canyon an impassable barrier between the rims.

Donald Edward McHenry

Ranger Naturalist Louis Schellbach, who has so helpfully served in the Educational work at Grand Canyon since the beginning of the summer tourist season, has been assigned to the Educational Headquarters at Berkeley, California, as Director of Museum Technique and Archaeological Exhibits for the National Parks and Monuments in the West.

