

NATURE NOTES

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GRAND CANYON NATURE NOTES

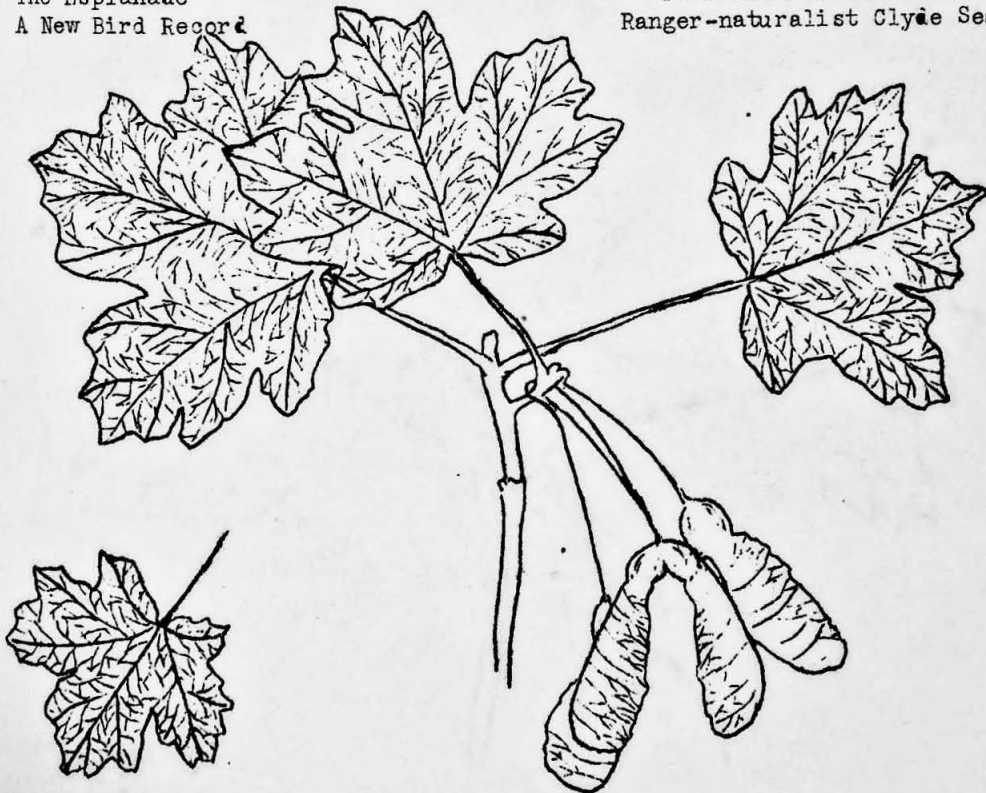
No. 11
September 30, 1930

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.

M.R. Tillotson, Superintendent, Edwin D. McKee, Park Naturalist

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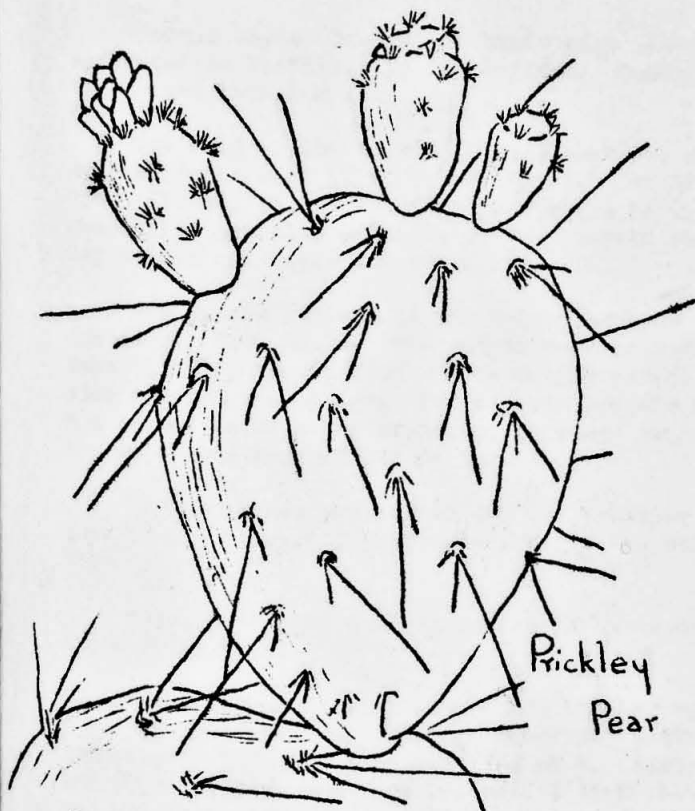


SOME GRAND CANYON PLANTS & THEIR USES

By Ranger-naturalist Pauline Mead

Low, scrubby trees, shrubs and flowers of the northern semi-desert cover the plateau that lies on the South Rim of the Grand Canyon. It was upon these plants and the native game animals that the early Indians and pioneers of the country had to subsist. On first impression it would seem that such a living might be meager enough. But the pinion pine, the Spanish bayonet and the cactus, the century plant and the cliff rose, all contributed leaf, root, stem and fruit, to satisfy the needs of the Indian and the pioneer.

Probably the cactus contributed more and in a greater variety of ways than any other one native plant. It was and still is used as fruit and vegetable, as a forage plant, also for building purposes and the spines were sometimes used for hocks and awls.



The Papago Indians of southern Arizona probably used the cactus more than did any other Indian tribe. The fruit of the big-jointed prickley pear of the species found in the bottom of the Grand Canyon and also that of the giant Sahuaro is prepared by the Papago in a variety of ways. Syrup, candy, preserves, pickles, cheese and drinks are made from the fruit. It is also eaten fresh and is sometimes dried on lattice-work shelves of switches tied together with agave fiber. During the drying process sugar seeps through the rind and crystalizes on the outside of the fruit. Dried fruit is often packed in woven rush bags. It remains somewhat moist in the center and has

about the same consistency as fresh dates. When desired it is cooked as is any dried fruit. ✓

To make syrup from cactus the fruit is boiled for several hours; the juice is strained from the seeds, then poured in wooden troughs and cooled by beating with wooden paddles. When cool it is packed in earthenware jars and stored. It will not crystalize for about two years. The candy is made in somewhat the same way except that it is kneaded by lifting a lump of the material over the head and throwing it down on a stone a hundred times or so. It becomes candied and is packed in earthenware jars

or in empty corn husks. The "cheese" is also made in the same way, but is kneaded twice as much. It is often flavored with vegetable juices.

The cactus stem is used as a vegetable. Young, tender pods of the prickly pear are often peeled, cut into strips, and boiled or fried. They taste something like string beans and are called "Nopalillos." Buds of blossoms are frequently cooked in the same way.

The barrel-cactus, found in the lower parts of the Grand Canyon, contains a great deal of water so is most welcome to a thirsty desert traveler. The Papago Indians during the dry season get their water supply from the cactus. The water is obtained by cutting a slice off the top of the plant, mashing the flesh into a pulp, and squeezing out the water. The water tastes rather salty and herbaceous, but is not unpleasant. It is used by the Indians as a flavoring in cooking and is often mixed with bread dough.

Cactus seeds, because of their oily content are ground up and used as butter on tortillas by the Indians. Sometimes the seeds are parched and ground into a meal.

The wood of the cactus is occasionally used for building purposes, such as frame work in adobe houses, and for making fences. The beautiful fluted, hollow wood of the Opuntia is used for making a number of decorative articles - candle sticks, napkin rings, picture frames, walking sticks and table and chair legs.

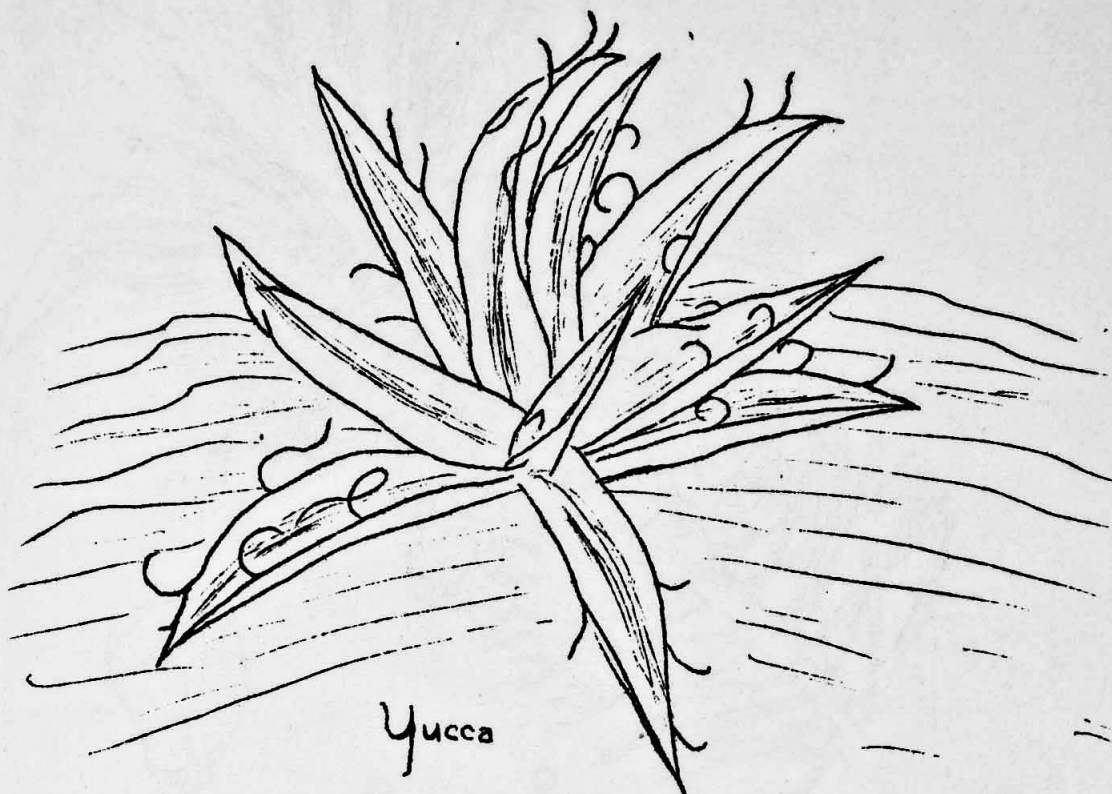
The Mohave Indians of the Colorado River used spines of *Echinocactus* for making fish hooks. The spines were soaked in water until they became pliable, then heated and bent into shape. Needles and combs were also made of the spines. Prehistoric Indians at Iquique were known to use spines as awls for fastening together skins in which the bodies of the dead were wrapped before burial.

If the spines are burned off the prickly pear it makes a fairly good forage plant. The spineless cactus is used quite extensively in this way.

There is a good deal of potash in the cactus and this may be used for a fertilizer.

The Yucca or Spanish bayonet is another very useful plant. The fiber of this plant is found in prehistoric dwellings where it was used principally for making sandals and mats. Today it is the most important fiber used by the Hopi Indians in their basketry. The Yucca leaves are buried in wet sand before they are used. Whip-cord baskets are made by wrapping these fibers around a ground work of bunches of grass

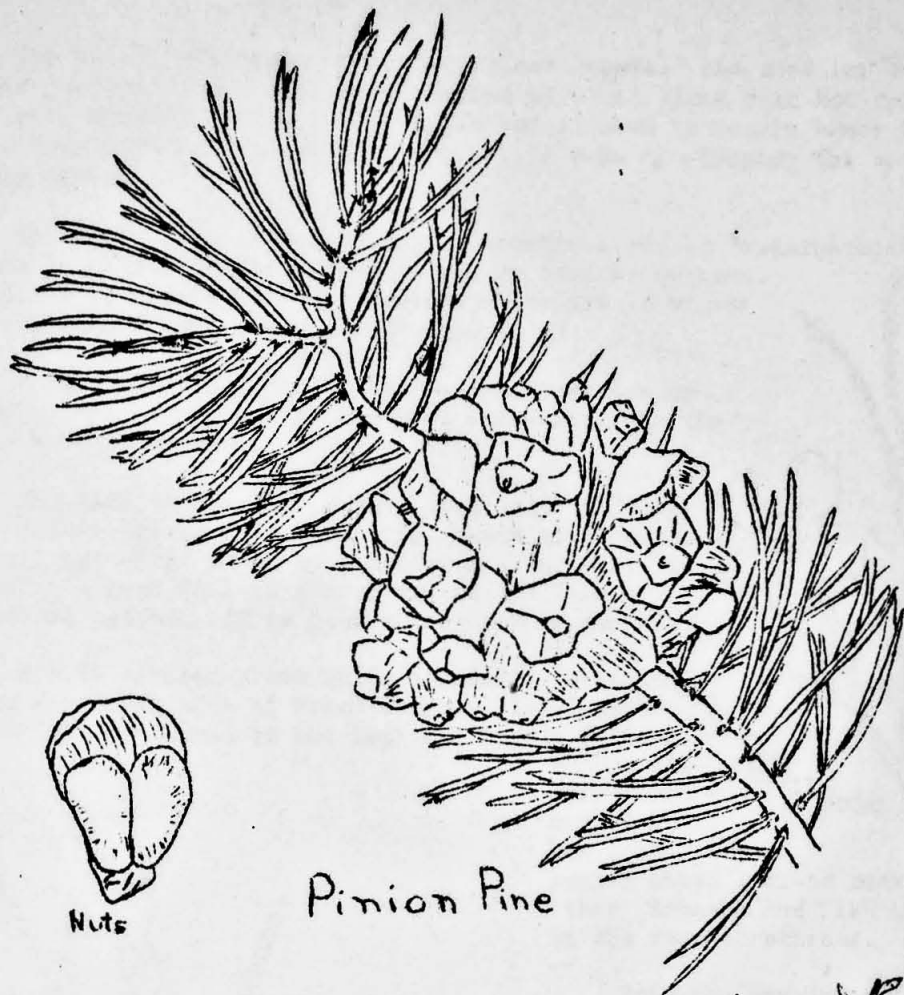
The wicker tray baskets are made by using sumach twigs as ground work and wrapping them with dried branches of rabbit brush. Yucca fiber is then used for a binding around the outside of the basket.



The Hopi pottery makers chew the ends of yucca fibers and use them for brushes in painting their pottery.

The yucca is often called "soap weed" because excellent soap may be made from the root. Both the Hopi and the Supai Indians use it for this purpose. The Hopis use the soap in the wedding ceremony. The yucca root is pounded up and two bowls of soap are prepared in the pueblo of the bride. Before the ceremony the future mother-in-law of the bride washes the bride's hair in one bowl of soap and the future mother-in-law of the groom washes his hair in the other bowl of soap.

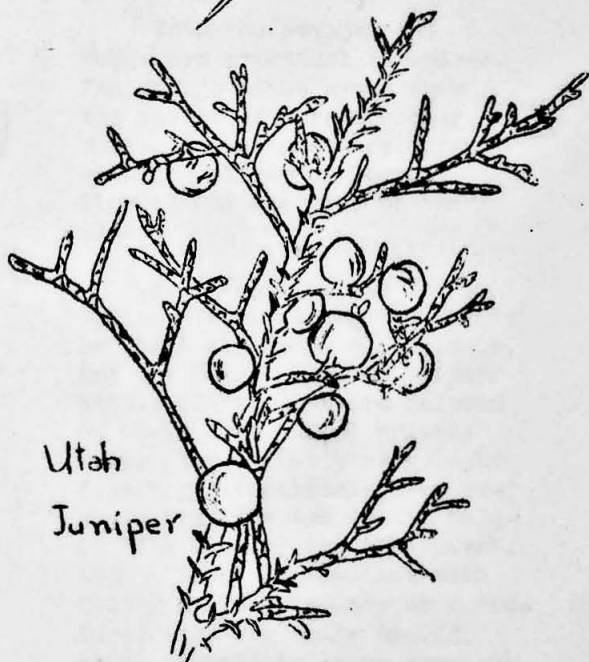
The pinion pine with its rich nut and the Utah juniper with its oily berry have much to offer. The pinion nut, born in baskets at the base of the cone scale, is sometimes ground by the Navajos and used as a butter spread since it contains a high percentage of fat. It is also roasted and ground into a meal. The Hopis use the nut as a shortening in cakes and to enrich stews. It is eaten very commonly as a nut by both the Indians and white people. The pinion wood is used quite extensively by the modern Hopis in constructing their pueblos.



Nuts

Pinion Pine

The juniper berry is used for making gin. The stringy bark makes good fire tinder and was used a great deal for this when the Indians made fire with flint and steel. Beams in many prehistoric dwellings are made of its wood. From the root of this tree the Navajos make a red dye sometimes used in blanket making.



Utah
Juniper

The bud of the agave or century plant "mescal" was used for food by the Supais. These buds were roasted in a pit lined with hot rocks. They were covered with more hot rocks and allowed to remain there for about five days before eating. Tea may be made by steeping the heart of the agave.

The cliff rose or buck brush is sometimes called "quinine bush." If tea is made from the leaves it may be used as quinine. It is the bush that forms the principal browse in winter for the deer of the Grand Canyon region.

Brigham tea (Ephedra) makes an excellent tea by steeping the branches. It was used extensively by the early Mormons in Utah.

The bulb of the sago or mariposa lily, a flower that covers the country along the canyon rims in the spring, was often eaten by pioneers and Indians. It contains a good deal of starch and tastes like a sweetened potato. It is good either raw or cooked.

A wild tobacco grows quite abundantly on both North and South Rims of Grand Canyon. Its leaves are dried and smoked by the Hopi and Navajo Indians.

Before the rain ceremonies in the late summer these Indians smoke this tobacco and blow it in the four directions.

Both the Navajos and Hopis are practical botanists. The Navajo plant names show the result of careful observation. The names are descriptive of roots, leaves, flowers and the uses of the plant.

For these Indians there are no dieties among the plants as there are among the animals. But the Hopis place on prayer sticks plants that are beloved by their gods. Hopi priests prize plants that were brought from a great distance, for example from the sea coast, called "The Land of the Far Water". Such a plant is combined with sacred smoking tobacco or introduced into the charm liquid, which is used in every ceremony to mix paint for the prayer sticks.



So the semi-desert of the South Rim of Grand Canyon is far from being a desert to man. Even the spiny cactus is his friend and the twisted scrubby trees, the sharp-pointed yucca, and the sweet-smelling cliff-rose of white flowers and plumes.

THE CARRYING POWER OF THE COLORADO RIVER

By Ranger-naturalist R.L. Nichols

The U.S. Geological Survey has stationed at the bottom of the Grand Canyon, near the mouth of Bright Angel Creek engineers whose job is to measure the velocity of the river, its depth, width, silt content, discharge, etc. Among the many interesting facts which they tell us, none is more startling than that the Colorado River on the average carries past any given point approximately 1,000,000 tons of sand and silt every 24 hours. I think everyone who has ever been down to the river will agree that although it is too thin to be classed as a solid, it is much too thick to be used as a beverage. And none of us would ever imagine that the river carries 1,000,000 tons of silt per day. If man wanted to equal the work of the Colorado as a transporting agent he would have to use 200,000 five-ton trucks continuously for 24 hours a day. But that is not all. During the first week of August 1926, there was a series of very heavy thunderstorms upstream which caused the swollen river to carry past the gauging station near Bright Angel Creek 26,000,000 tons of sand and silt during one period of 24 hours. If we had gotten all the trucks in Boston, New York, Los Angeles - every truck in the whole United States all of these working together for an entire day could not have equalled the carrying power of the Colorado for that particular time. The Colorado is indeed a most powerful transporting agent; a mighty river!

DINING SOLITAIRE

By Ranger-naturalist E.W. Count

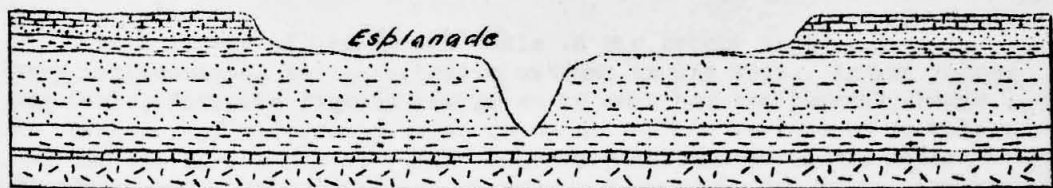
Visitors who come to the South Rim frequently encounter the little rock squirrel (*Otospermophilus grammurus grammurus*); and are distinctly reminded of the common gray squirrel (*Sciurus sp.*) found in various forms over most of the United States. But the rock squirrel hugs the ground and leaves it only occasionally. He is frequently to be seen along the rim of the Canyon.

His body is mottled black and white on back and tail, with a decided brownish tinge to the posterior half of the back. The anterior is only slightly brown, the belly is lighter. The ears are a dark sepia on top and inside. As a whole, the animal is a light brownish-gray.

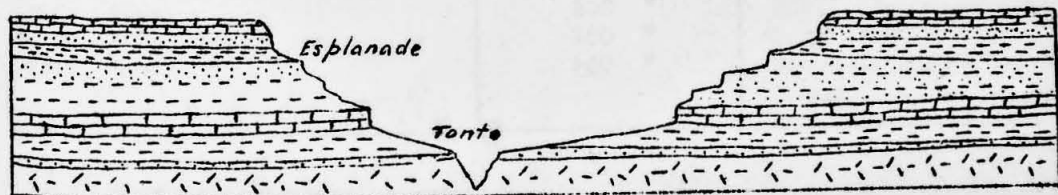
Traveling down the brink one day, I met a little rock squirrel sprawled over a Serviceberry bush, pulling twigs towards him from all sides, and nipping off the fruits. Gradually his cheeks, below his ears, swelled out, giving him the ridiculous appearance of a case of mumps. He did not mind me; he clambered down, passed me within a few inches, then disappeared down the Canyon. Farther on I at last came upon him again, perched on the brink of a remote little cave in the limestone, where he could command a soul-filling view of the Canyon depth. One berry after another he worked forward from his cheeks, held it in his paws, chewed out the seeds with that squirrel-chatter of the jaws, then, with some quick, glancing pats of one paw against the other, such as you would use to slap dust or grime from your hands, or a sudden, babyish toss of those paws, he sent the hulls of the fruit fluttering canyonward.

THE ESPLANADE

By Park Naturalist E.D. McKee



Cross-section of Grand Canyon in western part (Kanab Cr.)



Cross-section of Grand Canyon in Bright Angel area to east.

The beautiful and classical hand sketches of the Toroweap Country by Holmes bring to mind a section of the Grand Canyon vastly different in appearance from the well known Bright Angel region farther east. Yet the western area is equally fascinating both from a scenic and a geologic standpoint. It is in that section that the topography of the Canyon consists, from top to bottom, of first a drop representing the Kaibab and Coconino formations, then a wide bench made in the Hermit shale, and finally another and still greater - a very precipitous drop formed by the Supai and underlying formations. Little wonder is it that Dutton from observations in that region was led to describe this wide, flat shelf-- the Esplanade, as the proof of a definite pause in the erosion cycle which brought about the steep-walled Grand Canyon.

Recent geologists studying the Grand Canyon where its topography has a very different character in the more eastern areas, have readily recognized an error in Dutton's conclusions, and have found another explanation for the Esplanade bench. An examination of the nature of the material, the soft Hermit Shale, that forms this shelf, readily explains the situation. In brief, the Esplanade is today considered to be the natural result from the existence of a very soft layer of rock between hard, resistant ones. Rapid erosion of the soft layer has been inevitable, and has resulted in the forming of a platform whose width varies with the thickness of the middle layer. This is a situation exactly analagous to that of the Tonto Platform in the eastern part of Grand Canyon.

The thinness of the Hermit Shale in the Bright Angel region is very noticeable as is the opposite extreme in the west. In the following table, definite figures are given to show how the general change in character of topography is so dependent on the variations in thickness of the Hermit Shale. This apparently substantiates the modern theory.

Location	Thickness	Width of Bench
Apache Point, Great Thumb	550 feet	1.2 miles
Havasupai Point	400 "	.2 mile
Topaz Canyon	300 "	.1 "
Bright Angel Trail	250 "	Less than .1 mi.
Desert View	150 "	Bench at minimum

A NEW BIRD RECORD

By Ranger-naturalist Clyde Searl

The name of one more bird has been added to the already large list of Grand Canyon National Park. On the 31st day of August, a number of Black-billed Magpies (*Pica pica hudsonica*) were seen at Bright Angel Point, North Rim, by the writer. With him at the time was a group of people returning from a nature walk, and many of the party spoke of the characteristic note of the Magpie.

Mrs. R.E. Laws, wife of a park ranger stationed at the North Rim, reports having seen Magpies near the ranger station on the same day. Magpies have been reported in northern Arizona, but not in Grand Canyon region until this year.

THE CANYON TOWHEE

By The Park Naturalist

Another name to the Grand Canyon bird records was added on September 25. The Canyon Towhee was seen on the South Rim in company with a flock of Gambel's Sparrows, finches, and other birds which were undoubtedly migrating. The total number of species of birds recorded from the park is now 158.

