

GRAND CANYON Nature Notes



October
1931

Vol. 5-No. 12

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

Vol. 5
Grand Canyon Nature Notes

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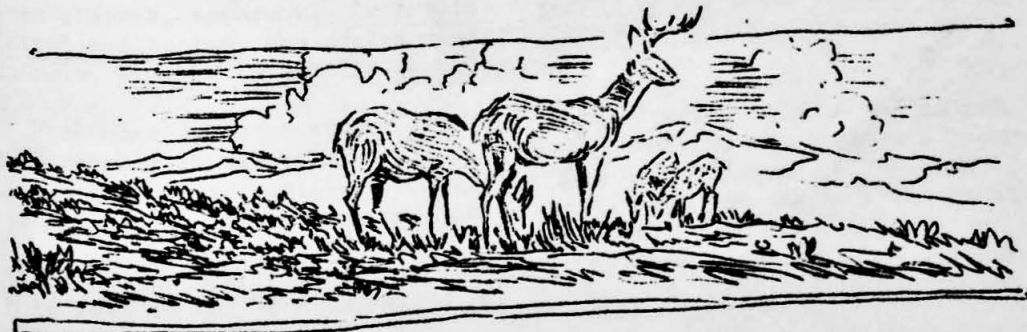
This Bulletin is issued monthly for the purpose of giving information to those interested in the natural history and scientific features of the Grand Canyon National Park. Additional copies of these bulletins may be obtained free of charge by those who can make use of them, by addressing the Superintendent, Grand Canyon National Park, Grand Canyon, Arizona.

M. R. Tillotson, Superintendent

Edwin D. McKee, Park Naturalist

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A TRIP DOWN TANNER TRAIL

By Vernon Bailey, Chief Field Biologist,
U. S. Biological Survey.

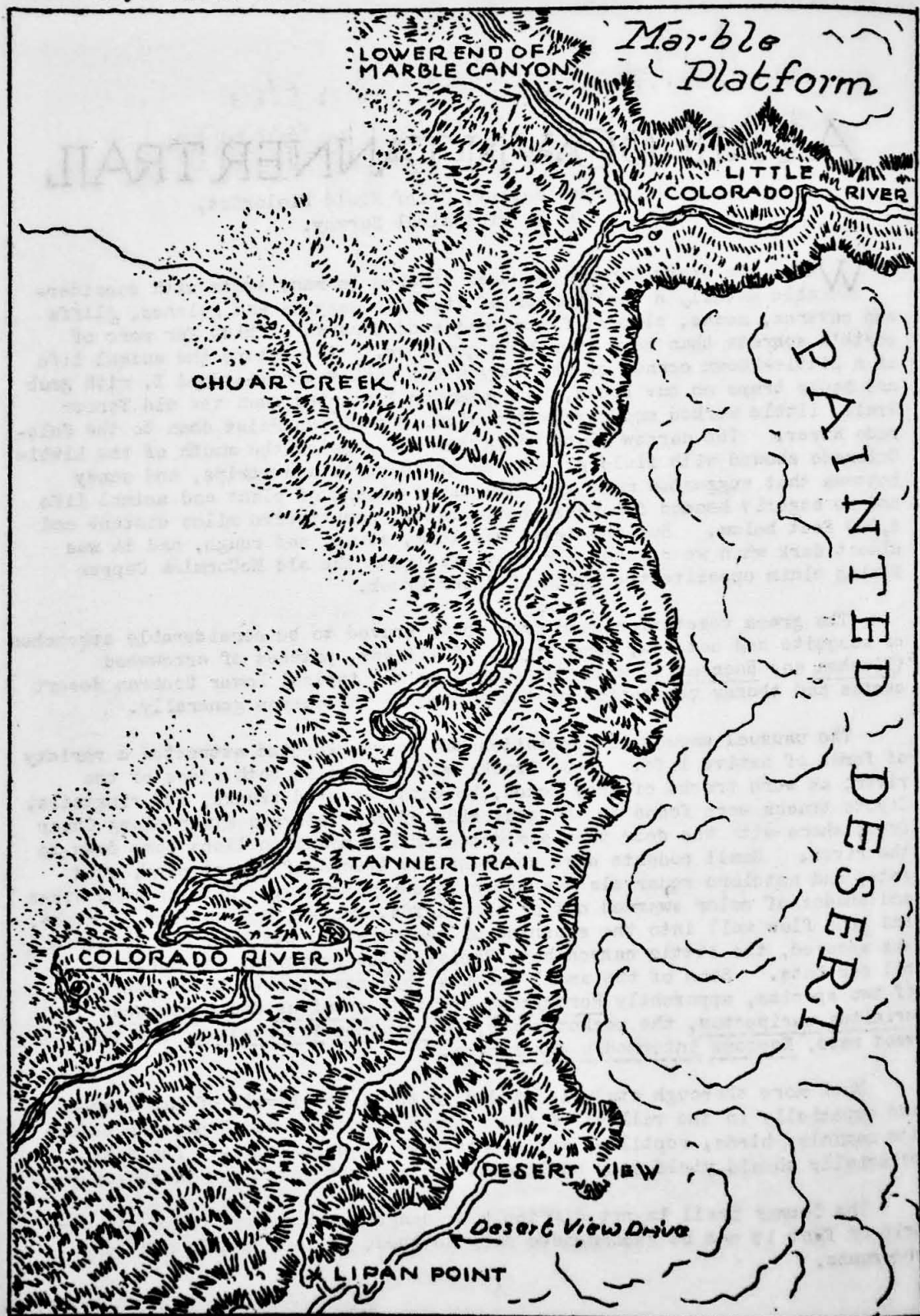
WHILE the Grand Canyon has been studied in many spots with considerable detail, a vast number of its side canyons and gulches, cliffs and caverns, mesas, slopes, flats, and sand bars still hide far more of earth's secrets than have ever been given up. To explore the animal life of a little-known corner of the canyon the Park Naturalist and I, with grub and mouse traps on our backs, on September 1 started down the old Tanner Trail, little worked and rarely traveled, from Lipan Point down to the Colorado River. The narrow flats along the river below the mouth of the Little Colorado showed with field glasses as green spots and strips, and sandy bottoms that suggested more than the usual amount of plant and animal life and we eagerly headed for these bottomlands, some twelve miles distant and 5,000 feet below. But the trail was long, steep, and rough, and it was almost dark when we reached our camp site near the old McCormick Copper Mining claim opposite the mouth of Chuar Creek.

The green vegetation seen from above proved to be considerable stretches of mesquite and catclaw, some strips of willows, patches of arrowweed (*Pluchea* and *Baccharis*) well surrounded by the typical Lower Sonoran desert cactus and thorny vegetation of the bottom of the canyon generally.

The unusual amount of vegetation had as we expected attracted a variety of forms of native life. Deer tracks were common on both sides of the river, as were tracks of gray foxes, bobcats, spotted skunks, and ringtails. Coyote tracks were found on the west side of the Colorado River along Chuar Creek where with the deer they and occasionally mountain lions come down to the river. Small rodents were abundant and tracks of desert mice, wood rats, and antelope squarrels were seen in sandy places. Bats of many sizes and shades of color swarmed out of the cliffs, cracks, and caverns at night, and some flew well into the sunshine of the morning, but only one specimen was secured, the little canyon bat, *Pipistrellus hesperus*, the smallest of all our bats. Some of the small rodents collected proved to be deer mice of two species, apparently *Peromyscus eremicus eremicus* and *Peromyscus crinitus auripectus*, the pocket mouse, *Perognathus intermedius*, and the wood rat, *Neotoma intermedia desertorum*.

Much more thorough study is needed in the lower levels of the canyon, and especially in the valleys of Chuar Creek, Kwagunt, and Nankoweep before its mammals, birds, reptiles, and plants will be well known. The bats especially should yield many additional species not yet taken in the canyon.

The Tanner Trail is not difficult or dangerous but just for a pleasure trip on foot it can be recommended only to those of good muscle and long endurance.



Additional Notes on the TANNER TRAIL TRIP

By Edwin D. McKee, Park Naturalist.

BECAUSE the eastern section of the Grand Canyon is so entirely different in profile and in topographic features from the better known Bright Angel section further west, biological studies in the former area promise to be especially important in explaining some of the major problems of the region. Further east and northeast in the sandy, open stretches of the Painted Desert and House Rock Valley have been found Kangaroo Rats, Earless Lizards, Tiger Lizards, Horned Toads, and numerous other mammals and reptiles which are as yet unknown from the rocky slopes of central Grand Canyon. In eastern Grand Canyon, however, among the gently sloping red shales and sandstones and the extensive sand beaches, are found conditions not unlike those in the Painted Desert. Here one might expect some of the interesting animals of the open desert to have found conditions to their liking and natural routes of travel through the Marble Canyon or the gorge of the Little Colorado. To search for these animals then was the principal objective of a recent trip down the Tanner Trail.

During the period between September 1 and September 4, Mr. Vernon Bailey and I covered in a general way the area on the east side of the Colorado River between the great bend to the south and a point probably less than a mile below the mouth of the Little Colorado River to the north. (We were unable to go the entire distance to the junction because of sheer walls that rise directly from the river bed a short distance below it.) We also explored and collected up Chuav Creek on the west side of the river for a distance of some three miles.

Although the Tanner Trail trip did not produce any of the rather exciting results which I, at least, had anticipated, still it succeeded in giving negative evidence and in showing what forms of life are abundant in that area. Mr. Bailey in his account of the trip has already told about the mammals observed and collected, and about the principal plants found in the region. I shall now briefly list the birds and reptiles recorded since these too are of scientific and general interest.

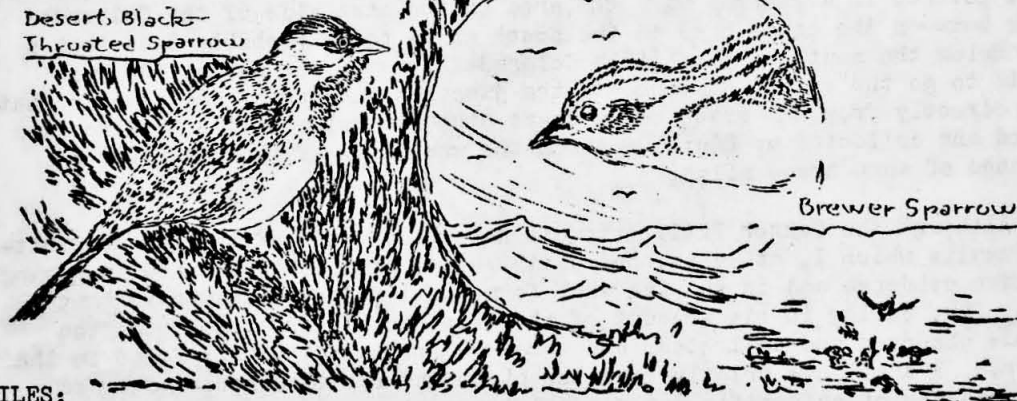
BIRDS

<u>Date</u>	<u>Name</u>	<u>Remarks</u>	<u>Locality</u>
September 1	Lead-colored Bush-tit	Flock	Above Redwall
	Canyon Wren	Numerous	Various altitudes
	Rock Wren	Several	Canyon bottom
	Yellow Warbler	Probably Seneca	River beach, below camp
	Sandpiper	Species ?	River beach, below camp
	Mourning Dove	Several	Mesquite by river, camp

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BIRDS (Continued)

<u>Date</u>	<u>Name</u>	<u>Remarks</u>	<u>Locality</u>
September 2	Green-tailed Towhee	Two	Mesquite by river, camp
	Mourning Dove	Several	River beach near camp
	Arkansas Kingbird	Found dead	River beach near camp
	Flycatcher	genus Empidonax	Mesquite by river, camp
	Brewer Sparrow	Very tame	$\frac{1}{2}$ mile up Chuar Creek
	Western Vesper Sparrow	Several	1 mile up Chuar Creek
	Western House Wren	One	2 miles up Chuar Creek
	Sharp-shinned Hawk	Pair	Mouth of Chuar Creek
	Western Gnatcatcher	Flock	Mouth of Chuar Creek
September 3	Western Gnatcatcher	Flock	Mouth of Chuar Creek
	Western Vesper Sparrow	Several	River beach, camp
	Goldfinch	Only heard; species ?	River Beach, camp
	Pinyon Jays	Flock	Near Camp
September 4	Cinnamon Teal	Six	River below camp
	Desert Black-throat Sparrow	Two	Lower part of trail
	Brewer Sparrow		Lower part of trail



REPTILES:

- Collared Lizard *Crotaphytus collaris* (Say)
 - Large specimen collected near mouth of Chuar Creek
 - Seen also near lower part of trail
- Uta ornata symmetrica*
- Uta stansburiana stejnegeri*
 - Several specimens collected in sand near camp, east side of river.
 - Fairly numerous.
- Desert Scaly Lizard *Sceloporus magister* Hallowell
 - One small one collected among logs near camp
- Desert Whiptail Lizard *Cnemidophorus tessellatus tessellatus* (Say)
 - One collected and several others seen along sandy beach on east side of river.

AN HISTORICAL RECORD

AS a supplement to an article appearing in the January issue of Grand Canyon Nature Notes (Vol. 5, No. 3) concerning an exploration of the Colorado River by Lieutenant Ives of the War Department in 1857-58, the following letter received by Superintendent Tillotson from Mr. Godfrey Sykes will be of import to those interest in the early history of the Colorado River region:

"Dear Mr. Tillotson:

In the prosecution of the historical portion of my work in the Colorado Delta, I have lately had occasion to examine the files of several of the early Californian newspapers for contemporary information concerning the river, and have been fortunate enough to find the record of an early voyage from the canon to the sea of which I have had no previous knowledge.

It is contained in a personal letter written by Antoine Leroux to Asst. Surgeon H. R. Wirtz, U. S. A., and published by the latter in the San Diego Union of June 20th, 1857. In his covering letter Mr. Wirtz states that he has 'just received the following letter from my old friend Antoine Leroux, who now resides in New Mexico, which is given verbatim'

The letter follows:-

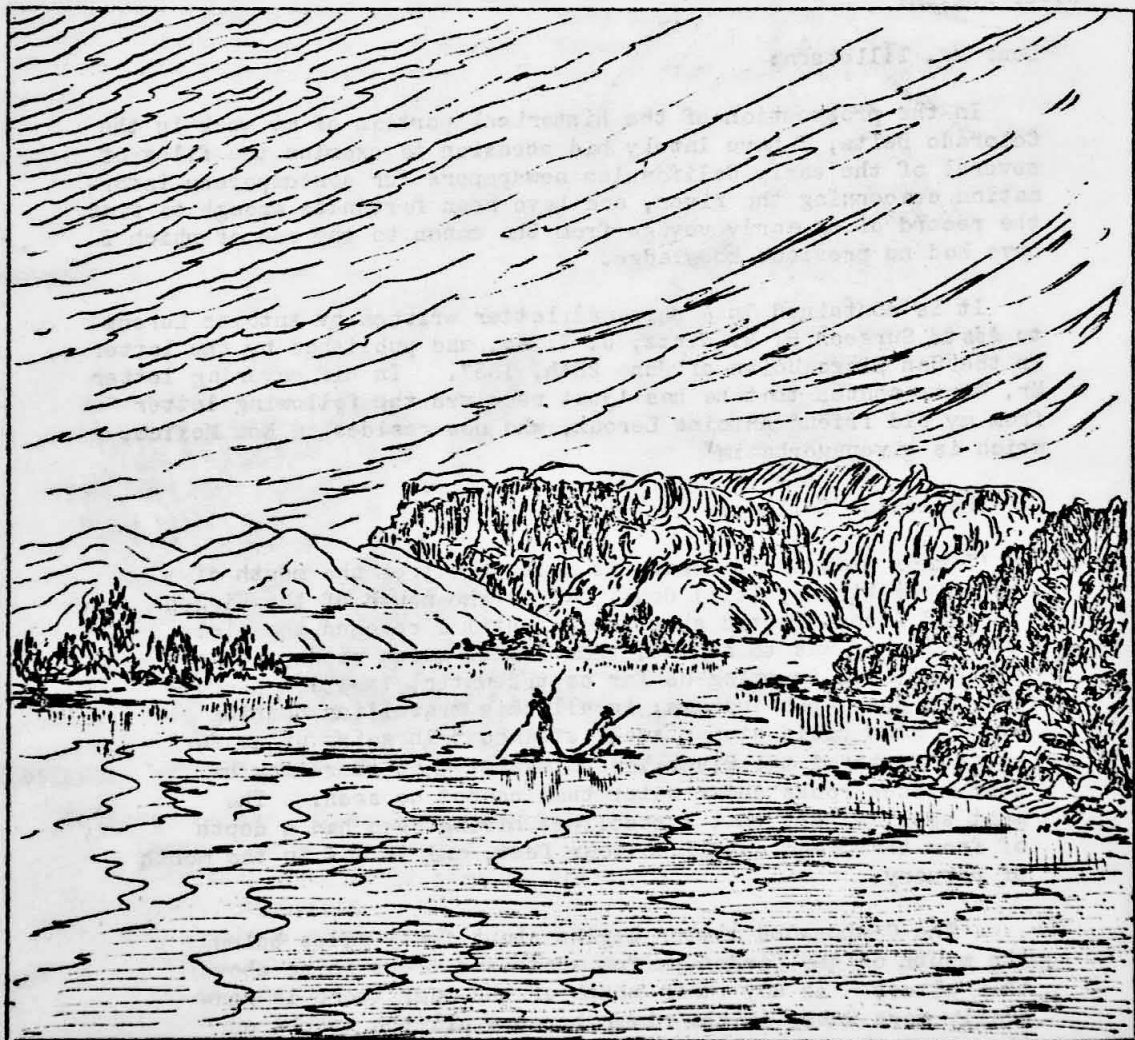
'I know that the Colorado is navigable from the mouth of the River Virgen, (sic) down. From the mouth of the Virgen in 1837 I constructed skin canoes until I reached the place where timber was to be had; then I made seven wooden canoes and continued trapping as far as tidewater, in which place I met the Co-ca-pah Indians; in all this travelling nothing that I know could stop a small steambot in going up as far as the mouth of the River Virgen except that there may be some hidden rocks under water than cannot be seen. The most shallow part that I recollect having seen had a depth of from three and a half to four feet, and it was in the month of January.

The Cottonwood timber begins about forty miles below the mouth of the Virgen, a few scattered trees being above that place. In any other month of the year there is generally more water in the river because all the creeks on the river above the big canon are frozen in that month*.

Leroux, as you will doubtless recall, was one of the better known of the group of trappers and explorers who made history in the Southwest in the

early years of the nineteenth century. He was much in northern Arizona, - or as it was then, the Spanish Province of New Mexico, and has left his name about the San Francisco Mountains.

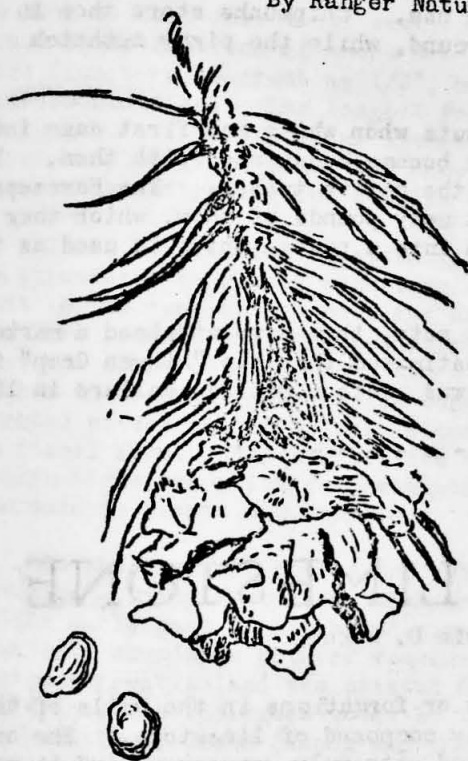
As far as I know, his letter is the earliest actual personal account of a voyage from the canons to tidewater. I have your little monthly magazine in mind in sending it to you".



View of Northern Entrance to Monument Canyon

PINYON PINE NUTS

By Ranger Naturalist K. A. Redburn



OUR attention has recently been attracted by the numerous little brown nuts which we see lying on the ground beneath the Pinon Pine trees everywhere along the South Rim of the Grand Canyon. All during the past summer months many cones were growing on those trees in their upper branches. In the middle of September these cones matured, started to open, and due to heavy winds and cold weather at that time began dropping their nuts to the ground. Now we see many Indian parties and also groups of white people out collecting these nuts -- to be used during the long winter or to be sent away to friends.

The Grand Canyon region is especially fortunate in having so many of these trees, (*Pinus edulis*), which furnish a bountiful supply of nuts. During the months of September and October the seeds of these pines complete their growth within the cones which house them; the cones then open, apparently in the same manner that

flowers do, dropping the seeds. These are the nuts, called Pinon Nuts or Pine Nuts, that have become famous because of their sweet white meat which can readily be extracted from the shells. The shell is soft, and can be broken with the fingers or teeth. The kernel is of one solid piece, white, and sweet. The nuts are found housed in the female cones of the trees. Each cone is made up of a number of woody wings, and at the base of each are two small cavities in which are found the nuts, so a single cone contains a great many. In examining a large number of cones, I have found as many as 34 nuts in an individual. The average is about 15.

The occurrence of the nuts of Pinon trees is somewhat occasional. A large crop occurred in 1927, a medium sized one in 1929, while this year the growth is about average. No doubt the occurrence of a good growth of cones on any individual tree is not an annual event, but with so many trees in this area, it is usually bountifully supplied with nuts even though productive localities may change from year to year. Undoubtedly the amount of precipitation during the preceding winter months and during the time of growth, has much control of both quality and quantity, in the development of those nuts.

Pinyon nuts form the principal winter food for the chipmunks and squirrels in Grand Canyon National Park. It is a common occurrence to see these nuts being collected and stored away for future use. Chipmunks store them in their nests; squirrels bury them in the ground, while the pigmy nuthatch places them in the bark of trees.

The Indian was making use of Pinyon nuts when white man first came into this region, so it was through him that we became acquainted with them. The nuts are being used today in many ways by the native tribes. The Havasupais, Hopis, Navajos and others annually collect many pounds of them, which they grind into a meal. The Navajos make them into a paste, which is used as the white man uses ordinary butter.

Due to such popular demands for these nuts, they have attained a market value of forty cents per pound. It was estimated that the "Pinyon Crop" in Mexico and the Southwestern United States was worth a million dollars in 1927.

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CRINOIDAL LIMESTONE

By Park Naturalist Edwin D. McKee.

FIVE of the fourteen major divisions or formations in the walls of the Grand Canyon are largely or entirely composed of limestone. The conditions under which these were formed varied extremely, moreover, and in most cases are not yet entirely understood. Limestones may be formed, (1) by bacterial precipitation, (2) as the result of photosynthesis of plants, (3) by evaporation as in caves, springs, and playas, (4) by mechanical deposition of calcium carbonate fragments, (5) by a change of conditions allowing the escape of CO₂ from water, and (6) through the accumulation and cementation of organic structures. The Bass limestone and limey parts of the Chuar and Supai formations are known to have been formed as reefs by the action of primitive plants (algae). Limestone deposited as travertine in recent times is found in many places in Grand Canyon, notably around the waterfalls of Havasu Creek, while many of the other limestones of Grand Canyon were formed from the skeletal remains of sea animals.

One of the finest possible examples of limestone formed from the remains of marine animals was recently discovered in the Redwall formation of Grand Canyon. About midway in that stratum, where the Kaibab Trail passes is a layer about ten feet in thickness which at first glance appears to be composed of crumbly sand. Closer examination, however, shows that the material is actually a mass of crystals of the mineral calcite and that these preserve the forms of multitudes of crinoid stems (sea lillies). In most parts of this

layer the crinoids make up the entire rock but in some areas the rather well preserved shells of another sea animal (*Spirifer centronatus*) are found associated with them. The so-called "stems" of the sea lillies are much broken so that at best only small sections of them remain intact, but many beautiful round cross-sections of these are prominent throughout the limestone. Some have diameters as great as $1\frac{1}{2}$ ", but a majority are smaller, even approaching microscopic size. The longest fragment to be found was a section about $3\frac{1}{4}$ " in length. This crinoidal limestone is as fine an example of an extensive layer completely composed and made up of the skeletons of sea animals, and clearly demonstrating the details of their form, as I have seen anywhere.

These sea lillies or stone lillies, so-called because of their similarity in appearance to plants with long stems, were marine animals which were abundant in the seas of the past and are represented by nearly 600 living species. They are sedentary or stalked forms related to the Star Fish and Sea Urchins. They are composed of a crown and a stalk - the latter usually six to eighteen inches in length. The stalks consist of many superimposed, disc-like, perforated pieces called columnals and these are the parts most commonly found in fossil form. The sea lillies are usually found at moderate depths although there are a few deep-sea and shallow water types. They feed on microscopic plants and animals.

In the Jurassic period the crinoids or sea lillies reached their greatest size - fifty feet high, with crowns a yard wide - but long before that, in the early part of the Mississippian period they had reached the stage of greatest abundance both of species and individuals. In western United States a great inland sea existed during much of the Mississippian period. Its traces are indicated today by the Madison limestone of the Yellowstone, the Redwall of Grand Canyon and the Escabrosa limestone of southern Arizona. These formations vary in thickness between a few hundred and a few thousand feet, indicating not only an extensive inland sea but also one of long duration. It was filled with many marine animals including an abundance of crinoids in great variety and showing a degree of development never again obtained by animals of that class. As yet only three genera - *Arophocrinus*, *Actinocrinus*, and *Platycrinus* - have been identified from the Redwall Limestone of Grand Canyon, but undoubtedly there are many others represented in this formation. In general it may be said that these animals developed during the Mississippian Period from delicate forms to larger, thicker plated, coarser, and more ornate ones with the passage of time.

