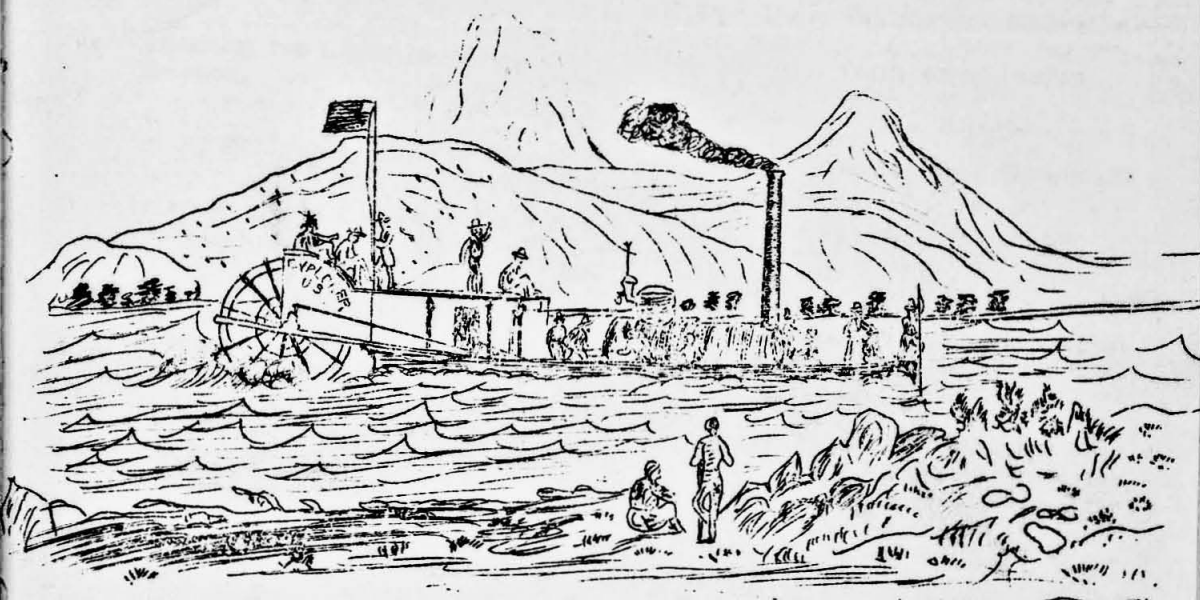


NATURE NOTES
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THE EXPLORER

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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 -- Clyde C. Searl, Acting Park Naturalist
Pauline Mead, Ranger Naturalist.

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N O T E:-

Mr. Edwin D. McKee, who has served as park naturalist since April 8, 1929, has resigned effective December 31, 1930, in order to devote a few months to advanced studies under Dr. A. Stoyanow at the University of Arizona. It is expected that Mr. McKee will return to the Service at the conclusion of his studies next spring. In the meantime, the educational work is being carried on by Ranger-naturalist Clyde C. Searl as acting park naturalist, assisted by Ranger-naturalist Pauline Mead.

Mr. McKee's contributions to NATURE NOTES will continue to appear monthly as he prepared several articles before his departure and will submit others in connection with his studies, which deal principally with the rocks of the Algonkian era that are exposed in the Grand Canyon.

"THE EXPLORER"

By M. R. Tillotson, Park Superintendent.

There has recently been much legal argument and court procedure with a view to settling the question as to the navigability of the Colorado River. The determination of this feature was one of the primary reasons for the Colorado River expedition made by the War Department in 1857-58 under the leadership of Lieutenant Joseph C. Ives of the Corps of Topographical Engineers. It was the thought of the War Department that if the river should be found to be navigable it could be used as an economical avenue for the transportation of supplies to the newly established military posts in New Mexico and Utah and it was with this in mind that the Ives Expedition was authorized. Lieut. Ives soon found that the turbulent Colorado could not be made to serve in this manner as a waterway for the transportation of freight to those points and he states in his official report to the War Department (Chapter VI, page 87) that "the foot of Black Canyon should be considered the practical head of navigation". This point is a few miles downstream from the proposed Hoover Dam site and whether or not Lieut. Ives' opinion as to the navigability of the stream coincides with later court findings, his report certainly makes most interesting reading for those who are at all concerned with the early history of the Colorado River and the entire southwest.

A copy of this original report issued in 1861 as a Senate Document and entitled, "Report Upon The Colorado River of the West" is one of the most valuable and interesting books among the many which make up the reference library in the office of the superintendent of Grand Canyon National Park.

The boat, afterwards christened the "EXPLORER", in which the expedition was made was built to special order by the shipyard of Reaney, Neafie and Company of Philadelphia. It was an iron steamer, fifty feet long and constructed in sections so that, after a trial trip on the Delaware River, it could be knocked down, taken to New York and thence shipped by boat to California via the Isthmus of Panama. It was, of course, shipped across the Isthmus by rail and from there to San Francisco by water.

In San Francisco the cargo was transferred to the "MONTEREY", a small 120 ton schooner commissioned to carry supplies to the head of the Gulf of California for transmission to the garrison at Fort Yuma. The "MONTEREY" left San Francisco on November 1, 1857, traveled down the coast and up the Gulf, finally coming to anchor at Robinsen's Landing near the mouth of the Colorado River on December 1. On the following day the party began the arduous task of unloading the steamboat and boiler and putting it together for the historic trip up the Colorado. On December 30, under a brilliant moon and with a favorable tide, the boat was launched and made ready for the unknown hazards which might be waiting on the unexplored Colorado River above

Lieut. Ives' description of the boat after launching is as follows:

"She is fifty-four feet long from the extremity of the bow to the outer rim of the stern wheel. Amidships, the hull is left open, like a skiff, the boiler occupying a third of the vacant space. At the bow is a little deck, on which stands the armament - a four pound howitzer. In front of the wheel another deck, large enough to accommodate the pilot and a few of the surveying party, forms the roof of a cabin eight feet by seven".

The personnel of the Ives party included, in addition to the leader, Dr. J. S. Newberry, Geologist (and also physician) to the expedition; F. W. Egloffstein, topographer; P. H. Taylor and C. K. Booker, astronomical and meteorological assistants; a Mr. Mollhausen, artist and natural history collector; C. Bielawski, surveyor; A. J. Carroll, steamboat engineer, and Jasper S. Whiting, assistant surveyor. A number of sailors and helpers together with a military escort under command of Lieut. Tipton of the Third Cavalry made up the balance of the crew.

The full account of the trip up the river is most detailed and interesting as to its description of the river itself with its currents and channels, its topography, wild life, geology and other natural features. Much space is devoted to a description of the various Indian tribes encountered and to the habits, dress and customs of the Indians themselves. On the whole the Indians were friendly altho sometimes suspicious and distrustful. They were always curious and naturally they were usually frightened by the sight of this strange iron beast puffing up the river. Their friendship and confidence was usually won with but little difficulty and they proved indeed valuable allies not only toward furnishing supplies in exchange for gaudy trinkets, but also as guides through this region unknown to white men. One Mohave by the name of Iretaba was an especially valuable guide. The farthest point reached by the "EXPLORER", designated as Camp 59, was computed to be 530 miles from the mouth of the river and 380 miles above Fort Yuma.

Reaching the foot of Black Canyon, which he termed the head of navigation, on March 12, 1858, Lieut. Ives decided to abandon the river trip and continue overland with a train of pack mules which had been previously arranged for. The packmaster was G. H. Peacock of California and of his skill and good management as a packer Lieut. Ives speaks in the most highly complimentary terms. Accordingly, the boat returned downstream to Mohave Valley where the party split, Taylor, Booker, Bielawski, half of the escort and all but three of the men returning to Fort Yuma with the "EXPLORER". The overland party continuing under the leadership of Lieut. Ives consisted of Dr. Newberry, Egloffstein, Mollhausen, Peacock, three laborers, the Mexican packers together with twenty soldiers under the command of Lieut. Tipton.

Leaving the river at a point near that shown on our modern maps as Mohave City, just west of Oatman, the overland party traveled easterly and thence northeast, passed a little north of the present site of Kingman, thence toward Diamond Creek and on to Havasupai Canyon, within what is now Grand Canyon National Park. After visiting the home of the Havasupai Indians (called by Ives the "Yampais") on April 14, 1858, the party turned in a southeasterly direction, skirting the north side of Bill Williams Mountain, and passed directly south of the San Francisco Peaks through the present site of Flagstaff. From here they continued westerly, crossing the "Flax" (Little Colorado) River at about the present site of Leupp. After a brief swing to the north they returned and followed up the Little Colorado to near where Winslow is now located. Here they located a well beaten Indian trail which they followed to the north and this time were successful in reaching the Moqui (Hopi) villages on May 11, 1858. Ives gives the name of the first village visited as "Mooshahneh". From his description of it and of other villages to the west and east this was evidently the Second Mesa pueblo of Mishongnovi.

Like Don Pedro de Tovar who visited these same Hopi villages in 1540, Lieut. Ives was also told by the natives of a great river distant by four days travel to the northwest. He started to continue his explorations to the northwest but was forced to abandon the trip on account of lack of water and feed for the mules. A return was made to "Oraybe Gardens" (presumably what we now call Moenkopie) where the stock and men spent one day in recuperation. Here a guide was secured to conduct the party eastward to Fort Defiance, stopping enroute at "Tegua" (the First Mesa Tewa village of Hano). The party reached Fort Defiance on May 23, 1858. Here the field labors of the expedition terminated. The party continued, however, to Santa Fe where all but Lieut. Ives crossed the plains to Fort Leavenworth, thence back to the Atlantic seaboard. Ives took stage from Santa Fe to El Paso, thence followed the overland southern mail route to San Diego. He stopped in Yuma long enough to dispose of the "EXPLORER", settle up the affairs of the expedition, etc.

Lieut. Ives was apparently far more skilled as an explorer and engineer than as a prophet for we find in his diary a statement, made immediately after leaving the only section touched by his expedition which is now in Grand Canyon National Park, to the effect that (see Chapter VIII, page 110):

"Ours has been the first, and will doubtless be the last, party of whites to visit this profitless locality. It seems intended by nature that the Colorado River, along the greater portion of its lonely and majestic way, shall be forever unvisited and undisturbed".

From the date of the creation of Grand Canyon National Park, February 26, 1919, until January 1, 1931, Park Service Records show that a total of 1,437,220 tourists have visited this "profitless locality".

Little is known of the subsequent history of the "EXPLORER" except that she was sold out of Government service and, some years later, broke away from her moorings and drifted down into the Mexican portion of the delta. Early in 1930 the remains of an iron hull were discovered by a surveying party some 14 miles southwest of San Luis, Sonora, and several miles from any existing active channel of the river. The dimensions and general character of this partially buried hull corresponded quite closely with the published description of the Ives boat. Later and largely due to the efforts of Mr. Godfrey Sykes of Tucson a more thorough examination of the hull, coupled with a critical reading of Lieut. Ives' report, positively established the remains as that of the "EXPLORER". Lieut. Ives describes in his report the necessity of placing two iron patches over the lower portions of the slots which had been provided in the stern of the boat in order to allow for the free movement of the connecting rods. It was discovered that these slots had been cut so deeply into her transom as to allow water to enter when she was in motion. Her engines were, therefore, slightly raised and the two patches were riveted over the lower ends of the slots before she started on her voyage up the river.

Mr. Sykes has very generously furnished the National Park Service with two fragments of this historic old vessel; a small section of the wooden gunwale and a portion of the port patch, above mentioned. He also contributed several photographs, one of the lately discovered hull just as it was found lying deeply buried in the silt, a view of the stern showing the still remaining portions of the transom and still another view of the patches described, by means of which positive identification was made. The sketch on the cover sheet of this issue of Nature Notes is from a photograph made by Mr. Sykes of the engraving published in the original report, showing the "EXPLORER" on her voyage upstream.

These relics of the history-making old "EXPLORER" and the photographs so generously provided through the courtesy of Mr. Godfrey Sykes have been carefully mounted in a glass case together with suitable explanatory maps and notes and now form a permanent exhibit in the park museum. It seems most fitting that these remaining portions of Lieut. Ives' boat should find a final resting place in the National Park for the development of which we are so greatly indebted to Lieut. Joseph C. Ives and other pioneers of his caliber and courage.

B-E-E-T-L-E-S

By Clyde C. Searl, ~~Acting~~ Park Naturalist.

The old story of the three blind men and the elephant has many parallels in the scientific aspects of Grand Canyon. Because of the very nature of the place a scientist of any group can visit the place and see only that which pertains to his particular field. First of course, came the geologist, and following him came the various sciences closely related to geology.

The exponents of geology and paleontology could be asked concerning the zoological and botanical features of the region, and the answer could be that as far as the two fields were concerned the situation was very poor. The interior of the Canyon is a semi-desert and the surrounding region is little better. One can see a few birds and animals, and perhaps an occasional snake.

However, there are few fields more interesting in all lines of natural science than the Grand Canyon region. The very nature of the region makes the problems for the collector difficult, but a very little work in any field brings a decided reward.

Almost daily, people are surprised to hear that in the park there are an even sixty species of mammals alone, and this list will probably be added to as time goes on. It is also hard for people to believe that within the park boundaries there is a list of almost five hundred species of flowers and plants.

One of the latest fields to enter the Canyon is that of entomology, and untold surprises await the ardent collector in that field. Although one should not expect to find a great variety of insects, as the region is arid, the number that one can find is worthy of note.

Following is a list of beetles collected July 15, 1930, on a few hours' journey down the Kaibab Trail from the North Rim to Roaring Springs, a distance of about five miles, and a change in elevation of about four thousand feet. The trip was a leisurely one, but the families and the beetles collected are an index to what one could find with a little exertion. In addition to beetles many representatives of other groups were found.

Cincindelidae (Tiger beetles)
Cincindela carthagina var. humeralis Lec.
Dytiscidae (Predaceous diving beetles)
Laccophilus simulatus ?
Hydrophilidae (Water Beetles)
Berosus striatus Say

Melcidae

Macrobasis segmentata Say.

Lampyridae

Tenaspis angularis Gorrh.

Coccinellidae (Lady-bird beetles)

Hyperaspis lateralis Muls.

Hippodamia convergens Gohr.

Adalia rigida var. *humeralis* Say.

Meloidae

Anelastes drurvi var. *latreillei* Lec.

Scarabaeidae (Scarabs) Scavenger beetles)

Phyllophaga vetula Horn.

Lycidae

Lycostomus loripes Chev.

Cerambycidae (Long-horned beetles)

Ergatus spiculatus Lec.

Tragidion amulatum Lec.

Chrysomelidae - (Leaf beetles)

Chalepus ater Weise.

Lema trilineata Oliv.

Cryptocephalus leucomelas Suffr.

Haltica obliterata Lec.

Pachybrachys bivittatus Say.

Groburius montezuma Suffr.

Zygogramma bigenera ?

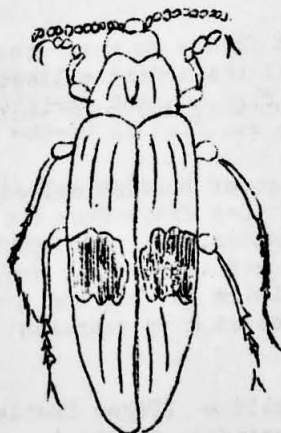
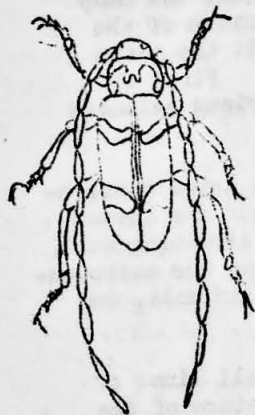
Curculionidae (Weavels)

Tricobaris compacta Say.

Buprestidae (Metallic Wood-borers)

Buprestis maculiventris var. *rusticorum* Kby.

Chalcophora angulicollis Lec.



THE ORIGIN OF HERMIT BASIN

By Edwin D. McKee.

Many parties since the first scientific expedition to the Grand Canyon in 1857, have visited this region to study its great geological features. Nearly all of the geologists have concluded among other things that the Canyon area is remarkably free from "faults" or breaks in the earth's surface. In 1902-03, however, Mr. F. E. Matthes of the U. S. Geological Survey while making the topographic map of Grand Canyon, observed through the accuracy of his instruments that there was actually many faults cutting across the Canyon and that a large majority of the side canyons have been determined by these.

The conclusions of Mr. Matthes appear entirely logical when one considers that this whole region has been arched or domed up from near sea-level to its present altitude of seven to nine thousand feet. Breaks and fractures in great numbers it seems probable, would accompany, if not cause, such a tremendous and widespread crustal movement.

By virtue of many Canyon trips during the past few years, I have been strongly impressed by the accuracy of Mr. Matthes' conclusions. In eight different side canyons used in the descent from the Rim, I have found one or more fault lines in each. It is undoubtedly because of the deceiving appearances due to perspective from a distance, and because of the much eroded surface of the plateau on top that the many minor faults continually pass unnoticed even by those with keen geological eyes.

The Hermit Basin to the west of Grand Canyon village presents one of the finest examples in the entire region of the influence of faulting upon canyon sculpturing. Probably eighty percent of all visitors to the South Rim see this large canyon with its well rounded upper end, yet few, if any, realize that its presence and its shape is accountable to a great series of faults or fractures which radiate from its center in all directions. Most of these planes of slipping show but slight displacement - that is, from a few inches to a maximum of 20 or 30 feet, yet they are extremely numerous. In most of them the movement is vertical, yet in some cases it is horizontal, or at a decided angle. From the rim of Grand Canyon probably none of these fractures are apparent, yet by following the contact between formations in the walls of Hermit Basin one is amazed by the frequency of the faults. In a trip of less than half a mile along the upper surface of the Coconino Sandstone, I recently counted over 50 faults distinctly indicated where the red basal portion of the Kaibab Limestone had been dropped down below the general level of the white Coconino.

SECOND REPORT OF THE GERMINATION OF NATIVE WILD FLOWER SEEDS

By Ranger-naturalist, Pauline Mead.

In the December issue of Grand Canyon Natures Notes, a preliminary report on an experiment on the germination of native wild flower seeds, was published. Reports on this experiment will continue to appear monthly. It is hoped that this study by shedding light on the behavior of wild flower seeds will assist in the eventual replacement of exotic plants by native wild plants in landscaping within the National Parks.

Nineteen species of seeds, in most cases 100 seeds each, were planted on December 11 under greenhouse conditions. On December 26 it appeared that some seeds of all but three species had germinated. It was discovered later, however, that plants that were taken for seedlings of the pink pentstemon and sulphur flower were only weeds, difficult to identify in the very early stages. By the middle of January many of the seedlings had developed leaves and were much more easily distinguished than they had been before.

About January 18 seedlings of Indian paint brush appeared for the first time and by January 23, 9 plants were above ground. Since last observation, December 26, 35 seedlings of western virgin's bower, 23 seedlings of Apache plume, 11 seedlings of the tall blue pentstemon, 10 seedlings of cliff rose and 6 seedlings of the beautiful purple prickly aster have come up.

To date the highest percentages of germination have been established by seeds in the following order: bluebonnet, western virgin's bower, Apache plume, prickly aster, cat's claw and trefoil. No seeds of the sulphur flower, crane's bill, pink pentstemon or vine figwort have germinated.

It is interesting to note that cliff rose and Apache plume seeds are germinating since they are plants that are difficult to transplant. The clematis would be a lovely vine to use in landscaping and its seeds have given the highest number of seedlings. The pentstemons are comparatively slow in germinating, though seeds of the early summer blue pentstemon (*Pentstemon glaber*) and of the scarlet bugler may prove practical for planting in wild flower gardens.

Forcing methods will be tried only in cases of seeds that fail to germinate under normal conditions or seeds that are particularly slow in germinating. One set of seeds is to be planted in an outside bed where they will be exposed to full sunlight and to the winter temperatures. These results will be compared to those obtained in the greenhouse.

The results observed January 23 are as follows:

Name of Plant:	Number of seeds planted.	Number of seedlings above ground.	Percent of germina- tion.
Western Virgin's bower (<i>Clomatis ligusticifolia</i>)	100	37	37
Sulphur Flower (<i>Friogonum stillatum</i>)	30	0	0
Mountain Mahogany (<i>Cercocarpus montanus</i>)	30	2	10
Cliff Rose (<i>Cownia stansburiana</i>)	100	13	13
Apache Plume (<i>Fallugia paridoxa</i>)	100	24	24
Cat's Claw (<i>Acacia greggii</i>)	5	1	20
Crane's bill (<i>Geranium incisum</i>)	3	0	0
New Mexican Locust (<i>Robinia neomexicana</i>)	50	4	8
Trefoil (<i>Lotus nerightii</i>)	10	2	20
Blue bonnet (<i>Lupinus barbiger</i>)	4	2	50
Globe Mallow (<i>Sphaeralcea marginata</i>)	100	8	8
Creeping Pentstemon (<i>Pentstemon linarioides</i>)	100	2	2
Tall Blue Pentstemon (<i>Pentstemon glaber</i>)	100	13	13
Pink Pentstemon (<i>Pentstemon palmeri</i>)	100	0	0
Scarlet Bugler (<i>Pentstemon torreyi</i>)	100	6	6
Red Pentstemon (<i>Pentstemon bridgesii</i>)	100	1	1
Indian Paint Brush (<i>Castilleja linariaefolia</i>)	100	9	9
Vine Figwort (<i>Maurandia antirrhiniflora</i>)	100	0	0
Prickly Aster (<i>Macharenthera angustifolia</i>)	100	24	24

THE BADGER AND ITS ENVIRONMENT

By Ranger, Chester Markoley,

One thinks of Arizona, and Grand Canyon National Park as being a country semi-arid to almost a true desert type of habitat. But in northern Arizona, in the vicinity of the Grand Canyon of Colorado, we find a land of high plateaus, which are mountainous in altitude and in many places Canadian in climate, several places such as the mountain peaks near Williams and Flagstaff, being mountainous in aspect and arctic-Alpine in climate. Let us go just sixty miles north of these two mentioned towns and welcome to the Grand Canyon of the Colorado. Here we stand on the brink of that magnificent gorge which the mighty forces of nature have cut from solid rock. Across that fearful span of spectacular splendor, we see the spruce, fir, and aspen forest type characteristic of Canada, the Canadian Life Zone. Dropping our glance just the slightest, to the very rim itself, we see the yellow pine forest type of Colorado, the Transition Life Zone. Lowering the head just a trifle, until our glance passes right beneath the North Rim we see the Pinyon-juniper forest type, typical of the arid west. This is the Upper Sonoran Life Zone. And then, as we look lower and lower, down in the shadowy depths of the Canyon, we see the end of the tree line, where the desert shrubs and cacti of Mexico, meet our eyes, the Lower Sonoran Life Zone.

On the South Rim of the Canyon, where there is an intermingling of the Upper Sonoran and Transition Life Zones, lives the wolverine of the south, known as the badger, scientifically named Taxidea taxus berlandieri. It is an animal easily recognized by his robust body, short legs, the feet of which are armed with long, strong claws. These claws are his weapons and the means of obtaining a livelihood and with which he digs up his prey with the tenacity of the wolverine. His courage and strength is to be feared by any animal his size. When cornered, he gives a dog a hard fight. When caught in a steel trap, he piles the dirt high in the air, as far as the chain allows him to reach. I have seen where a badger uprooted sapling trees in a ten foot circle, when caught in a trap.

The washes and draws thru the yellowpine and pinyon-juniper type forests are his home; usually in or near a prairie dog town, and occasionally in any clearing in the pinyon-juniper forest, where he has located the homes of the ground squirrel, rock squirrel, chipmunk, pocket gopher, or any small member of the rodent family.

The occurrence of the badger on the south rim of the Canyon has always been regarded as normal, for here is the environment to which he is most perfectly adapted. The badger has been listed as occurring on the South Rim with no mention that he might be present on the North Rim of the Grand Canyon. In October, 1930, I was fortunate in seeing a badger on

The North Rim in the vicinity of Powells Plateau. It was undoubtedly ranging in both the Transition and Canadian Life Zones where the habitat appeared unusual because of the presence of Aspen, maple, locust and yellow-pine, vegetation in no way resembling that of the open country of the South Rim. This dense stand of timber, and a very shallow soil, makes it very difficult for the badger to protect himself from the coyote, bobcat, and cougar, and to stalk and dig out his prey. This very unfavorable environment is perhaps the chief reason why the badger is uncommon on the North Rim of the Grand Canyon.

THE GOAL OF YAVAPAI

By Acting Park Naturalist, Clyde C. Searl

The museum and observation station at Yavapai Point on the South Rim of Grand Canyon, dealing principally with the geological story of the Canyon, gives to many people their first idea of what geology could really mean. The majority of visitors have had their first glimpse of the Canyon before they find their way to the museum, and because of this, the museum can better serve its purpose.

Unless one has had a previous background of geological study, the Canyon at first impression, means very little more than that which would appeal to a sense of beauty, or to some sense dealing with the awfulness and majesty of the place. And unless one has some imagination there is nothing to be seen except rocks -- -- red rocks, buff colored and white ones; dark gray rocks in the innermost and deepest parts of the Canyon; blue rocks when evening shadows turn the place into a hazy dream. Its beauty can mean as much to one who has never opened a geological book as it can to minds trained in the story of the earth's history. The question as to how the Canyon was formed will inevitably enter, and in the explanation, that which was formerly only beauty takes on a different element of interest.

By the time the visitors reach the museum their first impression of the Canyon has begun to fade. Perhaps the thought of how the Canyon was formed has begun to creep more strongly into their minds. It is interesting to note the first reaction of people when it dawns upon them that there is a wonderful story written in the rocks beneath their feet, and to perceive the eagerness with which they delve into the story as it is told in the exhibits. It is interesting to study the best methods to use in making the story most easily understood by those who have had no geological training as a background.

The word "rock" may be applied to any natural stone, regardless of its texture. Hence it could be mud or sand, clay, coal, sandstone, shale, granite or limestone. But when it can be impressed upon people that all kinds of rock are different, and that all kinds of rock tell a different story, one has gone a long way in preparing them for a clearer understanding of the history of the earth as written in the rocks.

Show to people a rock containing a sea shell, and the story of how it got there is easily understood. A piece of sandstone containing a series of well preserved tracks of some prehistoric animal seldom calls for a lengthy explanation, nor does a slab of shale on which is the imprint of a fern or leaf, or the remains of some ancient insect. The greatest trouble is encountered when one tries to connect the story; to show the relation between series of different rocks. A layer of sandstone resting upon a layer of limestone, or vice versa, involves the factor of crustal movement of the earth, one of the hardest factors to explain.

It is only natural that people should expect conditions always to have been as they are at present in any given locality. When the story in the rocks of Grand Canyon is told, however, it helps them to realize the changes that have occurred on the earth. From the lesson taught it can be learned that once huge granite mountains stood where now lie the many colored bands of sedimentary and organic rocks. It can also be learned that time after time the region sank, allowing the ocean to sweep in, each time receding and leaving a thick layer of limestone. Again the region was a vast delta and the story is clearly told by layers of shale in which are found fossil remains of life which existed at the time. Layers of sandstone tell a story of the region having been lifted above all water and left an arid waste where wind piled high sand dunes in which great reptiles have left their traces.

Clear records of ages past are contained in the rocks forming the walls of Grand Canyon. In learning what the rocks consist of, how they are made, and how they came to be as they are now seen, one unravels a great part of the history of the earth. Even the commonest bit of rock one can pick up along a trail has its own part of the story to tell. If one feels that it is worth while to go through all the trouble of learning to read for the sake of knowledge found in books, he will realize that he is fully repaid in acquiring a knowledge of how to read the meaning of stones. It is to this end that the educational division of the National Park Service, by means of the Yavapai station and its personnel, is working. It is endeavoring to teach the visitors that the earth's history is written in clear and legible language which with a little patience can be learned. The project is facilitated by having the largest cross section of the earth opened up before the museum.

After one spends considerable time in the observation station talking to people, answering their questions and more fully explaining the conditions which the exhibits portray, it is possible to conceive that the greatest benefit of the place might not be in its explanation of the Canyon, but in the fact that one there first receives an incentive to delve deeper; to find an increasing delight in getting away to hills and valleys, quarries and brooks and sea shores, to any place where the rocks stick out on the surface, that they may be examined and from them to learn the story which they have to tell about the changes in the history of the earth.

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In the early part of last fall a group of Gila chipmunks (*Eutamias dorsalis dorsalis*) decided that the interior of the woman's dormitory on the South Rim of the Grand Canyon, afforded excellent places for nest building. In the back porch they found a bag of pinyon nuts and immediately went to work, explored the house for hiding places and were successful.

The girls were, at first, mystified to find the coffee pot half full of nuts, little depressions in the bedding filled with nuts, nuts hidden in the floor mop and even the shoes in the closet were not spared.

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North of Rowe's Well in a small canyon there is an overhanging cliff that forms a sheltered room. Not long ago a human skull was found lying only partially buried in the ground near the cave. It was a small skull quite distorted in shape and the lower part had disintegrated. It was identified by Dr. Alea Hrdlicka of the United States National Museum as being the skull of a Pueblo Indian child between one and two years of age. He stated that the pronounced distortion is an artificial deformation (occipital flattening) caused by the cradle board to which the Indian mother had fastened the child.

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Friends of Edwin and Barbara McKee will be interested to know that they are the proud parents of a son, William Dinwiddie, born in Tucson on January 19. Barbara writes that "he looks as tho he'll be joining the ranger force soon". The postoffice address of young Edwin Dinwiddie and his father and mother is Box 511, University Station, Tucson, Arizona.