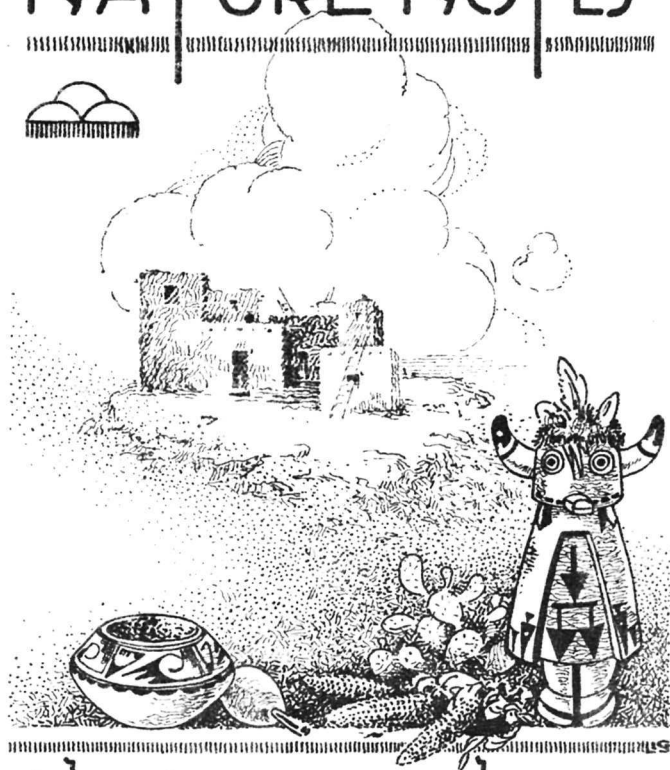


GRAND CANYON NATURE NOTES



Vol. 8, No. 7.

October, 1933

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Office of National Parks,
Buildings and Reservations
Grand Canyon National Park.

Grand Canyon Natural
History Association

This publication is issued monthly for the purpose of recording observations and of making known the results of research and scientific investigation in the Grand Canyon region in the fields of natural history, history and related subjects. It is published by the Natural History Association for the Grand Canyon National Park. Membership in this Association is \$1.00 per year and includes a subscription to Nature Notes. Additional copies of Nature Notes may be obtained at 10¢ each by addressing The Grand Canyon Natural History Association, Grand Canyon, Arizona

M. R. Tillotson,
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Illustrations by Ranger Naturalist Louis Schellbach



Woodland Parks on the North Rim

By Donald Edward McHenry, Junior Naturalist.

NESTLED here and there among the stately trees of the Kaibab Forest on the North Rim of Grand Canyon are beautiful open grasslands known as parks. These parks offer a series of delightful surprises to the visitor and unexpected variety to the scenery as one drives along the interesting forest roads.

Many a person has asked the reason for these parks; and why the trees of the forest do not close in upon them. To the writer it seems evident that these open areas fall into three distinct categories.

One type of park is represented by such areas as V. T. Park, found just outside of the National Park boundary, and by Little Park, through which the highway runs after it passes the checking station. Here we find the broad, flat floor of a shallow valley into which drains the water from the surrounding slopes. Running the length of such a valley usually is found a series of sink holes, some stopped up and forming small lakes,* others still open to the passage of water. The floor of such a valley is composed of a layer of alluvial material resting upon the surface of Kaibab limestone. Thus there is a very shallow water table. With the melting snows this alluvial soil becomes saturated with drainage water. As the season advances the water from the meadow soil either evaporates or drains off to the sink holes. The ground then reaches an extreme in dryness.

Conditions of extreme wetness and dryness are unfavorable to natural reforestation on the Kaibab Plateau. During

* Greenland Lake. E. D. McKee, Nature Notes, Vol. 6, No. 4, February, 1932.

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the spring and early summer the excessive moisture and cold temperature of the soil make germination of seeds from the surrounding trees unlikely. With the arrival of warm weather the soil becomes as dry as it had been wet, a condition hardly more favorable to the germination of these seeds. It is noteworthy that the floral structure of such parks is largely composed of plants best adapted to a very dry environment. Sedges are conspicuously absent in these areas except about water holes. There is no evidence that trees ever grew in these open places.

In a few cases limited attempts at natural reforestation may be seen. Here and there a small vanguard of the seedlings of the Engelmann Spruce and the Blue Spruce reaches down the slope, encroaching upon the grass-lands. These trees are hardly more than eight or ten years old at the most, and probably indicate a recent and very slowly changing condition in that restricted environment. In most cases, however, these parks are bounded very definitely by stands of mature trees with practically no reproduction. It is in such parks then, as the dusk of evening advances, that the visitor today will see bands of deer numbering around a hundred or so. Not many years ago herds of deer numbering as high as 1,400 were seen in these same parks.

Another category into which the writer would place woodland parks is one which would include definite drainage valleys. On the North Rim of Grand Canyon, drainage takes place from the region of the National Park checking station southward to the Colorado River. This has resulted in the formation of a number of drainage valleys leading into side canyons just below the North Rim. In many of these, intermittent streams resulting from the waters of melting snow and from rains not infrequently assume the proportions of raging torrents. Nor are such drainage basins always confined to restricted areas at the bottoms of narrow valleys. Sometimes they appear as broad areas, as the Coconino Basin, where are found slopes draining from three directions over a rock surface which is sparsely covered by a thin layer of soil. Frequently, also, otherwise narrow valley parks will be broadened in places by alluvial fans at the mouths of tributary draws.



Where Park and Forest Meet

In parks having the type of drainage origin described above, water is usually overly abundant at a time when conditions would otherwise be favorable to germination of seeds from the trees of the forest. Any seedling which might get a slight start is likely to be washed along with the shifting soil. These parks are covered with a characteristic vegetation of grasses and a few semi-arid flowers. Such vegetation is able to establish itself during the dryer part of the season after the conditions favorable for the development of tree seedlings have passed. In these valley-drainage parks one finds now and then localized areas of sedges. Somehow these have become established during the wet part of the season.

One more category into which we should place woodland parks, includes areas located on south facing slopes in drainage valleys. Examples of such parks are to be seen along the road leading to Point Sublime as it passes through Kanabownits Canyon. Here and there along this delightful woodland road one finds these grass lands reaching up the

side of a south-facing slope to the forest above. The north-facing slope opposite will be heavily wooded with a substantial stand of spruce and fir almost to the very bottom of the valley.

In places of the type just described, the natural drainage of the south-facing slope will be greatly aided by the drying effect of the hot, direct rays of the sun and possibly the hot, dry winds from the southwest. Any seed of the trees above which might begin successful germination on such a slope during the moist part of the season would quickly succumb to an advancing drought condition. Occasionally we do find on such slopes a very slow encroachment of the forest from above, as the trees along the forest rim afford a rather meager fringe of protective shade to a sparse reproduction.

Visitors to the North Rim of the Grand Canyon have abundant opportunity to enjoy the delightful woodland parks of the Kaibab Forest, for all the principal roads follow along valleys in which these picturesque meadows are enclosed by the somber green walls of surrounding spruce and fir.



A Large Cliff Dwelling

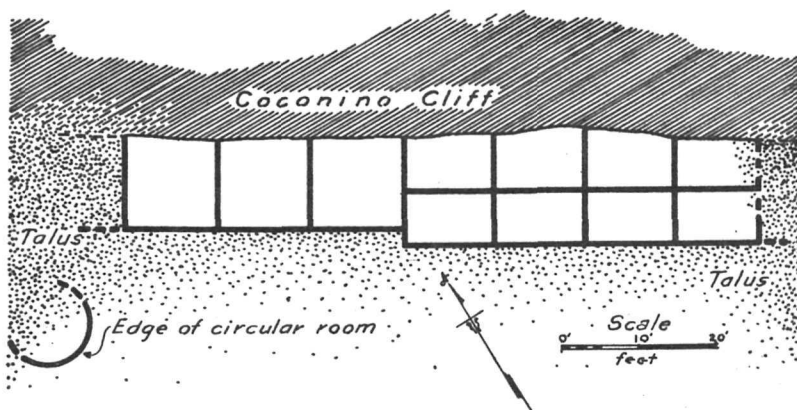
By Barbara H. McKee, Grand Canyon

A WEALTH of material indicating the presence of ancient man is to be found not only on the south side of Grand Canyon but also on the North Rim and in the side canyons to the north of the Colorado River. Most of the ruins north of the river have been seen only infrequently and by few white men. Most of these men have not been archaeologists so we have today only vague stories of the things that have been seen and found. The whole area is waiting to be studied.

Not long ago I had the opportunity of visiting Powell Saddle which connects a plateau of the same name with the main part of the North Rim of Grand Canyon at a place some 30 miles west of Grand Canyon Lodge. Powell Saddle is a narrow neck of land curving downward toward its center which is at the level of the Coconino sandstone. We hiked down a trail from the Canyon rim and visited a spring of clear water a few hundred feet east of the saddle.

About a hundred yards east of the spring we came to a flat, wide platform at the base of the Coconino sandstone, the sheer, white cliff of which towered above. On this ledge had once been a settlement for we could see the outlines of numerous rooms with the stones still built up and on a large talus slope in front we found fragments of pottery.

The rooms which could be seen were laid out in the following plan:



Very likely at one time there were two stories to the building for we could see mud and small sticks plastered, in places 20 feet and more, up on the cliff and crevices were filled with mud and sand. Also, in examining one of the crevices in the cliff, we found the dessicated section of a corn cob which showed ten rows of kernels.

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More rooms could very probably be shown by excavation as the heap of talus in front of the visible ones was very large. A little to one side of the house we found the traces of a large circular room, but it appeared as little more than a mound covered with a dense growth of shrubs except where its outline of rocks was visible. Very likely this was at one time a kiva.

Since this ruin was built on a flat, wide ledge so near the water and so accessible to the trail, it has been a favorite camping place for cowboys. Ranger Ed Laws who has visited the place several times in past years says that a great deal more of it was standing when he first saw it. A few years ago a prospector spent the winter near this place and pulled down many of the walls. Moving the flat slabs some hundred feet nearer the spring he built himself a small house under an overhanging rock. Thus this prehistoric dwelling has been slowly demolished.

From a superficial examination of stray pottery fragments or sherds which we picked up Mr. Louis Schellbach has estimated that this ruin belonged to the last phase of Pueblo II culture or the first phase of Pueblo III. This dates it roughly as being built and occupied somewhere between 1000 and 1200 A.D.

The following is information regarding the pottery sherds which has been supplied by Mr. Shellbach:

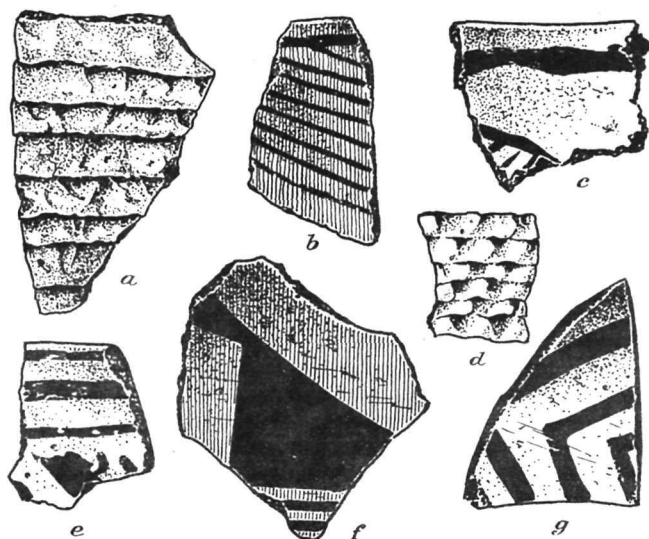
Number of sherds	72
Number of corrugated sherds	40
Number of black on white sherds	19
Number of black on red sherds	5
Number of plain sherds	8

Plain Ware: Hand lens examination of these sherds indicates that a sand tempering was used. Two sherds in this group have a white slip. These two sherds may be parts of a black and white bowl. The sherds, however, do not show any black decorations.

Black on Red Ware: These show a fine paste with possibly a ground sherd tempering. One sherd of thin ware has decoration on the inner side of bowl. The decoration consists of fine lines. (Fig 1, *b-f*)

Black on White Ware: One sherd shows a corrugated outer surface while the inner surface has rather a broad black line; tempering of ground sherd material. The white slip on both the inner and outer sides is rather heavy. Twelve sherds show a sand tempering while seven show a sherd tempering of rather a fine paste. One sherd of this lot shows the black design painted on the white slip and then polished before firing. The other sherds do not indicate that the black design was polished after application. (Fig 1, *c-e-g*)

Corrugated Ware: Of the corrugated ware there are the straight coil and the stick indented types. All specimens of these indicate sand tempering. Some show improved coil type having a grey-white slip on inner and outer side. (Fig.1, *a-d*)



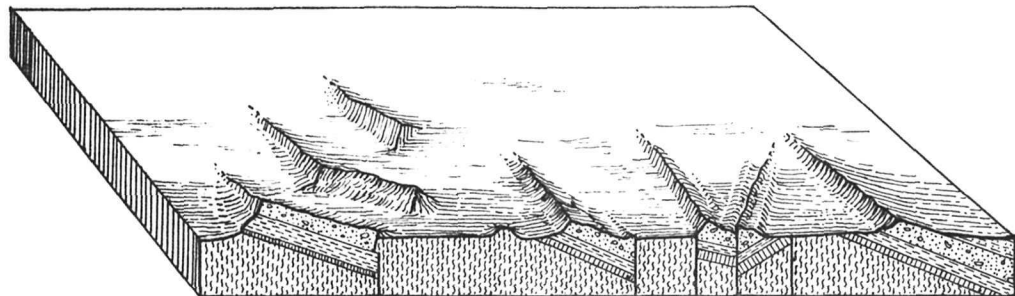
Mountains at close of the Algonkian Era

By Edwin D. McKee, Park Naturalist.

THE rocks of Grand Canyon which have been assigned to the Algonkian age appear in many scattered localities over a distance of about 42 miles from east to west along the course of the Colorado River, and in several places they extend northward for some miles along the canyons of tributary streams. The lower half of the Algonkian rocks, known as the Unkar group, has been studied in detail in two of the four main exposures. Dr. C.D. Walcott¹ measured the section in the eastern end of Grand Canyon in 1895 and Dr. L.F. Noble² did likewise in the Shinumo Canyon some years later. The excellent exposure along Bright Angel Creek, however, located nearly midway between these two, has until recently³ been neglected as far as detailed work is concerned, although it is today one of the most readily accessible and most frequently visited areas in the Grand Canyon. Another large exposure is at Tapeats Creek, and minor ones are at Vishnu, Clear and Crystal Creeks and several other places.

Because of the lack of fossils which can be used for correlation of the Algonkian beds, the changes in character of individual members must be traced by means of detailed sections measured at places as near each other as outcroppings permit. The Algonkian rocks of the Bright Angel Creek section show a similarity in structure to those of most other exposures in the Grand Canyon in that they dip in a general northeasterly direction, the result of one of a series of more or less parallel faults running in a north-south direction. In brief, the mountains which existed in this region during Algonkian time must have developed from a series of fault blocks and formed a surface not unlike that of our basin-ranges of today. (See illustration No. 1.) The major faults are crossed by minor ones in many places but the direction of dip is to the east or northeast in most areas so far examined.

Landscape of Grand Canyon Region
at close of
ALGONKIAN ERA



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That the course of Bright Angel Canyon was determined by a Cenozoic fault following closely the line of a great Pre-Cambrian fault was recognized by Ransome⁴ and later described in detail by the writer⁵. A similar situation was noted in the eastern end of Grand Canyon by Walcott⁶. The Pre-Cambrian faults in these areas and in others, all nearly parallel, dropped the soft basal material of the Algonkian (Hakatai shale and Bass limestone) down below the level of the Archean peneplain so that they were protected under the base level of erosion, and thus the Algonkian wedges of Grand Canyon are accounted for. Interestingly enough, wherever these blocks were dropped sufficiently to leave the base of the hard cliff-forming Shinumo quartzite at or near the peneplain surface, that rock because of its resistant nature afterwards formed an island in the Cambrian sea. The relationship between the Algonkian monadnocks and the hardness of the Shinumo quartzite is a consistent feature in Grand Canyon, as shown in the accompanying block diagram.

1. Walcott, C. D., Algonkian Rocks of Grand Canyon of the Colorado, The Journal of Geology, Volume III No. 3, 1895.
2. Noble, L. F., The Shinumo Quadrangle, U.S.G.S. Bull. 549, 1914.
3. A measured section was made by the writer in 1932 and detailed work is being done there at present by Dr. N.E.A. Hinds and associates working under a grant from the Carnegie Institution.
4. Ransome, F. L., Pre-Cambrian Sediments and Faults in the Grand Canyon of the Colorado, Science, Vol. XXVII, No. 695, 1908.
5. McKee, E. D. The Origin of Bright Angel Canyon, G.C. Nature Notes, Vol. 6, No. 2, Dec. 1931.
6. Walcott, C. D. Study of a Line of Displacement in the Grand Canyon of the Colorado. Bull. Geol. Soc. Am., Vol. 1, 1889.



Miscellany

Shortly after the completion of this issue, Edwin D. McKee, editor of Nature Notes and Executive Secretary of the Natural History Association, is leaving for Berkeley, Cal., where he will spend several months taking advanced courses at the University of California and working on the problem of the Kaibab limestone. During Mr. McKee's absence from the Park, Junior Naturalist D. E. McHenry will assume the editorship of Nature Notes. All correspondence regarding the publication should be addressed to Mr. McHenry at Grand Canyon, Arizona.

A light snowfall occurred on Point Imperial in mid summer this year. Here at the highest point on the rims of Grand Canyon (8,801 ft.) snow covered the ground for a short time on the twenty-third of July. Paul Kraus.

According to Mr. Georges Vorbe, geologist from the Univ. of Calif., several mule deer have apparently become permanent residents in the remote and isolated valley of Nankoweap creek. They were seen at various times during his stay (June and July) in that hot locality.

On August 21 three Mearns Woodpeckers were seen in some pinyon pines near Powell's Saddle. This is the second record of this species from the North Rim of Grand Canyon. On the same date a Band-tailed Pigeon was seen at the springs nearby. Although individuals and flocks of this pigeon have been seen at that locality numerous times before, it is interesting to note this frequency since the species is comparatively scarce at other localities in the area. E. D. McKee.

Two Marsh Hawks were seen soaring over meadows near V.T. Park, North Rim. One of these was later found catching grasshoppers on the ground nearby. So far as can be ascertained, there is only one other record of this species from the North Rim area. E. D. McKee.



