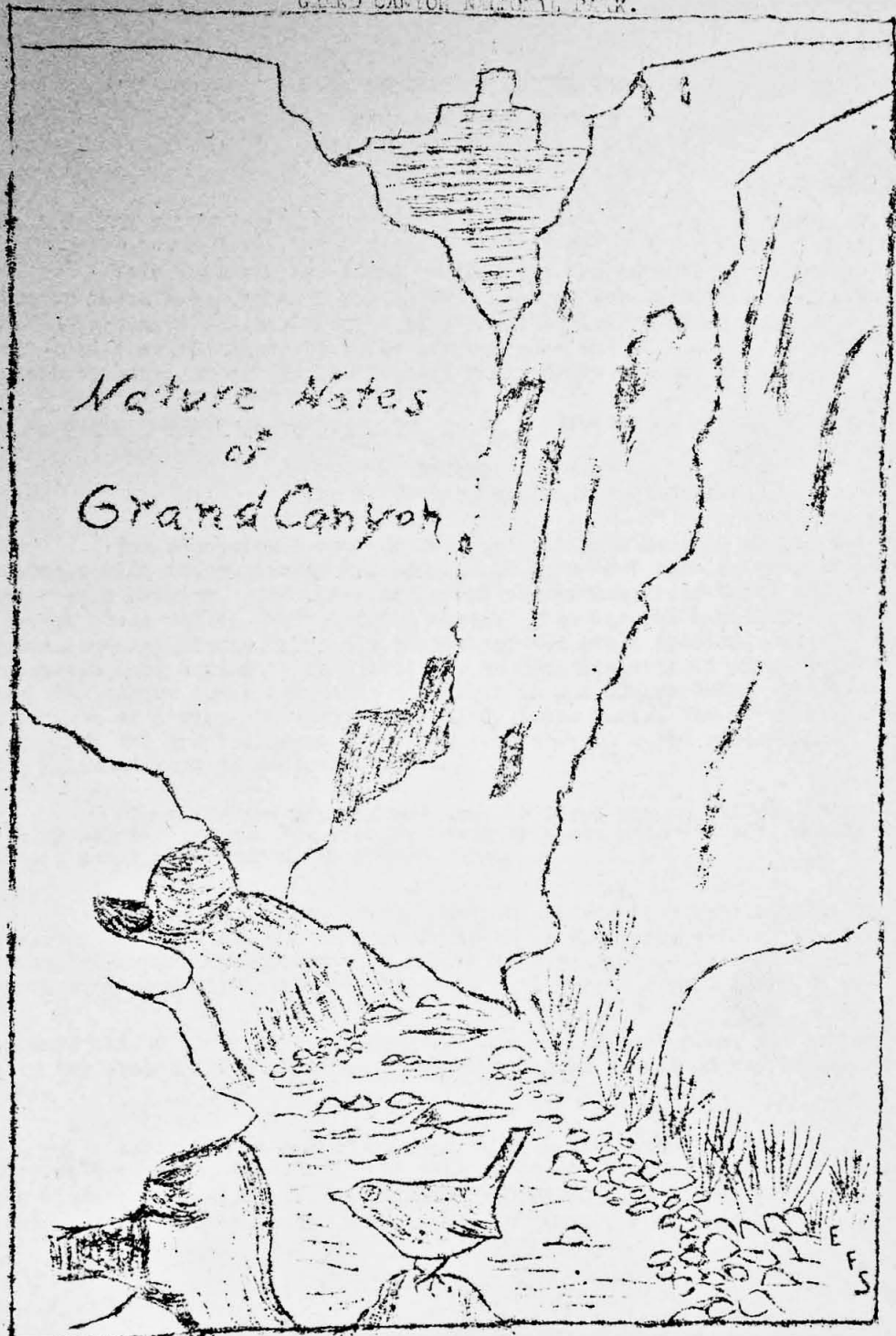


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GRAND CANYON NATIONAL PARK.

Nature Notes
of
Grand Canyon



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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 contained free of charge by those who can make use of them, by addressing the Superintendent, Grand Canyon National Park, Grand Canyon, Arizona.

J. R. Eakin - Superintendent. G. E. Sturdevant - Park Naturalist

EDUCATIONAL PLANS
(By E. T. Scoyen, Chief Park Ranger)

The educational work of the National Park Service should not be confused with the publicity and propaganda work that usually masquerades under this heading. The parks are great wilderness areas which are to be forever preserved in their natural state. They have been called outdoor museums, and are places where the wonders of the great American out-of-doors are preserved, not behind plate glass, but as geologists often say, "in place". Here the nature lover can study nature as it has always been. It is with the intention of having all people appreciate these facts, and to enable them to interpret the great lessons of nature and life, that the educational work in the National Park is undertaken.

Plans for the educational work in Grand Canyon National Park the coming summer, include the regular issue of these Nature Notes, nature guide trips, campfire lectures and museum service.

During the course of the next few years, this little bulletin will cover practically all the outdoor features of the park, such as the flora, fauna and natural phenomena. If anyone receiving these bulletins will preserve them carefully, in a few years he will have a fine library on the

natural history, not only of the Grand Canyon National Park, but of practically the entire state of Arizona and to a lesser extent of the entire southwest.

Early in the coming summer we will institute a nature guide service. This will consist of trips afield with a competent guide who will identify the flowers, trees, birds and animals as well as explain the geological features. This has been a popular service in other parks, and with the wealth

of material available, we expect park visitors to use the opportunity at Grand Canyon. Parties will be in charge of National Park Service Rangers, and there will be no charge, not even tips being accepted.

In the evening those who wish can gather around a large campfire in the public auto camp. Here park rangers will tell the story of the Grand Canyon. We expect thousands to listen to these lectures, and will spare no effort to make them instructive and interesting.

We already have some interesting exhibits in our information office which will have to serve as a museum for the present, although space is limited. A museum is of greatest importance in educational work as it is a key to the out-of-doors; the place where people can identify the things they see around them in the field.

All of these activities should greatly stimulate interest in the park and the natural features therein. It should benefit the visitor to be able to understand the things he sees around him. Although the beginning will be modest, we hope to make it a feature of each person's visit to the Grand Canyon National Park in the near future.

WESTERN YELLOW PINE (Pinus ponderosa)

(By G.E. Sturdevant - Park Ranger)

The western yellow pine, forming eighty per cent of the stand in the forests of the north rim as well as a large per cent of the forested area on the south rim of the Grand Canyon, is without question the most valuable tree of northern Arizona. Rating second only to the sugar pine in size, it holds an enviable position in the future pine timber supply of the United States.

These straight-trunked trees are characterized by long, narrow, or crowns of hugely developed bent branches. The trunk is smoothly cylindrical, with little taper, until the large crown branches are reached. The bark of the older trees is marked by broad russet-red plates, the surface of which is peculiar in that it is made up of small concave scales. Younger trees, up to two feet in diameter, generally have a dark red-brown or blackish narrow furrowed bark, and are called "blackjack" pines. The leaves or needles, varying from four to eleven inches in length, occur in bundles of threes. The young yellowish-green shoots have an orange-like odor when bruised. Unlike deciduous trees, each season's growth of leaves remains on the tree about three years. The cones are quite variable in size and color. Those appearing on some trees are bright grass-green when mature, while those on other trees are dark purple. Maturing in two seasons, the cones measure 2-3/4 to 5-3/4 inches in length. The scale-tips, of these massive cones, are very thick with stout recurved prickles. The seeds contained therein, are dull yellowish-brown in color and resemble small navy beans in size. To each seed is attached a light brown seed wing some three fourths of an inch in length. One of Nature's methods of perpetuating each form of life is evidenced by often times finding these wind-borne seeds germinated considerable distance from any seed tree.

Although growth is continuous throughout life, western yellow pine like most forms of life, attains most rapid growth during youth. With a practically clear trunk of from forty to sixty feet, they range in height from 125 to 140 feet with occasional specimens towering as much as 180 feet above the ground. Nothing is more exhilarating to the tourist who has traveled over the sandy deserts in either direction than to inhale the pure air in the shade of these majestic monarchs. They grow to best advantage on mountainous or exposed sites where the unruly winds would play havoc with a tree of denser foliage. Their narrow leaves are admirable adapted to evade the force of winds, resulting in a continuous soft, peculiar, murmur. Under proper conditions, the western yellow pine reaches an age of 350 to 500 years, with a diameter up to sixty inches. A single specimen attaining an age of three hundred years with a diameter of four or five feet contains a lumber content of four thousand board feet or enough to build a good sized house. Most of the operators object to the term "yellow" pine as yellow signified to many a poor grade of lumber. Because of the high quality and light appearance of the western yellow pine, it generally reaches the market under the name of "Western white pine".

At the present time about 150,000,000 board feet are harvested annually from this great forest. In order to insure a perpetual supply of timber, scientific plans have been introduced whereby lumbering will proceed on a 200 - 250 year cycle. Fortunate indeed may Arizona sense her tardy development; for under supervised cutting future generations will look more and more to this state to supply much of their sorely needed pine timber.

The range of this pine is entirely west of the 100th meridian, from British Columbia and Montana, south through California, Arizona, and New Mexico into Old Mexico. It grows at elevations from 1,800 to 9,700 feet, where it forms extensive forests. The lowest elevation recorded at the Grand Canyon and perhaps in this section of the state is that of one sturdy specimen growing in Bright Angel Canyon at an elevation of 3,350 feet.

Recent investigations have shown that spacings of growth rings indicate the amount of rain for each year. The precipitation as evidenced by spacings of growth rings has coincided to accurately with the measured precipitation for the last score of years that climatologists have lately availed themselves of this wonderful record kept by Nature for so long a period. If you wish to know if there was drought or unusual heavy precipitation in this area when Columbus discovered America, you need only ask the climatologists who have counted back on these rings.

"A forest in which cutting is not followed by reproduction is doomed to ultimate extinction." This was the case of many of the great hemlock forests of the eastern United States. Reforestation of burnt or cut-over areas is one of the great problems of the Government today. Careful study has revealed that artificial reforestation in the western yellow pine areas of Arizona and New Mexico is impractical because of high costs and slow growths,

Where extensive lumbering operations are carried on, natural reforestation is resorted to as being the most efficient and economical means. Under this method a few mature trees are allowed to remain to serve as seed trees to reforest the adjoining cut over area. A limited example of natural reforestation can be seen in the fenced cemetery plot at Grand Canyon where in places the ground is almost completely covered with small seedlings.

Hundreds of times during a single season is the remark made by visitors to the Grand Canyon. "Why you have trees here." That the far-away blue mountains are clothed with timber is inconceivable to one traveling over the desert traversed by the motor highway or transcontinental railroad. It is still more difficult to convince the traveler that the great western yellow pine belt extending from the Grand Canyon in a southeasterly direction for a

distance of 200 miles to New Mexico, is the largest known forest of one species in the world. This timbered area is important both from a grazing and watershed view point as well as for its timber production. About 290,000 cattle and 280,000 sheep find range therein. The streams which furnish water for the various irrigation projects of the state, rise within the forested areas.

The act creating the National Park Service gave as the purpose of our organization, "to conserve the scenery and the natural and historic objects and the wild life therein, and to provide for the enjoyment of the same by such means as will leave them unimpaired for the enjoyment of future generations." At present the National Park Service has under its control over eight million acres of land, including 19 National Parks and 32 National Monuments. About two-thirds of this area is covered with forest. There is a difference between the other forests and those in the National Parks. Timber conserved for utilization can be valued because it has a commercial value. Forests in the National parks are conserved for preservation, and cannot be valued because they are priceless. The large timbered areas in our National Parks are not only a great scenic asset, but in many cases they protect the sources of important rivers and watersheds, thereby preserving other scenic beauties. It is the duty of every American citizen to guard constantly against the encroachment on National Parks by commercial interests that would impair or destroy their forests and other wonders. At the present rate of consumption we will feel the "pinch of forest exhaustion in fifteen years" and soon the only virgin stands of forests in the United States, available to all people, will be in the National Parks.

WATER OUZEL (*Cinclus mexicanus*)

(By G.E. Sturdevant - Park Ranger)

A bird with a song as sweet as the canary's, a bird of unusual interest to the scientist and Nature lover, a bird without webbed feet but which swims and lives with the ease of a duck, cast out from its original abode but now adapted to a vacant place in Nature, such is the story of the water ouzel.

These curious members of bird life have been cited by Darwin as one of the exponents in proving the theory that ~~man~~ made him famous. Considered originally as members of the thrush and wren family, it is interesting to give in detail how the scientist has explained their adaption to their new environment. At some remote period, probably hundreds of generations of bird life ago, a bird which was perhaps the common and more generalized ancestor of our thrushes, warblers, wrens, etc., had spread widely over the great northern continent. There may have been some great crisis in this once single family. This crisis may have been the result of food shortage, natural enemies in their old environment, or some other cause. At any rate this stock gave rise to numerous varieties adapted to special conditions of life. Among these some took to feeding on the borders of clear streams, picking out such larvae and mullusks as they could reach in shallow water. When food became scarce they would attempt to pick them out of deeper and deeper water. While doing this in cold weather many would become frozen and starved. But any which possessed denser and more hairy plumage than usual, which was able to keep out the water, would survive; and thus a race might be formed which would depend more and more on this kind of food. Following up the mountainous streams where the velocity of the water was great enough to prevent it being easily frozen over, they could live there during the winter, protected from their enemies, and with ample shelter for their nests and young. Further adaptations occurred until the wonderful power of diving and flying under water was acquired by a true land bird. Regardless of the merits or veracity of this explanation, the water ouzel is present and adds to the picturesqueness of the mountainous streams of central and western North America, from the Yukon to Guatemala.

Perhaps in no part of its range does its voice sound sweeter or carry a greater distance than it does in the deepest cut canyon of its distribution. Here along the side streams where the Colorado river has performed the greatest example of stream erosion, does its song appear most clear. The song, never to be forgotten if once heard. Echoes and re-echoes above the water for a great distance in either direction. The birds are particularly numerous in Bright Angel and Phantom Canyons in Grand Canyon National Park.

These birds are small, being about one-third larger than the common English sparrow. They resemble small thrushes, having very short wings and tail and very dense plumage. They are distinguished from the thrush family, however, by an almost straight compressed, sharp-pointed bill, and still more by their manners and habitat. The feet are well formed for walking. The strongly curved claws aids them in retaining their grasp on the rocks while feeding under water. The food consists of water-beetles, caddis-worms, and other insect-larvae, as well as numerous small fresh water shells. With the aid of their short muscular wings for power they are able to propel themselves about under water without the customary aid of webbed feet. According to the best observers, this extraordinary power of flying under water is their process of diving in search of their prey.

Coming up to the side of one of these apparently deserted streams, it is almost startling to see a water ouzel come to the surface in full flight. Unlike the ordinary water fowl, there is no flapping of the wings to rise from the water. Their very dense plumage absorbs practically no water. The flight is apparently continuous from water to air. Bopping up like a cork there is not a moments hesitation from the time the water ouzel comes up from his submerged feeding grounds until he is darting on his way.

As nature provides a protective coat for many of the furred animals at different times of the year, so in like manner, but on a somewhat lesser scale, is the water ouzel provided with a protective coat. During the summer the whole body is nearly a uniform slate grey, being a trifle lighter below. The head and neck are faintly tinged with brown during this period. During the winter, however, the feathers of the wings and underparts are lightly tipped with white, giving them an ideal protective appearance against the white background of snow. Thus they would be rendered quite inconspicuous if it were not for their continuous bobbing or bopping which has earned for them the name of "dippers." In fact, perched on a boulder in mid-stream, the continuous becks or dips of the head accompanied by an upward jerking of the tail, is the only life manifested in many of these lonely mountainous streams.

Careful search may reveal the nest, of oven-shaped structure, in some mossy bank close by the stream or near or under a cascade. The bulky nest of curiously interwoven green moss is domed with an entrance at the side. Here carefully hidden from all enemies, are the four or five pure white eggs deposited, incubated, and the young reared.

Although the statement has often been made that the water ouzel is a destructive bird in that he feeds on the spawn of trout and other fishes, this has never been proven against him. Unlike many families of birds he is not migratory but remains continuously in his native haunts where the nature lover has studied him at all seasons in all his phases throughout the entire year.