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GRAND CANYON NATIONAL PARK



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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 of Grand Canyon National Park, Grand Canyon, Arizona.  
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PINON PINE ( *Pinus edulis* )

(By G. E. Sturdevant-Park Ranger)

The pinon pine making extensive growths on the south rim of the Grand Canyon as well as limited growths on the north rim and within the Canyon itself, is the only tree prized primarily for its nuts in this area.

This tree is a small stunted pine rarely exceeding fifty feet in height and two and one-half feet in diameter. When fully mature it averages about twenty feet in height and one foot in diameter. Although not considered a long-lived tree, ring countings have revealed an age in excess of 350 years for a few members of this specie.

Pinon pine has been observed growing in Grand Canyon National Park at elevations from 3,000 to 8,300 feet. The most vigorous growths, however, are found at elevations between 6,500 and 8,000 feet. At such altitudes it is distributed from the eastern slope of the Rocky Mountains in Colorado and New Mexico, south into the mountains of western Texas, westward to central Utah and western Arizona, and from the border of Wyoming south into the mountains of northern Mexico. It is found interspersed with Utah juniper on the south and west exposures below altitudes where a less drought-resistant tree would not survive.

This pine is admirably adapted to adverse weather conditions. The climate is dry with wide daily and annual ranges in temperature. The annual rainfall, which is largely torrential in character, is generally limited to about eighteen inches. In such apparently unfavorable localities for vegetational growth, is the pinon pine suitably distributed by Nature.

This distinctly desert-foothill type grows most commonly in mixture with Utah juniper in open stunted stands. From a distance it usually bears a close resemblance to orchard trees. The outline is irregular, even gnarled, with no clear length except under the most favorable conditions. Leaves (needles) are borne in bundles of two and measure from three fourths to one and one-half inches in length. The cones are about the length of the needles and as stout as broad as long. They have relatively few scales between which their edible, nut-like seeds are borne. The seeds are unusually large with a very thin shell covering. In size they compare favorably with large coffee beans. They are marketed extensively as a sweet meat under the name of "pine nuts" or "pinon nuts."

Seasons of especially abundant production occur at intervals of five to seven years. A mature tree will produce from one to eight bushels of cones in a good year. Although a cone may average ten to twenty seeds, a high per cent are usually infertile. While reproduction is limited at times by man, birds, and rodents, accumulating hoards of nuts, the same agencies also aid in dissemination. Since the heavy seed has no well-defined seed wing by which it can be wind-borne, the above agents often cache the seeds in places suitable for germination and growth.

If you were to ask the Indian inhabitants around the Grand Canyon, "what is the most valuable tree in this section of the country", the unanimous reply would be "pinon pine". Pinon nut picking is always looked forward to by the Hermit tribe of Supai Indians dwelling in Havasupai Canyon in Grand Canyon National Park. Each year, late in the fall, excursions are made to the best pinon nut picking grounds of the season. The spectacle afforded by entire families riding in horse-drawn vehicles on the way to the pickings reminds one somewhat of the excursions once made to the huckleberry mountains in the East. Oftentimes an old gray-haired Indian may be seen riding a horse leading the procession. Pack horses of many colors follow. Occasionally two or three papooses are mounted on a single horse guided by a squaw. It is not uncommon to see a few of the poorer squaws trudging along at the rear of the procession.

The increasing popularity of the seeds on the market has caused the Indians to sell large quantities of the sweet meats in late years. They receive about twenty cents per pound for those sold. A supply sufficient to last throughout the winter, however, is retained for food. An exceedingly palatable dish is prepared from these nuts. The nuts are roasted until thoroughly baked. The thin shells are then easily broken on a "metate" or mealing stone by a small smooth stone known as a "mano" or hand stone. The nuts are then thrown in the air and the thin shells fanned away or as the Indians say "put through a vabsite process". The nuts are afterwards returned to the metate and ground. The meal is moist from its own oil and sticks together. Then the meal is shaped into cakes or "Moatahtahs". Small Moatahtahs are made for the individual although large ones may be made which serve the entire family. Some people have suggested that the rich oil contained in the pinon nut meal has such fattening properties as to account for the corpulency of the Supai squaws.

The Navajo Indians place an equal stress on the importance of picking their winter's supply of pinon nuts. Their weaving is entirely neglected during this period. They will dash off to the place where pinon nuts may be found, selling partly completed blankets for what they will bring.

The nuts are not sought solely by man. Rodents and birds are also present at the pickings. The Abert squirrel and members of the jay family even exceed the Indian in the art of gathering the nuts. Extreme jealousy exists between the three. No honor is shown for each will steal from the other. The jay makes the most noise about it, especially when he has been driven from a well-laden tree. He will sit in another tree close by scolding at the top of his voice. If the scoldings could be interpreted properly his adversaries might resent the remarks.

Pinon pine has considerable value aside from the nuts that it bears. It forms extensive growths interspersed with Utah juniper in regions too dry for other trees. In such localities this desert-foothill type of tree helps to retard erosion and maintain an even flow of water. The small size and crooked form prevents the use of pinon pine for lumber, but large quantities are consumed annually as fuel wood. In favorable localities it is merchantable for fuel as early as the twenty-fifth year of its growth. Occasionally a market is found for other products such as small poles, fence posts, railroad ties, and mine timbers.

#### ANCIENT FERNS.

(By G. E. Sturdevant - Park Ranger)

The recent discovery by the National Park Service of several specimens of ancient fern impressions, at least 25,000,000 years old, will undoubtedly reveal certain truths regarding a portion of the past history of the Grand Canyon in a more simple and more effective manner than can be learned elsewhere.

All of the specimens occur in Hermit Basin in the Hermit shale of Permian age. The Hermit shale that has preserved this ancient flora for so long a period is deep brick-red color. It varies in places from a fine-grained sandy or a gillaceous shale to a friable sandstone.

Three distinct species are represented in the entire collection. A slab about two feet square contains one nearly complete specimen. This species is excellently portrayed with the main stem, side branches, and leaves in perfect arrangement. The side branches running out from the main stem measure seven inches in length while the leaves average three quarters of an inch in length. Another slab shows a portion of a much larger species of fern, as each leaf measures about one and seven-eighths inches in length. The third species is represented by a vertical section of a fern with six leaves branching out from the main stem at frequent intervals.

The third species is of particular interest in showing the rate of accumulation of the sediments. In cleaving off the shale where this form occurs, a nearly complete vertical section is exposed. In order to preserve a fern standing upright the sedimentation must have been much more rapid in this vicinity than formerly supposed.

The Hermit shale which contains this ancient flora fills the eroded depression of the Supai formation. Seeing this, one must marvel in the change of drainage patterns. Where there was once a depression into which the streams carried this flora of the past, now is presented a uniform slope where the intermittent streams are at work carrying the loose material of these old sediments into the Colorado river.

The great abundance of these highly developed forms in early Permian time when this formation was deposited indicates a large amount of precipitation and a warm climate. Where the Hermit shale once supported so luxuriantly this tender flora now under more difficult and trying conditions does it support a semi-desert vegetation. The precipitation once so abundant in this locality is now limited to about eighteen inches per annum. The climatic con-



ditions are also more severe. The semi-arid flora that now clothes scantily this area undergoes a perpetual struggle to adapt itself to these adverse conditions. Among the flora now present might be listed such forms as stunted pinon pine and Utah juniper, mormon tea, desert sage, and yucca.

Although ancient forms have been found in this locality before, the present collection is undoubtedly the best yet made. This collection will make possible an easy scientific determination of each specie. During the present year the National Park Service intends to increase the collection and have each specimen accurately determined.

LONG \* CRESTED JAY (*Cyanocitta stelleri diademata*)

(By Glen E. Sturdevant - Park Ranger)

The Long-crested jay receives perhaps more admiration and causes more comment than any of the birds at the Grand Canyon. Requests for the identity of this jay are received daily at the information office.

This jay closely resembles his near relative the Steller Jay which is also a resident at Grand Canyon. The former, however, is distinguished by the conspicuous white spots over his eyes and the white streaking on the forehead. The varied markings of the different parts of the body are so sharply contrasting as to make the bird exceedingly conspicuous. The head is shiny black while the back is grayish-blue, which contrasts sharply with the dark blue wings and tail barred with black.

The Long-crested Jay is not noted for his singing qualities. The "chack-ah, chack-ah" cry appears quite harsh to the ear. That he possesses a much softer and sweeter song is verified by the residents at Grand Canyon who feed these vociferous members of bird life. This latter song is heard when the jay is perched in a nearby branch waiting for somebody to toss a few pinon nuts on the ground. Whether this song is his method of begging or merely an assurance of friendliness is not known. It is amusing to watch the jay when he comes down to receive the pinon nuts. Although beautiful he appears awkward on the ground. Both feet move in unison resulting in a jerking hop.

Sharp eyes are necessary for locating the nest as it is generally confined to a thick-branched evergreen. In such a place, about twenty feet above the ground, occurs the nest of twigs and dry grass cemented with mud with its well selected lining of fine roots or grass. The four or five pale bluish-green eggs are deposited in the nest and the loud-lunged youngsters reared until self-dependent. At least two broods are brought forth in a single season. Race suicide is not in vogue with these members of the jay family, as the eight to ten young more than off-set the normal death toll.

Not all of his attributes to fame are complimentary, however, as he is the recipient of many nefarious names because of his "taking" ways. The Long-crested Jay is not as honorable in respecting the property rights of others as his well-kept appearance might indicate. These "taking" ways have brought forth from the camper victim such epithets as thief, robber, and scoundrel. Woe to the unwary camper who leaves his edibles exposed while he saunters off for his anticipated view of the Canyon. The jay is quick to see his chance and loosed no time in partaking of the best of the dishes at hand. His natural curiosity, however, generally causes him to prefer a sample of all. Even a cake of soap may retain a few holes where the long, sharp, bill entered to see if the interior portion was more appetizing. A diligent search may re-

small portions of bread hastily hidden in a crotch of a tree or near the surface of the ground.

The Long-crested Jay becomes quite tame when fed regularly. He is always on hand when food is to be had. The two rangers stationed on the north rim throw out regularly the table scraps each morning. Several members of the jays have become so dependent upon this source of food supply that they are always on time at this meal. In fact, they let it be known by their loud calls if the rangers are not prompt in performing this duty. Their natural food supply, however, consists of pine nuts, pinon nuts, and grasshoppers.

When throwing our pinon nuts to the jays it is amusing to watch their antics. They will eat until a full crop is evident and then hastily bury the remaining nuts. The jay has been seen carrying away as many as nine nuts to his hiding place at a single time. Occasionally another jay will watch the hiding process until it is completed and then attempt to steal the hoarded surplus. That the rightful owner has prior rights is evidenced by his putting to flight quickly the would-be thief. Whether the jay ever returns to his hidden food supply or whether he is merely one of the small cogs in the great wheel of Nature that insures perpetuation of the species is not known. Perhaps he returns to these recently hidden in case of need while other seeds may have germinated before his return.

In spite of any harmful trait which may lend a certain unpopular regard for this bird; the charm and grace of the flash of blue, boldly asserting itself from tree to tree, would be sorely missed.

#### ANY PORT IN A STORM

Any port in a storm was evidently the foremost thought in the mind of the junco bird that sought refuge at the north rim station.

A raging storm was in progress while the two rangers stationed at this place were comfortably housed in their log cabin structure enjoying the warmth of their fire. Hearing a slight chirping noise on the porch, the rangers found upon investigation a Thurber Junco taking advantage of the slight shelter offered by the front-porch. The bird failed to move at their approach evidently taking them for fellow travelers in distress. Picking the little fellow up, a careful examination revealed no injuries. He was placed on a box where he minced on some appetizing corn bread for the remainder of the day.

Thinking that some possible harm might befall their feathered friend during the night, they placed him on a nearby limb of a sheltered tree.

That he was thankful for the kind treatment received at the hands of Uncle Sam's trusted employees, is vouched for by both rangers who see him along with many other birds daily partaking of the remains of hot cakes, biscuits, and numerous dishes prepared by Rangers Winess and Brown.

The American Forests and Forest Life Magazine announces two picture prize contests. They are open to everyone who can click a camera.

The first is the cover page contest. Pictures will be considered from the standpoint of their suitability for use on the cover of the magazine. The subjects must be chosen from the outdoors - forest, mountain or river scenes; wild life in its native haunts; the woodsman at work; the fisherman in action; camp and trail scenes; fires in the forest; winter scenes in the woods; forest activities, either work or play; fire lookouts; wild flowers; trees. These and any other subjects having a rich forest flavor are eligible. The more action in the photograph, the better.

The winner will receive \$25.00, second place \$15.00 and third place \$10.00. Any additional photo retained for use will be paid for.

The second contest is for those who have the best picture of some freak of nature. This may be a queer plant, tree or geologic formation, or anything from the out-of-doors that is bizarre or unusual. The first prize is \$10.00, the second \$5.00, and the third a fifteen months subscription to the American Forests and Forest Life. A short description of from fifty to a hundred words should accompany each photo curiosity, explaining what it is and including any interesting points about it.

For full particulars address, the Photo Contest Editor, The American Forestry Association, Lenox Building, Washington, D. C.