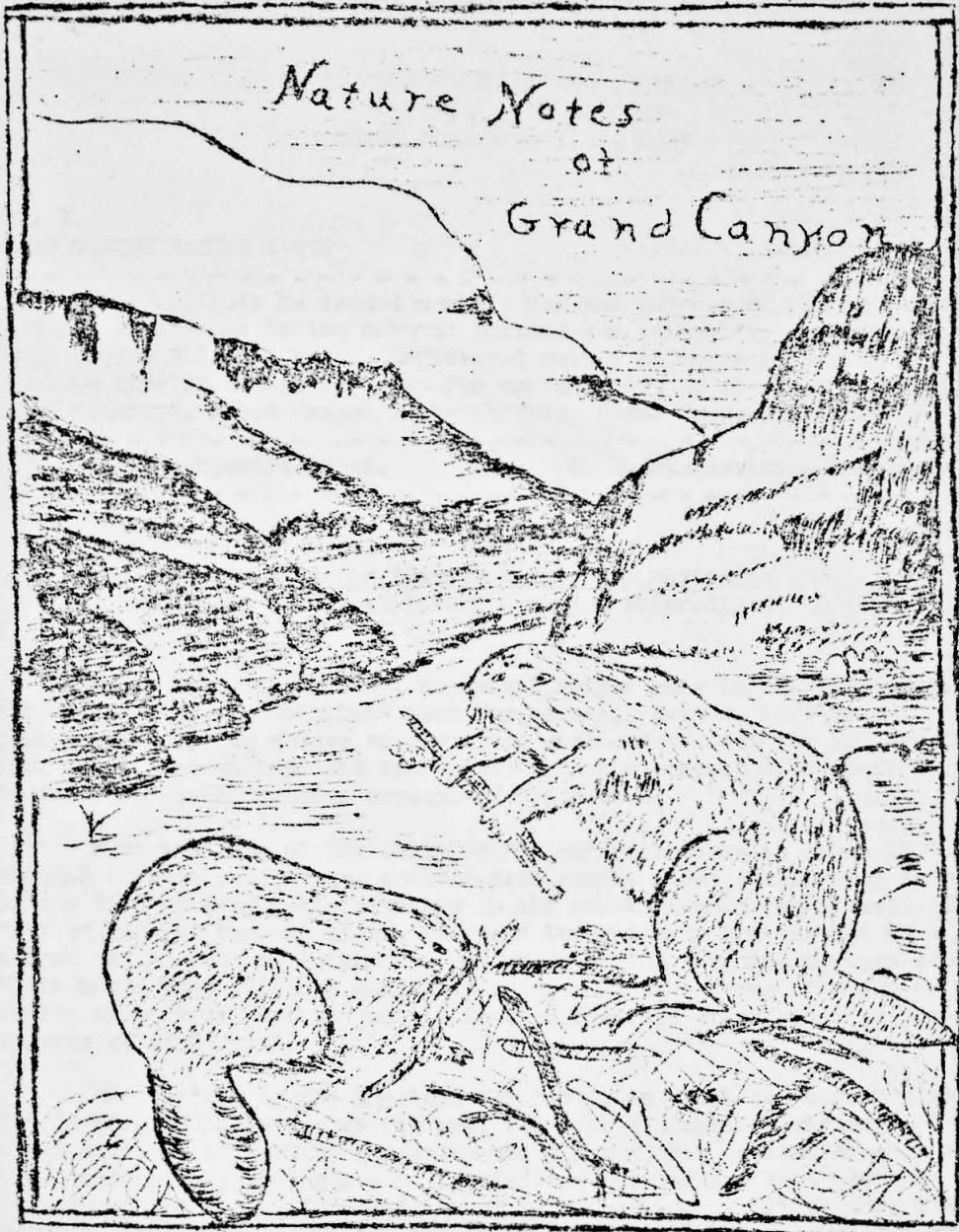


GRAND CANYON NATIONAL PARK

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

J. R. EAZIN - Superintendent. G. M. Sturdevant - Ranger Naturalist

American Beaver (*Castor canadensis merriami*)
(By G. M. Sturdevant - Ranger Naturalist)

Aside from the buffalo, no animal helped more in the development of the west to his own detriment than the beaver. Beaver, buffalo and gold, combined with a love of adventure were undoubtedly the primary factors that lured many an intrepid individual from his contact with civilization, to the remote, unexplored, regions of the west.

From the time of the early French explorers down to about 1900, the thought of easy money being derived from beaver hides caused many to resolve upon a life of danger and hardship in the great unknown wilderness. This "pot of gold at the end of the rainbow" lowered many individuals to a lonely death. An encroachment upon the red man's hunting grounds or upon some white man's trap line was generally followed by the twang of a bow or the report of a rifle that sealed the fate of hundreds of unfortunate fore-runners of civilization.

The history of the American fur trade, in which the beaver played the leading role, is one of the most romantic of American History. The feuds between the various companies and the outlawry actions of each side, could undoubtedly fill pages of interesting reading now left blank in the history of the west. The exploits of such trappers as Kit Carson, Jim Bridger, and James O. Pattie, and the alluring tales they carried back to civilization, are probably unsurpassed as epic tales of adventure. The excellent memoir, "The American Fur Trade of the Far West" by H. M. Chittenden, deals at length with the travels and adventures of these intrepid trappers of the Rocky Mountain region.

Since the English Parliament passed the Act of 1658, prohibiting the use of any other material for hats until the beginning of the

twentieth century, beaver hides have been an increasingly hunted article. The constant inroads made on the ranks of these animals, who helped so materially in the exploration and settlement of the west, reduced their numbers almost to the point of extermination. The horde of white hunters which swept over the beaver country, were not imbued with principles of sportsmanship nor did they have any conception of even the fundamentals of game conservation. In all of their operations they "trapped clean"; failing to leave a single pair to repopulate the streams. No spot was so remote that it failed to challenge the attentions of these hardy and aggressive pioneers. In the ever spreading search for beaver hides, attempts were made to penetrate even the carefully hidden secrets of the Grand Canyon. In fact during the tremendous rapids of the Colorado, these men set out in poorly constructed boats, and probably even rafts, to float down the river to trap beaver along its banks. It is barely probable that any but a few ever returned as it was hardly to be expected that their poor outfits could survive conditions which have overcome parties much better organized and equipped. However, it shows the spirit of the early trapper, which produced conditions against which even the hardy and prolific beaver failed to hold his own.

The American beaver is closely related to his European and Asiatic cousin "Castor fiber." The chief difference between the two species being in the form of the nasal bones of the skull. The beaver is about two feet long exclusive of the tail which is about ten inches in length. The tail differs from all other members of rodentia in that it is large, flattened horizontally, and covered with scales rather than hair except at the root. The beaver owes his destruction to the high commercial value of the fine grade of fur that covers his entire body. Two kinds of hair are found on the fur; the longer hair, commonly called "guard hair," being comparatively coarse, smooth and glossy, the other close set, soft, silky and of a reddish brown. Many trappers spent long winter evenings plucking out the coarse "guard hair".

Just as the bats serve as a striking example of the way mammals have adapted themselves to an aerial life, so likewise does the beaver, along with the muskrat, present an equally striking case of adaption in another direction. By adaptive radiation these two members of rodentia have become aquatic-amphibious forms of life.

The typical incisors or gnawing teeth of the beaver exhibit the distinctive character of the order to which it belongs. An incisor has the hard enamel confined to a band on the front face, the remainder of the tooth consisting of softer dentine. This results in a very efficient and continuously sharpened chisel-like tool for gnawing. By constant use in gnawing wood the incisors are ever being worn away. It would seem at first thought that Nature has kindly provided for such an exigency by having the teeth grow throughout the life of the animal. However, the ever-growing teeth may result ultimately in the death of old beavers, especially when the teeth grow faster than the beaver can wear them away.

Each foot is found to possess five toes. Those of the hind-feet are long^{and} webbed to the very nails. The hind-feet are spread out not greatly unlike those of a goose. The toes on the fore-feet are short and not connected by a web. The hind-feet alone are used in swimming. The fore-feet, aside from an ambulatory aid, serve as a trowel in plastering the mud on their structures.

These vegetable-feeding mammals have a well-developed social organization as all unite for the construction of such public works as the dam. The beaver is recognized as a constructional engineer. His efficiency along this line never fails to bring forth admiration from mankind. Where the water is too shallow he builds the dam so that it impounds the water to a depth sufficient to meet his demands. The twigs and branches cut into suitable lengths from cottonwoods, felled by arduous labor, as well as stones and mud are worked into the dam. The mud and stones are carried by the fore-paws while the branches are carried by the teeth. Since the beaver is mainly nocturnal in habit one is prevented from seeing the actual construction work being carried on except the progress as it is made from day to day. The dam varies with the velocity of the stream in which it is located. If the stream is slow moving, the dam is constructed nearly directly across its path. The tributaries of the Colorado river within the Grand Canyon National Park have steep gradients. Here the beaver builds a curved dam, curving with the convexity of the current.

The onslaught of man has in general caused the beaver to forsake his "lodge" with the entrance beneath the water and his gregarious tendencies, for better security in a hole in the bank, whence the name "bank beaver". In such a place the two to seven "beaverettes" are born in the spring of each year. Although the dam is considered a public enterprise and all unite in its construction, the social organization is not carried into the individual home. Here each works for himself and lives his own family life more or less regardless of others in the community.

With the coming of spring and high water the beaver deserts his winter quarters and wanders around, never venturing far from water except in case of necessity. Single beavers are frequently met with which are conquered males driven out from the colony. With the approach of autumn the beaver returns to his winter home where he busies himself laying up his store of provisions.

The beaver is entirely a vegetarian. The food consists of roots of water lillies, and the bark and twigs of trees and shrubs. The diet within the Grand Canyon is by necessity limited to the flora found along the tributaries of the Colorado river. This consists chiefly of fast growing cottonwoods.

The automobile windshield stickers, provided each National Park

generally contain the picture of an animal characteristic of that particular region. The American Beaver adorns the sticker from Grand Canyon National Park. Many ask "Why do you have a beaver as an emblem on the sticker from this park?" The answer is, "that the beaver is indigenous to this region and that the Colorado river and its tributaries within the Grand Canyon National Park now serve as an undisturbed rendezvous for these vanishing members of wild life. Their recent workings as well as the occasional presence of their dams never fail to bring forth comments from the tourist who happens to go within the canyon and observes them. Some of the felled cottonwood trees often measure over a foot in diameter. The beaver dams in Bright Angel and Phantom Canyons, within the park, are generally washed out in the spring of each year because of the large volume of water that pours down these narrow gorges. Each autumn the dams are reconstructed.

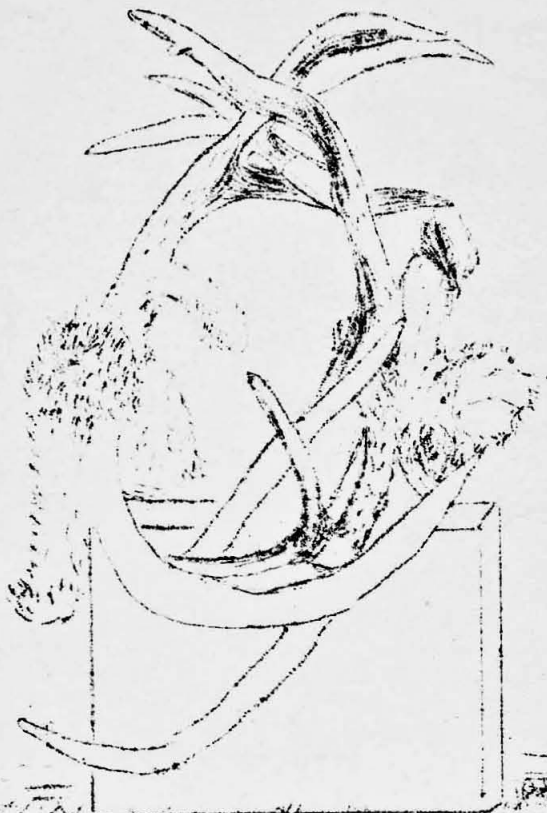
For many years the beaver has been at least partially protected from the trapper. In many places his habit of damming streams has caused the flooding and consequent damage to the various improvements of civilization. When such a situation arises, our wild life must give way and supervised trapping is carried on, in some cases to exterminate him, and in others merely to keep him under control. Our National Parks, being game sanctuaries, offer him a place where he can carry on his operations undisturbed and thereby provide a means for his perpetuation as one of our most interesting forms of native wild life.

Intelligent Robin

How intelligent is a robin? Perhaps a pair of the most intelligent western robins make their home at Grand Canyon National Park.

Dry weather had prevailed for several weeks. A pair wished to build their nest but found the long needles of the western yellow pine stiff, and difficult to weave. Water is rather scarce for bird life on the south rim of the canyon so many of the Government employees provide drinking fountains for their feathered friends. The robins evidently knew from past experience or perhaps instinct that wet needles are more pliable than dry. At any rate the birds would fly to the drinking fountain and dip the needles giving several swishes of the head so as to thoroughly moisten them. After being assured of their pliability the robins would fly to the upper branches of a Utah juniper and carefully lay the corner stones of their home.

In order that this action should not be mistaken for accident, the pair were watched throughout the day. Except during the middle of the day when the robins desisted from their industrious occupation, the incident was repeated with great precision.



Courtin' Time

(By G. E. Sturdevant - Ranger Naturalist)

The coming month will mark the start of a change in the deer herds in the Grand Canyon Park. The reddish brown coats of the deer, especially the bucks, will start to change from the summer color of reddish brown to blue. It is the beginning of what the Indians call "the period of the blue moon". This change is really a dressing up process for the courting season which is some weeks away. During this time the horns will harden and the velvet will be polished off by rubbing against small trees and brush. This constant charging and rubbing of horns in the brush also serves to harden the animal's muscles for the terrific battles he will probably have to fight during the height of the social season.

That terrible battles have been fought in the silences of the great Kaibab Forest, is amply proved by existing records. A short time ago there was found a grim reminder of one of these battles in which death was the only victor. Rangers on patrol came across the skeletons of two deer close together, and upon investigation, found that during the fight their horns had become so tightly locked together that they ~~were~~ not able to separate, starvation evidently ending the fight. A photograph of this unique exhibit has just been received on the south rim.

Two of the Park Rangers at the North Rim Station have lived practically their entire lives around the Kaibab Deer Herd and have witnessed several of these great duels. However, the most dramatic on record is one witnessed by Ranger Fred Johnson and two companions in November 1917. While riding through the woods they came upon two bucks with their horns locked together and both were nearly exhausted. The older and larger buck was lying upon the ground where his weight bowed the head of his young rival. Realizing that both deer would soon perish unless released, they attempted to part them. Well aimed rocks failed to break the horns, so as a last resort one horn of the down deer was splintered about six inches from the base by a rifle bullet. However, this did not effect the release, and it was necessary to break the tips of the other horn with rocks. Realizing that the animal still standing was soon to be released, Johnson and his friends sought refuge in some nearby trees. The freed buck paid no attention to the spectators. He shook his head, hooked his rival in the flank, and then stamped him with his fore feet. At last standing over the prostrate deer on the ground, the younger buck lifted his head, sniffed the air and then trotted away from his dying adversary.

Ranger Arthur Brown at the same station once came upon a scene of a battle after both of the principals were dead. One buck had fastened his horns in the ribs of his opponent, and was unable to free himself. After killing his rival, he himself had faced a slow and terrible death by starvation.

These and other observations show conclusively that when battles take place during the mating season, they are duels to death, and all participants recognize them as such. On a still night the clash of the horns can be heard for a long distance through the forest, and observations of scenes of fights show that the ground, torn up and in some cases even small trees are uprooted. Only when the defeated deer is a faster runner than his opponent, do both survive the fight. Thus it is seen that even among wild animals, footwork is a valuable asset in a fight.

^{Few}
~~A Few~~ Pets

(By E. T. Scoyen - Chief Ranger)

Perhaps the most interesting things in the Park Information Office are the few animals that are kept there. To date these consist of one Gila Monster, a side-winder rattlesnake, a porcupine, a lizard and a few horned toads.

The Gila Monster is the oldest exhibit, as we have had him for over a year. He is known by the name of Hal, which is short for his full name of Hal I. Tosis. Although not indigenous to the park, he is kept here because he was presented to us by Mr. McCormick an Indian Agent near Tucson, Arizona. He is perhaps the greatest attraction in the office.

Rattles is what his name indicates. Although rattle snakes are not found in most sections of the park, and we have no record of one being seen around the Grand Canyon Village, they occur to some extent in the canyon itself. The specimen in the office is a small sidewinder. He is very obliging about shaking his rattles for visitors.

"Oswald is a recent acquisition, and threatens to oust Hal from his place as the most popular exhibit. He is a baby porcupine, and was caught by Ranger Leo Smith near the Checking Station a few days ago. The first night he escaped from his cage and disappeared. All-efforts to locate him proved futile, and it was finally decided that he had escaped through an opening in a window. Two nights later a pitiful cry coupled with some scratching overhead attracted the attention of the ranger on duty. A flash-light revealed the small quilled fellow hiding between the ceiling of the information office and the floor of the Superintendent's Office. He was taken back to the information desk where he readily partook of food and water. The next day he showed no displeasure at the presence of human beings as he minced on the pine needles given him. His insatiable appetite serves to attract small groups of tourists to him throughout the day.

At present writing, "Oswald" spends the entire day on top the Gila Monster's Cage, and is always ready to eat fruit cookies and cakes, as well as pine needles. His favorite dish at present is apples. If allowed to smell one he sets up a pitiful wail until presented with a portion. The little quilled creature has become a decided pet with park employees. He climbs around in their arms and apparently enjoys their gentle strokings of his back.