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Acting Superintendent



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YOSEMITE NATURE NOTES

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THE HALF DOME CRACK

By Ralph Teall

THE crack on the summit of Half Dome has long been an object of some interest both to the geologist and the laymen, but its general description has been wild and its existence often completely denied. A recent trip there offered opportunity for more accurate observations which are recorded here.

The crack is located at the base of a roughly equilateral triangle whose two sides are formed by the edges of the overhanging ledge on which are located the flag pole and register box. Its ends, however, do not even closely approach the actual cliff. It is between 150 and 200 feet long and averages at its broadest part, from 8 to 10 inches wide. The general clearance plane roughly parallels the sheer north-west face of the dome.

The depth of the crack has been the subject of many wild conjectures and reports. In this case it was observed by timing the fall of a series of various sized stones. It had been commonly reported at such an attempt would result only in hearing the rock or stone rattle down indefinitely and never strike bottom but there was no corroboration for this view. In every case the stone apparently came to a definite stop. The longest time of fall recorded was seven seconds,

while the general average was four. Only a very few observations varied as much as one second from this average. By the formula for bodies falling freely under the influence of gravity the approximate depth of the fissure was calculated to be about 256 feet.

This figure is subject to error from rebounds or obstructions causing deviation from a straight course or constant acceleration, although this would cause error on the side of a too large estimate rather than otherwise. A rustling or splashing sound at the bottom suggested that water filled a considerable depth and caused false observations, but this idea was abandoned as too fantastic and the noise attributed to tin cans and papers lodged there, the remnants of innumerable lunches.

Nevertheless, this fissure still retains "interest and significance. It is the best accessible example of a vertical granite clearance plane and corroborates the theory of the formation of Half Dome. These observations would, however, suggest that the fissure is far from bottomless and there is no apparently imminent or moderately remote complete clearance and discard of this huge sheet of rock.

BROKEN WING RUSE

By Beryl Rapp

During our stay in the Yosemite Valley we have had the opportunity of studying intimately the habits of the birds nesting there. We have seen the thrush start silently from her nest in the willows and return by a circuitous way stopping many times en route to look cautiously about for enemies. We have seen the mother robin spread her wings above her young to shelter them from the blistering rays of the sun at noonday. And we have protested when young grosbeaks seemingly large and able-bodied have lifted their wings and voices demanding food from an obviously overworked and bored parent.

But the ruse used by some birds to draw possible enemies from the nest is perhaps the most interesting instinct of all. While swinging along the McGee Lake trail we were suddenly startled by the sharp cry of a small bird as it fell into the path in front of us from a thicket of young pine. The little junco flopped in a distressing manner as though its right wing were broken and its left foot badly hurt. Still it made surprising speed ahead in spite of its injuries.

We searched the copse and ground thoroughly but failed to find the nest though each time we pushed our way into the pine thicket the birds fairly gnashed their bills and once the little female flew directly into our faces.

Once in crossing a meadow in search of violets I was startled by a meadowlark starting forward directly under my feet with the same "broken wing ruse" used by the Sierra junco. Fearing that I really had hurt the beautiful creature I was led away some distance, but later, when it became quite evident that the bird was only fooling me, I managed to find the covered nest on the ground with its short tunnel entrance.

In the mountains between Imperial Valley and San Diego we came upon a quail with her brood of downy chicks no larger than my thumb. In an instant the downy bits faded into the dry landscape while the mother fluttered away with a broken wing. Finding that I would not follow she returned several times before giving up and calling her chicks.

The killdeer carries the same "broken wing ruse" to such an extent that you become impatient with her. Her fright cry and her noisy flapping in the tall grass or willows disturbs the other birds and ruins the afternoon's study.

With the possible exception of the Western mourning dove all the birds which I have observed making use of the "broken wing ruse" have been ground nesting birds. The meadowlark, Sierra junco, quail and killdeer, all build their nests flat on the ground or sunk to the level of the earth. The dove may be the case which proves the rule, for it is entirely possible that this bird was once a ground nester and has only recently taken to nesting in tall shrubs and to trees.

STUMPS THAT GROW

By Paul J. White

Douglas fir stumps recently have been discovered growing many years after the trees were felled. Four cases of this unusual growth are in evidence along the Vernal Falls trail near the bridge.

A few yards from the south end of the bridge beside the trail one may find a growing stump thirty inches in diameter and two feet high. The cambium layer continued to grow after the tree had been felled, forming wood and bark which has grown over the top of the stump, making a roll entirely around the periphery two inches deep and three inches thick. This bulging growth resembles that which a tree produces to cover large scars. A short distance up the trail there are three other growing stumps, one of which we sectioned vertically to determine the method of development.

The Explanation of the Unusual Occurrence

The cause of this continued growth is not evident since the Douglas fir does not stump-sprout and since there are no green leaves present to produce food for growth. The explanation is the accidental grafting together of a root of the stump with a root of a growing tree from which is taken its sustenance. That this is possible is evidenced by two specimens of perfect grafts, one of which is on display in the Yosemite museum and the other on the Vernal falls trail. The graft in the latter case has taken place just below the surface of the soil but has since been exposed to view. This is the only logical explanation for this phenomenon.—By Paul J. White.

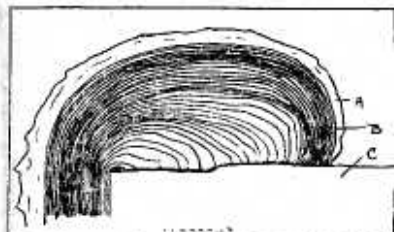
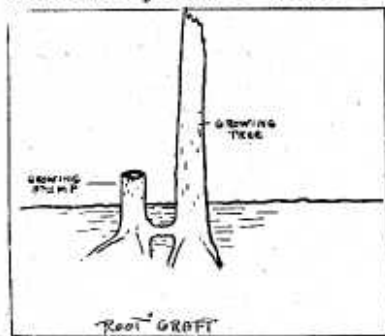


Diagram showing growth on Douglas fir stump. A, bark. B, annual rings; new growth thirty-four years. C, top of old stump.

This section shows the outer bark, cambium layer and wood, the latter made up of thirty-four annual rings indicating the number of years' growth since the tree was felled. During the first year the cambium grew vertically as well as horizontally but curved inward, the center of the stump forming a tiny semi-circle one-eighth of an inch in diameter. Subsequent annual growths built upon this in irregular semicircles until a roll of wood had been formed around the top of the stump three inches thick covered with a thin bark.



THE GRASS CARPET ON YOSEMITE'S FLOOR

By E. M. WOODHAM

"Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of canyon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass-grown like rural lanes and are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal."—James Ingalls.

The grass family is a large one containing 6000 known species, 350 of which are grown in the United States. It includes three-fourths of the cultivated forage crops and all of the cereals except buckwheat. The steppes of Russia, the pampas of South America, the broad reaches of Australia and the vast plains of America are covered with its members and these regions have become the great pastures of the world.

The grass plant is a herb, having alternate leaves with parallel veins. It usually has a hollow stem which is cylindrical and closed at the nodes. The leaves consist of two parts, the sheath at the base enclosing the stem and the blade or leaf paper. The flowers are tiny, usually perfect, and are arranged in spikelets.

The beautiful green carpet in the meadows and the open spaces of the woods in Yosemite Valley form a most striking contrast to the great gray walls of granite that tower above its floor. As the visitor to the valley enters the gateway between Cathedral Rocks and El Capitan after a hot ride from El Portal, he is thrilled with the vivid green that meets his eyes as he rides from one end of the valley to the other. The valley floor is a veritable carpet woven from many species of grasses, sedges, rushes, ferns, weeds and colorful flowering plants.

The most common grass found in the nap of Yosemite's carpet is the Kentucky blue grass (*Poa Pratensis*). This is a native species and of all the grasses is undoubtedly the most widely distributed throughout the area of the Yosemite National Park. It thrives best where there is at least thirty inches of rainfall or its equivalent and it will take complete possession of land containing limestone soils. It establishes its way without man's

help and crowds out all other species maintaining a dense sod. In this respect it sometimes becomes a pest. In midsummer it sends forth feathery yellow-green flower spikelets which give a beautiful garnish to the lower plants of the carpet. This species is native, soon covering the bare spots throughout all the life zones of Yosemite National Park. It is cultivated as a lawn grass and makes excellent pasture for grazing animals of the region.

Another native form, *Panicum*, or panic grass, is found in clumps growing in moist rich soil. One species, *Panicum pacificum*, is scattered throughout the nap of our carpet. It is often found in the higher country protruding in beautiful feathery plumes from between large rocks near mountain springs.

California wild oat, *Danthonia californica*, is found in dry places of the Transition zone and in the mountain meadows of the Alpine zone. This species is one of the common weeds of the Pacific Coast region. The wild form is taller than the cultivated form and its seeds are of a purplish color.

Wild barley has become a very offensive weed in Yosemite's carpet for when it is mature the axis of the spike breaks at the joints and each group of three spikelets becomes separate. These are the "arrowpoints" that work through the soles of the shoes and hose of the walker as he travels through the meadows in late summer.

Bent grass, *Agrostis*, gives a very beautiful pattern to Yosemite's carpet. It, like panic grass, grows in clumps in the moist, rich meadows, attracting the attention of man because of its showy head, which towers above the other grasses in the carpet.

Many of the grasses on Yosemite's floor are forms that have been

brought into the valley in the hay fed to the animals. Brome grass is one of such forms. It is adapted to porous soils and semi-arid climates, enduring dry weather well and being affected least by the frost. Cheat grass, *Bromus secalinus*, is scattered throughout the meadows on the valley floor. This species is well-named, for it will replace other growths very quickly and is really a weed. To keep it from crowding out the more valuable grasses it should be cut so that it cannot scatter. It makes fair hay but is not of sufficient value to make it worth cultivation.

The History of Wild Timothy

Timothy grass adds its bit to the carpet also, for it helps make a pattern scattered as it is throughout most of the meadows of the valley. This is an introduced species from Europe. Originally the name, meadow cat's tail, was applied to it because of its resemblance to the cat tail reed. Timothy Hansen brought it to America from England in 1720. It was cultivated with success in this country and ranks very high as a hay grass because its yield is so heavy, it is so palatable and easy to cure. Timothy sends out new shoots from its bulb root. These in turn form bulbs from which other bulbs are produced. These bulbs are the food storage houses which nourish the plant throughout the winter.

In most grass plants new growth is added to the tops of the stems and branches. If such plants are cropped off the growth is checked until new stems or branches are sent out. Grasses make their new growth at the base of the leaves. The lengthening blades are merely pushed along from below and the growth is not seriously checked by the removal of the tips of the leaves. This explains their value as forage crops.

English Blue Grass

Meadow fescue, *Festuca elatior*, sometimes called English blue grass, is another species which helps to form the pattern of Yosemite's carpet. It likes the rich moist soil of the meadows and thrives on land too wet, either for blue grass or timothy. It is often found scattered in the lawns of the valley where, because of daily sprinkling it gets the moisture it

loves. It, like cheat grass, is a native of Europe, has escaped from cultivation.

Velvet grass, *Notholcus lanatus*, is one of the most beautiful grasses that helps make the nap of our carpet. It grows in clumps, is very leafy, grayish in color and both stems and leaf blades have a smooth, velvety feeling. The leaf blades are flat, six inches or less in length. The flowers form a soft, purplish plume-like panicle. This species was introduced into America from Europe. It has been cultivated as a pasture grass but has not been valuable. It has become abundantly naturalized in mountain valleys.

Most grasses are wind pollinated. Oats and wheat are self-pollinated. The fruit and grains are among the staple foods of the human race, as well as of animal life. The grasses may be divided into two classes—annuals, persisting for only a single season, and perennials, persisting for more than two years. They have three ways of multiplying: (1) by means of seeds; (2) by underground stems, rootstocks or bulbs, and (3) by stems (stolons), which grow along the surface of the ground. The roots of all grasses are very slender and have few branches. New roots are formed each year, even in perennials.

Two kinds of grasses are cultivated for food—grain crops, those grown perennially for seeds or grain, and forage crops, those grown for forage, roughage or bulky food of animals. Among the giant grasses are bamboo, corn and sorghum, all of which have valuable food properties.

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PLURALITY OF MATES

Enid Michael

The California woodpeckers have more leisure than most birds. In the fall of the year they gather and tuck safely away a store of acorns to tide them over the winter. When the harvest days are over they have time to play, or simply loaf in the sunshine, which they frequently do. Here in Yosemite valley these wise and thrifty woodpeckers have more leisure than ever now that they have adopted up-to-date storing methods. In times passed, before the valley was made "bigger and better" by the promoters of the tourist trade, the California woodpeckers had certain "cupboard trees," where holes were drilled to receive snugly each a single acorn. To drill a hole for each individual acorn that was to be stored was a prodigious task—a task that is no longer necessary under the present storing methods.

All the buildings of the valley are either roofed with shakes or shingles. Where the shingles or shakes lap together along the edges of the roofs or at the eaves there are crevices which the woodpeckers have learned to utilize as storage bins for their winter supply of acorns. It would be difficult to store a full round acorn in the crack between the shingles, but the woodpeckers obviate the difficulty by hulling the acorns and poking them away a half at a time. Man moves into the Yosemite and cuts down the woodpecker's storage trees; the woodpecker retaliates by pounding acorns between the shingles of man's dwellings.

Not only are the California woodpeckers notable for their habits of thrift and their sunny dispositions, but, also it seems, for their peculiar marriage customs. One sunny morning in early spring I happened to be the witness of the culminating scenes of what had evidently been a vigorous courtship. Loud chattering attracted my attention to the scene. Three California woodpeckers were racing through the treetops in a spirited game of tag. There was one bird out in front

leading the way for the two pursuers. The pursued one led her pursuers on an erratic course, diving through treetops, leaping into the air and plunging again toward the earth. In general the race course, although irregular, described a circle the round trip of which would cover a distance of perhaps 400 yards. After two or three trips, the leader would come to perch on a certain dead oak bough above my head. The pursuers would also come to perch and then there would follow wild hiccupping chatter, which chatter was accompanied by much bowing and scraping. After a few moments the birds would be off again. This performance was repeated a number of times and then the female bird, the leader in the play, came to perch where she noised with fluttering wings and upturned tail. In this position, in turn, she was embraced by her two lovers.

The strange performance described above aroused my curiosity, and I wondered if the social order of the California woodpeckers sanctioned a plurality of mates. Subsequent investigation brought out facts which would tend to substantiate the belief that polyandry is practised among California woodpeckers. And here follows the substantiation: Late in the month of May young woodpeckers were being fed in two different nestholes. These nests were separated by a distance of a half mile, and neither nest was the nest of the woodpeckers I had seen go through the mating ceremony. In both cases, however, two males and one female were involved in the feeding of the young. Occasionally two parent birds would be in the nest-hole when the third bird arrived. In this case the third bird would cling chattering to the tree trunk until both occupants of the hole had left, then she would take her turn in the nest-hole. In these family groups of California woodpeckers all birds apparently live happily together, and certainly the young are well cared for.—Enid Michael.

MEDICINAL PROPERTIES OF SOME YOSEMITE PLANTS

By Fern E. Miller

Yosemite School of Field Natural History

In making a survey of the park flora possessing medicinal properties, some interesting facts have come to light regarding various plants and their uses—many of which seem very queer. We have all seen and admired the beautiful flowers found here, but how many people know that many of these plants serve purposes other than pleasing the aesthetic senses?

The little meadow plant with a bright pink flower which Spanish Californians call *Canchalagua* (*Erythraea venusta*, Gray) is also known as Wild Quinine because of its bitter taste and usefulness in treating fevers.

We usually think of our *Godetias* with their rich magenta coloring as objects of admiration rather than a basis for a hand lotion. However, the leaves of this plant have been mixed with lard, heated and strained and when cool, used as an application for chapped hands.

Another flower whose beauty brightens many parts of our state is the California Poppy (*Eschscholtzia californica*, Cham) This is not found commonly in the park, but may be seen near Bridalveil Falls, where, Hall says, it is apparently native. This plant has been an object of interest to chemists and therapeutics, for it is said to act in a manner similar to opium

without any of the objectionable features of that drug. The flowers, placed in oil and exposed to the sun have been thought valuable as a hair tonic and scalp cleanser.

One of the most popular medicinal plants of the state found in the park is *Yerba Santa* (*Eriodictyon californicum*, Greene), the "holy herb" of the early Spanish settlers, who valued it as a blood purifier, a cure for consumption, bronchitis, catarrh, and rheumatism. The Indians used it also in treating colds, asthma and grippe. A tea is made of the dried leaves, or, if the bitter taste is objectionable, by boiling them with sugar. This is one of the few medicinal plants of the park recognized as official in the United States Pharmacopæia.

Plants were found by the early inhabitants for practically every necessity. Among other uses, *Chia* (*Salvia columbariae*, Benth) furnished a means of removing foreign particles from the eye. The seeds are mucillagenous and, placed under the eyelid, collected the offending substance and relieved the sufferer. These seeds were also an important article of diet for the ancient Mexicans, who cultivated the plant, and for the Indians, who used them in soups, etc.

There are, in the park, over 120 plants possessing medicinal properties in greater or less degree. While many used by Indians and settlers probably have little or no intrinsic value they are harmless; and some have proved of real worth in curative processes.—

AUTUMN LIFE AMONG THE RED FIRS

By D. D. McLean

I had gone up the slope to the south of Shippey Meadows, just wandering along to see what was present in the form of animal life among the giant Red Firs. The giant trunks towered high above and shut out the sunlight from the ground beneath. The air was cool and colors of fall were beginning to show on the plants near the small trickle of water that flowed down the steep gully that I was traversing.

The huge firs whispered softly as the wind waved their crowns far above. I worked on up until I reached the summit of the ridge and finally came out onto a great stretch of granite where scattering Lodgepole and Jeffrey pines forced their roots into the cracks.

A small flock of Cassin Purple finches were on the ground under a couple of much dwarfed and twisted Lodgepoles. A little farther on two Audubon warblers were seen in company with a small group of Western bluebirds. Juncos were everywhere and a few Chipping sparrows accompanied each flock. As I went on northeast along the ridge two Clark nutcrackers started to scold at my intrusion on their domain. They flew on ahead as I finally approached them too closely. I sat down and watched a Golden-mantled ground squirrel for a few moments, and as I started on two large mule deer bucks trotted out of some brush and stood looking at me from about one hundred feet. As I passed them they followed along out of curiosity. A pair of Townsend solitaires were feeding at a current bush in a low, damp creek and flitted up to dead limbs on a fir overhanging the creek. As I started on from there a Chickaree was heard scolding in a very

emphatic tone off to the right; so I investigated and found him grumbling over a Sharp-shinned hawk perched on a dead stub about ten feet high. The hawk dashed off down the gulch, but the Chickaree started scolding me instead.

Just as I rounded a turn in the gulch near the meadows, a band of deer broke out and dashed away pell-mell through the Lodgepoles and firs only to stop and look back after the first wild rush.

Here a group of Chickadees, Golden-crowned and Ruby-crowned kinglets, Lutescent warblers and Red-breasted nuthatches greeted me.

The Chickadees were very numerous. A Hermit thrush was perched peacefully on an oldwater-logged stump that just protruded from the ground.

As I entered the meadow, once again the Chipping sparrows started to rise and head for the trees. Two Mountain bluebird were lazily catching grasshoppers over a bare piece of ground. One Williamson sapsucker flew across the meadows apparently on his way to roost.

The wind was blowing a gale now. Everything was becoming dusky due to the coming of darkness, and the air was bitter cold; so homeward I journeyed.

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