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LIFE IN A DROP OF WATER

By Ranger-Naturalist C. W. Schwartz

Many visitors in Yosemite admire the lily pond in the meadow behind the Old Village but few are aware of the many plants and animals which live in the water there and are too small to be seen with the naked eye. If a drop of water is taken from this pond and placed under a microscope as I did, a new world will be opened. In this drop there is considerable activity, queer shaped organisms appear and swim across the field of vision. Some go in a spiral while others spin like a top. Still others appear motionless but when observed carefully may be seen to literally glide along very slowly.

Let us follow one of the larger madly rushing organisms. It is a one-celled animal known as Paramecium or slipper animalcule because it is slipper shaped. It is observed under higher magnification we find that it moves by tiny hair-like processes called cilia which cover its surface in definite rows and beat in unison propelling the animal through the water in a spiral course. The path is very erratic because it must avoid first one obstacle then

another. Or maybe it is stimulated by the presence of food particles which it ingests through a gullet.

We may notice a number of strange cup-like structures with tiny jelly-like projections extending out from the opening of the cup. This cup is really a shell secreted by the jelly-like unicellular animal which lives inside and is classified as Arcella. There are other shells nearby which are made by similar animals known as Difflugia. In this case however, the shell consists of grains of sand cemented together and sometimes these shells are lavishly ornamented by pointed projections. These animalcules move by the jelly-like projections which are called pseudopodia or false feet.

Many brilliant green organisms are seen swimming in the field. They are very streamlined and are propelled by one or two long whip-like processes known as flagella. These flagella are very difficult to see because they are very small and move very rapidly. These green organisms, known as Euglena, are very unusual because they manufacture their own food by a process known as photo-

synthesis, the same way plants do. Consequently they are included with the plants by many authorities. However they have many animal-like characteristics and by others are included with animals. These organisms may be considered as a connecting link between plants and animals.

The apparently motionless forms which are seen in the water exhibit many beautiful geometric shapes and may be highly colored in browns, yellows and green. These are true plants known as diatoms.

In addition to the strictly single celled animals and plants we may see groups of individuals living together in a colony. These associations are composed of like individuals which may be arranged in a sphere or branch-like colony.

In contrast to these unicellular forms, large multicellular individuals are seen swiftly swimming about, feeding on these smaller forms. There are Rotifers which in turn are preyed upon by still larger animals such as water fleas which are to be seen in the same sample of water. The struggle for existence does not stop here but each predator serves as prey for some other species.

CLIMBING THE "HOFFMANN THUMB"

By Ranger-Naturalist Arthur Carthew

Rising in the geographical center of Yosemite National Park is Mount Hoffmann, 10,921 feet in elevation. It is a mountain of strikingly individual

character that literally beckons the ambitious hiker to test his ability on its steep slopes. Readily accessible from the May Lake High Sierra Camp snuggled at its base, Hoffmann is frequently climbed by members of the Seven Day Hiking parties.

On August 14, 1939, a group of five hikers ascended the mountain from the May Lake side. One member of the group, Warren Butz, a bit more ambitious than his colleagues, made a solo ascent of the pinnacle jutting above the main backbone of the mountain known as "the thumb."



This interesting erosional remnant rises to a height of sixty feet or more and is so difficult of ascent that it was not scaled until October 16, 1932, when Jules Eichorn of the Sierra Club made his way to the top. In the year 1934 two Sierra Club

parties climbed it, a group of eleven on July 19, and a smaller group of four on July 20. Mr. Butz reported sixteen names on record at the top indicating that it has not been as-

cended since 1934. Although Mr. Butz made the climb alone and unaided by ropes, such a feat is not recommended as a regular event of the Seven Day Hike.

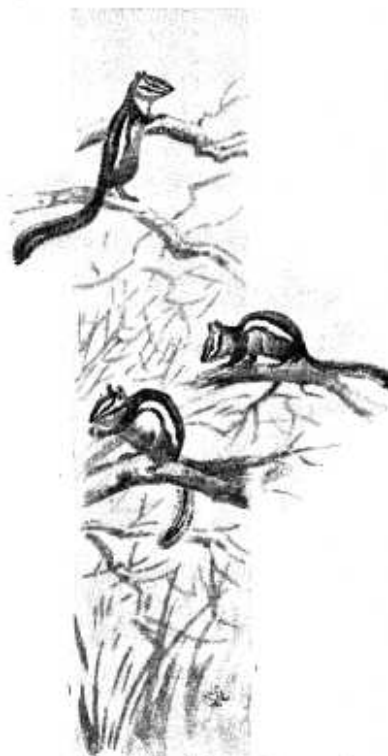
CHIPMUNK FEEDING ON WHITE FIR APHIDS

By Ranger-Naturalist Verlin G. Baysinger

While on duty at the Grizzly Giant during July, 1939, many interesting happenings occurred. I not only had numerous contacts with people but I also enjoyed associations with birds and animals. A Pileated Woodpecker was a recurring attraction. And after much observation I found that a pair of these large birds was nesting in a dead tree in the dense growth east of the Grizzly Giant. The most interesting companions, however, were the squirrels and chipmunks.

The Tahoe Chipmunks were constant associates and they gladly shared my lunches. One afternoon a movement in one of the young White Firs attracted my attention and I saw a Tahoe Chipmunk in the branches, its weight causing considerable swaying. The chipmunk seemed to be intently engaged and upon closer approach I could see that it was feeding. To me the procedure seemed very much out of order. I went over to the tree and the chipmunk scampered away. I could find only a few aphids on the bark and needles of this year's growth. I brushed off all the aphids and then marked several other branches on the same tree which

held numbers of these little aphids. I left the tree and retiring some distance, stopped to watch the action of the chipmunk which ran only a short distance from the tree when I disturbed it.



Engaged by the visitors for a time, I had nearly forgotten the chipmunk. I later chanced to recall the experiment and saw the animal feeding

on a branch just above. I did not disturb the animal until it left that branch for another. And then when I studied the action from closeup I saw that the chipmunk was actually feeding. When I examined the branch the aphids had been completely stripped off of the branch and foliage. This observation was repeated on several occasions during my assignment in the Mariposa Grove and the deduction was substantiated.

The Tahoe Chipmunk was feeding on an aphid which is specific for

the young foliage and bark of the White Fir. The insect has a classification in the aphid family as (*Cinara occidentalis* Davidson.) This aphid is harmful to the new growth on the White Firs and further study revealed that numerous White Firs were suffering from these insects. The new foliage had been so seriously deprived of the necessary nourishment that it withered and dried. We should doff our hats to the little Tahoe Chipmunk if it can help to control this plant lice affliction of the White Fir.

RED-BREADED NUTHATCH AS A FLYCATCHER

By Ranger-Naturalist Enid Michael

It is a well-known fact that many species of birds other than flycatchers are adept in the art of catching flying insects on the wing. Such birds as California Woodpecker, Audubon Warbler, Western Tanager and hummingbirds practice the art consistently. I have even seen Spot-

Red-breasted
Nuthatch



ted Sandpipers and Northern Phalaropes indulging in the sport. However, knowing that birds of any sort will take their meat where they find it, I was nevertheless surprised on

the morning of June 23, 1939, to see a pair of Red-breasted Nuthatches plucking food from the air. On this day there was a flight of ladybird beetles and the air was alive with these slow flying insects.

There were young in the nest-hole of the Red-breasted Nuthatches. The nest-hole was in a dead cottonwood about fifteen feet above the ground. About four feet above the hole the cottonwood was broken off and here at the top of the stub perched the parent nuthatches. From this vantage point, with beetles passing in droves, there was presented a happy situation for parent birds with hungry young in the nest. They could just step out into the air, pluck an insect and drop directly to the nest-hole. It is not often that parent birds have such easy picking.



ABNORMAL LEAF GROWTH ON BIG-LEAF MAPLE

By Ranger-Naturalist Ernest A. Payne

As members of my all-day hiking party were nearing the Vernal Fall Bridge on their return to the Valley from Mount Broderick on July 28, 1939, one of the hikers called our attention to the large leaves growing on a tree near the trail. The tree was a Big-leaf Maple (*Acer macrophyllum*) which by nature produces large leaves, but the leaves of this specimen were particularly conspicuous because of their size. Most of the leaves were larger than normal and several drew especial notice. One of these was collected and carefully measured and its dimensions through various sections were as follows: Entire leaf including petiole and blade, $28\frac{3}{4}$ inches; petiole, $9\frac{1}{2}$ inches; blade, $19\frac{1}{4}$ inches; width at base of blade, $16\frac{3}{4}$ inches; width at widest part of blade, 19 inches; Width at apex of blade, $9\frac{1}{2}$ inches.

How do we account for such a growth? Undoubtedly the most significant single factor contributing to the formation of such an abundance of leaf tissue in this individual tree

was the absence of a top and its accompanying terminal bud. The trunk which measured approximately six inches in diameter at breast height had been broken off about fifteen feet above the ground. No large branches were present and all the leaves were distributed along the upright trunk in three or four dense clumps.

These abnormal clusters of large leaves were apparently the result of the sudden stimulation to activity of the heretofore dormant adventitious buds due to the injury to the upper portion of the tree and augmented by the abundance of food material present in the trunk at this particular season of the year.

This phenomenon in which the adventitious buds are activated is commonplace in plant propagation and it is capitalized upon in the development of hedges and other ornamental plantings but its manifestation in such definite proportions in nature is worthy of consideration.



MOUNTAIN WEASEL CATCHES GOLDEN-MANTLED GROUND SQUIRREL

By Ranger-Naturalist Verlin G. Baysinger

The All Day Hike to Glacier Point by way of the Ledge Trail usually offers a variety of interesting happenings. The hike on July 8, 1939, proved to have no unusual trend of events during the morning trip. The stream had decreased considerably in volume. Even the flowers on the stairway had passed their climax of bloom. After reaching the shade and cool depths of the Red Fir forest at the top of the trail, our labors seemed rewarded. It is interesting to see a Mountain Weasel in his habitat. But the occasion which permits an entire hiking party to observe such an animal is not common.

The group was informed by a sharp cry that something was happening. At a distance of about thirty-five feet from the party a Mountain Weasel had captured a Golden-mantled Ground Squirrel. The weasel held the squirrel in its mouth, having a tight hold from the side and into the neck at the rear of the head. Two young hikers ran over toward the scene and the weasel being frightened dropped its prey

and scampered behind a boulder. We examined the ground squirrel and found that in the brief moment the weasel had bitten into the neck of the squirrel and severed the spinal cord, because the squirrel was perfectly relaxed. The examination completed, the squirrel was placed in an open sunlit spot within twenty feet of our group. We awaited the results of this action. In a few moments the weasel again appeared and, returning to the spot where the ground squirrel had been dropped, the weasel made a cursory examination. It ran back behind the boulder only to reappear in a few moments again searching further for its quarry. This action was repeated several times until it sensed the location of the dead squirrel. Cautiously the weasel approached the spot near us and with a dash it reached the dead squirrel and grabbing it ran under the chinquapin bushes.

This observation was interesting from several viewpoints. We had a chance to definitely identify the Mountain Weasel and its quarry, the

Golden-mantled Ground Squirrel. Also, we saw the weasel securing its food and learned something about its action. Such incidents make our guided hikes very much worthwhile to the Yosemite visitor who participates in the Naturalist program.

AN UNUSUAL ADVENTURE

By Ranger-Naturalist Harold E. Perry

While driving into the parking area in front of the Rangers' Club at Government Center the morning of August 23, 1939, my attention was attracted to a Blue-fronted Jay which was having an adventure with a Meadow Mouse. Undoubtedly the latter was having a harrowing experience as well.

The jay was the aggressor in the situation. It followed after the mouse, pecking at it repeatedly. Strangely enough, the mouse did not seek protection in any one of the several holes in the ground near at hand, but ran towards a Black Oak tree a few feet away. Arriving there, it began climbing up the trunk. The jay followed on the wing, its pecking being so vigorous as to knock the mouse to the ground. Repeatedly the mouse sought safety up the tree and just as often the jay defeated its purpose. Occasionally their energy was expended in going around and around the base of the tree, the mouse scampering as fast as its little feet could travel, the jay following in big, hopping strides.

After watching from the car a

couple of minutes, I continued to the parking area and came back on foot to observe the adventure which was still in progress.

Frequently both the mouse and the jay would rest awhile, each apparently ignoring the other. Then the mouse would again attempt to scale the tree and again the jay would knock it down, even from a height of four or five feet. After many attempts, the mouse reached a crotch in the tree some six feet above the ground. The jay soon turned its attention elsewhere and flew away to new fields of interest.

When last seen, the mouse was recuperating on a branch of the tree some fifteen feet above the ground. Later observation revealed that it had departed, back to the normal routine of life probably. But what an experience it was able to relate in Mouseville that night.

A SIERRA CROSSBILL FAMILY

By Edward Butts, Field School, '39

On the Tenaya Lake Trail from Yosemite Valley one mile from Lake Tenaya, during the afternoon of July 26, 1939, several Field School members were fortunate to see a mother crossbill feeding a young bird.

We were walking parallel to Tenaya Creek about fifty feet away and were attracted by a series of noisy squeaks and chirps to a clump of *Vaccinium*. On approaching cautiously we noted a young crossbill clinging to a limb overhanging the creek fluttering its wings and beg-

ging for food. The young bird was not at all afraid so we walked to within ten feet of it. The mother circled about peering this way and that. She then flew down near the young bird and was seen to work her neck back and forth and to puff it out at the sides. The young one meanwhile was so anxious to eat that it shivered and vibrated at the same time fluttering wings and uttering several variations of notes. Instead of turning around to face the mother it turned its head over the left shoulder where the mother finally placed her beak and regurgi-

tated food into the young bird's mouth.

This was my first view of a Sierra Crossbill and I was struck by the finch-like appearance and call notes of this splendid bird. We noted numerous crossbills from this point almost to Glen Aulin, then no more. Mr. Joseph Dixon said that in the same area last year, only four or five were noted while I myself noted at least twenty in two days. Doubtless this plentitude was because of abundant Lodgepole Pine cones on which they were feeding continuously.

THE CROSSBILL IN TUOLUMNE MEADOWS

By Lloyd M. Smith, Field School, '39

The Sierra Crossbill (*Loxia curvirostra bendirei*) is usually not common in Yosemite and the chances of seeing even one or two individuals are not good. However, the summer of 1939, this species proved to be quite common in the vicinity of Tuolumne Meadows. At Soda Springs I observed a pair feeding upon lodgepole cones. The cones were detached and held by one foot against another limb. Then the seeds were forcibly extracted by prying the cone-scales apart but not entirely removing them. Consequently, when the cone was deseeded and let fall to the earth, the scales were still in place but about eighty per cent of the seeds had been removed and eaten. The cones fed upon were still green and about five minutes' time was expended per cone. In actually pulling the seed out, it appeared as if the bills were separated and then

closed about the seed, overlapping at the tips. When this had been done, a pulling motion of the head drew the seed out of its niche.

The manner of foraging of the crossbill is opposed to that of the Clark nutcracker. The latter bird flies to the cone, perches upon the bobbing branch, and then proceeds to peck vigorously away at the seeds, tearing the cone apart but leaving it on the terminal twig. The crossbill, however, removes the cone first, holds it with its feet, and extracts the seeds without utterly destroying the cone.

A nest of crossbills was located near the public campground in Tuolumne Meadows on July 27. It was in the process of being built at that time. It was composed of pine twigs and string, with a lining of finer material. The site was in a lodgepole pine at a height of about forty-five feet.



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Dan Anderson