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W. B. LEWIS
Superintendent

"LEARN TO READ THE TRAIL-SIDE"

YOSEMITE NATIONAL PARK, CALIF. 1927

A PERSONAL INVITATION.

YOSEMITE NATIONAL PARK IS YOURS! WE OF THE NATIONAL PARK SERVICE WANT TO HELP YOU TO MAKE FRIENDS WITH YOUR PARK AND TO UNDERSTAND IT IN ITS EVERY MOOD. ALL OF THE FOLLOWING SERVICE IS OFFERED TO YOU *free* BY YOUR GOVERNMENT:

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See Schedule of Nature Guide Field Trips.

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ALL OF THESE OPPORTUNITIES ARE PROVIDED FREE OF CHARGE BY YOUR GOVERNMENT.

—TAKE ADVANTAGE OF THEM—

Volume VI March 31, 1927 Number 3

"HIGH SIERRA WINTER RESIDENTS"

By CARL P. RUSSELL

FREQUENTLY I have been asked, "What animals are to be found in the high mountains in winter?" Practically no true field work has been done in the High Sierra in winter, and available information on animals forms that are active there during that season is meager indeed. The hurried trips made by Yosemite rangers on snow surveys do not permit of trapping and thorough study. Eventually, the National Park Service will make the desired expeditions of some weeks' duration that will make possible the recording of results of detailed studies. Recently (March 18 to 22) I made another brief journey into Yosemite's snowy heights for the purpose of observing animal activities and will report some of the observations here.

The area traversed is that country lyin gbetween the "rim" of Yosemite Valley and the heights above Tuolumne Meadows. The "rim" is 7096 feet above the sea, and the highest point visited is just short of 10,000 feet elevation. Habits, in general, were observed as carefully as possible, but no specimens were taken, and of course no stomach contents determined.

Of the birds, the short-tailed Mountain chickadee was found to abound in greatest numbers. This species was seen at all levels visited. At the head of the Tenaya Trail zigzags a band of them was seen to forage among the needles of the red fir, and near the summit of Lambert Dome several very talkative individuals busied themselves among the needle tufts of lodgepole and mountain white pine.

No Sierra grouse was seen nor heard on this trip, but numerous tracks about Snow creek attested to their presence. On our return, in the hours just before daylight, a Pigmy owl trilled his prolonged too-too-too-too-oo from the heavy timber in the bottom of the Snow Creek gorge. On the heights above Snow creek a Northern white-headed woodpecker flew from the trunk of a lodgepole pine, emitting his ringing staccato call. Red-breasted nuthatches were seen and heard several times in the red firs and lodgepole pines along the Tenaya Lake trail. On the last summit above the Tennya basin, Clark crows serenaded us with their raucous calls, just as they would in summer.

READING YOSEMITE'S SNOW DEPTH

"Ten and twelve-foot poles, painted white, and graduated in feet and fractions of a foot, set in the ground at strategic points, make it possible to observe and record readily the snow depth throughout the area in question." The gauge pictured above, showing a snow depth of nine feet, is located on the Tioga road just above Cathedral creek. It and others in the area were visited by National Park rangers March 18 to 22, 1927.

WHY ARE SNOW SURVEYS MADE?

By C. P. Russell

For fifteen years snow surveys for the purpose of forecasting water supply have been practiced in California, Utah, and Nevada. More recently similar activities have been carried on in the Bitter Root mountains, Yellowstone National Park, and elsewhere. The work has been done by such bodies as the Nevada-California Co-operative Snow Surveys, the Washington Water Power Company, United States weather bureau, the City of Los Angeles, the Kings River water storage district, the Southern California Edison Company, the Southern Sierras Power Company, the Bitter Root irrigation project, the United States Reclamation Service, the United States National Park Service and Canadian Meteorological Service.

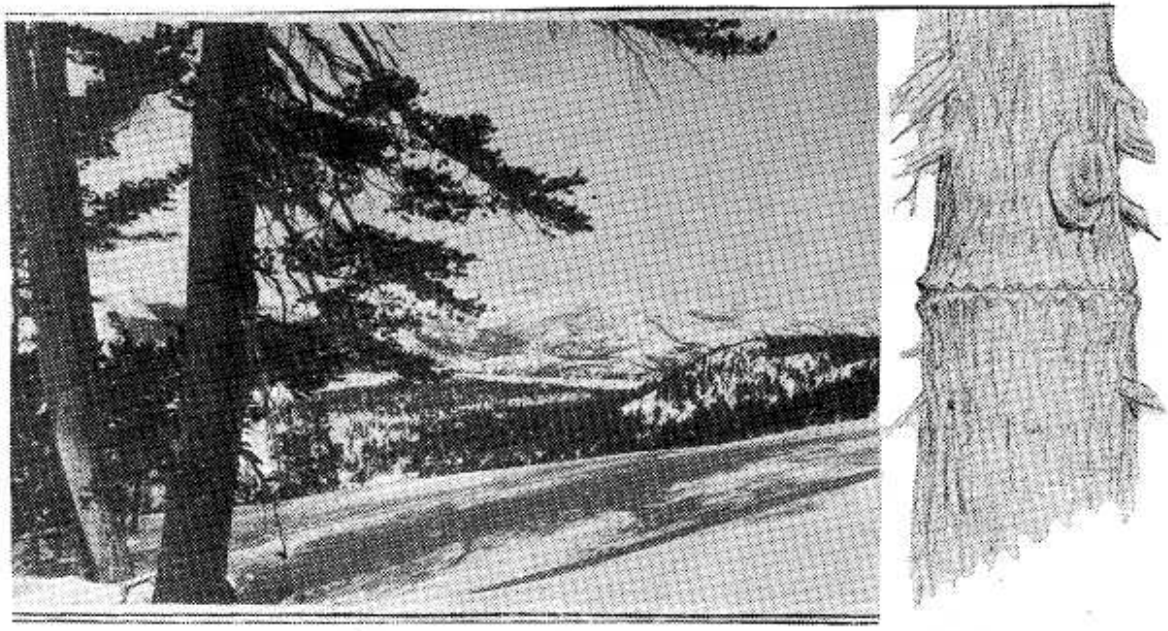
The mention of most of the above organizations and concerns suggests that snow surveys have commercial importance. For the most part hydro-electric companies and irrigation projects are primarily interested in the results obtained. However, it is not an interest in future commercial use of the run-off that prompts Yosemite officials to investigate High Sierra snow conditions

Park rangers observe and record the depth of snow in the high levels of Yosemite National Park for the purpose of foretelling roughly what the summer condition of the famous waterfalls of the park are to be and to gain advance information on the approximate dates of the opening of high trails, roads and camping spots.

Members of the Yosemite ranger force travel on skiis or snowshoes between Yosemite valley and the Sierra crest. Tioga pass, about 10,000 feet above sea level, usually is the highest point visited. No attempt is made to determine the density of the snow cover or its percentage of water content. The number of actual acre feet of water in the Yosemite snow blanket is unimportant from a Park Service standpoint. Ten and twelve-foot poles, painted white, and graduated in feet and fractions of a foot, set in the ground at strategic points make it possible to observe and record readily the snow depth throughout the area in question, and cursory examinations of the compactness of the snow make it possible to compare roughly its density with that of preceding years.

This year Ranger Wegner, Photographer Arnold Williams, and the park naturalist traveled on snowshoes to Tenaya lake, Tuolumne Meadows, Tioga pass and the summit of Lambert dome. At Tenaya lake eight and a half feet of snow was found. On the summit above Cathedral creek the gauge indicated nine feet; at Tuolumne Meadows, five feet, and at Tioga pass, one and a half feet. The return trip was made from Tenayya lake via the Tioga road to Snow Flat. Here the depth was greater than elsewhere, the gauge showing a full ten feet.

Since this trip was made (on the 18th and 22d of March), heavy storms have added to the precipitation recorded, and indications are that Yosemite valley will enjoy full waterfalls this summer. High country trails, roads and camping spots will be delayed in opening.



Left—Tuolumne Meadows from Lambert Dome. Amid such surroundings, nearly two miles above sea level, a few birds elect to brave the deep snows of winter. Right—Trees injured by sapsuckers react by producing rings or swellings along the horizontal lines of punctures. Juniper on slopes of Lambert Dome.—(Sketched from a photograph.)

SOME WINTER OBSERVATIONS ON THE WILLIAMSON SAPSUCKER

By C. P. RUSSELL

On March 20, 1927, I was exploring the deeply snow-covered slopes of Lambert Dome (9400 feet above sea level) in search of evidences of animal activities. Not far from the summit of the Dome, my attention was attracted to a bird very actively engaged in pulling the resinous berries from the upper branchlets of a small Sierra Juniper. Upon approaching the tree, which stood alone upon the steep slope of the snowy granite, I found that my subject was undisturbed and I reached a position no more than twenty-five feet from it. It was then revealed that the bird was barred with brown and black and white, that its head was brown, and that its rump exhibited the white patch and its breast the black patch that marked it unmistakably as a female Williamson Sapsucker. It was further revealed that its activity was most certainly centered upon the Juniper berries. As I watched, eight of the fruits were pulled off and swallowed by the bird.

Upon this same slope of Lambert Dome is much evidence that the Sierra Juniper affords other foods for sapsuckers besides the berries. Not a few of the trees are encircled by rows of punctures in the bark, made by the drill-like bill of the Williamson. During the period of sap flow, there is exudation of sap from these holes. The birds are known to return to their workings again and again, taking the exuding sap and any insects that may have been trapped in it. Since the resinous berries prove to be attractive to sapsuckers, it is not at all surprising that they show a liking for Juniper sap.

Trees injured by sapsuckers reject by producing rings or swellings along the horizontal lines of punctures. Some of the Junipers on Lambert Dome exhibit amazing swollen rings of this sort. Occasionally, no doubt, the tree may be girdled by the bird, and death results. No Junipers were found, however, that had been thus killed.

The following paragraph from Grinnel and Storer's "Animal Life in Yosemite,' is quoted because of its significance in this connection:

"During the winter months when sap is practically at a standstill in the coniferous trees at high altitudes, the Williamson Sapsucker must needs seek other fare. A few of our own observations added to those of other naturalists suggest that during the winter season the birds may forage in large part on dormant insects or on insect larvae hidden in crevices in the bark. If such is the case, whatever the damage done by these birds to the forest as a whole during the summer months, it is partially offset by their winter-time activity. In any event, the attacks of the Williamson Sapsucker on the Lodgepole Pines of the central Sierra Nevada cannot be considered as of great economic importance, for these trees are there used little, if at all, for lumber or for any other commercial purpose."

HIGH SIERRA WINTER RESIDENTS

Continued from page 17.

During our stay at Tenaya lake, no birds were seen nor heard except more Clark crows. In following the Tioga road from Tenaya lake to Tuolumne Meadows, chickadees were frequently in evidence, and at the top of the long grade east of the lake our attention was directed to a woodpecker in one of the numerous dead lodgepole pines It was evidently an Arctic three-toed woodpecker, and several times, as we observed it, it gave a melancholy, long-drawn and far-carrying cry such as I have never known to be attributed to it by any bird student. While we watched, it took flight and alighted upon a distant slope from where its peculiar call again came to us.

Townsend Solitaire on Lambert Dome

At Tuolumne Meadows a Townsend solitaire was seen, and snatches of its elaborate song were heard. A small flock of twittering Mountain bluebirds crossed our line of travel just before we reached Lambert Dome. In climbing Lambert Dome, I saw many chickadees and had the good fortune to observe a female Williamson sapsucker feeding upon juniper berries. The bird that I had most hoped to see, the Sierra Nevada rosy finch, was not to be found. Presumably the species remains in the high mountain cirques some hundreds of feet above the highest point reached by us.

One who imagines that the High Sierra supports a large and active winter mammal population would be disappointed in his findings. The track most frequently seen was that of the pine marten. We found it crossing our route throughout the journey. The animal was apparently most numerous in the Ten Mile Meadow region. But three trails attributable to the coyote were seen. No tracks of this predator were observed above Tenaya lake.

In Ten Mile Meadows we observed numerous chickaree tracks, and this little squirrel's presence was frequently evidenced at Tenaya lake, along the Tioga road and in Tuolumne Meadows. One of the animals was seen at the site of the Tuolumne Meadows Lodge, the only mammal observed on the trip. This is not surprising, inasmuch as all other active mammals of the region are night prowlers

The lacy network of tracks made by a Mountain Lemming mouse, or possibly a Meadow mouse, was found among the hemlocks on the summit above Cathedral creek. Judging from the great lack of "sign" made by members of the mouse family, the mousers of the locality are apt to take other fare

I had high hopes of seeing a Sierra white-tailed jack rabbit in winter coat; however, not only did I fail to see the animal, but I also failed to find more than a few tracks left by the snow-shoe footed "jack." In crossing Tenaya lake, we saw the first one. At the edge of the dome east of Tenaya a second was found, and on Tuolumne Meadows a third. In the region about Lambert Dome, a favorite spot for the animals in summer, a thorough but vain search was made.

Only one trail that could be construed as that of the Pacific Fisher was seen. On the Tioga road about one mile east of Tenaya lake one of these large mustelids had crossed our trail. We followed the tracks for some little distance, but had to discontinue the trailing because drifting snow had obscured them.

UNIQUE FOOD OF MONOS

By CARL P. RUSSELL

While we consider the attractions and commodities that induced the Yosemite Indians and the Monos to open avenues of trade between their opposed territories so naturally separated by the great ridge of the Sierra, we must not slight the entomological delicacy Koochahbie. This added article of ancient commerce came from the saline waters of Mono lake in the form of a peculiar insect pupa. Ephydra hians, a species of fly, breeds in Mono lake in great numbers. Any late summer visitor at the lake must be impressed with the great dark ridges along the shore, made up of millions of bodies of the undeveloped insects, which have hatched in the lake and been cast in windrows upon the sands by the waves.

Early explorers in the Great Basin country noticed the abundance of the unusual creatures in the several salty lakes east of the Sierra and, in some instances, chronicled their observations in their journals. General J. C. Fremont in his "Report of the Second Exploring Expedition to Oregon and Northern California," 1843-1844, remarks on the abundance of the insects and the shore birds that congregate to feed upon them. He gives this further information:

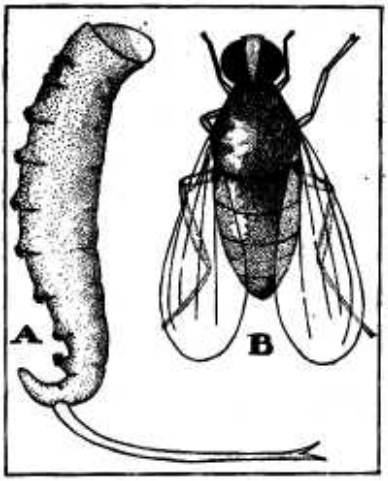
"When traveling—in company with Mr. Joseph Walker, an old hunter, I was informed by him that, wandering with a party of men in a mountain country east of the great California range, he surprised a party of several Indian families encamped near a small salt lake, who abandoned their lodges at his approach, leaving everything behind them. Being in a starving condition, they were delighted to find in the abandoned lodges a number of skin bags containing a quantity of what appeared to be fish, dried and pounded. On this they made a hearty supper and were gathering around an abundant breakfast the next morning when Mr. Walker discovered that it was with these, or a similar worm, that the bags had been filled. The stomachs of the stout trappers were not proof against their prejudices, and the repulsive food was suddenly rejected."

Galen Clark, who began studying the local Indians in 1857, knew of the Indian trade that was carried on across the summit of the Sierra and records Ka-cha-vee (Koochahbie), Mono lake "worms," as one of the articles of trade. According to Clark, the insects formed an important dish at every feast.

Mark Twain's Story of Mono

In 1862 Samuel Clemens disengaged himself from his Nevada mining enterprises long enough to journey to the weird Mono lake region to view for himself the uncanny phenomena described by the Comstockers, who had visited the place. In "Roughing It" he sketches our subject in a style nearly as accurate as it is humorous:

"There are no fish in Mono lake, no frogs, no snakes, no polliwogs, nothing, in fact, that goes to make life desirable. Millions of wild ducks and sea gulls swim about the surface, but no living thing exists under the surface except a white, feathery sort of worm one-half inch long, which looks like a bit of white thread frayed at the sides. If you dip up a gallon of water, you will get about 15,000 of these. They give to the water a sort of grayish white appearance. Then, there is a fly which looks something like our house fly. There settle on the beach to eat the forms that wash ashore, and any time you can see there a billion of flies an inch deep and six feet wide, and this belt extends clear around the lake, a belt of



The edible "worm" and the fly into which it develops (seven times natural size).

A is the pupa, great masses of which are dislodged by storms, from their attachments in Mono lake. They accumulate in long piles along the lake shore and are scooped up by the Indians for food.

B is the little fly, Ephydra hians say, which enters the salty waters of Mono lake and deposits tiny eggs. From them develop larvae and pupae, which in turn become flies.

—From photographs and specimens in the Yosemite Museum.

flies one hundred miles long. If you throw a stone among them, they swarm up so thick that they look dense like a cloud. You can hold them under water as long as you please. They do not mind it; they are only proud of it. When you let them go, they pop up to the surface as dry as a patent office report and walk off as unconcerned as if they had been educated especially with a view to afford an instructive entertainment to man in that particular way. Providence leaves nothing to go by chance. All things have their uses and their part and proper place in nature's economy. The ducks eat the flies, the flies eat the worms, and Indians eat all three."

Bodie Newspaper Tells of Larvae Crop

The old files of newspapers of that once important city, Bodie, California, can be depended upon to yield accounts of any early-day activities of Mono Lake. The August 7 1880, number of the Bodie Daily Free Press contains an account of Piute squaws harvesting "grubs" at Mono. The wave-washed pupae were scooped into large piles with baskets and the smelly mass allowed to dry thoroughly. When dry they were rubbed, which procedure removed heads, tails, legs etc. After further drying, they were packed for winter use. White miners of the Mono region sometimes made use of them, grinding the tiny bodies with flour and frying the cakes so formed.

Mrs. Fannie Crippen Jones, once of the famed Barnard's Yosemite Hotel, described to the writer a trip she made in 1882 with a lady guest at Barnard's Hotel to Mono for the express purpose of witnessing the Mono Indians harvesting this strange crop of the lake. The journey was made in the saddle via the old Mono Trail. At the lake numerous Mono squaws were busy with basket scoops, transferring the white foam of the shoreline and its contained "larvae" to platforms built of strips of bark. On these platforms drying was accomplished, preliminary to further preparation.

At the present time Yosemite visitors hear of this strange food through nature guides and the Yosemite Museum. The Yosemite tribe no longer exists to import the finished article and but few of the Mono Indians now prepare it. Like many other primitive foods, Kacha-vee is replaced by canned goods of the white man, and even the automobile road to Mono does not often make accessible the sight of Indians gathering "worms."

Essig Describes the Worm

E. O. Essig in his "Insects of Western North America" has the following to say of the "Mono worms":

"Ephydra hians Say is 3.2 to 5.6 mm. long, black or wholly opaque gray, with shining dark green front, and the abdomen with a greenish ground color. The larvae are 12 mm. long, whitish, with a wide shagreen pigmented band the full length of the dorsum, eight pairs of prolegs, the last pair of which is reversed so as to enable the larva to grasp a solid object for attachment. The anal tube is variable in length, but considerably shorter than that of the preceding species, and does not have the basal fork. The larvae live near the bottoms of salt or alkaline lakes and are attached or wriggle about, but do not come to the surface. The pupae are normally attached to rocks or some other object at the bottom. Storms frequently detach immense numbers which float and are carried to the shores where they are thrown up in great heaps. According to J. M. Aldrich, the Indians in early days collected dried, and after rubbing off the skins by hand, prepared a food called Koo-chah-bie' by the Pah-ute Indians. The adults are abundant at the edges of the water and enter the water from a rock or other solid object, enveloped in a globule of air. The small, white, slightly curved smooth eggs, 0.8 mm. long, are laid in this manner or dropped directly into the water. The present known distribution includes Soap lake and Lake Como, Washington; Albert lake, Oregon; Borax pond near Clear lake, Mono lake, Owens lake, Borax lake and East lake, California; Soda lakes, Pyramid lake and Lagoon south in Nevada; Great Salt lake, Utah; Wyoming, Nebraska, Minnesota and Mexico."

A small basket full of the pupae prized by the Indians is exhibited in the Yosemite Museum. They were presented to the writer by "Maggie," a Piute squaw, who resides in Yosemite. Recently her son, a Mono native gathered a quantity of the food and sent a share of it to Maggie. Maggie's name for it is Ka-cha-vee, rather than Koo-chah-bie.

FROM THE NATIONAL CONFERENCE ON OUT-DOOR RECREATION

Called by PRESIDENT COOLIDGE

"THAT THE CONFERENCE ENDORSE NATURE STUDY IN SCHOOLS AND THE EXTENSION OF THE NATURE STUDY IDEA TO EVERY AMERICAN SCHOOL AND FAMILY; . . . . . THAT THE ESTABLISHMENT OF MUSEUMS OF NATURAL HISTORY IN NATIONAL PARKS WILL INCREASE THE EDUCATIONAL RECREATIONAL VALUE OF THE PARKS".—*Resolution of the Conference.*