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The Fluctuating Population of Yosemite Animals

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In a nation that shows universal decennial interest in its population figures our national parks stand out as little islands where the animal census taken each year ranks with the human census in importance. In Yosemite National Park the California gray squirrel population has attracted wide notice because of its great fluctuations, but other species have shown similar though less spectacular variations in numbers. This year seems to have been an especially favorable one for the raising of large families among many of the forest dwellers. Rangers and other keen observers have reported unusually large numbers of fawns successfully raised this summer; chickarees are now noticeably abundant in Yosemite Valley; gray squirrels have been reported by more persons and in greater numbers than at any time since 1922, and white-footed mice are so numerous as to attract the attention of every resident of the park. The accompanying increase in carnivorous animals and birds has not yet been so noticeable, which is in accord with ecological studies elsewhere proving that the maximum population cycle of carnivores lags behind that of animals upon which they prey.

Cycles of increase and decrease in animal life have been observed for hundreds of years, but we still have much to learn concerning their causes. Favorable climate and food conditions play a large part, and are probably responsible for the increases noted this year in Yosemite, increases which may continue for several years until the resultant overpopulation may induce an epidemic that will start the cycle back to a period of minimum population.

GRAY SQUIRREL CYCLES

In this connection it is of interest to outline the fluctuating numbers of California gray squirrels (Sciurus g. grisens) in Yosemite during the last 17 years. Grinnell and Storer, in "Animal Life in Yosemite," reported that, in 1914, "4000 gray squirrels were computed to be on the valley floor and the lower slopes adjacent. In the spring of 1916 the number was very

much less." Between 1920 and 1922 California gray squirrels were *almost wiped out in Yosemite Valley* and adjacent transition zone areas by an epidemic of scabies caused by a mite (Notoedres minor var. cati) This epidemic extended over all of Northern California, being first reported in El Dorado county 60 miles north of Yosemite, in 1917. In 1919 it was raging on Pit river, 130 miles farther north, and in 1920 it had extended on a little farther to McCloud river. Records of the southward spread of the pest between El Dorado county and Yosemite are not available, but it was not serious here until 1922, when apaprently the *entire California gray squirrel population* was wiped out in one season. It is significant that the crop of acorns, chief food of gray squirrels, was poor that year. Recovery has been slow because of the great destruction wrought and because the epidemic, or later minor outbreaks, continued in various sections until 1925, when the malady was again reported from McCloud river.

In considering gray squirrel cycles in California there is significance in the following statement made in 1920 by B. J. Shannon, *a forest officer of Yreka, Calif.*: "It is reported that a disease breaks out every few years among the squirrels on the lower Klamath river." Elton in "Animal Ecology" states that "squirrels in North America have periodic maxima in numbers, separated by intervals of five to 10 years."

ALL BUT WIPED OUT

In Yosemite Valley and vicinity the epidemic of 1922 was so severe that only one or two squirrels were seen for several years after. But from 1926 to the present date more reports have been coming in each year. This year many observers noted a decided increase in California gray squirrels, although not nearly enough to warrant their classification as a common animal. Several "families" seem well established near the base of El Capitan, where they have been frequently observed during the past two years. During the first week of November, 1930, a single California gray squirrel was observed in the Lost Arrow region and at Mirror Lake. It is to be hoped that the increase will continue so that park visitors may again have many opportunities of seeing these magnificent squirrels. Naturalists also will be interested in learning whether this species can regain its niche in Yosemite Valley against the competition of the chickarees which have usurped it.

SHREWD FOR SHREWS

Elizabeth Loofbourow

On July 18, while trapping in the Happy Isles swamp for Yosemite shrews and white-footed mice, one individual of the species Neosorex palustris navigator, the navigator shrew, was taken. So far as is known, this is the only record from the valley. Grinnell and Storer give the range as "common in the Canadian and Hudsonian zones on both slopes of the Sierra Nevada. Recorded from Merced Grove of Big Trees and Chinquapin, east to Mono Lake postoffice, and Walker Lake." This shrew is larger than the Yosemite shrew. Its toes are provided with stiff fringing hairs, enabling the animal to swim near the surface, or "walk on the water" as is sometimes reported. The measurements of the individual taken were:

Total length, 161 mm.; tail, 83 mm.; hind foot, 19 mm.; ear, 2 mm.

This specimen is in the Yosemite Museum collection.

Feeding Habits of the Woodpeckers in the Yosemite Valley

Enid Michael

SIERRA RED-BREASTED SAPSUCKER (Sphyrapicus varius daggetti)—The Red-breasted Sapsucker is a sparsely represented winter visitant to the Yosemite valley. Its foraging activities are confined almost exclusively to the apple orchards when in the valley. Seldom have we found more than one bird working in an orchard and at no time did more than one bird make an extended stay.

In the study of sapsucker work most of our attention was devoted to the old apple orchard on the north side of the valley, near Yosemite creek. A survey of this orchard showed every tree more or less pitted with bird-borings. At the time when we first examined the trees, in the summer of 1920, there were no fresh cuts, but judging by the vast number of old wounds we thought there must have been an army of sapsuckers at work here some time in the past. However, after having the orchard under observation for more than seven years we now realize that all this vast cutting might have been the work of one or two birds working only during the winter months. In the old workings of the sapsucker we found the holes round, about a quarter of an inch in diameter, and from a half to three-quarters of an inch apart. All of the holes bore evidence of having been cut through the bark to the sap-wood, and in the fresher holes there was no question in this regard as in the bottom of these pits dried sap could be seen. All scars were approximately the same size.

The Red-breasted Sapsucker is a systematic worker. It has been our observation that when the sapsucker first arrives in the orchard he will move about freely, drilling holes in many different trees. Finally four or five trees will be selected to receive his especial attention. In each of these trees he may drill a dozen or more holes. With this work done he is in a position to eat regularly, for at times during the day each of these trees will receive his attention. He sucks the accumulated sap from the pits and gathers in any stray insects that may have been attracted to his honey pots. Now with a source of food assured he may employ all of his spare time on the certain tree that has proved most satisfactory. Here he sets to work increasing the number of sap pits. Drilling in live bark he works silently and there are but slight sounds of his tapping.

Watching a Sapsucker at Work

At odd times, for thirteen consecutive days during February 1921, Mr Michael and I watched a sapsucker at work. On our many visits during this time we never failed to find the Red-breasted one at work on his favorite tree. The bird became accustomed to our presence and after a few visits we were able to stand within six feet of him without disturbing him in the least. The result was that the process of drilling actually took

place before our eyes while we stood but a few feet away.

The tree on which the bird worked was a large one, about a foot in diameter, and the work was confined to the north side of the tree. The first row of holes was started about two feet above the ground. Day after day the bird worked up the tree, adding row after row. A count made after the sixth day disclosed 601 freshly cut sap pits. While no new holes were cut after the eighth day many of the previous punctures were enlarged and somewhat slightly squared. In one case two of the holes were joined together, making a hole much larger than any of the others. After the bird deserted the tree another count was made and we found 721 holes. The vast majority of these holes were perfectly round and in nowise different from the freshly cut holes in other trees. In almost every case the holes were cut through the bark into the sap wood. In some of the trees many of the fresh cuts were merely the opening up of old wounds, but where smooth bark was available new cuts were made. In no case were the new drillings made to completely circle the tree. In many trees, however, the old pits scars did completely girdle the trunks, but from our investigation we came to the conclusion that these complete girdles were the result of more than one season's work. In other words, the sap pits being cut in parallel horizontal lines to extend part way around the tree a sapsucker might return at some subsequent season to complete the circles. In their struggle for existence the sapsuckers have learned that to completely girdle a tree is to kill the goose that lays the golden egg.

Remarkable Uniformity of Cuts

The approximately uniformity of the cuts made in the bark of the apple trees is remarkable when considered with the fact that the work of these same birds is quite different when performed on the bark of the oak or cottonwood. When operating in oaks or cottonwoods the Red-breasted sapsuckers work in the upper branches of young trees where the bark is thin. Square and rectangular patches are cut away and narrow strips of bark are left between the cuts. These cuts average a half inch in width and are often two or more inches in length. The narrow strips act as stops to collect the sap and to prevent it from flowing down the limb. This difference in the plan of cutting may possibly be due to a difference in the volume of sap flow in different species of trees. At one time we considered as a possible explanation the difference in volume of sap flow at different seasons, but this theory was exploded when finally we found a Red-breasted sapsucker drilling round holes in an apple tree during the summer season.

On one occasion we chanced to come upon a family group of Red-breasted sapsuckers working low down in a willow thicket. Evidently the young were being taught the aart of sapsucking and judging from the crude appearance of their work they had much to learn. The young sapsuckers were working on willow branches of less than two inches in diameter. They employed no system and as a result the sap wood was exposed in ragged patches, bearing no resemblance to the intricate pattern of true sapsucker work. Drilling a series of holes very close one next to the other they were able to loosen and slip off

irregular strips of the tender bark. It was not pretty work, however, the sap wood was "bleeding" freely, insects were gathering in numbers and the young sapsuckers were learning to feed themselves.

A RARE VISITOR

ENID MICHAEL
Ranger-Naturalist

Chasing birds is a great hobby. One can never know what is going to happen, or when. Days may go by without adventure but always there is expectation. All hours in the field have possibilities, and surprises do come. Take the morning of October 15, for example. The morning stroll was almost over when the surprise came. When first seen the bird was on the ground among the dry Lessingia plants. It was a stranger in our Yosemite. Only once before during our 11 years in the valley had we seen Pinon jays, and on this occasion—April 27, 1923—a small flock were seen flying across the valley. To us it was a thrilling adventure to discover one of these jays on the ground not 20 feet away. The first interesting character that we noted in this bird's behavior was its mode of locomotion—he walked, while all other jays of our acquaintance hop. His was the swaggering gait of the Brewer blackbird and though a much larger bird and a bird of a peculiar soft shadowed blue color, his shape and deliberate demeanor were also remindful of the blackbird.

AN INTERESTED FEAST

When we came upon the Pinon jay he was picking up food, probably seed of the Lessingia, but after a minute or two he took to wing and his crow-like flight carried him to an oak about 50 feet away. We followed and again caught glimpses of him through the open spaces in the foliage of the oak. While here he spoke to us several times, in a pleasant, entirely un-jay-like tone of voice—"Queh, guah—quah, queh, queh"—in a fairly high-pitched, slightly nasal tone.

His next move was to a tall yellow pine near by that still bore many clusters of partly closed cones. He remained in the pine about half an hour and was busy all the while.

Now his behavior was remindful of the Clark crow. He would step out to the end of a branch where the stranger. Hopping from branch to branch, they advanced up the tree till they reached his level, then one at a time they hopped close to the stranger and looked him over, the while making a pretense of searching for food themselves. Although they came close to the stranger, they made no gesture of offense, nor did they scold. Looking at the stranger's bill, so much longer and more powerful than their own, they may have concluded that he was a good fellow to let alone. Be that as it may, these blue-fronted joys, who are habitually quick to discover and deride a stranger, took one good look and drew away in silence.

CALLS AT POSTOFFICE

When the Pinon jay had finished his lunch of pine nuts he left the pine and flew to the top of the ancient black oak that stands by the postoffice. Looking about from this vantage point he discovered the bird's drinking pool half-hidden in the grasses beside the Foley studio. He dropped to the ground nearby and stepping close picked up an acorn that lay beside the pool. With this he retired to the top of a post and holding the acorn with one foot ripped off the shell and appeared to enjoy the fat nut. Then he took wing and when last seen he was on his way to the oak grove across the road.

YOSEMITE TREES

WILD LIFE AS RELATED TO GIANT SEQUOIA

By Ranger-Naturalist A. E. Borell

While stationed in the Mariposa Grove of Big Trees this summer I had opportunity to gather notes on the wild life as related to the Big Trees and some unusual observations were made.

As compared with other species of trees the Big Tree (Sequoia gigantea) is remarkably free from insect attack. However, certain insects do frequent its soft, fibrous bark. Two trees were found which had a section of the bark riddled by the passageways of large black ants. One of the ant homes in the bark had been discovered by a bear. The bark being soft and deep made it easy for the bear to scratch and pull out large pieces of it in order to devour the ants. Pieces of bark which had been removed, four feet from the ground, were lying at the base of the tree and distinct claw-marks could be seen about the section inhabited by the ants.

In two other trees chipmunks had excavated homes or nest cavities into the deep bark. The chipmunks were seen as they ran in and out of their burrows in the bark. On one occasion one carried cotton nest material into the cavity. Chipmunks climbed freely over the bark and were seen as much as 60 feet from the ground. Someone remarked that the largest trees in the world harbored one of the smallest squirrels.

From August 15 to September 1 the chickarees, or pine squirrels, were busily engaged in cutting the cones from various species of trees in the grove. The cones of the sugar pine seemed to be preferred, but the cones of the sequoias were not ignored. Beneath certain trees fresh green cones were found every day showing that the chickarees were busy laying in a winter supply of food, and that at least in some cases the seeds of the giant sequoia form a large portion of their winter food. The green cones containing seeds are stored beneath logs or in hollow logs or stumps.

Among the birds which frequented the trunks of the sequois in the Mariposa Grove, the Sierra creeper was the most characteristic. It was a common occurrence to see these little wren-like birds working up the deeply furrowed bark of the giant trees. Sometimes they would disappear entirely into the crevices and folds of the bark to reappear a foot or two away from the place of entrance.

Red-breasted nuthatches and white-headed woodpeckers also foraged over the trunks of the Big Trees. Although the Big Trees suffer only very slightly from insect attack, the presence of this group of insect-eating birds on the trunks of sequoias indicated that at least certain insects use the bark as a place of shelter, hibernation or pupation.

Is the Giant Sequoia a Dying Race?

RANGER-NATURALIST A. E. BORELL

It is not at all uncommon to hear people say that there are no young or even middle-ageed Big Trees and that when the trees which are now standing fall there will be no more Sequoia gigantea. This may be true when we think in terms of very long periods of time but is not the case if we are speaking of hundreds or even three or four thousand years. The seeds of our Big Trees are fertile, even those from the oldest trees and there are young trees of all ages from tiny seedlings up to those ten feet in diameter in each of Yosemite's three groves of Sequoias. The mature trees are so conspicuous that most people do not notice the young trees and if they do they often mistake them for trees of some other species.

NEED THE SUNLIGHT

Another factor which most people fail to consider is the fact that the Big Tree, both young and old, are intolerant to shade. That is they must have an abundance of sunlight in order to thrive. For that reason it is hard for the young tree to get a start beneath the large trees which keep the ground shaded a large portion of the day. However, where there is an opening among the trees and the soil conditions are favorable there we find healthy stands of young Sequoias. When there is sufficieint sunlight often there is such a thick layer of debris on the ground that the seedlings die before their roots reach good soil.

A short time ago I had an opportunity to spend a day in the Fresno grove of Big Trees, where lumbering began 43 years ago (1888-1890). When the mature trees were cut and the dense shade removed the seeds began to sprout and the young trees began to thrive. There are now actually thousands of young sequoias growing in thick stands over most of this area. Gradually certain of the more vigorous of these young trees are reaching above the others and eventually the smaller trees will be killed by shade, thus leaving a stand of trees of about the same height as close together as light will permit. There are still a few mature trees standing which will continue to scatter their seed over the area, but it will be only those which fall in openings and where soil conditions are favorable which will be able to gain a foothold.

COAST GIANT IS DIFFERENT

The coast redwood (Sequoia sempervirens) grow from seeds but principally from sprouts which are much more tolerant of shade. The Big Tree (Sequoia gigaintea) grows from seed only.

Since the seeds of Big Trees are fertile and do sprout and grow as soon as the shade of the mature trees is removed there is no reason why we should think that the world famous Big Trees will die out, at least within the next few thousand years. The mature trees will stand fire remarkably well, but the young trees to a much less degree, and therefore it is essential that fire be kept out of new stands such as the one at the Fresno grove.

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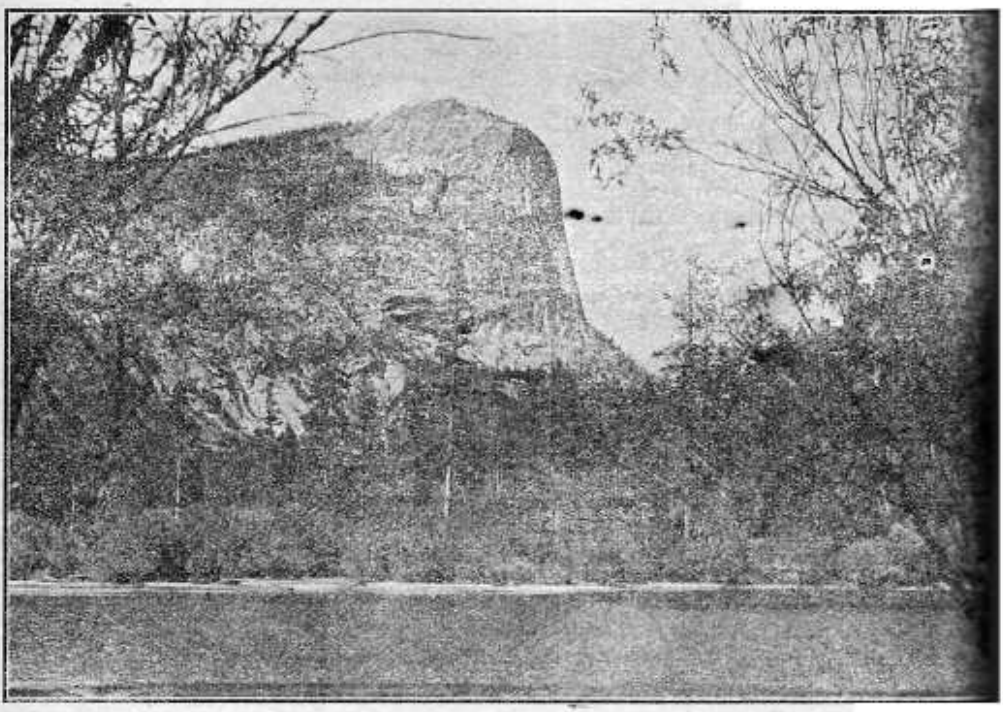
California's Gem

Edw. B. Hall

The light and shade in forest glade,
The wind-song in the pines;
The singing water of Nature's Daughter.
Her granite-tow'r'd sky lines,
The sweet bird-call, the waterfall
The azalea's fragrance rare,
The scented night, the bright star-light,
The pure, untainted air—
Make this a spot not soon forgot,
California's jeweled prize;
Our hearts shall grieve that we must leave
This earthly paradise.



Mt. Watkins from Mirror Lake