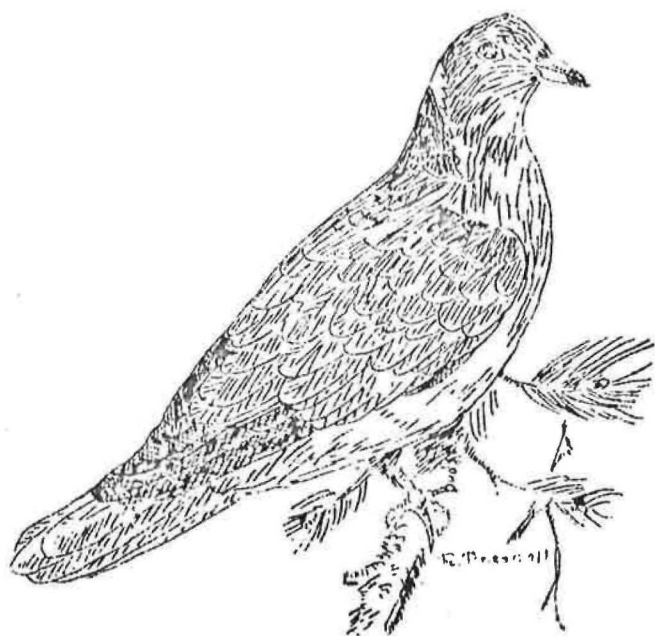


Zion and Bryce Nature Notes



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UNITED STATES
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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 Zion and Bryce Canyon National Parks. Additional copies of these bulletins may be obtained free of charge by those who can make use of them by addressing the Superintendent, Zion National Park, Utah. PUBLICATIONS USING THESE NOTES SHOULD GIVE CREDIT TO ZION-BRYCE NATURE NOTES.

P. P. Patraw, Superintendent

C. C. Presnall, Park Naturalist

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Special Note. It has been decided that, beginning with this issue, Zion-Bryce Nature Notes will be published quarterly rather than bi-monthly as in the past. This change is made not only to conserve time and paper, but also to aid our limited personnel in getting out a more worthwhile paper.

BIRD BANDING EXPERIENCES

Henry Grantham

The most interesting and probably the most instructive E.C.W. job during this last winter has been the bird banding experiment this writer has been conducting for the past five months. This is the first work of its kind ever attempted in Zion National Park or vicinity. The purpose of the work is fourfold: to determine the various birds inhabiting or migrating through the park each year; to study the habits of these birds; to study local migration dates; and to aid in the study of nationwide migration routes. The following facts and interesting experiences come partly from records that have been kept of the entire banding operations, and partly from personal recollections.

Five hundred and twenty birds have been banded to date, of which 310 have been Oregon Juncos.* This bird has been the most prevalent one in the park during the period covered by the banding operations. The following is a record of the different birds banded and the number of each banded:

Junco (presumably Shufeldti) Junco oregonus shufeldti? 310. Gambel Sparrow, Zonotrichia leucophrys gambeli, 135. Song Sparrow, Melospiza melodia fallax, 26. Gray-headed Junco, Junco caniceps, 11. Spurred Towhee, Pipilo maculatus montanus, 10. Woodhouse Jay, Aphelocoma californica woodhousei, and Slate-colored Junco, Junco hyemalis, 7 each. Ruby-crowned Kinglet, Corthylio calendula, 4. Pink-sided Junco, Junco moearsi, 2. And one each of the following: Sparrow Hawk, Falco sparverius; Red-naped Sapsucker, Sphyrapicus varius nuchalis; Rocky Mountain Creeper, Certhia familiaris montana; Northern Shrike, Lanius excubitor (presumably invictus)**; Audubon Warbler, Dendroica auduboni; Fox Sparrow, Passerella iliaca; and Lincoln Sparrow, Melospiza lincolni.

Out of an average of thirteen birds handled per day, an average of four birds per day were banded, the remaining average of nine birds per day being previously banded birds recaptured. It may be of interest to note that sixty-five per cent of the banded birds repeat at least once.

* No specimens were collected, but winter specimens taken outside the park were all Junco o. shufeldti. C.C.P.

** A new park record. C.C.P.

The area covered by this banding work extends from the southern boundary of the park north along the Virgin River for approximately three-quarters of a mile.

Soon after operations were started it became apparent that the four factory-made traps that were available to start with were insufficient to cover the desired area and band the desired number of birds. A small quantity of hardware cloth was obtained and at times when storms made it impossible to trap, my time was occupied in the manufacture of traps. The beginning number of four traps was gradually increased until the present number of fifteen was reached. Several of the traps that were constructed were modeled after a type described in a bulletin on bird banding as a Government Sparrow Trap. It is ideal when used for birds that travel in flocks, such as sparrows and juncos, its advantage in this respect being due to its ability to catch anywhere from one to twenty birds without requiring resetting. It is not, however, very satisfactory for use in trapping birds of a very timid nature; this is true mainly because of the tunnel leading into the trap and the small opening into the trap. Among the original four traps were three which are known as two-coll drop traps, employing the use of a trigger and a drop door for their operation. This type of trap requires frequent attention to maintain its efficiency; its advantage lies in its relatively large door. Two tree-trunk traps were made with the intention of catching woodpeckers. These traps were a disappointment, perhaps due to improper location or to an abundance of the woodpecker's natural food supply. Four of the constructed traps are of an original design employing a trigger trap door principle and using an elastic band for motive power in closing the door. This trap has proven very efficient although like the drop trap it requires constant attention.

Throughout the entire banding operation, problems of an unexpected nature kept presenting themselves for solution. The first real problem was that of the squirrels and chipmunks springing the traps and consequently keeping many birds from being caught that otherwise would have been. Fortunately, this problem solved itself temporarily with the coming of winter and the consequent hibernation of the animals. Another problem, one that threatened for a while to assume serious proportions, was that of predatory birds, such as the Sparrow Hawk and the Northern Shrike, attacking trapped birds and sometimes killing them. The fact that only the drop trap was vulnerable limited the difficulty considerably. A super structure was placed entirely around the trap leaving only openings for the entrance, thus very effectively solving that problem.

During and immediately after a snowstorm has proven to be the ideal condition under which to band. The birds being banded here are mostly ground feeding varieties and of course snow covering up their natural food supply drives more of them to the bait in the traps than would normally come. On the contrary, a rainstorm has just the opposite effect, cutting down the number banded considerably. In fact, not until the ground is almost dry does the number banded again reach normal. Curiously enough, should the work be discontinued for a number of days or a week and then resumed, there is a very noticeable increase in the number of birds banded.

Concerning reports, it is found that six per cent of the banded birds report ten times or over. This percentage can be classed as birds having formed the trap habit. Those birds are often caught two or three times in the same day, in fact, there are some cases where a bird caught in one trap is caught a half hour later in another trap. Most of the birds that are afflicted with the trap habit continue to report until they either leave or are accidentally killed.

A very unusual phenomenon expressed itself in this study; that is, junco apparently feeding in couples. In a number of instances two of them caught at the same time in traps located near each other or in the same trap are found to report together. Sometimes even the usual laws of migration are broken, as illustrated by an incident that occurred here last winter. A young Audubon Warbler was banded about three months ago and reported a couple of times over a period of a month. In addition to the recorded facts, he was observed by the writer in the vicinity for a longer time than that. All this despite the fact that this warbler is supposed to winter a hundred miles or more further south.

There is, of course, no need to stress the scientific value of this work, although for a complete study it must be carried on for years. Even in this short period of time new facts concerning migration habits and flocking are unveiled. Definite identification of different species is made much easier and without the necessity of taking specimens. Material for future study is produced with each bird that is banded. This material is not only available for local study but also available for migration study throughout the country. It is true that to date no birds have been trapped here that have been banded elsewhere, but this is to be expected in a region where few, if any, banding stations are located. One thing to look forward to is that this station being started here will tend to cause a number of people interested in bird study to start banding operations in this section of the country.

In addition to its scientific aspects, this work has a personal significance. The writer, although always interested in nature study, never before had the intimate association with nature that this work has given him. Ability to recognize birds and to classify them correctly has been increased considerably through this practical training and through the aid of the Park Naturalist. When first undertaking this work, the writer had difficulty in associating bird call notes and songs with the proper bird, but now he is often able to identify various birds by their song before seeing the birds themselves.

In conclusion it might be suggested that an increase in the value of these banding operations would result if additional stations could be placed at Bryce Canyon, Cedar Breaks, and on the rim of Zion Canyon. Many of the birds that stay during the winter in Zion Canyon are to be found in the higher elevations during the rest of the year. This writer wishes to express his sincere hope that this work which has proven so valuable in its beginning may be made a continuous long time project.

FLOCKING HABITS OF WINTERING JUNCOS

C.C. Presnoll and Henry Grantham

Juncos are the most common of all birds in Zion Canyon during winter months, when they are so numerous as to attract the attention of everyone, even giving rise to a popular fallacy that birds are uncommon in the canyon at any other season. Park rangers and other residents have enjoyed feeding and observing the juncos for several years, but serious study of their habits was not undertaken until the past winter, when bird banding was first started in the park. Many of the unsuspected traits of bird behavior that were learned while banding are told in the article by Henry Grantham in this issue; the present article will tell only of the flocking habits of juncos.

It is well known that many game animals and birds move about in herds or coveys, each group ranging over its own territory without trespassing upon that of others; hence it was no surprise to learn that juncos acted similarly, at least during the winter. The surprising things disclosed by our banding operations were the small areas occupied by each flock, and the closely knit organization of each flock; that is, there was very little intermingling between flocks even when not separated by natural boundaries. These two features are brought out more clearly in the following narrative of our winter's work.

Banding started on November 7, 1934, and has continued steadily from that time to the present with but two brief interruptions. The number of traps has varied from 4 to 15. The period covered in this study of juncos extended from November 15 to March 15, this being the period when the wintering birds were not disturbed by migratory movements. From November 7 to 15 new flocks of juncos were arriving each day from the north, many of which flew on southward before they had become well acquainted with our feeding stations and traps, but after the 15th there were few new arrivals and many "repeats" (birds banded by us and returning soon to the same or nearby traps). After a month of banding we began to suspect, from observations and repeat records, that there were three distinct flocks in the small territory covered by our operations; accordingly we began shifting the traps and cataloging the records to secure more accurate data. This was continued until March

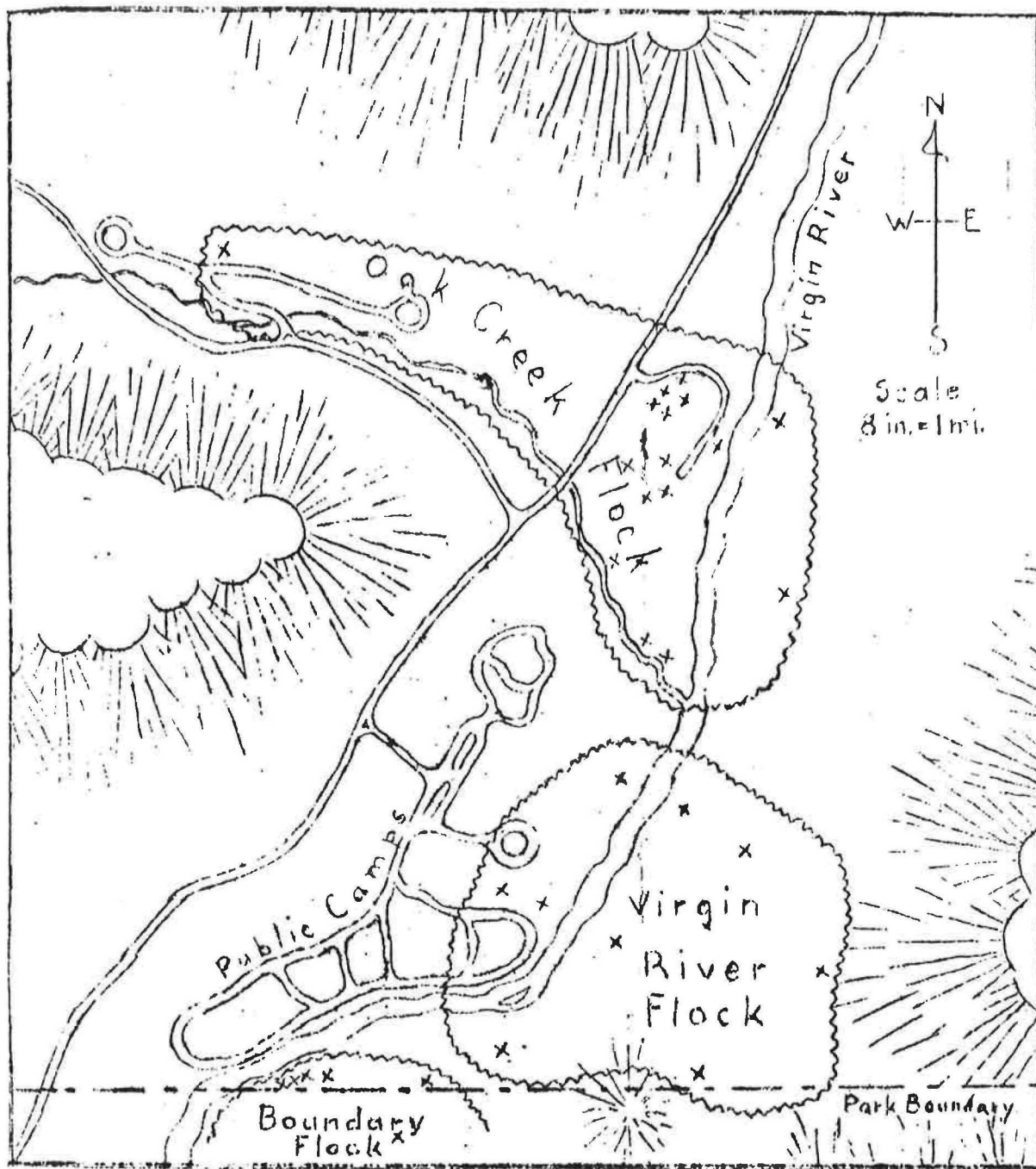
15, when spring migration broke up the settled affairs of the flocks on which we were working, as indicated by the large numbers of unbanded birds captured after March 10, and the almost total lack of old "repeats" after the 15th.

The records of the intervening four months clearly showed the existence of three flocks, which are indicated on the accompanying map as the Oak Creek flock, the Virgin River flock, and the Boundary flock. All feeding stations and trap sites are indicated by x, and from the records at those stations we have been able to establish the territories occupied by each flock (indicated by zig-zag lines). Of course, traps were not kept at all designated points all the time, in fact no one point was occupied by a trap for the entire four months, and in many cases a trap was kept only a few days at a place, just long enough to learn which flock visited that place and thus establish boundary lines. As an example, the operations on the Boundary flock are given below.

In mid-November three traps were placed near the south boundary of the park, in a patch of dead sunflowers; in them we immediately began to capture unbanded birds and did not capture any "repeats" that had been banded in other traps farther north. All but one of the eighteen juncos that repeated in these three traps during the ensuing two months had been originally banded in them, and only three birds banded at the boundary wandered away to repeat in some other territory. Other traps, located as shown on the map, extended the boundary territory slightly, and observations just outside the park line showed that the same birds ranged an undetermined distance to the south. Similar methods farther to the north showed that certain juncos ranged in what we later called the Virgin River territory, and seldom wandered out of it; and another group kept itself rather closely confined to the Oak Creek area. The following tabulation gives a summary of work on each of the three areas, but fails to give an accurate picture of actual conditions.

Flock	No. of Trap Days	No. of new "repeats"	Ratio between trap days & repeats
Oak Creek	660	53	1:12.4
Virgin River	228	24	1:10.7
Boundary	237	18	1:13.2

The last column in the above table conveys the impression that the Virgin River flock was the largest, but it was actually about the same size as the Boundary flock, the poor ratio obtained on the Boundary flock being due to the fact that it ranged much of the time outside the park



Sketch map showing areas occupied by Junco flocks
at south end of Zion Canyon. Traps and feeding
stations indicated by x.

and beyond our trapping area. Both of these flocks seemed larger than the Oak Creek flock, and both were much more compact, wandering very little outside their respective areas, and moving as one group through their own ranges. The Oak Creek flock scattered widely over its territory, and individuals occasionally wandered to the other flocks. Our records showed a total of thirteen juncos that wandered from the territory where first banded (300 were banded in all) and six of these were originally from the Oak Creek flock. Ten of the wanderers made only one move, one moved from his original flock to another and then back home, and two shifted erratically between all three flocks. One (No. 34-95152) was nicknamed "Hobo" because in a series of thirteen repeats he changed territories six times. Such freakish individuals served but to emphasize the strict flocking tendencies of the majority. It might be argued that the birds were not showing such tendencies, but were simply developing the habit of frequenting certain feeding stations, but I believe our method of shifting traps frequently over comparatively wide areas would eliminate such a factor.

Another thing that indicated the accuracy of our methods and conclusions was the sharp dividing line between flocks, a thing which would not have been apparent if the trap habit had been a principal factor. However, we were at a loss to explain why the divisions between territories were located where we found them. The amount and distribution of shelter seemed equal everywhere, and belts of brush or weeds often extended from one territory into another. Slope and exposure were practically uniform throughout. Food conditions differed somewhat. The Oak Creek flock foraged chiefly in dead grasses around clumps of brush and trees; the Virgin River flock had similar conditions with a noticeably greater percentage of weeds among the grasses; the Boundary flock had still more weeds on that portion of their range that was inside the park, and foraged in small fields, barnyards, and orchards outside the park.

To summarize the results of our study: The juncos residing in Zion Canyon during the winter (November 15 to March 15, approximately) segregate themselves into loose or compact flocks of about one hundred individuals, each flock (excepting a few individual wanderers) maintaining its own autonomy within a certain foraging territory, of which the size and boundaries are determined by factors not known to us.

(Note. In the foregoing study no attempt was made at precise identification of species, and no specimens were collected. Specimens collected in areas immediately adjacent to Zion National Park indicate that the great majority of juncos wintering here are Junco oregonus shufeldti. Field identifications of birds banded by us also include a very limited number of Junco hyemalis, Junco mearnsi, and Junco caniceps, the latter being the most numerous of the three.)

ALONG NATURE'S HIGHWAY

The effect of altitude, and consequent temperature changes, upon the distribution of animals was well demonstrated in a recent study of the mammals of Bryce and Cedar Breaks, at 8,000 and 10,400 feet elevation respectively. Both regions are inhabited by the same two forms of chipmunks: a small one, E. minimus consobrinus, and a larger kind, E. quadrivittatus inyoensis. The relative abundance of the two forms varies with the altitude. At Bryce, in October, 23 chipmunks were found drowned in a metal horse trough; of these, approximately forty per cent were the small variety. Close checks on all chipmunks seen or killed throughout the park this year show that the proportion ranges from 35 to 40 per cent small ones. At Cedar Breaks similar data collected in October show that the proportion is increased to from 45 to 50 per cent small ones. Still higher, at 10,500 to 11,000 feet, on the slopes of Brian Head, near the Breaks, there were not enough observations made to warrant a definite statement, but all chipmunks seen in a three hour walk were small ones. Similar sight records at elevations of 6,700 feet in Zion, where both varieties are known to occur, show a proportion of one small chipmunk to fifteen large ones.

C.C.P.

At Blue Springs, near the northwest corner of Zion National Park, I discovered, on November 2, 1934, the nest of a Chickaree (Sciurus f. fronti) which was made chiefly of sheep's wool. The nest was located near an old bed ground where small fragments of wool were scattered about in the brush. About a peck of these fragments had been gathered by the squirrel, and woven in with an equal quantity of white fir cones in every stage of disintegration to make a nest nearly two feet in diameter. The nest was located in a small white fir (Abies concolor) about thirty feet from the ground, and was cradled firmly against the trunk and several small branches on the north side of the tree.

Somewhat similar structures were observed at Cedar Breaks on October 16, but there they were used as food caches, being entirely filled with tondstools of some sort - about a quart in each cache. Two such structures were found in the small branches of a spruce (Picea engelmanni) about eight feet from the ground. They were made of grass, and were hung in the branches some distance away from the tree trunk. No squirrels were seen to enter the caches, but they violently objected to my trespassing.

C.C.P.

Gophers in Zion Canyon have recently been of assistance to the E.C.W. cleanup program by killing small specimens of the exotic tamarisk (Tamarix gallica) which is gradually encroaching upon the park from well established stands along the lower Virgin River. Several small trees have been found eaten off just below the ground, and on January 29 an unusually large one was found. It was 8½ feet high and measured two inches in diameter at a point nine inches below the ground where the gopher had gnawed it completely through. The gnawing was done almost entirely from one side, making a notch five inches long.

G.Y.Croft.

While on a ski patrol at Cedar Breaks National Monument on February 26, 1935, fresh tracks of a wolverine were noted within the monument, approximately three miles northeast of Sunset Point, elevation about 10,600 feet. The wolverine had picked up the trail of a cottontail and was following it. The writer followed back on the tracks of the wolverine and soon came to a den which was on a low knoll under two basaltic rocks with three entrances which led through the 55-inch snow pack. After following the wolverine tracks forward for about an hour, the study was halted by the arrival of a semi-blizzard which soon obliterated the tracks and rendered efforts to follow them futile.

L.F.Keller.

On March 29, 1935, at 10:00 A.M., a local rancher herding a flock of domestic rams near the south boundary of Zion National Park in the Parunuweap Canyon, observed a bighorn ram shyly circling the domestic sheep. About 11:00 A.M. the bighorn began to feed with the domestic rams, and later disappeared on the ledges toward The Watchman. The next day an ECW foreman reported seeing two domestic rams dash down the hill. He expected a coyote was after them, but observed that a large bighorn ram was causing the stampede. The bighorn ram would dash at the domestic rams and when close to them he would stop suddenly with stiff front legs. The same morning, C.C.C. boys reported seeing two goat-like animals feeding near the domestic sheep. These, no doubt, were bighorn ewes. After several trips up the East Fork of the Virgin River, I was rewarded, on April 2, by seeing a bighorn ram and a ewe (Ovis c. canadensis) wending their way up the ledge toward Stevens Wash. At this time the domestic sheep were about a mile away. A week before this incident, on March 23, the tracks of two bighorn were followed from Stevens Wash down the ledges to a point three-quarters of a mile from the river, where the tracks were lost. Apparently the natural range of these bighorn is in the high, rough country northeast of The Watchman, between Zion and Parunuweap Canyons, approximately 2,000 feet above the floor. They seem to have been attracted into the Parunuweap Canyon by the domestic sheep.

L.F.Keller.

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Protection of territorial rights in the bird and animal kingdom often leads to some interesting combats, especially in the autumn when several species are competing for the pine nut crop. One such battle interested me at Bryce for an hour during the afternoon of October 13, 1934, when the homestead rights of a large ponderosa pine were being contested by a Clark nutcracker and a chickadee. I was surprised to see that the nutcracker, in spite of his large beak, was no match for the squirrel, which chased him vociferously from limb to limb, using up much energy in running out to each limb tip that the bird alighted upon. The tree was large, and the nutcracker persistent, but after an hour of noisy quarreling the squirrel was left to gather cones in peace.

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Somewhat similar quarrels occur between chipmunks and nuthatches, but in this case the contest seems to be for territory alone, since the two creatures are foraging chiefly for different kinds of food. After watching many contests in the ponderosa pines at Bryce during September and October, I would classify the contestants as follows: The Rocky Mountain nuthatch can drive away the chipmunks, but does not bother the black-capped nuthatch; but the latter always yields to the chipmunks. Of the two varieties of chipmunks at Bryce, the larger always wins, as would be expected.

C.C.P.

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Dinosaur tracks are of rather common occurrence in the Chinle shales of this region, but had never been found within the park boundaries until last summer, when Ranger-Naturalist Anderson discovered some in Zion Canyon. A second discovery was made by Superintendent Patraw late in March of this year, consisting of eight imprints of a small, three-toed foot, about the size of a man's hand, on a slab of dark red Chinle shale lying near the foot of a talus slope below the Mountain of the Sun. The footprints can be easily seen by motorists driving up the Zion Canyon road.

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After Superintendent Patraw had located this slab, I explored the entire talus slope above it, examining each fragment of similarly colored shale. I was pleased to find one slab, six by four feet, on which were five imprints, also three-toed, but somewhat larger than the others - about ten inches from heel to end of middle toe. The tracks on both slabs are indistinct, as though made in soft mud, and sun cracks are common on nearby slabs of similar rock.

C.C.P.
