

## COMMUNISM IN THE CALIFORNIA WOODPECKER

WITH ONE PHOTO

By FRANK A. LEACH

THE CIRCUMSTANCES here related are the details of an exhibition of industry on the part of some woodpeckers that equals the proverbial reputation of the ant family in their loyalty to labor. The species referred to is the California Woodpecker (*Melanerpes formicivorus bairdi*). Birds of this species are seen most frequently where valley oak trees abound, and they can easily be identified, as their black and white bodies and red-crowned heads make them conspicuous. They are seldom at rest, and their movements about the limbs of a tree, or from one tree to

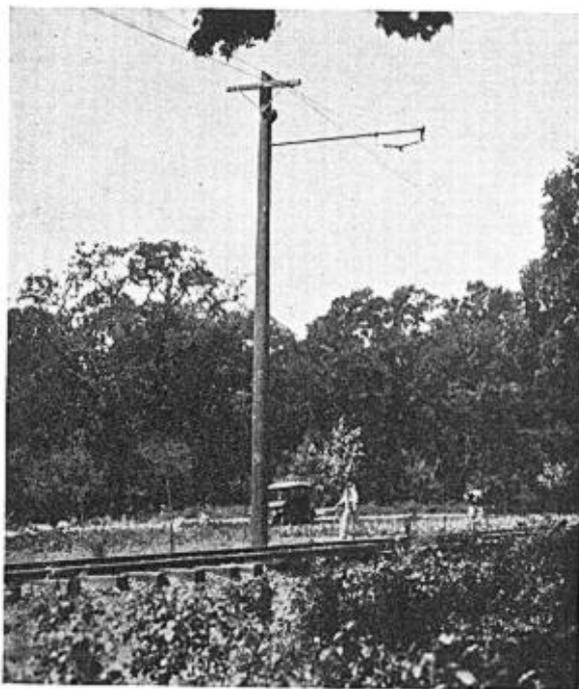


Fig. 7. TROLLEY POLE IN WHICH CALIFORNIA WOODPECKERS EXCAVATED THEIR NEST. ENTRANCE IS SHOWN AT LEFT OF THE BIRD SEEN CLINGING TO THE POLE.

another, are frequently accompanied by about the most unmusical and harshest of bird notes, in which they also commonly indulge when not on the wing.

It was on February 2, 1922, at Diablo, California, that I discovered a California Woodpecker at work digging a hole in a wooden trolley-pole, about two and a half feet from the top. After a few moments of observation I was satisfied that the bird was engaged in excavating a cavity for the purpose of a nest. The round entrance, marvelously perfect in its circle, had been completed, and further excavation had been carried into the pole so that the bird in its operations was at times partially hid from

view. From the number of blows given, and from the time taken to remove the small chips found on the ground about the base of the pole, it was evident that work had been going on for at least two or three weeks prior to the time of discovery. The chips were but little more than good sized slivers. They averaged about five-eighths of an inch in length and a little more than a sixteenth of an inch in breadth.

It was impossible for me to determine the exact date of the completion of the excavation, but I concluded from the actions of the birds that it was some time near the latter part of April. For a couple of weeks or so towards the end, the only way I could tell that the work of digging out the wood was being carried on, was by seeing the birds disappear in the hole, then hearing the rapid blows given by their bills on the interior, and occasionally seeing them come to the entrance and throw out chips. An examination of these pieces showed that the timber was not decayed, but that it was what might be called "soft" wood. From the middle of January, the time at which the work must have been started, to the time when active operations in excavating ceased, was over three months.

The first month or more of nest building was the period when the woodpeckers exhibited their greatest industry; there was then scarcely a moment between sunrise and sunset, rain or shine, that one or another of the birds was not at work on the job, in no half-hearted way. Their close application and earnestness, it might be said "feverish haste," in carrying on the work at that time, seemed to indicate that they appreciated they had undertaken a task of no small proportions. The birds worked during this period in relays. When the bird that had been resting or taking its time off returned to the pole, it would alight within a few inches of the hole. This was the signal for the previous worker to depart. The relief immediately took the vacated position and proceeded with the drilling operation, in which its long, sharp beak worked with the rapidity of a mechanical riveting device. There seemed to be no regularity in the time each bird should remain at work before being relieved, but some of the "spells" for a worker appeared to run into hours.

One of the most puzzling features of the nest building was the fact that more than a pair of woodpeckers seemed to be interested in the proceedings. There was seldom less than two or three other birds near by, and sometimes more, while the one at the hole was at work. These birds would be clinging to the sides of the pole or perching on the cross arms. It was not an uncommon thing to see a bird fly down to the hole and act as if its purpose was to inspect the work or to take note of the progress being made. The complexity of the matter was greatly increased when the time for mating approached. There seemed to have been no previous actual pairing, at least so far as I could determine. Whether this is characteristic of these woodpeckers or is an exceptional case, I am unable to say, for it was the first opportunity I had had to study them while nesting.

Perhaps the peculiarities referred to will be made clearer by the following summary of the notes I recorded from time to time, while observing the work and conduct of the birds pertaining to the nest in the pole. These notes cover the period from February 2 to the latter part of July.

February 2nd. Discovered woodpeckers excavating a hole in a trolley pole; they must have been engaged two or three weeks in accomplishing as much as they have. The cavity made by them in the pole is deep enough to admit the greater part of the body of the bird that is working.

3rd. Found the birds working without intermission all day long.

4th. Enlarging the cavity near to entrance employed the time today. Working "fast and furious."

5th. Noted that work was not discontinued until after sundown.

6th. Visited the pole several times and found the birds earnestly working at all times. The depth of hole notably increasing.

7th. Noticed the working bird relieved from its labor for the first time. I think the relieving bird was a male. It was not quite so energetic as the other, and it seemed pleased to give up the job in the course of ten or fifteen minutes.

From the 7th to the 12th. Stormy weather prevailed, but it did not prevent the birds from continuing their work, as the cavity now protected them, admitting the entire body of the bird. On the 12th larger chips were being thrown out. The only work a relieving bird did on one occasion was to lean into the hole and pull out chips that apparently laid in the bottom of the cavity. Its laziness seemingly was observed, for in a few moments it was replaced by an earnest worker.

From the 12th to the 23rd my notes contain no more than mention of the progress of the work and repetition of the conduct noted for the preceding days. The noise of monotonous drilling continued with but slight interruptions from morning until night, regardless of weather conditions.

23rd. Cavity now sufficiently large for the operating bird to go in, turn around, and come out, head first. Heretofore he came out backwards.

24th. Not working so incessantly as previously. Two birds remained near-by the hole clinging to the sides of the pole when not working. Frequent resting periods noted.

25th to 28th. Still excavating. Am not sure, but I think more than two birds have been and are working on the job. Collected a sample of the chips thrown out by the birds, that litter the ground about the base of the pole.

March 1st. The cavity is now large enough to admit the presence of two birds. Saw two go in one after the other. Both appeared to be working on the inside. Two other birds on the pole showed interest in the work by remaining there and taking an occasional peep into the hole.

2nd. The birds act as if they thought their job was nearing completion. They keep reasonably busy but do not work so steadily as they did during the first few weeks, or with such feverish zeal and close application.

3rd to 6th. Work still goes on about as last noted. Frequently saw four woodpeckers about the hole. The relations of these birds with the one at work are harmonious. They manifest an interest in the work, and I think that more than one, if not all of them, take turns in working on the excavation. I can not distinguish one bird from another, so can not be positive about it.

7th. Still excavating, but saw only one woodpecker at work or about the pole all day.

20th. All the work for several days past has been done by the birds digging on the inside of the hole out of sight, but the sound of the rapid blows of a bird's bill on the wood is plainly heard outside by persons standing forty or fifty feet away from the pole. A male bird, supposed to be inside for the purpose of working, took advantage of the absence of its mate or mates and loafed for several minutes with its head out of the hole, possibly watching for their return.

21st. The birds were working industriously on the inside while two other birds were on the pole close to the hole, into which both occasionally peeked.

22nd to 31st. The daily record was simply "still working inside."

April 2nd. The woodpeckers are not working more than half the time. Several birds are frequenting the place. Mating proceedings noted.

3rd. Not very busy in nest building. From four to six woodpeckers about the place all day. On one occasion saw three go into the hole. Heard digging while they were inside. Mating going on but no serious fighting.

4th. Several birds about, going in and out, but little work being done.

7th. Work of excavating still going on but not steadily. Six to seven birds almost continuously near-by. Their presence is puzzling. Have more than a pair an interest in the work and nest to be? Their actions seem to answer in the affirmative, unnatural and inconsistent as it may appear to be. Mating among the birds common, with but little show of opposition or antagonism.

8th. Work going on about as last recorded, with the usual attendance of surplus woodpeckers.

17th. Conditions and proceedings unchanged. Today saw three birds go into the cavity and soon after heard two of them working. Four other birds were on the pole, one looking into the hole.

20th. Occasionally hear the birds at work on the inside, but only for brief periods. They now are doing more loafing and love-making than work. Not uncommon to see three birds go into the nest and remain several minutes. Sometimes one would come out and leave the others to work for a brief time. At times one bird would remain on the inside with its head poked out of hole "taking in the sights," while the other birds worked cutting out chips in enlarging the cavity. At times, when three birds were inside, a fourth and even a fifth would go to the hole and peek in without objections from the insiders; but when the fourth attempted to crowd in, it was made to retire by the active protests of those in the hole. Later, no objections were made.

Am unable to determine whether the presence of the unusual number of birds and their peculiar conduct indicates that this family of woodpeckers are polygamous, polyandrous, or a compound of both. The woodpecker is a queer bird. Its habits in other matters, as well, have been puzzling to students of its life.

27th. Have heard the birds at work on the inside of the cavity occasionally for the past week. Not quite so many woodpeckers around the place.

30th. No drilling or digging in the nest has been noticed for the past two days, although birds go in and remain longer than my patience will permit of waiting for their coming out. The long stay with no work or noise suggests egg-laying if not incubation.

May 1st. Very quiet about the nest. The "crowd" has left, but I can at nearly all times count on the presence of three or four birds. This is most perplexing, as a single pair is all that should be expected, according to the usual customs and habits of other bird species. No more excavating heard.

7th. About 8 A. M. saw a woodpecker enter the nest. Waited a half hour or more to see if the visit was temporary, but it did not reappear. A couple of other birds remained near-by, either on the pole or in a neighboring tree. One or both would occasionally fly down to the hole and peek in, but make no effort to enter.

8th. From the length of time the bird remains in the nest and the comparative quiet that prevails about the place, I think incubation has been in progress for several days.

16th. Very quiet. Have noticed only one bird about the place on the outside for a week past.

20th. No change in conditions at the nest.

21st. Noticed a bird at the entrance of the hole acting as if feeding young ones inside.

26th. For the past five days have observed an old bird make repeated trips to the hole and lean into the entrance as if delivering food to occupants of the inside. It is fair to presume that the nest now holds a brood of young woodpeckers.

27th to 31st. No notes. Called away on business.

June 1st. Old birds are feeding the young ones in the nest.

2nd. A young bird could be seen near the entrance on the inside; appeared to be well feathered.

3rd. For a good part of the day a young bird occupies a position on the inside of the nest so it can put its head out and watch for the coming of the old ones with food. The latter have much trouble in getting by with food for the other young ones.

4th. The young bird at the hole has become strong and vicious. When the old ones refuse it the youngster strikes at them with its long sharp bill. The blows are not always avoided, but no resentment is shown.

5th. Feeding infrequent. As much as a half hour noted between trips. Three or four old birds about the pole the greater part of the time. When one goes off for food, it is common for them all to go together. The food as near as I could determine consisted of insects in mature and grub form. The former were caught on the wing, and taken from crevices in the bark of the trees, while the grubs were largely obtained from tree-stored acorns which the birds opened.

On the 6th of June there was no young woodpecker thrusting its head out of the hole, nor parent birds making trips to the nest with food, as had been the case for several days prior. I watched the place that day and on the following day until I became satisfied that the young birds had left the nest. The family, parents and young ones, were not in evidence even in the oak trees near by, so I assumed that I had reached

the concluding chapter of this little history of the activities and habits of the woodpeckers in raising a brood. Therefore I gave the trolley pole nest and occupants no further notice until the 2nd day of July, or almost four weeks after I noted the departure from the nest.

On that day I happened to be in the neighborhood of the pole, and was surprised to see a woodpecker fly to the hole and lean in as if feeding young birds in the nest. I remained long enough to record several trips of woodpeckers with food in their mouths, establishing the fact that another brood was receiving the attention of parent birds. But whether these were the parents that had worked so long and industriously in excavating the nest and had raised one family, there was no way to determine. It may be that another female took possession of the nest immediately upon its being vacated by the first brood.

The same perplexing feature that attracted my attention in the rearing of the first brood was again apparent, and that was that more than a single pair of old birds evinced interest in the second brood. I had suspected that more than two old ones gave their time to feeding the young of the first lot, but I never actually saw the delivery of the food. However, in the case of the second brood, on eight different occasions I saw three different old birds feed the young ones in the nest, and at one time I witnessed a fourth one delivering food to them.

The daily conduct of the old birds and the unusual number remaining about the pole were the same as noted during the rearing of the first brood. The odd family seldom quarreled, and from all appearances the strange relation was a harmonious one.

On the 8th of July, in the afternoon, I counted ten trips made to the nest by the old birds in feeding the young, in thirty-six minutes. I was interested to know how many young birds were in the nest, but there was no way by which my curiosity could be satisfied. Even if by the means of a ladder I could have reached the nest, I could not have seen through the small entrance hole what was in the bottom of the cavity. For ten days or more the only evidence I had that there were young birds in the nest was comprised in the activities of the old birds in bringing food. Later on, when the youngsters became stronger and were able to climb up on the inside wall of the cavity and poke their heads out and watch for the coming of the parents with food, one or another of them occupied the "doorway" a great part of the day.

Florence Merriam Bailey and other authors say the California Woodpecker lays four or five eggs. Therefore it was reasonable to suppose this was about the size of our family. Although only one young bird could be seen in the nest in the trolley pole for the reason stated, it was evident that there were more in the brood. The majority of times the old birds would crowd past the young one in the hole in their meal-bringing errands, and reach down as if delivering food to the waiting mouths in the bottom of the nest. The youngster that occupied the point of seeming advantage, the entrance place, did not appear to get more than its share of food. The parent birds were persistent in ignoring its clamorous demands for all of the food brought to the family. Frequently it behaved very badly by pecking the parents when they refused to give it the share of food that was intended for its brothers or sisters. On one occasion when passed by the old bird the youngster seized a claw of the former and shook it viciously. The conduct of this forward youth was not unlike that of the young one of the first brood, but it seemed somewhat more vicious and piggish. This was more apparent after it became fully feathered and grown. I assumed that it was the same bird at the hole all the time, as it never exchanged positions with any of the other young birds while I was watching.

The last two or three days before the second brood left the nest, the old birds had the greatest difficulty in getting by the "pig" at the entrance. Sometimes there would

be two or three old birds clinging to the pole near the hole with food in their beaks, making efforts to pass the morsels to the young ones below. Several times after making repeated failures I saw the old ones swallow the food and then fly away. The youngster would hang half way out of the entrance; then its fluffy body would practically fill the passage way. When doing this, it was either in an attempt to reach one of the old birds near by or in anticipation of their coming. The old birds would never feed it while in that position, something it soon learned; for subsequently when they were approaching, it would withdraw its head into the hole; but it maintained a point of advantage from which it fought for every particle of food brought to the family. At times some of the old birds took considerable punishment in their persistent efforts to divide the food impartially. I looked to see the old birds show some resentment, but so far as I observed they patiently overlooked this conduct.

Perhaps if I had been able to determine the sex of the superfluous woodpeckers, it might have simplified some of the mystifying features of the incident. There is so little difference in the coloring or markings of the male and female that it is only under favorable conditions that the sexes can be distinguished one from the other while they are in freedom. With the male the red of the crown comes down on the forehead and meets the white splotch above the bill, whereas with the female a black band intervenes between the white above the bill and the red of the crown. However, whatever the sex of the extra birds may have been, a determination of the matter could not have accounted for their participating in the labor of feeding the young, and in the work of excavating the nest.

The cavity made by the birds consisted of the hole driven into the solid wood for the distance of five or six inches, and the bowl-shaped space below which I estimated to have been hollowed out to the depth of eight or ten inches. At no time did I see the birds carrying in material of any kind to line the nest.

*Later.*—I thought that with the paragraph above I had finished the history of the nidification of these birds for the year, but to my great surprise, about two weeks following the date of the second brood leaving the nest, I happened to be in the vicinity, when I noticed a woodpecker make a visit to the pole and enter the nest. It did not remain longer than a moment or two, but came out and flew off to a neighboring tree. While standing there and pondering over the meaning of the visit, another woodpecker came and entered the nest but did not come out until I rapped on the pole. This was on the 16th of August. On the 19th of that month I visited the pole, and made a note of the fact as follows: "Notwithstanding the improbability of such a thing, the woodpeckers are acting as if they intended to produce a third brood in the trolley pole nest."

Ten days afterwards (August 29), after watching the entrance of the nest for fifteen or twenty minutes and seeing no birds go in or out, I knocked on the pole, and a bird flew out. The following day under the same circumstances I repeated the action, when two woodpeckers flew out. The natural inference to be drawn from the action of the birds was that they were laying eggs or had done so, and were now engaged in incubation. However, considering the lateness of the season and the improbability of a nest being used continuously in this manner, I concluded it was best to wait and watch the place for a few days before attempting to interpret the conduct of the birds.

During the following ten or twelve days I made three or four brief visits to the pole, but saw so little of the birds about the place that I began to think I had been too hasty in inferring the possibility of a third brood. But the uncertainty of the matter was to continue no longer, for on the 13th, a few moments before 3 P. M., I saw a bird at the entrance of the hole, dipping in as if feeding nestlings. A few moments of

careful observation settled it: there was a *third brood* of woodpeckers! I not only witnessed the old birds repeatedly in the act of feeding the young ones, but I frequently heard the harsh squeaking of the nestlings. From three P. M. until quarter past five I held the place under close observation. For the first hour and a quarter it was very hot and there were only eight trips by the old birds to the nest, but they made eighteen in the next hour following, when the temperature had fallen.

I devoted the afternoons of the three following days to the study of the actions of these remarkable birds in connection with their third brood of red-headed babies. To give the details of what I noted would be little more than a repetition of the particulars recorded in the history of the first and second broods. It would have been interesting to know whether the same birds were the parents of all three broods; but there was no way by which this matter could be determined. However, I could not help thinking that the last brood, as with the previous ones, was a community affair.

In the large oak tree standing so near to the trolley pole that some of its outer branches nearly reached the pole, there were almost always from six to eight mature woodpeckers, all of which seemed to be interested in the welfare of the nestlings in the pole. I repeatedly saw three of them feed the youngsters, and on two occasions noted four different old birds perform this parental service. I was satisfied from the actions of the birds that a majority of the flock, if not all of them, participated in the care of the young woodpeckers; but it was so difficult to keep track of the movements of all of the mature birds at the same time, I could not be positive as to the number participating beyond what has been stated. There was no quarreling among the old birds in the tree. More than once I saw four of them sitting on a branch so close together they might all have been covered with a hat.

The time which elapsed between the appearance of the third brood and the previous one was about the same as between the latter and the first brood. The unusual conduct of this group of birds while rearing these three broods does not establish the peculiarity as a habit common with all woodpeckers. But it is sufficient to stimulate a more extended study of the breeding habits of these birds, as well as of some of their other habits, all of which seem to indicate a community existence. Some observers are of the opinion that these birds bore holes in the bark of trees and elsewhere for the storage of acorns, by coöperative action; that when the acorns are stored the holes are filled by the birds operating jointly; and that later on they are resorted to as a common supply of food, over which there is no quarreling, fighting, or setting up of proprietary claim by any individual bird.

For others than the parent birds to feed the young was a custom that was not confined to this group or flock at the trolley pole. At about the time the young were leaving that nest, I discovered another nest in a large oak tree situated about a quarter of a mile distant from the pole, where I found from one to five old birds, and possibly more, very busy feeding the nestlings. The flock of woodpeckers here seemed to be more numerous than the one at the pole. The same degree of amity among the old birds was apparent at this place as was noted at the other.

I could not find that individuals of either of these two flocks of woodpeckers strayed away to any great distance from the nest localities, or that birds of one flock mingled with the birds of the other. This suggests further the possibility that these birds lead a community form of existence, but whether that is so or not can only be established by more extended observation of the habits of the woodpeckers than here noted.

During the following year (1923) three broods of California Woodpeckers were reared in the same nest in the trolley pole, with a repetition of all the peculiarities of actions of the old birds described for the first year. In the meantime I prepared my

observations for publication. A friend living in New York who was acquainted with my discovery submitted the paper to some eastern ornithologists. These gentlemen declared that the facts stated by me were so inconsistent with all known habits of bird life that they would have to be confirmed by indisputable evidence before they could be accepted as true. It was my intention this spring (1924), when the birds began rearing families again, to supply the evidence demanded, with aid of a camera and witnesses; but there came a chain of circumstances which for a time I thought would thwart my efforts.

The trolley pole containing the nest was one of the lot carrying the current of electricity by which a branch of the Oakland and Antioch line was operated from Diablo to Saranap. To my great chagrin this branch line of railroad was abolished and the work of removing the tracks, poles, and other appurtenances was begun early in April. Having noted that the woodpeckers at this time were frequenting the nest in the pole, I concluded they were beginning their nesting operations for the season, therefore I made a request of the man in charge of the work to leave the pole standing in its position. Upon my explanation of the object and purpose of the request, he very courteously promised that the pole should not be disturbed. Within three days from that time the pole was flat on the ground, accidentally knocked down by the machine employed in taking up the iron rails. With the fall of the trolley pole my expectations were shattered as well.

There was one satisfaction left to me, however: I could now examine the nest and obtain its measurements, something I had desired to do for the two years past. I found that the nesting place excavated by the woodpeckers was 16 inches deep and  $6\frac{1}{2}$  inches in diameter, which left only  $1\frac{1}{2}$  inches as thickness of wood for a wall. The entrance to the nest was a hole two inches in diameter at the top of the cavity. Some broken egg shells were on the ground by the hole, confirming my conclusion that the birds had begun their nesting program for the season.

But now an angle in the matter came into view that relieved me of any further anxiety to secure the evidence mentioned. In scanning the pages of Mrs. Harriet Myers' *Western Birds* I found that she had discovered the peculiar habits of the woodpeckers in question, as detailed in her book. And, moreover, in conversation with Mr. Joseph Dixon, of the Museum of Vertebrate Zoology, University of California, I learned that he, too, had observed the young woodpeckers being fed, or cared for, by several old birds. In concluding this discussion I am able to say that I again witnessed the same conduct on the part of these strange birds this past spring of 1924, at a nest in an oak tree.

While having this colony under observation, the probability was suggested of their having still another habit at variance with the conduct of the rest of bird kind. From all appearances incubation was carried on by relays. Upon arrival of one bird at the entrance of the nest, the one already there would come out and fly away. Thereupon the new arrival would enter and remain until relieved. At no time did a bird come out before the arrival of a relay. The time of duty on the nest varied from five to fifteen minutes. If my interpretation of this conduct of the birds is correct, it is no more than consistent with their other communal habits in building the nest, when the colony worked three months in relays making the excavation, and afterwards in participating in feeding the young woodpeckers.

*Diablo, California, October 4, 1924.*