

CALIFORNIA JAYS, THEIR STORAGE AND RECOVERY OF FOOD, AND OBSERVATIONS AT ONE NEST

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During the fall of 1943, two California Jays (*Aphelocoma californica*) were busy gathering English walnuts from a large tree on a lot adjacent to our home in Pasadena. They hid many of them in the deep ground cover of leaves on our lot; some were hidden entire and others were opened and partly eaten, the remainder being stored. With the smaller pieces, and also with sunflower seeds and pieces of bread, the hiding was often accomplished by placing them directly in loose ground. When an object was to be hidden, it was held in the beak and thrust downward and forward under the leaves or into the ground. If the going was hard, the object was sometimes hammered with the closed beak or taken to another place. When hammering, the whole effort seemed to be directed definitely toward getting the object out of sight and not toward opening the nut or sunflower seed as stated by Amadon as a probability with the Florida Jay (*Aphelocoma coerulescens*) (Amer. Mus. Nov., No. 1252, 1944:3). After thrusting the object to an apparently satisfactory position a clod of dirt, a rock, or a leaf, or more than one of these, was usually placed over it.

The fact that, while raking leaves over a small part of the yard, we found 16 walnuts without any effort to look for them, substantiates the conclusion that large numbers were hidden by the jays, a conclusion already reached by observations of their considerable carrying and burying activities.

Do jays recover the food that they hide in this way? That they do not recover all of it was surprisingly evident one spring after the jays had had free access to the box of chicken feed which contained a liberal admixture of sunflower seeds. Sunflower plants came up all over the block. On the other hand even casual observations convince one that they recover a part of the food hidden, the amount probably depending to some extent upon their need to draw upon that supply. Also, observations make it easy to conclude that they remember, or know in some way, where at least some of the food has been hidden.

During the winter, one, and probably both, of the two individuals mentioned above was seen to alight on an extensive pile of leaves, look around deliberately, take a few hops, throw aside a few leaves, look around again, take a few hops to another spot and again throw aside a few leaves. On one such occasion half a walnut was uncovered on the third trial, all three trials being made within a circle of three-foot diameter. On another occasion ten trials were made within a fifteen-foot circle before a nut was found. In another instance grass was being removed from a thick growth of low ground-cover plants. A jay came looking about among the plants four feet from the worker. It was thought to be looking for insects that had been disturbed. It picked up a eucalyptus seed pod and threw it aside. After repeating this three times within a small area, it picked up a part of a walnut in the shell, carried it about fifteen feet away and hid it in a pile of leaves.

These jays opened the English walnuts at various places in the yard, such as in the gutter of the garage roof or beside a garden hose lying on the ground, in which case the nut was placed on the ground and against the hose while the bird stood on the hose with one foot close on each side of the nut, holding the nut if need be. But the favorite cracking "anvil" was in the low, nearly horizontal branches of a shrub where three branches, two of them with forks, lay side by side in a manner that formed a secure

resting place for a walnut and a perch above. Here, standing with both feet on the perch, the jay could hold the nut with one foot (see fig. 33). The nut was turned to the right position with the beak, held with the foot against further turning, and hammered a few times with the beak. Then it was turned again, held and hammered. This was continued until the shell was opened. The nut was struck on the line of cleavage between the two

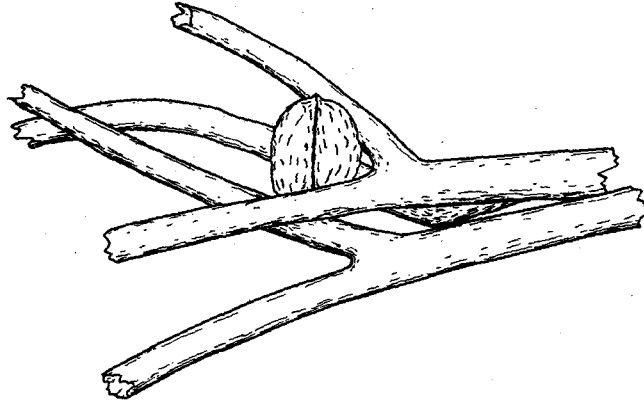


Fig. 33. California Jay's "anvil" on which English walnuts were cracked.

halves. About two quarts of shells were gathered from the ground beneath this anvil in February and many more accumulated there during the following month. So many nuts have been hammered on this anvil that the bark of the four branches against which the nuts rest shows considerable wear. The observations on this "anvil" of the California Jay recall the "chopping block" of the Lewis Woodpecker reported upon by J. Eugene Law (*Condor*, 31, 1929:233-238).

Herbert L. Stoddard in his book "The Bobwhite Quail" suggests that the Blue Jay (*Cyanocitta cristata*) in a measure balances its injury to the quail's eggs and young by opening nuts and scattering about parts of the kernels. This distribution of food was observed at the anvil of the California Jays. White-crowned Sparrows, Spotted Towhees, House Finches and Plain Titmice were seen to feed on pieces of nut found on the ground below the anvil. The titmice, above all others, seemed to be aware that the jay was opening a nut. One was seen to begin to scold from the bush just above the anvil almost as soon as the *whack, whack, whack* of the jay's beak on the nut began. The scolding and watching continued until the jay went away with a large piece of kernel, leaving the remainder on the anvil. The titmouse was down at the anvil in an instant but only had a peck or two at the nut before a Spotted Towhee flew in from a distance of about 20 feet, scared the titmouse away and knocked the nut to the ground with its first peck. Then it flew away. The titmouse came back to the ground and took a piece of the nut up to a low perch where it held the nutshell with its feet and ate a couple of pieces of kernel. Then the jay came back and the titmouse flew away, dropping the piece of nut, but was back again looking around as soon as the jay went away.

About March 12 these jays were seen pulling fibers out of an old door mat and carrying them away, evidently for nest lining. On March 18 the female (?) was seen to have an injured foot. Previous to this the male (?) was seen to give food to the female on several occasions. On April 10, about mid-morning, they were seen to be carrying twigs to a multiple crotch about 20 feet up in a rather open *Pittosporum* shrub of about 25

feet total height. There were only a few twigs in place when first observed. Both birds were breaking dead twigs off some guava bushes about 50 feet away and carrying them to the nest. Apparently both birds placed twigs in the nest, but poor visibility and the fact that the birds were not conspicuously marked prevented definite determination of this. The female's injured foot had improved so much that it no longer served as a ready means of distinguishing her from the male. They were still gathering twigs at 7:00 p.m. (P.W.T.). These observations led to the belief that this pair of jays was lining a nest on March 12, that about March 18 something happened that stopped activities at the nest and injured one foot of the female, and that on April 10 they began to build another nest.

By mid-morning of April 11 the nest was a well-formed open-mesh basket which, from the ground, appeared to be about eight inches across the top and five inches deep. At noon on that day they were seen gathering branchlets from dead asparagus fern which hung from the lower part of the nest tree. On April 12 they were seen gathering fibers from the old door mat. They had been seen taking dead twigs from guava, *Cassia*, *Pittosporum*, and Chinese elm, but, so far as seen, had taken nothing from the ground except fibers from the old door mat. Twigs dropped to the ground as they were broken off were not retrieved. They were not seen to try to break off living twigs.

During a little more than an hour of watching in mid-afternoon of the 13th they came to and left the nest four times, but whether they carried nest material could not be seen. However, while at the nest, they moved about as if working on it. They were not watched steadily on the 14th and 15th but were seen or heard at the nest several times each day. In going to and from the nest the birds stayed quite close together. One sometimes would remain at the nest a few moments after the other had left. Watching the nest was so unsatisfactory, because of the obstructing foliage, that it was given up.

The male jay became more and more domineering toward the other birds in the yard, including the Chinese Spotted Doves. He would chase them away from the food shelf and vicinity and would apparently try to keep them away. The food shelf was about 70 feet from the nest. House Finches (*Carpodacus mexicanus*) nesting in the next yard were heard several times giving their distress notes and on May 5 the jay was seen to kill a fledged House Finch on the ground under the jay-nest tree. After pecking it vigorously he flew with it in his beak for about 10 feet where he dropped it, apparently accidentally, since he was back immediately within two or three feet of the observer who stood over the House Finch while it gave its final wing-beats. The jay talked in its conversational way and continued to do so for a few minutes after the House Finch was taken away. The next day a trap was set and baited with sunflower seeds. The jays apparently paid no attention to it, which was strange, for jays usually cannot resist sunflower seeds. On May 7 a hen's egg with a small hole in the shell was put in the trap. Early in the afternoon the male jay was in the trap and was killed. No calling was heard from the female. The next morning she was busy, evidently feeding and brooding young in the nest. It is not known when they were hatched. She seemed to be getting along very well and had no time to bother other birds. Everything seemed peaceful among the birds in the yard.

During a watch of 4 hours and 11 minutes, from 10:05 a.m. to 2:16 p.m., she completed 23 *on-off* cycles of an average duration of 10.9 minutes (24 maximum and 3 minimum). The *on* periods averaged 7.2 minutes (18 maximum and 1 minimum) and the *off* periods averaged 3.8 minutes (6 maximum and 2 minimum). The weather was dull and dark with a high fog and a temperature of about 60° F.

On the next day, May 9, she completed 12 *on-off* cycles in 3 hours (10:30 a.m. to 1:30 p.m.) with an average duration of 15 minutes (21 maximum and 9 minimum). The *on* periods averaged 10.25 minutes (16 maximum and 1 minimum) and the *off* periods averaged 4.75 minutes (8 maximum and 2 minimum). The weather was cloudy with a light mist which had loaded all the shrubbery with water but which stopped about the time the observations were begun.

The foliage screened the nest site so that only the general position of the bird at the nest could be seen. When she went to the nest, she stood, apparently on the rim of the nest, with head and tail bobbing up and down, for as much as a minute sometimes, and then settled down into the nest. She was not observed sufficiently while off the nest to obtain a comprehensive idea of the food that she was eating or carrying to the young. She was several times seen to take bread; at one of these times nut-meats, sunflower seeds and a broken egg were nearby. At other times she was also seen to take nut-meats.

On May 10 the jay was seen to be going to and from the nest and to the food trays but was not watched much. Early in the afternoon another jay was calling nearby. In mid-afternoon it was seen about two feet from the nest. Because it showed more blue than the female, it was judged to be a male. There was no major disturbance in the nest tree during the afternoon. No calling had been heard since the male of the pair was killed except two short series at about 6 a.m. on May 10.

On May 11 there was no unusual calling near the nest tree during the morning. Observations were not begun until 12:15 p.m. No jay was seen near the nest until 2:10 when one came to the nest and bobbed head and tail as if feeding young or pecking into the nest. In a few minutes another flew into the tree from the north and the first one flew out to the south. The second hopped around a bit and left to the north. At 2:35 one flew into the tree from the northeast, perched about three feet from the nest for a minute or two and then left to the north. At 2:47 two jays flew into the tree and there was considerable fluttering and fighting in the vicinity of the nest for a few seconds. After a few minutes one flew to the north and the other perched a short distance above and to one side of the nest. A little later one flew south past the tree and upon investigation two jays were heard "talking" on the south side of the fence, perhaps 20 feet from the nest tree. At 4:30 two recently killed young jays were found on the ground about 100 feet from the nest. One of them had lost its head and one leg. The primary pinfeathers were about three-eighths of an inch long and the body feather tracts were dark and rough but the pinfeathers were not really coming through yet.

There was considerable calling on the 12th and 13th. Either the female that owned the nest had moved away or she had changed her pattern of actions so that she was no longer recognized. Occasionally a jay came to the nest tree but soon departed. The one that was thought to be the one that broke up the nest life occasionally took high perches within the area not over 100 feet from the nest, with more or less bobbing and with some calling as he went to and from those perches.

During the afternoon of the 13th, in rather close succession, a jay twice went to the nest. For a minute or two it was apparently standing on the rim of the nest. Its tail, the only part visible, was flipping up and down as if it were pecking into the nest. At each visit, as it left through the branches of the tree on the opposite side from the observers, it seemed to be carrying something that hindered its movements. The two observers came to this conclusion independently from different locations in one instance.

It is concluded that the female, deprived of her mate, cared for the young successfully from the afternoon of May 7 to the afternoon of May 10. By that time, another male discovered that the territory was not being protected by a male, moved in, and

found the nest. By noon of May 11 the female had stopped attending the young, although in mid-afternoon she fought with the intruding jay in the nest tree for a few seconds. By 4:30 that afternoon the young jays had been killed and two of them carried and dropped 100 feet away from the nest. During the afternoon of May 13 a jay twice took a dead young from the nest and carried it away. During the 32 days from April 10 to May 11, inclusive, the nest was built, the eggs laid, incubated and hatched, and the young had reached the stage of having primary pinfeathers three-eighths inch long.

Pasadena, California, June 24, 1945.