

## ANOTHER LEWIS WOODPECKER STORES ACORNS

WITH THREE ILLUSTRATIONS

By J. EUGENE LAW

Two previous detailed accounts have recorded the acorn-storing activities of the Lewis Woodpecker (*Asyndesmus lewisi*). Brewster (Auk, xv, 1898, p. 188) records an observation by Sidney French which, while presented as tentative at the time, may be accredited as accurate, it seems to me, in the light of the impressive study furnished by Michael (Condor, xxviii, 1926, pp. 68-69) and the verification which my own observations afford. Ritter (Condor, xxiii, 1921, p. 3, and xxiv, 1922, p. 109) has discussed at length the similar habit of the California Woodpecker.

One hesitates to record in minute detail observations which are, in a measure, duplications of previously published data. However, confirmatory evidence has its value, I believe, particularly as different observers are wont to stress different features and thus round out the factual minutiae. No matter how complete one may think he is making his own record, a later review of it usually reveals gaps that could have been filled. To another observer, the data that will bridge these gaps may have been of primary concern.

Then too, the set of conditions under which the bird works is often different and it is instructive to observe variations in mode when the same function is performed in different environments. New settings compel adaptive thought and may reveal peculiar mental limitations or brilliancies.

The questionnaire circulated by Dr. William E. Ritter concerning the acorn-storing habits of the California Woodpecker had brought to my consciousness the paucity of detail in accounts, other than those mentioned, relating to any similar habit of the Lewis Woodpecker, a species whose winter activities had, in my experience, been correlated closely with the presence of oak trees. It was a pleasurable surprise, therefore, to have a Lewis Woodpecker take up its winter abode in the vicinity of my home, the first observed time in six years that I have resided here.

A rather unusual abundance of this species in southern California in the autumn of 1927 was coincident with a very bounteous acorn crop in the foothill regions. In January, 1928, a Lewis Woodpecker could usually be found somewhere near a certain huge live oak which stands isolated from other trees along a little-used street. On the opposite side of the street is a line of tall poles. These poles contained long deep cracks, many gaping the width of one's finger, and, of course, pinching out toward the heart of the pole.

Sometimes the bird (for clarity of pronouns, I shall call it a male) was resting on the top of some one of the tall eucalyptus trees a hundred yards away. At other times he sortied off a quarter of a mile to other oaks or to sit on a high wire. But oftenest, especially in early forenoon, he worked with acorns, either on the isolated oak or on one of the three nearest poles, 50 and 150 feet away. He seemed to have no competitors of his own species at these stations, but was very suspicious of Flickers which occasionally landed on one of his poles and which he usually drove off.

One had only to sit quietly and obscurely under the big oak for a few minutes any morning, and the woodpecker was sure to come into the tree. Soon it became apparent that the bird returned again and again to the same spot in the tree: the upper side of a large near-horizontal limb where open spaces in the foliage gave elbow room for direct arrival and departure.

When I climbed the tree to inspect this spot, I found a roughly triangular pocket some two inches across on the upper side of the limb. See figure 67 (left). It appeared weathered and much used and was produced by the absence of a block of the thick outer bark so that the grain of the heart wood was exposed. Evidence seemed lacking that it had been made by the woodpecker. A blunt apex of the triangle was down limb and was apparently the point oftenest used in breaking up acorns. A half shuck was still present with a longitudinal quarter of the kernel. This, I believe, with the contour of the shucks which I recovered from the ground under the limb, and of the part-kernels stored in the cracks of the poles, gives a definite clew to the manner of cutting up the acorns; and such observations as I could make with an 8-power lens confirm the impression.

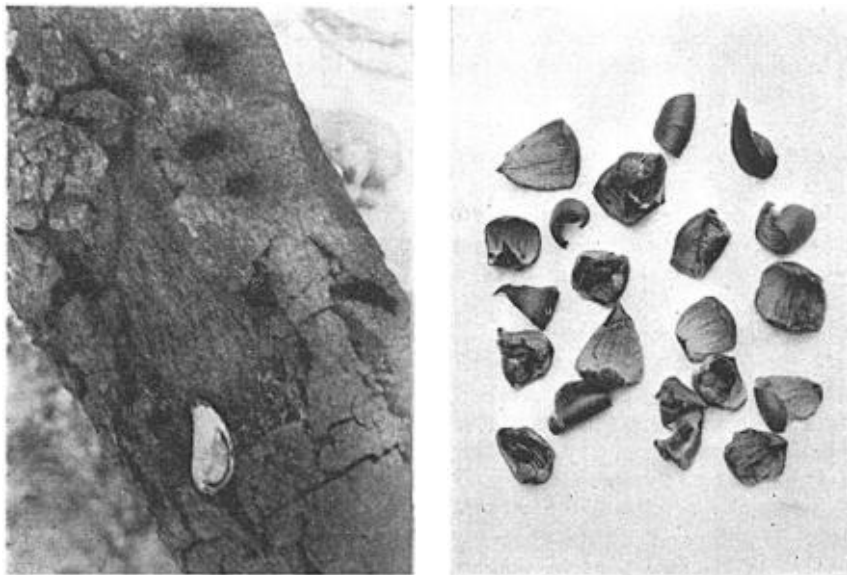


Fig. 67. THE "CHOPPING-BLOCK" (AT LEFT) USED BY A LEWIS WOODPECKER. THE PART-ACORN PICTURED APPROXIMATES ONE FOUND THERE WHEN THE BLOCK WAS FIRST INSPECTED. LEWIS WOODPECKER "SIGN" (AT RIGHT). THESE SHUCKS OF ACORNS WERE PICKED UP UNDER THE CHOPPING-BLOCK. THEY QUICKLY CURL IN THE DRY AIR.

With an acorn wedged into the crevice of the "chopping-block", the bird works around until the axis of his body is parallel with the axis of the nut. Then with blows directed at the middle he splits the acorn in half. There was room in the pocket to push one half of the nut aside while the other half was further broken up. Wedging the half into the same crevice, the woodpecker, from the same position as before, then proceeds to break up the half-kernel which often splits along its axis in nice form to be stored. By this method the shucks of the acorn are released in approximate halves and some of the kernels in quarters.

A heavy rain and wind some weeks earlier had laid the bulk of the acorn crop on the ground. When I began observing this woodpecker there were few acorns left under trees where ground squirrels were uncontrolled. Two hundred yards away, where ground squirrels had probably yielded to the presence of vicious

wolf-dogs, this woodpecker found his ground larder, and from thence he brought acorns, one at a time, to his chopping-block or to the poles. The acorn was always held between his mandibles. On no occasion did I see him carry an acorn with his beak thrust into it.

His mode of procedure, never quite duplicated, seemed to be influenced by two purposes. If his whim directed him to store an acorn entire, he flew to one of the poles, usually well up, sometimes on top, sometimes to an arm. After a trying pause, quite possibly a survey for marauders, he dropped perpendicularly to land again on the pole, then backed down in obvious search for a suitable crack in which to store the acorn. Sometimes he backed down from the start.

If his whim directed him to break the acorn, he usually went to his chopping-block on that large limb of the oak. Sometimes he ate the acorn there, often he ate only a little of it, if any, and carried shucked quarter-kernels to the poles where he wedged them into the smaller cracks, by tapping them with his beak. Kernels so lodged had nicks in them, no doubt made in hammering them in.

Directly under the chopping-block the ground was littered with the half-husks, which curled up as they dried. Some of these shucks are shown in figure 67 (right). A few such shucks could be found under each of the poles, indicating that the woodpecker sometimes broke up an acorn, as I occasionally saw him do, on the tops of the poles. At such times he usually stood at the upper edge of the side, probably with a toe or two overlapping the edge of the top, and the acorn seemed to be close to his body. Both quail and ground squirrels gleaned under the poles and oak for fallen bits.

The chopping-block in the tree had the appearance of having been used in previous years. At other places on this limb and on near-by limbs were roundish holes freshly cut through the living bark, each large enough, some more than large enough, to hold the attenuate acorns locally common, but all the holes were empty. Three such holes appear in the top-center of figure 67 (left).

In view of the known storing habits of the California Woodpecker, one who chooses to ponder on the urge and phylogeny of instinct may here find food for thought. This Lewis Woodpecker, while working at storing and eating acorns, seems to be playing with an idea which it does not crystallize into purpose. It is erratically making holes similar, but less accurate in size, to those regularly made with apparent purpose by the California Woodpecker, but the storing idea of this Lewis Woodpecker is limited to natural crevices. Or has the abundance of natural crevices in these utility poles relieved the bird of the necessity, probably present before the advent of man-placed poles, of digging its own storage holes, while the urge to do so, inherited as part of the acorn-gathering episode, finds expression in an occasional outburst of hole-digging?

But must we, to explain these actions, compose involved evolutions based on the mysterious persistence of primitive habits? If habits make their impress on morphological change, so does structure direct the course of habits. The beginnings, at least, of the acorn-storing habit seem to be rather positively forced on the individuals of each new generation of woodpeckers by the limited tools with which they are supplied: a beak for piercing and, whether by structure or because of the mental incapacity of the bird, feet unfitted for holding acorns.

When a woodpecker seizes an acorn in his beak, there are several mechanical difficulties which he must solve. To begin with, so long as he carries the acorn in his beak he cannot eat the kernel. If he lays it down anywhere but on the

ground it will roll away, unless it is in a groove or niche, and before he can drive his beak into its smooth round surface he must have it tightly held. As the ground does not hold an acorn securely, some other base is naturally sought. Lodgement of many acorns in cracks seems to be a logical sequence. Their abandonment there is just as logical.

And as to the small holes which they make, we should, perhaps, have in mind a necessity which a woodpecker cannot ignore, namely, that of keeping its beak sharp. For it is largely by constantly driving its beak into the fiber of wood that sharpness is maintained. For much of the year the Lewis Woodpecker lives largely on insects caught in the air. For briefer periods fruits and mast supplement this diet. None of these can seriously whet the beak unless it be the acorns. There-

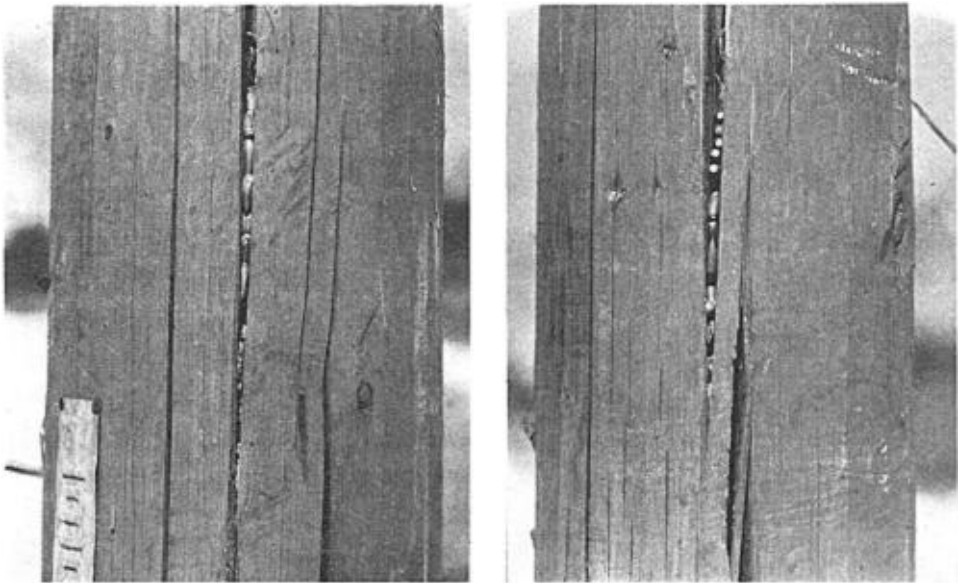


Fig. 68. ACORNS AND ACORN KERNELS STORED BY A LEWIS WOODPECKER IN A STREET UTILITY POLE. Photographed by Dr. Spencer R. Atkinson.

fore, hole-digging might seem to be a vital function in maintaining a sharp beak. Even the depth of the holes has a suspicious correlation with the length of the beak.

The thrill of life is in activity. Healthy creatures must have an outlet to the urge for action. They must keep active to keep fit. Specialization prescribes the activities of woodpeckers to a narrowed field. Pastime for birds, as for human beings, may reflect functional necessities. Indeed, what would Lewis Woodpeckers more naturally do with their spare time if they did not store acorns at the season when a score or two of acorns and an hour or two spent breaking them up furnished attractive food for the day, or if they did not dig holes to keep their beaks sharp at the season when only a slightly longer part of the day had to be used to catch the day's ration of insects? This thought may be less facetious than it appears to be.

Of course, I realize that these suggestions do not account for the laborious persistence with which acorn-storing woodpeckers continue their work for months at

a time. I have no doubt that there is an element of greed, urged, perhaps, by visible competition with jays and rodents. But when a bird, as did the one under observation, deliberately flies to the same distant point time after time, day after day, and week after week, and on each return brings an acorn to his definite storage place and there follows a definite routine, even though the routine is prescribed by physical factors, that bird must be gratifying an innate urge unexplained by visible influences.

Before this Lewis Woodpecker ceased bringing acorns, he had stored from one to many acorns or acorn meats in every crack of sufficient size on all three of the power poles, down to 18 inches from the ground. (See figures 68 and 69.) There was no selection as to exposure of the opening. As some of the cracks were wide, the acorns therein appeared to have been thrust in about as far as the thickness of the woodpecker's head would allow him to place them, and probably too

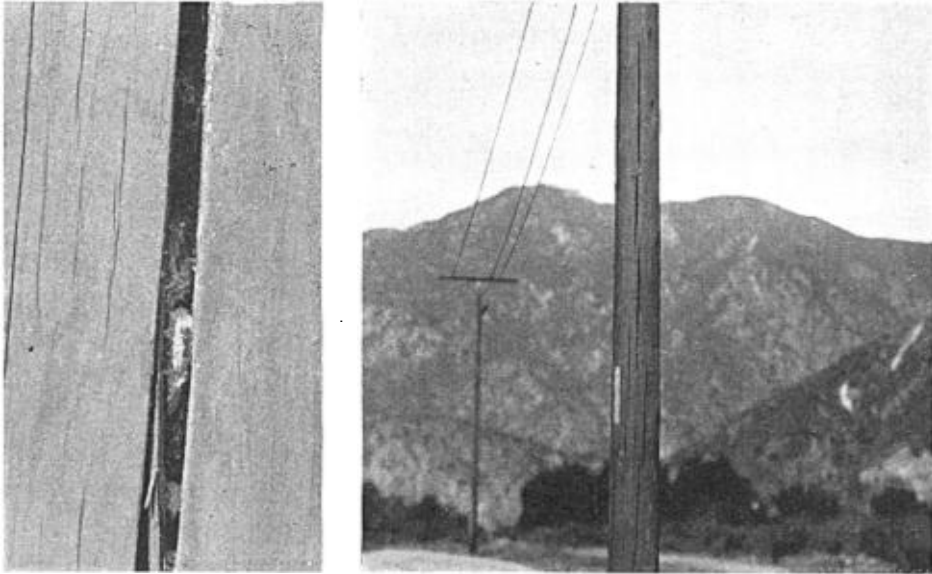


Fig. 69. A CLOSE-UP OF THE SHUCKED ACORN KERNELS STORED IN A CRACK BY A LEWIS WOODPECKER (LEFT). ONE OF THE STORAGE POLES (RIGHT). MOST OF THE ACORNS WERE BROUGHT FROM THE CLUMP OF OAKS IN THE DISTANCE BEYOND THE POLE.  
 Photographed by Dr. Spencer R. Atkinson.

far ever to be recovered. Some few of the cracks had narrow splinters freshly chipped off their edges, to no obvious purpose.

It was notable that, while the bird devoted himself to storing and eating acorns during the cool morning hours, or on cloudy days, just as soon as the air warmed up he ceased bringing acorns and devoted himself to catching insects on the wing, usually using the poles as his base of operation. Whether or not he again indulged in acorn activities later in the day, I did not determine.

These observations and the fact that, as far as I could observe when the poles were re-inspected in the early summer following, most of the acorns and acorn meats seemed to be still present in the cracks, and both intact and edible, led me to think that this storing activity was at most merely for morning and cold day

food in winter when flying insects are not about. I have no evidence, however, that this woodpecker ever ate any acorns once stored. As February, 1928, was balmy in this section, and flying insects probably became increasingly available, it is not surprising, perhaps, that he abandoned his acorn larder, though, of course, some fatality may have overtaken him.

A year later, in early winter, 1929, an inspection of the three storage poles showed much of the acorn supply still present in the cracks. As no less than three Flickers were flushed from one of the poles, from which they were trying to dislodge the acorns, the stock remainder consisted largely of acorns that had gone in too deep for dislodgment. Many had been broken up in the cracks. The Lewis Woodpecker did not, I think, return this winter.

In conclusion, I should like to brief certain inferences drawn from the observations herewith presented. I grant that they are largely hypothetical.

1. For the most part, at least, it was the meat of the acorns and not the worms in the acorns that this Lewis Woodpecker was after. The fact that he stored sections of shucked kernels seems significant in this connection.

2. This bird seemed entirely content to use ready-made cracks for his storing, while certain holes in the bark of the oak (which I believe he made) remained empty.

3. For a woodpecker whose food is obtained by means other than by drilling into wood, much of his hole-cutting may have the functional purpose of maintaining a sharp beak. Acorn-breaking may serve this function during the period when mast is eaten.

4. Physical limitations may be controlling factors in some of the apparent technique which accompanies acorn-eating and hole-cutting.

5. The nature of the food sought and the method of eating it may provide the dominant motive for leisure time, and stimulate activities of little economic value to the woodpecker.

I acknowledge with gratitude the kindly interest of my neighbor, Dr. Spencer R. Atkinson, who took a series of photographs of the stored acorns from which the prints for figures 68 and 69 were selected.

*Altadena, California, March 13, 1929.*