

SEALED-IN WINTER STORES OF RED-HEADED WOODPECKERS

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WINTERING Red-headed Woodpeckers (*Melanerpes erythrocephalus*) have been numerous along the Potomac River and the Chesapeake and Ohio Canal, attracted mainly by pin oaks (*Quercus palustris*) in bottomlands extending for several miles up and down stream from Seneca, Montgomery County, Maryland. The present communication describes the systematic way in which these woodpeckers harvest and store acorns, then seal their stores from view, apparently as protection against theft by other animals. Closely guarded winter territories, which will be the subject of a second report, afford additional protection. Two observations suggest that the birds are closely dependent on the oaks. First, pin oak acorns make up a large part of their winter stores and, second, Red-headed Woodpeckers were absent from the area in the winter of 1953-1954 when the acorn crop failed.

HARVESTING OF ACORNS

The woodpeckers were studied in two areas of woodland; one along the canal and the other a grove largely surrounded by fields. Upon their arrival in the first part of September Red-headed Woodpeckers started collecting acorns, and, in 1956, continued to do so through the first week in November, by which time the oaks had been denuded. When harvesting acorns, the woodpeckers were most energetic, flying back and forth from their individual territories to the nearer acorn-bearing oaks. Thus, three or four of them might come to a single tree. A Red-headed Woodpecker would cling in awkward fashion, often upside down, in order to work an acorn loose from its cup. When returning with an acorn in its bill, a woodpecker usually would fly downward, then up to some broken stub which served as an anvil. Here it would hammer an acorn into pieces and devour some of the crumbs before looking for a storage place. Storage in this first phase consisted in pushing whole acorns or sections of acorns into cracks and crevices wherever available, whether in furrowed or loose bark, splintered stumps, dead limbs, or where vines grew around tree trunks. Since competition for acorns was keen, the hastiness of this initial storage may have insured a maximum harvest while the supply lasted. The principal avian competitors in woodlands under observation were Tufted Titmice (*Parus bicolor*) and Blue Jays (*Cyanocitta cristata*). Both these species were observed storing acorns on the ground, at a distance from the pin oaks. Crows (*Corvus brachyrhynchos*) and Red-bellied Woodpeckers (*Centurus carolinus*) were additional competitors. The last two species were chased away by the Red-headed Woodpeckers on all possible occasions. After depletion of the crop in the oaks, Red-headed Wood-

peckers harvested from the ground below, many acorns having fallen while the picking was going on above. Further collection of acorns during the winter was only sporadic. Only two Red-headed Woodpeckers, both immature, were observed in mid-winter flying to distant oaks of another species to collect larger acorns.

RE-STORAGE

The Red-headed Woodpeckers, of which 12 were under special observation, were active in the late fall, taking acorns or fragments of them from one crevice to another on the same or more often on another tree for re-storage in situations ranging from high limbs to holes two or three feet from the ground. Whole acorns might be split, prior to re-storage, on some broken stub serving as an anvil. A general impression was that the woodpeckers were distributing their stores as widely as possible within their territories, and one might speculate that such a dispersal would prevent any rodent or bird competitor, if successful, from stealing too much at one time. Acorns were hammered so tightly into crevices that it was difficult to dislodge them. For example, a Blue Jay under observation worked vigorously before extracting a stored acorn. The jay had time for the operation only because two other jays were distracting the woodpecker involved. Red-headed Woodpeckers had their greatest difficulties with Tufted Titmice, since five or six of these birds might invade a single woodpecker territory at a time. It became apparent, after some months of observation, that the woodpeckers had, in addition to wide dispersal, firm wedging in crevices and constant guarding of their stores, a still further method of protecting them.

WALLING-IN OF WINTER STORES

On November 18, 1956, I observed a type of behavior which I had not witnessed previously. It was exhibited by four different Red-headed Woodpeckers within a few hours. One, for example, flew back and forth five times from a rotten stub. On each occasion it would hammer vigorously, and finally loosen a sliver of wood 1 to 1½ inches in length. The woodpecker would arrange the sliver to point forward from its bill, then fly directly to another tree. The slivers were hammered into crevices, and all loose and shredded ends were gathered up and pounded firmly into place. Although I noticed individual birds carrying splinters on succeeding week ends until January 12, 1957, it was only on December 16, 1956, that I again noticed numbers of woodpeckers simultaneously engaged at this occupation. On the latter date I walked through four adjacent winter territories and observed the occupants of each making regular trips to rotten limbs or stubs. Splinters collected by the woodpeckers were all hammered in place elsewhere. It was puzzling to consider why, as on November 18, numbers of Red-headed Woodpeckers should be doing the same thing on the same morning, a type of

behavior that they had performed only rarely in intervening periods. A chance observation gave an answer to this problem. One Red-headed Woodpecker on December 16 was trying to handle an especially long sliver, the ends of which hung down as limply as wet paper. It then occurred to me that the wood had been soaked by a heavy rain on the preceding night. I worked a sliver loose from a damp rotten log and found that it could be readily molded into a crevice. The Red-headed Woodpeckers apparently were doing just that. Upon reviewing my notes I found that the morning of November 18 had also been preceded by a heavy rain, a circumstance which appears to incite these woodpeckers to collect splinters of damp wood.

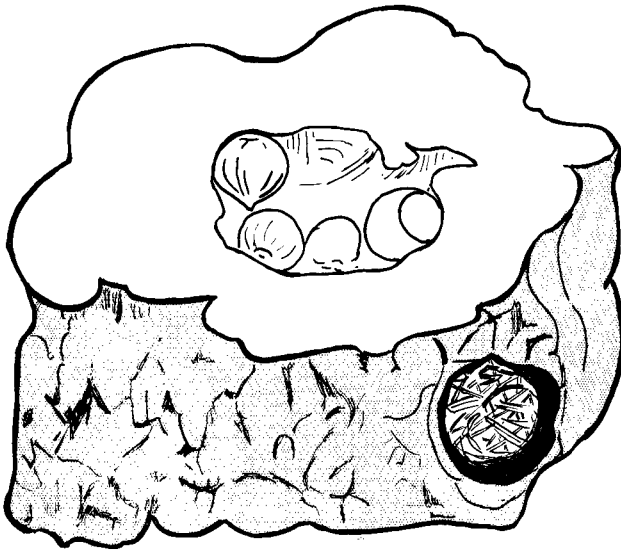


FIG. 1. Diagrammatic cross section of a dead stub. The natural cavity, used for storing acorns, was reached by a round hole drilled at one side. This entrance was sealed later with splintered wood.

Seeking more direct observations, my son and I brought a ladder and a hand saw to the study area on December 22. We were now able to inspect storage trees in some detail. It was readily apparent that acorns stored in various cavities from near the ground to high up in trees had been completely sealed in by means of shredded bits of wood which had become firm on drying. We sawed off branches, stubs, and boles on trunks for closer study. These specimens are illustrated in accompanying figures. Figure 1 shows a diagrammatic cross section of a dead stub which projected from a black cherry tree (*Prunus serotina*). The woodpecker apparently had drilled a round hole $\frac{1}{2}$ inch in diameter into a natural cavity within the heart wood.

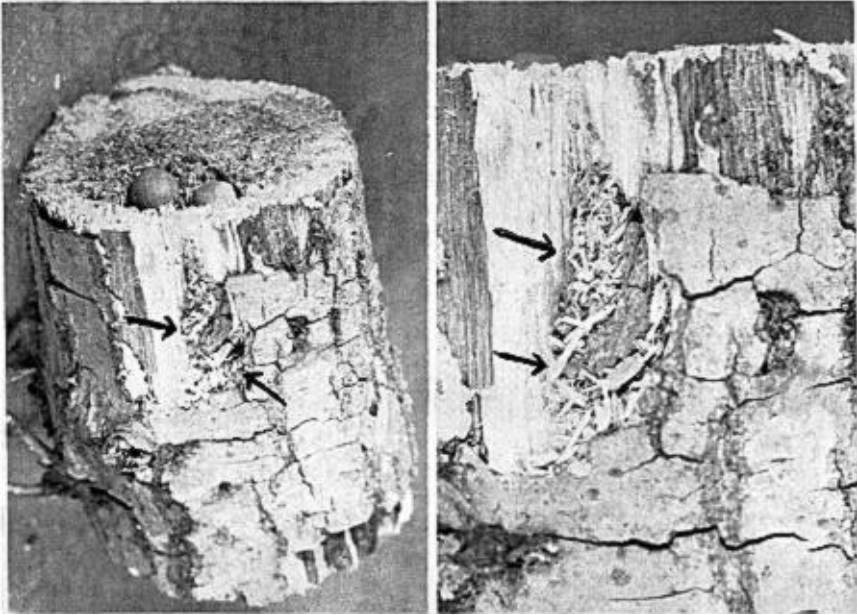


FIG. 2 (left). Pin oak acorns stored within a dead stump six feet above ground. The elliptical entranceway is sealed with splintered wood and a piece of bark.

FIG. 3 (right). Detailed view of the sealed entrance shown in Fig. 2.

The cavity, when sawed open, was found to be filled with whole acorns, hidden from view by a sealed entrance.

Two more drawings (Fig. 4) show the front and reverse sides of a bole sawed from a hackberry tree (*Celtis occidentalis*). The small entrance hole, $\frac{1}{4}$ inch in diameter, was easily seen from the ground because it was plugged by a wad of pale splinters that contrasted with the surrounding bark. A cluster of insect remains filled the inner cavity. The insect fragments were identified by members of the Entomology Research Branch, U.S. Department of Agriculture. The cache included a wasp (*Polistes fuscatus* F., *sens. lat.*), a cricket (*Melanopus* sp.), pupal remains of 2 species of moth (Arctiidae) and a carabid beetle (*Harpalus* sp.). No other caches of insects were encountered. Figure 5 is a longitudinal section of a swamp cottonwood (*Populus heterophylla*), showing acorns rammed in linear fashion down the hollow heart wood. Obviously such acorns could not be removed by the same opening through which they were inserted. It became evident as the winter progressed that the Red-headed Woodpeckers had to chisel away wood to remove stores pushed into natural cavities through small apertures. Most of the stores discovered were sealed in. Uncovered caches usually consisted of one or two acorns in shallow depressions.

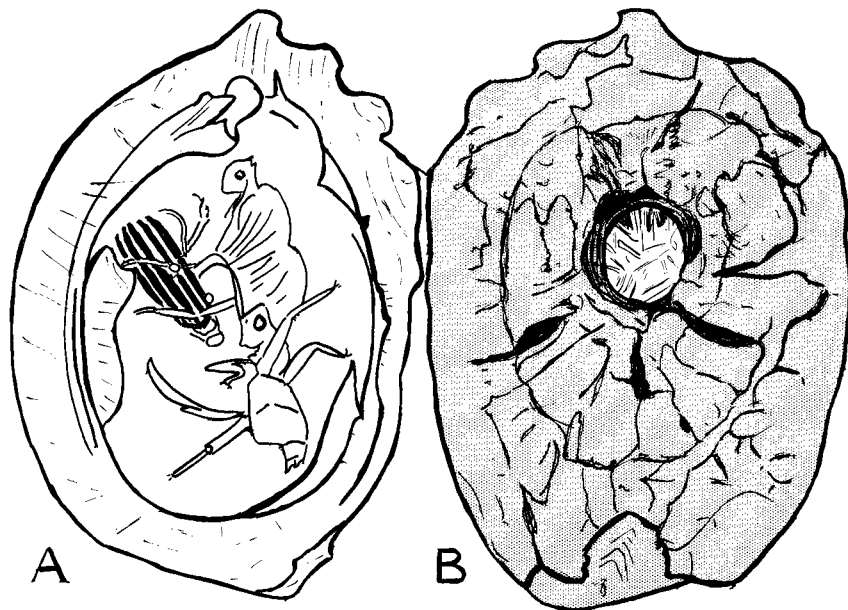


FIG. 4. Reverse (A) and front (B) views of a bore sawed from a small tree. A Red-headed Woodpecker filled the natural cavity with insects, then sealed the round entrance shown in (B) with splintered wood.

OTHER WINTER FOOD

The Red-headed Woodpeckers caught insects on warm days during the winter, even in January, often by clinging to the uppermost twigs on a tree, then flying out with rapidly beating wings to make their catch with a final upward swoop. Some individuals appeared to catch insects on the ground in an open field. Red-headed Woodpeckers with territories several hundred yards from a corn field made trips there to pick up kernels from the ground. The woodpeckers were much attracted to sap. When sap flowed from holes drilled by Yellow-bellied Sapsuckers (*Sphyrapicus varius*), which appeared to be only at times of freezing nights and thawing days during the fall, winter, and spring (Kilham, 1956a), Red-headed Woodpeckers fed from the holes in systematic fashion. One could see sap glistening on their bills. Most of the individuals involved were those with territories either containing or closely adjacent to a sapsucker tree. Unlike other species of woodpeckers in the vicinity, Red-headed Woodpeckers were not seen eating berries of any kind.

DISCUSSION

Red-headed Woodpeckers observed in the vicinity of Seneca, Maryland, are remarkably efficient at storing and protecting a winter supply of acorns.

Guarding of individual territories in which the acorns were stored, although effective against other woodpeckers, appeared to be less effective against birds which came in groups, such as Tufted Titmice and Blue Jays. The Red-headed Woodpeckers had at least three methods of preventing other birds from robbing their stores. First, acorns were stored widely, with no great concentration in any one place; second, they were wedged so tightly in crevices that it was difficult to work them loose. The third and most interesting method was the hammering and molding of splinters of damp, semi-rotten wood, along with bits of bark, to seal off holes leading to storage cavities. When dry, such entranceways were somewhat camouflaged and were not readily opened.

The only other report of sealing in of stores by the Red-headed Woodpecker known to me is that of Hay (1887). He described this woodpecker in Indiana as a hoarder, hiding great numbers of beech nuts in every conceivable situa-

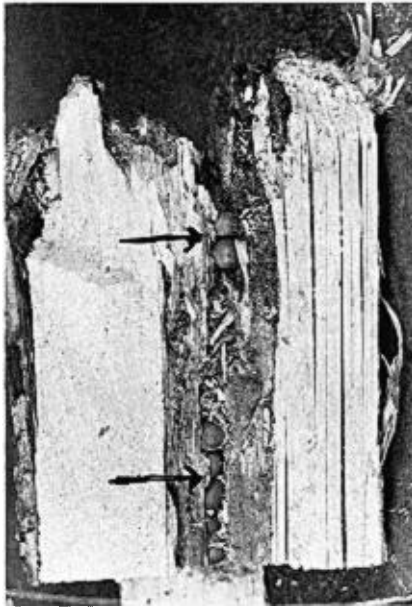


FIG. 5. Pin oak acorns rammed into the hollow core of a dead swamp cottonwood.

tion. Hay stated further that (p. 195) “. . . afterwards pieces of bark and wood have been brought and driven down over the nuts as if to hide them from poachers. These pieces of bark are sometimes an inch or more square and half an inch thick and driven in with such force that it is difficult to get

them out. In one case the nuts were covered over with a layer of empty involucre."

These methods of sealing in caches have not been noted among other acorn-storing woodpeckers, of which the Red-bellied was the only one observed in the Maryland area. According to Ritter (1938) the California Woodpecker (*Melanerpes formicivorus bairdi*) stores acorns in large numbers, each within a single hole made for the purpose in pine bark. His photographs show hundreds of acorns studding a pine tree, but none is covered from view.

Two other groups of birds have a habit of sealing off entrance holes. The British Nuthatch (*Sitta europaea affinis*) may reduce the size of nest holes and fill crevices with hard mud (Witherby, Jourdain, Ticehurst, and Tucker, 1940:242). Female Hornbills of many species wall themselves into nest holes, leaving a slit through which their mates can feed them. In one African species (*Bycanistes subcylindricus*) studied by Kilham (1956*b*), the earth used for cementing walls was obtained principally from termite mounds. The material used by Red-headed Woodpeckers to seal holes appears to be unique among birds.

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