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A FEMALE CARDINAL AND HER REFLECTION

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In an interesting note published some years ago in *The Migrant*, Willie Ruth Reed (1938: 17-18) described the behavior of an "uncommonly pugnacious" female cardinal, *Richmondena cardinalis* (Linnaeus), which persistently "attacked her reflection" in a window in Greeneville, Tennessee, in mid-January. A noteworthy accessory fact was that the male bird which accompanied this belligerent female "behaved as a bystander and never became sufficiently interested to join the attack on the persistent intruder."

On two occasions in mid-April, 1946, while walking from Forest Home (a suburb of Ithaca, Tompkins County, New York) to my office on the Cornell University campus, I watched a female cardinal attacking her reflection in a basement window at the end of a small school building. The behavior of this bird, and of a male cardinal which I saw with the female on one of the two occasions, was strikingly similar to that of the Tennessee birds.

There was no blind at the schoolroom window, but the building inside was dark and the glass mirrored the bird fairly clearly. This I confirmed by looking at the window with my head near the place from which the bird flew when making her attack—a branch between 5 and 6 feet from the ground and about 4½ feet from the window in the lower part of a spreading tree. A good deal of shrubbery (4 to 15 feet high) grew about the building and scattered small conifers stood near by. About 50 yards to the north, on slightly higher ground, was the edge of a dense planting of pines. About these pines I had repeatedly seen a male and female cardinal during the latter two weeks of February and the first week of April.

I first saw the female darting at the window on April 9. That morning, at about 6 o'clock, I noticed the chirping of two cardinals as I approached the school building, saw a male and female flitting about the shrubbery as I drew closer, and watched them move toward each other and out of the branches of the shrubbery. The sounds I heard

clearly indicated excitement, but rather than being incisive chirps of alarm these were throaty chuckles and tuneless warblings such as I had heard many times, some years before, from captive cardinals nibbling at each other's plumage or chasing each other about the house (see Sutton, 1941: 270). Observing the birds closely, I perceived that the female was responsible for most of the outcry. Just as I fully sensed this, she darted at the window, struck it lightly with her bill and feet, hovered near it an instant, and returned to her perch. Paying no attention to the male, which was about five feet away and at about the same distance from the ground as she, she moved up and down the branch, lifting her crest, swiftly wiping her bill, flashing her tail, and looking frequently at the window. Realizing by this time that she was watching the image of herself in the glass, I wondered whether she was attacking and trying to drive away this "third bird" or merely playing with it. The more I watched and listened the more surprised I was at the inattentiveness of the male, who moved farther away as the female darted again and again at the image, striking the glass with her beak (or beak, feet, and wings) during each attack, then returning to the perch to chirp, chuckle, and sing low snatches of song. After she had made nine or ten attacks she joined the male, and the two birds moved away from the building in a series of short flights. Presently the male flew to the ground about 40 yards off and began hunting food. The female now hopped to the top of the shrubbery, lifted her crest, and sang a full loud song of six or seven *whit-year* phrases.

The male did not respond to this song in any way so far as I could ascertain. He went right on looking for food on the ground. The female now returned to the window alone, took exactly the same position as before in the shrubbery, and began darting at the glass. Her call-notes clearly indicated that the image was stirring her emotionally. I say this advisedly, for I have observed the behavior of captive cardinals by the hour. The male did not join her at the window, though he could hardly have failed to hear her cries. She darted at the window seven times, flew away from the building, looked for food on the ground for a minute or so, then returned to the window for the third time, again going through the routine of chuckling, hopping about with body plumage and crest lifted, and darting at the window. It was quite apparent that she had remembered where that "third bird" was. That she (or she and the male) had been at the window many times was obvious from the numerous droppings on the ground under the perch and between the perch and the window.

On April 15, at 6:10 A.M., I again saw a female cardinal darting at the window. She struck the glass quite hard with her bill and more than once fluttered at it as if trying to get at the "bird" which she was seeing. She darted at the image six times, then flew round the building. I did not see the male at all that morning, though I saw him later in the

day. Studying my own reflection in the glass with eyes in about the position of the bird, I noted that neither the colors nor features were very distinct, but that the silhouette was clear.

The more I think about what I have reported above, the more I wonder at the male's failure to see, or at any rate to pay attention to, his own reflection in the window. The female's agitation roused his interest a little, I thought, but he never once darted toward his own reflection while I was watching him, and he displayed no inclination to linger about the window as the female did.

Mrs. Margaret Nice, who has been good enough to assist me in interpreting what I have just described, has reported (1945: 9) certain winter observations of cardinals at Columbus, Ohio, specifically one concerning a female bird which "darted at" another female trapped in a cage, others concerning females at a feeding-shelf, which "drove each other far more viciously than the males drove them or other males." Whether this can be called territory defense, strictly speaking, is questionable. It certainly is not winter territory defense comparable to that reported for the California Loggerhead Shrike, *Lanius ludovicianus gambeli* Ridgway, by Miller (1931: 149, 152), for the female shrike guards a considerable individual feeding ground against all shrike intruders. If it is winter territory defense at all, it is certainly more aggressive than that reported for the female mockingbird, *Mimus polyglottos* (Linnaeus), by the Micheners (1935: 99).

The New York cardinals discussed above almost certainly were paired. So far as I was able to ascertain there were no other cardinals in the immediate vicinity. They probably were on their nesting ground, though I noted little in the behavior of the male, aside from his occasional singing, which indicated that he was defending a territory *of any sort.* Since spring was well on its way, the female's fighting of her reflection could hardly have been defense of *winter* territory in the restricted sense of the phrase employed by Nice (1941: 464); nor was it defense of nest territory like that ascribed to the Northern Phalarope, *Lobipes lobatus* (Linnaeus), by Tinbergen (1935: 18). More than likely it was aggression against "trespassing females" comparable to that which Nice (1943: 166) observed among Song Sparrows, *Melospiza melodia* (Wilson), or "sexual fighting" like that reported for the female Snow Bunting, *Plectrophenax nivalis* (Linnaeus), by Tinbergen (1939: 65), in which "the situation that releases the sexual fighting is: another female Snow Bunting coming too near the male."

While consulting various articles pertaining to reflection-fighting by birds I found (a) that female Pied Wagtails, *Motacilla alba* (Linnaeus), and European Blackbirds, *Turdus merula* Linnaeus, observed by Brown (1937: 137-138) paid no attention to their reflections in mirrors, whereas the males of the respective pairs fought their own reflections vigorously; (b) that a female Magpie-Lark, *Grallina cyano-*

leuca (Latham), observed by Noel Roberts at Epping, near Sydney, New South Wales, paid no attention to her reflection in a mirror, whereas her mate "attacked his reflection so persistently that the mirrors were removed" (Hindwood, 1941: 23); and (c) that the female Blue Wren, *Malurus cyaneus* (Latham), of Australia has on several occasions been known to fight her reflection (Hindwood, 1941: 20-21).

Whatever the underlying cause of the female cardinal's pugnacity, we should bear in mind that the cardinal is one of the few American birds in which the female sings quite as well as, and possibly as frequently as, the male (see Shaver and Roberts, 1933: 116). The sexual bond may therefore be as stoutly maintained or guarded by the female as by the male.

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