

- Warren, D. C. and H. M. Scott. 1935. Physiological factors influencing the rate of egg formation in the domestic hen. *J. Agr. Res.*, 51(6):565-572.
- 1936. Influence of light on ovulation in the fowl. *J. Exp. Zool.*, 74(1):137-156.
- Wetmore, A. 1932. Bird migration. *Sci. Monthly*, 34(5):459-462.
- Whetham, E. O. 1933. Factors modifying egg production with special reference to seasonal changes. *J. Agr. Res.*, 23(3):383-419.
- Witschi, E. and W. N. Keck. 1935. Differential effect of some gonado-tropic substances on development of cyclical sex characters in the English Sparrow. *Proc. Soc. Exp. Biol. Med.*, 32:598-603.
- Witschi, E. 1935. Seasonal sex characters in birds and their hormonal control. *Wilson Bull.*, 47:177-188.
- 1936. The bill of the sparrow as an indicator for the male sex hormone. I. Sensitivity. *Proc. Soc. Exp. Biol. Med.*, 33:484-486.
- Wolfson, F. 1936a. Synchronicity, periodicity, and the length of the asexual cycle of *Plasmodium rouxi* in the canary. *Am. J. Hygiene*, 23(2):340-348.
- 1936b. Periodic phenomena of the asexual cycle of *Plasmodium circumflexum* in canaries. *Ibid.*, 24(1):207-216.
- 1937. A strain of *Plasmodium praecox* (Relictum) with highly synchronous matinal sporulation. *Ibid.*, 25(1):177-186.
- Wynne-Edwards, V. C. 1929. The behavior of Starlings in winter. *Brit. Birds*, 23:138-180.
- 1930. On the waking time of the night-jar (*Caprimulgus e. europeus*). *Jour. Exp. Biol.*, 7(3):241-247.
- Zavadowsky, B. 1929. Hormones and plumage in birds. *Am. J. Physiol.*, 90(2):565-7.

TRINITY COLLEGE, HARTFORD, CONN., and
MARINE BIOLOGICAL LABORATORY, WOODS HOLE, MASS.

THE MOCKINGBIRD IN WESTERN SOUTH DAKOTA

BY CLAUDE A. BARR

The arrival of Mockingbirds at our grove in May, 1936, brought to us the pleasant expectancy of a number of days of unusual entertainment, and the recollection of visitations of other years, but no more than a promise of the eventful season of observation and enjoyment that was to be ours.

In our twenty-six summers on the plains, Mockingbirds (it is the western form, *Mimus polyglottos leucopterus*, with the larger white wing patches, which comes to this southwest corner of South Dakota) had been rare. The first was noted perhaps twenty years ago, unmistakably, for we had known the Mockingbirds of Arkansas and Illinois. He stopped for a morning's rest and inspection of the relatively new homesteads and young trees. The tally of those that had been seen prior to 1936 was no more than seven, including two pairs in different seasons. One pair had remained for thirteen days.

On the morning of May 2 bold and ringing notes were heard, and the new visitor was eagerly sought out, for to be able to see and to

watch the performance of a brilliant and distinguished singer is no small part of one's satisfaction in hearing his recital. This bird proved to be delightfully friendly and fearless, coming now and again to the trees nearest the house, occasionally using as a stage an adjacent shed, or the house chimney. His excellent repertoire included calls of the Bluebird, Bluejay, Meadowlark, Catbird, Robin and, somewhat rarely, those of the Goldfinch, Grackle, and Shrike, and his imitation of the common, noisy small talk of the English Sparrow was nearly perfect. As with others of his kind the greater part of his song was made up of elements we could not distinguish, though several phrases, we felt, from their frequency, must have been gleaned from his sometime neighbors with which we were unfamiliar. Then, too, it seems probable that some songs are disguised by the Mocker's own vivid and intense nature or by his vocal restrictions.

One of our earlier friends, I recall, had spent much time practicing a certain *prair-e-chick, prair-e-chick*, hesitating and prolonging the first syllable, slurring the second, accenting and staccatoing the last. His production never seemed to quite satisfy him. Instead of his usual rapid changes he would often sit quiet a moment or two before going on, or returning for another try at *prair-e-chick, prair-e-chick*. Another bird by practice or superior endowment had become a past master at Bluejay imitation. He would give the jay's explorational or arrival call of *jay, jay, jay!* and follow it immediately with a repetition that gave the effect of a sociable fellow amid numerous friends in the upper branches of red oaks at a little distance; and as often would continue with a *jay, jay, jay!* that you would say came from deep woods two hundred yards away, if you had not observed the actual enunciation; all this practically on the open prairie, for our trees, even today, are relatively small—there are no red oaks on the dry, high plains—and without changing his post.

It was not until the tenth day that we got sight of a second bird, which we were sure had been about from the beginning. Now we checked the days carefully, hopeful that the previous fateful record of thirteen would be exceeded. It was. The delightful concerts were continued, at dawning, the morning long, at high noon, often throughout the afternoon, well into the night; not so much through the night, it seemed, as with the birds of Illinois; near the house he sang, here and there through the grove, much of the time in a neighboring grove, that of my parents, similar in extent, four or five acres, and separated by a bit of meadow and a road.

As the days advanced well into late May we began to wish fervidly that the season might not be too unkind, that the supplies of water, seeds, insects, whatever else might come in the line of necessities would prove ample for the summer, so that our birds would not find it obligatory to retreat the eighteen miles to the south across the line into Nebraska, the recorded northern nesting limit of the species.

About this time shrikes began to make themselves much too obvious. The singing, all the habits of the Mockingbirds were continually interrupted. No actual contact battles were witnessed, but the days came to be filled with skirmishings. Neither shrike nor Mockingbird seemed to gain an advantage. The thrilling dark gray and white was pursuer as often as the bullet-like pearl-gray, white, and black. There was, however, this difference: the shrikes were more or less at ease in their usual rôle, while the Mockingbirds impressed one as brave but very much annoyed. By the third or fourth day the leader of the Mockingbirds, too hard pressed, was tiring, and nerve strain had become evident. We were compelled to take a part. Mrs. Barr, as "gunman", went out with the .22 and easily "got" two of the shrikes. The others became wary but within a few days three more were downed, and the one or two that hung about a few days longer gave no trouble. The Mockers accepted the relief promptly, and all was well, as indicated by the floods of song that were poured out again.

It was a week or more after this that Mrs. Barr hurried out with the .22 in answer to a shrike call. It seemed to come from the end tree of a row of silver poplars. The Mockingbird was there upon a high twig, unafraid, giving out an occasional note or two. The shrike could not be sighted. At last, as she was about to turn back to the house, the shrike call came again, at close range, and the Mocker himself was discovered to be the guilty party. This incident would have given fitting denouement to the shrike episode but that, still later, shrikes did appear again. They listened to the Great Mimic's shrike song, slunk away to a low corner of the orchard, sat, bewildered, in a cherry tree for an hour or more. And the final end was that they silently folded their tent and beat it.

In early June a nest was found about six feet from the ground in the crotch of a twiggy lower limb and the trunk of a dead Norway poplar. The tree had been retained for winter windbreak effect and headed back to twelve feet to prevent possible breaking and damage to interplanted pines and ashes. The nest was open to the sun until mid-afternoon but had a secluded location in being beyond the orchard, in the least frequented part of the grove and near to a dense,

tall hedge of Russian olive. It was a large nest, built mainly of rather coarse sticks, and impossible, perhaps, for a novice to distinguish from the nest of a shrike. It was, possibly, a trifle deeper and certainly not so well lined, rather coarse rootlets composing the finish. There were but three eggs, greenish gray, spotted dark brown.

The discovery of the nest was of extreme import, for the authority for the region ("Birds of South Dakota", by William H. Over and Craig S. Thoms) states: "South Dakota is north of the range of the Western Mockers, although they are occasionally seen in the Black Hills or along streams on the adjacent plains", and added this remark, "The Mocking Birds have no equal as singers, and it is hoped that by kind treatment they may become regular summer residents of our state." A second point of interest is that this chosen summer home was not near a stream, but near the height of land between the Cheyenne and the White Rivers, and with no group of native trees that could be termed a grove closer than seven or eight miles, and as much as thirty miles in other directions. Nor is there any other planted grove of equal size, and few of any description within this extensive, naturally treeless area. Attracting these rare visitors was a triumph of wholly man-made environment.

Also of note were the extremes of drought and temperature that characterized the season. From June 1 to September 1 only a few light showers fell, no one of them wetting the ground as much as an inch and a half. Along in July the temperature many times exceeded 112 degrees, a high of 115 being recorded by the nearest official thermometer. Through late July and the month of August all known supplies of water available to the birds within many miles were exhausted. Absence of all water for extended periods is not a new obstacle to Meadowlarks and Horned Larks and a few other less frequent species, which on such occasions do not move out. As at such times no dew falls, it is believed the birds obtain their moisture needs from insects devoured, or from fruit, in the case of those which come to the grove. The Mockingbirds stayed through to September.

On Sunday, June 7, Prof. A. C. McIntosh, of the South Dakota State School of Mines, observed the rather shy mother bird of the nest, and identified the eggs. Prof. McIntosh had known Mockingbirds in Indiana. We were agreed that the western bird differs from the southern chiefly in the darker, less showy tone of the gray color. The book of South Dakota birds notes that the western form is distinguished by a brownish tinge below and larger white wing patches. The individuals we observed here were not soiled white below, as the southern

form is described, neither distinctly brownish-tinged, but gray, a somewhat lighter tone than that of the sides and back, and decidedly lighter at the throat. A faint brownish tinge might fairly be said to pervade all the gray parts of the plumage.

The Great Mimic had been spending more and more time at the neighboring grove, vocalizing much in a certain silver poplar near the house, and convenient to a closely set row of cedars. Mrs. Barr was intrigued as to his particular interest there. From an upstairs window she saw the birds entering a dense, low cedar, and there a nest was found, only five feet from the ground, quite filled with nearly fledged young.

A mystery, somewhere. This was a day or two after Prof. McIntosh's visit. On Friday of the same week I looked again into the first nest, and counted three young, two or three days from the shell. Less than a week later the nest was empty. The nest itself was apparently undisturbed, so the suggestion that a bullsnake had raided it is as good as any. But the male parent of the first nest? Polygamy, as an answer, was hardly satisfying. Doubtless there was a male bird, shy to an extreme, and doubtless it was he that authored the songs we heard a few times at a distance, when the Great Mimic was somewhere near, and loud. Perhaps a young fellow. We do not know that we ever saw him.

The summer grew hotter and the Mimic's family made greater demands; singing became intermittent, finally almost ceased, so that we came to ask one another whether the Mockingbirds had been seen during the day. But when his brood left the nest there was glorious singing. A day, two days, and then . . . There must have been a curtain lecture, perhaps a series. The old boy got right back to business. Friend wife had not come to Dakota for a pleasant vacation, there was work to be done, a mark to set. And good work was done. It is of record that but one of that brood met ill fate, from a cat. Further, on July 12, in the very silver poplar that had witnessed so many of the Great Mimic's public successes, and about fifty feet from the cedar of the second nest, a third nest, about eight feet from the ground, was found, already comfortably full of half-fledged young. Four or five, I should say, not venturing to move the step-ladder close, they were so wide-awake. At this date and later the earlier brood, frequenting the ease and umbrage of the air-conditioned pines, continued to receive a degree of supervision and a part of their food. No wonder there was hardly time for a phrase of song, only for the brief, routine signals of business.

But at that there were the cats to be looked after, particularly Mother's big gray tiger that lived on the steps or about the coal-shed, and prowled here and there with the least possible judgment, and the dog. The cat, if out away from his sleeping quarters, often came in for uncomfortable, cringing moments as the Mimic darted about him, almost touching him. It was part of the ritual, especially in the early forenoon, when the Mimic had captured worm, moth, or grasshopper, to look into the deportment of the cat at the moment. Food in bill, he would perch upon the peak of the coal-house, no more than twenty feet from the kitchen porch steps, and repeat his scolding note until content that all was well. If the enemy was in view, even asleep or otherwise uninterested, the scolding might be kept up for as long as twenty minutes, the food at last delivered to the waiting young. An observing critic might discern in this by-play a temperamental need for stage stuff, especially as the other birds did not find such performance unavoidable. And the threats directed at the dog, even to alighting on his back; it is hard to determine the genuine occasion of that. Unless this dog, retaining a puppy-like fondness of pursuing any small flying thing, even such small prey as grasshoppers, had at some time been caught by the Mimic in an ill-considered act.

Just back of the coal-shed and a line of the quadrangle of ever-greens stood a group of mulberries, densely foliaged, stunted trees, and Mockingbirds were often seen there. The group was, perhaps, good hunting ground, or a shelter from the intense sun as were the pines and cedars, or merely a way station to the coal-shed lookout, as seemed likely. Yet when the leaves had fallen in October there was disclosed a used nest of the year, by all the characters a Mockingbird's nest. Can it be that the pair whose first nest was broken up came and nested here successfully?

During the great heat of the summer all living things sought shelter from the sun at every opportunity. The young birds were seldom in evidence. Never more than five birds were observed at one time, with usually an old one or two in the number. On September 2 or 3, four, which I took to be young ones, were playing along a barb-wire fence eight or ten rods to the east from the grove. It was the only time any of them were seen so far from the trees. On the third an old bird was noted once or twice. Early the next morning I may have heard a call note; I listened, but it was not repeated. The season was over.

SMITHWICK, S. D.