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THE SHORT-EARED OWL AS A FOSTER-MOTHER

BY ALEXANDER DAWES DU BOIS

Plates XIX-XXII

THE phenomena of foster-parentage cast many interesting side lights upon the moral and mental endowments of the lower animals. It is well known that, under certain circumstances, animals sometimes adopt the young of others. Any failure to gratify the compelling, maternal instinct in the natural way constitutes the commonest and most potent of these circumstances. It is usually the female that becomes the foster-parent. She may voluntarily adopt the young of other animals of the same species, or even those of other species and different genera.

Frequently the animal foster-mother undertakes responsibilities of a nature wholly unknown to her through any previous experience. This is true of birds in whose nests man has substituted entirely strange eggs, (or even other objects which resemble eggs) in place of the bird's own.

What would an Owl do if I put hen's eggs in her nest? This question stimulated my natural curiosity to the point of trying the experiment. The Short-eared Owl (*Asio flammeus*) is the only one of our Owls which nests upon the ground, and which, therefore offers a favorable opportunity for such an experiment.

A homesteader's shack, in the prairie region of Montana, was my headquarters. Its door looked out upon a checkered pattern



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A FAITHFUL FOSTER-MOTHER.
Short-eared Owl Mothering Three Domestic Chicks.

of cultivated fields and virgin prairie. Frequently I had seen two Short-eared Owls flying over a field of wheat stubble in which young winter-wheat was growing. A systematic search of this field was at first without result, but the second time over it, while sitting on the ground to rest and to watch a ground-squirrel's burrow, I heard a slight sound behind me and turned just in time to see an Owl rising. With the greatest confidence I searched the vicinity but found nothing. Having given up the quest, I started toward home, but, obeying a sudden impulse, struck off at right angles and had gone only a few rods when a Short-eared Owl rose from the ground, scarcely thirty feet ahead of me. It flew slowly and without apparent concern; but at the spot from which it had risen was a nest containing three eggs. It was a slightly hollowed depression in the soil, partially lined with dried vegetation. This was on the twenty-first of May. On the twenty-sixth I revisited the nest and found five eggs in it. The Owl was incubating and she flushed at about the same distance as before.

Early in the afternoon of the twenty-ninth, finding the bird upon her eggs and no addition to her complement of five, I removed the Owl's eggs and substituted in their stead three hen's eggs which had been procured from a neighboring farmer. I had selected the smallest and whitest from the farmer's stock but they were far too large and much too long in shape and dark in color to resemble the eggs I had taken; for the Owl's eggs are pure white and more nearly spherical. The difference was so pronounced that I feared the Owl would not adopt them. The total area occupied by the three hen's eggs was however about the same as that of the five Owl's eggs; so I felt assured that the Owl could cover them properly if she would. After making the substitution I promptly left the field.

During the next two days I was away, on a side-trip to a distant alkaline lake, and the absence of any human being within three-quarters of a mile of the Owl's abode was doubtless a reassuring circumstance. When I returned she was sitting on the hen's eggs. She remained at her post while I walked around her in a circle of respectful radius. Following me intently with her eyes, she turned her head until I had described an arc of something like 270 degrees; then she reversed the twist, turning her head the other way around.

I was careful not to disclose my interest in her and left the place without flushing her.

A few days later the tripod tent, which was to serve as observation-blind and photographic studio, was placed at a distance of some eight or ten feet from the nest. This tent, of brown fabric fitted over an old camera tripod, formed a small triangular pyramid or tetrahedron, a shape which does not loom up in alarming proportions as viewed from the ground. From an interior point of view there is not so much to be said in its favor, for there is barely room inside of it to sit—Japanese fashion—beside one's camera. The tent was left for the Owl to become accustomed to it before any observations were attempted.

The first photograph was made from this hiding place on the seventh of June. The Owl had flushed from her nest as I approached the tent, but when I had been hidden a short time she began to fly around within sight of it. Soon she dropped to the ground and sat, at a considerable distance, peering curiously at the tent and bobbing her head, first up and down, then from side to side, in an intense effort to penetrate the mystery. She then flew up, and, alighting a few feet from the nest, walked to it, her body held in a horizontal position—not upright as when perching. She walked into the nest, pulling the hen's eggs under her with her bill, and settled herself to the task of brooding. The sun was hot and soon she opened her mouth and began to pant. Although her body pointed to the east she kept her head turned toward the south, for the tent was south of her and her suspicious gaze was fixed intently upon it. It was interesting to observe the response of her eyes to the changes of light. When the sun shone upon one eyeball but not upon the other, the pupil of the eye in shadow was considerably larger than that of the eye in sunlight. She frequently blinked her eyes; sometimes simultaneously, sometimes one after the other, and occasionally only one. The color of her eyes was pale yellow.

Her remarkably accurate sense of location of sounds soon became apparent, for whenever the slightest sound was made inside the tent, such as a faint scratching on a tripod leg with a finger nail, the bird shifted her gaze instantly to the exact spot whence the sound came.

She had come to the nest with a fluffy feather adhering to her lower mandible, and there it remained, for she was not concerned with such trifles under the unusual circumstances.

Again, four days later, although the weather was too windy for photography, I spent some time in the blind. The bird faced in the same direction as before. On this occasion she permitted me to make considerable noise, as I moved about in the tent, without leaving her nest. Before I departed for the day, I shifted the blind for the last time, staking it to the ground in its final position within arm's length of the nest.

With the tent at such close range it seemed best to let the Owl become thoroughly accustomed to it before disturbing her again. Accordingly no further observations were attempted until the morning of June thirteenth. On that day the Owl was very quiet and the fortunate coincidence of a lull in the wind and a whitish cloud over the sun permitted an exposure of a full half-second (with a lens aperture of F-8) and thus assured a fully-timed negative, which is not always possible when photographing birds at close range, with diffused lighting.

It had always been the custom of the Owl to go to her nest from the west side and to sit facing east while incubating, but on the morning of June fifteenth she faced toward the camera and thus posed for a different portrait. She often sat with her eyes half closed when there were no sounds to disturb her. Part of the time, when the sun was very warm, she panted. Her short plumicorns, known popularly as "horns" or "ear tufts," were usually not visible, but sometimes she erected them. At best they were very inconspicuous. They were approximately the same distance apart as the eyes, a "horn" being located on the top of the head directly over the pupil of each eye.

When I visited the nest at 6:30 (sun time) on the morning of June nineteenth the Owl flushed from three fluffy domestic chicks. She had removed all the egg shells from the nest with the exception of a few small fragments. A fresh-killed mouse lay on the ground at the nest rim. The chicks, which were of a brownish yellow color, looked quite vigorous. I left at once without disturbing them, but returned with the camera after breakfast. The Owl was again on the nest, with two chicks under her and one in front



1. Short-eared Owl on Nest, Gazing Suspiciously at the Tent.
2. Showing Small Size of Pupil of Eye upon which the Sun Shown Compared with One in Shade.

against the feathers of her breast. She was facing toward the east. As I approached too closely she flew suddenly from the nest.

I got into the tent as quickly as possible. The chicks of course could run about quite nimbly and soon they left the nest and came close to the tent, crying for their foster-mother. She returned after an absence of fifteen or twenty minutes, alighting within eight or ten feet of the nest and walking up to it, holding her body in the strictly horizontal position which gives such an odd appearance to an Owl. Settling herself on the empty nest she sat silently watching the chicks which remained near the tent; then she assumed a half-standing attitude in the nest and waited. Soon she became frightened or suspicious, probably the tent material was not sufficiently opaque, and with the sunlight behind it she had seen some movement within, at any rate she flew away. The chickens cried, slept and "whitted" by turns until I went out and put them to sleep in the nest. Before long the Owl returned, walking to the nest from the north-east side. She went part way into it, facing almost toward the tent, and half sat, half stood, with her wings hanging loosely at her sides, while the chicks cuddled up to her. One of them pecked at her bill; the other two went under her. After a little while two of the chicks left the Owl, to run about, close to the tent, but the remaining one staid under her for a long time.

When the chicks had been away from her for some time and I had come to the conclusion that she had no voice for them, I suddenly heard a low "cuk," somewhat resembling the "cluck" of a hen. Later, when the chicks were crying, she "cuked" twice. When they "whitted" she seemed satisfied to let them stay away. Eventually the crying of the chicks became too insistent and their Owl-mother called them, rapidly, with a series of "cuks" which merged into something like the alarm note of a hen, all the chicks running meanwhile toward her. Her "cuks" became higher in pitch as the chicks went under her, the last notes being high-pitched and very rapidly uttered.

At one time during the morning it was evident that the Owl was watching some bird directly above her, but I was unable to see from the tent blind, what it was. Once she called a sudden alarm note to the chicks.

She had a curious way of spreading herself and looking under her body, or of scratching in the nest hollow as she settled herself in it.

Once, when she was brooding, a chick poked its head through the rear part of her wing and climbed out by that route.

Having left my post at noon, I returned at 2:00 P. M. to find the Owl brooding two of the chicks while the third was enjoying itself in the cool shadow of the tent. The dead mouse was gone. I had brought some moistened corn meal to feed the chicks, and while I tried to induce them to eat it, both of the Owls were near. One was flying over me, delivering a tirade of barking notes, while the other sat on the ground, about a hundred feet away, uttering its "mayow" or "keyow" (sometimes drawn out to "ka-a-yów") with an impressive accent on the last syllable. When the Owl flew overhead, one of the chicks instinctively uttered its twittering alarm and all of them stood still. They would run to their Owl-mother on the ground, but they feared her in the air.

Before re-entering the blind I placed all the chicks in the nest but they would not stay. When the Owl came back she sat or stood in the empty nest; she deepened the hollow by scratching; she let her wings hang loosely and waited patiently for the independent youngsters. The latter went around the corner of the tent and I got them inside and put them to sleep between my hands. Meanwhile the Owl remained patiently at her post. When the chicks had been quietly pushed out of the tent she observed them at first indifferently, but when they fell to crying she "cucked" rapidly and all the chicks ran to her.

She endeavored to feed them, uttering a high pitched note and rubbing their backs with her bill, but they of course would not respond to the feeding stimulus; instead, they ran under her. At such times the Owl showed a slight swallowing motion of her throat and bill.

Occasionally the Owl repeated her performance of scratching and wriggling in the nest cavity, looking under herself, with head turned down, and then looking up again with a queer expression which might remind one of an old man peering over his glasses. Much of the time when the sun was hot, she stood in the hollow with her wings pressed against the ground like sled runners; thus



1. Owl and Chick with Dead Mouse in Foreground.
2. Chick Pecking at Owl's Eye.

she formed an open-fronted shelter under which the chicks might go or come at pleasure. They stayed under her, or slept outside, or ran around the premises as they pleased. Their world was a circle five or six feet in diameter and in most of this area they were quite at home, but they never ventured into the strange jungle of wheat-stubble which surrounded them. One of them ran out to the tent several times. I saw another catch and eat a fly. Sometimes a chick would reach up and peck at the Owl's eye, forcing her to close it, which she did without moving her head.

The Owl fondled or nudged the chicks again with her bill and opened her mouth. This time one of the chicks apparently ate something from her mouth. Again I could see her swallow slightly.

During the afternoon the foster-mother closed her eyes and dozed a good deal while she brooded her charges. All of the chicks were under her when I slipped out of the rear of the tent, about 6:00 P. M., well nigh exhausted.

The next day (June 20) upon making my morning call I found a fledgeling, beheaded and disemboweled, lying at the edge of the nest. The victim was a young Longspur, probably just able to fly. The Owl was brooding and one chick had its head protruding through the scapular feathers between her wing and back, while another was just in front of her in the nest. During the morning my photographic endeavors were stimulated to the utmost when one of the chicks climbed upon the Owl's back, but I did not succeed in recording this interesting picture.

In beginning the afternoon session I managed to stalk up to the blind from the rear without flushing the Owl. This time she sat facing north. Once again the chicks ran over her back, but for the most part they stayed near the base of the tent. They learned to drink from the shallow cup of water which I had provided, and during the afternoon I "fished" them into the tent and fed them with corn meal.

Periodically the Owl scuffled around in the nest, to relieve the tiresome monotony of brooding. When the chicks were around her she fondled them with her head, but when they came rushing up to her from a distance, in a manner which she did not approve, she soughed or hissed at them—a sound evidently not made by the vocal chords but by the rapid expulsion of air through the open

bill. She had an exceedingly high note, a series of squeaks in reality, to which she gave utterance while fondling the chicks against her face.

Again the next morning (June 21) I attempted to stalk up to the tent unobserved, but the Owl flushed. The chicks "froze" in their places as she rose into the air, but remained thus for only a short time. The lining of straw, all of which was scratched out of the nest cavity the preceeding day, had been replaced and the nest was now well lined. After feeding the chicks I spent a short time in the blind. The sougling hiss of the Owl, previously mentioned, is doubtless a warning or an expression of displeasure, for she repeated it, directing her attention toward the camera lens, when my shutter made a whirring noise in releasing.

In the evening, after supper but before dusk, the chicks were fed again. When I arrived I found one of them inside the tent, crying, and unable to get out, but the Owl was brooding the other two. While I fed the chicks, both Owls flew around and above me, "barking" and "mayowing." One of them alighted in the field about two hundred feet away and for a short time kept up a very high pitched squealing cry, which presumably was meant to imitate a bird in distress.

Next morning when I took more cornmeal to the chicks, both Owls were at first quite demonstrative in the air. Then one of them floundered about on the ground in ostensible helplessness, uttering its squealing notes, while the other sat on a large weed and watched. The floundering one was perhaps a hundred feet away.

There was some rain during the day of June twenty-third and my only visit to the nest was in the evening. A calamity had befallen the little family. The most precocious chick lay dead in the wheat stubble about twelve feet from the nest, its crop distended with wheat kernels. The second chick lay helpless three feet from the nest, with its legs stretched out behind it. The third chick however was under the Owl apparently well and happy. The sick one was taken to the house but did not survive its gluttony for wheat.

In the morning (June 24) the Owl family's larder was well supplied. The carcasses of a mouse and another young Longspur had been placed at the edge of the nest. I suppose that these

supplies were brought by the foster-mother's mate although I could not verify that point. The surviving chick was apparently in good condition. When the nest was approached the Owl contracted herself in a manner which made her head seem amazingly small.

From the twenty-fourth until the twenty-seventh I brought food for the chick each day. Always the faithful foster-mother was at her post. In the early afternoon of the twenty-seventh, when I cautiously approached the nest, the Owl was preening the feathers of her breast while the young chick sat contentedly upon her back. She flushed as I came up. I entered the tent and remained an hour and a half, or perhaps two hours, but the Owl did not return.

At nine o'clock the next morning (June 28) I made the usual visit with the chicken feed and found the chick inside the tent. The Owl was not anywhere to be seen, though a large fresh Owl's feather was in the nest. I put the chick out of the tent and left the place immediately.

Soon after noon I returned and found the chick near the nest; but the Owl was not there. The weather was turning cold and by five o'clock it was very cold and windy and threatening rain. The chick was then half squatting, half standing, by a bunch of stubble at the edge of the nest, trying to sleep. The Owl was nowhere to be found. I made a circuit of the surrounding portion of the field to look for her. The weed which had so often served as a lookout was deserted. I took the chick to the house with me together with the tent and other paraphernalia, and although I visited the stubble field afterward I did not see the Owls again.

The Owl seemingly abandoned the chick when it was ten days old, but its independent actions, so different from the habits of Owls, may have led her to suppose it capable of caring for itself. The human factor which was injected into the Owl's affairs must also be considered. She would doubtless have remained with the chick much longer had it not become accidentally imprisoned in the tent. It had probably spent the night there while the Owl sat, childless and to no purpose, on the nest. The fresh feather found in the nest the next morning was evidence that the owl had

been there. Surely she had reason to believe that the chick had deserted her.

In any event, this outcome must have been the ultimate one, and it is not likely that more could have been learned through a more prolonged foster-parentage.

It should be remembered that the altricial young of the Owl are born from the egg shell, blind and helpless, unable to stand on their feet, and entirely dependent upon the parent birds for sustenance. In contrast, the precocial young of the domestic hen are able to run about and pick up their own food soon after they are hatched. It is not altogether surprising therefore that the Owl as a foster-mother exhibits more patience and self-sacrifice, and even perhaps a more demonstrative affection in the care of her foster-children, than the hen exhibits toward her own offspring.

Observers of birds sometimes jump to the conclusion that a foster-parent, in accepting the eggs of another species without show of concern, thereby demonstrates an inability to recognize her own eggs. It would seem that such a conclusion is by no means justified. I do not flatter myself that I fooled the Short-eared Owl with the hen's eggs. She was of course incapable of reasoning as to cause or effect involved in the mystery. Her most powerful impulses sprang from the maternal instinct. This led her to adopt the strange eggs, in the absence of her own, and to devote her untiring mother energies to the care of the amazing chicks which hatched from them. She could not abandon these strange foundlings so long as they were dependent upon her. Such, it seems, is her law.

For the benefit of those inquisitive persons who wish to know what became of the chick, be it here recorded that the chick "lived happily ever after." At least to my knowledge it grew to fine brown pullethood. Until it was well feathered it lived the life of a solitary pioneer, never venturing more than a few feet from my cabin. Its chief diversion was fly-catching; indeed it developed this pursuit to the proportions of an industry, running back and forth for hours, in pursuit of the flies which settled in the shadow of the house. It had become remarkably inured to wind and changes of temperature. In its infancy the monotony of its existence was one day nearly cut short. Hearing its urgent cries, I ran out just



1. Wings Pressed down to make a Shelter which Chicks Entered at Pleasure.
2. Owl Rummaging Nest and Looking under Herself. Chicks under Wing.

in time to rescue it from a ground squirrel (Richardson's Spermophile) which had laid hold upon it and was about to carry it off.

Eventually the chicken was delivered to the farmer's wife who had supplied the eggs, so that presumably it was privileged to associate with its rightful mother in the barnyard. It is safe to say that the old hen never knew it, even though we concede the farmer's assertion that it "favored her" in appearance, much more than it did the Owl.

327 S. Glenwood Ave., Springfield, Ill.



NOTABLE MIGRANTS NOT SEEN AT OUR ARIZONA BIRD TABLE.

BY FLORANCE MERRIAM BAILEY.

Plate XXIII

I. THE FIRST LAP OF THE MIGRATION.

SEEDEATERS such as Sparrows and Doves might naturally be tempted by the offer of a seat at a bird table and in arid Arizona it would not be surprising if a variety of birds came for water. That a Flycatcher—a Cassin's Kingbird—should be one of these and that a Warbler—a Long-tailed Chat—should come for raspberry jam might seem a trifle anomalous, although a day of dry insects and a suddenly discovered sweet tooth might serve to account for them. But most of the insect-eating Flycatchers, Warblers, Orioles, and Vireos, together with the flesh-eating Hawks and Kingfishers, and above all such birds of the air as Swallows, Nighthawks, and Hummingbirds fall in an entirely different category from Sparrows and Doves—a bird table would be a far cry to them. While we did not have the pleasure of numbering them among our Santa Rita dinner guests, many of them visited camp and others were seen about the ranch not far away.

The first of the homecomers which we saw, the bird that heads my migration blank under date of March 5, 1921, was that beautiful Swallow of the western mountains whose name—the Northern Violet-Green—merely suggests the remarkable color combination