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### NESTING HABITS OF THE PIED-BILLED GREBE

BY MURL DEUSING

*Plates 11, 12*

THIS study of the nesting habits of the Pied-billed Grebe (*Podilymbus podiceps podiceps*) was made by Peter Stieb, Carl Kinzel, and the author during the summer of 1938 at Lake Koshkonong, Wisconsin. The nest, found on July 10 (rather late for our nesting season), contained two eggs. It was of the regular floating type made up of wet and decaying plant materials mixed with some green stems of arrowheads. The nest was floating in two feet of water about forty feet out from the cattail-lined shore of an old swampy slough. It was surrounded by a thick growth of arrowheads. On July 17 we returned to find seven eggs in the nest. On that day we built a blind six feet from the nest for observations and photography. From July 17 to August 6 we spent forty-two hours of observation in the blind. These observations were made on twelve different days in periods ranging from one to seven hours in length.

On July 31 the first eggs hatched, one in the forenoon and one in the afternoon. Depending upon whether the first egg was laid on July 8 or July 9, the incubation period for these two eggs was twenty-one to twenty-three days. The third egg hatched on August 2. We were unable to return to the nest again until August 6, when we found two eggs remaining in the nest; the others apparently had hatched. I broke open one of these eggs and found a living chick inside; if given time there is no doubt that it would have hatched.

In our observation we found no truth in the theory that the grebe trusts to the warmth generated by decaying vegetation for the incubation of the eggs. After eliminating those periods of time during which the grebe was disturbed or alarmed, and counting only the periods during which the birds were working under normal conditions, we found that the eggs were left unattended on an average of only eight minutes at a time with the longest



PIED-BILLED GREBE ARRIVING AT THE NEST



PIED-BILLED GREBE UNCOVERING ITS EGGS

period of absence thirteen minutes. Both male and female incubated. The female incubated from twenty-four to fifty-three minutes at a sitting with an average of forty minutes. The male incubated from nine to sixty-five minutes at a sitting with an average of twenty-nine minutes. The male and female, with one or two exceptions, alternated at the nest, taking turns at incubation. On only a few occasions did we see both of the adults at the nest at the same time. We could identify the male from the female by both a larger size and a peculiar dark mark on the bill near the eye of the male. Several times we noticed that the male and female would touch bills as they passed each other in exchanging places at the nest.

The grebes did not seem to have a favorite approach to the nest. They came to the nest from any direction, though of course they used the side opposite the blind most freely. In coming to the nest, the grebe would generally make an underwater approach, rising next to the nest. Often it would look about quickly then dive again to come up on the other side of the nest or in the midst of the arrowheads nearby. After a few minutes of appearing and reappearing about the nest, the grebe would swim up to the nest and touch it with its breast. Then backing up a few inches, the grebe would work its legs vigorously for a second or two, and then hop up on the edge of the nest. Several times the grebe skipped all of these preliminaries and without any previous reconnoitering popped out of the water a foot or two from the nest, and landed lightly on its edge.

Once on the edge of the nest the grebe would stand erect, and after a few preliminary pokes at the nest material it would begin to sidestep around the rim of the nest, removing the covering from the eggs with quick, short jerks of the bill. From one to two circuits of the nest were usually necessary to remove all of the vegetation from the eggs. With the eggs uncovered, the grebe would set its legs one on each side of the nest, and with a business-like wiggle of its body flop forward over the eggs. Occasionally the grebe would not be satisfied but would rear up and remove a strand or two of vegetation that had been overlooked, or would poke at the nest material along the edge of the clutch of eggs. In doing this, an egg or two might be turned slightly, but there was never any rolling or shifting of the eggs as is done by many of the other marsh birds. Shortly after settling on the eggs, the grebe would frequently take the loose vegetation that had recently covered the eggs and pack and press it about the sides of its breast. Once settled, the grebes would often keep their position for the full length of the period of incubation. Occasionally they would yawn vigorously, and then fall asleep on the nest, with bill resting on the breast. The slightest noise, however, would wake them. Time was also passed by preening both the breast and the back feathers and poking at the rim of the nest. All of this was done without moving the position over the eggs.

On hot days the grebes were much more restless at the nest than on cool days. They would rise up now and then to readjust themselves. Sometimes they would stretch the neck way over the rim of the nest and take a drink of water without leaving their position on the eggs. With each swallow the grebe would throw its head back, wiggling its throat and bill much like a chicken when it drinks. When the sun shone directly on them they would pant very rapidly, and often they would produce a curious motion of the wings. This wing movement was done while the grebe was settled in a natural position on the eggs. It consisted of raising and lowering the wings, one at a time alternately, about one-half inch above the back. This shifting of the wings was done rapidly with the rhythm of marching feet. On one day we saw an even more curious wing movement. Standing very erect on the nest, the grebe began to fan its wings, holding them directly out backward with a peculiar quivering motion so rapid that the wings became a blur. On the motion-picture screen the effect is much like that of the wing movements of a drumming grouse. However, the grebe's wings made absolutely no sound. We saw this action a total of six times, all during a single day. Five times the grebe performed the action just after arrival at the nest, and while the eggs were still covered. Once the grebe had been incubating for a period of twenty-two minutes when it suddenly stood up and fanned its wings. The day upon which this peculiar wing movement occurred was a very hot one, and it is possible that the action may have helped to cool the eggs. However, on several other equally hot days the grebes did not perform in this way at all. We are at a loss to explain this curious action.

The grebes had a variety of calls and notes about the nest. The *wup, pup, pup, pup, kaow, kaow, kaoo, kaoo* call of the mating season was heard irregularly all through the nesting season. This call was generally given by the grebes while off the nest. Twice, however, we saw the male grebe give the *wup, pup, pup, pup* call from the nest. In giving the call, the bird stretched its head forward and upward, and with throat and cheeks puffed out full and round delivered the call. Often the male would call *wup, pup, pup, pup, kaow, kaow, kaoo* from out in the marsh, and would be answered by the female on the nest with a soft *whut, hu, hu, hu, hut*. The grebes also had a very striking call which they seemed to deliver when in a state of alarm. This call sounded very much like the air compressor of a street car pumping up, but was more resonant. In words it might be described: *hu, hu, hu, hu, hu, hu, hu*. This steady rhythmical calling might be kept up for some seconds.

On three occasions we saw the grebe add material to the nest, always inserting it into the rim of the nest. On one day we saw the female spend about ten minutes in gathering brown, partly decayed plant material from

the bottom and inserting it in the rim of the nest. Much of this came from the area directly around the nest. Green materials, obtained at some distance from the nest, were inserted into it on two other occasions. All the building operations we observed were done by the female.

Upon leaving the nest the grebes reversed the action of covering the eggs. Standing up erect, the grebe would sidestep around the edge of the nest, and with quick, short thrusts of the bill cover the eggs. The grebes seldom left the eggs uncovered. Three times, however, we saw them leave their eggs uncovered while working under normal conditions. Twice the male and female were exchanging places at the nest. On one of these occasions the male slipped off the nest, meeting the female coming toward it. They touched bills, then the male dove and the female hopped on to the nest and settled on the eggs. Another time the female left the nest with the eggs uncovered. Both birds could be heard a few minutes later back in the arrowheads. Eight minutes later, the male came up to the nest and took his place over the eggs. On a third occasion the male left the nest without covering the eggs as the female approached. Both birds dove together. Five minutes later the female appeared behind the nest. She poked at the nest rim several times and then dove. Five minutes after the appearance of the female, the male came back to the nest, covered the eggs thoroughly, and then dove out of sight.

When alarmed, the grebes could cover their eggs very rapidly. The first time we started to take motion pictures, the grebe became alarmed at the noise of the camera. Jerking upright the grebe covered the eggs with three or four short thrusts of the bill. Then slipping off the nest backward it disappeared. The whole performance was over in less than five seconds. The covering over the eggs, however, was not complete, and the eggs showed through. Five minutes later, the grebe was back at the nest. It hopped on to the nest, covered the eggs more thoroughly, then dove. Often when alarmed the grebes would quickly cover the eggs and then sit down on top of the covered eggs. If no danger developed the grebe would uncover the eggs again and continue the incubation.

When thoroughly frightened the grebes left the nest without covering the eggs. Once, without warning, I stuck my head out of the blind. The grebe on the nest gave me one startled, wild look and slipped off the nest without covering the eggs. I left the blind immediately but returned three minutes later. The grebe had returned and covered the eggs in my absence. Natural noises in the marsh, even if they were loud and startling, never frightened the grebes. Carp jumping and splashing so close to the nest that they startled us in the blind, did not cause any apprehension on the part of the grebes. Noises from the blind, however small, frequently caused alarm. Even visits to another blind four hundred feet away from the



PIED-BILLED GREBE INCUBATING



PIED-BILLED GREBE SHAKING YOUNG OFF ITS BACK

grebe's nest by other members of our party would cause the grebe to leave the nest and investigate.

Turtles and the Long-billed Marsh Wren came to the nest in the absence of the grebes. Once a Marsh Wren came down to the nest and began to hop around catching insects. Finally it began to spread its wings out in a quivering fashion and flutter around the nest in a mating display for a female sitting on top of the blind. In the meantime one of the grebes appeared in the arrowheads back of the nest. It sat there for several minutes watching the wren intently. When the wren began to flutter about on the nest the grebe dove and rose up suddenly between the blind and the nest. The wren flew quickly away. The grebe sank slowly and swam away. Another time while one of the grebes was incubating the eggs an eight-inch turtle came swimming up from behind the grebe and placed its forelegs on the rim of the nest. The moment the turtle touched the nest, the grebe whirled around and struck at the turtle, which quickly disappeared.

With the hatching of the young the habits of incubation changed decidedly. The female did almost all of the incubating after the young began to hatch. With two young in the nest the average period of incubation dropped to seventeen minutes. Intervals between sittings ranged from sixteen minutes to several hours. On the day the third young hatched, the female came to incubate only once for a period of six minutes. The male did not appear at the nest after the day the first young had hatched. No adequate observations were made after the third young hatched. With the hatching of the first two young, the grebes became careless about covering the eggs, and about half of the time they failed to cover them. With the hatching of the third young the eggs remained uncovered all day.

One thing that amazed us was the speed with which the chicks freed themselves from the eggshells. We found the first young hatched on the morning of July 31. No trace of the eggshell remained at the nest. At 10.30 o'clock that morning the remaining six eggs were carefully checked. There was no evidence of pipping—no cracks appeared on any of the eggshells. Yet at two o'clock the observer in the blind was startled to see a young grebe stick its head out of the covering of vegetation over the eggs, and then wiggle itself free. When the observer left the blind forty-five minutes later he checked the nest again and found five eggs remaining and the empty eggshell of the sixth. The young grebe had freed itself from the eggshell in three and one-half hours, and without any previous cracking or pipping of the eggshell. With the hatching of the third young we saw the female remove the eggshell from the nest. Taking it in her bill she swam about ten feet away, then dove to the bottom with it.

We had many opportunities to see the young crawl up on the backs of the adults. The young always crawled up alongside of the tail and up under one

of the wings. Often they would crawl far forward under the feathers and finally their little black and white striped heads would appear out of the hollow of the adult's back just behind the neck. If one young gained the back (and this seemed to be the coveted spot) the second young to crawl upon the back remained under a wing. We never saw more than two young upon an adult's back at one time, but there is no doubt that a third young could have been accommodated under the other wing. The struggle to get up on the back was a violent one for the new-born young. It was always accompanied with much wiggling and scrambling, and often the young would rest when halfway up, its legs dangling out from under the adult's wing in a ludicrous fashion. The young scrambled up on the back of the adult both from the nest and from the water. When the young wanted to get up on the back of the adult while swimming in the water, it would swim up to the old bird and begin to poke at the breast or sides. The adult would then deftly swing around and present its tail to the young. With much pushing and wiggling the young one would scramble up under the wing. Sometimes the adults would dive with a young one under the wing. Often the adult would carry the young ones to the nest under the wings. However, if the old birds stood erect to uncover the eggs, the young would frequently slide out from under the wings. Once we saw the female shake out the young from her back after she had settled on the eggs, and at another time the young were dislodged when the female preened her back and wing feathers while on the nest.

While much of the feeding was done back in the arrowheads and out of our range of vision, we were fortunate enough to see several feedings at the nest. Most of the time the young were fed on dragonfly nymphs. Some of these were almost as long as the young grebes, and though they tried mightily the young could not manage to swallow the large nymphs. In this case the old grebe took the nymph from the young and shook and threshed it under water until the insect broke in several parts, whereupon the young swallowed the parts greedily. Once we saw an unusual feeding operation. A young one climbed up under the wing of the adult in the usual fashion. The old grebe sank out of sight, but within a few seconds rose to the surface again with its back covered with the lace-like stems of the bladderwort. The young one pushed its head out of the back and then the old grebe, turning its head backward, began to pick small insects out of the mass of bladderwort and feed them to the young.

The young grebes had a bright metallic *chip* with which they called incessantly during the absence of the adults. When they were alarmed, however, they remained very silent, and if we approached the nest they frequently dove off the edge and hid in the arrowheads nearby. After an alarm the adult grebe would call her family together with a soft grunting *hu, hu, hu,*



*puh*. The last note though soft as the others, was sweet and high with a slightly falsetto quality. The young would answer with their sharp, chipping call as they came from their hiding places. We were able to observe for the first three days after the young began to hatch, and then we had to give up the work until the seventh day. On the seventh day we returned for more observations. We saw very little because most of the action took place in the arrowheads. We saw three of the five young that had hatched by that time, following one of the adults. Added to their sharp chip call was an excited *weep, peep, peep*, much like the call of young ducks; and like young ducks they followed the adult constantly, clamoring continually for food. The old grebe dove frequently, but just what the young were being fed we could not determine.

After five of the young were hatched we were unable to carry on any further observations. Of the two remaining eggs in the nest we opened one and found the chick inside alive and well developed. We have no doubt that the egg we left in the nest eventually hatched and the chick joined the rest of the family. Other business forced us to give up our observations after August 6, so that we were unable to follow this interesting family further and get data on their activities after they had left the nest.

The accompanying photographs are by Carl Kinzel and Peter Stieb.

*Milwaukee Public Museum*

*Milwaukee, Wisconsin*