

NESTING HABITS OF THE SPOTTED SANDPIPER<sup>1</sup>

BY HENRY MOUSLEY

*Plates 27, 28*

It certainly came as a great surprise to find that out of over eighty species of sandpipers and plovers treated by Bent in his 'Life Histories of North American Shore Birds, Order Limicolae' (Bull. U. S. Nat. Mus., no. 146, pt. 2, pp. 78-97, 1929), the Spotted Sandpiper (*Actitis macularia*) held the lowest incubation period, namely fifteen days, no other species having less than seventeen days, and only two I think at that, all the others ranging from twenty-one to twenty-eight days. In a paper on the 'Diving Habit and Community Spirit' of this sandpiper published in 1920 (Canadian Field-Naturalist, vol. 34, pp. 96-97, 1920), I drew attention to the little we really know of the very intimate home life and traits of even the commonest birds, as only just lately had the incubation period of the Common Sandpiper (*Tringa hypoleucos*) of Europe (a first cousin to our Spotted) been ascertained to be twenty-one days. It was only in 1935, that the opportunity came to me of going into this matter with regard to our Spotted Sandpiper, for in that year I was fortunate enough to find two nests in the making, and to note the date of the first egg laid in each case, besides obtaining pictures of the hatching of the chicks, their hiding, and the parent brooding them. Both these nests were very carefully watched, and in each case the young hatched out on the twenty-first day from the laying of the last egg. This past year (1936), I had hoped to find these birds back on their old ground and to corroborate my records still further. Only one nest, however, was located on June 14 (twelve feet from the site of last-year's nest), but unfortunately it contained four eggs. From the actions of the parent as it flushed from the eggs (I shall refer to this later), I think it had been incubating a few days. These eggs hatched out on June 30, so even in this case I had watched the incubating bird for sixteen days, and feel sure I could safely add another four or five days, as the parent when flushing resorted to the so-called 'injury-feigning' trick, as seldom done unless incubation has been in progress a few days; as a rule the bird merely contents itself with quickly running off the nest, without any demonstration, if the set of eggs is incomplete, or quite fresh. When flushing, not only the smallness of the parent, but its behavior, put into my mind two thoughts: (1) Was it the male that was incubating? and (2) Why not pay especial attention to Dr. Friedmann's theory regarding this so-called 'injury-feigning' trick? With these two thoughts in mind, I paid frequent visits to the nest, in all about a dozen on different days before the hatching of the eggs. The nest

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was nearly at the top of a little embankment alongside a railway track, and it was the invariable custom of the incubating bird whenever I appeared above the nest, to run down the bank and along a dry ditch at its foot, sometimes displaying and squealing (if I attempted to follow); at others, merely contenting itself with running along for some little distance, or even at times standing still, before taking flight. On every occasion it was the same small bird with lightly spotted breast, and at the time I made up my mind to collect it at the end of the study and prove its sex. Fortunately, this was not necessary as will be seen later. I never once saw a second bird at the nest, but on one occasion a larger and more heavily spotted one was noted some hundred yards or so away. On the day of the hatching, however, both birds came to meet me as I approached the nest. I could see at a glance the appreciable difference in size and heavier markings on the breast of the female compared to the male, the smaller and lighter-marked bird I had been watching, and the one that now made all the fuss of wing demonstration, sometimes curling itself, as it were, into a little ball as it ran along, reminding me very much of a little hedgehog, whilst the female merely ran rapidly about in all directions. There were no misgivings on my part that the male had done most, if not all of the incubating, as has been proved by Miss Theodora Nelson (*Bird-banding*, vol. 1, pp. 1-13, pls. 1-6, 1930), and by others again in the case of the male Least Sandpiper (*Pisobia minutilla*).

The young had left the nest and were in hiding not far off, but I failed to find them, so decided to give up the search for the present and return again later, in the hope that by then the parents would eventually have led them to more open ground across the railway tracks (as was the case the previous year), where some timber screens used in the winter to prevent snowdrifts on the railway are stacked up at intervals, thus forming excellent vantage points for the parents to watch the young and give warning whenever danger threatened. I did not return for some hours, but when I did, sure enough, the young had been enticed away from the nest to the old feeding ground of last year, with a parent keeping guard perched on one of the stacks. As I drew nearer, I could see that this bird was the male, who was soon joined by his partner when he alighted on the ground and ran to meet me. The young were not visible, and so long as I remained stationary, the parents did not display any great emotion, but immediately I began to move about they became very excited, especially the male, running all around and about me in every direction, thus giving me another excellent opportunity of comparing their size and markings at close quarters and on open ground, and eliminating the necessity of collecting them. The broken-wing trick was not resorted to by either bird, except by the male (slightly) on one or two occasions, when I made as if to follow it; but both birds merely contented themselves by running about very excitedly in all directions, the



MALE SPOTTED SANDPIPER PERCHED ON GOLDENRODS

male always in the forefront quite close, the female behind him and well away from me. I managed to take a few snapshots of them, a somewhat difficult and unsatisfactory business with a plate camera. After a time, and failing to find the young, I sat down, when the male returned to his lookout on one of the stacks, and the female must have quietly taken herself off, as I never saw her again. Resuming my search after a time for the young, I must have come very near their hiding place in a large bed of tall goldenrods, which I had not thought of looking in before for, without any warning, the male suddenly became very excited, flying all around me and trying to perch on every obstacle that came in its way. This reminded me vividly of my experience at Hatley, on July 19, 1915, with an excited parent with young under similar conditions, which finally ended up by perching on a cat-tail head (*Auk*, vol. 33, p. 66, 1916). When I resumed my search near the goldenrods, the male became more and more excited, in fact, demented is the only word for it, flying not only around and about me, but all over the area in wide circles, eventually landing on the top of a goldenrod plant where it became normal again, remaining long enough for me to take two snapshots of it in that position. This exhibition was so novel and exciting that I decided to see if it would be repeated on a subsequent visit. So a few days later I again visited the spot, when the young would have grown somewhat, and be easier no doubt to find. On arrival, the male was again on his vantage ground, the stack of screens, and by hiding, I at last saw one young come out into the open (away, however, from the goldenrods); but before I could reach it the parent had given the warning note and it had vanished, never to be seen again. It was evident that the young were scattered about, as on again approaching the belt of goldenrods the male became even more demented than on my previous visit, flying excitedly about in all directions as if not knowing what to do, sometimes trying to perch in trees, at others on goldenrods, and yet again running rapidly over the ground in all directions, without displaying. This latter phase, i. e., not displaying, gave me the idea of seeing what it would do if I followed its movements slowly. So long as I did so, it merely kept running in front of me, but immediately I doubled my pace, in fact ran, thus gaining on it rapidly, it resorted to the so-called 'injury-feigning' trick, ruffling up its feathers until it looked like a little ball rolling along, as already described, and sometimes squealing loudly. After these displays had lasted a few moments, the bird became normal again, running along the ground for a short distance before rising and flying back to its lookout post on the stacks. As already mentioned, it is not easy to obtain snapshots in focus with a plate camera, irrespective of being on the spot at the right moment, but I was certainly fortunate in obtaining about half a dozen somewhat unique pictures of this sandpiper perched in trees and on goldenrod plants, more especially the latter. Altogether,

during the three hours of this and my previous visit, I must have seen this bird perched in these un-sandpiper-like positions at least two dozen times. The female never put in an appearance, and this was the case in the previous year; only one parent was present, and I feel sure it was the male from this year's experience. The male when perched on the stacks gave vent to the sharp alarm notes *weet, weet*, almost continuously, interspersed very occasionally with *pip, pip, pip*, notes which I cannot remember having heard at any other time.

Before summing up, let us for a moment consider the literature on this so-called 'injury-feigning' subject. First of all, there is Dr. Friedmann's notable work, 'The Instinctive Emotional Life of Birds' (Psychoanalytic Review, vol. 21, 1934) reviewed in the January issue of 'The Auk' for 1935, in which the author considers the so-called 'broken-wing ruse' of many birds to draw an intruder away from the nest or young, as rather the result of conflict between the emotion of fear, occasioned by the approach of an apparent enemy, and the reproductive emotion, which makes the bird loath to leave the nest. The conflict of emotions produces muscular inhibition or inability to fly, until the fear emotion gains control, as the bird gets farther and farther from the nest. This opinion I find has already been held by Dr. Douglas Dewar who, in his 'Birds at the Nest' (London, 271 pp., 1928) devotes a whole chapter (pp. 167-194) to the 'broken-wing trick.' On page 168 he says: "For years have I urged that it is a mistake to say that the parent bird pretends to be wounded. The movements in question are the result of mental disturbance, caused by the clash of conflicting instincts—the parental instinct opposing itself to the instinct of self-preservation. The result of this clash of instincts is that the bird loses temporarily its mental balance and is unable properly to control its movements." As long ago as 1847, Dewar goes on to say, Jonathan Couch wrote ('Illustrations of Instinct,' p. 243): "It may be questioned, whether the lameness and fluttering are not so much the paralysing affections of fear as of cunning," and more recently Eliot Howard as the result of prolonged study of the habits of British warblers has asserted that birds do not deliberately feign injury. Of course there are others who hold this 'broken-wing trick' as instinctive, of which Dewar mentions several whilst giving their reasons supporting their contentions. More recently in this category, I might mention the name of the late Harry S. Swarth and others, who have expressed their views in letters to the Editor in recent numbers of 'The Auk.' After giving the names of those who do not apparently support his views, Dewar goes on to deal with the views and experiences of those who do so, under the following eight very pertinent headings, which I take the liberty of enumerating:

- (1) Birds have neither the requisite knowledge nor the intelligence to

enable them to practise such a ruse. The performers, in order consciously to deceive, must know how a bird having a wounded wing behaves. It has no means of acquiring this knowledge.

(2) If birds when performing these antics are deliberately feigning injury in order to entice intruders from their young, it is most surprising that so many species have hit upon this ingenious device, birds belonging to very varied families and living in all parts of the world.

(3) Birds often flutter about, as though injured, in circumstances in which such behavior cannot assist the young in any way, indeed occasionally, when it betrays their presence.

(4) If a bird knowingly simulated injury in order to draw an observer from its young or eggs, we should expect it to be careful to keep in view of the intruder while so performing, but this does not always happen.

(5) If birds feign injury in order to entice an intruder from their young, or if the behavior be instinctive, we should expect the same parent to perform the trick with the same vehemence at all times when the young are unable to move as quickly as the parent. This does not appear to be the case; at all events, the behavior is not always equally vehement in any given species.

(6) If birds feign injury to entice an intruder from their nest, we should expect both parents to take part in the game, but this does not always happen. Sometimes the female will perform these antics while the male shows fight; at others the male appears to be surprised at the behavior of its mate.

(7) Eliot Howard records ('British Warblers') that warblers sometimes, under the influence of sexual excitement, behave as though they were injured.

(8) Many birds, when their young are threatened, perform antics which do not make the bird appear to be feigning injury.

Let us now consider the points raised in the present paper, as follows: (1) that with more intensive study on the part of other ornithologists, I feel sure that the incubation period of the Spotted Sandpiper will be found to be nearer twenty or twenty-one days rather than fifteen; (2) also, that with more intensive study it will be found that the male more often than is generally supposed, takes entire charge of the incubation of the eggs; (3) that the evidence produced with regard to the so-called injury-feigning trick seems more in favor of its being considered the result of the clash of conflicting emotions rather than the result of instinct or intelligence. In support of the former, what better evidence could be found than the behavior of the bird on July 6, the day on which I spent three hours watching it? As already stated, the conflicting emotion of fear at my presence coupled with the emotion of parental anxiety for the safety of the young literally

drove the bird crazy, in fact, demented; and its normal equilibrium was only restored upon its coming to rest either in the trees or on the goldenrod plants. This behavior seems to fit in beautifully with what Dewar says: "The result of this clash of instincts is that the bird loses temporarily its mental balance and is unable properly to control its movements." Reverting to its behavior at the nest, this always seemed of a very stereotyped order, for directly I appeared above the nest it would always run down the slope into the drain at its foot, run along this, sometimes displaying, at others merely running for a short distance, and then taking wing. The broken-wing trick was only resorted to if I attempted to follow rapidly (to try and get a snapshot) as was the case on July 6, as already described. May we not attribute this behavior on both occasions to the emotion of self-preservation at my very near approach asserting itself as strongly as the parental emotion, causing for the moment that muscular inhibition described by Dr. Friedmann, which prevents the bird from rising and flying? Certainly, the flight never took place until the bird had come out of its contortions, and had run along a little, and so regained its normal equilibrium.

In conclusion, may not many of the varied antics displayed by birds at courtship and other times, be the result rather of involuntary movements caused by great excitement at a time when they are in a very nervous state, rather than the result of instinct or intelligence?

Since this paper was written, my attention has been drawn to an article 'Injury-feigning in Birds' by the Rev. F. C. R. Jourdain, published in 'The Oologists' Record' for June, 1936, pp. 25-37, in which the author states that the main object of his paper is to show how far this habit is prevalent among Palaearctic birds, rather than to discuss the meaning and origin of actions in beings whose mentality is utterly different from our own. However, while Jourdain admits that the theory that the bird is the victim of contrary emotions explains most cases, he thinks that it does not account for all; yet he states that the action "is not the result of a thought out plan to make the looker-on believe that the bird has been injured."

POSTSCRIPT.—Following the above account I have had the good fortune this summer (1937) of verifying my suppositions of last year. The birds came back and nested again in the very identical spot in the ground as last year; the first egg was deposited on May 25, the last on May 28. After the laying of the eggs, the female was never seen again at the nest, not even at the hatching of the young (as was the case last year), at which I was fortunate enough to be present on June 17. The incubation period was thus twenty days as against twenty-one of last year. The incubating bird behaved exactly as last year, and again I felt sure it was the male. Arriving at the nest early on the morning of June 17, I found two of the young dried



SPOTTED SANDPIPER BROODING



NEWLY HATCHED SPOTTED SANDPIPER HIDING



out, the remaining two in the wet stage only partially dried out. On my return some two hours later, one young only remained in the nest.

Two days later, from the actions of the parent, all four were discovered with some difficulty sixty yards from the nest. The parent had led them across one track of rails but not to the same ground as last year. At a later visit the same day, the parent had led them still farther away, until they were now 190 yards from the nest, and it looked as if further delay might lose me the opportunity of this time verifying the sex of the parent. Much as I hated it, I steeled my heart and collected the bird from the top of a box freight-car, its lookout post on this occasion, for there were no stacks of timber on this side of the tracks as there were last year. As I had surmised both last, and again this year, the incubating parent turned out to be the male.

It should now prove interesting as well as desirable, to get at the respective rôles played by the sexes in the home life of this species. Do the females, as in the case of the phalaropes, press their suits on the males at courtship times, or otherwise? Unfortunately, sight identifications in this matter have so far proved entirely fallacious, and much as we may dislike it, the matter can only be definitely settled by the judicious collecting of a number of the displaying or aggressive birds at courtship times.

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