

dition of our domesticated animals it is easy for us to give some slight aid to wild birds, leading them to trust to man's habitations as centers of food supply, nesting sites and diminution of enemies. Ample return for this small investment of time and thought is found not so much in the help rendered to man in diminution of his insect enemies, as in the great gain of feathered associates, interesting in form and habits and often the source of pleasure through the ear as well as the eye.

Future developments of such commensal intercourse between man and bird may serve to make human life both more complex and more perfect in its ethical aspects.

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## OBSERVATIONS ON THE SPOTTED SANDPIPER.

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NEXT to the Killdeer, the Spotted Sandpiper is probably the best known of all our shore birds, and in consequence a great deal has been written regarding its nesting and courtship. My own experience with this Sandpiper (*Actitis macularia*) is rather limited in so far as nesting birds are concerned, but some of the notes made are so at variance with what has been published that there seems a good excuse to record them even though they are more suggestive than conclusive. The careful observations of Dr. Loye Miller and Alden Miller are incorporated herein. Their acquaintance with nesting Spotted Sandpipers is so much greater than mine that they should properly be the writers of this paper. However, they have requested that I prepare it, and have very generously contributed their notes concerning these birds.

In the first place, there are many references to the courting antics of the male, but in reading over a goodly number of accounts which have been written about it, I fail to find a single instance in which the courting bird has been collected. It is obvious that in most cases the sex has been taken for granted. In other words, because the birds were courting, they were assumed to be males. The

following extract from Dr. Miller's notebook is significant in regard to this point: "Altitude 9,000 feet; Mammoth Lakes, Mono County, California; July 4, 1923: [Spotted] Sandpipers are just beginning to pair, and several seen in courting flights. One especially active bird was shot and proved to be the female. She came to an imitation of the call,—soared over a fallen log before alighting on it. She then ruffed out the feathers and strutted like a turkey cock, with head thrown back. The ova were the size of buck shot."

The writer joined the party shortly after this date, but because of bad weather conditions we did not go up to the lakes to permanent camp until July 22, and it was only for an hour or so on such days as we happened to be passing the lakes that there was any opportunity to look for Sandpipers. By this date, they were all through pairing and had quieted down for the routine duties of incubation. On July 11, in a boggy meadow near the water's edge, we found a nest of four eggs which seemed nearly fresh. We often had occasion to pass this nest, but there was never more than one bird present. On July 25, the eggs had hatched and after a short search we found the downy young in the short grass. They were collected with the parent, which proved to be the male. The sides of his breast and belly were worn quite bare of feathers, showing that he had done most if not all of the incubating. On succeeding days, we frequently passed the old nesting place, but never saw any other Sandpiper in the vicinity. On July 26, Alden Miller and the writer were on the headwaters of the San Joaquin River, in Madera County, and while there found a nest on a grass-grown gravel bar in the river. It contained young which were just emerging from the shells. These were collected with the parent which, as in the first case, was the male. We were at this nest and in the immediate vicinity nearly an hour, but no other adult appeared. A mile or so farther down stream was another single Spotted Sandpiper which almost certainly had eggs or young in the gravel, but we could not find them, so were unwilling to shoot the parent. A nest which Dr. Miller observed in the Yosemite Valley in 1920 is thus recorded in his notebook: "June 17: Chief Townsley wished to make a group and nest, so we went down and flushed the incubating bird. It soon returned and was collected, and proved to be a male. The other bird was quite wary and would not return to the nest." On visiting this nest the next day, they found that

the eggs were cold and no bird was anywhere about. These eggs were on the point of hatching. The Millers found several other nests in the Yosemite in 1920. In at least one other case, two birds were present, but one was still strutting and the eggs were perfectly fresh. In two other instances, only one bird was on hand. The remaining nests noted are not clear as to the matter of the presence or absence of both birds—usually because nests were rather near together and determination of the number of parents to a nest would have been a more or less uncertain matter.

As a result of these experiences, I had come to have an idea that perhaps the home life of Spotted Sandpipers paralleled that of the Phalaropes, but there is ample evidence that the female is sometimes present throughout the incubating period, and also assists equally in the care of the young. Dr. Joseph Grinnell has written me of three specific instances in which the females were with young or eggs and certainly the impression gathered from nesting accounts in general is that both parents were present.

The foregoing observations certainly indicate that the female is often so lacking in maternal instinct that she will desert her mate and nest for no reason at all, or on slight provocation, while the male is invariably keenly solicitous. Then, too, one of the strongest arguments in favor of the belief that there is at least a strong tendency toward the relation typified by the Phalaropes is that the female does the courting. True, this last statement is based on but one instance, but it is the only specific occasion that I have been able to find where the strutting bird was shot and sexed.

There is room here for field studies of great interest not alone with the subjects of the present paper, but with shore birds as a group. In at least one other species which is covered by personal experience, the male is afflicted with an inferiority complex. During the courting season in July, 1912, one of the everyday sights of a Salvadorean marsh was a male Jacana being pursued by one or more females of half again his size. Unfortunately no eggs had been laid at the time of my departure and therefore the role assumed by the male during the incubating period is unknown to me.<sup>1</sup>

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<sup>1</sup>In this connection it would seem desirable to call attention to Dr. Alexander Wetmore's suggestion that from his study of the body temperature of birds and other investigations, it would seem probable that the reversal of sexual activities was more frequent in the Limicolae than was generally supposed. Cf. *A Study of the Body Temperature of Birds.* Smithsonian Misc. Collns. Vol. 72, No. 22.—Ed.