

NOTES ON THE FLOCKING OF SHORE BIRDS.

BY J. T. NICHOLS.

On Wheeling Flocks.

ONE of the most striking phenomena of flocking in shore birds, although one that is in no wise confined to this group, is the way in which flocks at times fly holding a close ranked formation, and the seemingly instantaneous precision with which they wheel in unison, as though each individual were motivated by a common impulse, rather than adjusting itself to the movements of its companions. This has seemed to me something of a mystery until a recent observation suggested a simple explanation perhaps bearing on the mechanics involved as well as on the purpose of the maneuver.

Two Dowitchers, young of the year, had been frequenting a narrow bit of favorable bay shore screened by sedge grass, for some days if not weeks. On the nearby ocean beach, reached through a short break in the dunes, Black-bellied Plover were usually to be found. This morning about a dozen Black-bellied Plover were alighted on the bay side with the Dowitchers, and sheltered by the grass, we detected a single Golden Plover among them, and had the pleasure of watching it at close range for as long as we desired. We then flushed the flock with the intention of picking out and comparing the Golden with the other Plover on the wing. Its flight was relatively fast, now it bounded off ahead of the flock, and as they wheeled finding itself in the rear, rose above them and dove down through to the front rank with a few swift wing strokes. Similarly the Dowitchers, naturally less fast than the Plover and straggling in the rear, were picked up as the flock wheeled and went off as an integral part of it.

When flocks of shore birds are making a protracted straightaway flight they usually move in comparatively open formation and are particularly apt to straggle when more than one species is involved, the bunching and wheeling is most frequent when a flock takes wing and may well serve to hold it together until the faster and slower individuals have adjusted speeds.

A simple explanation of mechanism would be that the faster finding themselves isolated in the van turn back and in so doing provide a single visual impulse on which the remainder of the flock may swerve almost instantaneously. With this thought in mind I have made a few observations on wheeling pigeons which do not entirely bear it out, it being often, perhaps usually the front rank of one of the sides of the flock which initiates the change in direction. In any event any change in direction is correlated with a change of leadership, and in a flock wheeling back and forth the fastest birds that shoot out ahead cover more and the slowest that straggle in the rear less distance, which if these be the same individuals in each case, amounts to the full diameter of the flock each time it wheels.

Association Preferences of Shore Birds.

When in sufficiently large numbers any shore bird species flocks by itself. Most species have, however, distinct association preferences at other times, which will be helpful in placing a bird the companions of which one knows.

The following occur only singly or in (usually small) flocks of their own kind. Woodcock, Wilson's Snipe, Solitary Sandpiper, Spotted Sandpiper, Upland Plover, Killdeer.

In my experience on Long Island, N. Y., the same might be said of the Hudsonian Curlew, but on the New Jersey Coast Mr. C. A. Urner has seen it in mixed flocks particularly of migrating Curlew and Dowitchers. There the Curlew is also more frequently seen in larger flocks.

The Stilt Sandpiper and Lesser Yellow-legs fly with the Dowitcher.

The Dowitcher and Lesser Yellow-legs fly with the Stilt Sandpiper.

The Semipalmated Sandpipers mix indiscriminately with the Least Sandpiper, and Single Dowitchers or Pectoral Sandpipers as well as an occasional White-rumped Sandpiper fly with considerable flocks of these smaller species.

Single White-rumped and Red-backed Sandpipers flock with the Sanderling on open shores.

The Black-bellied and Golden Plover (occasionally) and the Lesser Yellowlegs fly with the Greater Yellow-legs.

The Wilson's Phalarope, Dowitcher, Stilt Sandpiper, Pectoral Sandpiper (occasionally), Greater Yellow-legs and Turnstone fly with the Lesser Yellow-legs.

The Marbled Godwit and Willet are said to have flocked together in the days of their abundance.

The Golden Plover used to fly with the Eskimo Curlew and vice-versa.

The Knot, Willet, Greater Yellow-legs, Golden Plover (occasionally), Ringneck Plover and Turnstone fly with the Black-bellied Plover.

The Ringneck, when single, flies with almost any species, large or small, from the Greater Yellow-legs (or even an aloof Hudsonian Curlew) to the Least Sandpiper.

Correlation of Gregariousness and Habitat in Shore Birds.

The different species of shore-birds show every degree of gregariousness.

There is a distinct correlation between gregariousness and restricted feeding grounds. Thus the Spotted Sandpiper with great adaptability as to habitat (pond, stream, bay or ocean shore,—mud, sand or rock), at home almost anywhere, is one of the most solitary, the Greater Yellow-legs with more catholic tastes than the Lesser, is less gregarious than it.

The Lesser Yellow-legs as I know it in migration has very distinct preferences for new standing non-tidal rain or flood water, which concentrates the tarrying population about certain relatively few restricted coastal bits of marsh or pools. The species which habitually travel with it (Dowitcher, Stilt Sandpiper, etc.) share this preference. It is at least partially true that concentration on a restricted feeding ground makes a bird gregarious not only with its own kind but with others with which it is thus associated.

Chance unusual feeding associations which bring unlike species together may make close temporary associates of them. Such a case was two Dowitchers in a flock of Black-bellied Plover (mentioned elsewhere). Mr. Urner tells me of Lesser Yellow-legs availing themselves of adjacent feeding habitat and habits of the Upland Plover, and these two species flocking together.

The numbers of each species are spacially restricted some more,

some less, to preferred feeding and resting grounds and migration routes. When the territory is narrow and the numbers are high, a given species will occur in flocks, which species when less abundant would be much more scattering, though its inherent sociability would be partially compensated by mixing with unlike species.

It is partially true that shore-birds bunch up when feeding or tarrying, and scatter out when travelling. Thus the Hudsonian Curlew which seldom pauses on its passage along the shores of Long Island is usually seen passing singly or not more than 4 or 5 together, whereas farther south it occurs in flocks of considerable size.

However, the opposite tendency is observable under slightly different circumstances, either because a definite flight of some species congests its numbers along a given bit of migration route so that flocks are readily formed, or because an unmixed flock of the right size is a social unit not easily diverted. When a flight of Dowitchers is on they move in close bunched unmixed flocks, ten or 20 together being frequent, flying swiftly and silently, and though under ordinary circumstances a sociable, 'gentle' bird, it now will hardly respond to decoys.

Size of Flocks, etc.

A given species of shore birds seems to travel comfortably in flocks up to a certain size, and larger flocks though they will gather and wheel about a restricted bit of favorable feeding ground have little cohesion in moving from place to place. Such size of flock, varying by place and circumstance, would be for the Greater Yellowlegs perhaps a dozen birds, for the Lesser Yellowlegs or Sanderling 40 or 50, for the small (Least and Semipalmated) Sandpipers 100,—on Long Island in southward migration.

Even the most gregarious species also fly singly, but as Horst Wachs has recently (1927) noticed in migration observations on the coast of Mecklenburg, single shore birds are more noisy and fly more hurriedly and irregularly than flocks of the same species. Such behavior is probably correlated to their finding the companions they seem to be seeking. Two individuals, usually, but not always of the same species, frequently travel in company, and three together occur so often that it can hardly be mere coinci-

dence, but rather because this is a small unit with a definite majority to give it cohesion. The shore bird's flocking instincts being what they are, a single would be unlikely to leave (or not to follow) two birds.

There is an interesting recent German paper on the flocking of shore birds by Heyder (1929, *Mitteil. Ver. sächs. Ornithologen*, II, p. 187-194). He finds all species observed more or less gregarious, the Dunlin and Ringed Plover among the most, the Common Snipe and Common Sandpiper (which correspond to our Wilson's Snipe and Spotted Sandpiper) very little so. When the breeding season is concluded and during the ensuing migration period, the various species form flocks primarily of their own kind, but also flock with other species, the tendency of each to enter mixed flocks being more or less in direct ratio with its own flocking tendency. The species may further be divided into those with an active tendency to seek the company of other species, and those which merely tolerate the same, the smaller as a rule belonging to the former group, the larger to the latter, so that in general a species is attracted by birds larger than itself, disregards but tolerates smaller birds. There are also cases of especial affinity as between the Ringed Plover and certain Sandpipers, notably the Dunlin.

The writer can endorse the above generalizations from observation of American birds in migration, and would add that numbers 'draw' almost equally with size, most larger birds, if sufficiently in the minority, will be attracted by smaller birds if sufficiently numerous. Also species are continually 'decoying' to one another, more or less, which from lack of affinity are unlikely to travel in the same flock.

*American Mus. Nat. Hist.,
New York.*