Southern Herons in New Jersey

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THE material increase in the northern flight of Southern Herons along the Atlantic Coast during recent summers is indicated by the following records from nineteen localities in New Jersey compiled from the field notes of the writer and other members of Linnaean Society of New York and Delaware Valley Ornithological Club. Day's maxima from each locality are added:

	1928	1929	1930
American Egret	21	58	264
Little Blue Heron (White)	205	991	1205
Little Blue Heron (Adult)	21	130	31
Snowy Egret		2	11
Yellow-crowned Night Heron	5	11	3
Louisiana Heron			1
Totals	252	1092	1515

In both 1929 and 1930 there were scattered records of small companies of white herons from various parts of the state not here included.

In 1929 Cape May had the principal White Heron roost in New Jersey, the maximum count being 549 of which 124 were dark Little Blues. In 1930 the principal roosts known to the writer were at Barnegat where about 550 birds, including about 12 adult Little Blues, were reported; at Princeton where the high count was 125, practically all in white plumage; a locality west of Troy Meadows where over 75 roosted, and a locust grove on Newark Meadows where the high count was 273. The Cape May Roost was not used in 1930.

The increase in Snowy Egrets in New Jersey in 1930 was most gratifying. The writer saw at least 11 individuals, the largest number being 6, on August 23rd, in Troy Meadows; at least 2 on Newark Meadows (various dates); 2 at Sea Isle City (seen first by William Vogt) and 1 on different occasions at Barnegat Inlet, the last date being Sept. 14th.

The Yellow-crowned Night Herons of 1929 were chiefly immature birds, the largest number a flock of 9 on Brigantine.

In 1930 a pair of adults was seen in mid-May as far north as Troy Meadows (Walsh and others). The Louisiana Heron was seen at close range by the writer on Newark Meadows on August 13th and again on August 24th by John F. Kuerzi.

The dark adult Little Blue Heron has been relatively more abundant in the southern part of the state than to the north, their northern movement apparently being less extensive than that of the young.

During the summer of 1930 frequent trips to Newark Meadows permitted the recording of the rise and fall of the White Heron movement and some facts of possible interest concerning roosting habits. The first recorded Little Blue Heron reached Newark Meadows about July 10th. The number increased quite rapidly after that date, reaching 102 by July 31st and 145 by August 7th (one blue adult on that date carried a band on the right leg). The peak was reached August 30th when 247 white and 6 adult birds were counted and the number held up well until the first days of September, after which there was a rapid decline. Only 86 went to roost on Sept. 13th, 11 on Sept. 21st and but 1 on Sept. 28th.

The season's first reported Egret in Northern New Jersey was on July 5th; the highest number on Newark Meadows was reached on August 16th (41 birds) and the latest record was on Sept. 28th.

From August 13th to Sept 21st on twelve separate evenings I checked the herons as they lit in the locust grove on Newark Meadows. There were apparently several factors affecting the time of arrival at the roost:—(1) time of sunset; (2) light conditions, cloudy or clear; (3) lateness of season (probably temperature); (4) distance from the roost the birds were feeding; (5) the state of the tide at bedtime as it affected feeding conditions. There was a tendency, though not uniform, for the birds to roost earlier as the days shortened. On the darkest, cloudiest evening all were at roost before sunset and on the clearest evening, with moon, the majority went to roost after sunset. But this relation of time of roosting to sky conditions was not constant, in fact the average time of roosting on clear evenings was 25 minutes before sunset

while the average time of roosting on very dark evenings was 18 minutes before sunset, indicating that other indefinable factors had an influence. The distance from the roost was of only minor importance since the Little Blues roosting in the locust grove, as far as I could determine, all spent their days on the surrounding salt marsh and were rarely over a mile or two from the grove. It seemed certain that the birds roosted earlier in relation to sunset as the season advanced, a tendency possibly due to lower temperatures and a desire to seek the shelter of the grove. Feeding conditions seemed to have an influence on the time of roosting. The birds lived chiefly upon grasshoppers and salt water minnows or other forms of aquatic life. Many, each day, left the grasshopper infested salt meadows for the mud flats as these were exposed by the falling tides. If the flats were just uncovering at roosting time the tendency was to tarry and arrive at the roost later than under other tide conditions.

A clear indication of the effect of light conditions upon the roosting instinct, independent of sun time, was observed on August 17th when a very heavy thunder-cloud darkened the sky at 4.30 p.m. As the darkness deepened herons began to fly to the grove. Some 20 had arrived when the cloud parted and these all left the grove as the sun shone forth again.

The accompanying tables give an idea of the time of roosting in relation to sunset and clock time.

ARRIVAL OF LITTLE BLUE HERONS AT ROOST IN RELATION TO SUNSET
(TOTALS OF 12 EVENINGS)

Minutes	*Total Arrivals*	*Per Cent*
80 to 98 minutes before	15	.7
70 to 80 minutes before	56	2.5
60 to 70 minutes before	36	1.6
50 to 60 minutes before	88	3.9
40 to 50 minutes before	120	5.4
30 to 40 minutes before	192	8.5
20 to 30 minutes before	318	14.2
10 to 20 minutes before	554	24.7
0 to 10 minutes before	399	17.8
0 to 10 minutes after	328	14.6
10 to 20 minutes after	133	5.9
20 to 25 minutes after	3	.2

Keeping score by 5-minute intervals the largest numbers reached the grove from 15 to 20 minutes before sunset.

MEAN OR AVERAGE TIME OF ARRIVAL OF LITTLE BLUE HERONS AT ROOST

Date	**Hour*	*Sky*	*Date*	*Hour*	*Sky*
Aug. 13th.	7.37	Clear	Aug. 30th.	7.30	Clear
16th.	7.48	Partly cloudy	Sept. 1st.	7.09	Very dark
17th.	7.25	Dark	3rd.	6.58	Partly cloudy
20th.	7.13	Very dark	6th.	6.50	Clear
23rd.	7.16	Partly cloudy	13th.	6.46	Dark
27th.	7.22	Very dark	21st.	6.00	Clear

* Daylight Saving Time.

The locust grove is situated upon the bank of a creek running east and west, joining Newark Bay to the east. The birds, with the exception of two single birds on one evening, always came to the grove by way of this creek, either from east or west. Those feeding over the easterly half of the marsh or mud fill flew to the creek, and along it to the grove. Those feeding on the westerly half did likewise. It was interesting to note that flock feeding on the marsh a mile or two to the south of the grove would never fly directly to the grove over the marsh, but would first fly east to the shore of Newark Bay, then North along the Bay to the mouth of the creek, then west along the creek to the grove. In other words they came home to roost around three sides of a square. Here we may see an elementary example of how migration routes are first built, the birds returning over the route along which they entered the new region, even though the route was very indirect.

The average time required for all the birds to come to roost, from first to last, was 75 minutes, mostly 60 to 80 minutes, and once, 110 minutes.

Sometimes the birds came to the roost flying rather high, making a beautiful picture as they dropped by side-slips and sharp dips to the grove; other evenings they came very low along the creek and on a few evenings the first flocks would come in high and the late ones low. I was not certain of the factors influencing height of the incoming flocks, but air con-

ditions were probably responsible. The birds would settle first on the branches of the higher dead trees but as the light faded they would fly down into the thick cover nearer the ground and by dusk all would be out of sight.

As stated earlier the peak in numbers on Newark Meadows was reached August 30th. On that evening, after a number of flocks had flown into the grove to roost a group of 10 whites and 1 blue left the grove ten minutes before sunset. For the first time that evening there was considerable calling and squawking among the roosting birds as they assembled and some uneasiness for which there was no apparent cause. The departing flock, the first birds I had seen leave the grove after going to roost, gained altitude as they flew and headed due south. I watched them through the glass as long as they were visible and they passed from sight flying high and holding to a southerly course. Again on Sept. 1st there was considerable calling as the birds assembled and finally a flock of 16 whites and 1 adult left, heading south and flying at a good height. Also, on Sept. 3rd 23 whites and 1 adult flew out in a flock after coming with others into the roost, finally disappearing to the south, flying high. It is interesting, though not necessarily significant, that each flock thus seen to leave the roost and journey to the south at evening, contained 1 adult bird.

ARRIVAL OF EGRETS AT ROOST IN RELATION TO SUNSET
(TOTALS 12 EVENINGS)

No. Minutes before Sunset	*Total Arrivals*
60 to 110	16
30 to 60	30
20 to 30	64
10 to 20	37
0 to 10	35
0 to 10 after	10
10 to 20 after	16

The Egrets roosting in the grove always came from the east, from the direction of Newark Bay. Frequently they spent hours in the grove during the day, usually after eating or while waiting for the tide to uncover the muddy shores. The Egrets did most of their feeding in the shallow water along the

edges of the exposed flats. Their arrival time in relation to sunset as they came in for the night, fairly corresponded to that of the Little Blue Herons on the average, but it was more irregular.

The Egrets, when alighting, mixed with the Little Blue Herons, but later segregated and roosted, well spaced, in the taller trees.

The locust grove for over two months, served as a heron roost 24 hours a day, for the Black-crowned Night Herons roosted there throughout the hours of daylight, flying out a few at a time as the white birds came in for the night.

The 1931 flight of southern herons to New Jersey fell short of any of the preceding three years. Since scattered reports from some of the southern rookeries indicated a fairly successful breeding season and large numbers of birds it would appear that other factors than numbers affect this northern post-breeding season movement. The most likely additional factor is food supply as affected by rainfall and no doubt dry weather in 1929 and 1930 was partly responsible for the heavy flights of those years.