NOTES ON THE AUTUMN MIGRATION OF THE CANADA GOOSE IN EASTERN MASSACHUSETTS.

BY J. C. PHILLIPS.

THE Canada goose presents a comparatively easy mark for migratory study, and the notes which follow are based on data from the following sources:

First. Ten years continuous observations at a stand on Wenham Lake from about September 20 to about November 20, some years well into December.

Second. Five years continuous observation at Oldham Pond, Pembroke, from before October 1 to December 23–27.

Third. Record of first geese shot and totals of stand at the Island Oldham, 1876 to 1897. Scores at Baker's camp, Oldham, 1896 to 1904.

Fourth. Goose killings at a large number of gunning camps from all along the flight-belt. It may be here stated that these totals can be accepted as accurate, because, there being intense rivalry among the stands, the result of almost every shot is seen or heard among the neighbors, thus rendering exaggeration nearly impossible.

Daily Records.— The method of recording data at Wenham and Oldham Camps has been as follows:

At the end of each day the weather is briefly recorded, with the number and species of all fowl seen flying, and of all which lit in pond, together with those shot and details of shooting. Watch is supposed to be continuous, but is necessarily interrupted for meals, camp work, etc. Watch is usually kept on moonlight nights during flight-time for at least the first part of the night.

Scope of Notes.— In the notes that follow, I have attempted to gain a more accurate idea of the time, direction, volume and width of the autumn coastal flight.

General.— I have had a chance to study the geese in August, in James Bay, where the young families were beginning to arrive on the great marshes from the inland muskegs and ponds; and the flocks were mainly composed of separate families of from five to eight birds.

Currituck, N. C., has been visited nearly every winter for the past eleven years, and close observation and inquiry has led me to believe that geese are slightly on the increase in that sound. This may be due to a partial shifting of more westerly flights owing to changed conditions of the country, to an increase in the Atlantic Coast flight, or to a complex of conditions of which we are ignorant.

The score in geese at one club at Currituck, for the past season, was over one thousand; though this is an especially favorable place. At this same club 5795 geese have been taken in the last 22 years. 1909–10 is the largest year, corresponding with largest flight at Oldham Pond. It does not seem possible that geese can be even holding their own, though old goose gunners in Massachusetts see no decrease.

Arrival in Massachusetts.— Turning to Massachusetts, I find my earliest date for arrival is at Wenham, September 28, 1900. Earlier flocks have been noted, but I am not entirely satisfied that they were not cormorant, so I shall not consider them. In 1904 there is a date for killing on October 1 at Wenham. From 1900 to 1909, the average appearance at Wenham is October 16. The latest appearance is November 16.

The past five years at Oldham Pond, Pembroke, show earliest October 15, latest October 22, average October 19. Dates of first killing at the old Island camp, 1876–97, are earliest October 11, latest November 8, average October 23. I note that the ten year average at Wenham is earlier than any other average, which is curious, because fewer geese occur there. Since then I have found an earlier date, October 2, 1891, for Oldham — 6 out of 7 geese shot.

Perusal of my Oldham books shows in a general way an October flight from the 15th to 27th, which is followed by an entire blank. The November flight begins from November 5 to 19, the dates for the five years being November 8, November 5, November 19, November 8, November 5. Thus there is an interval during which no geese are seen. It averages seventeen days, or 12, 11, 27, 23 and 15 days respectively.

The birds in the early flight are apt to be low and to decoy well. No great flights are noted, and I should doubt whether they ever occur.

The November flight lasts for a long time, interrupted by periods

of a week or more during which no geese are heard of from any points. It lasts up until Christmas time, or a little before, the bulk having passed by December 1. It is apparently always followed by a small migration during the first week in January. Geese have often been reported to me at Ipswich during this time, and at Accord, Mass. The latest date which I have recorded is January 11, 1907, though I dare say there are much later ones. In early January, 1909, there was a good flight at Accord; as many as four or five bunches being seen in one day.

I have a letter from Mr. T. C. Wilson of Ipswich in which he says, "I gunned all day in a flight of geese, January 3, 1905 or 1906, — I can't recollect which date, but there were plenty of them. I killed four. In 1908 I killed one out of three on January 5, but they had been hanging around for some time."

It should here be stated that there are only very rarely any "tending" geese in the belt of migration which we are considering. Farther out on the Cape and on Martha's Vineyard a few spend the whole winter, especially if it be mild. Wood's in the 'New England Prospects,' 1634, says in regard to Geese: "These come in great flocks about Michelmasse, sometimes there will be two or three thousand in a flock: these continue six weeks and so fly to the southward, returning in March and staying six weeks more." This state of affairs, however, has passed long ago.

I have no systematic records for the spring flight, and will dismiss this subject by simply saying that it occurs in Massachusetts, well to the east of the fall flight belt, and that the birds have a tendency to tarry on the outer Cape and Vineyard.

Total Bags for Eastern Massachusetts.— To get an idea of the entire toll taken from the ranks of the geese in Eastern Massachusetts during the fall, I gathered a number of records from the stands in 1908, and allowing for those I did not know about, arrived at the figure 1450.

For the past season, with more extended data and a better goose year, I reached the figure 1900.

These figures in detail for 1908 are as follows:

Oldham Pond, Pembroke	96
Pleasant Lake, Harwich	9
Accord Pond, So. Hingham	120
Bog near Accord	30
Jacob's Pond, Norwell	25
Duxbury Bay	350
Silver Lake, Kingston	325
Great South Pond, Plymouth	125
Weymouth Pond	160
Whitman Pond, Weymouth	85
Robbins Pond, E. Bridgwater	100
Monponsett Pond, Halifax	70
Furnace Pond, Pembroke	8
Indian Head	2
Wenham Lake	14
Punkapoag Pond	about 120
Chebacco Pond, Essex	46
Clarke's Pond, Ipswich	about 40
Martha's Vineyard	about 25
All others	about 150
Total	1900

Map of Flight.— Various records for Essex County have showed that the western edge of the flight crosses Cape Ann near Essex, and that at Wenham we are just outside of it. For four years during which late records were kept at Wenham, an average of only 143 geese a year were seen, about 12% as many as the Oldham average. At Chebacco Lake, four miles east, many more are seen and taken each year,— therefore, we are here in the neighborhood of the western edge of the flight belt. Chebacco Pond records for the past six years have been examined with this point in view.

South of Boston, we find Punkapoag and Quincy Bay inside the belt. Passing east, we cross the flight-belt, which is about 36 miles broad and has its eastern edge roughly at Manomet Point, Plymouth, or the eastern coast of Buzzards Bay. I cannot find that such great flights as are witnessed at Duxbury Bay and Mattapoisett occur much further east. The ponds southeast of Plymouth, such as Long Pond, Halfway Pond, White Island Pond, and Billington's sea were never famous as good ponds.

As we go out on the Cape, we find the flight more and more scattering and irregular. At Pleasant Lake, Harwich, as many as 60 have been shot in the fall, and sometimes scarcely any at all,— last year 9. The same conditions hold at Cliff Pond, Brewster, Eastham Pond, and Gull Pond, Wellfleet. All these places occasionally get geese, but there is no dependable flight. It is the same with the Vineyard. I am told on good authority, from two different sources, that the fall bag for that island will not average much over 25 birds.

Direction of Flight.— It is interesting to try and get at the direction of this overland flight. So many times flocks going over

Hanover Four Corners, and identified there by count, have come straight over Oldham Camp, that I take this as a common direction line.

If we join these points we get a direction 20° east of true north. Now if we draw out this same course south of Essex, we find it touches Punkapoag Pond, as I think it should. Placing a parallel line to this through Manomet Point, we include a belt 36 miles wide which is strikingly parallel to the coast between Portland and Boston, and some distance off shore.

South of Massachusetts the flight must bend east. A considerable flight noted at Wenham and Oldham November 13, 1909, was recorded on the same date at Montauk Point, Long Island, as a "constant stream of geese." The general direction of large numbers of geese passing over us at Oldham has been noted. I should say that this was seldom over 35 degrees east of north. Of course, in heavy westerlies the birds must have to head into the wind to allow for drift.

Lines of Flight.— It is difficult to say whether inside our belt there is any preference for certain lines. It is a noteworthy fact that a flight lasting a day or more is very apt to follow a certain line. On November 18, 1908, I note,— "For last four days good flight at Accord Pond. Score for Pond 89 geese, none seen at other ponds." This sort of thing happens all the time. It is also a common observation, especially when a flight is on, to see one bunch following up another, and in sight of it. Often several bunches have come into the pond inside of five minutes. Valley routes seem to be preferred. At Wenham we have a striking example of this.

Birds are seen when they are looked for, and we know that at the following places considerable flights are seen every season: Weymouth Great Pond, Whitman's, Accord, Oldham, Silver Lake, Duxbury Bay, and Great South Pond. It will be noted that the best goose ponds are those lying within the flight-belt and nearest Massachusetts Bay. In reply to a letter asking about the size of goose flights at Duxbury, Dr. Rockwell Coffin writes me as follows:

"I should say I have, at times, seen between 2000 to 3000 geese in a day, many of them outside of the sand bar, and so far away that it is impossible to tell them from brant unless one uses a strong

glass. Besides these, during a flight we have a good many going over the island at night, which we can hear but not see. Last year, 1908, in the big flight, I have heard it said that at least 10,000 geese passed in one day, but probably this is an exaggeration."

Of course, it is probable that such large and attractive sheets of water as Duxbury Bay concentrate a migratory wave, even if few birds are stopping, and the same may be true with the larger ponds to a lesser extent. However, there are no extensive observations that I can find on points away from the ponds.

Calculations for Number.— Now as to the Oldham records on the point of numbers. I have the totals and averages for the past five years of all geese seen from this point. Flocks that are unestimated, of which there is an average of five each year, I place at 35, this being the average size of a migrating flock, as taken from a list of about 40 bunches which were carefully counted. Many of these unestimated bunches were large ones, so we are on the safe side.

The smallest year was 1906 — 458 and 9 bunches.
The largest year was 1909 — 1649 and 4 bunches.
The total average of geese per year is 1145.

To this I think it fair to add 50% more for all those passing unobserved in the night, for those which escape observation in the day time, and for the January flight. We then get a total yearly average of 1717. Now the arc of sky under observation at Oldham is comparatively narrow. Geese east of us can only be seen a very short distance on account of flat land and high timber, and west of us across the pond the land is fairly high. I assume this arc to be about 1½ miles wide. Some high geese would be visible outside of the limits thus set, while I think low geese near either edge might not be seen at all. The estimate of the width of this arc is of course open to serious error, but it is the best that can be done for the present. If then we divide the whole flight belt of 36 miles into 20 belts, each of 1½ miles, we get a yearly total of 34,340. Outside of our 36 mile belt, it is useless to speculate, but it seems probable that by far the largest proportion of the Atlantic coastal flight is included between our parallels.

I know very little about the height that geese may travel at. It is possible that many flocks may escape observation from their

height alone. The gunner usually depends on his decoy geese to show him high flying fowl.

The above estimates are, of course, only of comparative value, and must not be taken too literally.

Weather.— Every one who has gunned for migratory geese knows in a general way that calm weather or brisk southwesterly winds are better times to decoy birds than during northerly to northwesterly winds. Geese will almost never stop in brisk northwesterlies, though heavy flights occur on these winds. The gunner does not expect and only rarely does he see geese during easterly weather. Probably geese never start a migration with winds directly behind them, or with a low pressure area about them, but occasionally they run into a sudden local disturbance.

In an attempt to find out something more on this subject, I studied the United States Weather Charts corresponding to the dates of 12 big flights. I took only my own records for these dates. The weather charts run up to Father Point, Quebec, and include observation in Newfoundland. It would take a lot of work and careful study of the Canadian records to enable one to make definite statements. Speaking very generally in regard to the whole Northeast Coast, the most noteworthy feature of the weather on the dates of the flights seems to be absence of wind, or winds light N. W. to N., and lack of low pressure areas, though these may just have passed northeastwards over the Gulf of St. Lawrence.

An attempt was made to group flights into two classes,— Favorable and Unfavorable,— placing in the first class those high flights that paid no attention to decoys or ponds, and in the second class, periods when geese flew low and decoyed well. The data available are not sufficient, but seem to point to the fact that geese feel more like stopping after a long flight through calm warm air than during moderate to brisk north to northwest weather, even if it be complicated by cloud and precipitation.

Habits.— I cannot close without saying a word about the curious fact of migrating geese entirely losing their heads when a good shot is made among them. At such a time the same geese that would spring at the slightest notion of danger, will often allow themselves to be shot from a boat. I have once or twice seen wild geese sit on the beach after a shot has been fired. This must be

due either to a very strong interdependence of the flock, or to utter stupidity, and we can scarcely credit it entirely to the latter. Although geese are so very shy at home, they will at times light in the most astonishing places. At Wenham, geese have lit in a flooded orchard in the spring in answer to a few honks from captive geese, and wild geese were twice caught in my breeding pens on a small brook. They do not appear to pay any attention to buildings or artificial stationary objects if they once make up their minds to come to decoys, and in this way are wholly unlike their smaller cousins, the ducks.

In confinement geese are interesting pets and just fail to attain the state of complete domestication. Under the ordinary conditions of confinement, only a certain proportion mate and breed, many remaining celebates to a green old age.

Variation.— In regard to variation in the wild state, we notice a great range in size, and a considerable difference in the whiteness of the breast feathers. This last is not a difference due to age, as old geese kept by me are almost perfectly gray underneath, others close to pure white.

A gander of one of my mated pairs showed a very distinct ruddy tinge to the tips of the feathers of the upper back and sides, and this peculiarity was passed on to his young, though to a lesser degree. I have seen this variation several times in wild birds.

One hears a great deal of talk among gunners in Massachusetts about the late flight of white-bellied geese. These are supposed to be shorter necked and whiter on the breast. I have seen flocks consisting of probably a single family which were certainly white and full feathered, but I imagine these are birds which hatched and moulted early. It may be that a pair of birds showing less pigment than the average will have young like themselves.

Mr. J. W. Whealton of Chincoteague, Va., who has raised a great many Canadian geese on that island, has been reported by Mr. Beebe as believing in a distinct northern and southern race of geese, though no definite reasons for this statement are given. The northern race is supposed to be larger.

It is hoped to continue observations at Oldham Pond for the next five years which, when compared with or added to the present records may be of some interest and significance.

Brant.— At Oldham Pond the records for five years show the occurrence of Brant only four times. 1905 — 1 in pond, flock of 30 flying. 1907 — 1 in pond. 1909 — flock of 18 in pond. This shows clearly the preference of the Brant for the longer and more easterly route outside Cape Cod.

SUMMER AND FALL BIRDS OF THE HAMLIN LAKE REGION, MASON COUNTY, MICH.

BY RALPH WORKS CHANEY.

THE records upon which the following list of birds is based were taken in the Hamlin Lake Region, in Western Mason County, Michigan, during a period extending from June 20 to September 27, 1909.

The main portion of Hamlin Lake is some seven miles long and opens into Lake Michigan on the west through a channel less than a mile in length. Entering Big Hamlin from the northeast is Upper Hamlin Lake, which is less than half as long as the larger lake, and only half a mile across at its widest point. Into Upper Hamlin from the east flows the Sable River, at the mouth of which are large marshes, which I did not explore. Many small streams, usually heavily wooded, flow into Upper Hamlin, widening at their mouths into swampy "bayous" bristling with tall stumps and snags. Woods rise up on all sides of the lake, especially on the north, in which direction they extend for many miles. Formerly a lumbering country, this region now contains but few white pines, most of the timber being hardwood, beech, maple, oak and birch. Hemlock also is commonly scattered through the beech woods, and along the creeks arbor vitæ is the most abundant form. Parallel with Lake Michigan, numerous sand ridges extend toward the north, the tops of which are covered with oak and hemlock. The little valleys between these ridges are almost jungles, from their profusion of saplings, ferns, blackberry bushes, and other under-