

It was rather shy, and occasionally flitted from one brush pile to another, keeping quite well concealed the greater part of the time, but giving me several opportunities to obtain fine views of it. Unfortunately I had no gun with me at the time, and therefore could not collect it. I was perfectly familiar with the local race of the Grasshopper Sparrow, which is the only other Sparrow found on the island.

9. ***Geothlypis trichas brachidactyla.*** NORTHERN YELLOW-THROAT. —On April 18, 1924 I observed a brilliant male Yellow-throat at Desengaño. Although it was not collected it was observed at very close range in a pile of bamboo brush near a pool of water. I believe this is the first definite record of the occurrence of this species in Porto Rico. Dr. Wetmore¹ lists it as of uncertain status for Porto Rico, on the basis of rather vague statements of older writers.

In conclusion I wish to express my thanks to Dr. F. M. Chapman and Mr. W. de Witt Miller of the American Museum of Natural History for permission to examine the specimens in that museum, and to Mr. Miller for his critical examination of some of my specimens, and especially to Professor A. A. Allen, of Cornell University, for his helpful advice and guidance throughout my work in Porto Rico and since then.

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THE BIRDS OF THE DES MOINES RAPIDS.

BY W. E. PRAEGER.

THE Des Moines Rapids are no more and that fact is the chief excuse for publishing these old notes. Where the rapids used to be is now "Lake Keokuk" formed by the great Keokuk dam. The Rapids formed a unique feature in the course of the Mississippi, nothing like them occurring elsewhere between St. Paul and the Gulf. The present lake is almost as unique, few comparable stretches of deep, slow water are to be found in the whole length of the great river.

Ecologists certainly missed an opportunity when no careful survey of the biota of the old rapids was made. This could easily have been done especially as the river bottom was extensively bared during the building of the dam. The physical conditions were well known and weather and river changes had been recorded

¹ Wetmore, Alex., 1916, *Birds of Porto Rico*, P. R. Insular Experiment Station Bulletin, 15, p. 99.

for many years. It would have been most interesting to be able to record the changes in the biota that must have taken place with the creation of the lake.

The Des Moines Rapids "lie in a gorge cut in the Keokuk limestone, quite uniformly seven-eighths of a mile wide between bluffs, and twelve miles in length between Montrose and Keokuk. The river bed itself is generally three-fourths of a mile wide and the floor is remarkably uniform in elevation from shore to shore, so uniform as to be practically covered even at low water."

The fall in the twelve miles was given as 23.8 feet at highest water and 15.7 feet at lowest, but this was not uniform. For four and a half miles, as far as Nashville, it was less than a foot to the mile. At this point the government canal began and bordered the west side of the river to the foot of the rapids at Keokuk. In this stretch the slope was broken at low water by "chains" of more resistant rock, and here the river became more truly rapids. At high water the surface of the river might be unruffled and steamers could pass over the rapids and not use the canal. Broken water appeared when the river was low and even a log raft could not have come down in safety. The extreme range of the water level in 20 years was 12 feet at Nashville and 20.7 feet at Keokuk and the extremes of volume were given as 20,000 and 372,500 cubic feet per second.

It was my fortune to have my headquarters at Keokuk from 1883 to 1897 and during the later half of that period to live on the bluff overlooking the rapids. The river was under frequent observation though often only for a few minutes in a day owing to the demands of business. Never twice did the great river seem the same, its changes were fascinating, but it was the life upon it that especially attracted me. A field glass only enabled me to be sure of the birds on the Iowa side, but I was occasionally able to borrow a telescope and then, if the light were favorable, birds could be identified across the width of the river.

Often, especially during migration, the river valley would be full of life; the birds mostly on the water and drifting rapidly down stream. At the foot of the rapids the Keokuk and Hamilton bridge crosses the river and rather than go under it the birds would rise and fly up stream, sometimes for a few hundred yards, some-

times for several miles, only to be again carried down to this barrier. Thus there was often a congestion of birds, especially Ducks, towards the bottom of the rapids and the same individuals would repeatedly pass my point of observation.

The western bank of the rapids was parallel by the dyke of the government canal, now submerged. There was therefore no shore; the steep outer slope being of rough stone, with occasionally some bushes. The eastern bank was in its natural condition. Bottom lands, so characteristic of Mississippi scenery, were almost absent and the beach was usually narrow, rough and stony. About a mile and a quarter above the bridge on this side, Chaney Creek entered the river, and from here sandbars and low islands began and attained a considerable width before the bridge was reached.

Below the bridge a complex of islands, sloughs and sand bars stretched as far as Warsaw. In my day these islands were largely covered by a magnificent bottomland forest. Opposite Warsaw the Des Moines river joined the Mississippi and below this, in both Illinois and Missouri, the bottom land extended several miles from the river. These lands were liable to flood, and though the soil was so rich, had largely up to that time been neglected by the farmers so that much wild land remained. Here were lakes, ponds, sloughs, rivers, marshes, prairies, both wet and dry, and heavy and thin timber. These bottom-lands were wonderfully rich in bird life and much frequented by hunters in spring and fall.

To return to the rapids. The fluctuating depth of the water made frequent changes in the conditions, though I have never noticed any definite correlation between the depth of the water and the bird life on the surface. The birds of course avoided rough water and used exposed sand or rock for perching at low water. But in winter the conditions of the ice evidently influenced the bird fauna. Above the swift and shifting currents the ice, except in periods of steady and intense cold, frequently moved, piling itself into great ridges or leaving patches of open water. In times of low water and where the ice might touch the rocky floor, the changes were rapid and sudden. If the season were mild the river might not close all winter, but this was rare. A few extracts from my old notes may aid in picturing these conditions and the bird life associated with them.

January 4, 1891; "Showery, changeable, with few cold days and only one light snow. On the rapids Ice-Ducks (Goldeneyes) were common and a few Mallards were seen almost daily round the rock piles.

Geese were not seen till the 20th, but from that date several small flocks, aggregating about 100 birds, spent each night on the sand-bars between Chaney Creek and the bridge. They usually left the bars early but stayed on the river swimming up stream till full daylight when they rose and flew eastward."

Jan. 9, 1891; "Ice gorge on the rapids and river down to 2.4 below guage and in consequence the city was without water for a day."

(1890) The coldest spell of the winter was the first week of March; five below zero recorded. The river closed on the 6th, and opened on the 11th.

March 15, 1894; "Today saw on the market, shot on the rapids twelve species of ducks:—Mallard, Baldpate, Gadwall, Greenwing, Bluewing, Spoonbill, Sprigtail, Redhead, Bluebill, Blackjack, Iceduck, Butterball. There was one female Bluewing. This is two weeks earlier than usual. The only common migrant I have not seen as yet is the Wood Duck."

March 1894; "On the night of the 24th, it turned very cold with strong N. W. wind and on that and the two following nights there was about 20 degrees of frost while it was far below zero in the Dakotas. After the warm weather which had made the spring two to three weeks early the damage done to foliage was very great.

"With the cold wave the Ducks all came back in great numbers and were observed to fly high overhead in a southerly direction. Large bags were made by all hunters; two men killed ninety Ducks in one day near the mouth of Chaney Creek.

"On the 27th, it got warmer but the next morning the wind turned west with light snow and that night it was very cold again. The Ducks and Geese were thicker than ever; they were a drug on the markets, even in Chicago, and in some towns Mallards sold at three for 25 cents. *Dafila acuta* had mostly gone north and did not return with the first cold snap; on the 28th they were very abundant however. *Anas americana* and *Aythya americana* were the two commonest ducks, both unusually common."

November 7, 1892; "Up to this date Ducks had been very scarce, only a few small flocks had been seen. Yesterday it was wet with a strong south wind. At three this morning the wind turned west and it became rapidly cooler; the night was fine, cloudy, with a full moon. At daybreak the rapids were covered with Ducks, fully a thousand of many species right in front of our house where there had not been one the previous evening."

March 16, 1896; "Today Wooster brought in the result of three days shooting with a shoulder gun on the rapids. Three *Olor columbianus*, out of a flock of nine, 3 *Chen caerulescens*, one *Anser albifrons gambeli*, one *Branta canadensis*, 60 *Anas boschas*, 5 *Dafila acuta*, 10 *Anas carolinensis*. The weather had been cold with a good deal of small drift ice but not blowy or snowy."

The method of shooting on the rapids was to anchor the boat and let the birds drift down on it. Often the birds would not come near enough for a shot and chances were very uncertain. To collect the dead and wounded the anchor had to be slipped and after some vigorous rowing in the swift current the old position was regained. The boat used for this purpose was usually the flat-bottomed skiff. This is indeed the best type of boat for general river purposes if properly built, but badly designed skiffs were common which seemed to have made this interesting craft unpopular.

When watching the birds at long range through a telescope the size is often lost as there is nothing with which to compare the image of the bird. I found under these circumstances the light colors in the plumage to be the best guide to the species and often diagnostic. Most of our male ducks have light patches in the plumage that can be easily seen even when no other colors can be recognised, and whose position identifies the bird. I came to consider these marks "signal colors."

The question arises as to what birds should be considered characteristic of the rapids, or which species had any relationship to other members of the biota. It seems best to include those belonging to the first five orders in the A. O. U. 'Check-List'; the web-footed birds. Few others have any share in the ecology of the river. The shore birds, which migrate in numbers, are characteristic of the sandbars and sloughs and less common on the narrow

stony eastern shore of the rapids, while they are absent at all times from the "riprap" on the west bank. Apart from the "Natatores" I need only mention six birds that were at all conspicuous. The Coot or "Mudhen" often mingled with the Ducks in spring and fall. The Great Blue Heron frequented the eastern shore and occasionally the rock piles when the river was low. His smaller relative, the Green Heron, was a common summer resident and often seen. The Bald Eagle occurred at all seasons except midsummer. In winter they often lit on the ice or lingered around the "air-holes." They were on the lookout for fish or carrion. I only once saw a bird attacked and that was a badly wounded one which an Eagle took from me. The Osprey was common in April and September. Except one in early October, all my notes are in these two months. The Kingfisher was common along both sides of the river and doubtless took a considerable toll of the smaller fish.

I have usually quoted verbatim from my note-book; omissions and slight alterations for the sake of clarity were sometimes desirable. These broken records of bird life under conditions that are past may be of sufficient interest in themselves to justify publication. But it is to be hoped that in the future a study of the bird life of Lake Keokuk may be made by some fortunate observer when agreements with or changes from the following list can be recorded. Then my notes may become of much greater value than they can possibly be by themselves.

Colymbus auritus. HORNED GREBE.—It is strange I have so few records of this bird. I think I have occasionally seen it in the distance but never could be positive; perhaps the swift water was not suited to it. My only specimens were two shot some miles south of the rapids on October 23, 1895.

Podilymbus podiceps. HELL-DIVER; PIED-BILLED GREBE.—A common migrant and frequent summer resident. In spring and fall it was often to be seen on the rapids but in summer frequented the small ponds and marshes. I saw several on the rapids on July 2, 1898. Earliest date April 9 and latest November 5. It was most common in September and the first half of October.

Gavia immer elasson. LOON.—Frequent on the river in the late fall and never observed at any other season. Earliest noted October 24, and latest November 14. The birds were always in winter plumage except one shot on October 31, which showed traces of the summer condition; this was an exceptionally large bird, but it, and five others whose measure-

ments I have preserved, were within the limits of "elasson." One obtained on the rapids had in its stomach eleven fish from two and a half to six inches long. There is frequently gravel in the stomachs, though what the use of this may be to a fish-eating bird is hard to say. On July 4, 1889 a fine specimen in full summer plumage was captured alive at the Goose Ponds in Clark Co., Mo. It was chased into the reeds and there taken. No other bird was seen.

Stercorarius parasiticus. PARASITIC JAEGER.—One that had been shot opposite the city was brought to me on October 6, 1896. This is the only record. The skin is now in the museum of the University of Iowa.

Larus argentatus. HERRING GULL.—Common in early spring and late fall and a few seen through the winter. My earliest date for migrating birds is February 9, 1896, when they were common, but other years they might not be observed till March was well advanced. All my fall records are between September 14 and October 11. When the river was ice bound save for a few patches of dark water in the white snow, I have seen large gulls, probably of this species, around these "air holes," usually solitary birds, facing the cold and want.

Larus delawarensis. RING-BILLED GULL.—My positive records of this bird are very few, perhaps from the difficulty of distinguishing it from the more common Herring Gull. I have notes of its occurrence on April 4 and 12 and October 24.

Larus franklini. FRANKLIN'S GULL.—An irregular migrant. I have very few notes of this bird on the rapids. One I examined was shot on October 7, 1888. I have this note for November 17 and 18, 1891:—"A very severe cold snap came with great suddenness and the river was full of floating ice. Many boats and rafts were caught. Small Gulls (probably *L. franklini*) became very abundant on the river."

I have no records of Bonaparte's Gull though it probably occurs.

Sterna caspia imperator. COUES' CASPIAN TERN.—I have no note of this species in the spring. All my records are between September 9 and October 15. Five different autumns I have seen them on the upper bars near the mouth of Chaney Creek. Both old and young birds were usually present. In 1891 I have the following note:—"On September 19, a small compact flock passed flying south; on the 20th, a few were seen on the river, on the 21st, fifteen were together on the edge of the bar, some on the sand others in the shallow water."

"September 9, 1894. Very warm; in the afternoon watched several Caspian Terns flying over the shallows opposite our house. A boy appeared with a gun and shot several, for they were very tame, and let them float down stream. The terns remained till the afternoon of the 11th. They mostly rested in the shallow water and not on the sand."

On another occasion I note; "they kept calling loudly, their note is a harsh 'kwa-ah' or 'kwaw,' but they frequently give a loud sharp whistle."

Sterna forsteri. FORSTER'S TERN.—Occasional on migration. Two or three Terns stayed about the bridge for the first half of May 1888, and

one collected on the 12th made the species certain. On September 14, 1890, I note them as common. The common Tern may occur but I have never identified one.

Sterna antillarum. LEAST TERN.—I never saw it on the rapids. There are skins without records in local collections and they have been seen on sand-bars nearby in summer.

Chlidonias nigra surinamensis. BLACK TERN.—All records are in late spring and summer. The earliest is May 11, and often not seen till the middle of June; irregular in their appearance, common on August 4, 1898, and on July 20, 1898. On May 16 and 17, 1890:—"very abundant, the river was high and a quantity of debris was coming down stream; the Terns were perched on logs and other floating objects."

Phalacrocorax auritus auritus. DOUBLE-CRESTED CORMORANT.—An abundant migrant in April and October. Notes run from April 5-12, and from August 29 to October 27.

October 6, 1891: "After a spell of warm weather the wind turned N. W. with wind and rain and in the evening 33 degrees with snow. Oct. 7^o—Slightly warmer. Cormorants very abundant in the river; on the rock piles, on sand-bars, in the shallows, and swimming. The lower birds kept rising and flying to the head of the flock as it drifted down. At noon fully 200 had congregated on the third rock pile." April 5, 1885:—"Three Cormorants passed overhead; one of them kept uttering a note consisting of three short notes repeated in quick succession. This is the only time I ever heard a sound from a Cormorant."

Oct. 6, 1896:—"A Cormorant was brought to me alive. It had flown into a tree close to an electric light and, apparently quite blinded, was captured easily. There was a large migratory movement at the time."

April 27:—"Rowing in the sloughs; a flock of between 60 and 80 Cormorants passed over flying northwards in a single curved line."

Though these birds breed in central Illinois I have never seen them in the summer on the Mississippi. On a trip to St. Paul and back by the river between May 23 and 31, 1896, I did not see a Cormorant.

Pelecanus erythrorhynchos. WHITE PELICAN.—This glorious bird was a regular migrant. Noted in spring from April 11 to May 16, and in the fall from July 27 to October 4.

My earliest note for the Fall is July 27, 1893:—"No break in the heat and drought; a flock of Pelicans passed down the river this evening."

September 3:—"When two miles east of the river, a flock of about 500 Pelicans passed over flying west. They were in a network of lines across the sky with a long tail stretching out behind. It was curious to see how each bird followed every movement of the bird in front, either sideways or up and down." Another note says: "It was noticeable how the leader settled the mode of flight, whether flapping or sailing, each bird following suit, so that this passed slowly and regularly down the line; this probably was to maintain the same elevation."

September 14, 1885: "A flock of about 500 Pelicans passed over the city

this evening flying due south. They were flying in lines making a perfect network on the sky. The sun had just set and there was a strong red light from the west; as the birds' wings fell and rose their bodies looked black or shining rosy white. The sky was clear dark blue and the whole effect very curious and beautiful."

Mergus americanus. GOOSANDER.—Of regular occurrence on migration in small numbers. In spring from Feb. 24 to April 29 and in Autumn from Aug. 6 to Nov. 16.

February 24, 1895:—"Warm and clear but no migration as yet, and ice covers the river. In the afternoon watched through a telescope the Ice Ducks in the air-holes on the rapids. Among them was a pair of Mergansers; they were expert divers and very quick under water but did not remain long below."

This bird was sometimes called "Shelldrake," but usually all Ducks of the genus were simply called "Fishducks."

Mergus serrator. RED-BREADED MERGANSER. A rare migrant.—Probably seen on the rapids but females could not be distinguished from the preceding species and I never saw an adult male. The only time I ever had specimens in my hand was on February 14, 1890, when two females were shot.

Lophodytes cucullatus. HOODED MERGANSER.—Common as a migrant and occasional in summer; probably breeds. My earliest note is March 15, and they were common through April. In May I have several notes of flocks on the rapids, the birds usually in compact bunches of from twelve to twenty-five birds and apparently not paired.

July 11, 1894:—"M. Meigs brought me two Ducks killed with one barrel while flying over the canal. They were young *L. cucullatus*."

June 16, 1896:—"This evening there was a flock of 30 *L. cucullatus* on the rapids, apparently all young birds. Two other small Ducks were with them, probably *Q. discors*. July 1, 1897, A bunch of six young *L. cucullatus* on the rapids."

This bird seems to have no specific local name except rarely "Hammerhead." When the crest is depressed the reason is apparent. The crest is rarely raised, only at times of sexual excitement. I have few notes of their food; one taken in November had a fish four inches long in its stomach.

After the above note of July 11, I have not a single record till Oct. 28. They are often very abundant about the second week of November and my latest note is dated December 14.

Anas platyrhynchos. MALLARD.—Abundant migrant and rare winter resident. Most common in the last half of March and last half of October. Latest date in the spring May 20, and first in the fall September 5.

December 1890:—"A flock of Mallards were frequently seen on the rapids, usually on a stone pile or swimming near it."

The Mallard is usually in small flocks and in April is often paired. On March 5, 1896 a hybrid between the Mallard and Pintail was brought to

me; it had been shot on the rapids and was a male and a very beautiful bird.

Anas rubripes. BLACK DUCK.—Very rare, never seen on the rapids. The bird seems to be known to local sportsmen and it was said to be common on the Mississippi further south. The only one I ever saw to be sure of was purchased at a store on February 29, 1896. Its large size (wing 10.9) and tarsus and feet bright orange would seem to place it in the red-legged variety.

Chaulelasmus streperus. GADWALL.—A fairly common migrant but never abundant. It probably breeds in the vicinity. My own notes run from March 10 to May 1 and from October 20 to November 21. The bulk comes rather late, it is usually common during the second week in April but is scarce in the fall.

April 29, 1890: "*A. strepera* on the rapids in some numbers. The first I have seen anywhere this spring."

Marila americana. BALDPATE.—A migrant of irregular occurrence. Earliest date March 4, and usually common the last week of that month; scarce in April but I have notes of its occurrence in May. A solitary male on the rapids on May 21, 1900 is the latest date. In the fall it has occurred from October 14 to November 21, but is not common. The great flight of this species on March 27, 1894, has already been mentioned.

Nettion carolinense. GREEN-WINGED TEAL.—This is a cold weather Duck. Common in early spring and late fall and occasional in winter. Usually abundant in the last half of March and from October 10 to November 10. My earliest date is October 1 and latest April 1.

They were often common on the rapids. On March 30, 1890 I note: "Greenwings—the most abundant Duck for three days past; one flock had about one hundred birds feeding busily off the surface of the river."

During the spring of 1895 I did not see a single Greenwing anywhere; temperatures were normal but very dry and all waters low.

Querquedula discors. BLUE-WINGED TEAL.—This warm weather Duck usually arrived about April 1, but I have one record of one shot on March 15. It was perhaps most abundant the third week of April but left the river rather abruptly so that I have not a single May record. It bred in the neighbourhood, and I saw a pair at the Goosepond on June 6, 1893. On June 16, 1896, a pair on the rapids was "perhaps *A. discors*." Young have been reported in July but I have not a single record for May or August. In the fall they were most common during the first half of October. Earliest date September 4 and latest November 8.

Perhaps our best Duck for the table.

Spatula clypeata. SHOVELLER, SPOONBILL.—A migrant and probably bred in the vicinity. Earliest note for the rapids March 16, and latest April 26. The bulk comes after the majority of the Ducks and it was most frequent in mid-April. In the fall not common, but occurring from October 14 to November 15. They probably bred at the Gooseponds in Clark Co., Mo. I have a note of three males there on June 6 and others

have seen them in the summer. This Duck prefers sheltered ponds and is scarce on the river. Yet I have seen it common as on April 18, "in pairs and small flocks" and on March 31, when I watched several from the bridge that were remarkably tame. In April 1893 they were exceptionally common and during the second week outnumbered all other Ducks on the market. On the 23rd of this month I found a flock of thirty birds on a small temporary pond in the Des Moines bottoms; they were mostly males and as they flew they chattered continually in low deep notes.

Dafila acuta. SPRIGTAIL, PINTAIL.—An abundant migrant; the first to arrive in numbers in the Spring and the first to pass northward. I have only one winter record, a male on January 9. But if the weather be open, migrants may arrive in numbers in the last half of February: my earliest date is the 13th. Usually they were not common till March and are often abundant during the latter half, but all pass by the end of the month so that I have only two records for April. In the fall they occur from October 1 to November 8; they may not be as abundant as in the spring.

The following note though not referring to the rapids seems worth giving, Old Monroe, Mo., March 6, 1886:—"The Ducks we saw were nearly all Sprigtails. I saw them to great advantage and admired their graceful form while floating and their rapid, rushing flight. When descending they just quiver their wings while the usual rush of their wings becomes a perfect scream. They have two notes, a short sharp whistle and a kind of laugh. The flock consisted of male birds; scarcely a female was seen. The great return migration of this Duck on March 27, 1894 has already been described.

Aix sponsa. WOOD DUCK.—A fairly common migrant and probably bred. On the Rapids I have seen it between March 17 and May 18, and from October 4 to November 19, never in any numbers though most common about April 1. This is a "wood duck" and is often met with in the sloughs and about small ponds. I have seen it in June.

Marila americana. REDHEAD.—A regular migrant but never abundant. Common from the middle to the end of March, the extreme dates being March 1 and April 14. In the fall they were scarce but have occurred from October 4 to November 10. An unusual date was May 1, 1890 when a pair was seen on the rapids.

Marila valisineria. CANVASBACK.—The first Canvasback I ever saw was on March 27, 1888 when one was on the market. Another turned up a few days later shot on the rapids and was considered a rarity. On April 8 they were reported plentiful at Lima Lake, twenty miles south. The following year occurs a note under March 17—"Canvasback are now fairly common, the hunters say they were never seen here till last spring."

From that year on they were noted every spring between March 7 and April 8 but were rare in the fall, earliest and latest dates being October 4 and November 10.

March 19, 1891:—"First great flight of Ducks on the rapids; many of the common species and with them a good number of Canvasback."

March 12, 1892:—"Canvasback first seen on the rapids,—a flock of thirty."

Marila marila. GREATER SCAUP, BIG BLUEBILL.—All the books and other available information led me to expect this bird would be common. In my earlier notes I mention seeing it on the rapids, as for instance March 30, 1890 among the other Ducks: "*A. marila*, *A. affinis* and *A. collaris* abundant in moderately sized flocks, these species usually mixed." But I never had a bird in my hand and as such records as the above are questionable I doubt if it occurs. Perhaps it once was found but has now disappeared from this region.

Marila affinis. BLUEBILL.—An abundant migrant and probably bred. Earliest date February 23, but never common till March 15, then often abundant till April 1, regular in April and occurring in May, and flocks seen on June 11 and July 4. Here comes a blank till October 13. Abundant from October 28 till November 12. After that date only a single record on the 27th of the latter month.

March 31, 1889:—"In the afternoon the rapids were covered with Ducks; from the canal wall all I could see were Bluebills. They were feeding busily off the surface probably on what had been washed down by the heavy rain of the previous night; the water was very muddy."

March 20, 1890:—"Ducks abundant. As seen through a telescope they were all Blackjacks and Bluebills."

1893:—"Very abundant on the rapids during the first week of April."

March 1896:—"Mallard, Greenwings, Sprigtails and Blackjack were at times common, all other Ducks rare. Bluebills seemed to be entirely absent."

A few were seen later in the Spring.

October 28, 1890:—"Five degrees of frost this morning. Large rafts of Ducks were on the rapids apparently all being *A. affinis*. The first time I have noticed this species this fall."

June 25, 1896:—"It was reported to me that an old bird and three partly grown young were killed in the canal a few miles above the city. In July 1897, an old one with a brood of young was seen on one of the Clark Co. ponds."

Marila collaris. BLACKJACK, RING-NECKED DUCK.—Usually abundant migrant sometimes in large flocks. The times of migration coincide with that of the Bluebill but are more sharply defined and it is never seen in Summer. Earliest a pair on February 5 then none till the 23rd. Common from March 15 to April 5 and none later. In the fall the first noted was on October 1 and common from October 30 to November 12, after that not a single record.

The "full face" view of the Drake is very peculiar but the colors begin to fade immediately after death and it has been inaccurately described in recent works. The black tip forms the center of the picture bounded above by a white band. Then bluish-gray and lastly a ring of white, this being completed below by the triangular patch of white feathers. The yellow

eyes in the large glossy black head complete the weird picture. Soon after death the white becomes bluish and the blue-gray a dull black. The females vary greatly in tint of plumage, sometimes giving the effect of a grayish and sometimes of a brownish bird.

Glaucionetta clangula americana. ICE-DUCK, GOLDENEYE.—The only Duck that was regular throughout the winter. Earliest record November 11, and latest April 10. There were always a few in the "air-holes" on the rapids where they could be seen diving repeatedly or flying up stream close to the surface. The water in these open spaces was usually very swift and it is hard to see how they avoided being carried under the ice. On February 13, 1892, I skinned two shot at an air-hole. The stomachs were well filled with mollusks, both bivalve and univalve, crayfish, fragments of insects and their larva, and gravel. The gizzard of the male was fully three times as big as that of the female.

These birds do not go in flocks; even when there are many in a single airhole they act individually. On one occasion I saw over a hundred crowded together by moving ice till, as the floes joined, they all took wing together.

Glaucionetta islandica.—I have a note of a female that I found on the market on March 27, 1888. I do not have the skin now, and, though I remember using the greatest care in identification, I am not sure that with the books then available I might not have been mistaken.

Charitonetta albeola. BUTTERBALL, BUFFLE-HEAD.—A migrant; common in the last half of March and at other times rather scarce. In the spring noted from February 2 to April 8, and in the fall scattered notes between November 8 and November 27.

March 30, 1890:—"Butterballs common on the rapids. One I watched diving continuously kept under about 30 seconds each time.

1893:—"The spring has been marked by a total absence of *C. albeola*, I did not see a single one anywhere and other hunters noticed the same thing. They were here in the usual numbers last fall and I heard of one being shot out of a flock of four in December."

This Duck, though a diver, is often met with in the sloughs and small ponds. The inviting name "butterball" enabled the grocers to pass off a poorly flavored Duck as very choice.

Clangula hyemalis. OLD-SQUAW.—My only record is of four young birds on the market with thirteen other species of Ducks all shot on the rapids on November 7 and 8, 1892. "On the evening of the 6th no Ducks were in sight, wind south. At 3 A. M. on the 7th wind turned west and it became cooler. At daybreak the rapids were covered with Ducks."

Somateria spectabilis. KING EIDER.—On November 10, 1894 I happened to meet a boy who was proudly carrying a Duck he had shot opposite the city. It was a young male King Eider. The skin is now in the museum of the University of Iowa.

Oidemia americana. BLACK SCOTER.—One purchased on the market, on October 31, 1894; the only record.

Oidemia deglandi. WHITE-WINGED SCOTER.—One was shot on the rapids on October 26, 1894; the only record.

Oidemia perspicillata. SURF SCOTER.—I have two records. Both of the birds turned up in the grocery stores and were probably from the rapids; the dates are October 20, 1895 and October 22, 1896.

Erismatura jamaicensis. RUDDY DUCK.—A migrant in small numbers, more frequently seen in the Fall. Notes run from March 26 to May 9, and from October 15 to November 8.

October 28, 1888:—"A dozen Ducks shot on the rapids were all *Erismatura rubida*." May 11, 1890: "In the evening—a pair of Ruddy Ducks: through the telescope the white face and dark red of the male were very conspicuous. They did not hold their tails up as described by authors but floated low in the water. Going down with great ease they held their own against the current better than any Ducks I have seen, keeping their position when below and only losing a little when on the surface." I never saw one with the tail up and spread as in most pictures.

Chen hyperboreus hyperboreus. LESSER SNOW GOOSE, WHITE BRANT.—A rare migrant.

November 2, 1892: "No Ducks yet. Wet and cool. In the morning heard Geese calling, but with a sharper and shorter note than Canadas. Saw the flock through the mist flying south. One of them turned its back to me for a moment and I distinctly saw the white back and black tips of the Snow Goose. Probably the others were this species; they certainly were not Canadas."

March 30, 1894:—"Hunters report a flock of White Brants on the rapids." April 4, "A White Brant was shot, taken to Hamilton, plucked, and eaten."

March 14, 1886:—"From the bluffs saw a flock of about 20 White Geese."

Chen caerulescens. BLUE GOOSE.—An occasional migrant in the latter half of March; never seen in the Fall. My first specimen of this rare Goose was one obtained on the market March 18, 1893, "full of corn to the mouth, condition rather poor but good eating." At noon the same day I saw a flock in the distance on the rapids.

March 19, 1893:—"Sunday, a beautiful, calm, clear, cool day; river comparatively free from ice. Fewer Ducks than for some days past but still fairly numerous with Geese and Herring Gulls. Much interested in watching the flock of Blue Geese I had seen the previous day. They drifted down about once an hour all day. Thirty-nine birds in the flock, all perfectly typical. They were too wild for the boats to get a shot. They preferred floating down on ice to being in the water. They rose more easily than Canadas and settled more quickly without preliminary circling. They were careless of formation on the wing and individuals were continually changing places. They did not fly nearly as fast as Ducks but were not trying, as birds could leave the rear and pass to the front of the flock. On the wing looked like a dark bird with four light patches,—head, half of wings, and rump. Voice weaker and shorter than a Canadas, varied

occasionally to conversational tones and rarely a loud sharp call. Swimming they had shoulders down and tail up like a Speckle-belly and unlike a Canada."

One shot on the rapids on March 30, 1894, and two on March 16, 1896 complete my records. Perhaps the following note may be included though not of the rapids as opportunities of seeing this Goose are rare. "Urbana, Illinois, March 23, 1899. This afternoon a great flock of Geese in a network of lines across the sky passed over flying north. They had the call of Brants, short and sharp. Two of them were white but all the others grey and in spite of the height, the white heads and necks shone out clearly. Except for the two Snow Geese they were probably all *Chen caerulescens*. There may have been 100 of them.

Anser albifrons gambeli. SPECKLE-BELLY, WHITE-FRONTED GOOSE. —Occasional in both spring and fall from March 9 to April 17, and from September 20 to October 14. These dates would indicate that it was a warm weather Goose.

March 19, 1891:—"First great flight of Ducks and among them a flock of Speckle-bellies."

October 14:—"Two flocks of Speckle-bellies flew south today."

Branta canadensis canadensis. CANADA GOOSE, HONKER. A common migrant and in small numbers in winter. First seen from September 27 to October 20, and last from March 21 to April 17. A solitary bird was seen on May 3, perhaps a cripple.

This splendid bird is the "Goose," all other members of the Anserinae being known as "Brants." They vary greatly in size and I have measured specimens that might have been either the type of Hutchin's Goose though I have never seen an undoubted specimen of the latter.

For weeks together Geese would spend the night along the sand bars between Chaney Creek and the bridge, standing in the shallow water rather than on the sand and leaving with much noise just at sun-up. On wet or windy mornings they would leave later. In colder weather the edge of the ice would be their sleeping quarters. By day they were less often seen on the rapids but occasionally would frequent the rock piles or swim in the backwaters. Cold matters little to them if the ground is bare but snow covers their feeding grounds on the fields and prairies.

Cygnus columbianus. WHISTLING SWAN.—A scarce migrant, noted from March 9 to April 19 and on November 7 and 8. I have nothing on the habits of this species. The largest flock I have seen was twenty birds at Lima Lake. Only three times have I seen it on the rapids. A flock of five on November 7 and 8, 1890; of seven on March 18, 1893, and of nine on March 16, 1896. Three birds were shot from this flock and identified by myself.

It is the fashion among Duck hunters to claim all Swans are Trumpeter Swans unless proved to the contrary. I never saw a Trumpeter though I have examined several fresh and mounted Swans.

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