

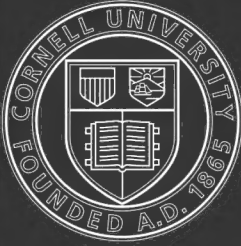
CORNELL
UNIVERSITY
LIBRARY



LABORATORY
OF ORNITHOLOGY
LIBRARY

Gift of

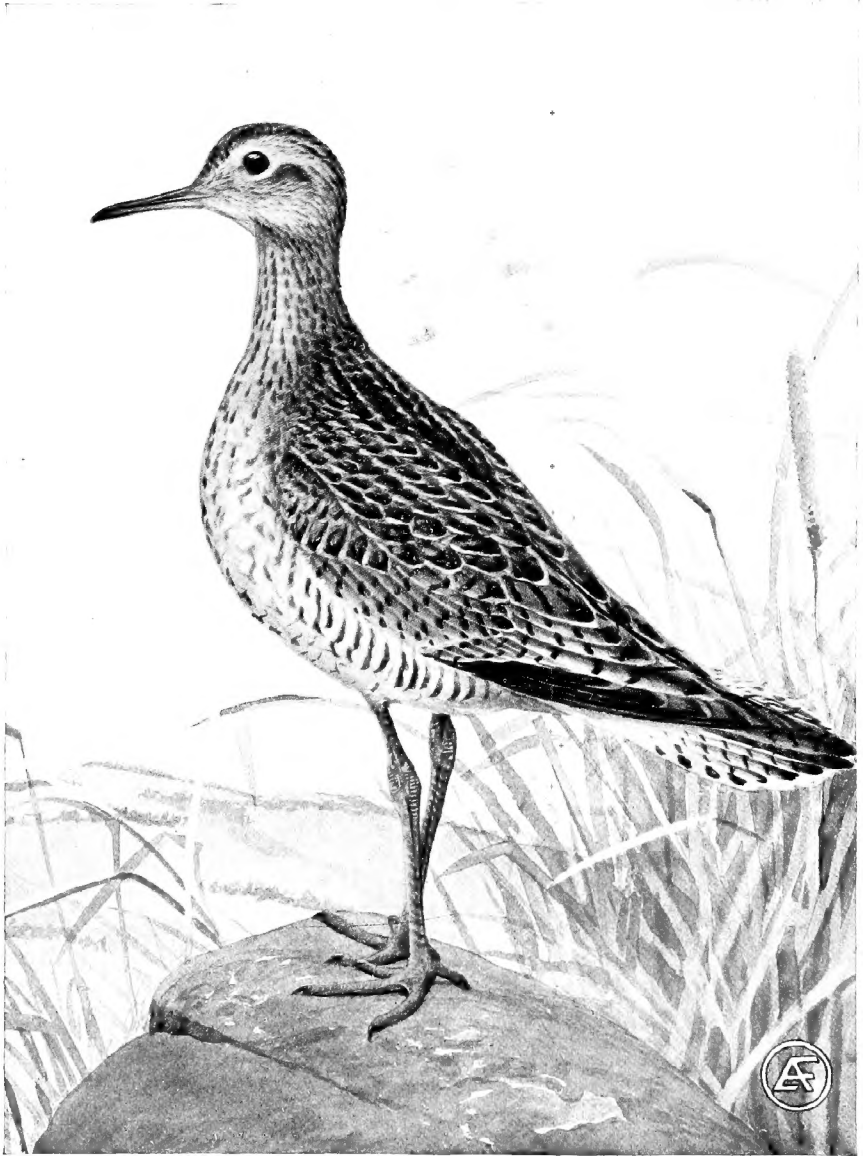
*Brewster
Collection*



Cornell University Library

The original of this book is in
the Cornell University Library.

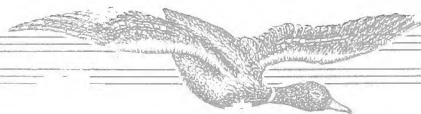
There are no known copyright restrictions in
the United States on the use of the text.



UPLAND PLOVER, OR BARTRAMIAN SANDPIPER.

Now (1911) in imminent danger of extinction. (From a drawing made by Louis Agassiz Fuertes for the National Association of Audubon Societies, and first reproduced in Bird-Lore.)

A HISTORY OF THE
**Game Birds, Wild-Fowl
and Shore Birds**
OF
Massachusetts and Adjacent States



Including those used for food which have disappeared since the settlement of the country, and those which are now hunted for food or sport, with observations on their former abundance and recent decrease in numbers; also the means for conserving those still in existence

By Edward Howe Forbush
State Ornithologist of Massachusetts

Illustrated with Drawings by W. I. Beecroft and the Author
and Photographs by Herbert K. Job and others

Issued by the
Massachusetts State Board of Agriculture
By Authority of the Legislature, 1912

BOSTON

WRIGHT & POTTER PRINTING COMPANY, STATE PRINTERS

18 POST OFFICE SQUARE

The Commonwealth of Massachusetts.

Resolves of 1910, Chapter 90.

A RESOLVE TO PROVIDE FOR THE PREPARATION AND PRINTING OF A SPECIAL REPORT ON THE GAME BIRDS OF THE COMMONWEALTH.

Resolved, That there be allowed and paid out of the treasury of the commonwealth a sum not exceeding four thousand dollars for preparing and printing, under the direction of the state board of agriculture, in an edition of five thousand copies, a special report on the game birds of the commonwealth economically considered, to include the facts already ascertained by the state ornithologist, relating to their history, value and the necessity for their protection, to be distributed as follows:— Two copies to each free public library in the commonwealth; two copies to each high school, and two copies to such schools in towns which have no high school as the school committee may designate; one copy to the library of congress and one copy to each state or territorial library in the United States; ten copies to the state library; one copy to the governor; one copy to the lieutenant governor and each member of the council; one copy to the secretary of the commonwealth; one copy to the treasurer and receiver general; one copy to the auditor of the commonwealth; one copy to the attorney-general; one copy to each member of the present general court applying for the same; one copy to each elective officer of the present general court; one copy to each member of the state board of agriculture; five copies to the secretary of the state board of agriculture; and four hundred and fifty copies to the state ornithologist for distribution to those who have assisted by contributing material for the report; the remaining copies to be sold by the secretary of the state board of agriculture at a price not less than the cost thereof. Additional copies may be printed for sale at the discretion of the secretary of the state board of agriculture, the expense thereof to be paid from the receipts of such sales. Any amount received from sales shall be paid into the treasury of the commonwealth. [*Approved May 5, 1910.*]

PREFACE.

This volume is intended to fill a place heretofore unfilled, in at least two respects, by any American work. The former abundance and later decrease of the migratory game birds of eastern North America have been studied and narrated at length for the first time, and the histories of the food species of New England which have been exterminated since the settlement of the country have been brought together. This has been done with a purpose.

Whenever legislation for the protection of shore birds or wild-fowl has been attempted in the Maritime States of the Atlantic seaboard, certain interested individuals have come forward to oppose it, with the plea that these birds are not decreasing in numbers, but, instead, are increasing, and that they need no further protection. Some admit that certain species are decreasing, but argue that shooting is not responsible for this condition. Similar statements are made in support of proposed legislation for the repeal of existing protective laws.

The object of the investigation on which this volume is based was to secure information from historical and ornithological works, and from ornithologists, sportsmen and gunners, regarding the increase or decrease of the birds which are hunted for food or sport.

The report is published with the intention, first, to show the former abundance of resident and migratory game birds in America and their subsequent decrease in numbers; second, to furnish gunners and others with the means of identifying game birds, that the people may recognize the different species and thus fit themselves to observe protective laws; and third, to demonstrate how these birds may be conserved. The narratives of early explorers and pioneers show plainly the former abundance of game birds. The unbiased statements of orni-

thologists of the nineteenth century exhibit the great decrease in numbers of many species, and estimates summarized in this volume indicate that the majority of the best informed gunners themselves now admit that the decrease of these birds has continued during the past thirty years, and that it is due largely to overshooting; therefore, the report will serve as a basis for both restrictive and constructive legislation for the protection and propagation of game birds.

The descriptions in Part I, written mainly in language understood by the people, and the cuts which have been made to show the form and markings of the species, taken together, will answer the second purpose for which the book is written. Prominent markings which readily may be recognized in the field, and which will help in identifying the birds, are given under the head of "field marks." The representations of the notes and calls of birds are taken mainly from the writings of others. Attempts to suggest bird notes on paper almost always are inadequate. My own always have been unsatisfactory, but it is hoped that those given may be of some assistance to the beginner. Brief descriptions of the nests and eggs of the species now nesting in Massachusetts or near-by States, or which are believed to have nested here formerly are given as a possible help to identification.

An attempt has been made to interest the reader in these much-persecuted birds for their own sake. For this reason the range, migration and habits of each bird are touched upon in nearly all cases.

In the introduction an attempt is made to narrate briefly the history of the decrease of resident and migratory game birds along the Atlantic seaboard. Part I continues this history, but particularizes and localizes by taking up separately each individual species that has been recorded from Massachusetts and near-by States. Part II groups together the histories of the species utilized as food which have disappeared from New England since the settlement of the country, and exhibits the causes that brought about the destruction of these species. Part III analyzes the causes of the decrease of the species of game birds, wild-fowl and shore birds that

are still extant, and indicates how they may be conserved and how depleted areas may be restocked with certain species.

It was my intention before beginning the work to undertake an investigation of the food of wild-fowl and shore birds, but as Mr. W. L. McAtee of the Bureau of Biological Survey of the United States Department of Agriculture was then engaged in a similar quest, and hoped to have the results published, I arranged with him to make use of his publication, and give credit to the Survey. Unfortunately, very little of the results of Mr. McAtee's work have been published, and this volume necessarily goes to press with but a small part of them. For this reason the observations on the food of these birds have not been brought down to date.

Many of Mr. Beecroft's drawings, from which the line cuts of the birds were made, have been corrected, and some of them have been largely redrawn by myself, with the assistance of Miss Annie E. Chase. Miss Chase also made the drawing of the Whooping Crane, the plate of which faces page 477. Mr. Beecroft was handicapped in his work by having no opportunity to make studies from the living birds, and by being obliged to draw his inspiration from skins, stuffed specimens, photographs and the illustrations of others. The drawings for the cuts of the Wood Duck, the Mallard and the Red Phalarope are my own; also the drawings for the cuts on pages 40, 49, 59, 70, 111, 147, 202, 224, 228, 230, 271, 277, 326, 331 and 417 (all after C. B. Cory), and the figures on pages 133 and 147. All concerned in the preparation of the drawings must acknowledge their indebtedness to many artists from the time of Audubon to the present day, and particularly to Mr. Louis Agassiz Fuyertes, whose excellent drawings as figured in Eaton's *Birds of New York*, gave many suggestions. The faults of the illustrations are obvious, but every effort has been made to secure such representations of form, proportion and markings as to make the species recognizable. It was my intention to have the birds of each family represented in Part I figured in proper proportion one to the other, — to have the Sandpipers, for example, of such relative size as to suggest the differences in

size between the different species. The engraver has not always been accurate in his reductions, but, in the main, the idea has been carried out.

The bibliography which was planned for publication herewith was crowded out because of the vast amount of material available for the work, which has resulted in increasing its bulk beyond the limit at first contemplated, and which has made necessary an abridgment of even the index; but the names of authors, contributors and collectors are inserted in the index because of the omission of the bibliography.

What an embarrassment is that of the author who desires to acknowledge his indebtedness to those who have gone before! I am under obligations to many hundreds of individuals from the early explorers, like Champlain and Hudson, down through the centuries to the ornithologists and sportsmen of the present day. A long list of the names of observers who have furnished information in regard to the commoner species is presented on the last pages of this volume, and many correspondents in many States whose names are not mentioned there are gratefully remembered. The writings of Mr. William Brewster, Dr. C. W. Townsend and Dr. D. G. Elliot have been exceedingly helpful, and those of many others have furnished facts and suggestions. In this connection mention should be made of a description of a flight of water-fowl in "The Water-fowl Family," by Sanford, Bishop and Van Dyke, which furnished the model for a similar description on page 4 of this volume. I am indebted particularly to my friends, Mr. William Brewster and Dr. George W. Field, who have kindly read brief parts of the manuscript, and more than I can tell to my wife, who has patiently assisted in reading manuscript and proof, and to Mr. Wilson H. Fay for his work upon the index. It is a pleasure to acknowledge the courtesy of the managements of Collier's Weekly, Forest and Stream and Bird-Lore, who, with many others, have given permission to quote or to use illustrations. Acknowledgments are due to Rev. Herbert K. Job, Mr. Charlesworth Levy, Mr. Howard H. Cleaves and others, whose names are mentioned elsewhere, for photographs. The Bureau of Biological Survey of the United

States Department of Agriculture has placed me under great obligations for much information for which the Survey has not always been given credit in the text; Prof. W. W. Cooke's paper on the Distribution and Migration of American Ducks, Geese and Swans, also his paper on the Distribution and Migration of North American Shore Birds, and Mr. W. L. McAtee's paper on Our Vanishing Shore Birds, all published by the Survey, have been utilized freely in the preparation of this volume. It would be extremely ungracious for any one at the present day to write anything on the economic relations of birds without acknowledging his indebtedness to the painstaking workers of the Survey, who have given to the world the greatest amount of valuable material on such subjects ever published anywhere. Mr. Charles W. Johnson, curator of the Museum of the Boston Natural History Society, has given every opportunity to both author and artist whenever specimens have been needed for examination. Mr. Ralph Holman has placed all his field notes at my disposal. The ornithological nomenclature used in heading each description of a species is that contained in the third edition of the Check List of the American Ornithologists Union, published in 1910. The range of each species is taken from the Check List in nearly all cases, though somewhat abridged. The statements regarding the decrease of birds taken from various authors are not quoted in full, but are abridged, care being taken not to distort their assertions. Dr. M. L. Fernald has placed me under obligations by bringing down to date the names of plants in the lists on pages 582-587. Other scientific nomenclature of plants and animals is given unchanged as taken from various authors from the time of Audubon to the present day.

Much of the manuscript necessarily was written and revised when I was fully occupied in other work of an executive character, often when travelling by train or boat, and at a distance from any library; otherwise, the task could not have been completed within the time limit. It is to be regretted that a work of this kind should have been done of necessity under circumstances of pressure that precluded literary excellence, but care has been exercised to state only facts, and I have en-

deavored always to give credit to other authors whenever it has been feasible.

It remains to express my gratitude to Mr. J. Lewis Ellsworth, secretary of the State Board of Agriculture, and the members of the Board, who have advocated the publication of this work and loyally supported the undertaking. This support has made the publication possible, and to these gentlemen is due whatever credit may be given. The responsibility for the shortcomings of the work is my own.

EDWARD HOWE FORBUSH.

JUNE 1, 1912.

CONTENTS.

INTRODUCTION:—	PAGE
America, A Country of Game Birds,	1
Abundance of Game found by Explorers and Colonists,	6
Former Abundance of Game Birds in the West and South,	12
The Decrease of Edible Birds,	22

PART I.

A HISTORY OF THE BIRDS NOW HUNTED FOR FOOD OR SPORT IN MASSACHUSETTS AND ADJACENT STATES:—

Grebes,	39
Loons,	49
Mergansers,	58
River Ducks,	69
Bay and Sea Ducks,	111
Geese,	169
Swans,	193
Rails, Crakes, Gallinules and Coots,	201
Phalaropes,	224
Avocets and Stilts,	230
Snipes, Sandpipers, etc.,	235
Plovers,	334
Turnstones,	358
Oyster-catchers,	361
Bob-whites,	367
Grouse,	375
Pigeons and Doves,	393

PART II.

A HISTORY OF THE GAME BIRDS AND OTHER BIRDS HUNTED FOR FOOD OR SPORT WHICH HAVE BEEN DRIVEN OUT OF MASSACHUSETTS AND ADJACENT STATES, OR EXTERMINATED SINCE THE SETTLEMENT OF THE COUNTRY:—

Extinct Species,	399
Great Auk,	399
Labrador Duck,	411
Eskimo Curlew,	416
Passenger Pigeon,	433
Extirpated Species,	472
Trumpeter Swan,	472
Whooping Crane,	477
Sandhill Crane,	483
Wild Turkey,	487

PART III.

THE CONSERVATION OF GAME BIRDS, WILD-FOWL AND SHORE BIRDS:—	PAGE
The Economic Value of Game Birds, Wild-fowl and Shore Birds, . . .	497
The Decrease of Game Birds in Massachusetts,	503
The Recuperative Powers of Nature,	508
The Causes of the Decrease of Game Birds, . . .	510
Market Hunting,	511
Spring Shooting,	516
Summer Shooting,	529
Settlement and Agriculture as a Cause for the Decrease of Wild-fowl, .	531
Night Shooting,	533
Pursuing Wild-fowl in Boats,	535
The Use of Live Decoys,	536
The Elements, Storms and Cold,	539
Epidemic Diseases,	540
Natural Enemies,	541
Telegraph, Telephone and Trolley Wires,	547
Minor Causes of the Decrease of Birds,	547
Lead Poisoning,	547
The Destruction of the Feeding Grounds,	548
Erroneous Opinions regarding the Causes of the Decrease of Game Birds,	
Wild-fowl and Shore Birds,	549
The Destruction of the Eggs of Wild-fowl for Commercial Purposes, .	553
The Decline of Agriculture,	554
The Increase of Cottages and Camps,	554
The Shortening of the Open Season,	555
Guns Most Destructive,	556
The Viewpoint of the Hunter,	558
The Introduction of Foreign Game Birds,	562
Game Preserving,	563
The Game Preserve increases Insectivorous Birds,	568
Methods of Attracting Water-fowl,	569
Attracting Upland Game Birds,	581
Statutory Game Protection,	588
Federal Supervision of the Protection of Migratory Birds,	590
Public Game and Bird Reservations,	591
A Brief Summary of Needed Reforms for Game Protection,	592
Enforcement of the Game Laws,	593
A List of the Names of those who filled out the Blank Forms for Informa- tion, which form the Basis of the Estimates on the Recent De- crease of Game Birds, Wild-fowl and Shore Birds,	597
INDEX,	609

LIST OF ILLUSTRATIONS.

PLATES.

Upland Plover (Colored Plate),	Frontispiece
PLATE I. — River Ducks and Swans,	faces page 39
PLATE II. — Two Baldpates on Leverett Pond, Boston,	faces page 69
PLATE III. — Canvas-back and Baldpate on Leverett Pond, Boston,	faces page 69
PLATE IV. — Group of Bay Ducks,	faces page 111
PLATE V. — Nest of Eider,	faces page 150
PLATE VI. — Barnacle Goose,	faces page 193
PLATE VII. — Woodcock on Nest,	faces page 235
PLATE VIII. — Spotted Sandpiper (Young),	faces page 322
PLATE IX. — Spotted Sandpiper (Adult),	faces page 322
PLATE X. — Ruffed Grouse Drumming,	faces page 377
PLATE XI. — Heath Hen,	faces page 385
PLATE XII. — Great Auk,	faces page 399
PLATE XIII. — Labrador Duck,	faces page 411
PLATE XIV. — Eskimo Curlew,	faces page 416
PLATE XV. — The Last Passenger Pigeon,	faces page 433
PLATE XVI. — Pigeon Net,	faces page 438
PLATE XVII. — Young Passenger Pigeon,	faces page 450
PLATE XVIII. — Eggs of Passenger Pigeon and Mourning Dove,	faces page 460
PLATE XIX. — Band-tailed Pigeon, Passenger Pigeon and Mourning Dove,	faces page 460
PLATE XX. — Trumpeter Swan,	faces page 472
PLATE XXI. — Whooping Crane,	faces page 477
PLATE XXII. — Sandhill Crane,	faces page 483
PLATE XXIII. — Wild Turkey,	faces page 487
PLATE XXIV. — Propagation,	faces page 497
PLATE XXV. — Protection,	faces page 497
PLATE XXVI. — Attracting Canada Geese,	faces page 508
PLATE XXVII. — A Result of stopping Spring Shooting,	faces page 524
PLATE XXVIII. — Wild-fowl on a Game Farm,	faces page 540
PLATE XXIX. — A Breeding Pen for Bob-whites,	faces page 563
PLATE XXX. — Group of Bob-whites in Confinement,	faces page 563
PLATE XXXI. — Wild Rice in Flower,	faces page 571
PLATE XXXII. — Winter Buds of Wild Celery,	faces page 576
PLATE XXXIII. — Seed Pods of Wild Celery,	faces page 576
PLATE XXXIV. — Wide-ranging Species of Pondweed,	between pages 578 and 579
PLATE XXXV. — Wide-ranging Species of Pondweed,	between pages 578 and 579
PLATE XXXVI. — Winter Shelter for Quail,	faces page 581

	Cuts.	PAGE
Holboell's Grebe,		41
Horned Grebe,		43
Pied-billed Grebe,		46
Loon,		50
Black-throated Loon,		56
Red-throated Loon,		57
Merganser,		60
Red-breasted Merganser,		64
Hooded Merganser,		67
Mallard,		71
Black Duck,		76
Gadwall,		81
Baldpate,		86
Green-winged Teal,		91
Blue-winged Teal,		95
Shoveller,		99
Pintail (Male),		102
Pintail (Female),		104
Wood Duck,		105
Redhead,		113
Canvas-back,		118
Scaup,		121
Lesser Scaup,		124
Ring-necked Duck,		127
Golden-eye,		129
Buffle-head,		135
Old-Squaw (Males),		139
Old-Squaw (Female),		140
Harlequin Duck,		144
Eider,		148
Scoter,		153
White-winged Scoter,		160
Surf Scoter,		163
Ruddy Duck,		166
Snow Goose,		170
Blue Goose,		174
White-fronted Goose,		175
Canada Goose,		177
Brant,		183
Whistling Swan,		194
Clapper Rail,		205
Virginia Rail,		207
Sora Rail,		210

	PAGE
Yellow Rail,	213
Black Rail,	215
Purple Gallinule,	217
Florida Gallinule,	219
Coot,	221
Red Phalarope,	225
Northern Phalarope,	227
Wilson's Phalarope,	229
Avocet,	231
Black-necked Stilt,	233
Wilson's Snipe,	245
Dowitcher,	253
Stilt Sandpiper,	260
Knot,	262
Purple Sandpiper,	268
Pectoral Sandpiper,	270
White-rumped Sandpiper,	274
Baird's Sandpiper,	277
Least Sandpiper,	278
Red-backed Sandpiper,	282
Semipalmated Sandpiper,	286
Sanderling,	290
Marbled Godwit,	294
Hudsonian Godwit,	297
Greater Yellow-legs,	300
Yellow-legs,	303
Solitary Sandpiper,	306
Willet,	309
Buff-breasted Sandpiper,	320
Long-billed Curlew,	325
Hudsonian Curlew,	330
Black-bellied Plover,	335
Golden Plover,	340
Killdeer Plover,	348
Semipalmated Plover,	352
Piping Plover,	354
Ruddy Turnstone,	359
Oyster-catcher,	362
Bob-white,	368

FIGURES IN THE TEXT.

FIGURE 1. — Foot of Grebe,	40
FIGURE 2. — Foot of Loon,	49
FIGURE 3. — Bill of Merganser,	59
FIGURE 4. — Foot of River Duck,	70

	PAGE
FIGURE 5. — Axillars of Baldpate, Axillars of European Widgeon,	84
FIGURE 6. — Foot of Sea Duck,	111
FIGURE 7. — Head of Female Ring-necked Duck,	128
FIGURE 8. — Head of Barrow's Golden-eye (Male),	133
FIGURE 9. — Bills of Eiders,	147
FIGURE 10. — Head of Male King Eider,	152
FIGURE 11. — Foot of Coot,	202
FIGURE 12. — Foot of Red Phalarope,	224
FIGURE 13. — Foot of Northern Phalarope,	228
FIGURE 14. — Foot of Wilson's Phalarope,	230
FIGURE 15. — Tail of Pectoral Sandpiper,	271
FIGURE 16. — Tail of Baird's Sandpiper,	277
FIGURE 17. — First Primary and Axillars of Long-billed Curlew,	326
FIGURE 18. — First Primary and Axillars of Hudsonian Curlew,	331
FIGURE 19. — Head of Wilson's Plover,	357
FIGURE 20. — Axillars and First Primary of Eskimo Curlew,	417
FIGURE 21. — Pigeon Basket,	440
FIGURE 22. — Wild Rice,	574
FIGURE 23. — Wild Celery,	576
FIGURE 24. — Leaves of Wild Celery, showing Venation,	577
FIGURE 25. — Sago Pondweed,	579
FIGURE 26. — Tubers of Sago Pondweed,	580

**GAME BIRDS, WILD-FOWL AND
SHORE BIRDS.**

Game Birds, Wild-fowl and Shore Birds.

INTRODUCTION.

AMERICA, A COUNTRY OF GAME BIRDS.

North America, at the time of its discovery, probably contained more game birds in proportion to its size than any other land. One hundred and seventy distinct species of game birds are found on this continent, and the list might be considerably extended by adding other birds which, although not considered as game, have been used for food. The check list of the American Ornithologists' Union (1910) gives twenty-four species and subspecies of Doves and Pigeons; six of Turkeys; forty-two of Grouse; nineteen of Bob-whites, etc.; sixteen of Plover; seventy of Snipe, Sandpipers, Godwits, etc.; twenty-six of Rails and Cranes, etc.; and seventy-four of edible web-footed wild-fowl, — all of which (excluding some necessary duplications) might be included in the list of North American game birds.

Game birds bred in countless numbers throughout the region now known as the United States and Mexico, when America first became known to Europeans. In autumn, winter and spring the migratory species swarmed in this region in numbers unprecedented in the experience of man in any land. The shape and situation of the continent and islands of North America are such as to provide in the temperate and northern portions an immense breeding ground for migratory birds, and to congest them in the southern part during the fall, winter and early spring. The general conformation of the North American continent is that of a triangle, with its base lying in the arctic regions and its apex south of the tropic of Cancer. The distance across the northern part of the continent, measuring from the easternmost point of Newfoundland to the northwestern shores of Alaska, is more than four thousand miles, and from the eastern point of Greenland to the western-

most of the Aleutian Islands is quite as far. Contrast this with the distance from the lower coast of Georgia to the Gulf of California (less than two thousand miles). Note also that a line drawn across Mexico on the tropic of Cancer measures less than six hundred miles. Such conditions are found in no other continent.

The position of South America is exactly the opposite in relation to bird migration, for the apex of the triangle of that continent lies toward the south pole and its base lies near the equator; therefore, there could be no such congestion of species caused by migration from the colder or southern parts of that continent toward the equator as is found in North America, when the birds that breed in the vast expanse of the north migrate to the comparatively contracted southern regions.

The lands of the eastern hemisphere, taken as one large continent, are wider toward the equator than toward the poles, and no conditions are found there similar to those in North America, except perhaps in China, Indo-China, the peninsula of India and the Malay peninsula, in all of which a congestion of species similar to that once found in North America probably occurs in the migration periods, but on a smaller scale.

North America has an advantage over all other countries in its great arctic breeding grounds, that offer extensive nesting places and feeding grounds for water birds. A great archipelago extends from the arctic coast of North America a thousand miles toward the north pole, and the vast expanse of Greenland lies to the eastward. On all these islands, great and small, water-fowl may nest forever, unmolested by civilized man.

In the light of our present knowledge, it is not difficult to imagine the great migration that annually occurred before the continent was peopled by the whites. When the short arctic summer drew to a close, — when the young birds had become strong on the wing, — the great exodus from the northern seas began. The Brant, which penetrated to the northernmost parts of Greenland and Ellesmere Land, even to the far shores of the Polar Sea, turned their faces to the south. As they moved southward, Auks, Murres, Gulls, Old-squaws and other

sea-fowl joined in the flight, part of which turned to the open waters of the Atlantic on the east and part to the Pacific on the west, but the greater part kept on, crossing the continent to the south. As this concourse moved on, the great islands of the North Georgia Archipelago gave up their quota of Snow Geese and other water-fowl; and as the widening, deepening wave rolled southward, it was swelled by countless Loons, Cranes, Swans and Plover from the great and lonely lands lying in the Arctic Ocean, between the Georgia Islands and the coast of the continent. Banks Land, Behring Land, Prince of Wales Land, King William Land, North Somerset Land, Cockburn Land and Baffin Land gave forth their thousands and tens of thousands; and when at last the aerial hosts reached the southern shores of the Arctic Sea, they were joined by the vast swarms of Geese and Swans that bred there upon the wide-spreading tundra. From the mouth of the Yukon to the shores of Ungava, Geese, Eider Ducks and many other water-fowl and myriads of shore birds joined the advancing tide of bird life. The wave of migration secured tremendous accessions from the Barren Grounds; but it was the timbered region, the great plains of the northwest and the river valleys of British America and Alaska that furnished the greatest flights of Swans, Cranes, Canada Geese, Ducks and Teal. Moving by easy stages through August and early September, the vanguard of the host reached the boundaries of what we now know as the United States. Great flights of Wood Ducks, Snipe, Curlews, Plover and Teal were in the advance. We have no adequate early records of the movements of these mighty hosts. A paragraph here and there from the narratives of early explorers is all that can be found, but even as late as the middle of the nineteenth century the flights were still immense. Had De Soto and the adventurers of his company kept and published an account of the flights of birds that they witnessed, they might have told of the impressions left by their first sight of this great congregation of migratory fowl. The advance of autumn and the sharp touch of the frost king in the north had sealed the waters of the upper half of the continent, — a seal that would remain unbroken until the return of spring.

Dark clouds of coming storms obscured the northern sky, and the wind blew wild and chill. The Indian hunter, standing on the river shore at sunset, might then have seen the whole sky overcast by clouds of birds, formed in dun strata, moving fast and far in varying lines, but all trending toward the south. Dense masses of Scaup winnowed their way low over the land. Vast flocks of Teal swept close by, with a roar of rushing pinions as they swayed and turned in quest of feeding grounds. Lines of Mallards extended across the dome of the sky, flock after flock, in almost continuous array. Swift flights of Canvas-backs kept their unwavering course. Masses of Red-heads kept them company, while smaller flocks discharged their members like zigzag bolts to the wave below. Here and there Teal and Widgeons rode down the air with stiffening wing, centering upon lake or river, where many a weary flock sought rest, until the water was black with floating birds, and still unwearied myriads high in air sped southward. Canada Geese, in the long "V" formation of the unbroken flock, in shattered ranks or in changing lines, trailing, crossing and diverging or converging in the sky, passed over in untold numbers with unslackening wing. Their musical notes filled the air like the cries of a thousand packs of hounds. The upper air was full of nameless water-fowl, while far above them all great flocks of Cranes swam in the blue sky; and higher still, in the full light of a sun now passed from view, rode long lines of snowy Swans, their clanging, trumpet tones lost among the nearer sounds of voice and wing that fell from the mighty hosts of smaller water-fowl and waders rushing on their way. Scenes approaching this great concourse of moving fowl were witnessed and described even as late as the middle of the last century, in the sparsely settled country of the middle west.

In early days the discharge of a musket near a marshy pool would seem to cause the whole marsh to rise in a mass that blotted out the sky. For days the sky was never clear of Pigeons, and sometimes was entirely obscured for hours.

The shape and character of the continent and its elevations and depressions are such that, while the autumn movement was generally south throughout the country, much of the

wave of migration which reached across the land swept from northwest to southeast; therefore, the greatest congestion of birds in winter was found along the middle and south Atlantic coasts, and in the southern States bordering upon the Gulf of Mexico. There was also in Mexico a similar congestion upon a smaller scale, for a considerable part of the flight coming down the Pacific coast penetrated to Mexico and beyond. Some species went on to South America, and a few followed the South American continent to Patagonia. This line of migration continues unchanged to-day, except for the decrease in numbers.

While many Alaskan birds come down the Pacific coast in their migration, a great part of them follow up the region watered by the Yukon and its tributaries, going southeast into the Mackenzie-Athabasca region, and reach the Atlantic coast, together with many of the birds of that area and others of the Hudson Bay country, by passing down south of Hudson Bay and through the region of the Great Lakes. Some thus reach southern New England and New York, while others appear on the Atlantic coast farther south; still others turn more to the southward, and, keeping east of the Rocky Mountains and the higher plains, or passing down the Mississippi valley, reach Florida and the other Gulf States. Southern New England was once particularly fortunate in the numbers of species and individuals which came into its territory in migration. Massachusetts, Rhode Island and Connecticut lie within the scope of the great wave of southeastern migration from Alaska and the region west of Hudson Bay, and they are also directly in the path of the flight from Greenland, Baffin's Land, Labrador and the Maritime Provinces. It was in part this fortunate position at the junction of two streams of migration that gave southern New England the abundance of migratory game birds which the early voyagers and settlers found there. Most of the maritime species from the Arctic and the north Atlantic come as far as Massachusetts in winter, while nearly all the wild-fowl and shore birds of the interior once visited our waters and shores in fall, winter and spring.

ABUNDANCE OF GAME FOUND BY EXPLORERS AND COLONISTS.

When the settlement of America was begun, the number of individuals of these species was beyond computation, and the statements made by those who wrote about the game of the country at that time seem utterly incredible when repeated to-day. Nearly all the earlier explorers and travellers who mention birds or mammals in their narratives tell of the "great store" of fowl in the country.

It is recorded that water-fowl, shore birds, Cranes and Herons bred along the Atlantic coast from Maine to Florida, and that they migrated back and forth along the Atlantic seaboard in incredible numbers. Ruffed Grouse, Pinnated Grouse, Bob-whites and Wild Turkeys were reported as appearing in great flocks, not only in the interior of the country, but along the coast, in suitable localities. We are not now accustomed to regard the Atlantic seaboard as a great breeding place and resort for water-fowl and game birds, but the early explorers and colonists found it alive with them, from the West Indies to Labrador. A few of their statements may be cited here.

Beginning with the West Indian records of the early explorers, we find that George Percy of Captain John Smith's company contributes a narrative in which he asserts that on April 4, 1607, the company anchored at the Isle of "Virgines," where, he says, they killed "great store" of wild-fowl; and again he says: "On the nineth day of April, in the afternoone, we went off with our boat to the Ile of Moneta, [Monica] some three leagues from Mona [an island near Hayti]. After wee got to the top of the Ile wee found it to bee a fertill and a plaine ground, full of goodly grasse and abundance of Fowles of all kindes. They flew over our heads as thicke as drops of Hale: besides they made such a noise that wee were not able to heare one another speake. Furthermore, wee were not able to set our feet on the ground, but either on Fowles or Egges which lay so thicke in the grasse. Wee laded two Boats full in the space of three houres, to our great refreshing."¹

¹ Tyler, Lyon Gardiner: *Narratives of Early Virginia*, 1907, p. 9.

There is no clew, however, to the species of birds found, except that they were "wild fowles" which in general implies that they were water-fowl. Undoubtedly many of the birds seen breeding in these lower latitudes were such as are known as sea-fowl or water birds, probably including Pelicans and Cormorants. Capt. John Smith mentions the Pelican as one of the birds on which he and his adventurers daily feasted in the "Virgines Isles."¹ He also states that on the isle called Monica they took from the bushes with their hands nearly two hogsheads full of birds in two or three hours.

When the first explorers reached Florida they found it swarming with wild-fowl, Turkeys and birds of many kinds. In A Notice of Commodities found in Florida, Monsieur René de Laudonnière early in the seventeenth century writes that there is "an infinite sort of all wild fowl."²

The English gave the name of Virginia to all the country between Florida and Nova Francia (Canada); this included New England. During the period between 1600 and 1630 many writers speak of the abundance of game birds and wild-fowl in this region or parts of it.

Capt. Philip Amidas, the first Englishman to set foot in North America, and Capt. Arthur Barlowe landed in 1584 upon an island in Pamlico Sound, "Virginia," named by the Indians "Wokokon." Here, their account states, they found "Deere, Conies, Hares and Fowle, even in the midst of Summer in incredible abundance."³

Lawson, in his travels in Carolina (1700), speaks of large savannas on the Santee River as "plentifully stored" with Geese and other fowl. In the adjacent woods were great flocks of Turkeys.⁴ At sunrise flocks of Turkeys, containing several hundreds in a flock, were seen. Again he says: "We saw plenty of Turkeys, but perched on such lofty oaks that our guns would not kill them."⁵

Sir Samuel Argal (1624) stated that in Virginia there were

¹ Smith, Capt. John, Works of: The English Scholars Library, No. 16, 1884, p. 386.

² Coll. Mass. Hist. Soc., Vol. VIII, 3d ser., p. 117.

³ Jameson, J. Franklin: Early English and French Voyages, Am. Hist. Asso., 1906, p. 229.

⁴ Lawson, John: History of Carolina, 1860, pp. 34, 50.

⁵ *Ibid.*, p. 79.

fowl in abundance, such as Swans, Brant, Geese, Turkeys, Cranes and Ducks.¹

William Strachey (1610) says, in his True Declaration of Virginia: "The Turkyes of that Countrie are great, and fat, and exceeding in plentie. The riuers from August, or September, till February, are couered with flocks of Wildfoule; as swannes, geese, ducke, mallard, teal, wigeons, hearons, bitters, curlewes, godwights, plouers, snights, dottrels, cormorants, in such abundance as are not in all the world to be equalled."²

Colonel Norwood (1649) states that great flights of fowl frequented an island on which he was cast away off the coast of Virginia.³

John Clayton (1688), in a letter to the Royal Society, giving accounts of "several observables in Virginia," says that Wild Geese and Brant in winter came in mighty flocks, with wild Ducks innumerable.⁴

Edward Williams, writing of "Virginia," states that wild-fowl in their seasons were innumerable.⁵

Thomas Glover (1676) says that on the bay and rivers "feed so many wild fowl as in winter time they do in some places cover the water for two miles."⁶

The above accounts refer mainly to the southern and middle portions of our Atlantic seaboard. Narratives of the Dutch, who first settled New Netherlands (now part of New York, New Jersey and the region along the Hudson), gave evidence of the vast numbers of wild-fowl and game birds found there during the early days of settlement.

Johannes de Laet (1633) says: "Innumerable birds are also found here, both large and small, those that frequent the rivers and lakes, as well as the forests, and possess plumage of great elegance and variety of colors."⁷

Nicolaes van Wassenauer (1624) writes: "In their waters

¹ Purchas, Samuel: His Pilgrimes, Glasgow, 1906, Vol. XIX, p. 209.

² Tracts by Peter Force, 1884, Vol. III, Tract No. 1, p. 13.

³ *Ibid.*, Tract No. 10, p. 23.

⁴ *Ibid.*, Tract No. 12, p. 33.

⁵ *Ibid.*, Tract No. 11, p. 48.

⁶ Glover, Thomas: An Account of Virginia, Philos. Trans. Royal Soc., June 20, 1676, reprint of 1904, p. 8.

⁷ Jameson, J. Franklin: Narratives of New Netherland, Am. Hist. Assn., 1909, p. 56.

are all sorts of fowls, such as cranes, bitterns, swans, geese, ducks, widgeons, wild geese . . . Birds fill also the woods.”¹

Isaack de Rasieres, in a letter to Samuel Blommaert (1628), states that there were many birds which were in abundance there in the winter.²

Rev. Johannes Megapolensis, Jr. (1644), asserts: “We have here, too, a great number of all kinds of fowl . . . which sport upon the river in thousands in the spring of the year, and again in the autumn fly away in flocks, so that in the morning and evening any one may stand ready with his gun before his house and shoot them as they fly past.”³

David Pieterszoon de Vries (1642) speaks of great quantities of different kinds of Geese, Curlews, Snipe, Gulls and many shore birds. Turtle Doves (Passenger Pigeons) were so numerous that the light could hardly be discerned where they flew, and other species of birds in large numbers.⁴

Hubbard (1680) says that on Long Island there was “great store” of wild-fowl, such as Turkeys, Heath Hens, Quail, Partridges, Pigeons, Cranes, Geese of several sorts, Brant, Ducks, Widgeons, Teal “and divers others.”⁵

Martin Pring (1603), who visited the northern part of Virginia (New England and adjacent lands), states that there was “great store” of river and sea fowl.⁶

In Archer’s account of Gosnold’s voyage we find the statement that about May 22, 1602, the company reached an island, south of Cape Cod, which they called Martha’s Vineyard, where they found wild-fowl breeding in abundance. This island evidently was that now known as “No Man’s Land.” It is given as in “latitude $41\frac{1}{4}$.”⁷

In Brereton’s account of Gosnold’s voyage (1602) there is a description of a fresh-water lake (which some later historians have located on the island now known as Martha’s Vineyard), in which stood a small island that was “exceed-

¹ Jameson, J. Franklin: *Narratives of New Netherland*, Am. Hist. Assn., 1909, p. 71.

² *Ibid.*, p. 113.

³ *Ibid.*, p. 169.

⁴ *Ibid.*, p. 221.

⁵ Hubbard, William: *General History of New England*, Coll. Mass. Hist. Soc., Vol. VI, 2d ser., p. 672.

⁶ Jameson, J. Franklin: *Early English and French Voyages*, Am. Hist. Assn., 1906, p. 350.

⁷ Coll. Mass. Hist. Soc., Vol. VIII, 3d ser., p. 76.

ingly frequented with all sorts of fowls," some of which bred low on the banks, and others on low trees about the lake in great abundance, the young of which the explorers took and ate.¹

In the various historical collections there may be found fragmentary accounts of the birds of Massachusetts, most of which will be referred to in their proper places under the heads of the various species. Josselyn (1672) particularly mentions large numbers of Wild Turkeys.²

Higginson (1630) says: "Fowles of the Aire are plentiful here. . . . Here are likewise abundance of Turkies often killed in the Woods. . . . In Winter time this Countrey doth abound with wild Geese, wild Duckes, and other Sea Fowle, that a great part of the winter the Planters haue eaten nothing but roastmeat of diuers Fowles which they haue killed."³

Morton (1632), who was a "fowler," also speaks of the numerous quantities of wild-fowl, shore birds, Turkeys, Cranes, Grouse, Partridges and Quail in New England. He asserts that he often had a thousand Geese before the muzzle of his gun, and that the feathers of the Geese that he killed in a short time paid for all the powder and shot that he would use in a year.⁴

Wood (1629-34) also writes of the large numbers of Turkeys, Cranes and other large birds, as well as Pigeons, shore birds and wild-fowl.⁵

These writers refer mainly to the region about Boston harbor and Massachusetts Bay, where the first settlements were made.

Lewis says of Lynn that at the time of the first settlement (1630) the ponds and streams were filled with fish, and that the harbor was covered with sea-fowl, which laid their eggs on the rocks and sands of the shores; he says that fifty Ducks were sometimes killed at one shot.⁶ He states, also, that gulls in abundance bred on Egg Rock, which lies off Nahant.

¹ Coll. Mass. Hist. Soc., Vol. VIII, 3d ser., p. 89.

² Josselyn, John: *New England's Rarities*, Coll. Mass. Hist. Soc., Vol. III, 3d ser., p. 277.

³ Higginson, Francis L.: *New England's Plantations*, Tracts by Peter Force, 1836, Vol. I, Tract No. 12, pp. 10, 11.

⁴ Morton, Thomas: *New English Canaan*, Tracts by Peter Force, 1838, Vol. II, Tract No. 5, pp. 46, 47.

⁵ Wood, Wm.: *New England's Prospect*, Pub. Prince Soc., 1865, pp. 32, 33.

⁶ Lewis, Alonzo, and Newhall, James R.: *History of Lynn*, 1865, pp. 46, 57, 80.

Wood asserts that the marsh at the mouth of the Saugus River near Lynn was crowded with creeks, where lay "great stores of Geese and other Ducks."

In Obadiah Turner's Journal, July 28, 1630, relating to the first settlement of Lynn, we find the following: "Of birdes wee saw great store . . . manie of wch wee knew not ye names. But wee are of a truth in a paradise of those moving things yt be good for foode."¹ In the same volume, under date of 1638, it is stated: "Upon ye beach they spied great multitudes of birdes of manie kindes, they being there to pick vp ye wormes and little fishes. They haue long bills wch they thrust into ye little holes in ye sand and pull up ye fat wormes with great relish. They lay eggs in ye sand and ye heate of ye sun being vpon them they speedilie hatch, and ye little birdes betake themselves to feeding. Ye beach birdes are verrie shy and quick a-wing, but our sportsmen, nevertheless, do bring down great plentie for their own vse and if need to supply their plantations."²

In an account of Levett's voyage to New England (1623) he mentions "great plenty" of wild-fowl at a pool nine miles below the mouth of the Saco. He says, "In this place there is a world of fowl," and also speaks of "much fowl" in other places on the coast and islands.³

In Rosier's narrative of Waymouth's voyage to the coast of Maine, in 1605, he records visits to Monhegan Island and St. Georges Isles, and in both places saw "much fowl of divers kinds" breeding. He gives a list of birds, and states that there are "many other fowls in flocks, unknown."⁴

The enormous numbers of game birds, which formed a staple article of food for settlers, were looked upon as a valuable asset in the new country; and the abundance of fowl was fully set forth in the publications destined for the eyes of presumptive immigrants.

The President and Council of New England (1622), setting forth the advantages of New England as a place of residence,

¹ Newhall, James Robinson: *Lin, or, Jewels of the Third Plantation*, 1880, p. 59.

² *Ibid.*, p. 67.

³ *Coll. Me. Hist. Soc.*, Vol. II, pp. 80, 82, 83, 85.

⁴ *Coll. Mass. Hist. Soc.*, Vol. VIII, 3d ser., pp. 132, 157.

speak of the country as abounding with diversity of wild-fowl, as Turkeys, Partridges, Swans, Wild Geese, wild Ducks and many Doves.¹

Sir Ferdinando Gorges (1658) states that there were plenty of fish and fowl for the "sustentation" of the settlers, "so that they could not say (according to the manner of their living) they wanted anything nature did require."²

The Baron de Lahontan (May 28, 1687) speaks of the immense numbers of Geese, Ducks and Teal, with an "infinity of other fowl," which he found at Lake Champlain, and states that his party ate nothing but water-fowl there for fifteen days.³

The early explorers of Newfoundland, the St. Lawrence River and Canada, both French and English, tell similar stories of an abundance of fowl. The references to birds are fragmentary, however, and the descriptions and nomenclature of the species are often indefinite and confusing. We can see from these accounts that game was very plentiful, and we can get some valuable information regarding a few of the larger and more conspicuous species; but to get an adequate idea of the former numbers of game birds in America we must turn to the more recent accounts of conditions in the great west, which has been settled within a century, or to the narratives of those who have hunted in the thinly settled parts of the south Atlantic and Gulf coasts.

FORMER ABUNDANCE OF GAME BIRDS IN THE WEST AND SOUTH.

Game has been abundant in the west and south within the last half-century, and game birds are still plentiful in some parts of these regions. Many species of game birds have been decimated and their territory greatly restricted, but by the records of their former or present abundance and their decrease in the west and south we may be able to approximate the conditions that formerly existed on the Atlantic seaboard. Audubon writes in his journal, in camp at the

¹ Coll. Mass. Hist. Soc., Vol. IX, 2d ser., p. 18.

² *Ibid.*, Vol. VI, 3d ser., p. 89.

³ Lahontan, Baron de: *Some New Voyages to North America*, 1703, p. 61.

mouth of the Omaha River, October 1, 1843: "The wild Geese are innumerable." Again on October 3, when he passed Soldier River, he writes: "The Geese and Ducks are abundant beyond description."

Murphy (1882) said that it was doubtful if the wild-fowl were as abundant in any other part of the world as they were even then on the North American continent, "myriads" being the only word that could give an idea of their numbers. In the seasons of migration the country so swarmed with them that they presented the appearance of numerous clouds of feathers, and the number of species was greater than those of any other part of the globe.¹

In presenting the following well-considered statements of standard writers, I cannot vouch for the accuracy of their assertions; but, as most of them are known as authorities on ornithology or sportsmanship, they will no doubt receive the credence justly due them.

Audubon writes (1838) that innumerable Ducks fed in beds of thousands, or filled the air at Chesapeake Bay; and that great flocks of Swans, looking like banks of snow, rested near the shores.

Lewis, writing of Chesapeake Bay (1850), says that all species of wild-fowl resorted there then, in number beyond credence or computation; and that it was necessary for a stranger to visit the region, in order to form a just idea of the wonderful multitudes and numberless varieties that darkened the waters and hovered in interminable flocks around the feeding grounds.²

Frank Forester avers that the bay and its tributary rivers were frequented by innumerable hordes of wild-fowl.

Murphy states that the bay during the season was like a battle ground, and that over ten thousand people were accustomed to shoot there.

Grinnell says that in early days slave owners, who hired out their slaves to others, stipulated in the contract that Canvas-back Ducks should not be fed to them more than twice each week; and copies of such contracts are said to be

¹ Murphy, John Mortimer: *American Game Bird Shooting*, 1882, pp. 265, 266.

² Lewis, Elisha J.: *The American Sportsman*, 1855, pp. 246, 247.

still in existence in Maryland. Redheads rafted in Eastern and Hogg bays in bodies miles in extent, probably not less than fifty thousand Ducks in a mass.¹

Robert Law of Chicago, who lived on the Chesapeake in his youth, is said to have hired slaves of their owners, and fed them on Canvas-backs until they rebelled and refused to be punished further with Canvas-backs, or to work longer unless fed on pork at least twice a day.²

These Ducks, so little valued then, sold at seven dollars a pair in 1890, and the demand is now unlimited.

Huntington asserts that the number of wild-fowl along the Atlantic coast was almost beyond belief; that there were flocks in sight following each other in quick succession for days at a time, and acres of Ducks on the water.³

Wild Geese were, and still are, more abundant in the southwest in winter than in any other part of the continent. The Snow Geese and other species once moved in such vast flocks that they might be compared to a snowstorm. They often destroyed large crops of winter cereals, and in California left scarcely any grain in a large district that they frequented. It is estimated that they destroyed crops valued at two hundred thousand dollars in one county of California in 1878, and that their depredations in other sections were as great. Shooting had so little effect on their numbers that the farmers gave up in despair and resorted to poison.⁴

All sorts of devices were used for killing Geese and Ducks. A man has been known to kill two hundred Geese in a day by stalking them under cover of a horse. By using a horse or an ox for stalking purposes, and a huge gun heavily loaded, one man is said to have bagged from ten to forty at each discharge, and earned in one day a hundred dollars.⁵

Fifty drams of powder and a pound of shot fired from a huge scatter-gun by a skilful gunner were sometimes very effective. Dr. Hatch says that a citizen of Sacramento, Cal., many years ago published the offer of a Panama hat, worth

¹ Grinnell, George Bird: American Duck Shooting, 1901, p. 473.

² Leffingwell, W. B.: Shooting on Upland, Marsh and Stream, 1890, p. 414.

³ Huntington, Dwight W.: Our Feathered Game, 1903, p. 141.

⁴ Murphy, John Mortimer: American Game Bird Shooting, 1882, p. 240.

⁵ *Ibid.*, p. 242.

twenty-five dollars, to the person who would beat his record—nearly fifty birds—for a single shot at Geese. Fifteen years later another gunner killed seventy-five birds at a single shot on Suisun Bay.¹

More recently the editor of *Recreation* investigated a story that W. E. Newbert and W. H. Young of Sacramento, Cal., killed one hundred and seventy-three Geese and “Brant” in seven hours shooting. He found it to be a fact. The Geese were so destructive to the newly sprouted grain that the farmers were compelled to hire men to drive them off.

In Dakota it was customary to build great fires on the roosting grounds of the Geese on dark nights, and to shoot the birds as they flew in “clouds” over the fires. One man in Minnesota is said to have killed three thousand Geese in this manner in ten days.²

Gillmore states that he and one companion killed eighty-five Geese and a “large number of duck” on the prairie in one day; and at Grand Prairie, Ill., he alone killed nineteen Geese and forty Ducks one day, and would have killed more, but his ammunition gave out.³

Hunter states that in one day at Cobbs Island, Va., he had killed fifty-six Brant when his shells gave out; and that Nathan Cobb killed one hundred and eighteen, which he considered a good day’s work. He stated that one hundred and eighty-six was his best tally for one day.⁴

A few of the scores made by gunners in the days of the old muzzle loader, supplied with the flint-lock or the percussion cap, will serve to indicate the former abundance of Ducks. Capt. John Smith, in his account of his journey to the Pamunkee, in 1608, makes the following assertion: “An hundred and forty-eight fowls the President Anthony Bagnall and Seriegent Pising did kill at three shoots.”⁵

Hearne (1769–72) says that some Indians frequently kill as many as one hundred Snow Geese each in a day.⁶

¹ Hatch, P. L.: Notes on the Birds of Minnesota, Zoöl. Ser., Geol. and Nat. Hist. Surv. of Minn., 1892, Vol. I, p. 76.

² Murphy, John Mortimer: American Game Bird Shooting, 1882, p. 246.

³ Gillmore, Parker: Prairie and Forest, 1874, p. 249.

⁴ Hunter, Alex.: The Huntsman in the South, 1908, pp. 157, 158.

⁵ Smith, Capt. John: General History of Virginia and New England, 1819, p. 206.

⁶ Hearne, Samuel: A Journey to the Northern Ocean, 1795, p. 439.

Audubon states that forty or fifty Ducks were often killed at one shot with a small gun at Chesapeake Bay.

Murphy says that pot-hunters sometimes killed twenty to forty "at a round" with a large naphtha lamp and reflector in a boat at night; and that he had been told that two men killed, in this way, with big guns, fifteen hundred birds from 7 P.M. to 3 A.M.; also, that two men in sneak boxes, armed with six guns, killed five hundred and sixteen birds in a day.¹

Grinnell says that four men on the Chesapeake enticed or tolled in a flock of Redheads and Blackheads, and gathered forty-seven birds from six shots; while poachers with big guns shot into flocks at night, sometimes killing seventy-five to one hundred birds at a shot.²

Many years ago there was a record of one gunner who from a battery killed five hundred Ducks in one day; and a more recent record of one who killed three hundred in a day's work.³

Mr. W. W. Levy killed one hundred and eighty-seven Ducks in one day on Chesapeake Bay, and shot seven thousand Canvas-backs in the season of 1846-47. A party of gunners often filled a small vessel with Ducks in two or three days, and dispatched it to the markets of Baltimore, Philadelphia or New York.⁴

Lewis states that in 1854, when the second edition of his work was prepared, the gunners in the vicinity of Havre de Grace killed three thousand Ducks on the first day of the shooting season.⁵ No wonder that the glories of Chesapeake Bay as a shooting ground have long since departed.

In Ohio, before the game laws were enacted, the explosion of guns in the marshes resembled the skirmish fire of an army. A market gunner of Sandusky killed one hundred and eighteen Ducks at a shot.⁶

On the Kankakee marshes Huntington saw boats come in loaded to the guards with Ducks; some barely floated. On

¹ Murphy, John Mortimer: American Game Bird Shooting, 1882, p. 292.

² Grinnell, George Bird: American Duck Shooting, 1901, pp. 481, 482.

³ *Ibid.*, p. 440.

⁴ Lewis, Elisha J.: The American Sportsman, 1855, p. 269.

⁵ *Ibid.*, p. 288.

⁶ Huntington, Dwight W.: Our Feathered Game, 1903, p. 142.

one occasion, he avers, the whole great marsh seemed to rise up with a roar, and the water dropping from the Ducks appeared like a heavy rain. The birds, he says, almost obscured the sky.¹

One clubman at the Palmer Island Club at Currituck Sound, N. C., is said to have killed one hundred and sixty Canvas-backs in a day's shooting.²

At one small lake on the Pacific coast four men shooting morning and evening made a record of over four hundred Teal, all killed on the wing.³

Enormous numbers of wild-fowl formerly migrated to Mexico in winter, and great multitudes still go there. Major Price (1877) stated that "clouds" of wild-fowl were seen by him on the River Santiago; and that even in China, one of the finest countries for Duck shooting in the world, he never saw these birds so numerous.⁴

Duck shooting in Mexico is largely monopolized by the owners of large estates or preserves. One of the most successful methods used in market shooting in Mexico is called the armada. It is built in a half circle, just above the water line of some pond. Two hundred to three hundred gun barrels are set so that one half will sweep the surface of the water; the other half are aimed a little higher. The Ducks are baited to the pond with barley and corn, and they are carefully guarded and fed by men on horseback, who ride around, but do not molest them until the birds become accustomed to their presence. When everything is ripe for the slaughter the Ducks are carefully driven within range, and the two sets of barrels are then fired one after the other, by an ingenious arrangement. The number of Ducks thus slaughtered in Mexico cannot be estimated. At the Hacienda Grande, at the north end of Lake Texcoco, four thousand six hundred and ninety-six Ducks were killed in this way at one discharge. They sold for two hundred and fifty-six dollars. Signora Cervantes de Rivas, owner of the hacienda, said that the net

¹ Huntington, Dwight W.: *Our Feathered Game*, 1903, p. 211.

² Hunter, Alex.: *The Huntsman in the South*, Vol. I, 1908, p. 289.

³ Huntington, Dwight W.: *Our Feathered Game*, 1903, p. 231.

⁴ Price, Maj. Sir Rose Lambart, Bart.: *The Two Americas*, London, 1877, p. 170.

profit in Ducks on that ranch in one winter was over thirteen thousand dollars, which represents two hundred and eight thousand Ducks; and there are hundreds of people pursuing the same business.¹ We accomplish the same result in the United States, but more people share in the sport and the profits.

Mr. T. Gilbert Pearson, secretary of the National Association of Audubon Societies, who visited President Diaz in Mexico City during the winter of 1909-10, in the hope of securing government action for the protection of game in Mexico, found the armada still in operation there. Fortunately, few if any wild-fowl that breed in New England or pass through it migrate to Mexico.

If we turn to the waders, we shall find plentiful evidence regarding their former overwhelming abundance, and the wonderful migrating army which once swept not only along our coasts but over the interior as well.

Frank Forester, writing about the middle of the last century, said that from the Swan down to the Least Sandpiper every species of aquatic bird abounded in its appropriate latitude in his day. From Boston Bay to the mouth of the Mississippi River some portions of the coast were then swarming at all times of the year with all the varieties of Curlews, Sandpipers, Plover and other shore birds. Long Island, New Jersey, the Chesapeake, the islands of Albemarle and Pamlico sounds, and the tepid waters of Florida, all abounded with these aquatic myriads.²

Gillmore says (1874) that there was no portion of the world with which he was acquainted where these birds were so largely represented both in species and numbers as in North America. Along the Atlantic seaboard of the United States they abounded in spring and fall, and their principal breeding places, like the coasts and interior of Labrador and Newfoundland, fairly swarmed with them; while the western prairies at the breaking up of winter were populated with such numbers as almost to cause the surface of the soil to

¹ Huntington, Dwight W.: *Our Feathered Game*, 1903, p. 143.

² Herbert, Henry William: *Frank Forester's Field Sports of the United States*, 1873, Vol. II, pp. 7, 8.

appear to move as they rushed about in search of the insects that formed their principal food.¹

King (1866) says that one of the peculiarities of Lakes Erie and Ontario consists of the great numbers of Sandpipers running along the beach in large flocks.²

Great bags of shore birds were made on the Atlantic coast, even as late as the last quarter of the nineteenth century.

Giraud speaks of one hundred and sixteen Yellow-legs killed at one shot.

Wilson tells of eighty-five Red-breasted Snipe taken at one discharge of the musket, and Audubon saw one hundred and twenty-seven killed by three barrels.

A gunner at Egg Harbor killed thirty-three Red-breasted Snipe by shooting both barrels into a passing flock; and Frank Forester says that in his day a sportsman might fill a bushel basket with the proceeds of a day's shooting on beaches and marshes.

Lewis states that he saw twenty-three Dowitchers killed at one discharge.

Bogardus mentions that he, with a friend, killed three hundred and forty Wilson's Snipe in a day on the Sangamon River in Illinois, and says that his bag in the right season was seldom as small as one hundred and fifty birds in a day.

Huntington states that on one occasion, in Ohio, he killed twenty-eight Wilson's Snipe in a little over an hour's shooting.³

There is a story current among old gunners in Concord, Mass., that years ago one man won a wager that he could kill fifty Wilson's Snipe in an hour or two with a limited number of shots.

Gillmore says that in his day, within thirty-six hours' travel of New York City, such Snipe shooting could be enjoyed as was to be had in no other portion of the globe. One of his acquaintances killed nine dozen in seven hours, and frequently killed from seven to eight dozen in the same time.

¹ Gillmore, Parker: *Prairie and Forest*, 1874, p. 250.

² King, W. Ross: *The Sportsman and Naturalist in Canada*, 1866, p. 114.

³ Huntington, Dwight W.: *Our Feathered Game*, 1903, p. 273.

Audubon says that adepts in the sport of Woodcock shooting have been known to kill upwards of one hundred in a day.

Doughty asserts that in 1825, in the meadows bordering on the Cohansey River, in the lower part of New Jersey, three men in about two hours killed more than forty Woodcock on a small spot of ground;¹ and also that in a very small spot in the lowlands west of New York City a party of two or three men killed upwards of eighty Woodcock, while in a very small spot of a few acres in Salem County as many as one hundred and fifty were killed during that day, and very many more on the same spot on the day succeeding.²

In the early days of the settlement of America, and for many years afterward, the Ruffed Grouse was not only very numerous in the eastern and middle States and in Canada, but was a tame and apparently stupid bird, as it still is in a few of the wilder regions of the country. Lahontan regarded the stupidity of the "Wood Hen" as the most comical thing he had seen, for they sat upon the trees in flocks, and were killed one after the other, without offering to stir. The Indians shot at them with arrows, for they were not worth a charge of powder.³ Evidently he refers to the Ruffed Grouse, for he describes how they drum on a log.

Wilson, in travelling among the mountains that bounded the Susquehanna River, was always able to get an abundant supply of these birds without leaving the path.

Abbott avers that in the swamps of central New Jersey these birds used to congregate by thousands, and that in the closing years of the eighteenth century it was a common sport on all farms to surround the Ruffed Grouse, and when a great host of birds had been gathered in a few trees, all the farmers would fire at a given signal, their old flint-locks loaded with bits of nails and cut pieces of lead, and representatives from the different farms would go home loaded with a "big mess of patridge." The Grouse congregated in

¹ Doughty, J. and T.: *The Cabinet of Natural History and American Rural Sports*, 1830, Vol. I, p. 97.

² *Ibid.*, Vol. II, p. 15.

³ Lahontan, Baron de: *Some New Voyages to North America*, 1703, Vol. I, p. 86.

the woods and swamps of central New Jersey by thousands, where they were netted by the inhabitants.¹

Audubon states that he had bought these birds at Pittsburg "some years ago" for twelve and one-half cents a pair, but that they now sold (1835) in the market at seventy-five cents to one dollar in the eastern cities.

Abbott believes that, common as this bird still was in New Jersey in 1895, it was as nothing compared to half a century ago; and, judging from old manuscripts which refer presumably to this Grouse, they were extremely abundant at one time, or when the country was settled, when "their drumming in the woods would sound often as if every hive of bees was swarming."

The Pinnated Grouse was found in enormous numbers along the Atlantic coast in suitable regions, and was still more numerous in the interior. Other and larger game was so plentiful that few people ate this bird during the first years of settlement. Audubon says that a friend of his killed forty of these Grouse with a rifle one morning without picking one up; and that when he first went to Kentucky no hunter of that State deigned to shoot them. In Massachusetts they were looked upon with more abhorrence than the crows, because of the injury they did in the orchards by picking off the buds in winter and picking up sowed grain in the fields in spring. Audubon states that his servants preferred fat bacon to the flesh of these birds, which often fed with the domestic fowls. As the deer and Turkeys became scarce, the Grouse were utilized; and twenty-five years later they had been nearly all driven out of Kentucky and had been nearly exterminated in the east, being then so rare in the markets of Boston, Philadelphia and New York that they sold at from five dollars to ten dollars per pair.²

Later, as settlement progressed westward, these Grouse were found so abundant in some portions of the west that it was nothing unusual for a person armed with a breech-loader to bag twenty or thirty brace a day.³

¹ Abbott, C. C.: *The Birds about us*, 1895, pp. 189-191.

² Audubon, J. J.: *Ornithological Biography*, 1835, Vol. II, pp. 491, 492.

³ Murphy, John Mortimer: *American Game Bird Shooting*, 1882, p. 63.

Mr. Samuel C. Clarke states that Pinnated Grouse were once so plentiful in Illinois that thirty to forty to a gun were killed in a day; and that one man drove from Fox River to Chicago, forty miles, with one dog, and killed about one hundred Grouse on the way. At that time they sold for only one dollar a dozen in the Chicago market.¹

The Bob-white or "Quail" was also found in countless numbers in favorable localities all along the Atlantic coast. Lewis says that a gentleman living on Chesapeake Bay, not far from Havre de Grace, asserted that his next neighbor caught in nets in one season on his own estate no less than nine hundred of these birds. He kept them in coops, and fed them to his negroes.² Lewis also avers that a gentleman living near Lynchburg, Va., killed over one hundred of these birds in a day's shooting during the season of 1851-52.³

Sir Thomas Button states that when his crew wintered in Port Nelson River, in 1612, they killed eighteen hundred dozen Grouse.

Hearne says that he has seen thousands of Ptarmigans in flight, and that the whole surface of the snow seemed to be in motion, where they fed on the tops of the short willows.⁴

Much more evidence might be given regarding the great numbers of game birds in America in early days; but sufficient proof has been cited of the abundance of edible fowl in this country at the time of its discovery and during its settlement. Further evidence regarding early conditions in Massachusetts will be given under the histories of the species. What have we done with this bounteous supply,—this great host of edible birds?

THE DECREASE OF EDIBLE BIRDS.

Josselyn, writing within forty years after the first settlement in New England, stated that the Wild Pigeon had decreased greatly, "the English taking them with nets;" and he said that the English and Indians had "destroyed the breed" of Wild Turkeys, so that it was then very rare to meet

¹ Leffingwell, W. B.: Shooting on Upland, Marsh and Stream, 1890, p. 262.

² Lewis, E. J.: The American Sportsman, 1855, p. 85.

³ *Ibid.*, p. 103.

⁴ Hearne, Samuel: A Journey from Hudson Bay to the Northern Ocean, 1795, p. 411.

one in the woods. This is typical of the white man's destructiveness. He puts firearms in the hands of the savages, and destroys the large game and the gregarious birds that can be taken easily in large numbers with the gun, trap, snare or net. The Indian had a plentiful supply of game until the white man came. The result of giving him firearms and a market for game was well shown in the last century in the valley of the Moisie River, Labrador. The Indians themselves admitted that it was the guns sold to them by the whites that proved their undoing. They shot the deer, sold the skins for more guns, destroyed all the large game in the country, and then either starved or left the country. The white men killed only the larger game at first, or such birds as could be shot in numbers from flocks. Even as late as the beginning of the nineteenth century, Wilson said that gunpowder was too precious in the mountains to be used on anything smaller than a Turkey; but in the valleys and along the coast a few years of settlement were sufficient to destroy most of the larger and much of the smaller game. Hunting was unrestricted. Practically all the male inhabitants were accustomed to the use of firearms. Like the Indians, the settlers killed game at all seasons. The mother bird on her nest, the eggs and young, — all were taken wantonly, without restraint, and all utilized as food. The result of such destructiveness was never for a moment in doubt. The end came quickly. The large game and the resident game birds suffered most, particularly near the centers of population, where the larger game animals and the breeding game birds, such as the deer, Wild Turkey and Pinnated Grouse, were soon extirpated.

Professor Kalm states that all the old Swedes and Englishmen born in America, whom he questioned, asserted that there were not nearly so many birds fit for eating "at the present time" (1748) as there were when they were children (1670-90), and that the decrease of these birds was visible. They said that their fathers also had complained of this; saying that in their childhood the bays, rivers and brooks were quite covered with all sorts of water-fowl; but when Kalm was at Swedesboro, New Sweden (now New Jersey) (1748), there was sometimes not a single Duck to be seen. He was

informed that sixty or seventy years earlier a person could kill eighty Ducks in a morning; "but at present," he says, "you frequently wait in vain for a single one." The Wild Turkeys, Grouse and Cranes, which were so numerous in former years, were now nearly all gone. Kalm says that the cause of this diminution was not difficult to find, for after the arrival of great crowds of Europeans the country had become well peopled, the woods had been cut off, and the people had by hunting and shooting, partly exterminated the birds and partly frightened them away. There were no regulations or laws to prevent the destruction of birds at any season of the year, and, had any existed, the spirit of freedom prevailing in the country was such that they would not have been obeyed. He heard great complaints of the decrease of eatable fowl, not only in Pennsylvania and New Jersey, of which he speaks particularly, but in all parts of America, wherever he travelled.¹

Audubon, in his Missouri River journals, frequently mentions the fact that Geese with young were shot, or shot at, by members of his party or the boat's crew; but he says that in some cases "the poor things fortunately escaped." This destruction of birds in the nesting season was even then common throughout the country. Audubon well describes the rapid destruction of game on the Ohio River during the early part of the nineteenth century. He says that when he first visited the region (about 1810) the shores of the river were amply supplied with game. A Wild Turkey, Grouse or Teal could be procured in a few minutes, and his party fared well. There were then great herds of elk, deer and buffalo on the hills and in the valleys. Twenty years later these herds had ceased to exist. The country was covered with villages, towns and farms, and the din of hammers and machinery was constantly heard. The woods were fast disappearing under the axe and fire, hundreds of steamboats were gliding to and fro over the whole length of the river, and most of the game was gone.

The gunner and hunter were not entirely to blame for the destruction of game; the cutting down of forests drove out

¹ Kalm, Peter: Travels in North America, 1770, Vol. I, p. 289.

many birds and mammals, and many were killed by fires in the woods. These fires not only killed many upland game birds, but they also destroyed many water-fowl as well. Wild-fowl, disturbed and bewildered by the light of the burning forest at night, have been seen to circle around the fire until overcome by the heat and smoke, when they fell into the flame. Some fell like stones from immense heights; others dove down, seeming to be fascinated, like moths, by the flame.¹

After all, however, the fires were local, and not nearly so destructive as the devices invented to capture the birds. Great traps were made, in which whole flocks of Turkeys or Quail were caught. Nets also were used for catching the smaller game birds, and the woods were full of snares in which Grouse and other small game were taken. The great guns used for shooting into the flocks of wild-fowl were destructive. They were usually mounted upon a swivel in the bow of a boat, like a small cannon, and the breech was held to the shoulder to take aim.

The diminution of game progressed faster along the coast, in the river valleys and about the lake shores than elsewhere, for there settlement first began; while in the unsettled interior of the north and west the birds were still nearly as plentiful as ever. Up to the early part of the nineteenth century the great interior of the northwest beyond the Great Lakes and in Canada was not only unsettled, but unexplored; therefore, notwithstanding the great decrease of the resident game birds along the Atlantic coast for three centuries after the discovery of America, the wild-fowl, shore birds and game birds still bred in almost undiminished numbers in the unexplored interior of the United States, British America and the lands of the Arctic Sea; and they still appeared in vast numbers in their migrations, sweeping in clouds over the interior, and moving in great flocks up and down the Atlantic seaboard. It was the unsettled wilderness, and the wilderness alone, which so far had maintained the supply; but when, in the latter part of the nineteenth century, railroads began to

¹ Hind, H. Y.: *The Labrador Peninsula*, 1863, Vol. I, p. 209.

extend throughout the great west and northwest, a rapid extermination of game commenced, such as was never known before in the world's history. The railroads carried settlers into the wilderness, and opened to them the markets of the east.

Before the advent of the railroads, game had been plentiful and cheap in the markets of the western cities. Audubon says in his journal that in 1843 at St. Louis the markets abounded with the good things of the land: Grouse could be had two for a York shilling; Turkeys, wild or tame, twenty-five cents each; Ducks, three for a shilling; Wild Geese, ten cents each; and Canvas-backs, a shilling a pair. When the railroads reached the country tributary to St. Louis, and thus connected it with eastern markets, building up also great markets in the central west, the prices of game gradually rose, while the game rapidly decreased. The fame of America as a game country was noised far and wide. Hunters and sportsmen came from every land; sportsmen, market hunters, big game hunters and skin hunters crowded into the new country. The improvement in firearms kept pace with the increased transportation facilities. The breech-loader gave the hunter an added advantage. Then followed the practical extermination of the American bison, the deer, elk, antelope, mountain sheep, mountain goat, Wild Turkey and Prairie Chicken over wide areas. Then first began the marked decrease in the numbers of game birds, shore birds and wild-fowl throughout most of the United States and British America, that has since become historic, and has had a marked effect on the migratory species that once inhabited or passed through Massachusetts and the other New England States in immense multitudes. Every chronicler, be he hunter, sportsman or naturalist, situated anywhere east of the Mississippi, records this decrease. The settler, the farmer, the sportsman and the market hunter eventually exterminated or drove out nearly all the breeding wild-fowl from the United States; and then the settlement of the country, the occupation of the birds' breeding grounds for agricultural purposes, and incessant gunning at all seasons, began to make itself

felt upon the vast multitudes of water-fowl that bred in the Canadian northwest. Farmers used every possible method to destroy the Ducks and Geese which consumed their crops. Market hunters systematically hunted the country. Flocks of Quail were enticed to certain points, where they were netted or trapped. Grouse were hunted by men in wagons, with trained dogs ranging near to put up the birds. Plover and Curlews were pursued by a small army of men, who followed them during their migration, and shipped the game to both western and eastern markets. The fact that these birds were among the most beneficial species on the prairie farms was not considered; they were exterminated without mercy. It was customary in the early days for a party of wild-fowl gunners to take along a horse and wagon to haul home their loads of birds. Mr. E. Hough, in writing of Duck shooting in North Dakota (1897), says that up to within two years of that time it was a daily sight at Dawson station to see the entire platform lined with Ducks. In warm weather it was not unusual to see two or three wagonloads of spoiled birds hauled away and dumped into a coulee.¹

Huntington tells of a time when the Ducks were so abundant in the markets of Detroit that they could not be used, and, warm weather coming on, they were thrown away.² He says that it was common in the old days for pot-hunters to fill their gunning boats to the gunwales, making such a glut in the market that large quantities of the birds spoiled.³

“Invisible,” writing in *Forest and Stream*, in 1899 states that there was not then one Goose left on the River Platte to fifty in days gone by. Ten or fifteen years earlier he had known a man to kill fifty-two between 2 o'clock and sundown. Similar statements came from sportsmen and ornithologists in many parts of the middle west. The shooting scores of gunning clubs show the decrease of the birds during the latter part of the nineteenth century.

¹ Grinnell, *George Bird: American Duck Shooting*, 1901, pp. 320, 321.

² Huntington, *Dwight W.: Our Feathered Game*, 1903, pp. 182, 183.

³ *Ibid.*, p. 206.

The following score,¹ from the Winous Point Club, indicates the decrease of Redheads in their region in twenty years:—

YEAR.	Birds killed.	YEAR.	Birds killed.
1881, . . .	1,415	1891, . . .	31
1882, . . .	1,987	1892, . . .	510
1883, . . .	1,699	1893, . . .	216
1884, . . .	927	1894, . . .	40
1885, . . .	1,058	1895, . . .	5
1886, . . .	366	1896, . . .	207
1887, . . .	21	1897, . . .	68
1888, . . .	56	1898, . . .	4
1889, . . .	16	1899, . . .	19
1890, . . .	63	1900, . . .	1

Another score² from the same club gives some information regarding three other species during the same time:—

YEAR.	Canvas-backs.	Mallards.	Blue-winged Teal.
1880, . . .	665	1,319	2,110
1885, . . .	237	943	1,019
1890, . . .	697	394	603
1895, . . .	72	218	21
1900, . . .	1	232	—

A club record³ from the Sandusky marshes in Ohio shows the decrease in Blue-winged Teal and Green-winged Teal in eighteen years:—

YEAR.	Blue-winged Teal.	Green-winged Teal.
1881, . . .	1,646	441
1885, . . .	1,019	506
1890, . . .	603	373
1899, . . .	255	184

¹ Huntington, Dwight W.: Our Feathered Game, 1903, p. 183.

² *Ibid.*, p. 212.

³ *Ibid.*, p. 232.

Long before the time of Audubon a decrease of the wild-fowl in Chesapeake Bay had begun, but they were still remarkably numerous there in his day and later. All writers since then who have investigated the diminution of the birds about the bay have found it progressive and continuous, notwithstanding the periodical fluctuations in numbers. Grinnell (1901) says that its glories as a Duck shooting ground largely have departed, that the gunning is a memory rather than a reality, and that the birds are yearly becoming more scarce. Similar reports have come from most of the ducking grounds of the United States. This decrease of game birds has been general throughout the country, except in a few far western States; but even on the Pacific coast the diminution of shore birds and wild-fowl has been noticeable in many places.

Dr. D. G. Elliot, author of several standard works on game birds, says: "North America at one time probably contained more Wild Fowl than any other country of the globe, and even in the recollection of some living, the birds came down from the northland during the autumn in numbers that were incredible, promising a continuance of the race forever. I have myself seen great masses of Ducks, and also of Geese, rise at one time from the water in so dense a cloud as to obscure the sky, and every suitable water-covered spot held some member of the Family throughout our limits. But those great armies of Wild Fowl will be seen no more in our land, only the survivors of their broken ranks."¹

The following is an extract from a recent work, *The Water Fowl Family*, by Sanford, Bishop and Van Dyke: "Between 1870 and 1875 fifteen thousand Ducks were not uncommonly killed in Chesapeake Bay in a single day. Here in February and March it was possible to see redheads and canvas-backs in rafts miles long, containing countless thousands of birds. Wild fowl up to 1860 had not been much hunted in this country, and during the Civil War were unmolested. From 1865 began their destruction, which has been steadily increasing since, with a result inevitable. In twenty-five years the greatest natural home in the world for wild ducks has been

¹ Elliot, D. G.: *Wild Fowl of North America*, 1898, Intro., pp. 21, 22.

nearly devastated of its tenants. The past few years have shown some betterment in the shooting there, and, with care, it may still improve, but the vast hordes of the past will not return. Inland bodies of water, extending through the middle west to the mountains, tell the same story. What sights were once seen on the sloughs of Indiana, Illinois and Minnesota! Now, in many places, the numbers left, an insignificant remnant, bear evidence of the past. After the large game had been destroyed and driven off, the small game was taken up, and the past twenty years have decimated the wild fowl almost beyond conception. Practically unprotected, shot from their first coming in the fall to the end of their stay in the spring, the result has been inevitable. Many of the most famous resorts are devastated, and the existing haunts exposed to such incessant persecution that local extinction is threatened, unless prompt measures of relief are afforded."

Prof. Lawrence Bruner, in his *Notes on Nebraska Birds* (1896), says that man, the greatest enemy, has so depleted their ranks in many localities that they have become scarce.

Mr. Rudolph M. Anderson, in his *Birds of Iowa*, tells of the decrease or disappearance of many species of edible birds.

Prof. Otto Widmann, in the *Preliminary Catalog of the Birds of Missouri*, says that the gun is the main factor in the disappearance of all the larger birds.

Mr. Witmer Stone, in his *Birds of New Jersey*, says that the number of gunners is vastly increased, and the number of game birds vastly decreased.

Dr. Sylvester D. Judd, in his *The Grouse and Wild Turkeys of the United States and their Economic Value*, says that a number of our game birds are now gone or are fast disappearing from their former haunts. The Heath Hen is practically extinct, and the Prairie Hen is nearly or quite gone from large areas in the west where it was numerous a few years ago.

Hearne said (1769-72) that in the Hudson Bay country the Snow Geese came in such numbers that when they alighted in the marshes the ground appeared like a field covered with snow. At Churchill River the people sometimes killed five or six thousand, and at York Fort they have salted forty hogs-

heads in a season. But he says, naively, that "Geese do not frequent these parts in such numbers as formerly." The sequel follows. In 1909 Mr. Henry Oldys of the Bureau of Biological Survey of the United States Department of Agriculture wrote me that Mr. Preble had learned, in his explorations about the west coast of Hudson Bay, that in this region, formerly one of the great highways of wild-fowl, the birds have become so reduced in numbers that the inhabitants, who were formerly accustomed to put down many of these birds for winter, are much straitened in their supply of food. In that wild region, where the supply of game is all-important to furnish food for the inhabitants, a diminution of water-fowl is seriously felt; and where moose are absent, caribou rare and the fishing poor, it is a serious matter. Many of the wild-fowl that go to the Atlantic coast in winter, as well as others that go to the gulf, breed in or pass through the region west of the bay. The destruction of these birds in the United States during migration is believed to have been the main cause of the present scarcity in these northern regions. Where one is killed there, a hundred are killed here. Only since protection in the spring has been given wild-fowl in the greater part of British America, and in most of the States, has there been any check to this continuous decrease of the wild-fowl in North America.

Regarding the general decrease in the numbers of shore and marsh birds, including Snipe, Plover and Sandpipers, the older gunners practically agree that it has been tremendous and continuous for many years, and, although some of them believe that the birds have gone somewhere else or "changed their line of flight," still, they say the birds "do not come here."

For about forty years, during which much of my time has been passed in the woods and fields and along the shores of Massachusetts, I have had opportunity to observe the diminution in numbers of those birds that are hunted for food, for their feathers or for sport. I have noted the gradual disappearance of Passenger Pigeons and Eskimo Curlews, the great reduction in the numbers of Golden Plover, Wood Ducks and other species of shore birds and wild-fowl, and I have kept

informed regarding the condition of the upland game birds; but during all this time I had hardly realized the gravity of the situation, until, in the pursuit of an inquiry regarding the destruction of birds by the elements, which was authorized by the State Board of Agriculture in 1903, people began voluntarily to send in evidence regarding the general decrease of birds. It was asserted by many correspondents that the extirpation of certain species was imminent in the region with which they were familiar, and that many others were rapidly decreasing in numbers.

The secretary of the State Board of Agriculture, on receipt of this evidence, authorized further investigation regarding the decrease of birds. Four hundred circulars asking for information were prepared and sent out in July, 1904, to naturalists, secretaries of game protective associations, sportsmen, game wardens, market hunters, farmers and other interested observers. In response to these circulars two hundred and seventeen satisfactory replies were received, and a large correspondence was opened, all of which formed the basis for a special report of one hundred and sixty-six pages.¹

The consensus of opinion of those correspondents who might be considered as competent to give expert testimony indicated a great decrease among game birds, shore birds, wild-fowl, Herons, birds of prey, and, in fact, among all the birds most hunted, and a somewhat less diminution among a certain few species of the smaller birds. It was shown that Ducks, Geese and Loons were disappearing from the ponds and rivers of the interior, and that even on the coast the most desirable species had greatly decreased. Grouse and Bob-whites were estimated to have suffered a diminution of from fifty to seventy-five per cent. within the memory of living men, and an even greater decrease was attributed to the shore birds. The completion of this report and its favorable reception led to the publication of a special report on the useful birds of the Commonwealth, and means for protecting them.²

¹ Forbush, Edward Howe: *The Decrease of Birds, and its Causes, with Suggestions for Bird Protection*, Mass. State Board Agr., 1904.

² Forbush, Edward Howe: *Useful Birds, and their Protection*, Mass. State Board Agr., 1907.

When this had been published, and while it was going through its several editions, my attention was again urgently called to the scarcity of game birds in Massachusetts, New England and the adjacent States. Reports indicated that Ruffed Grouse and Bob-whites had reached the lowest ebb in numbers ever known. This, with the previous decrease in water-fowl and shore birds, left New England, and particularly Massachusetts, with fewer game birds than at any time of which we have record. An insistent demand arose for more game. State game commissioners and individuals began to look about to see where it could be obtained. Attempts to procure Grouse and Bob-whites from other States were ineffectual, owing to laws which forbade the exportation of game.

Partly as a result of these laws, large numbers of European Partridges, Grouse and Asiatic Pheasants were introduced, and liberated in New England; while attempts were made in several Legislatures to prohibit the killing of all game birds for a series of years, or to further shorten the shooting season. The unrest of the sportsmen and gunners was manifested in attempts to change the personnel of the State fish and game commissions, and to secure better enforcement of the game laws. Advocates of the abolition of all game laws arose, and gained some following. The promulgators of new game laws readily secured a hearing. People began to awaken to the fact that game was disappearing, and to seek a remedy. The Legislature of Massachusetts enacted a statute providing for the appointment of a State Ornithologist, and he was authorized by the State Board of Agriculture to undertake an investigation of the former decrease in numbers, and the present scarcity of game birds in the Commonwealth, with a view to submitting a report on the causes of such decrease and the means of increasing the supply. After a study of the literature on the subject and considerable correspondence with those who were conversant with the conditions, a sixteen-page circular of information was prepared in October, 1907, containing questions regarding the most important food birds resident in the Commonwealth or migrating through it.

These circulars were sent out to old and experienced gunners, sportsmen and naturalists within the State, and to others along the Atlantic seaboard from the Maritime Provinces of Canada to the Carolinas, in order to secure data regarding the species that migrate through Massachusetts and all the coast region in their annual flights.

The replies on nearly five hundred blanks that were returned from these observers, together with facts from my own experience and much material gleaned from literature on the subject, formed the basis of this volume. Most of the observers who reported consulted with others when filling out the blanks; in some cases two or more assisted one another with notes and data. In other cases many of the members of a gun club were consulted, the different species were fully discussed, and the report as sent to me represented the combined knowledge and experience of many men. Probably these reports represent the observations of between one thousand and two thousand Massachusetts men (mainly gunners) regarding the present status of the game birds. They come from every county in the State. Many men give the estimated percentage of increase or decrease of each species; others do not. The average period during which these observers have been afield is twenty-seven years and three months. A careful comparison of these reports one with another, together with a consideration of the known and recorded facts relating to the subject, indicates that in nearly every case a conscientious effort has been made to state only facts. There are perhaps two or three cases where gunners in one county have overstated the increase of birds, in the attempt to show that the birds are increasing. When a man states that all species of certain families have increased two hundred per cent., where other observers in the same town see a decrease, or a very slight increase, there is something wrong with his mental attitude toward the facts.

Nevertheless, in making up the average for each species I have included all the estimates, for the reason that there are probably some pessimistic reports that will balance those that are extremely optimistic. Any estimate giving the percent-

age of increase or decrease of any species in a given locality must be regarded as merely an approximation; but, as these estimates are given by persons of intelligence and experience, the average of their opinions throughout the State must surely approach the actual facts. The results of this investigation are given in part under the heads of the individual species in the histories that follow in parts I and II, and a summary of the percentages of increase and decrease reported in Massachusetts is given on pages 504 and 505.

Many of the suggestions noted in the blanks filled out by correspondents appeared so full of possibilities that they were made the subject of correspondence. Some observers, not content with filling out the blanks, sent in long letters detailing their observations and experiences with birds in which they were particularly interested. Others failed to fill out blanks, but sent letters instead. This correspondence continued for three years and is not completed as the book goes to press. It will be seen that the author is so overwhelmed with material that he can publish but a small part of it in this volume, and can merely summarize a still larger part. Much of this interesting and valuable material may never reach the public; but it has aided the author greatly in reaching the conclusions expressed in this volume. A list of those who have filled out and returned the printed circulars will be found on the last pages of this volume. Statements from other correspondents are credited to them in the text.

A HISTORY OF THE BIRDS NOW HUNTED FOR
FOOD OR SPORT IN MASSACHUSETTS
AND ADJACENT STATES.

PART I.

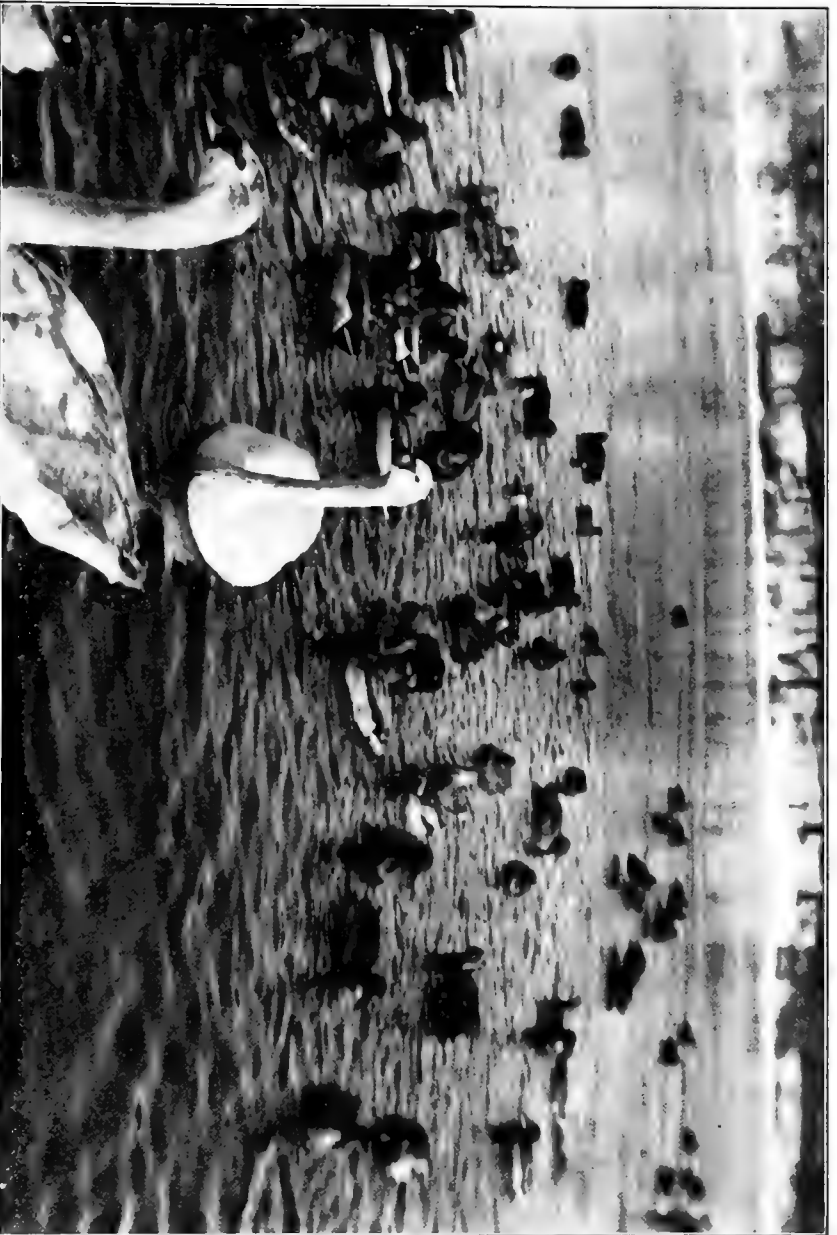


PLATE I.—RIVER DUCKS AND SWANS.

This photograph shows how wild fowl may be attracted to ponds, even in cities, where they are protected. Many wild Black Ducks are sitting on the ice in the background, two Baldpates are among the tame Mallards, two American Coots and one Ruddy Duck are swimming near the edge of the ice. The Swans are hybrids bred at the pond. (Photograph by W. Charlesworth Levey, Jamaica Pond, Boston, December 10, 1910.) (See page 571.)

PART I.

BIRDS HUNTED FOR FOOD OR SPORT.

The following histories of living birds include practically all the species and subspecies that are now hunted for food or sport in Massachusetts. The list includes many which are not strictly game birds; but most of them are of some value as food. The aim has been to present, first, a brief description of each bird and the principal marks and notes by which it may be identified; next, in case of those species which breed or formerly bred in Massachusetts or nearby States, a description of the nest and eggs. The history of the common birds contains such facts as could be gathered regarding their former abundance, together with some account of their depletion up to the year 1909; also some observations on interesting habits, migration movements and food. Unfortunately, the results of the work on the food of wild-fowl and shore birds, which has been undertaken by the Bureau of Biological Survey, have not yet been published, and there is no authoritative publication on this subject; but such material as is readily available regarding the food of each species has been utilized in the following pages.

GREBES (Family Colymbidæ).

In the modern system of classifying natural objects it is customary to present first the lowest and simplest forms. Since the extermination of the Great Auk, the Grebes have been the lowest in the scale of classification of the forms of bird life commonly hunted. They rank near to the flightless Penguins and the Auks, and only just above the Guillemots and Puffins. All these birds seem closely allied in some respects to the reptiles, from which birds are supposed to have originated. The beak of the Grebe is usually sharply pointed; the eyes well forward, the skin in front of them

bare; the head in most cases ruffled or crested, in the breeding season at least; and the neck long. The plumage is compact, smooth and rather hairlike, and of such a texture that when well dressed by the bird it is absolutely waterproof, and therefore Grebes, though constantly diving, never get wet. The wings are short and concave; the tail is a mere downy tuft, entirely without quill feathers; the legs are buried beneath the skin and feathers of the body, and the tarsi (commonly called legs, but which are in reality those parts of the foot extending from the heel to the junction of the toes) are very far back, and flattened so as to present the least possible

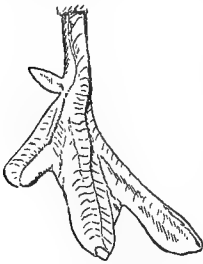


FIG. 1.—Foot of Grebe.

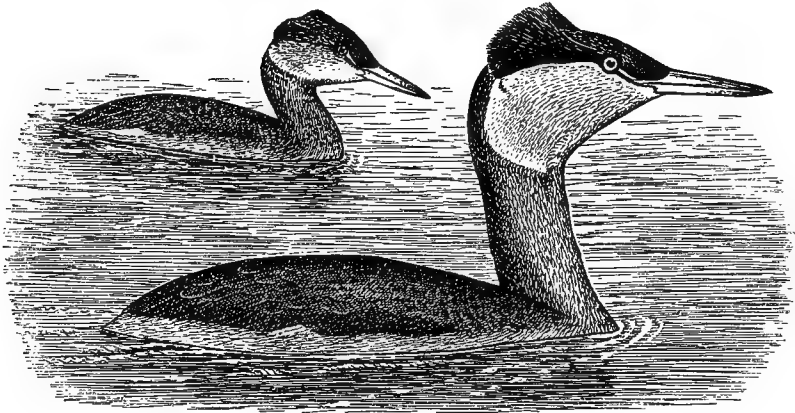
resistance in swimming. The toes are flattened and are further widened with broad lobes, and connected at the base by webs (Fig. 1); the nails are short and rounded, something like human finger nails. The whole foot forms a hard, scaly, flattened compound paddle, which, on the back stroke, spreads to push against the water, and automatically turns or “feathers,” so as to present little resistance to the water on the return stroke.

The feet and legs are so far back and so ill suited for walking that the Grebe, when on land, merely rests on its breast, or stands upright and can hardly walk at all. If hurried it flounders along on its breast, using wings and feet in an imperfect imitation of a tortoise. The feet are principally used in swimming, and they are among the most perfect and powerfully designed swimming feet of vertebrate animals. When a Grebe is held in the hand its feet will sometimes move so rapidly as to give them a hazy appearance, like the wings of a humming bird in motion. In flight, the feet are carried well out behind, where they appear to be utilized as rudders, serving the same purpose, then, that the tail serves on many other birds. The body of the Grebe is wide, boat-shaped and quite as much flattened as that of most other swimming birds.

Grebes may be distinguished from Ducks on the water by the sharp or pointed bill, the narrow head and neck, and the relative length of the neck when stretched.

HOLBELL'S GREBE (*Colymbus holbælli*).

Common or local name: Red-necked Grebe.



WINTER.

SUMMER.

Length. — 18 to 20.50 inches.

Adult in Late Spring. — Upper parts dusky; top of head, small crests, nape and back of neck glossy greenish black; chin, throat and sides of head light ash; front and sides of neck and sometimes upper breast rich chestnut; wings with a white patch; under parts silvery white dappled with darker; sides tinged with reddish brown; bill yellow below at base, black above and toward tip; iris carmine; feet black, yellow inside.

Adult in Fall and Winter. — Crests not noticeable; above blackish brown; front and sides of neck pale reddish brown; throat, sides of head and under parts whitish; mostly unspotted below.

Young. — Similar, but no reddish brown; neck gray; bill largely yellowish; tip dusky.

Field Marks. — Largest of the Grebes; may be distinguished from the smaller Loon by the white wing patch, which shows in flight or when the wing is flapped.

Notes. — An explosive *kup*; exceedingly harsh note, not unlike the voice of an angry crow, but much louder; the calls given more slowly, with singular deliberation; *car, car*, three or four times, sometimes lengthened to *caar*, and again broken and quivering, like *c-a-a-r* or *ca-a-a-r* (Brewster).

Season. — Not uncommon in winter coastwise; October to May.

Range. — North America and eastern Asia. Breeds from northwestern Alaska and Ungava south to northern Washington and southwestern Minnesota; winters from southern British Columbia and Maine south to southern California and North Carolina; casual in Georgia.

HISTORY.

Holboëll's Grebe seems to have very little history, except in the way of synonymy. American ornithologists have little to say of it. Wilson did not mention it; Audubon notices it briefly, and no one seems to have made or published any exhaustive study of its habits or food. Nevertheless, in migration it is not rare along our coasts; it winters here in small numbers, and sometimes visits the small fresh-water lakes and streams of the interior. Furthermore, it is one of the few species commonly hunted which does not appear to have decreased much in Massachusetts within a lifetime. This is possibly due to the fact that it is difficult to shoot while on or in the water. Possibly no other Grebe can escape a charge of shot at such close range as can this species. I believe that the bird was formerly much more common than now in the smaller fresh-water ponds, but that through the instinct of self-preservation it has learned to forsake them for the comparative safety to be found in larger bodies of water. Most of the individuals of this species seen here are believed to be young birds, but occasionally an adult may be seen in breeding plumage in the month of May.

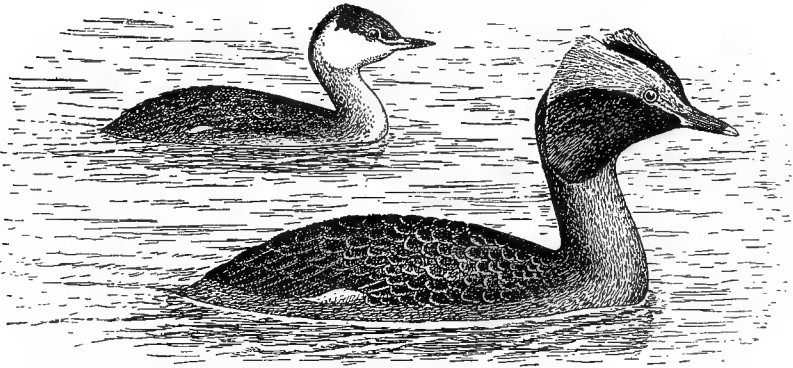
It is not uncommon on the Great Lakes and other large fresh-water lakes. In winter, when these are suddenly frozen, this Grebe is sometimes captured on the ground, ice or snow, where it has fallen exhausted in its attempts to reach unfrozen water. It is a bird of the open water, avoiding such shallow and weedy waters as are frequented by the Pied-billed Grebe.

Holboëll's Grebe apparently migrates over the greater part of the United States and Canada, and it is surprising that so little seems to be known of its habits and life history.

Audubon states that it feeds on small fish fry, amphibious reptiles, insects and vegetables. Dr. Warren found sand, blades of grass, small roots and feathers in the stomachs of two birds of this species. Knight states that as far as can be ascertained its food along the coast of Maine consists of small fish and surface-swimming crustaceans. In inland regions tadpoles and fish are reported as a part of the bill of fare.

HORNED GREBE (*Colymbus auritus*).

Local or common names: Hell-diver; Devil-diver.



WINTER.

SUMMER.

Length. — About 14 inches.

Adult in Breeding Plumage. — Upper parts dark brown or brownish black, the feathers paler on the edges; a brownish yellow stripe over eye, broadening, and deepening in color toward end of crest; throat and that portion of crest on side of head below eye black; bill black, yellow tipped; feet dusky and yellowish; iris carmine, with fine white ring next pupil; fore neck and flanks reddish brown; wings varied with white; lower parts silvery white.

Adult in Winter, and Young. — Similar, but grayer, with sides of head, throat and fore part of neck white, this color nearly encircling nape, and lightly washed with ashy gray on front of neck and lower belly; feathering of head not so full and fluffy as in summer; bill dusky, but somewhat whitish below.

Field Marks. — In breeding plumage the crested head of black and brownish yellow is distinctive; pure white under parts, and white wing patch which shows when the wing is open, distinguish it in any plumage from the Pied-bill. In winter the white cheeks contrast strongly with the dark upper head.

Season. — Common winter visitor coastwise; irregular inland; October 1 to May.

Range. — Northern part of northern hemisphere. Breeds from near the arctic coast south to British Columbia, central Minnesota, southern Ontario and northeastern Maine; winters from southern Ontario and Maine south to southern California and Florida.

HISTORY.

The Horned Grebe is known mainly as a salt-water bird, but is not by any means rare in fresh-water lakes and streams. Formerly a few summered in Massachusetts, according to Dr. J. A. Allen, who states that he has seen a pair in breeding plumage in June at Springfield. Probably it is now rarely seen inland here, except when driven in from the sea by severe storms. I remember that no longer ago than the 70's and 80's large numbers occasionally came into ponds of Worcester County on such occasions and remained for several days, or until killed off or driven out by constant persecution. Mr. Ralph Holman records in his notes that during the first week in November, 1886, a large flight of Grebes of all three native species came into North Pond, Worcester, after a severe six-day northeast storm, and a great many birds were killed there. All except the cripples left on the night of November 3. Probably few alight in that pond now, but along the coast they are still common in tidal streams and off the beaches. They are usually most numerous in October, but are common along rocky shores in winter. Brewster notes them occasionally in the ponds of the Cambridge region, and Dr. John C. Phillips regards them as not very common on Wenham Lake.

The expressive common names given this and other Grebes were suggested by their mysterious disappearances and the facility with which they seem to escape the charge of the gun by diving at the flash. The flint-lock was a poor weapon to use against them, and even with modern guns and smokeless powder the bird sometimes escapes. If it is at long range, heading toward the hunter, it is very likely to be mostly under water when the charge arrives. It then offers a very small mark, and even if it is hit the shot may glance from the feathers and bones of its back. In diving hurriedly it usually leaps forward and shoots beneath the water like a flash, but it can settle quietly down and disappear, leaving hardly a ripple to mark the spot. Sometimes it apparently remains under water nearly a minute, and it can swim or float indefinitely, with only the bill protruding above the surface. Dr.

Langdon is quoted by Dawson as stating that the young of this species, which he removed from the egg and placed in the water, immediately swam and attempted to dive.¹

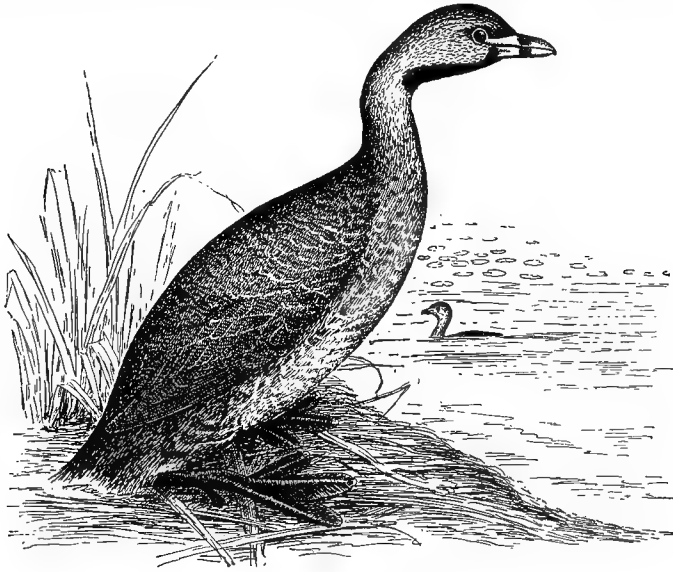
I have never seen this Grebe use its wings for propulsion beneath the surface, but Mr. C. W. Vibert of South Windsor, Conn., informs me that one which he kept alive for a time often raised its wings slightly when swimming under water. When driven into the ponds by storms, Grebes as well as Ducks show signs of weariness from their struggle with the sea, and are often so sleepy in the daytime that they will sleep on the water with the head drawn back and the bill usually thrust into the feathers of the right breast or shoulder. In this position a bird will often keep its place, head to the wind, or whirl about by paddling automatically with both feet or with one alone.

The food of the Horned Grebes, while on salt water, appears to be composed very largely of animal matter, shrimps, crustaceans, small fish and fish fry, but when on fresh water they appear to feed to a great extent on vegetable matter. They also take aquatic and terrestrial insects, leeches, small frogs, tadpoles and water lizards. Seeds and various portions of grasses and water plants are eaten; also, all Grebes appear to eat feathers, either from their own breasts or from birds of other species. These are found in their stomachs, particularly in spring.

¹ Dawson, William Leon, and Jones, Lynde: *Birds of Ohio*, 1903, p. 631.

PIED-BILLED GREBE (*Podilymbus podiceps*).

Common or local names: Dipper; Didapper; Dabchick; Hell-diver; Water-witch.



ADULT IN SUMMER.

Length. — Varying from 12 to 15 inches.

Adult in Summer. — Above mainly dark grayish brown or brownish black; chin and middle of throat black; sides of head and neck gray; fore neck and breast brownish gray; belly silvery ash; iris brown and white; eyelids white; bill very pale bluish, crossed near the middle by a black band; feet greenish black outside, leaden gray inside.

Adult and Young in Winter. — Upper parts sooty brownish; throat whitish, with no black patch; fore neck, breast and sides brown; rest of under parts silvery whitish; bill dusky yellowish, without band. Young have head streaked with whitish and throat with brownish.

Field Marks. — This bird has a more brownish cast than our other Grebes; the brownish upper breast distinguishes it from the Horned Grebe, but the best mark is the short and thick bill. In the breeding season the black throat patch and band on the bill are noticeable. This bird lacks the shining white cheeks peculiar to the Horned Grebe in winter.

Notes. — Somewhat like those of a cuckoo. A loud, sonorous *cow-cow-cow-cow-cow-cow-cow-cow-uh, cow-uh, cow-uh, cow-uh* (Chapman).

Nest. — A mass of stalks, etc., sometimes floating, and attached to surrounding reeds.

Eggs. — Four to eight, dull white, often tinged with greenish, more or less soiled or stained, about 1.70 by 1.

Season. — Summer resident; late March or early April to December.

Range. — North and South America. Breeds from British Columbia and New Brunswick south to Chile and Argentina, but often rare or local; winters from Washington, Texas, Mississippi and Potomac valley southward.

HISTORY.

The Pied-billed Grebe is the common Grebe of eastern inland waters. Undoubtedly it once bred here in considerable numbers, and as its habits during the breeding season are very secretive, it is probably more common still, locally, than the few records of its nesting would lead us to believe. Apparently it was very common in Massachusetts as late as the middle of the last century; but it has diminished much in numbers of late, and has disappeared from many places where it bred no longer than twenty or thirty years ago. It is shot wantonly by boys, gunners and sportsmen at every opportunity. Were it not for its facility in diving and concealing itself, it probably would have been extirpated ere now. This and all other Grebes should be protected by law at all times. Grebes are practically worthless as food, but they have a certain æsthetic value. Alive, they belong to all the people, and give pleasure to all who have the opportunity to watch their peculiar motions and antics. Dead, they are the property of the shooter, and are valueless beyond what their plumage will bring from the milliners' agent. There is a great demand for their plumage at times, and this demand alone may lead to their extinction, unless they are protected always. They are useful as decoys to lure water-fowl into our ponds and lakes, as they are less cautious than most other fowl, and whenever Grebes alight in a lake or river other wild-fowl will follow. Grebes are far more useful alive to the gunner as decoys than they can ever be for any purpose after death.

These little fowls have many natural enemies. Hawks stoop at them from the air above; turtles, fish and water snakes attack them from the depths. I once saw a Grebe, while watching a Hawk, spring out of the water to escape a

pickerel which had tried to seize it by the feet. The Grebe is able in some way to sink gradually backward into the water, like a "scared frog," sustain itself at any depth, and swim about with a little of the back showing, or with merely the head or bill out of water. When injured it will sometimes dive or sink, swim in among the water plants, come up quietly, showing only its bill above the surface, and, thus concealing itself, await the departure of its enemy. I have known a gunner to declare, at such a time, that the bird must have committed suicide, "as it never came up." I have never seen this species use its wings in flight under water, and ornithologists generally agree that it does not, but the speed that it sometimes attains leads me to believe that occasionally the wings are thus used. Audubon declares that he has seen one use its wings while swimming under his boat.

This species apparently is averse to flight. It cannot rise from the land, and rises from the water only after a run along the surface against the wind; but when once in the air it flies quite fast, with rapidly beating wings, neck fully stretched and feet trailing behind.

The nest, a mass of wet, muddy vegetation, anchored by growing grass or reeds, but often practically floating on the water, is an unattractive home for the little dabchicks. They tumble off into the water immediately after they leave the eggshell. Thereafter their only nest is the back of the mother bird, to which they scramble as she rises beneath them. When she dives they are left floating on the surface, but soon resume their place when she comes up. She can turn her head and feed them, and there they snuggle down amid the feathers between her shoulders, only their little heads showing above the contour of her back.

The food of the Pied-billed Grebe, according to Audubon, "consists of small fry, plant seeds, aquatic insects and snails; along with this they swallow gravel." He also found in their gizzards a quantity of hair and a feather-like substance which he "at length found" to be the down of certain plants, such as thistles, with the seeds remaining undigested and attached.

LOONS (Family Gaviidæ).

The bill of the Loon is stout, straight, narrow, sharp-pointed, with sharp edges so constructed that they cut into and hold securely the slippery fishes on which these birds mainly subsist. The head is feathered to the beak; the neck is long and sinuous. The plumage of the head and neck is short and of rather a furry texture, while that of the body is hard and compact; it forms a perfect waterproof garment. The wings are rather narrow, short and pointed, but are ample to lift the heavy body. The tail, though very short, is not downy and rudimentary like that of the Grebe, but is composed of eighteen or twenty stiff quill feathers. The leg, like that of the Grebe, is placed so far back and is so bound up in the skin of the body that the Loon walks or runs with difficulty. The tarsus is narrowed, like that of the Grebe, but the foot (Fig. 2) is a simple paddle, resembling somewhat the foot of a Duck. Loons, like Grebes, have a peculiar faculty of sinking gradually in the water without

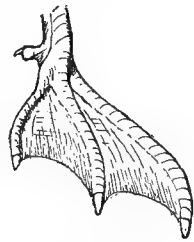
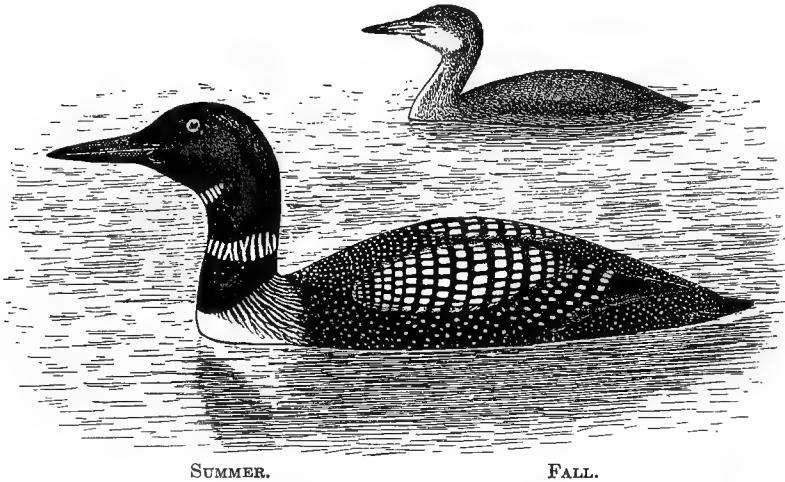


FIG. 2. — Foot of Loon.

apparent effort, and thus remaining partially submerged. It is believed that they are able to expel the air from the air cells in different parts of the body. Many water birds are provided with a cushion of air cells between the body and the skin, particularly on the breast and lower parts. If Loons are able to inflate or deflate these and other air cells at any time, the mystery of floating or sinking at will is explained. They are noted for their powers of diving and the long distances that they can swim under water without rising to the surface. The large size of the Loons, the long neck and rather long, narrow, sharp-pointed bill, distinguish them from the Ducks. Loons may be readily distinguished from Geese by their larger and more pointed bills, and from Grebes by their larger size, although the larger Grebes approach the size of the smaller Loons and are sometimes mistaken for them.

LOON (*Gavia immer*).

Length. — Very variable, ranging from 28 to 36 inches.

Adult in Spring. — Mantle black, spotted with white; head and neck black, with green and purple reflections; neck with three bands of white stripes; under parts white; bill and feet black; iris red.

Adult and Young in Fall. — Bill yellowish or bluish white, blackening above and toward tip; iris brown; legs and feet brownish or yellowish, never black; top of head and hind neck dull brownish black; other upper parts dark grayish brown, mottled a little, but with no *white spots*; sides of head and neck more or less mottled with ashy and dusky; chin, throat, fore neck and other under parts white.

Field Marks. — The size of a Goose. The black and white spotted adult is unmistakable in spring. The fall birds resemble the fall Red-throated Loon, but are much larger, have a bill much thicker at base, yellowish, with much of the tip black, while the Red-throated Loon has a slender, lighter colored bill, more white on cheeks and a bluish gray cast to the top of head and back of neck, where the Loon is brownish black.

Notes. — Loud maniacal laughing cries.

Nest. — A slight depression in ground close to water or an old muskrat house.

Eggs. — Two, about 3.50 by 2.25, elongated and pointed, olive drab, or dark olive brown, thinly spotted with dark brown and blackish.

Season. — Abundant transient coastwise; September to June; less common in the interior; a few summer here.

Range. — Northern part of northern hemisphere. Breeds in America from arctic coast and islands south to northern California, northern New York, New Hampshire, Massachusetts (rarely) and Nova Scotia; winters from southern British Columbia and southern New England to Lower California, Gulf coast and Florida.

HISTORY.

Probably the Loon once bred in suitable localities throughout Massachusetts. Wilson says that it is said to breed in "Missibisci Pond near Boston." Nuttall states that he found and captured in the Chelsea marshes (now Revere) a young bird partly grown. S. Davis asserts in his Notes on Plymouth, Mass. (1815), that the "loon cries and leaves her eggs" on the lesser island in Fresh Lake, now Billington Sea.¹ Old gunners have assured me that they have seen the Loon with small young near the shores of Buzzards Bay. Others report the bird as formerly breeding on Block Island, R. I.; and they bred about the ponds of northern Worcester County when I first visited them, more than thirty years ago. In 1888 Brewster reported them as breeding in all ponds of sufficient size near Winchendon, Mass.² They have gradually disappeared from Massachusetts waters in the breeding season. Probably they have not been driven away, as neither human neighbors nor much shooting have driven Loons from a favorite nesting place, but their eggs have been taken and the birds have been shot one by one, until all have vanished. There may be a few pairs still breeding in the State. If so, I cannot learn of them.

The Loon is not considered desirable as a table fowl. I have tasted one and do not care for more. Indians and some fishermen eat Loons and consider the young quite palatable. They are pursued mainly for mere sport by the devotees of the rifle and shotgun, and whenever one is accidentally stranded on the ice or on land it is usually pursued and clubbed to death. Boardman said that an Indian killed thirty Loons with clubs in the ice after a freeze.³ The mania for senseless slaughter seems to possess man, savage or civilized.

Probably the spring shooting of Loons has had something to do with their decrease in numbers. From the middle of April to about the first of June Loons fly eastward and northward along our coast. One principal line of their flight is up

¹ Coll. Mass. Hist. Soc., Vol. II, 2d ser., p. 181.

² Brewster, William: Auk, 1888, p. 390.

³ Forest and Stream, 1874, Vol. III, p. 291.

Buzzards Bay to its head, where, on the way to Massachusetts Bay, they cross the neck of Cape Cod at the narrowest point near the mainland, where the Cape Cod canal is now (1910) in process of construction. Tobey and Mashnee Islands lie on either side of the channel leading from Buzzards Bay into Manomet Bay. When the wind blows from the southwest the Loons pass up the strait between these islands at morning and at night, flying comparatively low. When the wind blows from any other quarter they fly high. Mackay says that years ago he has seen three tiers, of ten or a dozen boats each, stretched across this passage, and that sometimes on a "good southwest morning" fifty or sixty Loons were killed, and as many more wounded, which could not be recovered. He states that he is informed that this sport is kept up to the present day (1892).¹ Doubtless fewer Loons are killed there now. The spring shooting of Loons should be prohibited by law. Nothing can be more destructive than shooting at that time, when the birds are paired and headed for their breeding grounds.

Of all the wild creatures which still persist in the land, despite settlement and civilization, the Loon seems best to typify the untamed savagery of the wilderness. Its wolflike cry is the wildest sound now heard in Massachusetts, where nature has long been subdued by the rifle, axe and plow. Sometimes at sea, when I have heard the call of the Loon from afar, and seen its white breast flash from the crest of a distant wave, I have imagined it the signal and call for help of some strong swimmer, battling with the waves.

It is generally believed that in migration at least the Loon passes the night upon the sea or the bosom of some lake or river. The Gulls, Auks, Puffins and Cormorants, which live upon the sea, usually alight upon the high shores of some rocky island or on some lonely sand bar at night, but the Loon is often seen at sea when night falls, and its cries are heard by the sailors during the hours of darkness. Notwithstanding the general belief that it normally sleeps on the water, I believe that it prefers to rest on shore at night, when it can

¹ Mackay, George H.: Auk, 1892, p. 292.

safely do so. Audubon satisfied himself that on its breeding grounds it was accustomed to spend the night on shore. On an island off the coast of British Columbia, where there was no one to trouble the birds, I once saw, just at nightfall, a pair of Loons resting flat on their breasts at the end of a long sandy point. Cripples instinctively seek the shore when sorely wounded, but on our coast a Loon must keep well off shore to insure its safety, and probably few but cripples ever land on shores frequented by man.

The Loon's nest is usually a mere hollow in the bog or shore near the water's edge on some island in a lake or pond. Sometimes the nest is lined with grasses and bits of turf; more rarely it is a mere depression on the top of a muskrat's house, and more rarely still it is placed on the shore of the lake or on some debouching stream. Where the birds are not much disturbed, and where food is plentiful, two or three pairs sometimes nest on the same island. No doubt there was a time when nearly every northern pond of more than a few acres contained its pair of Loons in the breeding season, and this is true to-day of ponds in parts of some Canadian Provinces. The nest is usually so near the margin that the bird can spring directly into the water, but sometimes in summer the water recedes until the nest is left some distance inland.

The Loon is a clumsy, awkward traveller upon land, where when hurried, it flounders forward, using both wings and feet. Audubon, however, says that his son, J. W. Audubon, winged a Loon which ran about one hundred yards and reached the water before it was overtaken. Its usual method of taking to the water from its nest is by plunging forward and sliding on its breast. It cannot rise from the land, hence the necessity of having the nest at the water's edge.

When the young are hatched the mother carries them about on her back a few days (Boardman), after which they remain afloat much of the time until they are fully grown. If food becomes scarce in their native pond they sometimes leave it and travel overland to another. Dr. Hatch says that early in the morning the parents and the well-grown young run races on the lake, using their broad paddles for propulsion

and their half-extended wings for partial support. Starting all together they race down the lake, and then, turning, rush back to their starting point. Such exercises no doubt strengthen the young birds for the long flights to come.

The Loon finds some difficulty in rising from the water, and is obliged to run along the surface, flapping its short wings, until it gets impetus enough to rise. It is said that it cannot rise at all unless there is wind to assist it. Its great weight (from eight to nearly twelve pounds) and its short wings make flight laborious, but its rapid wing beats carry it through the air at great speed. Mr. R. M. Barnes states that one warm sunny afternoon, about 5 o'clock, on the flooded bottom of the Illinois River he saw a Loon rising from the water in a great circle, flapping its wings and then sailing. It circled much after the fashion of a Bald Eagle, rising higher and higher, continuing its flapping movements, alternated by sailing, until it reached a great altitude. When it had attained a height at which it appeared but little larger than a blackbird, it set its wings, and, pointing its long neck toward the pole, sailed away with great rapidity. He watched the bird with the glass until it passed out of sight, and could see no movement of the wings, although it was travelling at a tremendous rate. He believes that the bird was coasting down the air.¹ The ordinary migrating flight of the Loon is swift and steady, accompanied by rapid, powerful wing beats, and I have never witnessed anything like the performance described by Mr. Barnes. When it alights it often shoots spirally down from a great height, and plunges into the water like an arrow from a bow. It lands with a splash, and shoots along the surface until its impetus is arrested by the resistance of the water.

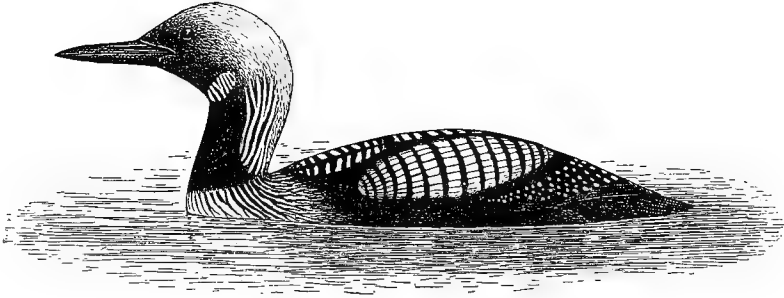
The Loon is almost unexcelled as a diver. It is supposed to be able to disappear so suddenly at the flash of a rifle as to dodge the bullet, unless the shooter is at point-blank range, but when two or three crack shots surround a small pond in which a Loon is resting it can usually be secured by good strategy. I once saw a Loon killed on the water with a shot-

¹ Osprey, Vol. I, No. 6, February, 1897.

gun, but the bird was taken at a disadvantage. It was on the Banana River, Fla., in January, 1900, and it had followed the fish (which were then very numerous) into the shallow water near the shore. Shoals extended out from the shore fully three hundred yards, so that the bird, in diving and swimming under water, could not use its wings to advantage. It was much impeded by the shoals and the vegetation on the bottom, and in swimming was so near the surface that its course could be followed readily by the ripple that it made. Two strong rowers were thus enabled to follow and overtake it. It escaped the first charge of shot, but its pursuers came so close the second time that the shot went home. In deep water, where the bird can use its wings and fly under water like a bolt from a crossbow, it can easily elude a boat. In old times the gunner used to "toll" the Loon within gunshot by concealing himself and waving a brightly colored handkerchief, while imitating the bird's call. But this will rarely succeed to-day in luring one within reach of a shotgun.

Loons are rather solitary in the autumn migration. They leave their northern homes and some begin to move southward in September, but many remain in the northern lakes until the ice comes. They move south along the larger rivers of the interior, but most of those near the Atlantic take the sea as their highway.

The Loon feeds very largely on fish. As it rests lightly on the surface it frequently thrusts its head into the water and looks about in search of its prey. When pursuing swift fish under water it often uses its wings, by means of which it can overtake the swiftest. This has been repeatedly observed. It can travel much faster under water in this manner than it can on the surface by use of the feet alone. Dr. C. H. Townsend records that he watched a Loon chasing some young Mergansers. The Ducks swam or fluttered along the surface while the Loon followed them under water. They made for the shore in alarm, clambered up on the rocks and escaped. This suggests that Loons may sometimes prey on young Ducks. Dr. Warren found the stomachs of two Loons filled with the roots and seeds of aquatic plants.

BLACK-THROATED LOON (*Gavia arctica*).

MALE.

Length. — About 27 inches.

Adult in Summer. — This bird bears a general resemblance to the common Loon, but is smaller; the upper part of the head and the back of the neck are bluish gray, gradually fading into black on the throat and fore neck; the white streaks on the sides of its neck form a lengthwise patch, and the white spots on its upper parts are more confined to restricted areas.

Adult in Winter, and Young. — Closely resemble the common Loon, but the Black-throated Loon has a much wider edging of bluish gray on the feathers of its upper parts, which gives it a peculiar “reticulated or scaly appearance.”

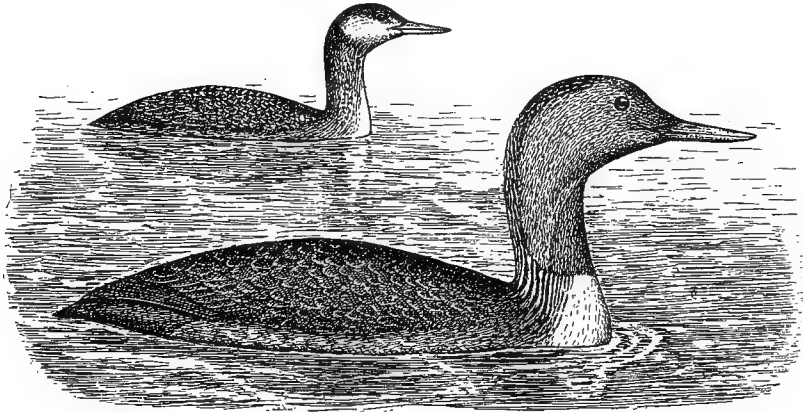
Range. — Northern part of northern hemisphere. Breeds from Kotzebue Sound, Alaska, west along northern coast of Siberia, on islands north of Europe, and from Cumberland Sound south to Ungava; winters in the southern Canadian Provinces; casually south to Colorado, Nebraska, Iowa, northern Ohio and Long Island, N. Y.

HISTORY.

Young of the Black-throated Loon have been variously recorded as occurring in Massachusetts, but none of these records is considered authentic. It is introduced in this volume merely because it has been taken on Long Island, N. Y. The only specimen from that region now known to exist was killed by Mr. Gus Merritt of City Island, Long Island, on April 29, 1893, between Sand’s Point Light and Execution Light. It is recorded by Dutcher in *The Auk*, 1893, p. 265.

RED-THROATED LOON (*Gavia stellata*).

Common or local New England names: Red-throated Diver; Little Loon; Cape Race; Cape Racer; Scape-grace.



WINTER.

SUMMER.

Length. — About 25 inches.

Adult in Summer. — Prevailing color brownish black above, varied by paler and white markings; middle of crown blackish; nape, back of neck and sides of breast lined with black and white; head and most of neck light slate gray, fore neck with a triangular patch of bright chestnut; under parts silky white; bill and feet blackish; iris red.

Adult and Young in Winter. — Similar to the common Loon in winter, but top and back of head and neck bluish gray (in the common Loon these are brownish black); throat without red patch; white of throat extending farther up on cheeks, and back *thickly spotted with whitish*; bill bluish white, darker on top; iris brown.

Field Marks. — Rarely seen in summer plumage; in fall plumage may be distinguished from the common Loon at close range by the small white spots on the back and by the slender bill, which is slightly concave near upper base, giving it a slightly upturned appearance.

Notes. — A harsh *gr-rga, gr-r, gr-r-ga, gr-r* (Nelson).

Season. — A common fall migrant coastwise; uncommon in late winter and spring, August to April.

Range. — Northern part of northern hemisphere. In North America breeds from northern Greenland and northern Alaska south to western Aleutian Islands, New Brunswick and Newfoundland; winters from southern British Columbia to southern California, and from Maine and the Great Lakes to Florida; casual far inland.

HISTORY.

The Red-throated Loon is mainly a salt-water bird while it sojourns in Massachusetts, although occasionally it is seen on some lake or river. Thoreau records in his journal that John Goodwin brought him a Loon on November 11, 1858, which he had killed on the river at Concord, and the description proves it to be a bird of this species. Probably, like many other birds, it was oftener seen on fresh water in early times than now. Dr. John C. Phillips records a specimen in his collection taken on Wenham Lake in October, 1896.¹ It is still not uncommon on the Great Lakes, and David Bruce of Brockport, N. Y., stated that he had found it on Lake Ontario during every month of the year.² In severe weather, when the lakes freeze, this bird, like the common Loon, is sometimes taken on the ice, from which it is unable to rise, and is easily captured. In autumn it may be seen in small parties or flocks floating and feeding near our coasts. Like Grebes and some other water-fowl, it often lies on its side or back while afloat, exposing its white under parts, while engaged in dressing or preening the plumage. This species migrates mainly along the coast in autumn, but as it is not so commonly seen there in spring, some portion of the flight may go north through the interior.

Its habits are similar to those of the common Loon. It is perhaps equally difficult to shoot on the water. When surprised on land it seeks to escape by a series of hops or leaps, using both wings and feet.

MERGANSERS (Subfamily Merginæ).

The Ducks, Geese and Swans comprise the family *Anatidæ*, which includes five subfamilies, the Mergansers, the River Ducks, the Sea Ducks, the Geese and the Swans. In the plan of classification adopted by the American Ornithologists Union, the Mergansers or Sheldrakes come first. They are much hunted, though not regarded highly as game. This family of

¹ Phillips, John C.: Auk, 1911, p. 197.

² Eaton, Elon Howard: Birds of New York, 1909, Vol. I, p. 104.

diving and fish-eating Ducks has the bill constructed especially for seizing and holding its slippery prey. The bill is long, slim, rather rounded, with a hooked nail at the end, and its upper part is provided with many tooth-like processes projecting backward, like the teeth of a shark (Fig. 3). These



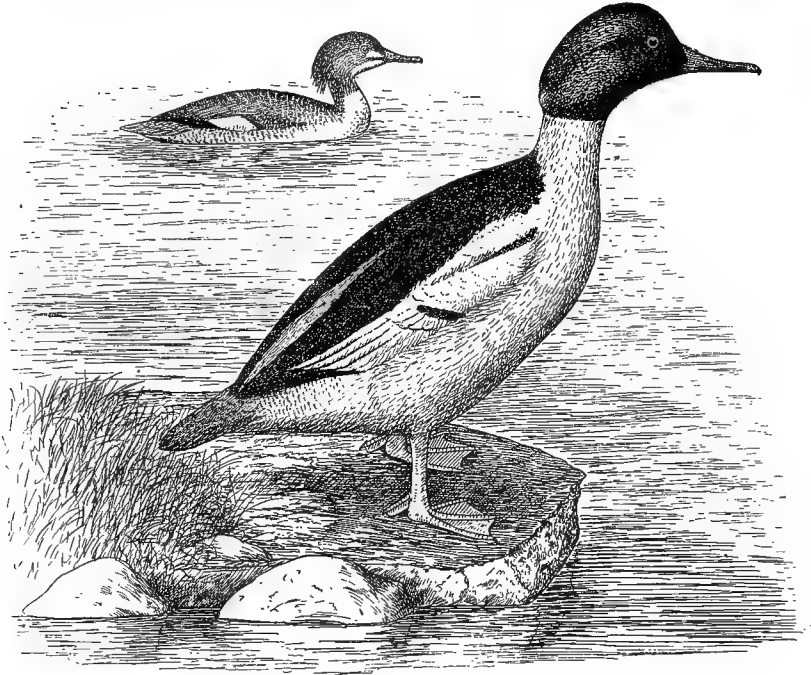
FIG. 3. — Bill of Merganser.

Ducks otherwise somewhat resemble the Loons, except that their feet are not so far back and their heads are usually crested. The hind toe has a flap or lobe, and the feet are broadly webbed, as in all Sea Ducks (see Fig. 6 on page 111). They are noted for their strength, vitality and diving power.

The Mergansers are commonly known as Sheldrakes. A good field glass or telescope will enable the observer to distinguish them from all other Ducks, at a considerable distance, by the long slim bill and the (usually) crested head. They all show a greater or less white patch on the wing in flight, and should not be confounded with the white-winged Scoter or "Coot," which is darker below than the Sheldrakes. In the field it is difficult for the novice to distinguish the females and young of one species of Merganser from those of another: but they may be identified, if seen in a good light, by one who is well acquainted with the peculiarities of the different species.

MERGANSER (*Mergus americanus*).

Common or local New England names: Sheldrake; Pond Sheldrake; Freshwater Sheldrake; Break Horn; Winter Sheldrake (Maine and New Hampshire); Buff-breasted Merganser; Goosander.



FEMALE.

MALE.

Length. — 23 to 27 inches.

Adult Male. — Head and upper neck glossy dark green (appearing black at a distance); scarcely crested; middle of back black; rump and tail gray; most of neck, sides of upper back and entire under parts white (tinged below with light buff or salmon); wings white, showing black quill feathers and a black bar when spread; bill red with black ridge, and feet red; iris carmine.

Adult Female and Young. — Much smaller than male; chin and throat white; rest of head and neck, with a long single crest on hind head, reddish brown; most of upper parts, sides and tail gray; wings largely black, with a white patch; below white, sometimes with slight salmon tinge; bill reddish brown; feet reddish orange; iris yellowish.

Field Marks. — Mainly in fresh water. The largest of the Sheldrakes. Male appears black and white at a distance; the head very slightly crested in male; more so in female, but without the elongated double crest of the Red-breasted Merganser.

Nest. — Of leaves, grasses and moss, lined with down, in a hole in a tree or cliff.

Eggs. — Six to ten, creamy buff, 2.65 by 1.75 (Chapman).

Season. — October to May; rare in summer.

Range. — North America. Breeds from southern Alaska, southern Yukon, Great Slave Lake, central Keewatin, southern Ungava and Newfoundland south to central Oregon, southern South Dakota, southern Minnesota, central Michigan, Ohio (formerly), northern New York, Vermont, New Hampshire and Maine; and in mountains, south to northern California, central Arizona, northern New Mexico and Pennsylvania (formerly); winters from Aleutian Islands, British Columbia, Idaho, northern Colorado, southern Wisconsin, southern Ontario, northern New England and New Brunswick south to northern Lower California, northern Mexico (Chihuahua), Texas, Louisiana, Florida and Bermuda.

HISTORY.

The American Merganser is the largest of the sawbill Ducks or Mergansers. The adult male is a very handsome bird with its glossy dark green head and salmon-colored breast. It is quite distinctively a fresh-water bird, and though often met with on the bays and estuaries of the sea, it is less often seen on the sea itself at any great distance from land. It breeds mainly by the ponds and rivers of the interior, and throughout the wooded part of its range in the northern United States and southern Canadian territory; nests mainly in hollow trees. It apparently prefers fresh water even in winter, and I have seen it feeding in the unfrozen waters of the rapids of rivers in Massachusetts and New Hampshire during the coldest months of the year. Comparatively few are seen now in most of our waters where shooting is allowed, but a few sometimes gather in protected ponds or reservoirs. There is quite a general belief in the interior that this species has decreased much in recent years. Mr. Robert O. Morris (1901) records it as the most numerous Duck in the Connecticut River from November to May. Thirty-nine of my correspondents in 1908, whose average experience in the field represents nearly thirty years, report it as decreasing, and ten note an increase. These reports cover nearly the entire State, as the species is noted in every county. Reports from the coastal States and provinces south to New Jersey

indicate a greater decrease, except in certain localities in Maine and New York. Since spring shooting was prohibited this large Merganser has become more common in our rivers in March than it was before. Along the sea-shore in fall and spring it is much less numerous than the Red-breasted Merganser, but as soon as the ice goes out of some of the ponds near the sea in the southeastern counties considerable numbers sometimes frequent such ponds.

According to Audubon this Sheldrake formerly bred in Massachusetts. It has been occasionally seen here in summer within the last fifty years, but it is impossible now to determine with certainty whether the young birds seen in the breeding season were of this species or of the Red-breasted Merganser. Howe and Allen regard it as possible that the bird may still breed here, and Mr. Robert O. Morris states that he has seen it repeatedly in midsummer in Hampden County.

The nest is usually made in a hollow tree, but probably sometimes on the ground, as in treeless arctic regions. Boardman, who found the first recorded nest in a hollow tree in Maine, says that the lumbermen told him that the mother carried the young to the water in her bill. Probably this species nested here not uncommonly in earlier times, but has been driven out by the destruction of the forests and unrestricted shooting.

Mergansers are tough and hard to kill. A wounded bird will often elude the most determined pursuit of the sportsman. It is an excellent diver, and swims so rapidly and so far under water that it can keep well out of range of its pursuers.

Its food is largely fish, and it sometimes swallows a fish too large for the stomach, and retains it in the gullet until digestion gradually disintegrates the head and later the entire fish. Knight states in his *Birds of Maine* that the adult birds feed exclusively on fish in the ponds of the interior, preferably, as far as he has been able to ascertain, on the various chubs and minnows. In winter on the coast, he says they eat many mussels and allied mollusks, swallowing the shells, which are ground up and disintegrated in the stomach and intestines.

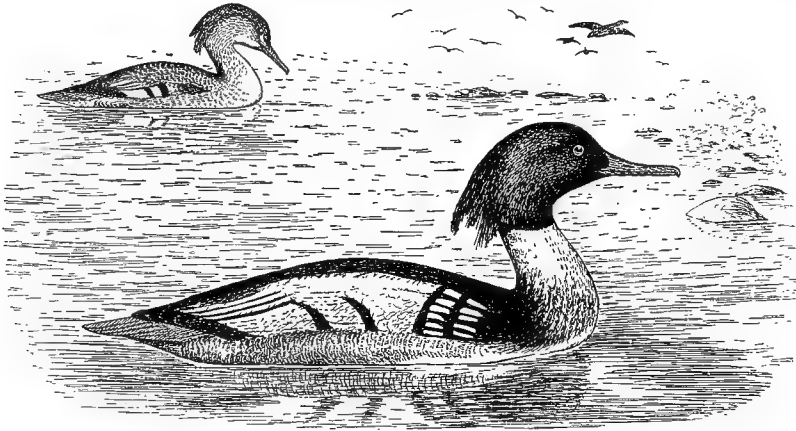
The opinion seems to be quite general among sportsmen and anglers that this is a noxious bird, because it eats fish. Probably, however, when its food is thoroughly investigated it will be found to feed on the enemies of the fish also. Minnows destroy the eggs and fry of trout. The fish-eating birds apparently serve mainly to keep the biologic balance true among the fishes and other animals on which they prey.

This bird, when cooked in the ordinary way, is about as palatable as a stewed kerosene lamp wick, but some people on the coast are able to prepare and eat a Sheldrake now and then with a clear conscience. There are some hardy gunners and fishermen whose appetites are so good that it is immaterial whether they are eating flesh, fish or finnan haddie, and I have been credibly informed by some of these enthusiastic coast gunners that they actually enjoy eating a Sheldrake or two in the spring after a hard winter.

Since the above was written, my son Lewis E. Forbush has informed me that he saw a mother Duck with her young on a pond in Worcester County, Mass., early in June, 1907. She carried some of the young on her back. He also says that he and others saw three Ducks flying about in the neighborhood during the summer. From his description, all these birds must have been Mergansers; but he is not positive whether they were of this species or the next. Under the present law, which forbids spring shooting, it is quite probable that Sheldrakes will breed in New England in increasing numbers.

RED-BREASTED MERGANSER (*Mergus serrator*).

Common or local New England names: Sheldrake; Spring-sheldrake; Shelduck; Shell-bird; Sea Robin; Long Island Sheldrake.



FEMALE.

MALE.

Length. — 22 to about 24 inches.

Adult Male. — Head dark green (appearing black at a distance); long crest on hind head; a broad white ring around neck; upper back black, lower back gray; tail grayish brown; wing mainly white, crossed by two black bars; a patch of white black-bordered feathers in front of wing; flanks barred with fine wavy lines of black; lower neck and upper breast buff or pale cinnamon, streaked with black; below white; iris, bill, legs and feet red.

Adult Female and Young. — Smaller; throat white; rest of head and most of neck, with a crest on hind head, reddish brown; back and tail slate gray; wings darker, when spread showing a white patch; in closed wing this patch is divided by a black bar and bordered by another in front; below white; bill, legs and feet reddish.

Field Marks. — The streaked buff breast and the long loose crest on the green head distinguish the male. The female has less white on throat and fore neck than the female of the American Merganser; also, more reddish brown on sides of neck, a *double* crest and a divided white wing patch. Difficult to identify at a distance.

Notes. — When alarmed, several low, guttural croaks (Elliot).

Nest. — Of leaves, grasses, mosses, etc., lined with down, on the ground, near water, among rocks or scrubby bushes.

Eggs. — Six to twelve, creamy buff, 2.55 by 1.75.

Season. — Late September to late May; rare in summer.

Range. — Northern part of northern hemisphere. Breeds in North America from arctic coast of Alaska, northern Mackenzie, Cumberland Sound and Greenland (latitude 73 degrees) south to southern British Columbia, southern Alberta, southern Minnesota, central Wisconsin, northern New York, southern Maine and Sable Island; winters in southern Greenland, the Commander Islands and from southern British Columbia, Utah, Colorado, southern Wisconsin, southern Ontario and Maine south to southern Lower California, Louisiana and Florida; casual in Bermuda, Cuba and Hawaii.

HISTORY.

The Red-breasted Merganser was once numerous throughout New England, where it formerly bred about many of the lakes and ponds of the northern portions, while it frequented the rivers of Massachusetts in fall and spring. It still breeds to some extent in the wooded interior of Maine, Vermont and New York, and several gunners about Falmouth on Cape Cod claim to have seen females there with young Ducklings in summer.

Nuttall (1834) says that it frequented the fresh waters even in winter, but in Massachusetts it is now largely confined to the vicinity of the sea-coast; it is still numerous there in its migrations, particularly in the waters about Cape Cod. Eighty-two observers reported as follows in 1908 on the status of this species: fifteen record it as increasing; seven of these are in Barnstable County; thirty-four report a decrease. These reports are mainly from the interior, but the bird is recorded from every county in the State. Reports from the Maritime Provinces, Maine, Rhode Island and Connecticut indicate that the species has fallen off over fifty per cent. in numbers along the coast.

This bird is a swift and rather silent flier, and an exceedingly expert diver. While swimming on the surface it sometimes raises and lowers its crest. This is more of a marine species than the American Merganser, but is nevertheless not uncommon in the interior of the country, particularly in the lake regions, during migration. In Massachusetts there appears to be a double migration of this species, the first flight coming north in February and the second in April.

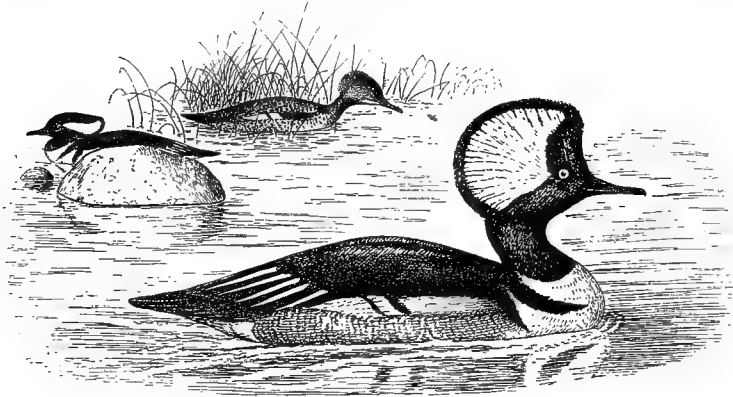
In winter, most of the birds of this species which are seen in Massachusetts appear to be full plumaged males, while in summer the few which remain with us appear to be females. Some of them, however, may be males in the "eclipse" plumage. I have noticed that practically all the birds seen in winter in Florida are females or young. This, together with the fact that most of those seen in Massachusetts in winter are males, seems to indicate that the hardy males do not go so far south in winter as do the females and young.

The Red-breasted Mergansers feed largely on fish, diving and charging through the schools of small fish, which they seize and hold fast with their saw-toothed bills. Thoreau notes that he saw Sheldrakes (presumably of this species) chasing fish by both swimming and flying along the surface. A few shell-fish are eaten at times.

Since the above was written evidence has been secured that corroborates the statements of gunners regarding the recent nesting of this species in Massachusetts. Mr. Jonathan H. Jones of Waquoit states that some years since some gunners there liberated two crippled birds in a pond near the village, and that a brood of young was raised there that year. He states that for several years he has seen broods of young birds along the south shore of Cape Cod, but is inclined to the belief that their parents were cripples which were left over from the spring shooting. This year (1911) I saw a female on the Agawam River at Wareham in June, and the same, or another, several times in July and August within half a mile of the spot where she was first seen. No young were seen, but a collector shot the bird on the last day of August, and he informed me that the condition of the ovaries showed that the bird had been breeding. I examined the specimen later, and it was undoubtedly a breeding bird. It could fly well, was not crippled in any way, and a careful examination revealed no old shot marks.

HOODED MERGANSER (*Lophodytes cucullatus*).

Common or local names: Hooded Sheldrake; Hairy Crown; Hairy Head; Wood Sheldrake; Swamp Sheldrake; Mud Sheldrake; Saw-bill Diver.



MALES AND FEMALE.

Length. — 16.50 to 18 inches.

Adult Male. — Head, neck and back black, a broad white patch extending from back of eye backward, with a narrow black border, forming a nearly semicircular crest when erected; if lowered, flattened and extended backward; two black bands extending from upper back toward breast before the bend of the wing; flanks grayish brown before, grading into reddish brown, crossed by fine wavy black lines; rest of under parts white; fore wing gray; wing patch and some long feathers on the back white; wing with two black bars, one before the white patch, the other crossing it; bill black; iris yellow; feet light brown; claws dusky.

Adult Female. — Chin and throat light; rest of head, with bushy crest, dull reddish brown, usually paler on cheeks; rest of upper parts sooty brown, inconspicuously barred; wing with a white patch divided by a dusky bar; flanks like upper parts; upper breast lighter; rest of under parts white; bill orange and blackish; feet light brownish.

Young. — Similar; but crest smaller.

Immature Male. — Head and neck light brown or grayish brown; neck blotched with black; crest brownish white, with brown edge; otherwise much like female.

Field Marks. — No other Duck except the male Bufflehead has the triangular white patch on head and crest; but he has no chestnut on sides, which are white. This Merganser may be distinguished from other Ducks by its long crest and slim bill; the female is much smaller than other Mergansers, head and neck darker and crest cinnamon and bushy.

Notes. — A hoarse croak, like a small edition of that of the Red-breasted Merganser (Elliot).

Nest. — In hollow tree, of grass, leaves and feathers.

Eggs. — About six, ivory white, 2.05 by 1.70.

Season. — Rather uncommon or rare migrant; March, October and November; rare in winter.

Range. — North America. Breeds from central British Columbia and Newfoundland south to southern Oregon, southern Louisiana and central Florida; winters from southern British Columbia and Massachusetts south to Lower California, the Gulf States and Cuba. Recorded from Mexico, St. Michael, Alaska, Europe and Bermuda.

HISTORY.

The Hooded Merganser was formerly very common in portions of New England. I believe that it is slowly vanishing from the east. It probably bred formerly throughout a considerable part of the Atlantic seaboard, but the cutting down of the primeval forest and unrestricted shooting have destroyed its nesting places and depleted its numbers. Like the Wood Duck, it frequents small ponds and woodland streams, where it is exposed to the gunner at all times. It bred and perhaps still breeds in Florida (G. B. Grinnell). It has been known to breed in Georgia (Wayne), and in South Carolina, Kentucky and Ohio (Audubon). Stone regards it as apparently much more plentiful formerly than now in New Jersey. It has been found breeding in New York, not only in the northern highlands, but in several counties (Eaton). Boardman found it breeding abundantly in Maine, but now Knight lists it as a rare breeder. It seems probable that it once bred in Massachusetts, but there is no record, although it has been noted here in summer.

My correspondents in 1908 did not report this bird from Berkshire or Franklin County. From the other counties ten report an increase and thirty-one a decrease. It is not noted as common anywhere, except in northern Essex County, where Mr. E. W. Eaton of Newburyport reports it as not uncommon in Hampton River near the New Hampshire boundary, and Dr. John C. Phillips sees it not uncommonly in Wenham Lake, in the towns of Beverly and Wenham, where he records the capture of forty-four birds in ten years (only one of which was



PLATE II.

Two Baldpates attracted by tame Mallards on Leverett Pond, Boston.
(Photograph by W. Charlesworth Levey.)



PLATE III.—CANVAS-BACK AND BALDPATE.

Attracted by tame Mallards on Leverett Pond, Boston. The pond is
surrounded by public streets and buildings. (Photograph by
W. Charlesworth Levey.) (See page 571.)

a male, in fine plumage); and he states that it is by far the commonest Merganser seen about the pond. Dr. Townsend rates it as a not uncommon transient visitor in Essex County. Mr. Jonathan Jones states that it was formerly plentiful at Waquoit, but has become rarer in recent years, and that is the general belief. Two gunners at Nantucket rate it as common, but all the others heard from call it rare. Brewster says that during the past twenty years "it has been steadily decreasing in numbers throughout New England, and is fast becoming a positively rare visitor to eastern Massachusetts." The species should be protected at all times in the New England States.

One of my pleasantest recollections is that of the sight of half a dozen birds of this species disporting themselves in a diminutive pond in the spring of 1900, while I lay hidden in the grass, watching the graceful evolutions of their beautiful forms. The two full-plumaged males raised and lowered their elegant fan-like crests to show off their plumage to the best advantage, and all raced swiftly about the little pool, unconscious of my presence. This is one of the swiftest Ducks that flies, and its progress beneath the water is remarkably rapid. Its speed even excels that of the swift-running fish, and as it feeds largely on fish, it is ranked among the enemies of the finny tribes.

Hon. John E. Thayer assures me that on Currituck Sound, N. C., this species feeds on the corn that the sportsmen use to attract other and more palatable Ducks. It appears to be more at home in the small ponds and streams of the interior than on the sea-coast; and even on the coast it keeps mainly to the fresh water.

Like the American Merganser this species seeks a hollow tree in which to build its nest. Hence it breeds only in the wooded regions of the continent.

RIVER DUCKS (Subfamily Anatinae).

This group contains most of the distinctly fresh-water Ducks; but they are by no means confined to fresh waters, and some often associate with the so-called Sea Ducks. The bill

is more or less broadened and flattened, and provided with processes through which, with the aid of the flattened, peculiarly constructed tongue, these Ducks are able to separate their food from the mud or muddy water in which it is largely

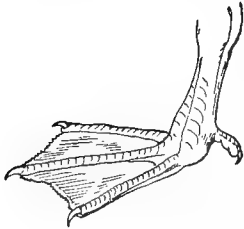
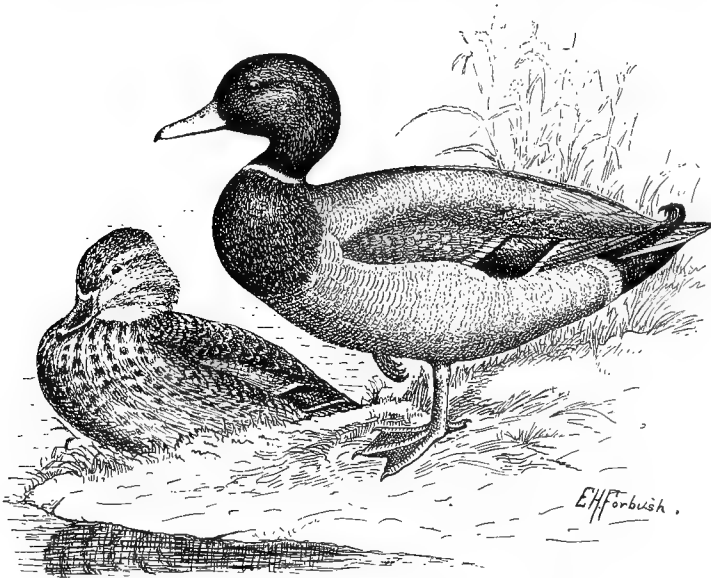


FIG. 4.—Foot of River Duck.

found. These Ducks differ from both the Mergansers and Sea Ducks in having no lobe or flap on the hind toe (Fig. 4). The plumage, though waterproof, is less dense than in the Loons, Grebes and Sheldrakes, and in the males it is often very beautiful. Both sexes have usually a glossy, brilliant patch on the wing, called the mirror or speculum, which is brightest in the male. The River Ducks might well be called "surface-feeding Ducks," for, although some of them are good divers, they all feed mainly in shallow water, by either dabbling in the surface mud or tipping their bodies forward and thrusting their heads and necks under water. They feed largely on succulent water plants and various forms of animal life. The males of most species appear to undergo a double molt in summer, during which they take on the "eclipse" plumage, much resembling that of the female. These Ducks are in great demand, both for food and sport, and their habit of feeding near the shore gives the gunner his opportunity. They need special protection. They have been diminishing in numbers for years in New England, and all but one or two have become rather rare in most of this region. Protection in spring and summer will tend to bring them back to their former haunts, as they are quick to find places of safety; but, unless the laws are respected and enforced, we cannot expect any lasting or permanent increase in the numbers of these wary birds.

MALLARD (*Anas platyrhynchos*).

Common or local names: Green-head; Gray Duck (female and young).



FEMALE.

MALE.

Length. — 23 to 24 inches.

Adult Male. — Head and most of neck iridescent green; a white ring almost entirely around neck, broken only on the nape; lower neck and upper breast chestnut; center of back brown, graying over shoulders and blackening toward tail; wings brownish gray; wing patch or speculum violet, bordered in front and behind with black and white; feathers under tail black; rest of under parts silver gray, finely cross-lined with black on the flanks, which end in white; a tuft of up-curved feathers on tail; bill and legs yellow; feet reddish orange; iris brown.

Adult Female. — Above dark brownish; feathers edged with buff; throat buff; speculum like that of male; head and neck lighter than body and finely mottled; top of head dark, as also an inconspicuous line through eye, and often another from lower part of bill crossing cheek then curving downward; breast brownish buff, marked with black; below white, spotted with dusky; bill greenish yellow; feet yellowish or orange.

Field Marks. — Size of the Black Duck; the green head and white ring around neck identify the male; female similar to the black Duck, but body lighter in color, with wing markings like those of male; speculum or wing patch bordered *both before and behind* with a white bar.

Notes. — The familiar quack of the barnyard Duck.

Nest. — On ground.

Eggs. — Six to ten, about 2.35 by 1.65, yellowish drab, variable.

Season. — An uncommon migrant, very rare in winter; March 27 to May 1; September 22 to December 1.

Range. — Northern hemisphere. In North America breeds from Pribilof Islands, northwestern Alaska, northern Mackenzie, central Keewatin and Greenland south to Lower California, southern New Mexico, southern Kansas, central Missouri, southern Indiana and Maryland (rarely); winters from the Aleutian Islands, central Alaska, central Montana, Wyoming, Nebraska, southern Wisconsin, northern Indiana, Ohio, Maryland and Nova Scotia (rarely), south to Mexico, the Lesser Antilles and Panama; casual in Bermuda and Hawaii.

HISTORY.

The Mallard is a cosmopolitan species, the wild Duck of the world. It is well known as the Duck from which nearly all varieties of the domestic Duck were derived. It is the common wild Duck over so large a part of the earth's surface that it is of greater economic value than any other Duck. It is exceeded by few, if any, in excellence for the table. The Mallard was formerly the most abundant wild-fowl on this hemisphere. Hearne (1795) found it in vast multitudes in parts of the Hudson Bay country. Now it is no longer abundant in those regions. Before the settlement of the west, the prairie sloughs swarmed with Mallards, and in winter the waters of the south were often crowded with them. Audubon (1832) found them in Florida in such multitudes as to "darken the air." He says that a single negro hunter, a slave of General Hernandez, supplied the latter's plantation in east Florida, killing from fifty to one hundred and twenty birds a day in the season. Mallards are now comparatively rare there. Prof. W. W. Cooke states that as late as the winter of 1893-94 a gunner at Big Lake, Ark., sold eight thousand Mallards, and one hundred and twenty thousand were sent to market during the season from that place alone. During the settlement of the west, hundreds of tons were killed in the south and west for their feathers, by negroes, Indians, half-breeds and whites, and the bodies of most of them were thrown away. In the southwest Mallards are still plentiful

in winter, though decreasing. The Houston, Tex., Post of January 29, 1908, states that during the previous week five citizens came upon a small lake into which the birds were flocking in great numbers. They flushed the game and emptied their repeating guns, gathering up afterwards one hundred and seven killed, not counting the wounded or missing; these were mainly Mallards.

Reports from many parts of the country indicate a decrease in Mallards of from fifty to ninety per cent. in the last thirty years. Mr. Edward L. Parker states that they were plentiful in Texas in 1898, but they have decreased rapidly since then. All my 1908 reports from every part of the Atlantic and Gulf coasts, outside of Massachusetts, indicate a decrease in the birds, except one from Connecticut, which estimates an increase of ten per cent. in a few years past. As the Mallard's breeding grounds in America lie mainly west of the meridian of Hudson Bay, and as its place in New England is largely taken up by the Black Duck, it is not common here. It is a hardy species, for, although it breeds normally in the United States and Canada, it goes very far north, and remains all winter in Alaska and Greenland in places where it can find open water and good feeding grounds. Judging from my own experience, I have leaned to the opinion that there had been a recent increase in the numbers of this species in Massachusetts, but the reports from observers in different parts of the State, received in 1908, do not support this view. Seventeen observers report an increase in the number of Mallards in the State, and sixty-three note a decrease. These reports certainly indicate a considerable decrease in the State. The reports of increase come mainly from Plymouth, Bristol and Barnstable counties, but those reporting decrease in those counties number more than twice as many as those reporting increase. Mallards have been rather common for many years in some of the ponds near Middleborough, Mass., and they are sometimes seen in considerable numbers locally in various parts of the six New England States. In years when they breed well, or possibly when food is more plentiful than usual in New England, flights of Mallards are seen. Dr. Townsend notes one

that occurred in the fall of 1904, when nineteen were shot October 23 at Hood's Pond, four at Wenham Lake, one or two at Chebacco Lake and seven in the creeks near Ipswich Beach, all in Essex County, Mass. Mr. J. H. Hardy counted nearly one hundred Mallards in the Boston market, sent there from Essex County during that week. Mr. John M. Winslow of Nantucket says that a number of Mallards were killed there about 1907. One man killed eighteen. A good many were taken at Tuckernuck. At one stand twenty were killed in a season. Mr. B. T. Mosely of Newburyport says that Mallards have remained about the same there for the last ten or fifteen years; ten or twelve birds killed every year.

The general migratory movement of the Mallard is north and south, with an easterly trend. It is evident that in former times, when the birds were so very plentiful in Florida and the south Atlantic States, a great migration moved to the southeast, and they are still numerous in some portions of the Carolinas.

The Mallard is not known to breed in Massachusetts, although it still breeds in New York State. It has been reported several times as breeding in Connecticut since spring shooting was prohibited there, but I am not aware that any nest has been found, and if Mallards are breeding there it is quite likely that they are birds that have escaped from confinement, as a number of people are breeding wild Mallards in Massachusetts and Connecticut.

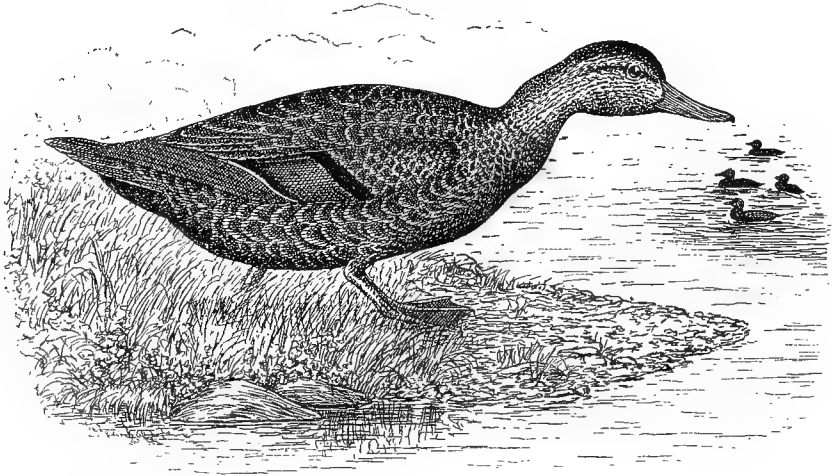
The Mallard is quite omnivorous in regard to its food. The animal food consists of small frogs, tadpoles, toads, lizards, newts, small fish, fish fry, snails, mussels, leeches, earthworms, mice and similar small game that it finds about the ponds and in the edges of the woods. Its vegetable food includes grass, many species of seeds and aquatic plants, grains, nuts, acorns, fruits, etc. It is particularly fond of wild rice. In the south the Mallard is one of the friends of the rice farmer, as it destroys the scattered rice or volunteer rice of the field, which, if left to grow, would greatly reduce the value of the crop. It is serviceable to the southern people in another way, as it feeds very largely upon crayfish,

which burrow into and undermine the levees and dikes. Examinations of one hundred and twenty-six stomachs of Mallards made at the Biological Survey reveal seventeen per cent. animal food and eighty-three per cent. vegetable. The most important items of the animal food were dragon fly nymphs, fly larvæ, grasshoppers, beetles and bugs. Mollusks, earthworms and crustaceans were found. The principal elements of the vegetable food, as found by the experts of the Biological Survey, were the seeds of smartweeds (*Polygonum*), seeds and tubers of pondweed (*Potamogeton*) and of sedges. Other items of importance were the seeds of wild rice (*Zizania*) and other grasses, of burr reed (*Sparganium*), hornwort (*Ceratophyllum*), water shield (*Brasenia*) and widgeon grass (*Ruppia*). A great many vegetable substances of less importance were included in the Mallard's diet, of which the following are worthy of note: wild celery, algæ, roots of arrowhead (*Sagittaria*); fruits, such as grapes, dogwood, sour gum and bayberries; and the seeds of such small aquatic plants as millweed (*Myriophyllum*), horned pondweed (*Zannichellia*) and mermaid-weed (*Proserpinaca*).

The Mallard is proverbially fond of grain of all sizes, from Indian corn to wheat or barley; hence the ease with which it may be domesticated, or bred in a semi-wild state for sporting purposes. This adaptability to man's uses makes it economically the most valuable of all Ducks, and a study of its favorite food plants and animals will materially assist those who wish to propagate this bird on preserves.

BLACK DUCK (*Anas rubripes*).

Common or local names: Dusky Duck; Summer Black Duck; Spring Black Duck; Black Mallard.



Length. — 22 to 25 inches.

Adult. — Top of head blackish; sides of head, neck and throat light grayish buff, finely streaked with dusky (old males have the throat unspotted); a dusky line through eye; rest of plumage dusky brown (apparently blackish, except in strong light or close at hand); speculum iridescent purple or greenish, edged with velvety black but no white; under sides of wings light silvery; bill broad and fairly long, yellowish green or olive; iris brown; legs and feet of male orange red, with dusky webs; females and young have legs and feet darker; old drakes have yellower bills, redder legs and feet, and more distinctly spotted throats.

Field Marks. — Large size, dusky color and silvery white lining under the wings, which shows in flight. May be distinguished from the female or young of the Mallard by the absence of white wing-bars.

Notes. — A quack resembling that of the Mallard (Reed). This is the call of the female; the male has a more reedy cry.

Nest. — On the ground in a wet meadow, on the border of lake or stream, in the rushes, or sometimes under a bush on a hillside.

Eggs. — Six to about twelve, pale yellowish drab or buff, more or less dingy, about 2.40 by 1.75.

Season. — Resident the entire year, mainly coastwise in winter. Many now breed; more winter, and still more migrate through New England in fall and spring.

Range. — Eastern North America. Breeds from central Keewatin and northern Ungava south to northern Wisconsin, northern Indiana and southern Maryland; winters from Nova Scotia south to southern Louisiana and Colorado; west in migration to Nebraska and central Kansas; casual in Bermuda; accidental in Jamaica.

HISTORY.

The Black Duck, owing to its ability to take care of itself, is the only fresh-water Duck which still remains common locally throughout the New England States. Although it has decreased greatly in numbers since early times, it has avoided the gunner by feeding mainly at night, and going out on the salt water or to some large lake during the day, where it is practically unapproachable. Now and then young or inexperienced birds lack some of the caution of the majority, but these are quickly killed, and only the suspicious ones survive to procreate their kind. The following abridged extracts from authors exhibit the former abundance of the species and its decrease: The most numerous of all its tribes that frequent the salt marshes; on the most distant report of a musket they rise from every quarter of the marsh in prodigious numbers; there are at least ten Black Ducks to one Goose or Brant, and probably many more (Wilson, 1811). Abundant winter resident; few breed (Maynard, 1870). Most abundant of all our fresh-water Ducks (Samuels, 1870). Abundant resident (Turnbull, 1869). Abundant winter resident; rare summer, formerly regular resident whole year (J. A. Allen, 1879). Formerly abundant, but now rare (H. L. Clark, 1887, Amherst, Mass.). Very common transient visitor, not uncommon summer resident (Brewster, Cambridge region, 1906). Mr. James Henry Rice, Jr., of Summerville, S. C., says that Black Ducks and Mallards are decreasing fast, although both mass around Georgetown. Market hunting is wiping them out. He has seen five thousand Mallards and Black Ducks brought into the Georgetown market in one day, all killed by the negroes. Forty observers in 1908 report an increase in Massachusetts, and one hundred and twenty-six report a decrease. Black Ducks breeding in the State are

reported on as follows: twenty-seven observers note an increase and eighty-three a decrease. Mr. Charles E. Ingalls of East Templeton says that thirty to forty years ago Black Ducks were very abundant; there were hundreds where one is now seen. Bags of ten to fifteen were not uncommon where birds were merely run into casually. Unnaturalized foreigners have been hunting them from boats in the summer time, killing the helpless young and the molting adults, until they are nearly exterminated there.

The Black Duck responds quickly to protection, and has increased in numbers in recent years wherever it has been protected in the spring. Mr. Talbot Denmead of Baltimore, Md., states that there has been a decided increase in Black Ducks around Bath, Md., in the last fifteen years. All the Ducks he gets are in good condition, as they are well baited with corn. Mr. Benjamin F. Howell of Troy Hills, N. J., says that sixty years ago Black Ducks were shot the year round in his section. Since the stoppage of spring shooting, in 1908, ten pairs of Black Ducks breed on the meadows, where one pair bred before. Mr. Gardiner G. Hammond, who protects the Ducks along the shore of a pond on Martha's Vineyard, states that about two hundred and fifty Black Ducks are gathered there early in September, which probably breed there or near by. The old and young Ducks are so numerous in autumn that they leave evidences of their movements from one pond to the other in the sheep paths, where they travel. He never saw any Ducks breeding there previous to his occupancy of the place.

No Duck is more wary than the Black Duck, or harder to deceive with wooden decoys. Sometimes on the sea-shore a few will come to wooden decoys. Gunners along the sea-coast sometimes attract this bird by putting out lumps of mud or bunches of seaweed upon some point. The theory is that the birds, seeing these objects from afar, believe them to be Ducks; but that on a nearer approach they find them to be neither wooden decoys nor living birds but harmless objects, and suspicion being allayed the birds sometimes will alight on or near the point. They are readily attracted in

this way at night or in the dusk of evening. They are easily deceived by live decoys of their own kind, and if the gunner has a well-trained flock of decoys, and is well concealed in a good location, his chances of success are greatly increased. I am somewhat skeptical about the alleged extreme keenness of scent of this bird, for on at least two occasions I have been able to get within gunshot of a flock by quietly creeping up to them, although they had the wind in their favor; but their sight and hearing are remarkably acute. Some Ducks will swim very close to a man in full sight and in daylight provided he does not move, but I have never seen a Black Duck deceived unless the man was concealed in some manner. This bird, when suddenly alarmed and fearful of ambush, will spring directly from the water and climb the air almost perpendicularly, until high out of the reach of the gunner, when it speeds away to safer quarters.

The great natural breeding ground of this species extends from Labrador to Pennsylvania, but it breeds to the westward of Hudson Bay, and seems to be somewhat extending its range westward in the northern United States. It migrates south along the Atlantic coast to Florida and even beyond, and winters about as far north as it can find open fresh water, sometimes to Nova Scotia. Black Ducks often fly very high in migration, and sometimes in the interior they may be seen to fall from far up in the sky into some pond or river, coming down with a roar of wings, like the Redhead. Often in severe weather they appear to prefer to sit about on the ice and starve rather than to go south, if they can find an open spring where they can get fresh water to drink. Gunners have told me that they have shot these Ducks at such times and found them nearly starved, with nothing but black malodorous mud in their stomachs.

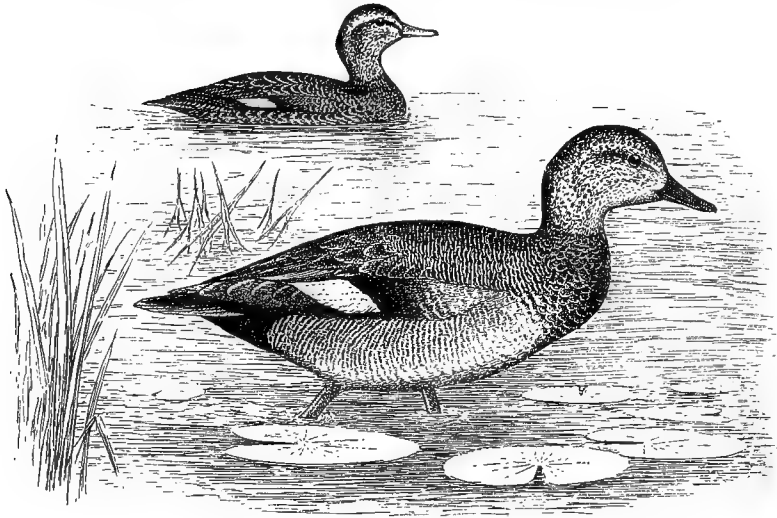
In the interior the food of this species is largely vegetable, particularly in the fall. In the spring more animal food is taken. The vegetable food includes grass roots taken from meadows, roots and shoots of aquatic plants, wild rice, grains, weed seeds, hazel nuts, acorns and berries. The animal food includes small frogs and toads, tadpoles, small minnows,

newts, earthworms, leeches and small shell-fish. The Black Duck is a gluttonous feeder. Knight tells of one which he found asleep under some berry bushes, and it was so gorged with berries that it could not fly. As a destroyer of weed seed the Black Duck is pre-eminent. Eaton in his *Birds of New York* recalls that on the morning of October 26, 1901, he "shot a Black Duck from a flock of 75 birds, which were returning to Canandaigua Lake from a flooded cornfield. From its gullet and gizzard," he says, "I took 23,704 weed seeds, which, together with a few pebbles, snail shells and chaff, were the sole contents of its stomach. Of these seeds 13,240 were pigweeds (*Chenopodium* and *Amaranthus*), 7,264 were knotgrass (*Polygonum*), 2,624 were ragweed (*Ambrosia*) and 576 were dock (*Rumex*)." The food of the Black Duck has the same practical interest for the game preserver as has that of the Mallard, for the Black Duck is closely related to the Mallard, thrives almost equally well on grain, and, when grain fed, becomes a very excellent bird for the table. It is the darker eastern representative of the Mallard, and can be artificially propagated, though it is somewhat quarrelsome in disposition, and, therefore, it is not usually profitable to confine it with Ducks of other species.

NOTE. — The Red-legged Black Duck (*Anas rubripes tristis*) is now generally regarded as the fully adult male of the Black Duck. The question of its validity as a subspecies has caused some discussion, and it has been placed on the hypothetical list.

GADWALL (*Chaulelasmus streperus*).

Common or local names: Gray Duck; Speckle-belly; Creek Duck.



FEMALE.

MALE.

Length. — About 18 to 22 inches.

Adult Male. — Upper parts and sides brown, so barred and vermiculated with black and white as to give a general appearance of brownish gray, passing to dusky on lower back and to black on upper and lower tail coverts; tail brown, edged with gray; head and neck brown, mottled with darker; wings largely brown, black, white and gray, in the order given; wing patch white, bordered in front and below by black; rump black; lower neck and breast dark gray; belly white, with fine wavy gray lines; bill lead blue or bluish black; legs and feet dull orange or yellowish, with dark webs.

Female and Young. — Much like a diminutive female Mallard, but wing similar to that of the male Gadwall; the white wing patch is smaller than in the male, but bordered similarly by black; lining of wings whitish, as in Mallard and Black Duck.

Field Marks. — The only river Duck with a *pure white, black-bordered speculum or wing patch*. The female resembles a small female Mallard, but the white wing patch is distinctive.

Notes. — Resemble those of the Mallard, rather more shrill, frequently repeated (Eaton).

Season. — Very rare or accidental visitant; April (?) and October to November.

Range. — Nearly cosmopolitan. In North America breeds from southern British Columbia, central Alberta and central Keewatin south to southern California, southern Colorado, northern Nebraska and southern Wisconsin; winters from southern British Columbia, Arizona, Arkansas, southern Illinois and North Carolina south to southern Lower California, central Mexico and Florida; accidental in Bermuda, Cuba and Jamaica; rare in migration on the Atlantic coast of the middle and New England States north to Newfoundland.

HISTORY.

In North America this almost cosmopolitan species breeds mainly, if not entirely, in the western province. There is reason to believe that the Gadwall was once not uncommon in New England; but within the last half century not many specimens are known to have been taken in Massachusetts. Wilson believed it to be rare in the "northern parts of the United States," and it was probably always less common in the New England States than in the west and south; but I am convinced, by the statements of the older ornithologists and by descriptions given me by some of the older gunners, that the Gadwall was more often seen in the early part of the last century than it now is, and that some of the so-called Gray Ducks which were then killed here were of this species. Mr. Willard C. Whiting, who has consulted with the Plymouth gunners and members of the Plymouth Natural History Society, and has examined the scores of the gunning stands, believes that the Gadwall was not uncommon there in the early days. Now, however, the bird is unknown to most of the present generation of Massachusetts gunners.

De Kay (1844) says that this species breeds in central New York. Eaton (1910) considers it as not common now in any part of New York, but states that Mr. Foster Parker once met a gunner with twenty, which he had recently killed in the "ponds." Linsley says that flocks of the Gray Duck arrived in Connecticut in August, 1842.¹ Dr. C. Hart Merriam, in his *Review of the Birds of Connecticut* (1877), regards it as not common. Even now, although it is very rare here, a few are still taken. Its only known breed-

¹ Linsley, James H.: *A Catalogue of the Birds of Connecticut*, *Am. Jour. of Sci. and Arts*, April, 1843, Vol. XLIV., No. 2, p. 269.

ing grounds in the east are on Anticosti Island, Gulf of St. Lawrence (Knight), where all the water-fowl have been protected for many years.

The Gadwall is a swift flier, resembling the Baldpate or Widgeon when in the air. It is quite distinctly a fresh-water fowl, and gets much of its living along the shores of lakes and rivers, concealed by the reeds, grasses and bushes that grow near the shore or overhang it. It is a good diver at need, and is seen usually in pairs or small "bunches," often in company with other Ducks. When approached from the land they usually make no attempt at concealment, but swim toward open water and take wing, making a whistling sound with their wings that is not so loud as that made by the Baldpate. This is an excellent bird for the table, which accounts largely for its present rarity. It is fond of grain and is easily domesticated. It breeds naturally in the latitude of Massachusetts, and it might prove a great acquisition to the game preserve or to the farm-yard if it could be propagated in sufficient numbers. It seems a promising species with which to experiment with this end in view.

The food of this bird consists of the tender shoots of grasses, blades and roots of aquatic plants, seeds, nuts, acorns, insects, mollusks and other small forms of aquatic life, including small fish.

EUROPEAN WIDGEON (*Mareca penelope*).

Length. — About 18 inches.

Adult Male. — Crown *creamy buff*; throat black; rest of head and neck *chestnut or cinnamon red*, mostly without green spots; otherwise similar to Baldpate.

Female and Young. — Head and neck strongly tinged with cinnamon; otherwise quite similar to female Baldpate.

Notes. — A shrill, whistled *whēē-you* or *mee-you*, the first note loudest and prolonged. Female, a low note, like *kir-r-r* (Chapman).

Range. — Northern part of eastern hemisphere. Occurs occasionally in winter and in migration from Wisconsin, Michigan, New York, Nova Scotia, Newfoundland and Greenland south to Nebraska, Missouri, Indiana, Ohio, North Carolina and Florida; and in Alaska, British Columbia and California.

HISTORY.

The European Widgeon is rated as a wanderer from the Old World. A statement that the bird has been taken here, made by Samuels and recorded by Dr. J. A. Allen,¹ is probably authentic, and an adult male was taken in Monponsett Pond, near Halifax, Mass., October 20, 1899.² There are seven records for New York State, and another bird, taken on Long Island, was apparently breeding. Mr. Foster Parker states that several more have been taken at Cayuga (Eaton). It is possible that many European Widgeons have been taken in this country, but have not been recognized as such, and we may yet have to revise our ideas regarding their breeding range.

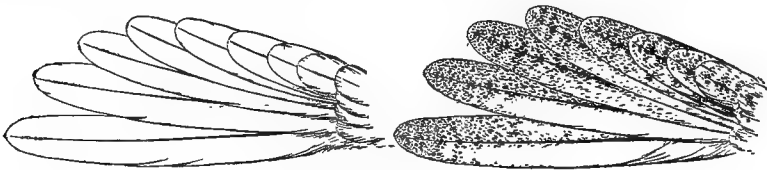


FIG. 5. — Axillars of Baldpate. Axillars of European Widgeon. Reduced. (After Phillips.)

Mr. Outram Bangs has called attention to the fact that the axillars or long feathers under the wings of the Baldpate are white, while in the European Widgeon these feathers

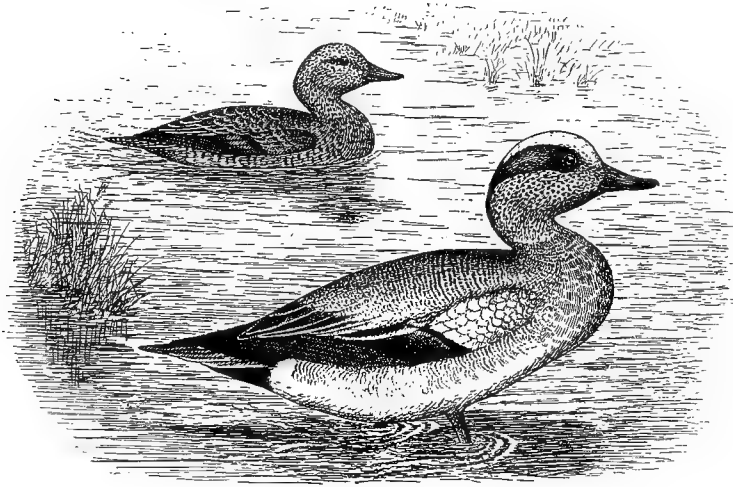
¹ Proc. Essex Inst., 1864, p. 88.

² Brewster, William: Auk, 1901, p. 135.

always are gray. This character appears to be constant in both sexes. Dr. John C. Phillips has published, in *Forest and Stream*, a drawing that shows at a glance the appearance of the axillars in each species, drawn from adult male specimens. These are reproduced herewith. If, with this distinctive mark in view, sportsmen will make careful examination of the Widgeons or Baldpates taken in this country, it may prove that the European species is less uncommon than hitherto has been supposed. Dr. Phillips has found, by comparing the axillars, that four birds taken at Wenham Lake are referable to the European species. The probability is that this bird is a permanent resident in North America, and breeds on this continent.

BALDPATE (*Mareca americana*).

Common or local names: American Widgeon; Widgeon; Southern Widgeon; California Widgeon; White-belly.



FEMALE.

MALE.

Length. — 18 to 21 inches.

Adult Male. — Forehead and top of head white; sides of head and neck less purely white or more buffy, speckled with lusterless dusky greenish; a broad glossy green patch extending from around eye back to nape; chin dusky; upper hind neck and back mainly pale brown or reddish, finely pencilled with black cross lines; fore wing with a broad white patch, bordered behind with a black band, and a metallic green speculum, which darkens behind; fore neck, upper breast and sides light brownish, red or wine red; rest of under parts white; primary wing quills and tail gray; feet light slaty bluish; bill grayish blue, with black tip and black edges; iris brown.

Female and Immature Male. — Top of head blackish; rest of head and neck whitish, spotted with dusky; back buff, barred with dusky; speculum mainly black; indications of white patch on fore wing, forming a white or whitish bar; breast and sides reddish brown, with dusky spots on the breast; rest of under parts white; bill and feet like male, but duller. There is considerable variation in all plumages of this bird.

Field Marks. — The adult male Baldpate may be distinguished by his pale neck and head, the latter becoming almost white on the forehead and crown, by the dark green patch through and behind the eye, by his wine-colored breast and white abdomen. The females and young,

when swimming, might at a distance be mistaken for female Mallards, although smaller and darker. When they tip up to feed, however, the white abdomen is seen; and this is also displayed when they stand up in the water to flap their wings. In flight, the white abdomen and the abrupt ending of the brown of the breast are also distinct field marks. Another point of difference noted when watching the two birds together on a pond is that the under surface of the wings of the Baldpate is gray, that of the Mallard snowy white. A white bar is visible on the wing of the Baldpate, and two are seen on that of the Mallard (C. W. Townsend).

Notes. — Male, a shrill whistling *whee-you*; a soft whistled *sweet* (Audubon). Female, a low purring growl (Saunders). The female has a loud cry like the syllables *kaow, kaow* (Eaton).

Season. — Uncommon or rare migrant; late February to April; early September to December.

Range. — North America. Breeds from northwestern Alaska south to Kansas and northern Indiana; winters from British Columbia, Maryland and Delaware (casually in Massachusetts and Rhode Island) south to Lower California and West Indies; rare in migration in northern Ontario and Newfoundland.

HISTORY.

The Baldpate is another fresh-water Duck, a valuable food species once common here, now becoming rare. The early historians speak of "widgens" in abundance, but they possibly included more than one species under this name, as some of our gunners do to-day. Wilson (1814) regarded it as very common in winter along the whole Atlantic coast, from Florida to Rhode Island. It must have been common then in Massachusetts in spring and fall.

Notes regarding its former and present status follow: Not uncommon migrant (Maynard, 1870). Uncommon transient visitor (Townsend, Essex County, 1905). Formerly not uncommon in autumn; rarely seen during recent years (Brewster, Cambridge region). The reports of the experience of observers for an average of twenty-seven years, up to 1909, read as follows: Baldpate increasing, nine; decreasing, thirty-four. As usual, the shore counties give the greatest number of reports on this species, Barnstable County leading with seventeen. Plymouth County comes next, with thirteen, and Essex next, with seven. Other reports indicate that the

bird is rare or decreasing along the Atlantic coast from the Provinces to Maryland and Virginia, where in the winter of 1907-08 it was plentiful. It appears to be decreasing also in some localities in Connecticut. In Massachusetts it appears to be least uncommon in Plymouth County, where it occurs quite regularly in some of the ponds. Dr. Albert H. Tuttle of Cambridge writes that nineteen were killed in one volley at Assawompsett in 1906, and that he has seen hundreds at this lake for several years. They have learned to distrust the decoys, and so fewer are shot than formerly. Mr. Israel R. Sheldon of Pawtuxet, R. I., writes me that the opening of the breach at Point Judith Pond has killed off most of the "feed," but Baldpates, which were once numerous there, are still common in the pond. Mr. Howard Remington (1908) of Providence states that the Baldpate has decreased nearly one hundred per cent. in ten years' time, because of shooting from power boats and spring shooting, but a few still winter in Rhode Island. Mr. Samuel L. Buffington of Swansea, Mass., near the Rhode Island line, states that the Baldpate is not uncommon on the coast, but he has never seen it up the river in his vicinity. Mr. C. O. Zerrahn says that he has observed but one in Milton, Mass., but that a few are shot at Ponkapog Pond, Canton, Mass., every year. Mr. Gardiner G. Hammond says that eight or ten are taken in his vicinity on Martha's Vineyard each year. Mr. Robert O. Morris says that they have decreased ninety per cent. near Springfield, Mass., in thirty years.

The Baldpate is one of the wariest of all Ducks, and its whistled alarm notes serve well to warn other and less astute birds. Elliot says that when speeding high in air the flock flies in a line nearly abreast, with the leader a little in advance in the middle, but when moving about ordinarily from place to place on the marsh they fly like a flock of pigeons. This bird breeds mainly in the west, and a line drawn from the western coast of Hudson Bay to the western shore of Lake Michigan marks approximately the eastern boundary of its breeding range. In its southeastward migration toward the Atlantic coast it naturally reaches Chesapeake Bay in

large numbers, and is less common north and east of Maryland and Virginia. Nevertheless, a large number of individuals must normally choose a route from the northwestern British provinces and Alaska to New York and New England. Knight states that it occurs quite generally along the Maine coast, but is rare inland; and Eaton finds it still a fairly common migrant on the shores of Long Island and in western New York.

This species often attends the Canvas-back and the Red-head. As it is rather a poor diver it watches these diving Ducks, and as one comes up from the bottom with the wild celery or other favorite root or bud in its bill, the Baldpate snatches the morsel and makes off. It also feeds much upon pond weeds and other water plants. It is very alert and active, and when feeding it is said that its flocks are prone to keep a sentinel on the watch. It is fond of seeds, the tender shoots of plants, insects and small aquatic shell-fish and vertebrates. It feeds in daylight if undisturbed; but where it is much hunted it feeds mainly at night. In feeding it is not confined strictly to fresh water but takes plants growing in brackish or even salt water. It is fond of grain, and Audubon says that it eats peas and earthworms, and that it often alights in the cornfields. It walks well, is not noisy, and would make a desirable bird for the game preserve could it be artificially propagated. It has been bred successfully in confinement, but, so far as I am aware, this has been accomplished only on a very small scale.

The Baldpate is perfectly at home in this latitude and responds quickly to protection. Since spring shooting was prohibited in Massachusetts its numbers have been increasing in some localities and Mr. Charles H. Brown informs me that from five hundred to six hundred frequented Martha's Vineyard in 1910-11, coming in November and remaining until driven out by the ice in February.

EUROPEAN TEAL (*Nettion crecca*).

Length. — 14 inches.

Adult Male. — Like Green-winged Teal, but no white crescent before wing; green band in chestnut of head behind the eye, bordered in front with yellowish white; barring of sides and upper parts much coarser than in the American species; long scapulars as well as inner secondaries creamy white, black-bordered externally; these form a conspicuous white streak along upper part of wing.

Female. — Like female of the Green-winged Teal; the bars and margins of the back feathers are of deeper hue; the sides of head, neck and throat deep buff, and much darker than those of the American species.

Range. — Northern part of eastern hemisphere. Occasional in North America; recorded from the Aleutian Islands, California, Greenland, Labrador, Nova Scotia, Maine, New York, Massachusetts, Connecticut and Virginia.

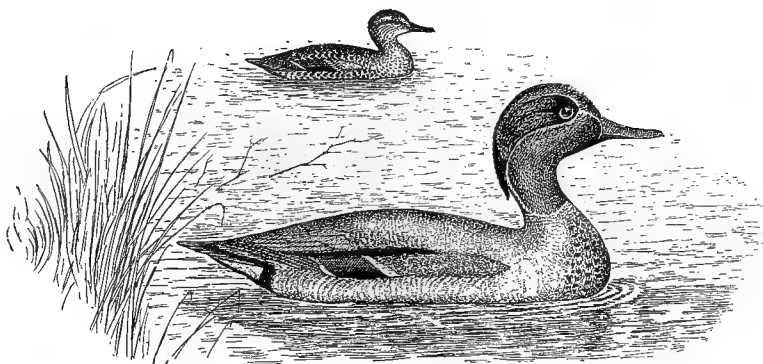
HISTORY.

The European Teal is a wanderer from the eastern hemisphere. The following Massachusetts records seem reliable: About 1855, a specimen, which was killed in Massachusetts, was sent to E. A. Samuels. An adult male was taken, March 17, 1890, on Muskeget Island, and is now in the Brewster collection. An adult male was caught in a steel trap about February 20, 1896, in Sagamore, by Rev. E. E. Phillips, and is also in the Brewster collection.¹ Several specimens have been recorded from New York.

¹ Howe, Reginald Heber, and Allen, Glover Morrill: Birds of Massachusetts, 1901, p. 52.

GREEN-WINGED TEAL (*Nettion carolinense*).

Common or local names: Green-wing; Mud Teal; Winter Teal.



FEMALE.

MALE.

Length. — About 14 inches.

Adult Male. — Head and upper neck chiefly chestnut; chin black, a broad patch from just before the eye to hind head metallic green, running into black below, bordered by a narrow buff line, and all ending in a black tuft on hind neck; rest of hind neck, sides of breast, upper back, scapulars and flanks very light gray, finely barred with black; a white crescentic band before wing; lower back brown; wings grayish brown or gray; speculum or wing patch metallic green, edged below with black, a bar of light chestnut before it; upper breast reddish buff, with round black spots; rest of lower parts whitish, sometimes tinged with brown; under tail coverts black, with a triangular patch of white on each side; bill black; legs and feet dark brown; iris brown.

Adult Female. — Top of head and back dusky brownish, the feathers of the back edged with buff; throat light buffy; wing much like that of male, but wing-bar lighter; breast buff, spotted rather finely with blackish; flanks heavily marked with dusky; rest of under parts whitish; bill brown; legs and feet brown.

Young. — Similar to female; largely white below.

Field Marks. — The small size, chestnut and green head and the white crescent before the wing distinguish the male. The flanks of females and young are *more coarsely* and *heavily marked* than those of the Blue-winged Teal.

Notes. — A peculiar chirping, almost a twittering, as they fly (Seton). Male, a short mellow whistle; female, a quack like the Black Duck, but small, high-pitched and oftener repeated (Eaton).

Season. — Uncommon or rare migrant and rare winter resident; early September to late April.

Range. — North America. Breeds from New Brunswick and Minnesota to Greenland and Alaska; winters from Virginia, Kansas and British Columbia to the West Indies and Central America.

HISTORY.

This species probably was never as abundant in New England as was the Blue-winged Teal, but it was once very common and at times abundant. Thomas Morton (1632), who lived at Mount Wollaston, Quincy, Mass., speaks of both the Green-winged and Blue-winged Teal, and says that he "had plenty" in the ponds about his house. Trustworthy old gunners have told me of remarkable flights in Massachusetts and Connecticut up to the middle of the last century.

Possibly its breeding range once extended into New England. The following abbreviated extracts from the works of ornithologists indicate its decrease: In autumn and winter very common throughout the waters of the United States (Nuttall, 1834). Have seen individuals breeding on the banks of the Wabash, Illinois (Audubon, 1835). Breeds along the Great Lakes and northwardly (De Kay, 1844). Common in migration (Maynard, eastern Massachusetts, 1870). Quite abundant in migration in New England; probably breeds in northern portions (Samuels, 1870). Common spring and autumn migrant (J. A. Allen, 1879). Quite common in the east in migrations (Chamberlain, 1891). Has become rare of late years, except in wilder portions of Maine (Hoffman, New England and New York, 1904). Uncommon transient visitor (Townsend, Essex County, 1905). Uncommon transient; met with regularly in former years; know of but two instances in last fifteen years (Brewster, Cambridge region, 1906).

My correspondents report upon this species as follows: six note it as increasing; seventy-one as decreasing. The species is reported from every county in the State, but is apparently least rare in the coast counties. The opinion that it is decreasing is practically unanimous among gunners of long experience. Similar statements come from the entire Atlantic seaboard, except from Maryland, where Mr. Talbot Denmead reports "a great many." Mr. Clement A. Cahoon

of Harwich says that Teal are seldom seen there now, but that fifty years ago both species were very plentiful. Mr. Nathan C. Perry of Pocasset has seen no Teal for about fifteen years, but used to see large flocks of both species forty-five years ago. Eaton reports it as not uncommon in western New York.

To-day the Green-winged Teal is becoming a rare bird in New England. More are seen near the coast than elsewhere, but even there not very many are seen or killed. Its scarcity is easily explained. Mr. W. B. Long states that when a flock comes to decoys it is usually "cleaned out," if the blind is well cared for. While I, with a friend, was watching three Green-winged Teal feeding on the shore of a pond in Nantucket, in October, 1910, a boy crept up and killed two of them. The other started to fly, but came back to its dying companions, and if the boy's shooting had been as deadly as his intentions he would have killed all three. These three were probably all that remained of a little family that had started south. It is inexplicable how any ever manage to run the gauntlet of the gunners and return to breed. Now and then a solitary bird of this species will find the safe refuge of some of the Boston ponds, where no shooting is allowed, and will remain about Boston all winter, going down the harbor when the ponds are frozen over. This species breeds much farther north than the Blue-winged Teal and winters oftener in temperate regions. It has been found in January near Halifax, N. S. (Cooke).

This Teal is so unsuspecting that it formerly flocked with domestic Ducks, and often came with them to the barnyard to be fed. Like the Blue-winged Teal it needs some kind of special protection. If in the east it could have a safe refuge in certain ponds it might be able to maintain itself. Large numbers still may be met with in the western States. It normally collects in large flocks, which fly at a tremendous speed, ordinarily in a direct line, but at times in the most tortuous and desultory manner. It is a rapid swimmer, feeds almost entirely in fresh water, and when alarmed springs into the air suddenly and easily. The flocks swim often so com-

pactly that a gunner who can choose his time can rake them terribly upon the water. They like to wade and paddle about in the shallow water near the shore of some pond, and to hunt insects in the grass. This bird feeds in daylight where it is not much disturbed, but otherwise, like all other wild-fowl, it feeds much at night, particularly on moonlit nights, when all Ducks appear to be active and often noisy. In the winter of 1877-78 I camped in a great marsh in Florida, where Ducks of many species could be heard calling and feeding throughout the night. Among them the notes of the Teal could be heard. This species shows good diving powers in times of danger, and it is almost as active on land as in the water, for it can run well at need.

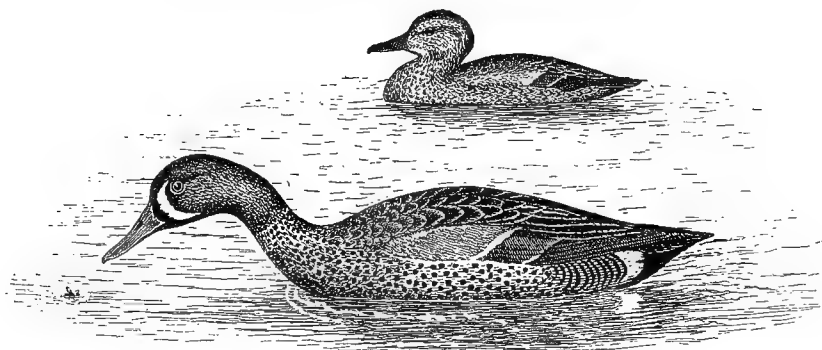
This Teal, like the Blue-winged Teal, is of excellent flavor when it has been feeding on wild rice, wild celery and various pond weeds, but when it is driven to the seashore in winter its flesh soon becomes inferior.

It breeds across the entire northern part of the continent, but few breed now in the United States east of the Rockies. Its principal breeding grounds now are in west central Canada.

It is fond of wild oats and rice and takes seeds of various grasses and weeds, also chestnuts, acorns, wild grapes, berries, insects, crustaceans, worms and small snails. Audubon states that he never found water lizards, fish or even tadpoles in stomachs of the Green-winged Teal. He regarded it, when fed upon soaked rice or wild oats, as far superior to the Canvas-back, and considered it the most luscious food of any American Duck. Possibly it might be domesticated to advantage, as it has been bred in captivity in a small way.

BLUE-WINGED TEAL (*Querquedula discors*).

Common or local names: Blue-wing; Summer Teal.



MALE.

FEMALE.

Length. — 15 to 16 inches.

Adult Male. — Head dusky, leaden gray; chin, forehead and crown blackish; a large white black-edged crescent in front of eye; back dark brown, upper part marked with buff; fore wing when closed shows a light blue patch, edged with white, which separates it from a greenish patch or speculum; a narrow white posterior edge to speculum; lower parts buffy, reddish buff, cinnamon or purplish gray, spotted with black, except lower flanks, which are sometimes barred in curved lines; tail coverts black, and a white patch on either side of tail; bill bluish gray, black on ridge; legs and feet yellow, with dusky webs and claws; iris yellow.

Adult Female. — Top of head blackish; throat whitish; rest of head and neck pale brownish or brownish white streaked with dusky; no white crescent; back and wings dusky, with V-shaped buff edgings on back; breast pinkish buff, marked with black; flanks with dusky V-shaped marks; belly whitish gray, with obscure markings; wing much as in male, but with less blue and little white; bill greenish black.

Young. — Like female, but with white belly and gray speculum.

Field Marks. — In spring or fall the broad white crescent in front of the eye distinguishes the adult male. The blue wing area is conspicuous in flight in both sexes, but is not so readily seen on the water. Female and young may be distinguished from those of the Shoveller, which also has a blue fore wing, by the comparatively narrow bill.

Notes. — The Drake, a whistling peep, repeated five or six times (Eaton); the Duck, a low quack.

Nest. — On ground in meadow or marsh, of fine soft grasses lined with down.

Eggs. — Six to fifteen, usually buffy white, about 1.75 to 1.90 by 1.30 to 1.40.

Season. — Late August and September mainly, rare in spring (April); August 16 to November 25 (C. W. Townsend).

Range.—Western hemisphere. Breeds from central British Columbia, Great Slave Lake, central Ungava and Newfoundland south to central Oregon, northern Nevada, northern New Mexico, central Missouri, southern Indiana, northern Ohio, western New York (occasionally Rhode Island) and Maine; winters from southern British Columbia, Arizona, southern Illinois, Maryland and Delaware south to the West Indies and South America as far as Brazil and Chile; accidental in Bermuda and Europe.

HISTORY.

This Teal was formerly one of the most numerous Ducks of New England and nested here. Mr. Louis Agassiz Fuertes says that it formerly bred abundantly at Cayuga, N. Y. Mr. Lawrence Horton of Canton, Mass., says that he believes it used to breed in the Neponset meadows as late as about the year 1888. It still breeds in the marshes of Seneca, Cayuga, Wayne and Oswego counties, New York, and in many other localities (Eaton). It is now becoming rare, and does not breed at all in the New England States, so far as I am aware, except in small numbers in Vermont and Maine. The species is recorded as nesting formerly in Rhode Island, and even as far south as North Carolina and Cuba.

The following abridged extracts from the writings of well-known ornithologists indicate its former abundance and recent diminution: Appears with us in September, when it is abundant on the Hudson, and soon leaves for the south (De Kay, New York, 1844). Common spring and autumn migrant (Maynard, eastern Massachusetts, 1870). Rather common spring and autumn migrant; formerly doubtless summer resident (J. A. Allen, Massachusetts, 1879). Uncommon in New England (Chamberlain, 1891). Have killed good bags of these birds on the fowl meadows lying between Canton and Dedham; it is also pretty abundant in the ponds and streams of Plymouth county (Samuels, 1897). Has become scarcer of late years; can hardly be called common except in wilder portions of Maine (Hoffman, New England and New York, 1904). Formerly one of the most abundant of the water birds that visited the region about Cambridge in autumn; now comparatively seldom met with (Brewster, 1906). Mr. Robert O. Morris of Springfield states that formerly large flocks appeared at Springfield. Mr. Lewis W. Hill states

that Teal were formerly more numerous than now at Edgartown, and that the old gunners have told him that the birds were once very abundant there. Mr. John M. Winslow of Nantucket writes that Blue-winged Teal were plentiful there many years ago. He saw one man kill an entire flock of eight birds at one shot, and fifty years ago Mr. D. N. Edwards killed thirty-five at one shot. Mr. Henry B. Bigelow states that they were common at Cohasset when he was a boy, but are now rare.

My correspondents, on whose reports this volume is based, are nearly unanimous in noting this bird as rare or decreasing in every county in Massachusetts. The reports on this species are voluminous and convincing, eight showing an increase and one hundred a decrease. This exhibits the growing scarcity of a bird that was abundant no longer ago than the middle of the last century.

Occasionally there are still some considerable flights. There was one in September, 1907, that was reported from Essex County to the Cape. Flights were noted also each year from 1904 to 1910. These flights were mostly early in September, and in most cases the birds are reported to have passed on without stopping. Possibly they are learning wisdom by experience. During my early boyhood large flocks were common in the ponds of Massachusetts in September, and they were so tame that when once they had alighted in a pond it was difficult to drive them out. An experienced gunner would get all or nearly all in such a case. Mr. William B. Long writes that flocks of twenty or so have been exterminated at Ipswich.

As this Teal is one of the best of Ducks on the table the reason for the reduction of its numbers is but too plainly evident. Although many formerly came south in the fall, few returned in the spring; but the species is so prolific that if protected in spring throughout the United States it might hold its own for a long time to come. Mr. E. T. Carbonnell of Prince Edward Island says that both Blue-winged and Green-winged Teal were very plentiful in 1898, owing to protection during a close season and the stoppage of spring shooting. Teal respond quickly to protection.

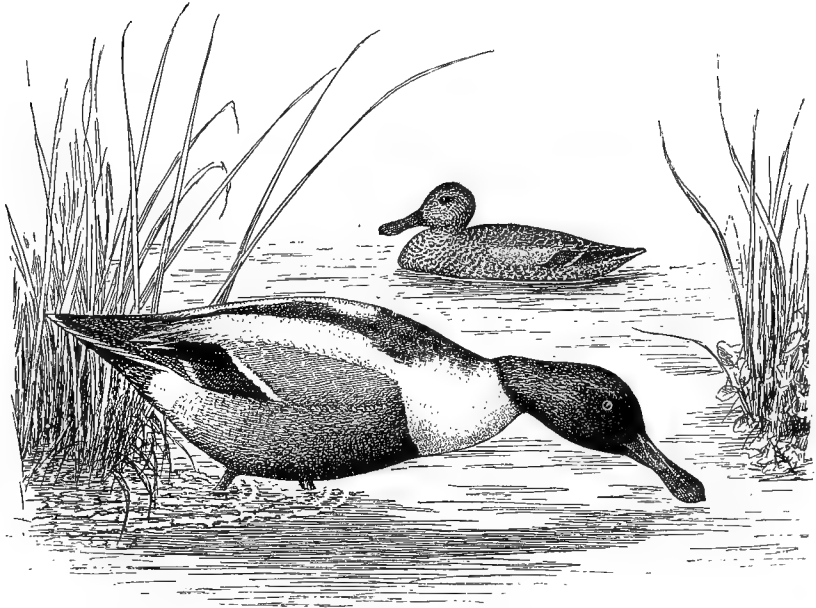
Blue-winged Teal are still numerous in the west, where most of them now breed, and the species is not, like the Wood Duck, in any immediate danger of extinction; but most of those which once bred in the northeast, or migrated through this region, have been exterminated, and we are now probably dependent mainly on the overflow from the great northwest for such flights of Teal as come to us in good breeding years. The Blue-winged Teal is such a comparatively tame and unsuspecting bird that it now needs special protection in the east. Elliot says that it begins to leave its southern feeding grounds in February, and that, like all Ducks at this season, it is poor in flesh and should never be shot. This Duck flies with terrific speed. In the fall the flocks frequent the wild rice marshes along the borders of rivers. When coming in to alight they seem very suspicious. They sweep up and down the river, not far above the water, as if reconnoitering, sometimes quacking as if in alarm, turning swiftly in concert, rolling from side to side, first showing the blue of their wings and then their backs. The flocks are seldom seen on the large, deep lakes, but frequent small ponds, marshes and shallow, sluggish streams. They like to alight in small ponds or sloughs among the wild rice, where they feed greedily on the seed that hangs down or that which has fallen off in the mud. Now they become very fat and are excellent eating, in great contrast to their condition in the spring. This Teal rests lightly upon the water, and the male in spring plumage is one of the handsomest of the Duck tribe.

Its food in the ponds includes much vegetable matter, seeds, grasses, pondweeds, etc. It also at times destroys snails, tadpoles and many insects.

NOTE. — The Cinnamon Teal (*Querquedula cyanoptera*) might be included in a list of the birds of Massachusetts and adjacent States as a single specimen was taken on the shore of Seneca Lake, Yates County, N. Y., about the middle of April, 1886, and is now in the collection of James Flahive, Penn Yan, N. Y. (Eaton); but as this is a neotropical bird, which occurs in the southwestern United States and west of the Rocky Mountains, is merely accidental in the east and is not recorded from Massachusetts, it is omitted from the present list.

SHOVELLER (*Spatula clypeata*).

Common or local names: Spoonbill; Spoonbill Teal.



MALE.

FEMALE.

Length. — 17 to 21 inches.

Adult Male. — Back dark brown, the feathers paler on the edges; wing coverts light sky blue; a green patch on the dark wing preceded by a white bar and bordered above by black; rump and upper tail coverts black; tail white; head and upper neck dark glossy green; shoulders, lower neck, breast, a patch on each side of tail, and vent white; belly and flanks rich chestnut; under tail coverts black; bill long, widened at the end and dark leaden blue; iris orange or yellow; legs and feet vermilion or orange red.

Female. — Dark and duller; plumage varied with brownish yellow and dusky; bill dull greenish above, orange below; iris yellow; legs and feet orange; head and neck mottled with two shades of brown and speckled with dusky; under parts pale brown or buff; traces of chestnut on belly; wing markings similar to those of male, but imperfect.

Young. — Similar, but fore wing more gray than blue. Immature males vary greatly.

Field Marks. — Smaller than Black Duck, male with white breast and rich chestnut belly. Female and young much like Blue-winged Teal, but recognizable by the long clumsy bill much broadened at tip.

Notes. — Generally a silent bird, but its note in breeding season is said to be *took, took*. A few feeble quacks (Elliot). May be compared to the sound of a rattle turned by short jerks (Eaton).

Nest. — On ground.

Eggs. — Seven to nine, sometimes more, 2.10 by 1.50; smooth, dull, pale greenish gray or buffy olive.

Season. — Formerly probably a summer resident; later a spring and fall migrant; now almost accidental in fall, from the middle of September to November.

Range. — Northern hemisphere. In North America breeds from northwestern Alaska, northwestern Mackenzie and southern Keewatin south to southern California, central New Mexico, northern Texas, northern Missouri and northern Indiana; winters from southern British Columbia, Arizona, New Mexico, southern Missouri, southern Illinois, Maryland and Delaware south to the West Indies, Colombia and Hawaii; in migration, occasional in Bermuda, and north to Nova Scotia and Newfoundland.

HISTORY.

The Shoveller, though a cosmopolitan species, is rare in New England, but, like most of the Ducks, is more common in the west and south. It is fairly common in western New York, and was probably much more numerous in New England in the early days of settlement than it now is, as it is mentioned by several of the old chroniclers. In Archer's account of Gosnold's voyage the "Shovler" is noted as among the water-fowl breeding on an island called Martha's Vineyard (No Man's Land), off the Massachusetts coast, on May 22, 1602. It was well known to the English settlers and voyagers. Its long broad bill is unmistakable, and as it still breeds in this latitude this record seems worthy of credence.

Dr. J. A. Allen (1879) says that it is rare in spring and autumn. Formerly, judging from its present breeding in interior, a frequent summer resident. But the only recent record we have of its breeding near Massachusetts is in the Montezuma marshes in New York (Eaton).

It is not a large Duck nor a swift flyer, and is rather an easy prey to the skilful gunner. I once shot one, however, which went past me, before a strong north wind, at such a rate of speed that, though it was stricken dead in mid air about thirty yards from my position, it struck the ground ninety paces away. It comes readily to decoys and offers a

fair mark. Audubon considered it one of the best of all Ducks on the table, and so it is when feeding on vegetable matter along fresh-water streams. Its flight is often peculiar and characteristic, — a kind of irresolute hovering motion, as if it were undecided regarding its destination.

The Shoveller is now a rare breeder in the northeast, and is scarcely common as far east as Hudson Bay. Its principal summer home in North America now is from the northern United States north to the Saskatchewan. As it is a cosmopolitan bird its scarcity now in the northeast may be accounted for in part by that overshooting which always follows settlement and civilization. Its abundance in the west, and the fact that it is still common on the Atlantic coast in winter from Chesapeake Bay southward, are also due in part to the fact that overshooting in the west began more than two hundred years later than on the Atlantic coast. Western-bred birds of this species reach the coast mainly south of the Chesapeake.

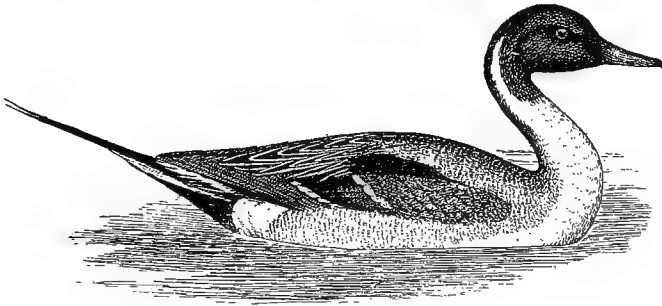
This Duck breeds mainly in habitable regions, and as it is the equal of the famed Canvas-back on the table, it will become extinct in North America unless rigidly protected.

Audubon states that repeated inspections of stomachs of this species disclosed leeches, small fish, earthworms and snails. It feeds also on aquatic plants, grasses, grass seeds and bulbs, which it procures along the shores of small ponds which it frequents. It often feeds by wading and dabbling in the mud, straining mud and water through its peculiarly constructed bill.

Dr. Hatch states that it feeds on aquatic insects, larvæ, tadpoles, worms, etc., which it finds in shallow, muddy waters; also crustaceans, small mollusks and snails.

PINTAIL (*Dafila acuta*).

Common or local names: Gray Duck; Sprigtail; Picket-tail; Pheasant Duck.



MALE.

Length. — Variable; 20 to 30 inches.

Adult Male. — Head, throat and upper part of fore neck rich dark brown; hind neck black, passing into gray of back and separated from fore neck by a white stripe, which extends upward from the white lower fore neck and under parts; speculum or wing patch bronze, with greenish reflections, deepening into black behind; speculum bordered by a bar of cinnamon before it and a white bar behind; long black feathers, edged with light silvery gray, extending from shoulder down the wing; narrow wavy dark cross lines extend over most of the gray of flanks and back; tail pointed; middle tail-feathers, five to nine inches long, and black; feathers under tail black; bill and feet slate; iris brown.

Adult Female. — Top and sides of head, and back and sides of neck light brownish, speckled and streaked with dusky; back brown, the feathers with dark centers and light edges; wing having the two bars but only a trace of the bright speculum seen in the male; under parts whitish, spotted with dusky, darkest on neck; bill and feet slate; tail pointed but not elongated.

Young Male. — Similar to female, but with speculum as in adult male.

Field Marks. — Long middle tail-feathers, pure white front neck and under parts, and the dark head distinguish the male in spring, but he is rarely seen in Massachusetts at that season. The long slender neck, small head and bill, and pointed tail distinguish the species.

Notes. — Rather a silent bird by day, but utters a low-toned hoarse quack at night. A loud quack, a low mellow whistle and a harsh rolling note (Nelson). Have heard a Pintail Drake utter a note when on the wing that resembled a quack, but was not as loud as that of the Mallard Drake, resembling the syllables *qua, qua* (Benjamin F. Howell). A low chattering note as the flock moves along the water (Hatch). The whistle noted above is usually attributed to the Drake and the quack to the Duck.

Season. — Very rare in spring; late February to April. Uncommon or rare in fall; early September to December. Very rarely winters.

Range. — Northern hemisphere. In North America breeds on the Arctic coast from Alaska to Keewatin and south to southern California, southern Colorado, northern Nebraska, northern Iowa and northern Illinois; winters from southern British Columbia, Nevada, Arizona, southern Missouri, southern Wisconsin, southern Ohio, Pennsylvania (rarely) and Delaware south to Porto Rico and Panama, and in Hawaii; in migration occasional on the Atlantic coast to northern Ungava, Greenland and Newfoundland, and in Bermuda.

HISTORY.

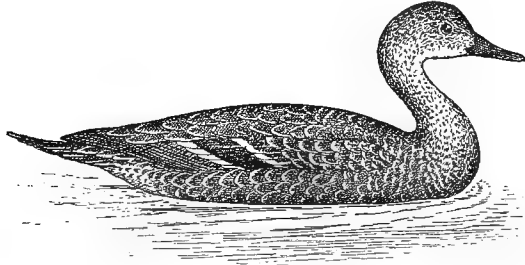
The Pintail is a large Duck of slim and graceful form. The striking colors of the male make his identification easy, but the female resembles somewhat the same sex of the Baldpate or the Gadwall. The females and young of the Gadwall, Baldpate and Pintail are all commonly called Gray Ducks.

The Pintail is no longer common in Massachusetts, where it is known mainly as a fall migrant. It usually appears in small parties, in pairs or singly, during late September or October.

The following notes indicate its former status and its decrease: More common in interior than along the coast (De Kay, 1844). Pretty common on our shores (Samuels, 1870). Rare winter resident on coast (Maynard, 1870). Uncommon transient, especially in spring; have seen this bird only once in Essex County (Townsend, 1905). Observers, representing all Massachusetts counties except Berkshire and Hampshire, report as follows: increasing, six; decreasing, thirty. Most of the reports come from the coast counties, and five of the six recording increase come from those counties; but the great majority of reports indicate that a considerable decrease in the species in Massachusetts has occurred within the thirty years prior to 1909, and that it is becoming rare except in localities on or near the coast and on the Connecticut River.

Mr. Alfred S. Swan states that at North Eastham the bird is practically gone, "gunned to death." He is told that forty years ago it was abundant. Rev. E. E. Phillips has but

one record in ten years, — a bird killed at Eastham in 1900. Mr. Vinal B. Edwards of Wood's Hole says that one was killed in 1875 and none have been seen since. Mr. Robert O. Morris of Springfield says that in the autumn of 1892 the Pintail was the most numerous Duck on the Connecticut River near Springfield. Mr. Israel R. Sheldon of Pawtuxet,



FEMALE.

R. I., states that it has been seen in small flocks near Narragansett Bay, and he thinks that it is increasing. Mr. Charles W. Hallett records flights of Pintails at Barnstable in 1907 and 1908. Mr. Benjamin F. Howell of Troy Hills, N. J., writes that Pintails began breeding on the meadows in his vicinity in the year 1908 after spring shooting was stopped there.

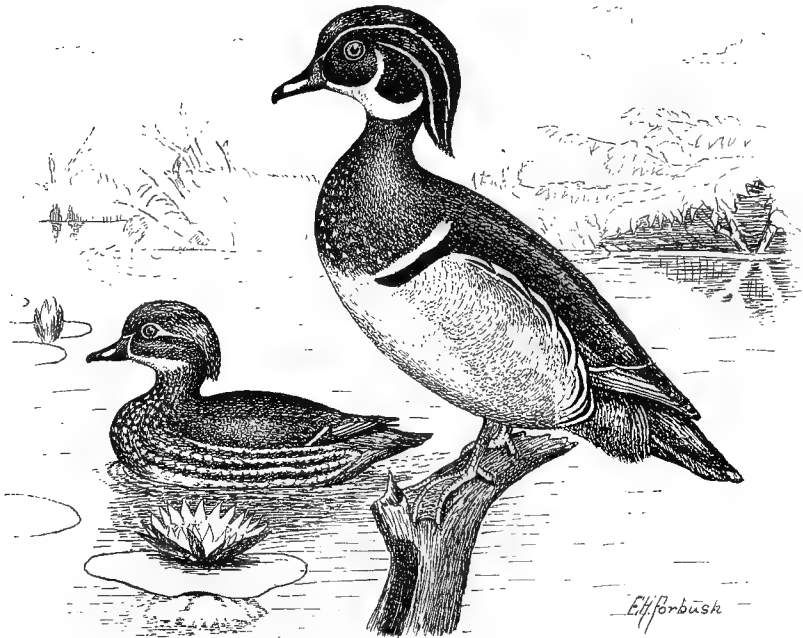
This bird feeds mainly near the surface, as it is not an expert diver. It flies very swiftly, and is capable of many tricks to upset the calculations of the hunter. In case of an alarm among a flock when settling to the decoys, the individuals spring high in air so suddenly that the hunter often misses his chance or shoots below them. Elliot tells of a performance given by the males in spring that resembles the drumming of the Snipe.

As the lakes and rivers of the interior freeze, the Pintail moves on southward. Its principal breeding grounds lie between North Dakota, Alaska and the west coast of Hudson Bay, but it is found in Greenland. It winters mainly in the southern States, and some go to the West Indies. It appears to go north mainly by the inland route.

Audubon says that the Pintail is an expert flycatcher and that it eats tadpoles, leeches, mice and insects.

WOOD DUCK (*Aix sponsa*).

Common or local name: Summer Duck.



FEMALE.

MALE.

Length. — 18 to 20 inches.

Adult Male. — Head profusely crested, metallic green and blue, ending in a long crest of purple and marked with two lines of narrow white feathers; sides of head deepening to purplish black below eye; throat white, the white running a spur up side of head and another across upper neck; upper body rich greenish brown, bronze green and purple; wings show velvety black, purple and white; tail long and dark; upper breast rich reddish chestnut, with small white markings, a white band edged with black before bend of wing; flanks light buffy brown, finely lined, and bordered above and behind by black and white; rest of under parts white, except under tail coverts, which are dusky; bill pinkish white, red and black; iris and eyelids red; feet orange with black claws.

Adult Female. — Less crest; head grayish; chin, throat, line about base of bill, ring around eye and patch behind it white; rest of upper parts brownish, dark or grayish brown; wings somewhat as in the male; neck, upper breast and flanks streaked and mottled with gray or brown and

buff; belly white, with here and there a dusky spot; bill dusky, with a large white spot on each side; legs and feet yellowish brown.

Young. — Similar to female.

Field Marks. — No other common summer Duck in Massachusetts has white under parts. The male is unmistakable; the female shows a rather conspicuous white eye ring, the white extending in a streak behind eye.

Notes. — A frightened plaintive whistle, *oo-eek, oo-eek* (Chapman). A note of the Drake is *peet, peet*, uttered at intervals; the Duck when startled, *cr-r-e-ek, cr-r-e-ek, cr-r-e-ek* (Eaton).

Nest. — In a hollow tree or nesting box.

Eggs. — Eight to fifteen; pale buff, cream or ivory white, about 2 by 1.50.

Season. — Early April to the middle of November; seen rarely in December.

Range. — Temperate North America. Breeding nearly throughout its range which extends from southern Labrador and British Columbia to Florida and Cuba; winters from British Columbia, southern Illinois and southern New Jersey to southern California and Cuba; accidental in Bermuda, Mexico, Jamaica and Europe.

HISTORY.

This species is the loveliest of all wild-fowl. Even the Mandarin Duck of China is not so strikingly beautiful. The female is a fitting bride for her lord. Her plumage is not so bright, but the colors and patterns are neat and modest, and her form and carriage are remarkably attractive. Nature presents no more delightful sight than a flock of these beautiful birds at play on the surface of a pellucid woodland stream, their elegant forms floating as lightly as a drifting leaf and mirrored in the element that they love. The display of their wonderful plumage among the flashing lights and deep shadows of such a secluded nook forms a picture, framed by the umbrageous foliage of the forest, that, once seen by the lover of nature, is indelibly imprinted on his memory as one of the episodes of a lifetime. I have taken more pleasure in watching a flock of these exquisite birds in such surroundings than I can imagine any one could take in shooting into the flock. But there are men who will watch a family of Wood Ducks through the summer, until the young are grown, and then hunt and exterminate them; or who will shoot them ruthlessly in spring, even after the nests are made and the eggs are laid.

Many years ago the Wood Duck was the most abundant of all wild-fowl in many well-wooded regions of the United States. Hundreds flocked along the wooded streams and about the woodland ponds. Even within the past fifty years this splendid Duck has been very numerous in the forested regions of some of the States east of the Mississippi. There are men now living who remember when it afforded the best Duck shooting to be had in the interior of Maine, and when Wood Ducks flying to and from their nests were familiar sights, comparable to robins and blackbirds. Mr. Edward F. Staples of Taunton, who has hunted in the vicinity of Lakeville, Mass., for nearly fifty years, states that the Wood Duck was plentiful up to about 1878, and that the sport was glorious. He has known one man to shoot sixty in a morning, but he now sees only one small flock in a summer. Mr. Charles E. Ingalls of East Templeton, Mass., says that thirty years ago the Wood Duck was very common everywhere in that region. He has seen three hundred to five hundred come into the swamp at the head of the reservoir in East Templeton in an evening many times, night after night, during the fall, but they are now among the rarest of game birds. They were shot at any time, spring or fall, whenever they exposed themselves. William Dutcher, in an investigation of the status of this bird in the United States in 1907, obtained similar reports throughout the country, and Dr. A. K. Fisher has called special attention to its threatened extinction in a bulletin of the Biological Survey. Within my own recollection it bred commonly over a considerable part of Massachusetts, but at the beginning of this century the species was evidently in danger of extinction.

The following notes exhibit something of its former abundance and recent decrease: Rather abundant at Boston; have seen hundreds in a flock (Audubon, 1835). Sometimes taken in nets; a Mr. Burns, thirty miles west of Albany, sends a large number to the New York market annually, taken in this way (Giraud, 1844). Rare on the sea-coast, but absolutely swarms during the month of September among the lily-pads of the western swamps (B. Roosevelt, 1866). Plentiful (Turnbull, eastern Pennsylvania and New Jersey, 1869).

Abundantly distributed through New England in the breeding season (Samuels, 1870). Common summer resident (J. A. Allen, Massachusetts, 1879). Less abundant, and has held its own because of ability to hide in the smallest bits of cover (Abbott, New Jersey, 1895). Thirty years ago Wood Ducks were killed by wagon-loads every spring (Dawson, Ohio, 1903). Now very rare (Hoffman, 1904). Uncommon summer resident; common transient visitor; formerly more common; decreasing (Townsend, Essex County, Mass., 1905). Formerly very common visitor and not uncommon summer resident; now seen only in migration and in no great numbers (Brewster, Cambridge region, 1906). Formerly common, breeding in every county; at present only a rare local breeding bird (Knight, Maine, 1908). Formerly common, but becoming rapidly reduced in numbers (Stone, New Jersey, 1908).

My correspondents at the close of 1908, when protection had begun to increase its numbers, report as follows on this bird in Massachusetts: Increasing, thirteen; decreasing, one hundred and four. This is convincing testimony of the decrease of this species in the past thirty years. All other reports from Nova Scotia to Texas agree that the species has diminished from twenty to one hundred per cent.

The fate of the Wood Duck is determined by its breeding and migration range. This lies mostly within the United States, where, for centuries, spring shooting has been allowed. Had it been able to breed in the far north, where few white men ever go, it would have been better able to maintain itself, or had it bred mainly in southern Canada even, where spring shooting is prohibited and where the law is respected, and had it been able to pass over the United States in its migrations without stopping, it might have avoided destruction; but it lives mainly within the United States. It frequents small streams and ponds only a gunshot in width or less, in wooded regions where it is easily ambushed by the hunter, and our people have ruthlessly destroyed this, one of the most beautiful objects of creation, and will yet eradicate it unless laws are enacted and enforced in all the States, protecting it at all times. This bird is better appreciated

abroad than here. In Belgium large numbers are reared in captivity, and they are in great demand as ornamental waterfowl. It may be that the bird can be saved from extinction only by rearing it upon preserves and large estates, and retaining enough in confinement each winter to perpetuate the species. It is now (1911) protected by law at all times in New York, Connecticut, Massachusetts, New Hampshire, Vermont and Maine.

Since the law protecting it went into effect in Massachusetts, New Hampshire and Connecticut, the Wood Duck, which had become rare, has increased in numbers considerably in the two latter States and somewhat in Massachusetts, particularly during the past year (1910), when spring shooting was prohibited. One hundred and five Massachusetts correspondents in 1908 report it as breeding in the State. These reports come from every county except Nantucket, although no Ducks breed in Suffolk County, the center of population. Formerly the spring duck shooters often killed breeding Wood Ducks, either by mistake or intention, but in 1910, as a result of spring protection, the species nested in many localities where it had not been seen before for years. Some States do not protect this bird at all; many others allow shooting for a part of the spring. Wood Ducks begin mating in the south in December, January or February, and are mostly mated when they arrive in the north. If all the eastern States would enact laws forbidding spring shooting, and protecting the Wood Duck at all times, a few years would suffice to repopulate the country with this beautiful bird.

In flight the Wood Duck is swift and direct when in the open, but it can penetrate among the many branches of the woods as swiftly and surely as a Ruffed Grouse or a Passenger Pigeon, twisting and turning rapidly in avoiding the many obstacles in its way. It nests usually near the water; but if no hollow tree or stump is to be found near its chosen feeding grounds, it will find one farther away, in an old orchard, a hollow elm overhanging a farm-house or some old tree by the roadside. I have been informed that the eggs of the Wood Duck are sometimes laid on the ground

where no better site can be found, but have never seen one so situated. The height of the nesting site above the ground or water varies from three feet, or even less, to forty or more. The bird is able to so compress her body that she can squeeze into a very small hole, but when the entrance is of a size to accommodate her easily, she appears to fly directly into it, striking the plumage of her breast against the lower edge of the entrance to break the force and speed of her descent.

When the young are hatched they are soon pushed out or fall out, and if the nest is favorably situated they drop upon the water. If the nest is some distance from the water the process of getting the young to it varies with individual birds. I have questioned people who claim to have seen the operation, and am convinced that the mother usually takes the young in her bill and flies with them to the water. Thirteen Massachusetts correspondents state that she carries them. In one instance a bird, presumably a Wood Duck, was seen to push her young out of a nest. They dropped about forty feet to the grass, apparently unharmed, and she then led them to the river. In another case a Maine guide reports that he saw a Wood Duck fly down and alight in the water, and that several young, which seemed to be clinging to her back, all fell off into the water as she alighted on the surface. Mr. Lyman Pearson of Newbury, Mass., says that he saw a Wood Duck once carry her young to the water. He thought that she carried them on her feathers. The destruction of the large and heavy timber does away with many a hollow limb, and the wood-cutter has been one factor in the decrease of the Wood Duck. Mr. J. J. Coburn of Worcester told me years ago that he once found a female of this species dead in a stovepipe leading from a stove in his boat-building establishment at Lake Quinsigamond. The bird had entered the pipe easily when looking for a nesting site, but could not get out, and I have heard of other similar cases. Dr. John C. Phillips of Wenham, Mass., says that a female Wood Duck came down a chimney of his camp at Wenham and was found dead inside, and he has heard of another instance of the same sort. A few nesting boxes put up in the trees about a pond

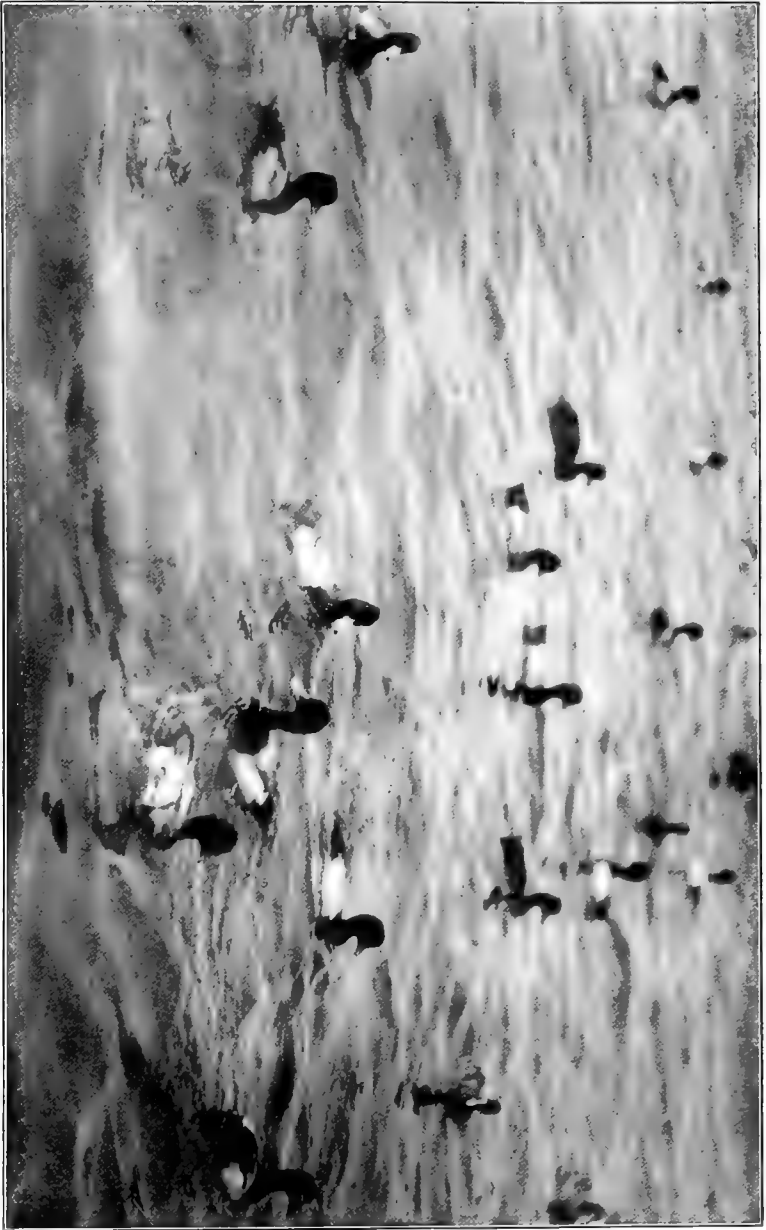


PLATE IV. — GROUP OF BAY DUCKS, COMMONLY KNOWN AS BLUEBILLS OR BROAD-BILLS.

Photograph by Herbert K. Job at Palm Beach, Fla.

may induce Wood Ducks to nest there. This device is often successful, and I have seen a Wood Duck family that was reared in a nest of this kind. Where they are unmolested they become tame. A family once frequented a small pond within a hundred yards of my house, and a pair bred in a city park several seasons.

The Wood Duck is a surface feeder. Most of its food is obtained in shallow water or on shore. It takes both vegetable and animal food, insects, chestnuts, acorns, etc.

BAY AND SEA DUCKS (Subfamily Fuligininæ).

The Ducks of this subfamily may be distinguished from the Mergansers by the broad bill, and from the River Ducks by the lobe or flap on the hind toe (Fig. 6), and the habit of diving for their food. This habit will not distinguish them from the Mergansers nor from the Grebes, Loons or other diving birds. To identify Ducks in the field a strong field glass or a small telescope is necessary, particularly with the Bay and Sea Ducks, which frequent large open

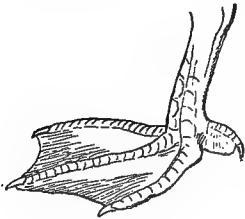
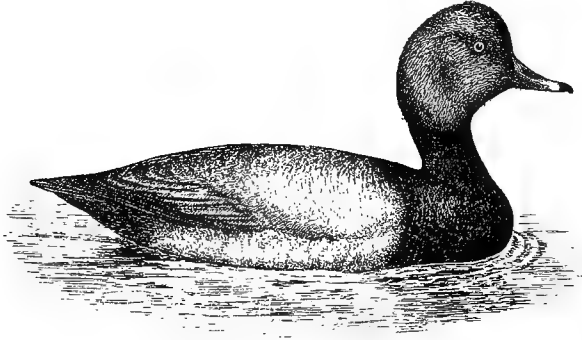


FIG. 6. — Foot of Sea Duck.

waters, and often cannot be approached under cover. Most of the species breed on fresh water in the interior, but a few, particularly the Eider, nest mainly on the coasts and islands of the sea. After the breeding season they all make toward the sea or the larger bodies of fresh water, where, with few exceptions, they feed largely on shell-fish and crustaceans, which give them a rank and fishy flavor. Many of these Ducks are rather heavy and unwieldy in rising from the water, but all fly swiftly and well. There is a wide variation in appearance not only in the different species but often between different members of the same species. Descriptions of a species by different authors rarely agree, unless copied one from the other. This is in part due to individual variation among the Ducks and in part to individual variation among authors. In the Scoters, commonly called Coots, for example, the young in passing to maturity (a process which occupies two or more years) not

only change the shades of the plumage more than once, but often change the color and shape of the bill, the color of the feet and that of the eye. The immature male may be anywhere in shape and color between the young of the first year and the mature male. One specimen of a species may be grayish brown and another brownish gray; or a bird may be grayish brown before death and change to brownish gray after death. The salmon-colored breast of a Merganser may, after death, change to plain buff, and then fade several shades after the specimen is mounted.

In some of the Ducks of this group the male puts on an "eclipse" plumage in summer, similar to that of the female; in others this change has not been noted. The bright metallic speculum is rare among these Ducks, but a white or gray wing patch sometimes takes its place. There is so much variation in the forms and plumages of individuals of the same species, and so many changes take place soon after death in the colors of the naked parts and in the tints of the feathers, that no description can be fully adequate that does not include all the many changes in plumage and colors of parts, taken from life, in the various individuals of different ages and sexes. Careful notes taken from a large series of specimens freshly killed might enable one to give fairly accurate descriptions, but when dependence is placed on dried skins, as it often is, many errors must occur. All that is attempted here is to try to give in each case such an incomplete description of the adult male and female as will serve, when used in connection with the cuts, to identify the adults of each species, and also to indicate in a general way how the young of the first year differ from or resemble the parents.

REDHEAD (*Marila americana*).

MALE.

Length. — 19 to 23 inches.

Adult Male. — Head and upper neck reddish chestnut or brick red, glossed sometimes with reddish purple or coppery reflections; rest of neck, breast and upper back black to bend of wing; rest of back, other upper parts and flanks mainly light gray, with very narrow wavy cross pencillings of black; speculum or wing patch gray; rump and tail dark or blackish; belly white; feathers under tail blackish; iris orange; bill pale blue, black-tipped; feet grayish blue, webs dusky.

Adult Female. — Head and upper neck dull or pale reddish brown or grayish brown, darkest on top of head, paler on cheeks and behind eye, sometimes whitish about base of bill, meeting white on chin; back brownish gray; neck, breast and sides brown; middle of belly white, lower belly brown; bill obscure pale blue with black tip; legs and feet grayish blue; iris yellow.

Young Male. — Somewhere between adult male and female.

Young Female. — Similar to adult female.

Field Marks. — The male can be mistaken for no other bird, except the female Golden-eye or Whistler and the Canvas-back, both of which have reddish heads; its body is darker than that of male Canvas-back and it has a higher forehead; the female Whistler has a snuffy brown head and a patch of white on wing. The female Redhead may be distinguished from female Canvas-back by the shape of head and bill, which resemble those of the male Redhead; she resembles a female Scaup, but has less white on her face about the bill; she still more closely resembles the female Ringneck, which also has a black tip on bill, but is considerably smaller.

Notes. — A hoarse, guttural rolling sound (Elliot). A hollow, rapid croaking (Chapman).

Season. — From the middle of September to about the first week in April; comparatively few winter.

Range. — North America. Breeds from southern British Columbia and the Hudson Bay country to southern California and southern Wisconsin; winters from southern British Columbia, Maryland, Delaware and Massachusetts south to southern Lower California and Florida. In migration casual in Alaska and regular on the Atlantic coast north to southern Labrador.

HISTORY.

The Redhead somewhat resembles the Canvas-back, though smaller, and when it has been feeding on wild celery it is often sold under the name of Canvas-back. Elliot in his *Wild Fowl of North America* (1898) states that the Redhead was once very abundant in many parts of the continent, but that constant persecution and indiscriminate slaughter have greatly reduced its numbers throughout the land, and that in many places where it was formerly abundant in winter it no longer appears. All but three of my correspondents (outside of Massachusetts) on the Atlantic and Gulf coasts state that the Redhead is decreasing. The percentage of decrease given varies from fifty to one hundred. The following notes from authors seem to indicate a decrease of the species in New England: Pretty abundant on our shores; several individuals, both sexes, seen on Lake Umbagog in June; not impossible it breeds in northern New England; seen in various localities until first week in June (Samuels, 1870). Uncommon or rare in New England and adjacent coast States (Chamberlain, 1891). Rare transient visitor (Townsend, Essex County, 1905). Rather rare transient visitor in autumn (Brewster, Cambridge region, 1906). The Redhead seems never to have been very abundant generally in Massachusetts. Audubon never saw it farther eastward, and it is now found in considerable numbers in this State mainly on the ponds of Martha's Vineyard, where the wild celery and the redhead grass grow, or in a few of the landlocked bays and the ponds of Cape Cod and Nantucket. Observers report to me its presence in all the counties of Massachusetts except Berkshire and Hampshire, but it is generally regarded as rare and decreasing everywhere, except

as above. Mr. Robert O. Morris has seen it formerly on the Connecticut River in large flocks, but that was unusual. The reports of increase in this species come as follows by counties: Barnstable, five; Dukes, five; Bristol, one; Plymouth, one; but only in Dukes County are they unanimous as to increase. Fifteen Massachusetts observers all told report an increase; thirty-four, a decrease.

Mr. John M. Winslow says that Redheads remain about the same in Nantucket, —not over a thousand on the island. Mr. Lewis W. Hill of Jamaica Plain says that Redheads and Bluebills are very plentiful at Edgartown, and that Bluebills have increased slightly in the "last five years." He believes that there are from five thousand to eight thousand Ducks every year in Edgartown Great Pond. A party of four men got one hundred and ten Redheads and Bluebills in five hours, and many bags of twenty to fifty were made in the fall of 1908. In that year, he says, there were many more Bluebills than Redheads; in the last three or four years the reverse has been true. Mr. Henry V. Greenough of Brookline says that about twenty-five hundred Redheads and Bluebills come into the Edgartown and Tisbury great ponds in the fall from October 1 to 15; rarely more come and seldom many less. At daybreak every day they leave Edgartown Great Pond and fly to Tisbury Pond, where the "feed" is more to their liking, spend the day there and return toward night to Edgartown. Some stop over at Fresh Pond and Oyster Pond. The number has not decreased and about the same number of birds are killed each year. Mr. Charles H. Brown of Vineyard Haven stated before the legislative committee on Fisheries and Game, in 1910, that the ponds on the south side of Martha's Vineyard were broken open by the sea in 1815 and flooded with salt water, so that they remained salt for years. This changed the character of the vegetable growth in those ponds. Some of them remained salt longer than others which earlier became fresh or brackish. From 1872 to about 1878 Edgartown Great Pond was salt as a result of artificial opening. Redhead grass (probably *Naias flexilis* and *Potamogeton perfoliatus*) grows in Great Pond. Various

pond grasses also grow in the ponds. More than twenty years ago Mr. Herman Strater introduced the so-called wild celery (*Vallisneria spiralis*). About six or eight years ago it became plentiful there. Since that time the number of Ducks on the island has increased slowly, and the increase of Redheads has been particularly noticeable. Mr. Brown says that two thousand Redheads remained in Antires Pond during the coldest weather of January and February, 1910, and that he has seen more than ten thousand Ducks in Edgartown Great Pond at one time, and perhaps two thousand in the other ponds in the same period.

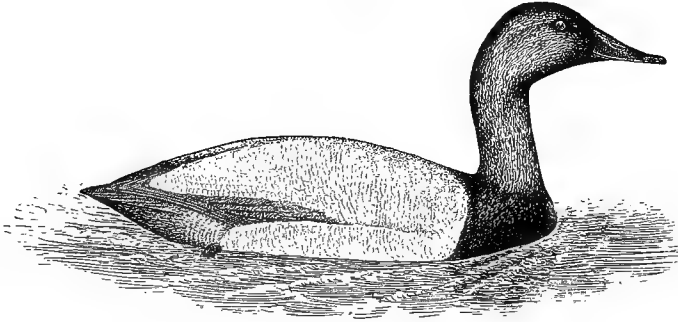
Mr. A. C. Bent of Taunton believes that the Redheads have increased fifty per cent. in the region with which he is familiar. Dr. L. C. Sanford states that thirty or forty thousand spent the fall of 1908 near Watch Hill, R. I. Mr. Israel R. Sheldon writes that they were formerly plentiful at Point Judith, but are now "scattering" there. The birds appear every year on their feeding grounds in October and remain for the rest of the fall, if not all winter. In migration the flocks fly high in air, with whistling wings, usually in a wide, V-shaped formation. Each flock, as it first comes in, passes and repasses over a favorite resting place, until, satisfied that peace and safety are assured, the birds settle on the water. Sometimes, when a large flock is already assembled, members of the incoming migrating flock will fall with roaring wings, zigzagging down from the sky like thunderbolts thrown by a giant hand, crossing one another and merging in indescribable confusion, until, having nearly reached the water, they set their pinions and sail down to join their kindred. While they are on their winter feeding grounds they keep in good training by flying about early in the morning and late in the afternoon. On such occasions they generally fly high and in irregular lines.

The greater number of all the Ducks of this species appear to breed in western Manitoba, Alberta and Saskatchewan. Comparatively few now nest in the northern United States. A few may nest east of Hudson Bay, as they have been reported from James Bay, Labrador and Maine. It seems

probable that most of the thousands of Redheads which reach southeastern Massachusetts come here from western Canada by way of the Great Lakes, and return by the same route. We know that many individuals come east by this route, and they are so rare northeast of us on the Atlantic coast that this seems the only tenable theory that will account for the number that visit Massachusetts. A sudden freeze, closing up the ponds, is likely to send the birds south.

The Redhead seems to be quite as fond of wild celery as is the Canvas-back, and is quite as capable of procuring the submerged buds and root stocks as is its more celebrated congener, but it is believed to feed less on the buds and more on the leaves. Its resemblance in appearance and flavor to the celery-fed Canvas-back makes it a desirable bird for the market, and it is highly prized by the gunner.

The Redhead, though classed among the Bay and Sea Ducks, feeds mainly in large fresh-water lakes on aquatic plants. It is a good diver, and usually keeps well away from shore, where it dives to the bottom to pull up the wild celery and other vegetation on which it feeds. Sometimes it feeds in the mud and marsh along the shore, where it takes insects and other forms of animal life. Audubon says that he has found stomachs of this species crammed with tadpoles, young water lizards and blades of the grasses growing about the bank, also acorns, beechnuts, snails and shells of small fresh-water clams. It feeds by night as well as by day, is usually not shy and is readily decoyed. If wounded it will dive and hide among the marsh grass, or sometimes even cling to the vegetation on the bottom, like a Scoter, until life is extinct.

CANVAS-BACK (*Marila valisineria*).

MALE.

Length. — About 21 inches.

Adult Male. — Mantle and sides all silvery white, daintily pencilled with fine, wavy lines of dusky; head and nearly all of neck brownish red, darkening on crown and fore face; lower neck all round, a little of upper back, most of breast, rump and tail coverts brownish black; wings and tail gray; below white; legs leaden gray; iris red; bill blackish; feet grayish blue.

Adult Female. — Head, neck and breast dull amber brown or brownish tan, darkest on top of head, grayish on throat; above grayish brown; belly white or yellowish white; iris reddish brown; bill and feet as in male.

Field Marks. — The white mantle of the male, the flattened forehead and the long, peculiarly shaped beak of both sexes, and the brown head, neck and fore body of the female, contrasting with the grayish back and flanks, serve to identify this bird.

Notes. — A harsh, guttural croak (Elliot). The female, a loud quack and a screaming *curr-row* when startled (Eaton).

Season. — Rare in spring; in fall from the last week in October to the middle of December; occasionally winters.

Range. — North America. Breeds from central British Columbia, Fort Yukon, Great Slave Lake and southwestern Keewatin south to Oregon, northern Nevada, Colorado (rarely), Nebraska and southern Minnesota; winters from southern British Columbia, Nevada, Colorado, Illinois, Pennsylvania and western New York south to central Mexico (Jalisco) and the Gulf coast; in winter formerly abundant, now less so, in Maryland, Virginia and North Carolina; occasional south to Florida, and casual in the West Indies, Bermuda and Guatemala; in migration north rarely to New Brunswick and Nova Scotia.

HISTORY.

This Duck is considered to have no superior upon the table. It once fed in countless multitudes along the Atlantic coast, particularly in the Chesapeake Bay region. It has now been greatly reduced in numbers in the south. Even so long ago as 1832 Dr. J. J. Sharples, in the Cabinet of Natural History, states that the number of fowl on Chesapeake Bay was then decidedly less than in years past.

In my early experience the Canvas-back was regarded as little more than a straggler in New England, though occasionally a few were taken. The number has been increasing, however, within recent years, and last year (1910) many were seen in the ponds on Martha's Vineyard, a lesser number in Barnstable, Bristol and Plymouth counties and a few stragglers wintered in or near Boston. Mr. Lewis W. Hill says that his brother saw a "bunch" of twelve at Martha's Vineyard (1908), and "last year" (1907) he himself killed three out of a group of ten. Mr. Louis Agassiz Fuertes of Ithaca, N. Y., says that Canvas-backs are far more numerous there than formerly. About fifteen years ago they began to appear about November 1, and since then larger numbers come each year. In 1908 a "bed" of about five hundred wintered. They are still considered rather rare in eastern New York. Whether this increase is due to better spring protection on their Canadian breeding grounds, or whether more of the species than usual are now breeding to the northward of New England, it is impossible to determine. Possibly the introduction and increase of the wild celery (*Vallisneria*) into several ponds in Massachusetts may have attracted more of these birds than came here formerly. They are rare to the north and east. There are not many records from Essex County, Mass., and they are rated as very rare in Vermont, New Hampshire and Maine. A good supply of favorite food is the main attraction to Ducks as well as all other birds, and only constant persecution will drive them from it. The following observations may furnish another clew to the recent increase of Canvas-backs in New York and

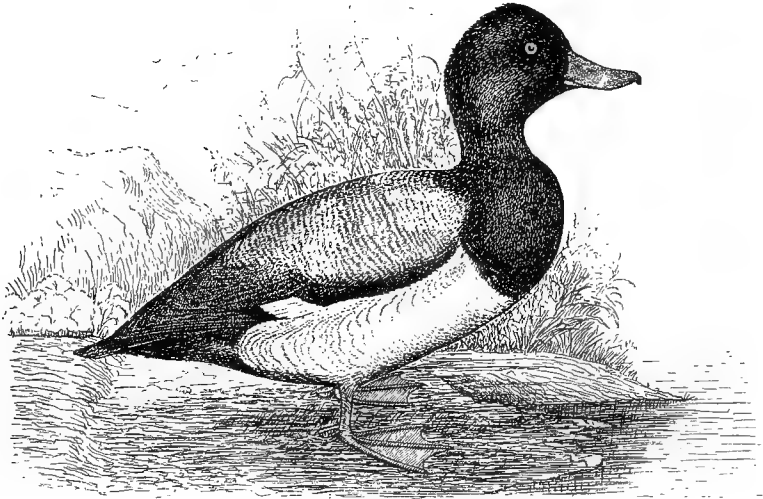
Massachusetts: Dr. L. C. Sanford writes me that about 1890 there was a sudden and nearly total disappearance of Canvas-backs in Chesapeake Bay, and that in the fall of 1891 they appeared in large numbers for the *first* time (so far as the memory of man goes back) at Port Rowan Bay, on the north side of Lake Erie. The gunners state that wild celery was noticed there about that time. In the latter part of November of that year Dr. Sanford passed through scattered flocks of Canvas-backs at Port Rowan Bay that extended for about seven miles, and must have numbered a hundred thousand birds. The Chesapeake Bay Ducks probably stopped on Lake Erie.

The great breeding grounds of the Canvas-back lie in the Canadian northwest. To reach Massachusetts they must travel a little south of east, and as numbers are seen in migration on the Great Lakes, and as the lakes lie in a direct line between their breeding grounds and their fall and winter haunts in this State, it seems probable that our birds come from the northwest. The Canvas-back is a good diver, and is able to reach its food in twenty to twenty-five feet of water. It is said to be more successful than any other bird in pulling up the roots of the wild celery. The wings are the chief propelling power in diving, as is the case with many other water birds. The Canvas-back is of high food value only when it has been feeding on wild celery; otherwise it is often thin, and usually poor and fishy in flavor when taken on the Atlantic coast. As it finds its favorite food in some of the ponds on Martha's Vineyard, this may account for the fact that it is more common there than elsewhere in Massachusetts. From its northwestern breeding grounds it migrates south and southeast, reaching the Atlantic and Gulf coasts. Only the most northerly edge of the great fan-shaped migrating movement reaches New England.

The Canvas-back is not by any means confined to the *Vallisneria* in feeding, but takes the seeds of wild rice, water lilies, pondweeds and other vegetable matter, as well as fish, tadpoles, leeches, mollusks and insects.

SCAUP (*Marila marila*).

Common or local names: Bluebill, Blue-billed Widgeon; Widgeon; Troop-fowl; Broad-bill; Black-head.



MALE.

Length. — 17.50 to 20.75 inches.

Adult Male. — Head, neck, upper back and breast black, the head and upper neck showing greenish reflections; back black, saddled with white, which is crossed with narrow wavy black lines; wing patch white; a white stripe along wing when spread; belly and flanks pure white, with more or less faint fine black cross lines; hinder parts black; bill dull blue or pale blue gray, with black nail; legs and feet lead color; iris yellow.

Adult Female. — Black of male replaced by dusky or snuffy brown; region around base of bill white; wings brown; speculum and stripe in extended wing white; under parts not so pure white; bill and feet somewhat duller than in male.

Young. — Resembles female.

Field Marks. — The conspicuous white mask of the female distinguishes it from all others except the female of the Lesser Scaup and the female Ring-neck. At close range or in a good light the head of the male is greenish rather than purplish, as in the case of the Lesser Scaup, and the full-plumaged male has the flanks much whiter and less lined than the male of the Lesser Scaup. In flight the front third of the body of a male Scaup appears black, and the hinder two-thirds of the body and the secondary wing quills appear white, only the tail showing dark.

Notes. — Call a discordant *scaup, scaup*. Similar to the guttural sounds made by the Canvas-back, Redhead and other diving Ducks (Elliot). Also a soft purring whistle (Eaton).

Season. — Common migrant coastwise; September rarely, common October to April.

Range. — Northern parts of northern hemisphere. Breeds in America from Minnesota, North Dakota and British Columbia to central Keewatin, Great Slave Lake and the Aleutian Islands; has bred casually on Magdalen Islands in Ontario and Michigan; winters from Maine to the Bahama Islands and from the Aleutian Islands, Nevada, Colorado and Lake Ontario to southern California and the Gulf coast; rare migrant in Central Ungava, Labrador, Newfoundland and Nova Scotia.

HISTORY.

This bird was formerly known as the American Scaup, but it is indistinguishable from European specimens. Commonly as this Duck is seen on our coasts in fall, winter and spring its habits and food are not as yet very well known. Its numbers seem to have decreased much in the past. It was formerly taken in numbers in some of the interior ponds and lakes of Massachusetts, where it commonly associated with the Black Ducks, but reports from all the interior counties of the State indicate that it had decreased from fifty to ninety per cent. in the twenty-seven years prior to 1908. Only two observers in the coast counties put the decrease as low as twenty-five per cent. within that period, but many record a recent increase. Sixteen Massachusetts reports on the species note it as increasing; forty-three show a decrease. This was one of the first Ducks to respond to spring protection in Canada and New England, and has been increasing along the New England coast now for several years. Unlike the Lesser Scaup it appears to be fond of salt-water bays, and lives and feeds much in such localities along our coast in winter. Long Island Sound, the great South Bay, the waters about Cape Cod and Massachusetts Bay all attract this species in fall, winter and spring, but it rarely winters in numbers much farther north on the coast of New England. A few years ago it was seen mainly in small flocks, but now flocks of thousands may sometimes be observed along the New England coast. As they have not increased so much

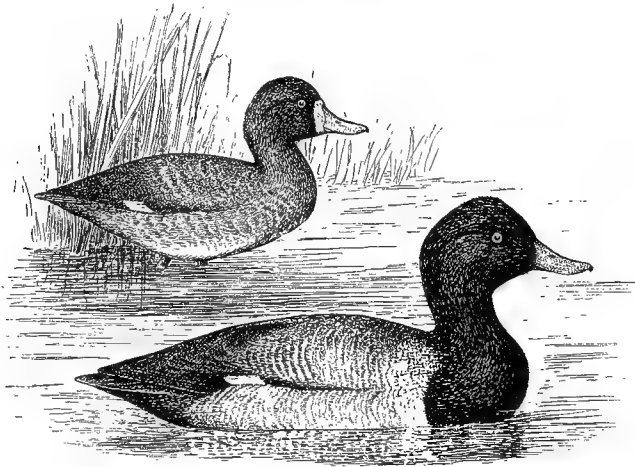
farther south, it is probable that the protection that they now receive here in winter and spring has induced many of them to remain here instead of going south.

The Scaup breeds from the northern United States northward to Alaska and the Aleutian Islands. It is rather rare in Greenland, where it probably breeds, but we have no means of knowing whether the Greenland birds come here in migration. It summers mainly in the northern part of the western province of North America, and it migrates southeast in fall to reach southern New England and the Middle States. Its center of abundance in winter is along the Atlantic coast. It returns by a similar route, though it sometimes pushes farther north along the coast in spring than the region included in its normal winter range. The regular southeastward migration of the species is usually finished in November, and they winter wherever December finds them; but in severe winters they are driven away from the open lakes and marshes by the ice, and at such times they fly to the coast in January, when they sometimes arrive in considerable numbers on Long Island Sound. In January and February the northward movement along the Atlantic coast begins, and as soon as the lakes of the interior are partly freed from ice, in March, the Broad-bills are seen on their way to their summer homes. Mr. Louis Agassiz Fuertes of Ithaca, N. Y., says that the Greater Scaup is a common bird there in winter on open marshes. Mr. John M. Winslow of Nantucket says that there are some fifteen hundred to two thousand Scaup around the island. The numbers do not change much.

On the Maine coast its food seems to consist largely of surface-swimming crustaceans and mussels (Knight). Fish fry, insects and the buds, stems and roots of aquatic plants are eaten by this bird in fresh water. It is fond of the buds and root stocks of the wild celery, and, in company with the Lesser Scaup, the Canvas-back and the Redhead, frequents waters where this plant grows, and, by diving, brings up the buds from the bottom.

LESSER SCAUP (*Marila affinis*).

Common or local names: Little Bluebill; River Broad-bill; Creek Broad-bill; Raft Duck; and other names that are also applied to the Greater Scaup.



FEMALE.

MALE.

Length. — 15 to 17 inches.

Adult. — Similar to Greater Scaup but smaller, head and neck of male showing purplish instead of greenish reflections; full-plumaged males have the fine black wavy lines on the flanks much more numerous and more distinct than those of Greater Scaup.

Field Marks. — The full-plumaged male may be distinguished from Greater Scaup at close range with a glass by the purplish gloss of the head. The female is indistinguishable from that of Greater Scaup except by measurement.

Notes. — Some shrill, others low and guttural; heard mostly at night.

Season. — Rather uncommon, or rare migrant, in New England; most common in fall; early October to May; rare winter resident in Massachusetts.

Range. — North America. Breeds from the Yukon valley, Alaska, and Fort Anderson, Mackenzie, south to central British Columbia, southern Montana, Colorado (casually), northern Iowa, northern Indiana and western Lake Erie; winters from southern British Columbia, Nevada, Colorado, Lake Erie and New Jersey south to the Bahamas, Lesser Antilles and Panama; rare in migration in Newfoundland, New Brunswick and Nova Scotia; accidental in Greenland and Bermuda.

HISTORY.

Little is known about the history of the little Scaup Black-head or Bluebill, for it was formerly confused with the larger species and is not now distinguished from it by many gunners. Therefore all statements regarding its distribution, migrations, increase or decrease in localities that are frequented by both species must be received with some caution. There is little to be learned about its former status in New England from ornithological writers. Brewster (1907) states that it formerly came into Fresh Pond, Cambridge, in small flocks, but recently it seems to have grown rarer there. Mr. Robert O. Morris of Springfield says (1901) that years ago he has seen five hundred of this species on the Connecticut River at one time, but they were driven away by gunners in boats. This species responds to protection readily, however, and is seen now in small numbers in the ponds about Boston where no shooting is allowed, particularly in Jamaica Pond. It frequents small fresh-water ponds, rivers and creeks and brackish waters, while the Greater Scaup appears to prefer large lakes and the salt water. For this reason the decrease of the Lesser Scaup in New England probably has been much more rapid than that of the Greater Scaup, which finds more safety in the larger ponds and salt-water bays that it frequents. Dr. John C. Phillips finds that in three years at Wenham Lake the number of Greater Scaup killed was only about twenty per cent. of the number of Scaup taken. Probably the reverse would be true on salt water.

Fifty-two of those who reported to me in 1908 gave information about this species, and thirty-two expressed an opinion that its numbers had changed. Only four reported an increase; twenty-seven a decrease. Reports all along the Atlantic coast indicate a great decrease in the numbers of this species. I have observed this diminution myself in the south. In January, 1878, on Lake George, Fla., Raft Ducks were scattered over the water as far as the eye could see, and on Indian River they were gathered in great rafts a mile or more in length, but by the year 1900 only a few hundred, or

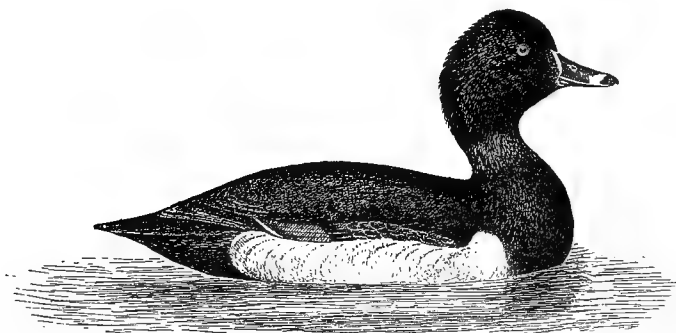
at most a few thousand, could be seen, and Mr. William C. Peterson of Canaveral, Fla., says that they are still decreasing. Within the past five years there has been an increase in many localities, which may be attributed, as in the case of the larger species, to spring protection. While this bird is uncommon on our coast, compared to the Greater Scaup, it is more numerous in central New York, and outnumbers its larger namesake in the more southern States. As it is not known to breed east of western Lake Ontario, its migration from the northwest in fall must have a strong easterly trend. Non-breeding individuals are sometimes seen in New England in summer.

In winter the Scaup often passes the night upon the water. On moonlit nights individuals of a flock will feed and play. On still nights large flocks can sleep on the water, with little danger of being disturbed by their natural enemies, although in the south alligators probably pick up a few birds, and in the north the Great Horned Owl may occasionally get one. If a breeze blows it sometimes drifts the whole flock upon a lee shore, where the lynx or the fox lies in wait for them. One morning in January, 1900, I crept down at daylight to the shore of the Banana River in East Florida, expecting to find a flock of Bluebills drifted inshore by the wind, but before I reached the shore I saw a creeping lynx stealing down the beach on a similar errand, oblivious to all but the Ducks, on which he also wished to breakfast. He has killed no Ducks since that day.

The food of this species differs from that of the preceding much as its preference for smaller bodies of water and fresh water would indicate. It takes the larvæ of insects, worms, crustaceans, snails, etc. Mr. Robert O. Morris (1901) says that it is not uncommon near Springfield in autumn, and that pond snails appear to be its favorite food while there.

RING-NECKED DUCK (*Marila collaris*).

Common or local names: Ring-neck; Ring-necked Scaup; Ring-billed Duck.



MALE.

Length. — About 17.50 inches.

Adult Male. — Upper parts, breast and under tail coverts black, deepest on head, which shows green, violet and purple iridescences at close range; a more or less inconspicuous orange brown collar on neck; triangular white spot on chin; wings slate gray; wing patch bluish gray; below white; flanks and lower belly marked with fine wavy lines of black; bill dark leaden bluish, tipped with black, and with subterminal and basal bands of pale blue; iris yellow; feet dusky blue.

Adult Female. — Lacks the neck ring and the wavy lines on flanks, which are barred; a well-marked band of grayish white around base of bill, shading to pure white on chin; general tints brownish; top of head, back of neck, back and wings dark brown; speculum or wing patch dark grayish blue, much like that of male; flanks coarsely barred with two shades of brown; below white; bill slate, black-tipped, with pale blue subterminal band and light basal band, as in male; eye dark, with white ring around it.

Field Marks. — The black back distinguishes male from other male Scaups, and female may be distinguished from other female Scaups by white eye ring and bands about bill. (See Fig. 7.) Its white face resembles those of other female Scaups, but it is lighter on cheeks. The grayish blue wing patch of both sexes is shown when the bird flaps its wings. This distinguishes this species from all other Ducks, except the Red-head, which is much larger.

Season. — Rather rare spring and fall migrant; very rare in spring on the New England coast; seen in autumn from about the middle of October to the first of December.

Range. — North America. Breeds from southern British Columbia to northern California, and from northern Alberta and Lake Winnipeg

south to North Dakota, northern Iowa, and southern Wisconsin; winters from southern British Columbia, New Mexico, northern Texas, southern Illinois, and New Jersey south to Porto Rico and Guatemala; occurs in migration north to Newfoundland, Nova Scotia, and Quebec; recorded from Bermuda and England.

HISTORY.

The Ring-necked Duck apparently is not recorded as very common anywhere and is certainly rare now, if not very rare, in Massachusetts, except in the southeastern counties, where it occurs more commonly in some localities. To the north and east it grows rarer. Dr. Townsend gives but one record

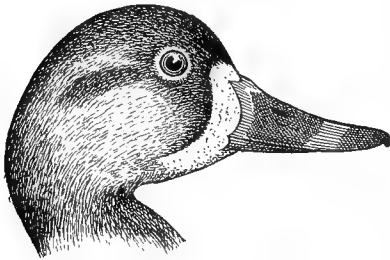


FIG. 7.— Head of female.

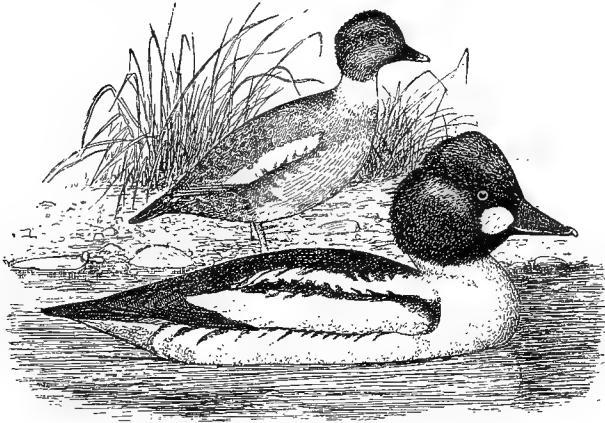
for Essex County, but Dr. Phillips records three taken at Wenham Lake. Rich says that probably not more than one specimen is killed during the year in Maine, and Knight regards it as a very rare migrant there, although he says that Boardman once found it breeding in Wash-

ington County. It resembles the Lesser Scaup in appearance, size and habits.¹ Like that species it is very swift on the wing. As it springs from the water it may be recognized by the distinct whistling sounds made by its wings in its sudden effort to escape danger. The only specimen I ever killed was one of a pair which passed me on a high wind at such speed that the second bird was beyond gunshot before I could cover it and discharge the second barrel. It associates with the Lesser Scaup and feeds on similar food. Minnows, snails, tadpoles, frogs, crayfish, the roots of aquatic plants and many seeds are eaten.

¹ It should be noted, however, that Boardman states in his Catalogue of the Birds found in the vicinity of Calais, Me., and about the islands in the Bay of Fundy, that the Ring-necked Duck does not breed in that region; but Mr. Knight writes me that he visited Mr. Boardman twice and that the statement as it appears in *The Birds of Maine* was taken from Boardman's last revision of his own field notes.

GOLDEN-EYE (*Clangula clangula americana*).

Common or local names: Whistler; Greathead.



FEMALE.

MALE.

Length. — 17 to 20 inches.

Adult Male. — Head and upper neck dark green (appearing black in the field except at close range in good light); slightly crested; a roundish spot below and in front of eye white; middle of back and tail black; entire under parts (except throat), neck all round and sides of upper back white; wing quills black, much of them covered with white of fore wing when closed, wing showing a broad patch of white when spread; iris yellow; bill blackish, tipped with orange; feet orange or yellow, with dusky webs.

Adult Female. — Head and upper neck cinnamon brown, with *no white spot*; back and wide band across breast dark grayish brown; ring around neck whitish, also rest of under parts; wing showing considerable white, both when closed and when open; iris yellow; bill brown, yellow or orange toward tip; feet yellowish, webs dusky.

Young Male. — Less gray on breast and indications of a white spot before eye.

Field Marks. — Male, conspicuous black and white, stocky; the dark, large, fluffy head, with rounded white spot before eye, distinguishes it. Female, a snuff colored head, unmarked; readily distinguished from the Redhead by the white on wing and yellow tip of bill. The sharp, high, whistling sound of their flight is characteristic.

Notes. — A low croak (Chapman). The male, when startled or lost, a sharp *cur-r-rew* (Eaton). The female a single whistling peep; a low-pitched quack to call young (Knight).

Nest. — In hollow tree or stump.

Eggs. — From five to twelve, glossy greenish, measuring about 2.35 by 1.70.

Season. — Common migrant locally, November to April; often locally abundant coastwise.

Range. — North America. Breeds from Central Alaska, northern Mackenzie, central Keewatin, northern Ungava and Newfoundland south to southern British Columbia, southern Montana, northern North Dakota, Michigan, New York and northern New England; winters from the Aleutian Islands, Utah, Nebraska, Minnesota, Lake Erie, Maine and New Brunswick south to southern California, central Mexico and Florida; occurs in Bermuda.

HISTORY.

I can well remember when this bird was a common and familiar sight on the ponds of Worcester County and was abundant on the Connecticut, Concord and Sudbury rivers; but it has become comparatively rare in inland Massachusetts in recent years, and like all our Ducks has been driven from its former haunts in the interior by incessant persecution. On the Charles River in the Back Bay district in Boston, and on some of the reservoirs where no shooting is allowed, this species has increased recently in numbers, which shows that it is not much afraid of people, buildings or boats, but is driven away mainly by shooting. My correspondence with over three hundred gunners and other observers seems to show conclusively that the species has decreased greatly throughout the State within the thirty years prior to 1909. Only ten correspondents note an increase in the species, and sixty-two note a decrease. Even in Barnstable County, where five observers report an increase, eighteen report a decrease. Mr. Clement A. Cahoon of Harwich states that fifty-five to sixty years ago Whistlers came into a large pond there by hundreds. People came five miles or more to shoot them. Now (1908) he says that he would "about as much expect to see a bullfrog flying over the narrows to that pond as to see Whistlers." Mr. Samuel L. Buffington of Touisset says that Bluebills, Whistlers and Sheldrakes have decreased at least seventy-five per cent. in the river near his home. Where there were formerly flocks of one hundred to two hundred they now see flocks of two or four to a dozen. On the other hand, Mr. George Spencer Morris writes me

that this species, formerly not very common near Cape Charles, Va., is now abundant there. I hear of no increase elsewhere along the Atlantic coast except at Prince Edward Island (where Mr. E. T. Carbonnel says that nearly all wild-fowl have increased under recent protection) and locally in Massachusetts, where Whistlers have increased since spring shooting was abolished.

The Golden-eye is commonly known as the Whistler because of the peculiar penetrating whistle made by its wings in flight. There are times when these cutting strokes can be heard even before the bird itself can be clearly made out. The Whistler breeds from just above the latitude of Massachusetts northward to the limit of trees, making its nest in a hollow tree near some fresh-water pond or river. It breeds in the interior of Alaska, but is very rarely seen on the coast. Barnum mentioned a case of its breeding in Onondaga County, N. Y., and Merriam, Ralph and Bagg record it as breeding in the Adirondack region.¹ It formerly bred abundantly in the Maine woods, and still breeds there and probably in northern Vermont and New Hampshire to some extent. Boardman states that in Maine he has seen the female Whistler pick up two of her ducklings, one at a time, and carry them across a lake, making a trip for each young one, and he was told by his companion that the mother birds often took their young from one lake to another when they thought the little ones were in danger. The bird appeared to carry the young by her feet pressed close to the body. When his companion shouted and threw up his hat the bird dropped the young one, but came back for it at once. Boardman's companion told him that the young were usually carried from the nest to the water in the bill of the parent, but to go any distance the feet were used in carrying them. The Golden-eye is found almost throughout the interior of North America, and is distinctly a fresh-water bird until the frosts of winter begin to close the ponds and rivers, when most of the Whistlers in New England go to the salt water. Some, however, still remain in the unfrozen fresh waters of the north, south and

¹ Eaton, E. H.: Birds of New York, 1910, p. 209.

west. Eaton says that it inhabits the open waters of every portion of New York State throughout the winter. Samuels (1870) says that it is often seen in the lakes and ponds of the interior of New England when they are open in winter. The average date of its appearance at Wood's Hole, Mass., is November 15, as given by Professor Cooke. It returns northward early, arriving in Canada in February, March or April, according to the season. Nuttall (1834) states that the natives of Lapland make nesting places for this bird by attaching hollowed pieces of wood to the stunted pine trees in which it ordinarily breeds. He says also that in its native haunts it is by no means shy; but this statement no longer applies to the Whistler of New England.

The Whistler is a remarkably active bird, dives like a flash and rarely comes well to decoys. It has learned to be extremely wary and cautious, but in stormy weather it often keeps close to shore, which gives the shore gunner his chance. It does not always dive for its food, but sometimes dabbles in the mud along the shore with Bluebills or other Ducks. Offshore it feeds largely on mussels, which it dislodges and brings up from the bottom. Audubon found it feeding on crayfish on the Ohio River. Wayne says that in South Carolina a small mussel of salt or brackish water is its favorite food. Knight has observed it feeding on these and also some vegetable substance. He states that it eats small fish and fry also, and along the coast it feeds on mussels and other mollusks; but Elliot believes that in the interior the Whistler feeds on vegetable matter, such as grasses and roots. When feeding there and when it first comes to the salt water in autumn the young are fairly tender and well flavored, being about on a par with the Bluebill as a table delicacy. Some of the residents of Cape Cod consider it superior to the Scoters. Nuttall says that it eats fresh-water vegetation, such as the roots of *Equisetums* and the seeds of some species of *Polygonums*.

BARROW'S GOLDEN-EYE (*Clangula islandica*).

Length. — 20 to 22.50 inches.

Adult Male. — Similar to Golden-eye; head moderately puffy, with feathers lengthening into a slight crest; gloss of head chiefly purple and violet; a large wedge-shaped, triangular or crescentic white spot between bill and eye, running up vertically to a point and extending along the whole side of base of bill; a white stripe on the black shoulder; white area on wing more or less divided by a dark bar.

Adult Female and Young. — Similar to female of Golden-eye; indistinguishable, except by a dark bar on white of wing, which is not always present, head usually darker in color, and this color extends farther down on neck, making the white collar narrower than in the Golden-eye; gray belt on breast is broader and the bill *relatively shorter, deeper and wider in proportion to its length*; sometimes nearly all yellow.

Field Marks. — In male, white spot at base of bill is triangular, not round, as in Golden-eye. (See Fig. 8.) Female and young indistinguishable in the field from Golden-eye.

Notes. — Probably a low croaking sound, similar to that produced by the Golden-eye (Chapman).

Season. — Very rare winter visitor.

Range. — Northern North America. Breeds from south central Alaska and northwestern Mackenzie to southern Oregon and southern Colorado, and from northern Ungava to central Quebec; winters from southeastern Alaska, central Montana, the Great Lakes and Gulf of St. Lawrence south to central California, southern Colorado, Nebraska and New England; accidental in Europe; breeds commonly in Iceland and a rare visitor to Greenland.

HISTORY.

The Barrow's Golden-eye is a northern bird and has probably always been very rare in Massachusetts within historic times. Mr. Boardman asserts that it formerly bred in Maine, but although a few birds may have summered in that State there is no record of the actual discovery of a nest. It is sometimes common in our markets, but most of the specimens procured there probably came from the west. The records of its occurrence here are not many, and Brewster doubts the authenticity of some. Never-

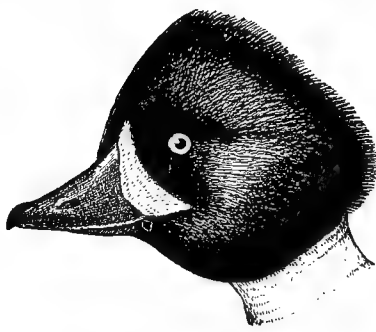


FIG. 8.— Male.

theless, a few evidently are authentic, and it is highly probable that the females and young come here in larger numbers than the males, but are overlooked on account of their close resemblance to those of the Whistler, as they make a similar whistling noise with their wings in flight and are indistinguishable from the Whistler, except by an expert. This bird seems to prefer the west or the interior of the continent to our coast. It is, or formerly was, not uncommon in northeastern Maine, and on the St. Lawrence River in northern New York.

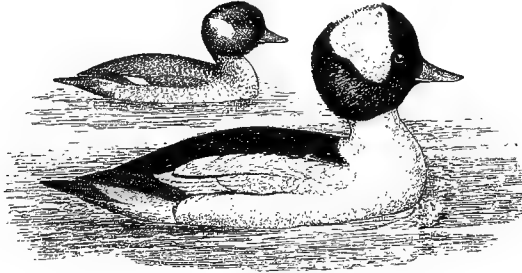
In the Vermont Agricultural Report published in the year 1901, Dr. George H. Perkins and Mr. C. D. Howe give a preliminary list of the birds of Vermont, in which they include this species and note that there is a specimen in the museum at St. Johnsbury which was taken in the State. Brewster (1909) gives but three authentic records for Massachusetts.

Since the above was written I have come to doubt whether it is possible for any one to distinguish with certainty the females and young of *americana* in all cases from those of *islandica*. The differences between the males may be seen at a glance; but such authorities as Brewster and Ridgway have both been somewhat puzzled in determining females. The typical shapes of the bill in each species are illustrated in Eaton's Birds of New York, but these vary, and not even the measurements of the wing can be depended upon. Any one who is in doubt regarding the identity of a specimen should consult an excellent article on Barrow's Golden-eye in Massachusetts by Brewster in the Auk,¹ and, if still undecided, should refer the matter of identification to some expert who has access to a large series of skins of both species.

¹ Brewster, William: Barrow's Golden-eye in Massachusetts, Auk, 1909, pp. 153-164.

BUFFLE-HEAD (*Charitonetta albeola*).

Common or local names: Dipper Duck; Dapper; Doppet; Robin Dipper; Butter Ball; Bumblebee Duck.



FEMALE.

MALE.

Length. — 12.25 to 15 inches.

Adult Male. — A snow-white patch from back of and below eye over top and back of head to other eye; rest of head and a little of neck apparently black, crested, and puffed out at sides (at close range showing glossy purple, violet and green); nearly all of neck, flanks and under parts pure white, turning to dusky white on belly, vent and tail coverts; back black; wings largely black, but most of fore wing and shoulders white; tail and upper coverts dark grayish; iris brown; bill dark gray; feet flesh color.

Adult Female and Young. — Head, neck and upper parts sooty brown; head and wings darkest; usually a patch back of and below eye whitish; wings brown, showing some white when spread; under parts (except throat and upper foreneck) white; bill bluish gray tinged with lavender.

Field Marks. — Size of Teal or smaller. Only the Hooded Merganser has a somewhat similar dark head with a triangular white patch when crest is raised, like male of this species. Female may be known by small size, white patch back of and below eye and white wing patch, when this can be seen.

Notes. — A single guttural note like a small edition of the Canvas-back's roll (Elliot). A guttural croak (Chapman). A short quack (Wilson). Resembles croak of Golden-eye but feebler (Brewer).

Season. — Rather uncommon spring and autumn migrant; formerly common, wintering occasionally on the coast; late September to early May.

Range. — North America. Breeds from the Yukon to central Keewatin and south to Newfoundland, British Columbia, Montana and Ontario; winters from the Aleutian Islands, southern Michigan, western New York and New Brunswick south to northern Lower California, central Mexico and Florida; recorded from Hawaii, Greenland, Newfoundland, Nova Scotia, Bermuda and Great Britain.

HISTORY.

This little Duck is widely known on fresh waters, for it is by nature a fresh-water bird, which in autumn and winter frequents the sea-shore. It was named Buffle-head (or Buffalo-head) because of its large fluffy head, which looks particularly big when the feathers are erected. The Buffle-head was not much sought by gunners until within recent years. Its great weakness is a fondness for decoys. Mr. George Spencer Morris writes me (1908) regarding the region about Cape Charles, Va., where he says that twenty-five years ago great flocks of this species were constantly seen and their notes were continually heard. He states the belief that they are not one-fourth as numerous now, yet about the same number as formerly are taken in a day's bag. He believes that the Dipper's infatuation for wooden Ducks will lead to its extinction. Mr. A. C. Bent of Taunton, Mass., says that it was formerly fairly common there but is now very rare. Mr. Israel R. Sheldon says that it was formerly very common but is now rare in upper Narragansett Bay, and that it frequents coves where it is easily taken. Mr. Lewis W. Hill says that it is usually common at Edgartown, Mass.; one man got fifteen in two days. The following brief extracts from authors indicate a decrease: Abundant October and May (Turnbull, east Pennsylvania and New Jersey, 1869). Abundant on our coast spring and autumn (Samuels, New England, 1870). Common winter visitor (Merriam, Connecticut, 1877). Uncommon migrant on coast, wintering rarely; not uncommon inland (Howe and Allen, Massachusetts, 1901). Not uncommon transient; rare in winter (Townsend, Essex County, 1905). Of late its autumn visits appear to have been becoming less and less frequent (Brewster, Cambridge region, 1906). Uncommon migrant and rare winter resident in New Hampshire, Massachusetts, Rhode Island and Connecticut, and uncommon migrant in Vermont (G. M. Allen, 1909).

Observers from all parts of Massachusetts, except Hampshire County (where none report it), are nearly unanimous in the opinion that this species is decreasing. Six think that

they have recently seen a slight increase, and one sees an increase of ninety per cent.; fifty-three report a decrease. As with all the water-fowl, the great majority of the reports are from the coast counties, which shows that this Duck, like many of the fresh-water fowl, has been driven from the interior, where it was formerly common, to the coast, where it is steadily decreasing in numbers. It is believed that this species formerly bred in Washington County, Me., and it may do so still, but there is no recent record of its nesting within the United States.

The male is a handsome bird; its bright contrasting tints are highly ornamental, but, as is usual among Ducks, the female is dull and inconspicuous in color and much smaller. My youthful experience with the Dipper Duck convinced me at the time that it could dive quickly enough to dodge a charge of shot; but its immunity from danger probably was due more to my inexperience and to the inferior quality of the gun and ammunition used than to the quickness of the bird. However, it dives like a flash, and is very likely to escape unless the gunner, warned by experience, uses a close shooting gun, judges well his distance and holds exactly right. When a few are together one usually keeps watch when the others are under water and warns them of danger by its short quack. In flight it hurls itself through the air with tremendous speed, its rapidly moving wings almost forming a haze about its glancing form, which buzzes straight away as if bound for the other end of the world. It alights on the water with a tumultuous splash, sliding along for a little distance over the surface. When it has once alighted it seems to prefer the water to the air, and will often dive, rather than fly, to escape danger. It is sometimes so fat that in the middle States it is known as the Butter-box or Butter-ball, but the flesh is not usually of a very good quality. Mr. F. A. Bates says that he prefers to hunger rather than to eat a Dipper. Others will agree with him, but I have never found any Duck that was not fairly good if properly handled and prepared. As with all Ducks the quality of its flesh depends largely on the character of the food it has recently eaten, and this species,

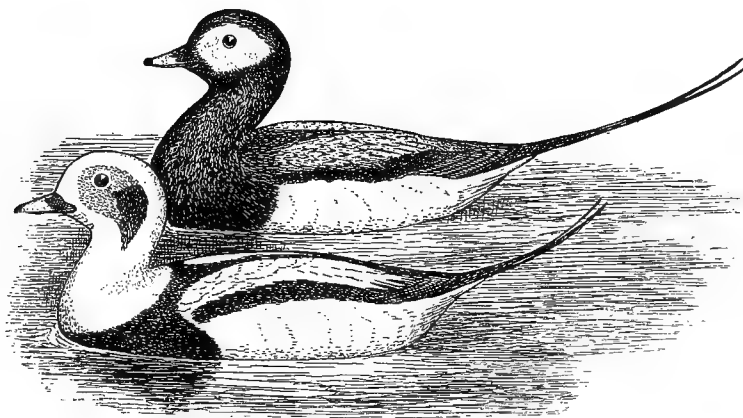
like others, is much more palatable when killed in the interior than when taken on the sea-coast. In February the males begin their mating antics, when they have a habit of stretching forth the neck and erecting the glossy feathers of the head as it is moved back and forth, so as to display their beauties to the best advantage in the sunlight. They are quite quarrelsome in the mating season and fight furiously for the possession of favored females.

Nuttall says that the Buffle-head feeds principally upon fresh-water and submerged vegetation, and that it sometimes visits the salt marshes "in quest of the laver (*Ulva lactuca*)," as well as crustacea and small shell-fish. Audubon states that it feeds on shrimps, small fry and bivalves in salt water, and on crayfish, leeches, snails and grasses in fresh water. Dr. Warren found small shells and coleopterous insects in stomachs of this species. Knight says that it eats young chubs, shiners and other small fish. It also takes locusts, grasshoppers and many other insects.

When it is considered that the minnows on which the Buffle-head feeds to a considerable extent eat the eggs of trout and other food fishes, it seems probable that it is a useful bird, and certainly it is a very interesting one. Its diminution on the Atlantic sea-board has been deplorably rapid. In 1870 Samuels regarded it as a "very common and well known bird" in New England and abundant in migration. At its present rate of decrease, another century will see its extinction as surely as the last century saw that of the Great Auk and the Labrador Duck. Its rate of decrease should be watched, and, if necessary, a close season should be declared for several years in every State and province where it breeds or which it visits in its annual migrations. It is unsafe to procrastinate in matters of this kind.

OLD-SQUAW (*Harelda hyemalis*).

Common or local names: Old Injun; Old Wife; Long-tail; South Southerly; Cockawee; Scoldenore; Scolder; Quandy.



WINTER.

MALES.

SPRING.

Length. — Male, variable up to 23 inches; female, about 16 inches.

Adult Male in Winter. — Patch on side of head and neck blackish brown (occasionally nearly absent); side of head elsewhere light gray, sometimes extending to forehead; rest of head, including eyelids, neck and upper breast, white; back, wings and tail dark brown or blackish; two light pearl gray patches extending back over shoulders and scapulars; lower breast and upper belly brown, rest of belly white; two middle tail feathers black, very long and narrow; outer tail feathers white; base and extreme tip of bill black, the rest pink and yellow; feet pale slate.

Adult Male in Late Spring. — Sides of head gray and white; rest of head, neck, back, breast, and upper belly dark brown or brownish black; feathers of the upper back and shoulders margined with reddish brown; most of belly white; tail feathers and feet as in winter.

Adult Female in Winter. — Head, neck and lower parts mostly white; top and back of head, throat and a variable spot on side of head dusky; other upper parts and upper breast mainly dusky brown; shoulders lighter; middle tail feathers not elongated.

Adult Female in Spring. — Similar to female in winter, but sides of head and neck largely dusky; feathers of the back margined with brown.

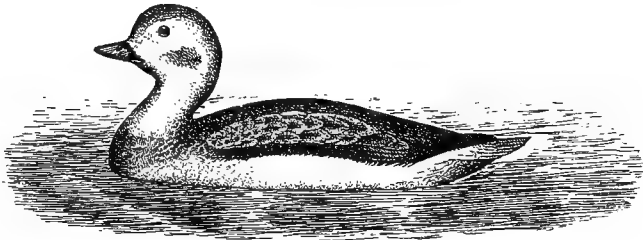
Young in Winter. — Similar to adult female in winter, or with head and neck chiefly grayish; sides of head whitish; breast streaked with dusky; often lacking much of the white of the adults.

Field Marks. — In winter plumage head mostly white; ashy or dusky patch on side of head and upper neck, which is conspicuous in old and young.

Notes. — Those most commonly uttered resemble the words, *sóuth sóuth sóuthérly* or *old sóuth sóuthérly* (Elliot). *O-onc-o-onc-ough-egh-ough-egh* (Mackay). *Owly owly owly* (Packard).

Season. — Common to abundant migrant and winter resident, mainly coastwise; October to May.

Range. — Northern hemisphere. In North America breeds from islands of Bering Sea, Arctic coast of Alaska, Melville Island, Wellington Channel, Grinnell Land and northern Greenland south to Aleutian Islands, east central Mackenzie, northern Hudson Bay and southeastern Ungava; winters from the Aleutian Islands south regularly to Washington, rarely to San Diego Bay, Cal., and in southern Greenland, and from Gulf of St. Lawrence south regularly to the Great Lakes and North Carolina, and rarely to Colorado, Texas, Louisiana and Florida.



FEMALE (WINTER).

HISTORY.

This species is beautiful in plumage and elegant in form, but is pursued mainly for sport as it is no table delicacy. Thousands of these handsome Ducks are shot annually along the New England coast, and the dead and wounded allowed to drift away on the tide or picked up merely to be shown as trophies and afterward left on the wharf or thrown away. Rich says that he has seen twenty boats at a time, each containing from two to four shooters, all killing and wounding Old-squaws, and half of them never stopping to pick up even one bird. "It is at the hands of such butchers," he says, "that the myriads of sea-fowl that once lined our coasts have been reduced to the hundredth part of their former numbers."¹ No species, however numerous, could stand forever such deci-

¹ Rich, Walter E.: Feathered Game of the Northeast, 1907, pp. 360, 361.

mation; and to make the matter worse, the greater part of them are killed on the way north to their breeding grounds. He has had every opportunity to observe the effect of this shooting on the Maine coast and note its results. It would seem from the descriptions of earlier writers that this species was formerly much more numerous than now. Peabody (*Birds of Massachusetts*, 1839) states that "the caravans of this species that pass along our coasts are large, and their noise can be heard at a great distance." De Kay (*Birds of New York*, 1844) says "they appear on our coast in autumn in immense flocks, and almost cover the surface of our bays in the coldest and severest weather of the winter." Merriam (*Connecticut*, 1877) tells of hundreds of thousands on the sound, covering the water as far as the eye can reach. Mr. Israel R. Sheldon of Pawtuxet, R. I., says that they are driven out of Narragansett Bay, where they were formerly very common. Mr. Willard W. Robbins of Medfield, Mass., says (1910) that he has known the occupants of six boats to kill as many as two hundred in one tide eight years ago. Mr. John M. Winslow of Nantucket says that he used to kill one hundred in a morning; but now gets very few. Eaton states in his *Birds of New York* (1910) that Old-squaws are far less abundant than thirty years ago.

It is probable that the continual harassing that this bird has received on the Maine coast has caused its decrease there by driving many south to the shoals off Cape Cod, so keeping up the Cape Cod supply. Notwithstanding the fact that the species has probably decreased somewhat even in our waters, the great breeding grounds of the far north still provide large numbers, and it is abundant on our coasts.

It is a very hardy bird, stiff set, strongly boned and muscled, covered with a coat of thick down and tough feathers, and rarely leaves its arctic home until fairly driven out by the ice. It is commonly seen in numbers on the New England coast from late November to late March. It is perhaps as swift on wing as any North American Duck. Sometimes a flock flying low over the water will plunge quickly down at the sound of a gun and pitch into the water, only to fly off

again. It often circles high in the air, apparently in play, and its flight is so erratic that I have seen individuals which were shot in the back when flying high over the shooter. If wounded it will dive deep and swim far, and often under such circumstances one will go to the bottom, seize some object with the bill and hang on until drowned rather than risk capture. Its swift movements, strong build, great vitality and thick plumage make it difficult to kill, and it is among the most expert of divers. It disappears so quickly at the flash of a gun that it seems almost impossible to kill one on the water. Gov. W. D. Hoard of Wisconsin assured me that the lake fishermen there take Ducks, presumably of this species, in their fishing nets, at a depth of fifty to one hundred feet, and I have heard similar tales told by Atlantic coast fishermen. Eaton in his *Birds of New York* (page 214) states that this bird is frequently taken in the Great Lakes in gill nets at a depth of fifteen fathoms, and sometimes at twenty-seven fathoms, or one hundred and sixty-two feet. He also quotes the statement that at Dunkirk, N. Y., between five and seven thousand of these birds were thus taken at one haul of a net.¹ It is evident that nets are very destructive to this species. People who have been accustomed to regard this as a salt-water bird may be surprised to learn that it resorts in numbers to the lakes in the interior, and breeds about little fresh-water ponds in the arctic regions. Nevertheless, the majority of the species spend a large part of their lives on the sea.

When wintry winds lash the dark water into foam and send it roaring upon our rocky coast, when the shore birds have gone and the Geese have flown, the Old-squaws still ride the waves just outside the breakers. They seem filled with abundant vigor and playfulness. Rising against the wind, they speed away and back again, splashing down into the sea. Their calls and cries are heard particularly at morning and late in the afternoon, when they are often very vociferous. It is hard to imitate these calls by printed words, but they are among the most musical cries uttered by wild-fowl.

¹ See Bacon, Samuel E., Jr.: *Ornithologist and Oölogist*, 1892, Vol. 17, p. 45.

Their gabbling somewhat resembles the cry of a pack of hounds, and has given the name "hounds" to the bird in some localities.

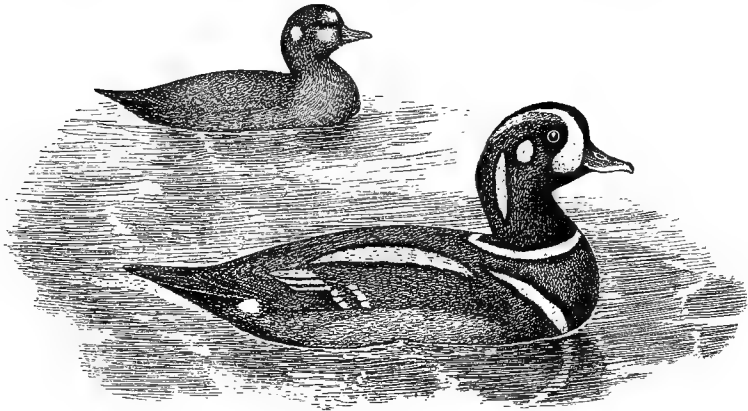
As spring approaches, whole flocks of Old-squaws may be seen to leave the water and "tower" to the regions of the upper air, swinging in wide circles, surmounting height after height, until almost lost to view, when they turn and plunge downward, hurtling through the air in arrowy flight, sometimes straight downward, sometimes zigzagging wildly, until they rest again on the surface of the sea.

Latham states that the down which the female takes from her breast to line her nest is equally valuable for commercial purposes with that of the Eider. As the Old-squaw still breeds in Ungava, it is not improbable that this Duck was one of the species formerly breeding farther south on the Labrador coast, where feather hunters, eggers and fishermen successively have destroyed thousands and tens of thousands of wild-fowl and sea birds. But most of the Old-Squaws breed in the far north, where they are safe from molestation by civilized man during the breeding season.

The Old-squaw feeds on small crustacea and mussels, fish fry, insects, etc., fresh-water or marine, according to the locality where it may happen to feed. Mackay says that they eat a small shell-fish resembling a diminutive quahog. They also eat sand fleas, razor shells (*Siliqua costata*), fresh-water clams, small white perch, penny shells (*Astarte castanea*), red whale bait, shrimps, mussels, small crabs and pond grass. In the severe winter of 1888 he has known them to go to the uplands of Nantucket in flocks and feed on the dried fine-top grass (*Anthoxanthum odoratum*).

HARLEQUIN DUCK (*Histrionicus histrionicus*).

Common or local names: Lord and Lady; Sea Mouse; Squealer.



FEMALE.

MALE.

Length. — 15 to 17.50 inches.

Adult Male in Winter. — General color leaden blue, changing to blackish at edges of white markings, blue black on lower back and bluish gray on belly; peculiar crescent-shaped patch in front of eye, extending from chin up to crown and alongside it, round spot near ear, narrow stripe from back of this down upper neck, narrow collar around lower part of neck, broad bar across side of breast to shoulder, other markings on wing and shoulders and a round spot on either side at base of tail white; lower and front neck, throat and bar on side of breast, center of forehead, crown and hind neck black or blackish; flanks and a stripe extending back above eye reddish brown; bill dusky or slate; feet slate, with dusky webs and pale claws; iris brown or reddish.

Immature Males. — Vary for two or three years between this plumage and that of the young, which is similar to that of adult female.

Adult Male in Summer. — Resembles female in plumage, except that non-breeding males retain their winter dress.

Adult Female. — Head, neck and back dark grayish brown; a white spot back of ear; sides of head marked with dull white mainly before or below the eye; flanks grayish brown; bill dusky; feet slate; iris brown.

Field Marks. — The male is unmistakable. Female smaller and duller, but resembling male in shape of head and short, slightly upturned bill.

Notes. — A confusion of low gabbling and chattering notes (Nelson). A peculiar whistle, generally by male in efforts to secure a mate (Elliot).

Season. — Rare winter visitant.

Range. — Northern North America and eastern Asia. Breeds in Alaska, on Arctic coast, Newfoundland, northeastern Asia, Greenland and Iceland, and south in the mountains to central California and Colorado; winters on Pacific coast from the Aleutian Islands to California, in the interior to Colorado and western New York, and on Atlantic coast from Gulf of St. Lawrence regularly to Maine, rarely to New Jersey and accidentally to Florida; accidental in Europe.

HISTORY.

The Harlequin Duck was formerly more common on the coast of New England than it is to-day. It formerly was noted as a summer resident on the coast of Maine, and this may have been authentic, as I found it in flocks in 1889 on Puget Sound in the height of the breeding season, in nearly the same latitude as the coast of Maine and in a milder climate. It is now a rare visitor to Massachusetts in early winter, and even in Maine it is considered uncommon. Knight says that the days of this little Duck are fast passing, and that it is likely soon to be shelved with other species as "formerly occurring along our coast." He states that it was once common on the Maine coast from November until April, but now occurs only in the extreme winter months along the outer islands, and that it seems very likely that two hundred would be a liberal estimate of those which now visit the entire Maine coast in winter.¹ Dr. Brewer states that specimens were occasionally seen in the Boston markets, but that after 1840 it became comparatively rare.

All the adult male specimens that I have seen taken in New England had only a stripe of white on the scapulars and no large patch of white there, and as this seems to be the common winter plumage here, the male is thus figured. I always have regarded the Harlequin as second only to the Wood Duck in beauty. On one occasion a small flock of these elegant birds visited my lonely camp on a little harbor of a small island near the Strait of Fuca, at the entrance of Puget Sound. I sat motionless on the shore until they came almost to my feet, playing about like children at tag, or dressing their plumage, entirely at ease, like so many domesti-

¹ Knight, Ora W.: Birds of Maine, 1908, pp. 105, 106.

cated birds in a duck pond. Apparently they considered me a part of the scenery, and gave me such an intimate view of their artless and graceful evolutions as falls to the lot of few persons in a lifetime. Evidently having fed well outside, they came in to the little rock-bound harbor of this uninhabited island to rest in the still waters and to dress their spotless plumage, and there disported themselves, as have their forebears for centuries, until, at my first movement, they lashed the calm surface into spray in their efforts to escape. Strangely, they did not attempt to dive but all took wing.

On the shores of New England the Harlequin is seen mostly along the outer surf-washed ledges. It is not esteemed by the epicure, and, aside from its beauty as a specimen of its kind, is of little value, but it is closely pursued. Sometimes a flock, when shot at in air, will plunge under water in such a way as to lead the eager sportsman to believe that he has killed them all; but soon they reappear at a distance as lively as ever. The Harlequin is now so shy and rare on the New England coast that it is almost never seen except by hardy fishermen and gunners who ply their calling off shore in the dead of winter.

This species feeds largely on mussels, which it obtains by diving, mainly along rocky shores. In New England it is a sea bird, but in the west it breeds in the interior on mountain streams, and nests either on the ground or in holes of trees or cliffs. In the streams it eats many insects.

NORTHERN EIDER (*Somateria mollissima borealis*).

Length. — 23 inches.

Adult. — Almost similar in size and coloration to Eider; less greenish on sides of head along border of black cap; frontal processes narrower and more acute than in the Eider; general upper outline of bill more nearly straight; when in hand the male may be distinguished from that of our Eider by the solid black cap which, in the Eider, is divided behind in the center by a white line; the breast is sometimes tinted with pink. The female differs as much from the male as does that of the Eider which it resembles (see Eider p. 148), but like the female of the King Eider it has two white wing-bars.

Season. — A rare straggler in winter; latter part of October to April.

Range. — Northeastern North America. Breeds from Ellesmere Land and both coasts of Greenland south to northwestern Hudson Bay and southern Ungava; winters in southern Greenland and south rarely to Massachusetts.

HISTORY.

This is a North American race of the common Eider of Europe (*S. mollissima*) and is almost identical with it. Probably it formerly occurred not uncommonly off our coast, and may yet appear here very rarely, as it nests on islands off the northern coast of Labrador and is a rare visitor on the Maine coast. It is rated as rare at Nantucket (Howe and Allen), which is believed to be about its southern limit. It may be readily distinguished from the common Eider when in hand by a difference in shape of the processes of the bill, as shown in Fig. 9.

This bird furnishes much of the eiderdown that is gathered by the Greenlanders, and it is not improbable that it was one of the species sought by the feather hunters on the coast of Labrador in the eighteenth century.

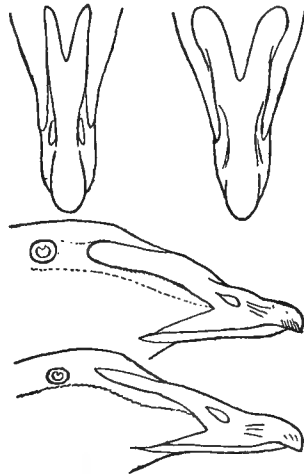
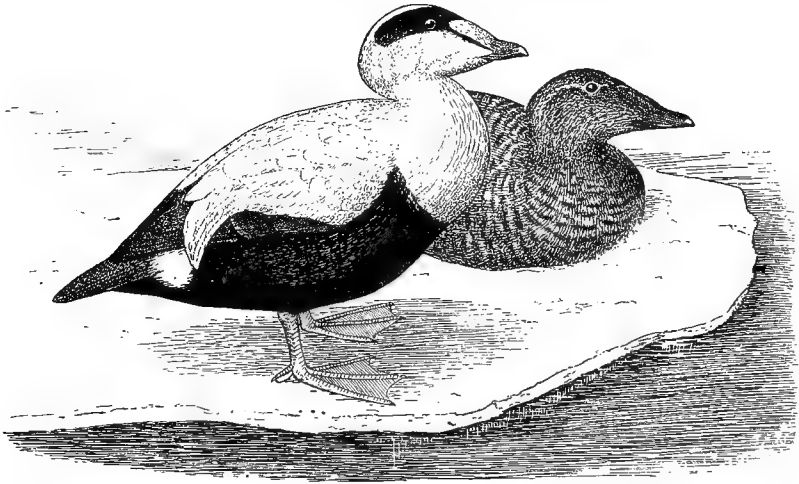


FIG. 9.—Bills of Eiders, one-quarter natural size, viewed from above and in profile. Upper right hand and middle figure represent the Eider; the others the Northern Eider (after Sharpe).

EIDER (*Somateria dresseri*).

Common or local names: Sea Duck; Isles of Shoals Duck; Wamp; Squam Duck; Canvas-back.



MALE.

FEMALE.

Length. — About 23 to 26 inches.

Adult Male. — Top of head black, divided behind by a white stripe on crown; rest of head white, tinged behind and on the sides to below eye with green; neck, breast and most of back white; breast tinged more or less with pale creamy brown; middle of lower back, wing quills, tail and belly mainly black; iris brown; bill varying from gray to green and flesh color, tip lighter; feet olive green, webs dusky.

Adult Female and Young. — Top of head blackish; rest of plumage buffy and brown, lightest on throat and neck, barred everywhere with black, except head and upper neck, which are streaked; bill pale green; eyes and feet as in male. Young more buffy than female.

Field Marks. — Almost impossible to distinguish females and young of this species, out of hand, from those of other Eiders. The difference in processes of bill are readily seen when bird is in hand.

Notes. — Male, a raucous and moaning voice, *he ho, ha ho*, or *a-o-wah-a-o-wah* (Knight); female, a cry like that of domestic Duck.

Nest. — On ground, generally sheltered by rocks.

Eggs. — Five to eight, pale bluish or greenish, tinged with olive, about 3 by 2.

Season. — A not uncommon winter visitor off the coast; formerly abundant; late November to April.

Range. — Northeastern North America. Breeds from southern Ungava and Newfoundland to southeastern Maine, and on the southern half of Hudson Bay; winters from Newfoundland and Gulf of St. Lawrence south on Atlantic coast, regularly to Massachusetts, rarely to Virginia, and in interior rarely to Colorado, Iowa, Wisconsin, Ohio and western New York.

HISTORY.

The Eider Duck formerly was abundant along the coast of New England as far south and west as Martha's Vineyard. The subjoined abridged extracts from standard authors indicate its decrease; October, 1832, seen in considerable numbers in Boston Bay; twenty-one killed about the Rocky Isles in one day by two gunners (a father and son); breeds in considerable numbers from Boston to the Bay of Fundy; Wilson saw them as far south as the capes of the Delaware; at present day an extremely rare occurrence, as Jersey fishermen know nothing of this Duck (Audubon). Formerly they bred in considerable numbers from Boston eastward (Peabody, 1838). Very abundant in the bays and inlets of our coast (Samuels, 1870). Uncommon winter visitor (Townsend, Essex County, Mass. 1905). It disappeared long ago from Massachusetts as a breeding bird, if it ever bred here, and probably not many more than twenty pairs now (1910) nest on the Maine coast, where they are protected from extinction during the breeding season by the wardens of the National Association of Audubon Societies. Thirty-seven Massachusetts observers report the Eider as decreasing, and but two report it on the increase. The decrease reported varies from twenty-five to ninety per cent. Mr. John M. Winslow of Nantucket says that with two other men he killed at Muskeget Island over two hundred in a morning about 1872. He secured and saved one hundred and fifty, and got fifty cents a pair for them. Mr. H. G. Worth of Nantucket says that he has killed thirty in three hours. Reports from Maine and Nova Scotia place their decrease at fifty per cent. within the memory of the observers, and this Duck seems to have nearly disappeared from Rhode Island in recent years. On the other hand, Rich regards this as the only Sea Duck that is holding its own on the Maine coast in winter.

The difference in the treatment received by Eider Ducks here and in Iceland is worthy of some notice. This bird, like other Ducks, lines its nest with soft down from its own breast, and before leaving the nest to feed covers the eggs with a blanket of this down, which it seems to have matted together for the purpose. Other species have similar habits. The covering sometimes is attached at one side to the nest itself, and can be removed from the eggs and spread over them again as a blanket is thrown off or spread over a bed. This gray down protects the eggs from the cold and hides them from their enemies. It (with the down of other Ducks) forms the eider down of commerce, and the natives of Iceland get a considerable revenue by collecting it. They make holes in the sod near their houses and even prepare holes in their sod roofs to induce the Ducks to breed there. The birds are absolutely protected and are as tame as domestic fowls. When the first downy lining is removed from the nest the female plucks her breast again to renew it, and if the second lining is taken it is said that the male then contributes the down from his own breast. The people never disturb the nest after this, and the birds are always allowed to raise a brood.

The treatment they receive on the Atlantic coast of the United States and the Canadian provinces is in sharp contrast to this. They have escaped extinction only because many of them breed in the far north, where white men rarely go, and because these northern birds are so hardy that they seek a temperate climate only in the depth of winter, when cold and storms make their pursuit a hardship. While here they usually keep well out to sea. Their food consists largely of mussels, which they can secure in ten fathoms or more of water, and they are so hardy, and so much at home in a storm at sea, that they are rarely seen in Massachusetts, except on salt water. They are rather rarely taken on some of the larger inland lakes of New York. They fully merit the name Sea Duck which is given them by the gunners.



PLATE V.—NEST OF EIDER DUCK.
From a photograph by T. Gilbert Pearson.

KING EIDER (*Somateria spectabilis*).

Length. — 20 to 25 inches.

Adult Male. — Top of head beautiful pearl gray, shading to deeper on the nape; a glossy black line bordering the base of the upper part of bill, which is reddish orange and formed like a shield for the forehead; cheeks pale sea green; small spot under eye, eyelid and V-shaped mark on throat black; rest of head, neck, upper back and shoulders creamy white; lower back, sides and under parts black; wings and tail dark brown; a large white patch on fore wing; two narrow white wing-bars; breast creamy buff; iris yellow; bill orange and yellow, with white tip; feet reddish orange, webs dusky.

Adult Female. — Nearly the entire plumage of two shades of buff, streaked and barred with dark brown; head, chin and throat dark buff, streaked conspicuously on head, faintly on sides; breast and flanks light buff, with irregular black bars on tips of feathers; under parts deep brown, more or less barred; tail black; iris brown; feet dull yellow, webs dusky.

Field Marks. — The male is distinguished by his peculiarly shaped head and its markings. The female in winter has two rather narrow but distinct white wing-bars.

Season. — Very rare winter visitor; November to April.

Range. — Northern part of northern hemisphere. Breeds along the whole coast of northern Siberia, Bering Sea (St. Lawrence Island) and Arctic coast of America from Icy Cape east to Melville Island, Wellington Channel, northern Greenland, northwestern Hudson Bay and northern Ungava; winters on Pacific coast from Aleutian Islands to Kodiak Island; in the interior rarely to the Great Lakes, and from southern Greenland and Gulf of St. Lawrence south regularly to Long Island, rarely to Georgia; accidental in California and Iowa.

HISTORY.

The King Eider is an arctic species and its habits resemble those of the common Eider. It is sometimes seen off the Massachusetts coast, and is usually rare on the Maine coast. It is a deep-water Duck, feeding mostly on mussels, according to Eaton, who states that it is taken sometimes in the deep-water gill nets of the lake fishermen in more than one hundred and fifty feet of water, where it is said to find its food. The female lines her nest with down, as do the other species, and it forms part of the eider down of commerce, which is gathered by the natives in Greenland. Knight found this species eating great quantities of mussels on the Maine coast,

and states that Mr. A. H. Norton found it subsisting on sea clams, sea cucumbers (*Pentacta frondosa*), and very little else.

Fig. 10 gives a very inadequate idea of the peculiar head of the male and no idea whatever of its beautiful and delicate

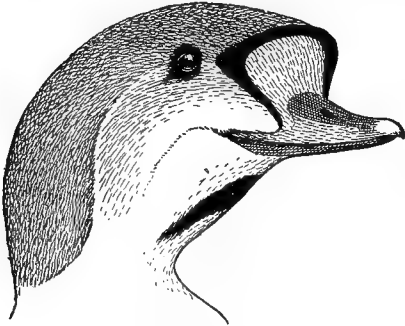


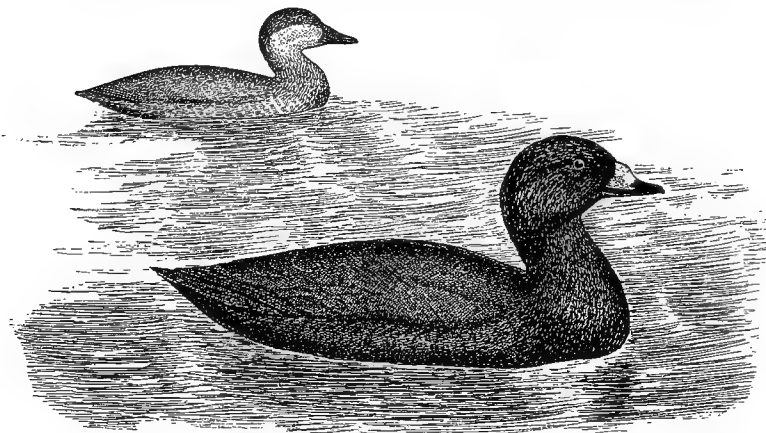
FIG. 10.—Male.

coloring. The raised frontal processes at the base of the bill, which adorn the head, develop immensely in the breeding season, bulging high above the rest of the bill. These processes are soft, and are supported upon a mass of fatty substance. They shrink and become more depressed in winter, when the general formation

of the beak is not much different from that of other Eiders. The female, however, does not resemble the male, and is not easily distinguished in the field from that of the American Eider. When in hand, the general resemblance of the bill and the head feathering to that of the male may be noted. As the males do not migrate so far south as do the females and young, it is not improbable that the latter are less rare in this latitude than they are generally believed to be.

SCOTER (*Oidemia americana*).

Common or local names: American Scoter; Black Coot; Butter-bill; Black Butter-bill; Yellowbill; Butter-nose; Copper-nose; Copper-bill; Pumpkin-blossom Coot; Whistling Coot; Little Gray Coot; Smutty Coot; Fizzy; Broad-billed Coot.



FEMALE.

MALE.

Length. — 17 to 20 inches.

Adult Male. — General plumage black; bill black, except most of the swollen base, which is vermilion or orange on the sides, changing to yellow above and in front; iris brown; feet brownish black, webs black.

Adult Female. — Much smaller than adult male; bill without hump at base; top of head to eye dark brown; sides of head below eye, chin, throat and upper fore neck grayish; rest of plumage sooty brown, lighter or grayish below; bill black, often marked or streaked with yellow; legs and feet brownish gray or olive brown, webs black. Young and female birds *not feathered* down on top of bill to near nostril, as in the other "Coots."

Young. — Similar to female; usually lighter below, sometimes whitish.

Field Marks. — The uniform black plumage of male and orange spot at base of bill distinguish it. *This species has no white marks in either sex.* The male is readily distinguished from the Black Duck by its habit of diving and by the absence of the whitish wing linings, which in the Black Duck are conspicuous in flight. The female and young closely resemble those of the Surf Scoter, but the sides of head and throat are distinctly gray where the Surf Scoter has indistinct white patches.

Notes. — A long musical whistle (Elliot).

Season. — Common migrant coastwise; late August or September to late May; non-breeding birds sometimes summer.

Range. — Northern North America and eastern Asia. Breeds in north-eastern Asia and from Kotzebue Sound to Aleutian Islands, including Near Islands; also on west shore of Hudson Bay, Ungava and Newfoundland; winters on Asiatic coast to Japan, and from islands of Bering Sea south rarely to Santa Catalina Island, Cal.; in the interior not rare on the Great Lakes, and casual or accidental in Missouri, Louisiana, Nebraska, Colorado and Wyoming; on the Atlantic coast abundant during migration from Newfoundland and Maine south (rarely to Florida).

HISTORY.

We have no means of knowing the early history of any one of the Scoters as they all were generally grouped together as "Coots" or "Black Ducks" by the early historians. The Scoters or "Coots," as they are called by the gunners and fishermen, are typical diving Ducks. They are very muscular and powerful in build. The bony framework is strong, the skin tough, and the feathers strong, coarse and very firmly attached to the skin. The whole structure seems to be formed to resist the tremendous water pressure that they encounter while diving at great depths. Fishermen, both along the Massachusetts coast and in the lake region of Wisconsin, have told me that they have taken these diving Ducks in nets set from fifty to one hundred feet below the surface. This may be an exaggeration, but Mackay says that they feed to a depth of forty feet. Under water they use both legs and wings for propulsion, and are even more at home there than in the air. If threatened with danger they are as likely to dive as to fly, and sometimes, when in full flight, they have been seen to dive. The Scoters are universally known as Coots along the New England coast, a name derived probably from the French fishermen who first established the fishing industry on the banks of Newfoundland. The true Coot, however, is a lobe-footed fresh-water bird (see page 221). The American Scoter and the two other New England species appear on our shores early in the fall, and usually congregate in greater or less numbers all winter on the shoals south of Cape Cod, where they remain in greater numbers than anywhere else along our coast. In the shoal waters near Cape Cod, Nantucket and Martha's Vineyard they find an abundant

supply of their favorite food. There, also, the influence of the gulf stream is felt. The sounds are rarely frozen, and as the waters are comparatively shallow the birds can feed at considerable distances from the shore; therefore they find some degree of safety there, as they are not so accessible to boats or gunners as are the birds which remain about Massachusetts Bay. Another advantage that they have about Cape Cod is that whatever wind blows they always can find a sheltered spot under the lee of the Cape, or somewhere about Nantucket, Martha's Vineyard or some of the other islands.

The "Coots" are rarely shot in the south, where more valuable Ducks abound, but their flocks form a principal object of sport on the New England coast, where most fresh-water Ducks have become rare. They are naturally rather stupid birds, easily approached or decoyed, and their own hardiness and thick, tough coat of feathers form their principal protection. They are so hard to kill that "Coot shooting" usually cripples a large percentage of the birds, which escape, either to meet a lingering death or recover, as the case may be. Since the law went into effect prohibiting Duck shooting from January 1 to September 15 unusually large "beds" of "Coots" have been observed in Ipswich and Massachusetts bays, but previous to that time these Ducks had decreased more or less along most of the New England coast.

Walter Rich, in his Feathered Game of the Northeast, says, the Scoters have decreased fifty per cent. Capt. Herbert L. Spinney, an old "Coot" shooter, published an excellent account of the sport in the *Maine Sportsman* for May, 1897, in which he says that twenty years before that time, both in the spring and fall migrations, these birds could be found all along the coast of Maine in great flocks or beds. Now he says "perhaps not a shoal for miles is occupied, and if at all, with only a few stragglers, and the flight consists of small flocks of which you may see a dozen or fifty in a day, and if the wind is favorable the birds will not stop at all." Very little decrease has been noticed in recent years on the Massachusetts coast south of Cape Cod, because the birds which have been driven from other parts of the coast have

concentrated there, until their numbers sometimes appear larger than ever; but Thoreau, who traversed the shores of Cape Cod on foot in 1864, states that he found practically a continuous flock of Coots just outside the breakers along the whole shore. Mr. George H. Mackay, who has published in *The Auk* an excellent account of the Scoters, and whose experience extends over fifty years, states that on March 18, 1875, while returning to Nantucket from a shooting trip to Muskeget Island, he saw a body of Scoters which his party estimated to contain twenty-five thousand birds. They were accompanied by about twelve thousand Eiders, forming altogether the largest body of wild-fowl that he ever saw. It is a well-known fact that Scoters feed largely on shell-fish of no great value to mankind, such as the mussel (*Mytilus edulis*); and it is stated by the fishermen that where a bed of these mussels near Cuttyhunk was destroyed, presumably by a storm, the "Coots" which were formerly very plentiful there deserted that shoal. Mackay states that these birds feed on small sea clams (*Spisula solidissima*), scallops (*Pecten irradians*), short razor-shells (*Siliqua costata*) and quahogs (*Venus mercenaria*). Fishermen and gunners sometimes assert that these Ducks are very destructive to valuable shell-fish, but I have noticed that scallops and quahogs decrease most rapidly in our inner bays, where these birds are fewest. We have no knowledge that would warrant us in failing to protect the birds. In fact, they are of some service in destroying enemies of the shell-fish, and they sometimes point out to the fishermen the location of beds of scallops.

As food, Ducks of this genus are regarded as nourishing but not very appetizing. Some writers have gone so far as to stigmatize them as abominable; but the people of Cape Cod are able, by parboiling, etc., to make a dish of even the old birds, which, though it may "taste a little like crow" to the uninitiated, serves as an agreeable variant to a diet of salt fish.

Mr. Frank A. Bates says, in his *Game Birds of North America* (pages 33, 34), that an old bird is simply infamous in flavor, and that he never saw a bird so young as to equal

a stew of old boots flavored with fish oil. "Pardon me," he says, "friends, devotees of the wily coot, my education has been sadly neglected. I can eat sculpin, but do not ask me to eat Coot."

A cultured Boston lady assures me that when she attempted to cook a Coot it drove everybody out of the house, and that she had to throw away the kettle that it was cooked in. Nevertheless, I have found the young palatable if properly prepared, though hardly equal to the celery-fed Canvas-back. Many Scoters are shot for food and sold in the markets, but large numbers are killed merely for sport, and either left to lie where they fall or drift away on the tide.

The American Scoter, Black Coot or Little Gray Coot, as it is commonly called, while a common bird, is the least numerous of the three Scoters which visit the New England coast. It often reaches Massachusetts in some numbers in September, rather earlier than the other species of the genus, and while at times it keeps by itself it is quite as likely to mix with flocks of the other Scoters. The flight of the Scoters is swift. I have heard it estimated at two hundred miles an hour with a strong wind, but this is probably exaggerated. They may possibly fly at a rate of over one hundred miles an hour under favorable conditions, but this is a high rate of speed for any bird. A flight consisting of this species and the Surf Scoter passes up Buzzards Bay late in May and crosses Cape Cod at the head of the bay, going over into Cape Cod Bay. Earlier in the season there is a considerable flight eastward through Vineyard Sound and around or over Cape Cod. This bird usually flies in lines at some distance from the shore, and the flocks are often led by an old experienced male, who will lead his following high in air while passing over the boats where gunners lie in wait.

This species, while mainly a salt-water bird in Massachusetts, formerly came into some of the fresh-water ponds in large numbers during northeast storms, and is still common in large bodies of fresh water in migration. According to Brewster it has been seen or taken on Spy Pond in Arlington, Fresh Pond in Cambridge and the Mystic ponds in Medford

and Winchester, and the older gunners had a tradition that large flocks of "Coots" used to come into Fresh Pond, and many were killed there.¹ Eaton says that at times it is abundant on the Hudson and is a common fall migrant on lakes Erie, Ontario and Champlain. Mr. James Savage refers to great flights of this species and the White-winged Scoter on Lake Erie, where they are abundant in October. He says that great numbers are killed there. In the fall flight of 1899 one gunner is said to have killed one hundred and nine in one forenoon, desisting for want of ammunition. On October 9, 1900, two brothers are said to have killed one hundred and five on Lake Erie, near Angola, Erie County, N. Y.² Mr. Charles E. Ingalls of East Templeton, Mass., says that the Scoter is seldom seen there, but was formerly common in fall after easterly storms. Mr. Lawrence Horton of Canton, Mass., says that all the Scoters formerly came to the ponds there in heavy northeast weather. Only a few come now, and, as a rule, they grow less each year. Mr. Herbert F. Chase of Amesbury says that the Scoters have decreased fifty per cent. in the last ten years in his vicinity. He has stopped shooting them now, as they are practically of no use, and he does not care to kill them for sport. He says, "I may be hungry enough sometime to relish Coot, but I hope not."

Reports received regarding the increase or decrease of this species come mainly from the coast counties, as it is now rare elsewhere. Seven observers report it as increasing in their localities, in Bristol and Barnstable counties, and forty-three as decreasing. These reports extend over an average period of nearly thirty years.

In migration this bird is often seen in flocks of one hundred or more, and in smaller groups at other times, but it associates with the other two species. Little is known about its early abundance, but it is probable that on the Atlantic it has decreased more in proportion to its former numbers than the other two common species. It is far more numerous now on the Pacific coast than on the Atlantic. So little is known

¹ Brewster, William: *Birds of the Cambridge Region*, 1906, p. 123.

² Eaton, E. H.: *Birds of New York*, 1910, p. 222.

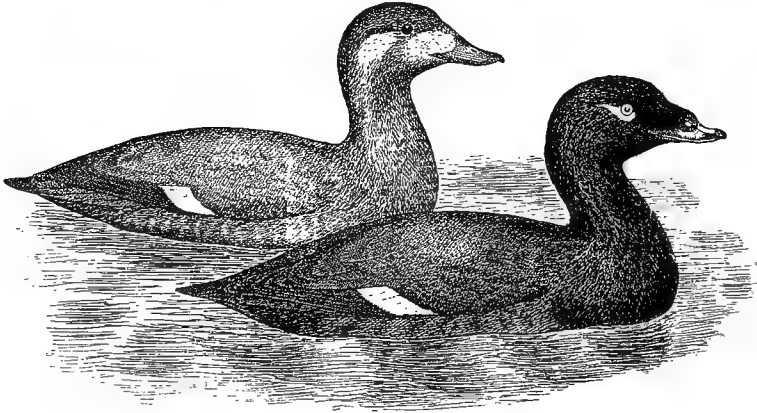
of its breeding grounds in northeastern North America, that Professor Cooke is obliged to reason, by exclusion, that as we have no record of its breeding west of Hudson Bay until we reach the Yukon valley, nor in Labrador south of about latitude 52 degrees, the multitudes seen in winter on the Atlantic coast must breed east of Hudson Bay, in northern Ungava. As this is one of the least explored regions of the world it is quite possible that vast numbers of Scoters and Mergansers breed there. It breeds mainly in fresh-water marshes and ponds in the north and also upon islands in the sea. It is a very expert diver, and is often able to get so nearly under water at the flash of a gun that the shot injures it very little if at all.

Its food consists largely of mussels, and when feeding on fresh water it prefers the *Unios* or fresh-water clams to most other foods. Thirteen Massachusetts specimens were found to have eaten nearly ninety-five per cent. of mussels; the remaining five per cent. of the stomach contents was composed of starfish and periwinkles. It is a common belief that all Scoters feed entirely upon animal food, but this is not a fact. Along the Atlantic coast they appear to subsist mostly on marine animals, but, in the interior, vegetable food also is taken. Mr. W. L. McAtee found the Scoters in a Wisconsin lake living almost exclusively for a time on the wild celery, but he does not state definitely what species of Scoter was represented there.¹

¹ McAtee, W. L.: Three Important Wild Duck Foods, Bureau of Biol. Surv., Circular No. 81.

WHITE-WINGED SCOTER (*Oidemia deglandi*).

Common or local names: Male: Black White-wing. Female and young: Gray White-wing. Both sexes: White-winged Coot; May White-wing; Eastern White-wing; Pied-winged Coot; Uncle Sam Coot.



FEMALE.

MALE.

Length. — 19.60 to 22.75 inches.

Adult Male. — Small patch below and behind eye, and wing patch white; rest of plumage black or brownish black; iris white; bill pinkish purple, reddish, orange, black and white; feet orange red or coral red and wine purple.

Adult Female. — Sides of head more or less flecked with whitish; wing patch white; rest of upper parts sooty brown or dirty gray; below grayish brown; iris deep brown; bill grayish black; feet brownish red. Trumbull¹ states that the adult female has a pink patch on the side of bill, but other authors disagree.

Young. — Similar, but no pink on bill; sides of head more or less whitish, divided sometimes, but not always, into two large spots by an extension of brown of neck up to eye.

Field Marks. — Size of Black Duck, black or dark brown. Hardly two authors agree in describing this bird. Some state that the female has two white patches on the side of the head, one near base of bill and the other behind eye; others say that only the young have these; others attribute them only to the young male, which usually has them. The descriptions of the coloration of the bill are widely different. The truth of the matter is that the individuals of the species vary so much in shape of fore part of head and bill, and in the distribution of the colors of bill and plumage, that the only safe field mark is the *white wing patch*, which no other New England Scoter has.

¹ Auk, 1893, p. 170.

Season. — Abundant migrant coastwise; September to June; a few summer; rare or absent in interior where formerly more common in migrations.

Range. — North America and eastern Asia. Breeds from the coast of north-eastern Siberia, northern Alaska, northern Mackenzie and northern Ungava south to central British Columbia, Alberta, northern North Dakota and southern Quebec; winters on the Asiatic coast to Bering Island, Japan and China, and in North America from Unalaska Island to San Quintin Bay, Lower California, the Great Lakes (casually to Colorado, Nebraska and Louisiana), and the Atlantic coast from the Gulf of St. Lawrence south (rarely) to Florida; non-breeding birds occur in summer as far south as Rhode Island and Monterey, Cal.

HISTORY.

The White-wing is one of the species which was once found in enormous numbers in most of our harbors and bays and all along our coasts, and as it was more of a fresh-water bird than the other Scoters it was more common in inland ponds and rivers. Mr. Israel R. Sheldon of Pawtuxet, R. I., says that hundreds of White-winged Scoters are shot from power boats and are put to no use. Ordinarily great numbers spend the fall, winter and spring about Cape Cod, or in the sounds and on the shallows to the southward, and in Connecticut, Rhode Island and New York waters. Many of these birds in fall come down the coast from the eastward, while others apparently reach Long Island Sound from the far northwest, and from there pass eastward to the vicinity of Cape Cod. Vineyard and Nantucket sounds are favorite feeding grounds. In April large flights of this species pass to the eastward along the coast on the way to their breeding grounds in Labrador and on the shores of the Arctic Sea. Later, usually about the middle of May, flocks may be seen toward night moving in a westerly direction. They appear, from the lateness of their migration, to be birds that breed in the far north or northwest, possibly in the ponds of the Barren Grounds in the arctic tundra or on the islands of the Arctic Sea. They are large, heavy, fully adult birds, and are called May White-wings by the gunners of Westport and Dartmouth. They are then mated and on the way to their breeding grounds. When migrating overland they start late in the day or at night, flying very high and due northwest, and probably do not

stop until they reach the Hudson River or the Great Lakes. Mackay says that this flight rarely begins before the second week in May; that the birds start at 3 o'clock P.M. or later and pass westward along the shore or over the sounds, often as far as Noank, Conn., before they begin to cross the country.

The White-winged Coot is the only Scoter that is usually abundant on the lakes of the interior in spring. There it seeks mainly fresh-water mussels. It gathers in large flocks over the beds of these mollusks in the Great Lakes, both in fall and spring, and even in winter when the lakes are open.¹ It breeds about ponds and lakes in the interior of the country from the northern United States northward. Though now rarely seen in the inland ponds and lakes of Massachusetts it was not very rare in certain ponds, lakes and rivers as late as the first part of the last quarter of the nineteenth century, and may still occur occasionally. Nuttall (1834) mentions this bird as "seen in Fresh Pond, Cambridge." Brewster says he can remember (1867 to 1872) when birds of this species used to alight there every autumn at daybreak, in both clear and stormy weather.² Mr. John H. Hardy, Jr., says that they still visit Spy and Mystic ponds. A flight is recorded in the autumn of 1895 at Cheshire Reservoir in Berkshire County.³ Apparently this abundant bird has decreased somewhat in numbers even on our coasts within thirty years. Only twelve Massachusetts observers report an increase in the numbers of this species and fifty-two report a decrease. As their reports cover an average period of about twenty-seven years, they deserve some consideration.

The stomachs of nine White-winged Scoters from Massachusetts waters, examined by Mr. W. L. McAtee, of the Biological Survey, contained of mussels, about forty-four per cent.; quahogs, twenty-two per cent.; periwinkles, nineteen per cent.; hermit crabs, nine per cent.; the remainder was caddis larvæ and algæ and other vegetable matter. Three birds from Nantucket had eaten only the common mussel (*Mytilus edulis*).

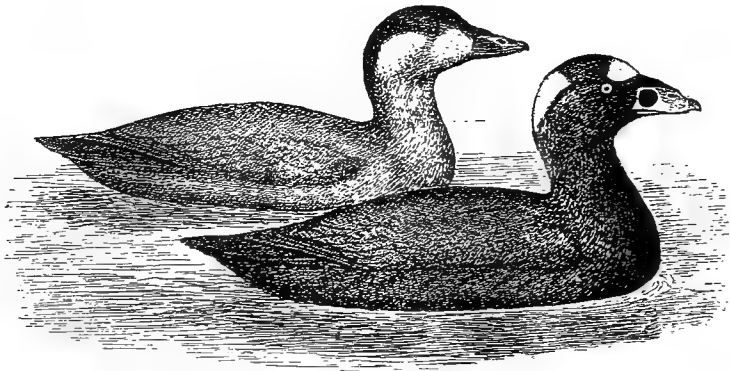
¹ Eaton, E. H.: Birds of New York, 1910, p. 223.

² Brewster, William: Birds of the Cambridge Region, 1906, p. 123.

³ Howe and Allen: Birds of Massachusetts, 1901, p. 56.

SURF SCOTER (*Oidemia perspicillata*).

Common or local names: Gray Coot; Horsehead; Skunkbill; Skunkhead; Skunk-top; Surfer; Google-nose; Patchhead; Patchpoller Coot; Pictured-bill; Plaster-bill; Snuff-taker; Butterboat-billed Coot; Butterboat-bill; Hollow-billed Coot; Brown Coot.



FEMALE.

MALE.

Length. — 18 to 21 inches.

Adult Male. — Triangular patch on forehead and longer one on hind neck white; rest of plumage glossy black, duller below; bill showing crimson, orange, scarlet, yellow, black and white; feet crimson and reddish orange; iris pearl white or pale cream.

Adult Female. — Top of head blackish, usually more or less grayish white on side of head below level of eye, sometimes divided into two patches; rest of plumage sooty brown, silvery gray below; feet, bill and iris dark.

Young. — Similar to female. Young males and possibly females have two patches of grayish white below level of eye, one before and the other behind it.

Field Marks. — Male distinguished from other Scoters by patch of white on hind neck. Female and young distinguished from White-winged Scoter by lack of white on wing, and from American Scoter by grayish white on side of head, sometimes but not always divided into two patches.

Season. — Abundant migrant coastwise; common to abundant in winter, rare in summer.

Range. — North America. Breeds on the Pacific coast from Kotzebue Sound to Sitka, and from northwestern Mackenzie and Hudson Strait to Great Slave Lake, central Keewatin and northern Quebec; non-breeding birds occur in summer in northeastern Siberia and south on the Pacific coast to Lower California, and in Greenland and south on the Atlantic coast to Long Island; winters on the Pacific coast from the Aleutian Islands south to San Quintin Bay, Lower California,

on the Great Lakes, and south casually to Colorado, Kansas, Iowa, Illinois and Louisiana, and on the Atlantic coast from Nova Scotia to North Carolina, rarely to Florida; casual in Bermuda; frequent in Europe.

HISTORY.

The Surf Duck is possibly the most numerous of all the Bay and Sea Ducks which frequent the New England coast, although the White-wing is a close second. These birds are even more plentiful on the Pacific coast, where until recent years they were rarely hunted. Nelson records a flock near Stewart Island, Alaska, which formed a continuous bed, sitting closely on the water all around the outer end of the island for about ten miles in length and from one-half to three-fourths of a mile in width. This was late in the breeding season, and the birds were apparently all males of this species. When they arose from the water the roar of their wings was like that of a mighty cataract. This was a remarkable host of birds, especially as they were all adult males, which, each fall, form a very small minority of the numbers of wild-fowl. Nothing like this is ever seen now on the Atlantic coast of the United States, and probably never will be seen again. Eleven observers in 1908 report an increase of this species in their localities in Massachusetts, while forty-six, mainly gunners of long experience, note a decrease. The few reports of increase come from all the coast counties except Dukes and Nantucket, but those of decrease come from all the shore counties. They cover an average period of nearly thirty years.

Early in September the adult birds of this species begin to appear in Massachusetts Bay on their southern journey. About the middle of the month the flight increases, and if the weather is favorable a good migration occurs during the latter third of the month. Near the last of the month young birds begin to appear, and large numbers may usually be seen on our coast before October 15. The main flight comes between the 8th and 20th, and they continue to pass on down the coast until near the latter part of December.

Mackay says that an easterly storm in the middle of August is likely to bring them along, but he has seldom seen

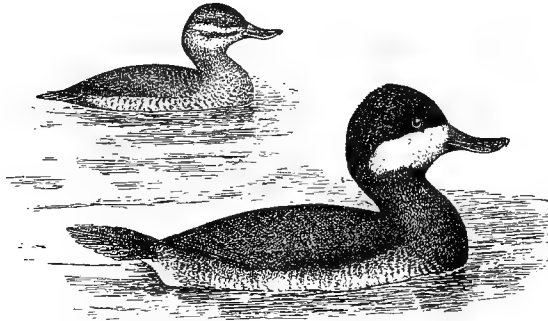
many at that time in fair weather. In migration this species ordinarily flies high, but, like others, it flies close to the water in strong, adverse winds. All Scoters often fly rather low in their daily flights on the feeding grounds. The great northward flight of this species begins rarely as early as the second week in April, but usually during the latter half of the month. Adverse weather sometimes delays it. The majority go east toward Nova Scotia, and these probably breed on the islands in the Gulf of St. Lawrence and on the coasts and islands of Labrador and Hudson Bay, as well as in the fresh-water ponds of the Labrador peninsula, where they are said to nest in larger numbers than the so-called fresh-water Ducks. Apparently there is a small flight of this species which leaves its winter resort south of Cape Cod in May and flies northwest overland. The birds composing this flight probably breed in the far north to the west of Hudson Bay, in the lakes and ponds of the interior or on the shores and islands of the Arctic Sea.

The "Coots" mate early, before the spring migration commences, and after they are mated if one be shot the other will follow it down to the water, and if frightened away will come back again. Therefore the gunner who understands their habits seldom fails to bag both. Mackay states that between April 15 and April 25 he has taken "eggs" from the ovary of the female that varied in size from that of a cherry stone to that of a robin's egg. This Scoter is an expert diver, and can swim such a long distance under water that it is easy for it to escape a gunner in a sailboat by constantly changing the direction of its flight under water. All the Scoters are hard to kill, and many a man has shot several times at a wounded bird before he has taken it. Sometimes a cripple, if pursued, will dive to the bottom, and seizing some marine plant with its bill will hold on and commit suicide by drowning rather than submit to capture by its greatest and most persistent enemy.

Nine Surf Scoters dissected by Mr. W. L. McAtee of the Biological Survey had eaten mussels, 79.6 per cent.; periwinkles, 13.8 per cent.; algæ and eelgrass, 6.6 per cent.

RUDDY DUCK (*Erismatura jamaicensis*).

Common or local names: Toughhead; Stiff-tailed Widgeon; Dipper; Dapper; Dopper; Bluebill; Broad-bill; Broad-bill Dipper; Hard-headed Broad-bill; Bumblebee Coot; Creek Coot; Spoonbill; Sleepyhead; Dunbird; Dumb-bird.



FEMALE.

MALE.

Length. — About 15 inches.

Adult Male in Breeding Plumage. — (Rarely seen in Massachusetts.) Cap black; cheeks and chin white; upper parts, throat and fore neck bright reddish brown; upper part of breast tinged with reddish brown; rest of under parts light silvery gray; tail brownish black, the quill feathers stiff and pointed; no white on wing; legs and feet ash; bill light blue and broad.

Adult Female and Male. — (As commonly seen in fall.) Top of head dark brown; a dusky stripe through whitish cheek (males have plain white cheeks in winter, Eaton); back grayish brown, with fine buffy bars; below silvery ash; bill dusky or bluish.

Young. — Resemble female; some specimens lack the stripe on cheek.

Authorities differ as to whether these are adult males, females or young.

Field Marks. — Size of Teal; figure short, plump, squatty; rather low forehead, thick neck; long broad bill curves upward. Prefers to dive rather than fly. Sometimes carries tail erect, but Scoters occasionally do so.

Notes. — A rather silent species, possibly hence the name Dumb-bird.

Nest. — In a slough or marshy place, generally on a mass of floating vegetation.

Eggs. — Six to ten, creamy or buffy white, about 2.50 by 1.80.

Season. — Rather common locally in autumn, late September to December; rarer in spring; a few summer; possibly some winter.

Range. — North America. Breeds from central British Columbia, Great Slave Lake, southern Keewatin and northern Ungava south to northern Lower California, central Arizona, northern New Mexico, northwestern Nebraska, southern Minnesota, southern Michigan, southern

Ontario and Maine, and rarely and locally in southern Lower California, Kansas, Massachusetts, valley of Mexico, Guatemala, Cuba, Porto Rico and Carriacou; winters from southern British Columbia, Arizona, New Mexico, southern Illinois, Maine, Pennsylvania and south to the Lesser Antilles and Costa Rica; rare in migration to Newfoundland and Bermuda.

HISTORY.

As long ago as the time of Nuttall the Ruddy Duck was much sought after for the markets of Boston, but no great decrease in its annual numbers was noted until within the past thirty years, when it began to be demanded by the markets of other parts of the country. In Wilson's time and until recent years it was almost never shot for market in the middle or southern States, and Wilson considered it rare because he never found a specimen in the markets. It came in numbers and fed unmolested among the decoy Ducks at the shooting stands; but during the latter part of the nineteenth century, when the bird came in fashion for the table, it became the custom for southern gunners to form a line of boats across a pond, river or inlet in which the Ruddy Ducks had gathered, and, advancing, drive out or kill most of them. As late as 1885 these Ducks were so numerous that Cape Cod gunners got from twenty to thirty a day, and twenty-five to thirty was the average bag to a boat near Chester, Pa. (Trumbull). Great quantities of these birds have been killed for food during the last twenty-five years along the Atlantic coast. Only nine Massachusetts observers (1908) report an increase in the numbers of this species, and fifty-five a decrease. Dr. John C. Phillips of Wenham says that the Ruddy Duck has decreased sixty per cent. in fifteen years on account of heavy market shooting in the south. The species has been decreasing steadily, and is in danger of extinction unless better protected.

The Ruddy Duck is an active, comical little fellow, with a broad bill and huge paddles. It is often addicted to the habit of carrying its tail cocked up, and when it swims low in the water, with the head well drawn back, tail spread and pointing in the general direction of its head, its appearance is anything but dignified. It is an interesting sight to see a large

flock disporting in a little pond. They are remarkably quick, and are at least as difficult to shoot on the water as the Buffle-head. In my boyhood days, when these birds were abundant, I fired at the members of a flock in a little pond until my gun-barrels were hot and my shells exhausted, without inflicting much damage to the Ducks. They will often remain in a pond until killed or so harassed that they are forced to fly, when they patter and splash along the water for a few feet before they can rise, although they rise readily from the shore. Sometimes when frightened or wounded they dive and hide in the water grass or sedge. The Ruddy Duck breeds normally in Massachusetts. Young birds, not able to fly, have been shot on Cape Cod,¹ and the bird has been taken in the breeding season at Cohasset, Wakefield and on the Charles River near Watertown. It has been taken in New Hampshire, also, in breeding plumage. It has been reported with young in the breeding season in New York, and as breeding in Washington County, Me.

It feeds largely on the roots and bulbs of aquatic plants. On the salt marsh it takes small univalve shell-fish.

¹ Miller, G. S., Jr.: Auk, 1891, p. 117. See also Deane, *Ruthven Am. Nat.*, 1874, Vol. VIII, pp. 433, 434.

MASKED DUCK (*Nomonyx dominicus*).

Length. — 13 to 14.50 inches.

Adult Male. — Chin, throat, front and sides of head to behind eye black; behind this mask chestnut red all round, brightest on back and lightening on belly to rusty yellowish; often more or less marked with darker above and below; white wing patch; bill mainly blue, black-tipped; feet dusky; iris brown, with a bluish ring; tail feathers long (4.50), narrow, stiff and pointed.

Adult Female and Young. — Sides of head buffy, turning to whitish on chin and fore throat; top of head, a broad streak from upper base of bill through eye (and sometimes another from lower base of bill through cheek) dark brown or blackish; back blackish, regularly barred with buff; plumage generally rusty dappled with dusky; a white wing patch as in male, but smaller; below washed with rusty.

Range. — Central and South America and the West Indies north to the Rio Grande or Mexican boundary of the United States. Accidental in this country; recorded from Texas, Wisconsin, Massachusetts, Vermont and Maryland.

HISTORY.

This bird is a mere straggler in Massachusetts. There is but one record; a male in full plumage taken August 27, 1889, in Malden. It was shot in a small pond of less than one acre, where it had been seen for more than a week, and is now in the C. B. Cory collection.¹

GEESE.

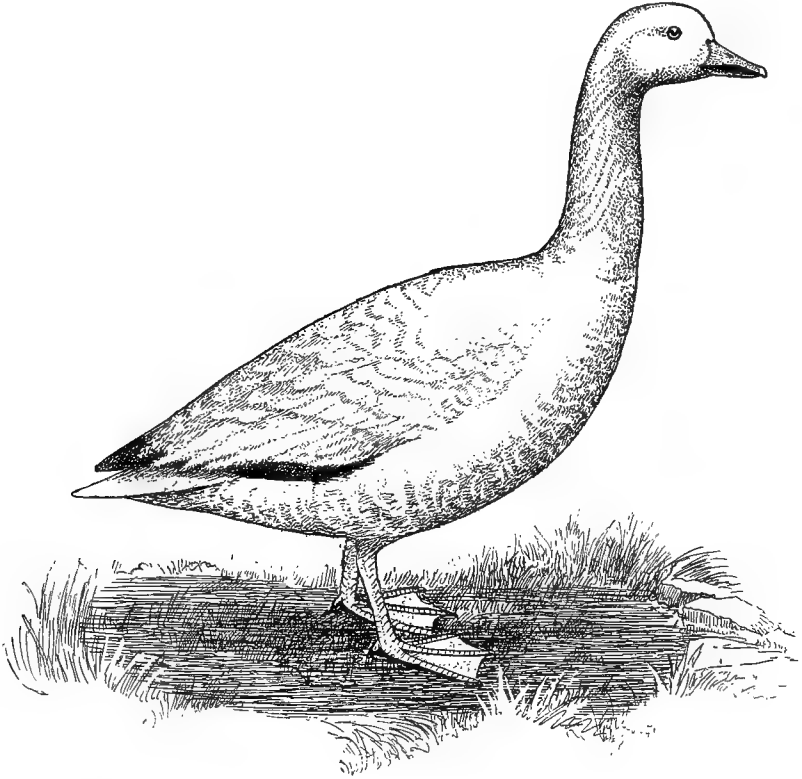
The Geese and the so-called tree Ducks (genus *Dendrocygna*) comprise the subfamily *Anserinæ*. The Geese are considerably larger than the Ducks; the legs and neck are longer and the body not so much flattened, and they are more at home upon land. They feed very largely upon grasses, grains and vegetable matter, and are valued for the table.

The Geese have no wing patch or speculum, and the sexes resemble each other closely. In size and length of neck they come between the Ducks and the Swans. They molt but once a year. With some few exceptions the plumage is not so varied as that of the Ducks.

¹ Cory, C. B.: Auk, 1889, p. 336.

SNOW GOOSE (*Chen hyperboreus hyperboreus*).

Common or local names: White Goose; Mexican Goose.



Length. — 23 to 28 inches.

Adult. — Plumage white; head and fore parts sometimes rusty; primaries black; bill dark red or salmon pink, black-edged; iris dark brown; feet red.

Young. — Head, neck and upper parts grayish; rump paler; under parts white; bill and feet dark.

Field Marks. — In the field this species is indistinguishable from the succeeding species. Both are white, showing black wing tips. The young appear white below, with grayish heads and necks. When flying high in migration the movement of the wings is often barely perceptible.

Notes. — A solitary softened honk (Elliot).

Season. — Usually a rare or accidental fall migrant; early October to December.

Range.—North America. Breeds from mouth of the Mackenzie east probably to Coronation Gulf and Melville Island; occurs on the arctic coast of northeastern Asia, but not known to breed there; winters from southern British Columbia, southern Colorado, and southern Illinois south to northern Lower California, central Mexico (Jalisco), Texas and Louisiana, and on the Asiatic coast south to Japan; generally rare in eastern United States.

HISTORY.

White Geese once visited the coasts of New England in enormous numbers. Hearne (1795) found them the most numerous of all birds that frequented the northern parts of Hudson Bay, and said that some of the Indians killed upwards of one hundred in a day. The early chroniclers of Massachusetts mentioned White Geese with the Gray Geese, and implied that they came in equal numbers. Wood (1629–34) says “the second kind is a White Goose, almost as big as an English tame Goose, these come in great flockes about Michelmasse, sometimes there will be two or three thousand in a flocke, those continue six weekes, and so flye to the southward returning in March and staying six weekes more, returning againe to the Northward.” From what is known of the distribution of the Snow Goose it is probable that these birds were mainly the Greater Snow Goose, which has a more eastward range than the Snow Goose. The Snow Goose must have mostly disappeared from Massachusetts during the seventeenth and eighteenth centuries, for Audubon (1838) states that Snow Geese are rare both in Massachusetts and South Carolina, although they pass over those States in considerable numbers. De Kay (1844) speaks of them as rather rare in New York. Turnbull (1869) says that they are rather rare in spring and autumn in Pennsylvania and New Jersey. Samuels (1870) states that they are rare on the New England sea-coast, and Allen (1879) records them as rare winter visitants. To-day the Snow Goose is rarely taken in Massachusetts waters; but White Geese have been seen in recent years in practically every county of the State, and still migrate in small numbers along our shores or across the State.

Mr. Sigmund Klaiber states that one or two flocks of forty or fifty are seen every year in Franklin County. Mr. Robert

O. Morris states that he has seen a Snow Goose twice near Springfield. Mr. Edwin Leonard says that one was taken several years ago and put with a flock of domestic Geese. Mr. William P. Milner of Concord, Middlesex County, says that there are a few left, and he believes that they are increasing. Mr. Charles J. Paine, Jr., has seen a large flock within a year. Mr. Alfred E. Gould of Malden has seen twenty in twenty years. Mr. Charles L. Perkins of Newburyport records one killed in December, 1908, and Mr. Herbert F. Chase of Amesbury states that they have been shot there three or four times within thirty years. Mr. Rockwell F. Coffin of Norfolk County saw them at Chatham in 1905. The species is reported in Plymouth County by Mr. B. T. Williamson, who says that he saw a flock six years ago, and by Mr. Wiley S. Damon, who has seen them but has not taken any. Mr. A. C. Bent and Mr. Horace Tinkham regard them as stragglers in Bristol County. Five observers report them as rare in Barnstable County. Mr. Isaac Hills of Nantucket says that he has not known of any killed there in twenty-five years. All these notes may refer to either this or the succeeding species. Dr. C. W. Townsend gives specific instances of the occurrence of this species in Essex County, and it is recorded in recent years from all the New England States and New York. Several flocks of White Geese have been seen and recorded by others in Massachusetts in recent years (see *Bird-Lore*). This species is still plentiful in some parts of the west and southwest, although Mr. J. D. Mitchell reports from Texas that he formerly saw great numbers in flocks on the prairie and now sees but from five to ten in the average flock, and Mr. A. S. Eldredge states that he "used to see great numbers there, but only saw one in 1908."

The bird is so conspicuous and receives so little protection that its chances for extinction are good, unless it is better protected. Also, it is often destructive to grain and grass in the west, and for this reason where it is numerous it incurs the enmity of the farmers, who welcome any one who will shoot it. It feeds more or less on berries and green vegetation.

GREATER SNOW GOOSE (*Chen hyperboreus nivalis*).

Length. — 30 to 38 inches.

Adult and Young. — Similar in color to the Snow Goose, but larger.

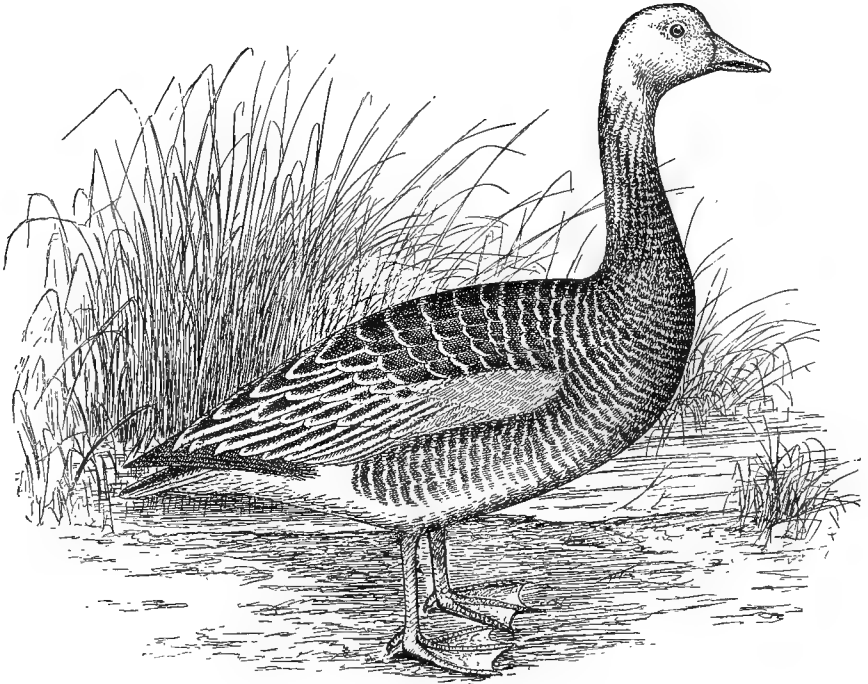
Season. — Formerly probably an abundant migrant in spring and fall; now only an accidental straggler, mainly in fall or winter.

Range. — Eastern North America. Arctic America in summer; full breeding range not known; but breeds in North Greenland, Ellesmere Land and on Whale Sound; winters from southern Illinois, Chesapeake Bay and Massachusetts (rarely) south to Louisiana, Florida, and in West Indies to Porto Rico; in migration rarely west to Colorado and east to New England.

HISTORY.

The earlier writers record White Geese in great numbers on the Atlantic coast from New England to the Carolinas, and from what we know of the present distribution of the Greater Snow Goose it is fair to assume that they were mainly of this species, as it is normally of the region east of the Mississippi, and not a far western migrant, like the preceding species. Morton (1632), who made a practice of hunting Geese at Wollaston, Mass., states that the White Geese were bigger than the Brant, and as Wood says that they were almost as big as tame Geese, the Greater Snow Goose probably made up the majority of those once so numerous in New England. Audubon says that he met with the Snow Goose in fall and winter in every part of the United States that he visited. What a change has occurred since his day! This Goose still appears in large flocks near Cape Hatteras and along Albemarle Sound (Elliot, 1898); but it is now merely accidental in New England, and there is no definite record of its capture in Massachusetts. It is less rare in New York than here; but Eaton gives only seventeen records of its occurrence there (1875-1910). It is not difficult to account for its decrease. When it is well fed no wild Goose can excel it in richness of flavor as a table fowl.

The Lesser Snow Goose, being usually strong or rank in flavor and more western in distribution, has not decreased so much. The conspicuousness of the larger species, its eastern range and its superior flavor account for its scarcity here.

BLUE GOOSE (*Chen caerulescens*).

Length. — About 25 to 28 inches.

Adult. — Back grayish brown; head, upper part of neck and rump bluish gray; wings same, shading to black at ends; flanks grayish brown; feathers tipped with pale brown; tail dusky, edged with white; under parts white; bill and feet purplish red.

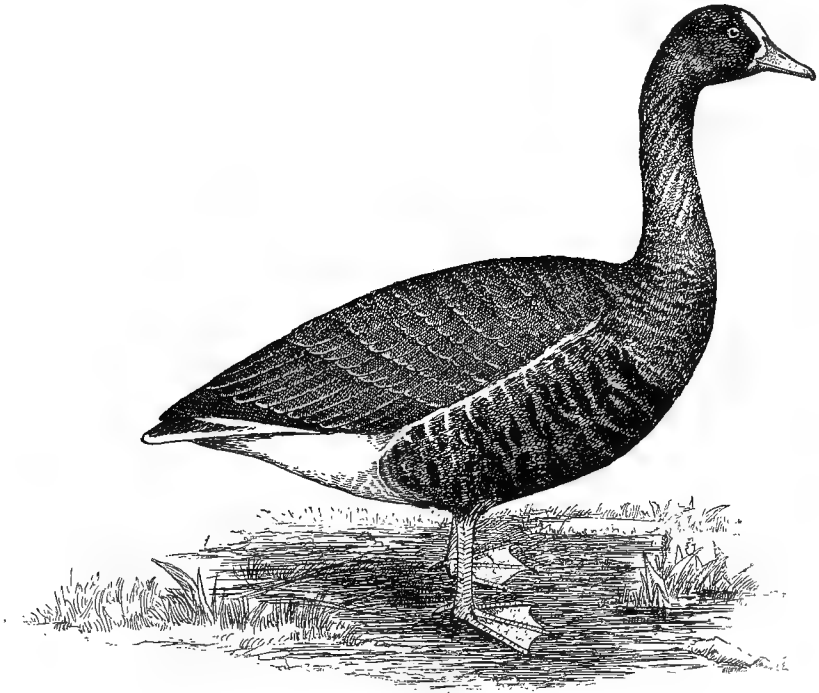
Young. — Like adult, except head and neck dark grayish brown; chin only white.

Range. — Eastern North America. Breeding range unknown, but probably interior of northern Ungava; winters from Nebraska and southern Illinois south to coasts of Texas and Louisiana; rare or casual in migration in California, and from New Hampshire to Florida, Cuba and the Bahamas.

HISTORY.

There is no reason to believe that this western species was ever more than casual here. A young female, shot at Gloucester, October 20, 1876, is now in the collection of the Boston Society of Natural History.¹

¹ Jeffries, Wm. A.: Auk, 1889, p. 68.

WHITE-FRONTED GOOSE (*Anser albifrons gambeli*).

Length. — 27 to 30 inches.

Adult in Fall and Winter. — Above brownish gray, the feathers paler on edges; forehead, fore face and after parts white; wings and tail dark; tail tipped and edged with white; under parts, except white ventral parts, brownish gray, with large blotches of black; a white or whitish line on upper edge of flank; bill pale carmine or pink, with white nail (the bill turns yellow in the breeding season); feet yellow; iris dark brown.

Young. — Similar but browner; markings more suffused, and without black blotches below or white on face; bill, eyes and feet as in adult, but bill has no white on tip.

Range. — Central and western North America and Pacific coast of Asia. Breeds on and near the Arctic coast from northeastern Siberia east to northeastern Mackenzie and south to lower Yukon valley; winters commonly from southern British Columbia to southern Lower California and Jalisco, and rarely from southern Illinois, southern Ohio and New Jersey south to northeastern Mexico, southern Texas and Cuba, and on the Asiatic coast to China and Japan; rare in migration on the Atlantic coast north to Ungava.

HISTORY.

The White-fronted Goose was formerly an uncommon spring and autumn migrant on our coast (Howe and Allen). Dr. J. A. Allen (1879) gives it as a rare migrant, spring and fall, and says that Dr. Brewer states that it was more common thirty or forty years ago, as was the case with many of our other Ducks and Geese. It is now regarded as a mere straggler on the entire Atlantic coast. There are but two definite records of its occurrence in Massachusetts. A male is recorded as having been shot in Quincy and presented to the Boston Society of Natural History (1849).¹ In Plymouth an adult male was shot November 26, 1897, by Mr. Paul W. Gifford; this specimen is now in the Brewster collection.² Boardman says that it occurs in Maine, and there are three New York records substantiated by specimens (Eaton).

It is known as a Brant in some of our western States, where it is abundant in migration. Formerly it was common as far east as the Ohio River, and specimens are likely to occur in Massachusetts.

The flight of the White-fronted Goose is similar to that of the Canada Goose. There is the same V-shaped formation, and at a distance it might be readily mistaken for that of the Canada Goose.

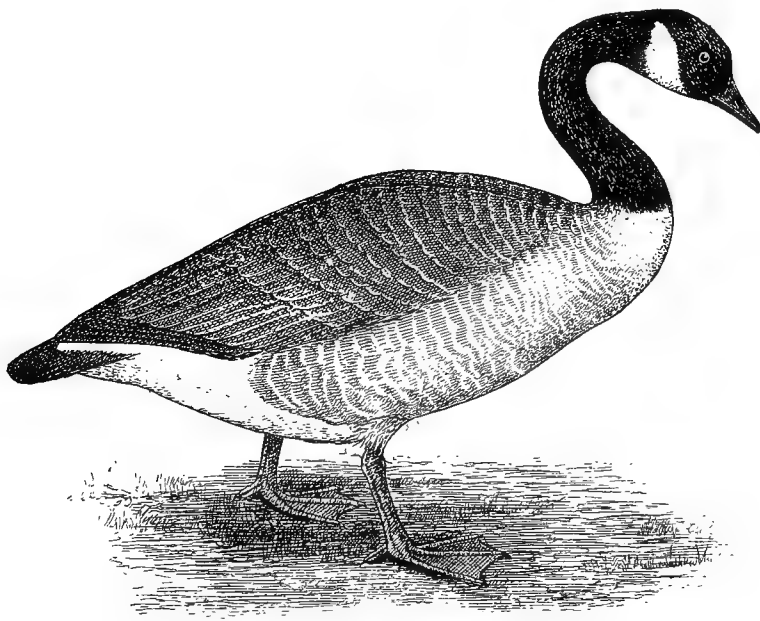
Audubon states that in Kentucky this Goose feeds on beech nuts, acorns, grain, young blades of grass and snails.

¹ Cabot, Samuel: Proc. Bost. Soc. Nat. Hist., 1851, Vol. III, p. 136.

² Brewster, William: Auk, 1901, pp. 135, 136.

CANADA GOOSE (*Branta canadensis canadensis*).

Common or local names: Wild Goose; Big Gray Goose; Honker.



Length. — 35 to 43 inches.

Adult. — Head and neck black; the white of throat extends up and back on sides of head; the body feathers with paler edges generally; back and wings brown; under parts ashy gray mainly; lower belly and under tail coverts white; tail black, base white.

Field Marks. — Black head and neck, with white cheek patches; great size distinctive.

Notes. — Sonorous, varied *honks*.

Nest. — Usually in marsh, rarely in trees.

Eggs. — Five to nine, dull pale greenish or whitish, about 3.50 by 2.50.

Season. — Common spring and fall migrant; rare in winter; a few recently have summered; early March to late May; late September to late December or early January.

Range. — North America. Breeds from Alaska and Labrador south to southern Oregon, northern Colorado, Nebraska and Indiana; formerly south to New Mexico, Kansas, Tennessee and Massachusetts; winters from New Jersey (rarely Newfoundland and Ontario) and British Columbia to southern California, Texas and Louisiana.

HISTORY.

There is no sound in nature more stimulating to the mind of the hunter than the call of the Wild Goose in the spring. When the returning sun has burst the icy bonds of our lakes and streams, and nature shows some signs of spring awakening; when the wood frogs begin to croak in the cheerless sodden pool, — then we hear far away in the twilight the free chorus of the Geese as they come coursing on the pathless air and steering toward the pole. The baseless triangle drifting across the sky stirs the blood of every beholder. The wild and solemn clamor ringing down the air turns the mind of the weary worker hemmed in by city walls to memories of open marsh, sounding shore, winding river and placid, land-locked bay. On they go, carrying their message to village and city, town and farm, all over this broad land.

Never shall I forget my first curious observation of their flight, when a little child at school. The great flocks came sweeping across the sky, and all the children welcomed them by pointing toward the zenith and calling "Geese! Geese!" as hour by hour the birds crossed our field of view from horizon to horizon. In those days, and for some time afterward, Geese were numerous in the migrations in most parts of the State, and sometimes flew very low. Now they are fewer in all except the eastern portions, and usually fly high out of gunshot; but even then they rarely alighted in our ponds and streams in daylight unless decoyed. The flocks of Geese which used to alight in the fields in early days were then a thing of the past, and no one could say, as Morton said (1637), "I have often had one thousand Geese before the muzzle of my gun." Wood (1634) states that the Geese came about "Michelmassé" in the fall, and sometimes two or three thousand gathered in a flock. They remained about six weeks and again about six weeks in spring.

Of all the observers reporting to me in 1908, only one man outside of the coast counties had seen any perceptible increase of Wild Geese in the last thirty years. Eighteen in the coast counties note an increase (recent in most cases) and eighty-

one report a fluctuating or continuous decrease in the numbers of this species. Other reports along the Atlantic coast, from Nova Scotia to South Carolina, also indicate a decrease; but locally, at least, reports of increase come from the latter State. Dr. J. C. Phillips, in a carefully prepared article on the autumn migration of the Canada Goose in Massachusetts,¹ computes the width of the coast autumnal flight at thirty-six miles, and the number of birds passing in this belt at thirty-four thousand three hundred and forty. The direction of the flight here seems to parallel the coast between Boston and Portland. He reckons the number of Geese shot at the various shooting stands in Massachusetts at nineteen hundred birds in 1908. This is not excessive shooting as compared with the score of a club in Currituck Sound, N. C., where over one thousand Geese were killed in the season of 1909-10.

Dr. A. S. Packard describes the decrease of Geese in Labrador, where Captain French saw Geese in enormous numbers in Old Man's Bight. Packard twelve years later (1890) did not see a Goose on the whole coast. The fact that the Geese have been holding their own so well along the Atlantic coast of Massachusetts for the past two decades may perhaps be explained partly by the betterment of conditions on one of their breeding grounds, the island of Anticosti in the Gulf of St. Lawrence. Formerly the island, which is about one hundred miles in length and larger than Long Island, N. Y., was inhabited by squatters and wreckers, who killed every Goose they could find during the breeding season. This island has many swamps, ponds and marshes, with little islands in them where Geese can breed nearly unmolested if not troubled by man. For years it was owned by Meunier, the French chocolate king, who evicted the squatters and maintained a colony of his own servants at every accessible landing or harbor. The island is now one vast protected nursery for water-fowl, and Geese have increased greatly there. The Geese bred on this island appear to cross the neck of the peninsula of Nova Scotia in their southward migration, whence, in company with flocks from farther

¹ Auk, 1910, pp. 267, 268.

north, they steer for the Massachusetts coast, usually crossing Cape Cod or Plymouth County. These flights are sometimes deflected out of their course by the wind, and thus the Goose shooting of Plymouth and Barnstable counties fluctuates from year to year. Practically all the Geese which come directly south across country to the Maine coast turn southwest and join this flight, which goes down along the coast of Massachusetts, and furnishes the Goose shooting of Essex, Norfolk, Plymouth, Barnstable, Dukes and Nantucket counties. The increase of Geese on Anticosti for the last twenty years probably accounts in part for the widespread belief along our coast that Geese are not decreasing. The sportsmen of Massachusetts owe much to the Meunier family for maintaining this great reservation for wild-fowl. It will be interesting to see what the effect will be when in the course of time this island passes into other hands. Another factor in maintaining the numbers of the coast flight may be the tendency of the birds to avoid danger in the interior by moving toward the coast. This would tend to decrease the interior flight and increase the coastal migration.

Many speculations have been offered by writers regarding the utility of the flock formation of this species. It is commonly held that the old gander, leading, breasts the air and overcomes its resistance, carrying it along with him, thus assuming the heaviest of the labor, and breaking, as it were, a way, like the foremost man treading out a path in the snow for his companions to follow, and those behind, each spreading a little to the right or left of the one preceding, have an easier task because of the work of the leader. The form of the Goose flight has one obvious advantage. Every bird in the flock, flying in a line parallel with the leader, can see what lies ahead, as there is no other bird directly before him, and this may be one reason why these wary birds almost always assume their "flying wedge" formation.

Geese evidently travel by well-known landmarks, and I believe they are never lost except in thick weather. I have known a flock to become utterly confused at night in a fog, and to wander about over a city square for a long time before

deciding where to go next. When Geese go south across the country they seem to use some hill or mountain near the shore for a landmark which they round, and then turn off and follow the coast. I believe they rarely if ever intentionally travel out of sight of land. Certain sea birds and shore birds can cross the sea even in fog without any landmark to guide them, but this seems to be beyond the power of Geese.

The autumnal migratory movements of this Goose seem to have less of a southeasterly trend than those of many Ducks. This species breeds throughout the northern parts of the continent to the tree limit, and even beyond in Labrador, where it nests on the arctic tundra. The flocks rush south in autumn until they reach unfrozen waters. In the spring they appear to follow the same route on their return.

The Canada Goose formerly nested in Massachusetts. The earlier explorers state that they found Geese nesting on islands along the coast. Samuels states that Wild Geese have bred several times on Martha's Vineyard and also near Lexington, Mass. They normally breed in this latitude, but only after they have attained the third year. The male does not incubate, but stays by the female and with her defends the nest against all assailants. The young are strong enough to eat, walk and swim as soon as they have hatched, and dried their plumage.

So much has been written about the habits of this bird that more would be superfluous. They feed largely on vegetable matter, the roots of rushes, weeds, grasses, etc., grass and many seeds and berries, and swallow quantities of sand as an aid to digestion. Geese feed either on shore, where they pluck up grass and other vegetation, or they bring up food from the bottom in shoal water by thrusting their heads and necks down as they float on the surface. Like the Brant, they feed on eelgrass (*Zostera marina*), which grows on the flats in salt or brackish water, in tidal streams and marshy ponds. Sometimes they are destructive to young grass and grain.

HUTCHINS'S GOOSE (*Branta canadensis hutchinsi*).

Common or local names: Little Gray Goose; Mud Goose; Short-necked Goose; Southern Goose (?).

Length. — Averaging about 30 inches.

Adult and Young. — Almost exactly similar to the Canada Goose but much smaller; occasionally a white spot on chin at base of bill and rarely a white ring on neck just below the black; tail of fourteen to sixteen feathers; the Canada Goose has eighteen to twenty.

Field Marks. — Like Canada Goose, but much smaller.

Notes. — Similar to those of Canada Goose.

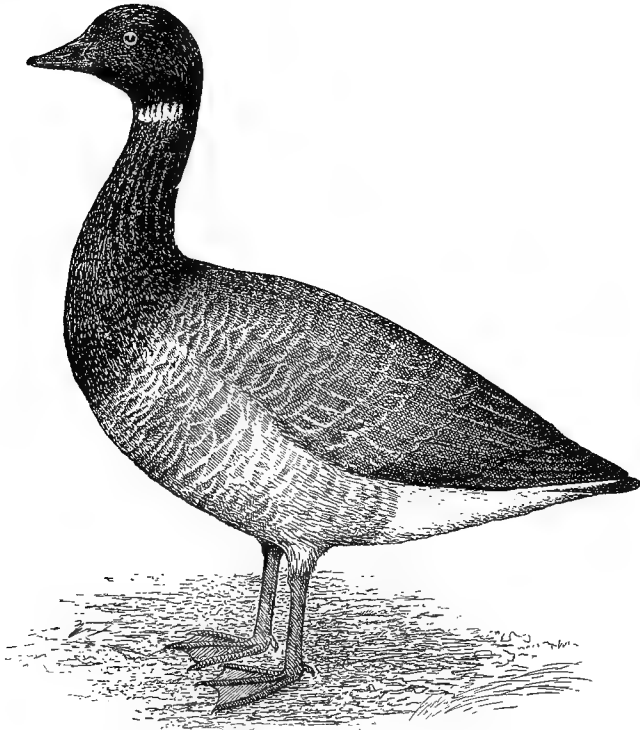
Season. — A rare or casual migrant at the same time as Canada Goose.

Range. — Western North America, mainly. Breeds on Arctic coasts and Islands from Alaska to northwestern coast of Hudson Bay and north to latitude 70 degrees; winters from British Columbia, Nevada, Colorado and Missouri south to Lower California, Texas and Louisiana; accidental in Vera Cruz; rare migrant east of the Mississippi valley region, but recorded on the Atlantic coast from Maine to Virginia.

HISTORY.

This is a smaller western race of the Canada Goose. It is generally regarded as a mere straggler here, and there are no definite records. It is not improbable, however, that it was formerly irregularly common here in times when water-fowl were generally plentiful. Dr. Brewer says that it was abundant in Massachusetts in the winter of 1836-37. He states also, in the *Water Birds of North America*, that at some seasons it has been found not uncommon in the neighborhood of Boston, and that numbers have been brought to market from Cape Cod. As it is so similar to the Canada Goose, and associates with it, it is no doubt usually regarded as merely a small specimen of that species. Some eastern gunners distinguish between the "long-necked Geese" and the "short-necked Geese." Rich states that he examined four of these "short-necked Geese," of which three were undoubtedly Hutchins's Geese.¹ Howe and Allen do not include it in their list of Massachusetts birds. It is included here only to call attention to the fact that it probably once occurred here, and as it is found in nearby States our gunners may find it here.

¹ Rich, Walter E.: *Feathered Game of the Northeast*, 1907, p. 270.

BRANT (*Branta bernicla glaucogastra*).

Length. — 23 to 26 inches.

Adult. — Head, neck and a little of fore part of body black; streaks of white in a small patch on the side of upper neck; back and wings brown; breast and flanks light ashy gray or brownish gray; belly white back of legs; tail black; upper tail coverts white; bill, feet and claws black; iris brown.

Field Marks. — Very small for a Goose; sooty black on head and neck, with small but conspicuous white patch on neck which can be seen at a distance with a glass. It flies in a more compact body than the Canada Goose or in irregular formation, with seemingly no chosen leader.

Notes. — A guttural *car-r-rup* or *r-r-r-ronk* (Elliot). *Ruk-ruk* (Hagood).

Season. — Abundant locally off the coast in migration, elsewhere rare or uncommon; March to early May, sometimes later; early September to early December. Some remain south of Cape Cod in winter, also off Long Island, N. Y.

Range.—Northern hemisphere. Breeds on arctic islands north of latitude 74 degrees and west to about longitude 100 degrees, and on the whole west coast of Greenland; winters on the Atlantic Coast from Massachusetts south to North Carolina; rarely to Florida; has been recorded in the interior from Manitoba, Ontario, Colorado, Nebraska, Wisconsin, Michigan, Indiana and Louisiana; accidental in British Columbia and Barbados.

HISTORY.

The Brant was formerly one of the most abundant of all the sea-fowl. The early historians mention it among the Geese which swarmed on the coast of Massachusetts when the colony was first settled. It found rest and shelter in every bay, harbor and estuary along our coast, where its principal food, the eelgrass (*Zostera marina*), grows upon the flats. The following notes from many authors will give some idea of its former status: Rare in New Hampshire, but in the Bay of Massachusetts found in great abundance (Belknap, 1793). Early in October they are seen to arrive about Ipswich, Cape Ann and Cape Cod in great numbers, continuing to come until November, and in hazy weather "they fly and diverge into bays and inlets" (Nuttall, Massachusetts, 1834). Early in October they arrive in large numbers; flocks continue to follow each other in long succession, and the gunners secure considerable numbers (Peabody, Massachusetts, 1838). Appears in great numbers on the coast of New York the first or second week in October; continues passing through until December (De Kay, 1844). In spring and autumn very numerous on our coasts, exceeding in number the Canada Geese and dusky Ducks (Giraud, Long Island, N. Y., 1844). Abundant (Turnbull, Eastern Pennsylvania and New Jersey, 1869). Found on coast abundantly (Samuels, New England, 1870). Common spring and autumn on coast (Maynard, Massachusetts, 1870). Not uncommon spring and autumn (J. A. Allen, 1879). "In former years were quite abundant at Montauk and in Gardiner's Bay on the west shore of Long Island, N. Y., and now they are much more scarce" (Leffingwell, 1890). Formerly very abundant along our eastern coast; have seen many large flocks in the bays of Long Island, but the persistent shooting

has diminished their numbers (Huntington, 1893). There is evidence that long before this time Geese and Brant had decreased in those waters. Prime (1845) makes the following statement in his history of Long Island. "Upon the return of cold weather, these [the wild-fowl] with the numerous progeny which they have reared, return and bespeckle the harbours and bays, which constantly resound with their untiring cackle. There is reason, however, to believe that some of these species, particularly the wild-geese, are greatly diminished in number, from what they were formerly. Many persons now living, can distinctly recollect the time when, both spring and fall, the passage of large flocks of geese over the island, at almost any point, was a matter of daily, and sometimes hourly occurrence. But now, it is a sight that is rarely witnessed. The same remark is applicable to a smaller species of fowl, though larger than the duck, commonly distinguished by the name of Brant. All the larger kinds of wild fowl are evidently scarcer, than they were formerly. The increased population of the country, and the improved skill and implements of gunning, probably account for the fact."¹

Old gunners have told me that Brant were very plentiful all along our shores sixty to seventy-five years ago. Mr. William C. Peterson, formerly of Marshfield, Mass., says that about the year 1855, during a southeasterly storm in the fall, *myriads* of Brant came in from seaward and flew up across Plymouth beach to Duxbury Bay. He has never seen such a flight since, but used to see more in fall than in spring. About Thanksgiving time in 1872, or thereabouts, more than one hundred big flocks came in during a storm; as near as he could estimate there were about ten thousand birds. He has not seen so large a flight since, and says they rarely see very many there now. Mr. Elbridge Gerry, a respected citizen of Stoneham, Mass, who hunted along the coast from 1835 to 1900, said (1904) that Brant were few of late years, even at Chatham, as compared with their former numbers. Dr. L. C. Jones of Malden says that Brant used to be common in

¹ Prime, Nathaniel S.: History of Long Island, 1845, Part 1, p. 21.

fall, flying at the same time with the Scoters. Now they are uncommon where he shoots. He saw a flock of about fifty at Sandwich in the fall of 1907, and a small flock in 1908. Daniel Giraud Elliot, author of standard works on wild-fowl, shore birds and game birds, who has had perhaps as long and varied experience with the wild-fowl as any man now living, says (1898) that constant warfare against the Brant has greatly depleted their numbers, and in many places where they were once numerous they are now seen in small bodies or are absent altogether.

Comparatively few observers reported to me in 1908 on the Brant, as it is commonly seen in but few localities. Fifteen noted the species as increasing in numbers and forty-one reported it as decreasing. Thirteen of the fifteen reports of increase came from Barnstable County. The reports point to the well-known fact that on the New England coast the Brant has concentrated now at a few outlying points, such as Chatham, Monomoy, Nantucket, Muskeget, and Point Judith. Many years ago they were abundant in the waters about Cape Ann, in Boston harbor, on the south shore, in Buzzards Bay, and, in fact, all along our coast. They were formerly plentiful at Brant Point on Waquoit Bay. A point of the same name in Nantucket harbor and Brant Rock on the south shore are said by old residents to have been famous for the Brant that frequented them in olden times. Mr. Henry V. Greenough of Brookline says that he judges that the Brant have decreased about Monomoy perhaps one-third in his time. He says that perhaps the reduction in the birds may be laid to the great increase in power boats, which frighten the birds away to a long distance, and they are less prone to stay several weeks, as they used to. Dr. Henry B. Bigelow of the Museum of Comparative Zoölogy says, "formerly Brant were very abundant in winter in all the salt broad-waters from Chincoteague, Md., to Cape Hatteras. On the eastern shore of Virginia, Brant have been very much reduced in numbers. We might suppose that this reduction was due to the increased oyster business and to other disturbances of their feeding grounds. Were this true, we should expect to find their num-

bers increased in Pamlico Sound; but this is not the case. Here, again, Brant, which were formerly among the most plentiful water fowl have decreased noticeably in the last five years, especially in the northern part of the sound. So true is it that at the Pea Island Club, of which I am a member, it is now hardly worth while to set out for Brant, although a few years ago we regularly had excellent Brant shooting. We might explain the decrease as due to some change in natural conditions, but, within a radius of forty miles of Ocracoke Inlet, probably the main wintering ground for Brant to-day, no increase in numbers is noted. On the contrary, all my inquiry among sportsmen, market gunners and club superintendents, gets but one answer, — a serious decrease.”

All the above seems to indicate that Brant, which were once so numerous that they were obliged to scatter along the coast to find sufficient suitable feeding grounds for their wants, have now been so reduced in numbers that a few isolated localities give ample accommodation for all that are left; and as practically all the Brant in North America visit these few localities in migration, they crowd them so that the impression is given there that they have not decreased in number, and have even increased. This is a condition analogous to that of the Passenger Pigeon, when in 1888 a great part of the species seemed to have concentrated in a few localities in Michigan. There they seemed at that time more numerous than ever, yet now the species is believed to be extinct.

On the other hand, we have the testimony of many of the Chatham and Monomoy Brant shooters, who follow Warren Hapgood in the belief that Brant are as plentiful as ever. While Hapgood did not deny that the Brant had probably decreased since the settlement of the country, he insisted that his experience of thirty-five years at Monomoy and Chatham convinced him that the birds had not decreased in his time, although he had seen a great decrease in Black Ducks during those years. Mr. Orville D. Lovell quotes arctic explorers and statements made to them by the Eskimos as proof that Brant are as numerous as ever in the arctic

seas, and he assures me that they are as plentiful as ever in Long Island waters. It is quite beyond the limits of probability, however, that the Brant could have maintained their numbers during the centuries of settlement without any protection whatever, — and they never have had any along their route of migration until quite recently. From the time that they reached Hudson Bay on their journey southward until they returned again to the Arctic Ocean they were pursued by the whites wherever they stopped to rest, and Eskimos hunted them during their breeding season in the north.

A glance at their line of migration will explain their appearance in numbers at points on the Atlantic coast. The breeding range of the White-bellied Brant is not well known, but it is believed that it breeds mainly if not entirely in the easterly portions of the northern part of the North American arctic archipelago. The Brant arrive late in May or in early June on the northwest coast of Greenland, and breed northward probably as far as land extends. In these remote regions ice begins to make late in August or early September, and in September the Brant move southward, passing down the Boothia peninsula and the west coast of Hudson Bay, from whence they apparently cross the Canadian wilderness to the Gulf of St. Lawrence. Reaching the shore of the gulf, they turn eastward toward Anticosti and Prince Edward islands. They then proceed across the neck of the peninsula of Nova Scotia, down the Bay of Fundy, and steer direct for the outer shore of Cape Cod. Sometimes they are deflected by the wind and run on to the Massachusetts coast, but they usually round the cape and pass Nantucket, touching afterward only at outlying points on the coast until they reach Virginia and North Carolina, where most of them winter, although many winter at points farther north and some in Massachusetts waters. The spring migration begins here about the last week in February or the first of March, and continues on the average six weeks or more. In April large numbers have reached the Gulf of St. Lawrence, crossing Prince Edward Island. Mr. E. T. Carbonnell writes me that the Brant arrive at Prince Edward Island in spring,

nearly always in the night, and that the dates when the large flocks leave Cape Cod coincide with the dates of their arrival at the island. About June 1, those in the district around Charlottetown (which probably comprise a great part of the Atlantic coast flight) begin to assemble in Hillsborough Bay, outside of Charlottetown harbor, on the south side of the island. Here they gather between St. Peters and Governor's islands, in preparation for their northern journey. From June 10 to 15 they leave in large flocks. Sometimes four or five such flocks follow one another, about a mile apart. They start northward, enter Charlottetown harbor, proceeding about two miles toward the city, then turn to the westward up West River, which they follow to near its head, when they wheel to the northwest and cross the island heading for the Gulf of St. Lawrence. Mr. Carbonnell is informed that they sometimes turn eastward and go up East River until near Mt. Stewart, when they turn northward and cross a neck of land to Tracadie Bay, on the Gulf of St. Lawrence. Possibly the choice of routes may depend on the direction of the wind.

Here observers agree that they fly to the west or southwest and go up the Gulf of St. Lawrence, finally turning overland on its northern shore. How the Brant reach the Arctic Ocean from this point is still their own secret. They are never seen in spring on the west shore of Hudson Bay. Possibly they may go up the east shore of the bay or cross the peninsula to the shores of Ungava. The average date on which the flocks reach the Gulf of St. Lawrence (latitude 46 degrees) is March 23, and they reach latitude 79 degrees about May 30, — an average speed of thirty-four miles per day (Cooke).

The most northern record of the Brant according to the same authority, is latitude 82 degrees 33 minutes, on the north coast of Grinnell Land. In this route of migration we have an explanation of the great apparent numbers of the Brant. Practically all the individuals of the species collect from a great area beyond the arctic circle and concentrate upon one line of flight along the Atlantic coast. The individuals of the Black Brant collect in a similar manner for a similar flight

down the Pacific coast. On this line of flight each of these species when so concentrated will always appear very numerous until they approach extinction, and particularly so when they are driven away from all but a comparatively few feeding grounds. If, during the recent scarcity of the Ruffed Grouse, all the Grouse of the species in North America had been collected and concentrated off Monomoy, the natives there would have been convinced that Grouse had increased rather than diminished in numbers. There are practically no Brant in North America during the migrations except on these two coasts. A few stragglers are met with rarely on ponds near the sea-shore, but Brant are rare always except on salt water. The so-called Brant seen in the middle west are other species of Geese. After the flight of Brant passes Nova Scotia on the southward journey, they rarely fly over any extent of land, but keep off the coast, avoiding even the points as much as possible.

While formerly tame and unsuspecting, this bird has learned wisdom by experience, and by keeping off shore and avoiding the vicinity of mankind it succeeds in holding its own much better than most edible water-fowl. It seeks isolated and extensive flats where the eelgrass grows, and where, although the water is shallow enough to enable it to feed by thrusting its head to the bottom and pulling up the roots of this plant, it can still find sufficient food at a long distance from the dangers of the shore. Floating batteries and decoys are still used in some States for its destruction, and in the south it is hunted by jack light at night, although this method is illegal in most States.

The Brant has one weakness — its fondness for sand. Large quantities of sand seem to be absolutely necessary for the proper digestion of its food, and the gunners assert that before attempting a long migratory flight the Brant alights on beach or bar and “takes in ballast” for the trip. This is the gunner’s opportunity, and a sunken box on a sand bar or point, surrounded with decoys, is the favorite shooting stand for Brant in Massachusetts. Hapgood gives a record of forty-four birds killed from one of these boxes *at one shot*, and states

that one thousand or fifteen hundred were killed in a season. This was many years ago, before the formation of the Brant clubs. No such number has been killed in recent years. The average number killed by the members of the Monomoy Branting Club for thirty-four years, during the Hapgood régime, is a trifle over two hundred and sixty-six birds per year. The members of the branting clubs state that only a few Brant (less than five hundred) have been killed annually in recent years in Massachusetts under a law which denied the birds protection, and that therefore no protection should be given them; but Mr. John M. Winslow of Nantucket says that under the policy of no protection probably four hundred or five hundred Brant were killed annually on Muskeget Island. The official figures of the Commissioners on Fisheries and Game show that two hundred and sixty-three Brant were killed on Nantucket in 1907, but probably the average number killed would be less than one hundred per year. Including those taken on Martha's Vineyard, Cape Cod and the entire Massachusetts coast, the number taken yearly is not excessive in the autumnal flight. Quite a number of Brant are now killed in the fall; but spring protection protects. In spring more Brant usually stop on the Massachusetts coast than in fall. They stay longer, the weather for shooting is better and the birds are not so much disturbed by scallop fishermen, etc. On the other hand, the experienced birds in spring are more shy and more difficult to take than the inexperienced young in fall.

Brant are well protected in summer by the inaccessibility of their breeding grounds. Few white men have ever seen them there. On the other hand, the very remoteness of their nesting places in the far north exposes their young to destruction. The adults have but three months at most to nest, deposit their eggs and hatch and rear their broods; the actual period in which they can rear the young after hatching is often not much, if any, over six weeks. Severe and unseasonable storms which occur in the polar summer or early fall sometimes must destroy the increase of the season, or force the parents to fly south, leaving the young to

their fate. In some seasons practically no young birds appear. A succession of such seasons with unchecked shooting might reduce the Brant to the verge of extinction.

When it is considered that the Brant has been hunted for centuries little seems to be recorded about its food and habits. Hapgood says that in confinement it eats dead wood and feeds readily upon corn, but it never has been known to breed. It does not dive for its food, but will dive well when wounded, and swim under water. At low water it tears up eelgrass, and after the tide rises continues feeding on what it has torn up. In the north it is said to feed on grass and berries, and at times it takes mollusks and other small marine animals. Its flesh is considered excellent, but its quality depends on the season and its food.

BLACK BRANT (*Branta nigricans*).

Length. — About 25 inches.

Adult. — Similar to Brant but darker; black of head and neck not ending abruptly on breast, but extending in a wash over flanks and much of belly; broad white collar on neck, interrupted behind; lower parts white behind.

Range. — Western North America. Breeds on arctic coast and islands from Point Barrow near mouth of Anderson River north to Melville Island; common on Siberian coast; winters on Pacific coast from British Columbia to Lower California; in interior to Nevada and on Asiatic coast to Japan; recorded as a straggler to Massachusetts, New York and New Jersey.

HISTORY.

The Black Brant is a Pacific coast species which breeds on the coast of northeastern Siberia, northern Alaska and in the western part of the North American arctic archipelago, and migrates south in vast numbers along the Pacific coast. It is accidental here. There is a single record in Massachusetts of a bird taken at Chatham in the spring of 1883.¹ There are three New York records (Eaton). Our eastern Brant is sometimes called the Black Brant, but this is an error.

¹ Cory, C. B.: Auk, 1884, p. 96.



PLATE VI.—BARNACLE GOOSE.

From a photograph by W. E. Freeman, made from his painting of the only specimen recorded from Massachusetts.

BARNACLE GOOSE (*Branta leucopsis*).

Length. — About 28 inches.

Adult Female. — Front and sides of head, chin and throat white; dark line from base of bill running back to eye; rest of head and neck black, the black extending on upper back and fore breast; shoulders and wing coverts gray, feathers tipped with black and white; rump and tail black; upper and under tail coverts, sides of rump, belly and lower breast white or whitish, the flanks shaded with gray; quills dusky.

Adult Male. — Duller than female; iris hazel brown; bill, feet and claws black.

Young. — White face, speckled with black; general plumage suffused with rufous brown, more or less marked, according to age.

Range. — Northern part of Old World. Breeds in northern part of eastern hemisphere as far north as Spitzbergen; winters in Great Britain and western Europe, occurring south to Spain; occurs in Iceland, and in migration on both coasts of Greenland; recorded from Ungava, Ontario, Quebec, Vermont, Massachusetts, New York and North Carolina.

HISTORY.

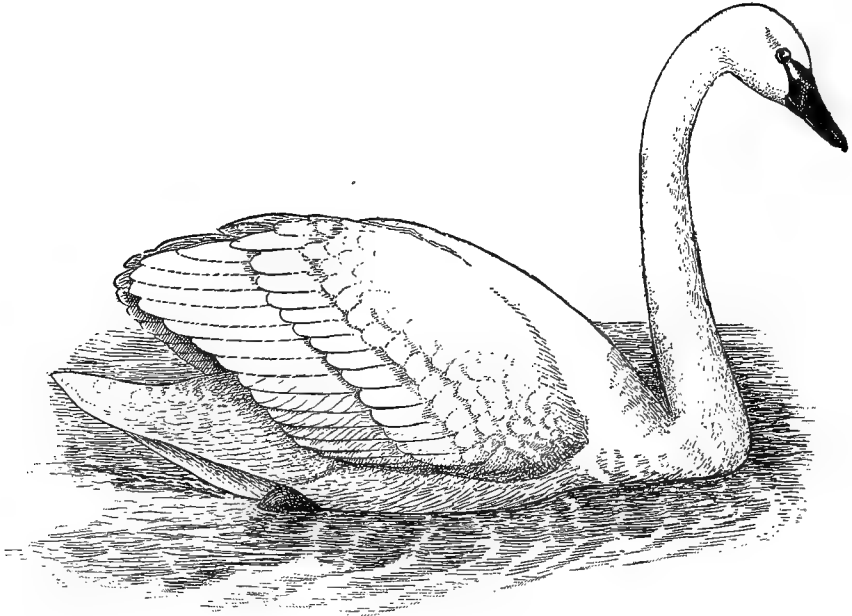
The Barnacle Goose is a wanderer from the Old World. One is recorded as having been killed at North Chatham, November 1, 1885, and mounted by N. Vickary.¹ Mr. J. A. Farley informs me that this specimen was shot at North Eastham, out of a "bunch of three or four presumably of the same species," by Joseph Dill. It is now in the Brewster collection.

Mr. Warren E. Freeman, who secured this specimen for the collection, made a painting of the bird, from which the plate facing this page is taken.

SWANS.

The Swans comprise the subfamily *Cygninæ*. They are among the largest of all water-fowl. They are distinguished by the long neck, the bare space from bill to eye and the exact similarity in color of the two sexes. They are less at home on land than the Geese, but are very graceful and elegant upon the water. Some Swans have resonant voices, while others are mute. In New England we have now but one species, which has nearly disappeared.

¹ Ornithologist and Oölogist, January, 1886, Vol. 11, p. 16.

WHISTLING SWAN (*Olor columbianus*).

Length. — 50 to 55 inches.

Adult. — Bill as long as head; feathers on forehead end in semicircular outline; nostrils extend forward beyond basal half of bill; plumage pure white, sometimes with rusty spots on head, neck and body; beak white; feet black; lores black, with orange or yellow spot before eye.

Young. — Gray; sometimes lead color first year; bill reddish. Second year, plumage lighter; bill white. Third year, plumage white, gray mottled; bill black. Plumage all white about fifth year.

Notes. — Principally a high “flageolet-like” note; very different from the trombone-like tones of the Trumpeter. Varied murmurings from high to low, but with less volume than those of the Trumpeter Swan; the leader of the flock calls *whō-whō-whō* in a very high key, and in response comes a chorus of weird sounds (Elliot).

Season. — Rare straggler in spring, autumn and winter; formerly abundant.

Range. — Formerly North America, from the latitude of Georgia to the coasts and islands of the Arctic seas; now rare or absent on the Atlantic seaboard north of Chesapeake Bay; breeds in Alaska and on Arctic islands from about latitude 74 degrees south to northern Mackenzie and northwestern Hudson Bay; winters to Louisiana, Texas and South Carolina, rarely to Florida; casual in northern Mexico; accidental in Scotland and Bermuda.

HISTORY.

The Swans, which once in great numbers frequented the rivers and estuaries along the Atlantic coast, from New England to Georgia, probably were mainly of this species, for it lives in preference nearer the sea than does the Trumpeter, which breeds mainly near the fresh marshes and about the lakes of the interior, while the Whistling Swan nests upon the shores and islands of the Arctic Ocean. Perhaps this species bred in early times on the northern coasts of Labrador or on Baffin's land and other lands to the northward, and the "greatest store of swans" which Morton and other writers speak of as frequenting New England may have been recruited partly from this source; but by the middle of the nineteenth century man's persecution had either killed them off or driven them away, so that they had become rare in New England. Up to that time, however, flocks of this species were seen occasionally on the coast of Massachusetts, and though they are now so rarely seen as to be ranked as accidental or casual visitors, a few still pass over the State or along our coasts. They are almost never taken here now, unless driven by severe storms to alight.

Fleming (1906) states that this species is rare now in Ontario, Can., and probably only accidental. He has seen only two dead birds and two specimens in the collection at Trinity University which were probably taken in Ontario.¹

In the early days Swans wintered much farther north than they do now. They were seen in winter about Lake Ontario, as well as on the New England coast. Mr. J. F. Lebaron, a well-known sportsman, stated (1879) that Swans were seen occasionally at Ipswich in former years. Maynard records them as rare in winter.² They sometimes wintered on the Island of Nantucket. Now they rarely are seen in the northern States in winter. They are decreasing in the Chesapeake, but are increasing in Currituck Sound, N. C. This increase of the Swans in southern waters has given rise

¹ Fleming, James H.: *Auk*, 1906, p. 446.

² Maynard, C. J.: *The Naturalist's Guide, with a complete catalogue of the birds of eastern Massachusetts*, 1870, p. 146.

to the mistaken idea, now held by many intelligent gunners and sportsmen, that the numbers of Swans are increasing. The Whistling Swan has been driven farther south year by year, until all its flocks are crowded into a region perhaps not one-tenth as large as the one formerly occupied by them, and in consequence they seem to be increasing there. In reality the species is decreasing steadily in numbers. Every year the increase of population in the southwest tends to render that region more unsafe for the Swan. Mr. J. D. Mitchell writes from Victoria, Tex., that forty years ago the bays and estuaries were full of Swans, and that he has seen more than a thousand at a time, not only in one locality but in several counties. He has not seen one now in more than ten years. Preble (1908) says that this species formerly was abundant in the Athabasca-Mackenzie region, where it bred. Now, he says, it passes through the region in small numbers, breeding only in the far north.

The records of the traffic in swan's-down tell the story. Sixty or seventy years ago, while the birds were still abundant in the fur countries, about five hundred skins were traded annually at the Hudson Bay Company's post at Isle à la Crosse, and about three hundred annually were taken at Fort Anderson during the five years of its existence. MacFarlane states that between 1853 and 1877 the company sold seventeen thousand six hundred and seventy-one Swan skins. The number sold annually went from one thousand three hundred and twelve in 1854 down to one hundred and twenty-two in 1877. From 1858 to 1884, inclusive, Athabasca district sent out two thousand seven hundred and five Swan skins, nearly all from Fort Chipewyan. Mackenzie River district furnished twenty-five hundred skins from 1863 to 1883. In 1853 Athabasca turned out two hundred and fifty-one; in 1889 the output had dwindled to thirty-three. In 1889 and 1890 Isle à la Crosse sent out but two skins for each outfit. The rapid decrease of those birds, says Preble, is well illustrated by these figures.¹

¹ Preble, E. A.: North American Fauna, Bureau of Biol. Surv., Dept. of Agr., 1908, No. 27, pp. 309, 310.

These skins were taken from both species, but Nuttall says that the Trumpeter furnished the bulk of them. When it is considered that from all this vast region the Hudson Bay Company collected in the best year given only one thousand three hundred and twelve Swan skins, and that in the old days thousands of Swans were seen in a flock, it is plain that this traffic cannot be held entirely responsible for the decrease of Swans; it could have been but a small factor in producing that result. The killing of Swans by Eskimos and Indians in August, when the birds are unable to fly, is a drain on their numbers; but that has been customary from time immemorial, yet there were multitudes of Swans when the white man came.

We cannot, if we would, evade the fact that the white man and his gun are the chief factors in the destruction of the Swan. The Trumpeter suffered first and most, because it bred in the United States and Canada, directly in the path of settlement. The Whistling Swan suffered less, because it nested mainly on the shores of the Arctic Sea, and in the great lands in that sea where white men rarely go. The only safety for the Swans in passing over the settled regions in their flight to the south is to rise high in the air, with favoring winds, and never rest until they have flown twelve hundred or fifteen hundred miles, passed over the teeming villages and cities of the north and reached the more secluded and safer waters of the south. Unfortunately for them, however, they are still prone to alight to rest in isolated lakes and ponds, where often they are waylaid by the hunter. If a storm overtakes them and they have to fly below the clouds to see their way the wearied birds are sometimes beaten to earth by sleet, or are forced to alight in some stream. In such cases they are hardly accorded the hospitality usually extended to storm-beaten travellers; instead, the people turn out to slaughter them.

Sennett describes an occurrence of this kind which took place in northwestern Pennsylvania, March 22, 1879. The Swans, overweighted with sleet and snow, came down in many places in Crawford, Mercer, Venango and Warren

counties. They settled in ponds, streams, fields or villages in an almost helpless condition. Guns, rifles and clubs were brought into play; a large number of the birds were killed and many were captured alive (twenty-five in one village), but all were killed later for their feathers and flesh. Most of the Swans which alighted within sight of human habitations were slaughtered, only a few escaping.¹

Occasionally they find safety during a storm by alighting on the great lakes, under the lee of some point or island. Rarely, a wearied, storm-beaten flock alights in Niagara River and is swept over the falls, where it meets with the usual reception.

There was a great slaughter of Swans at Niagara Falls, March 15, 1908; one hundred and twenty-eight birds were taken out of a flock that had been swept over the falls. On the morning of March 14 a flock of three hundred or four hundred Swans alighted in the upper Niagara River. All day Swans were seen floating down the river with the current, till danger of being swept into the Canadian Rapids caused them to rise and fly back to their starting point. Below Horseshoe Falls the water was breasted by a struggling mass of swans. The majority of them were carried by the current to the ice bridge, and either cast up or ground against it by masses of floating ice. Some were already dead, many were injured and the rest stunned and unable to help themselves. People came in crowds and killed all that could be reached with clubs, and the rest were shot. At least one hundred birds were slaughtered or picked up dead between the falls and the ice bridge; none escaped alive. On the 18th, three more Swans were taken, and on the 22d, twelve more came over the falls, eleven of which were taken. Others were taken in 1906 and 1907.²

There is little safety for a Swan in America unless it is high in the air or has a mile of open water all around it. When the shotgun will not carry far enough the long-range rifle is brought into play. If the Swan alights on a game preserve

¹ Sennett, George B.: Bull. Nuttall Orn. Club, 1880, pp. 125, 126.

² Fleming, James H.: Auk, 1908, pp. 306-308.

in the north it is shot because it is rare, and is wanted for a "specimen;" if it alights in New England, and is seen, it rarely gets away.

The great Swan shooting ground now is Currituck Sound. Here the birds find open water, food is plentiful and they are far less harried than on Chesapeake Bay. This is the secret of their increase there, and they will probably continue to maintain their numbers there for years, provided the conditions remain favorable.

There are a good many records of the occurrence of Swans in New England. Mr. Robert O. Morris of Springfield, Mass., saw one at Longmeadow "more than twenty years ago." Mr. John Daland, Jr., of Salem says that one was seen at Plum Island about 1885. About 1888 Mr. George Linder saw a flock of over twenty Swans flying very high over Newton, Mass. A small flock was seen on the Charles River in 1891.¹ A Whistling Swan was killed at Flatlands, within the limits of Greater New York, by Asher White, December 24, 1901.² Six on November 28, 1902, and another on December 1 were seen by W. H. Vivian of Gloucester, Mass.³ Mr. E. W. Eaton writes that he shot at a "bunch" of seven Swans near the mouth of the Merrimac River in November, 1902, wounding one; one of these was shot afterwards by George F. Thurlow (November 28). The Rev. Albert E. Hylan states that one was seen by the captain of a towboat on Long Island Sound in 1906. Dr. L. C. Sanford writes me that he saw a Swan flying over Watch Hill, R. I., in September, 1908. Mr. Talbot Denmead of Baltimore writes (1908) that about five hundred still winter near Carroll's Island in Chesapeake Bay, on a club preserve where few are shot; and Col. L. R. Cheney of Hartford states that he has seen as many as five hundred in a single day off Virginia beach, about eight miles north of the North Carolina line. Several correspondents state that three fine specimens of this species were taken on Nantucket, Mass., November 29, 1906.⁴ Two were shot on

¹ Chamberlain, Montague: Nuttall's Manual, 1891, Vol. II, p. 298.

² Braislín, William C.: Auk, 1903, p. 52.

³ Townsend, C. W.: Birds of Essex County, 1905, p. 151.

⁴ Bent, A. C.: Auk, 1907, p. 212.

Squibnocket Pond, Martha's Vineyard, Mass., by Mr. Gardiner Hammond, one on November 28, 1906, and the other on the next day. These are now in the Thayer collection at Lancaster, Mass.¹ John Burroughs has seen Swans passing in migration on the Hudson at a great height. It is easy for them to fly at such a height as to be above the notice of ordinary observers, and if any of the descendants of the Swans which once followed a flightway over New England are still living, they probably pursue the same line that was followed by their ancestors. Possibly a few still may breed in Labrador and migrate down the Atlantic seaboard. Mr. E. T. Carbonnell says that several flocks have been seen in Charlottetown, P. E. I., in recent years. One flew over the city in 1909.

In moving from their arctic homes in autumn the Swans seemingly divide their forces; part going toward the Pacific coast, part southeastward toward the south Atlantic States and part south through the region of the Mississippi valley. They seem to fly undeviatingly across the country, crossing river valleys or mountain ranges, steering a course straight for their distant goal. When they arrive at their destination they pay little attention to decoys, but busy themselves by plunging their heads to the bottom in shallow water and digging up the bottom grass with their beaks. When they find the favorite morsels they often dig large holes in the bottom. The Swan does not dive, but can readily reach bottom in about three feet of water by standing on its head on the bottom and paddling with its feet to keep its balance. When undisturbed it is a noisy bird, though silent when alarmed. When a flock is at ease, their weird, high-keyed calls and deeper tones may be heard in chorus. Dawson says that the bass horns "of tin rather than brass" are blown by the old fellows, while varied notes, like those of the clarinet, come from the cygnets or young birds.² Nevertheless, the old males often give utterance to very high shrill notes when leading the flock in flight.

One of the supposed myths of antiquity is the song of

¹ Thayer, J. E.: *Auk*, 1907, p. 212.

² Dawson, William Leon, and Jones, Lyndes: *Birds of Ohio*, 1903, Vol. II, p. 572.

the dying Swan, so often the theme of the poet. Elliot says that he has killed many Swans which never uttered a sound; but once on Currituck Sound, N. C., he and Mr. F. W. Leggett fired at some Swans passing high over head, and one of them, mortally wounded, set its wings and began its death song, "which was continued until the water was reached, nearly half a mile away." The song was plaintive and musical, and at times sounded like "the soft running of the notes in an octave." Dr. Elliot found upon inquiry among the gunners that others had heard somewhat similar tones from dying Swans. Thus another myth of the olden time becomes a reality.

With the first signs of spring the Swans marshal their depleted lines, and, rising high in air, set out for the shores of the Arctic Sea, where lies their only hope of safety and security.

NOTE. — The Whooper Swan (*Olor cygnus*) of Europe is noted by Knight in his Birds of Maine (page 124). This is a bird of the northern parts of the Old World, but occasionally visits Greenland. Knight refers to the taking of a specimen in Washington County, Me., by Charles S. Hunnewell. This was recorded by C. H. Clark (Jour. Me. Orn. Soc., 1905, p. 23), but the record is not mentioned in the third edition of the American Ornithologists' Union Check-List.

RAILS, CRAKES, GALLINULES AND COOTS.

This family of marsh birds, known to naturalists as the *Rallidæ*, is a large and important one, which occupies a position between the Herons and the shore birds. The members of the family are of small or medium size, with rather long narrow bodies and large strong legs and thighs, which probably have been developed by the effort of wading in mud and pushing the body through the tall grass, reeds, canes and water plants among which these birds find refuge. The feet usually are formed for walking, and the toes are long enough to support the body in passing over mud or floating water plants. The Coots, however, have the foot peculiarly adapted for swimming. It is intermediate between that of a Grebe and that of a Phalarope. Each toe is provided with

a membranous flap or lobe, thus making a folding paddle of the foot. (Fig. 11.) The wings of this family are not long and pointed, as in the shore birds, but short, rounded and concave. The flight is rather weak and not long sustained, except in migration; and some of the species, living on islands in the sea, do not migrate and have lost the use of their wings, except, perhaps, in diving and swimming under water.

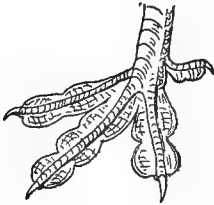


FIG. 11.—Foot of Coot.

Many species are very abundant, but they are such adepts at hiding that their very existence is unknown to the casual observer. The plumage usually is subdued in tint to facilitate concealment; but some of the Gallinules are rather brilliant in color; nevertheless, their colors may be so adapted to their surroundings as to be protective. America furnishes many excellent examples of this family.

Two species of Rail breed rather commonly in New York and New England along wet runs, in river meadows and in large swamps of grass, reeds and cat-tails. The Coot, which somewhat resembles a Duck in appearance, is not so common, and may be seen mainly on marsh-bordered ponds in autumn, while the Florida Gallinule is a rare summer resident of southern New York and New England.

KING RAIL (*Rallus elegans*).

Length. — 17 to 19 inches.

Adult. — Above rich olive brown, distinctly streaked with black and olive gray, sometimes with a yellow tinge; crown dark brown; a brownish white line over eye, turning to brownish gray behind eye, and a broad dusky streak through and below it; wings brown of varying shades; under parts deep cinnamon, darkest on breast, fading to dull white on throat, belly and under tail coverts; sides and flanks dark brown, dusky or black, with white bars.

Downy Young. — Glossy black.

Field Marks. — Much larger than Virginia Rail; closely resembling it, but sides of head less gray; size of Clapper Rail, but much brighter in color; olive brown above rather than gray, and breast cinnamon rather than buff, as in the Clapper.

Notes. — A loud *bup, bup, bup, bup, bup*, increasing in rapidity to a roll, then ending somewhat as it began, occupying about five seconds (Chapman). A grunting *umph, umph, umph, umph*; notes on same key and separated by rather wide intervals, deep and guttural, sometimes harsh and vibrant (Brewster). Eaton says that so far as he is aware no one has actually seen the bird uttering its notes.

Nest. — Of grasses, on the ground in fresh-water marshes.

Eggs. — Seven to twelve, buffy white, more heavily spotted and speckled with rufous brown than those of the Clapper Rail, about 1.68 by 1.20.

Season. — Has been taken rarely in New England or New York at all seasons.

Range. — Eastern North America. Breeds from Nebraska, southern Minnesota, Ontario, New York and Connecticut south to Texas, Florida and Cuba; winters mainly in the southern part of its breeding range; casual north to South Dakota and Maine.

HISTORY.

This large and handsome Rail closely resembles the Virginia Rail except in size. It is regarded as an accidental visitor to New England from the south. Following are all the Massachusetts records known to me: Mr. George O. Welch had, in 1877, a mounted specimen shot at Nahant, November 21, 1875.¹ In 1878 there was a specimen in the collection of Mr. George E. Browne of Dedham; killed, some years before, in Sudbury.² A male was taken at Chatham, September 24, 1884; it was preserved in the collection of Mr. Foster H. Brackett; the head and legs are now in the Brewster collection.³ A specimen was caught in a muskrat trap at North Truro, "early in February, 1892."⁴ An adult female was taken by Mr. J. H. Bowles at Readville, September 9, 1893.³ A male in the Peabody Academy collection was caught in a garden in Salem, on July 10, 1894.⁵ Another, a young bird, was taken by Mr. Bowles at Readville, August 27, 1894, and is now in the Brewster collection.³ A male was taken at Longmeadow, near Springfield, October 19, 1895, by

¹ Purdie, H. A.: Bull. Nuttall Orn. Club, 1877, p. 22.

² *Ibid.*, 1878, p. 146.

³ Brewster, William: Memoirs, Nuttall Orn. Club, No. IV, Birds of the Cambridge Region of Massachusetts, 1906, p. 144.

⁴ Miller, G. S., Jr.: Auk, 1892, p. 396.

⁵ Townsend, C. W.: Memoirs, Nuttall Orn. Club, No. III, Birds of Essex County, Mass., 1905, p. 159.

W. C. Pease.¹ A male, taken at Cambridge, December 30, 1896, is now in the collection of Mr. Alfred Hill of Belmont.² Mr. George Patterson shot a specimen at Ipswich, in October, 1901; it was placed in the Peabody Academy collection.³ At Ellisville, Plymouth County, January 20, 1903, an adult female was shot by Mr. Clarence Chandler.⁴ A male is recorded by Mr. F. H. Kennard as taken at Needham, October 10, 1907.⁵ An adult male was taken at Chatham, October 31, 1909, by Mr. Russell Bearse.⁶

As this Rail has been known to breed in Connecticut and near Buffalo, N. Y.; as it has been taken in New York in November, and is recorded from Maine and Massachusetts in winter; and as one of the birds taken by Mr. Bowles was very young, it possibly breeds in Massachusetts, and very likely is less rare than it is rated. Its retiring habits probably account for our lack of knowledge regarding it. Little seems to be known of it except that it appears to prefer fresh marshes to salt marshes. I have never seen it alive.

Dr. Bachman, in South Carolina, seems to have had a better opportunity of observing its habits than any one else who has written about it. He states that he found twenty pairs breeding within a space having a diameter of thirty yards, and that the nests were placed on the ground, being raised up six or eight inches by means of withered weeds and grasses; but Wayne, who has also found numerous nests, finds them in rushes or buttonwood bushes, from eight to eighteen inches over water. He noted that the female laid an egg each day after 11 A.M., and on laying the twelfth began at once to incubate. This Rail frequents the swampy borders of rivers and fresh-water ponds overgrown with vegetation. The stomach of one specimen was filled with seeds of *Arundo tecta*; that of another contained a quantity of oats.

¹ Morris, Robert O.: Auk, 1896, p. 86.

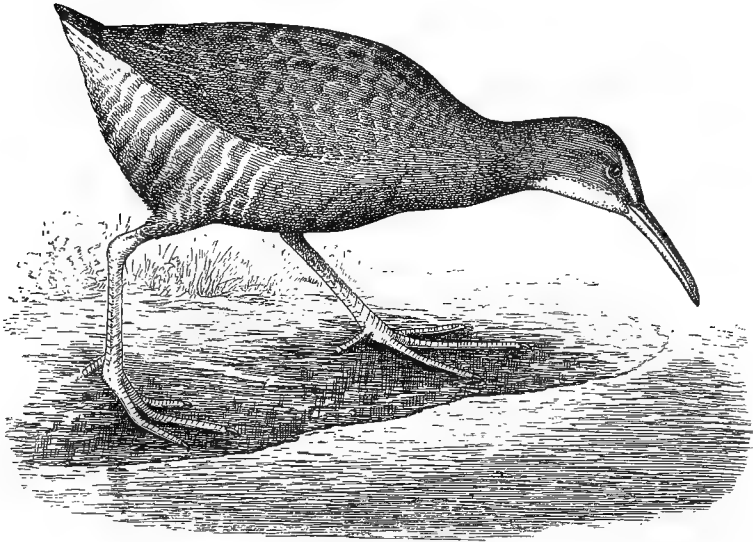
² Farley, J. A.: Auk, 1905, p. 409.

³ Townsend, C. W.: Memoirs, Nuttall Orn. Club, No. III, Birds of Essex County, Mass., 1905, p. 159.

⁴ Reagh, A. L.: Auk, 1903, p. 304.

⁵ Kennard, F. H.: Auk, 1907, p. 218.

⁶ Fay, S. Prescott: Auk, 1910, p. 221.

CLAPPER RAIL (*Rallus crepitans crepitans*).

Length. — 13.50 to 16 inches.

Adult. — Above ashy olive gray striped with olive brown, but not as distinctly as the King Rail; wings and tail brown; crown and nape brown or dusky; a white stripe from bill to above eye; sides of head, neck, breast and flanks ashy olive gray, turning to white on throat and chin and to pale brownish yellow or buffy on breast; flanks darker, barred with white; general tone subdued gray with subdued brown tints; bill long, slender and down curved.

Field Marks. — Resembles the Virginia Rail and the King Rail in form, but is much larger and grayer or paler than our common Rails; salt-water marshes mainly.

Notes. — *Glak, glak, glak*, at first loud and rapid, ending lower and slower (Chapman).

Nest. — A pile of dead rushes, grasses, etc., in the salt marsh.

Eggs. — Seven to twelve, about 1.70 by 1.20, buffy or whitish, rather sparingly spotted with reddish brown and obscure purplish.

Range. — Salt marshes of the Atlantic coast. Breeds from Connecticut to North Carolina; winters mainly south of New Jersey; casual north to Maine.

HISTORY.

This large Rail is regarded as an accidental visitor to Massachusetts from New York or farther south, where it lives mainly in the salt marshes. Linsley (1848) found it

breeding abundantly near Stratford, Conn. It was formerly very numerous on Long Island, and still breeds along the southerly end of that island in considerable numbers (Eaton). It has been reported from Rhode Island. It may have been more common in Massachusetts in early times than now, but there is no actual evidence that it ever bred here. A few specimens have been taken in Maine.

There are eleven definite records of its occurrence in Massachusetts, and two of these are in the neighborhood of Springfield, far away from its usual range in the salt marsh. The records follow: A specimen was presented by Theodore Lyman to the Boston Society of Natural History, August 7, 1850.¹ An adult was taken by Mr. G. E. Browne, at Dedham, in 1863.² One was shot by Mr. C. L. Blood, at Taunton, October 9, 1864.³ Mr. J. F. LeBaron informed Maynard that he shot one "some years ago," at Ipswich (prior to 1870).⁴ One flew aboard a vessel and was captured, May 4, 1875, and was placed in the mounted collection of the Boston Society of Natural History.⁵ Mr. Arthur Smith shot a Clapper Rail late in October, 1879, at Gurnet Point, Plymouth.⁶ A specimen was taken at Rocky Nook, Kingston, on December 29, 1885.⁷ Two instances of its occurrence are given at Northampton and Hadley Meadows by Mr. R. O. Morris.⁸ A male was taken at East Orleans, November 30, 1895, by John G. Rodgers, and is now in the Brewster collection.⁹ In Ipswich, September 15, 1908, Mr. William P. Wharton picked up, on the beach at Plum Island, near the mouth of the Ipswich River, a dead Clapper Rail.⁹ A young male was shot October 20, 1910, by T. C. Wilson, and recorded by Dr. John C. Phillips.¹⁰

¹ Cabot, Dr. S., Jr.: Proc. Bost. Soc. Nat. Hist., 1851, Vol. III, p. 326.

² Wakefield, J. R.: Birds of Dedham, 1891, p. 71.

³ Howe, R. H., and Allen, Glover M.: Birds of Massachusetts, 1901, p. 17.

⁴ Maynard, C. J.: Nat. Guide, 1870, p. 145.

⁵ Purdie, H. A.: Bull. Nuttall Orn. Club, 1877, p. 22.

⁶ Brewster, William: Bull. Nuttall Orn. Club, 1880, pp. 62, 63.

⁷ Browne, F. C.: Auk, 1887, p. 344.

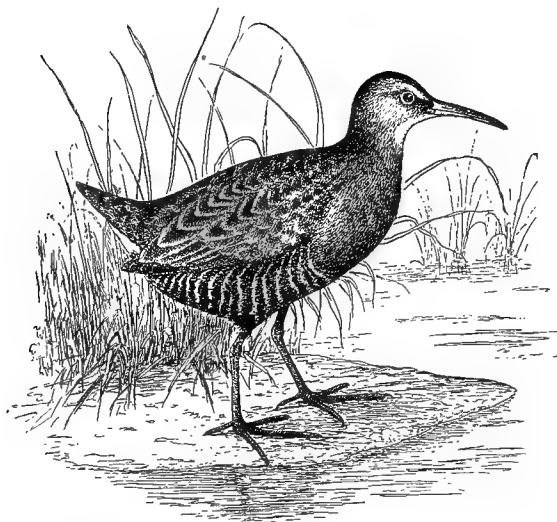
⁸ Brewster, William: Auk, 1901, p. 136.

⁹ Auk, 1909, pp. 76, 77.

¹⁰ *Ibid.*, 1911, p. 119.

VIRGINIA RAIL (*Rallus virginianus*).

Common or local names: Long-billed Rail; Fresh-water Marsh-hen.



Length. — 8.50 to 10.50 inches; bill 1.50.

Adult. — Top of head, back of neck and back rich olive brown, streaked with blackish; feathers sometimes bordered with pale grayish; sides of head ash gray; line from bill to above eye white; below it a blackish stripe from bill through eye; chin and throat white; wings and tail dark grayish brown; wing coverts rich reddish brown; below a warm brown; lower belly and flanks black, barred with white; bill long, slightly curved.

Young. — Above much as in adult but darker; throat and line down the middle of the under parts whitish; rest of under parts blackish.

Downy Young. — Sooty black, with yellowish bill.

Field Marks. — Size of Bob-white; long reddish bill and rich brown breast distinguish this bird from the Sora.

Notes. — Call, *kep, kik* or *kip*; song, a grunting sound, *wak-wak-wak*, and *cut, cûtta-cûtta-cûtta* (Brewster). Female, when anxious, *ki-ki-ki* or *kiu*, like a Flicker (Eaton).

Nest. — Of grasses in marshy land.

Eggs. — Six to twelve, pale grayish or buffy white, spotted and speckled with reddish brown and lilac, about 1.26 by .96.

Season. — Common local summer resident; early April to middle of October; a few winter in southeastern Massachusetts.

Range. — North America. Breeds from British Columbia, southern Saskatchewan, southern Keewatin, Ontario, southern Quebec and New Brunswick south to southern California, Utah, Kansas, Missouri, Illinois, New Jersey and eastern North Carolina, and in Toluca valley, Mexico; winters from Oregon, Utah and Colorado to Lower California and Guatemala; also in the lower Mississippi States, and from North Carolina (casually Massachusetts) to Florida; occurs casually north to northern Quebec and Newfoundland.

HISTORY.

It is difficult to obtain accurate data regarding the former numbers of this species, as it hides away in fresh-water marshes and is little known. It is reported, however, from every county in the State, and may breed in all. It is found on Cape Cod, Martha's Vineyard and Nantucket in winter, but probably the birds which summer there pass farther south. So little of the bird is known to the gunners among my correspondents that only thirty-four report it. Four mention an increase in its numbers in their localities and thirty a decrease.

One of the wonders of my early boyhood was a Rail's nest, discovered by a boy companion on the edge of a swampy run within the present limits of Boston. We got a glimpse of the long curved bill of the mother Rail, which proved it to be a Virginia. Great was our rejoicing over the eleven glossy, buffy eggs, with their lovely brown and lilac spots. The nest was built among the driftwood and grasses under an alder bush at the edge of the run.

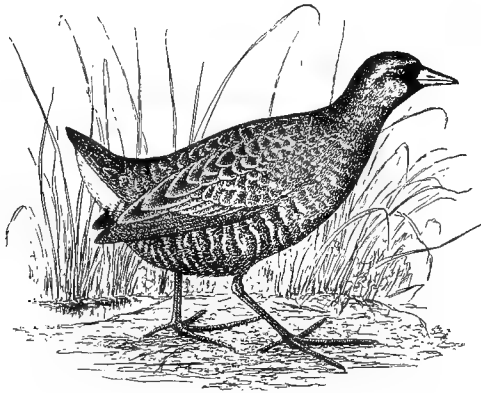
A little water, lots of mud, a lonely bog with a wilderness of cat-tails and sedge make an ideal home for Rails. "Thin as a Rail" they have to be to pass between the stems of the reeds and water plants under cover of which they live. An inch is ample space for a Rail to pass, for it can compress the narrow body until it takes less room than that. Much of the Rails' life is spent in running and sneaking about under cover of the rank vegetation of the marsh and meadow, for Rails have many enemies. When forced to fly they flutter feebly along, only a few feet from the grass tops, with legs dangling loosely, and soon drop back into cover. Little

is known about their habits and food. They walk or run rapidly over half-submerged vegetation, swim as lightly as a Duck in passing across from one cover to another, and slip easily through their covered ways, even in the night, for they are abroad more or less at night as well as by day. The hesitating, heavy flight of this Rail would seem to make a long migration difficult, if not impossible; nevertheless, long flights are taken yearly to the south. Rails in migration appear to fly very low, and many are killed by flying against telegraph wires. They cross large rivers and bays in their flights, which are made under cover of night.

This Rail feeds on beetles and other insects, and its food also includes caterpillars, earthworms, slugs, snails and such small forms of animal life as it finds on fresh marshes, for it rarely appears on salt marshes. As autumn approaches, seeds of various kinds are added to the bill of fare.

SORA (*Porzana carolina*).

Common or local names: Rail-bird; Meadow Chicken; Chicken-bill; Carolina Rail.



Length. — 8 to 9 inches; bill .75.

Adult. — Top of head and back of neck olive brown; a blackish stripe through the center of crown; back, wings and tail olive brown, streaked with black and a little white; sides of head and neck, line over eye, and breast ash gray; forehead, region about base of bill and a streak down middle of throat and breast black; lower belly white; flanks brown and grayish, barred with white and blackish; bill short, yellow.

Young. — Similar, but *no black about bill or on throat*, which is whitish; breast washed with cinnamon; darker above than adult.

Field Marks. — Nearly as large as Bob-white, but slimmer; short yellow bill distinguishes it from long-billed Virginia Rail.

Notes. — *Kuk* or *peep*; song, *ker-wee*; and a high, rolling *whinny* (Chapman). *Ca-weep-eep, ca-weep-eep-eep-ip-ip-ip* (Hatch). Also a variety of other notes.

Nest. — Of grasses, on ground in marshes.

Eggs. — Eight to fifteen, buffy white or buff, sparsely spotted and speckled with brown and purplish gray, 1.24 by .90.

Season. — Common to abundant migrant, and less common local summer resident; early April to early November.

Range. — North America. Breeds from central British Columbia, southern Mackenzie, central Keewatin and Gulf of St. Lawrence south to southern California, Utah, Colorado, Kansas, Illinois and New Jersey; winters from northern California, Illinois and South Carolina through the West Indies and Central America to Venezuela and Peru; accidental in Bermuda, Greenland and England.

HISTORY.

The Sora Rail inhabits the same localities as the Virginia Rail, but it also frequents the salt or brackish marshes near the mouths of rivers, and the bays and estuaries of the sea. It resorts to these situations in such numbers in Connecticut and the middle and southern States that gunners are enabled to take advantage of its predicament when the tide rises, and by pursuing it in boats they slaughter multitudes. The high water drives the Rails to the highest points on the marsh, and as the gunner in his skiff approaches they take wing. Their flight is so slow and direct that a good shot rarely misses one. Audubon states that he saw a gunner kill fifty Clapper Rails without a miss, and he was assured that another had killed one hundred "straight."

Dr. Lewis gives a record of the bags of Sora Rails killed by a few men on the Delaware River, below Philadelphia, in 1846. The thirty-four records of consecutive days show an average of about one hundred Rails per man per day. He states that over one thousand Rails were brought into Chester in one day. Dr. Brewer (1884) says that it is not uncommon for an expert marksman to kill from one hundred to one hundred and fifty Rails per day; and such scores were made on the Connecticut River in Connecticut in olden times, when there was no legal limit to the bag. This slaughter has made some inroads on the numbers of the birds in Massachusetts. Mr. Robert O. Morris writes that it is said that about one thousand were killed at Longmeadow, near Springfield, in 1908.

Five Massachusetts correspondents report the species as increasing in their localities, and forty note a decrease. Mr. Morris is very positive that there has been a great and continuous decrease of Rails along the Connecticut River near Springfield, and I have noticed a similar diminution in freshwater meadows in eastern Massachusetts.

The Sora is inclined to nest in more watery portions of the marsh or morass than the Virginia Rail. It is a good swimmer and diver at need, and the young will take to the

water as soon as they leave the egg-shell, if necessary to escape danger. The little ones are black, with a tuft of yellow feathers on the throat and a red protuberance at the upper base of the bill. Although this bird has the reputation of being very shy, I have come upon a single bird occasionally, while canoeing, in August, running along the muddy margin of a river or resting upon the bank. In such a situation it is easy to go very close to the bird without alarming it. Sometimes its curiosity is so strong that a small flock will surround a recumbent duck hunter and even peck at his clothing; but a sudden movement is enough to send them scampering into the reeds.

In September, when the wild rice is falling, these birds gather in our marshes to feed upon it, and at that season a stone thrown into the cat-tails or a paddle struck flat on the surface of the water will often start a chorus of their cries. I believe that individuals of this species have wonderful vocal powers. One moonlit evening on the Concord River I was entertained for more than an hour by a curious jumble of sounds from the marshy border of the river, that could be attributed only to this Rail. Many of the notes were recognizable as belonging to the Sora, but there were imitations of the Flicker, the Bob-white and several other species. It was a performance that would have done credit to many a bird regarded as a songster. The next morning a search along the river shore was carried on in vain, until finally, about 8 o'clock, the song was heard again. I was able, by careful stalking, to get within a few feet of the bird; but never saw it distinctly. At the first appearance of my head above the greenery of the shore the bird plunged in among the water plants, and I have never seen it since or heard a similar song. This was one of the unique experiences of a lifetime.

The Sora apparently possesses greater powers of flight than most other Rails, as Dr. Brewer states that large flights have landed in the Bermudas on southwest winds.

The food of this species apparently does not differ much from that of the Virginia Rail, but it seems to feed more largely on seeds and vegetation.

YELLOW RAIL (*Coturnicops noveboracensis*).

Length. — 6 to 7.50 inches.

Adult. — Above streaked with blackish and brownish yellow, with fine cross lines and bars of white; a dusky streak from bill across cheek to ear; sides of head, neck and under parts pale brownish yellow, fading on belly, with rows of darker marks on flanks and numerous narrow white bars; bill yellow; legs and feet pale brownish yellow.

Field Marks. — Small size, yellowish color; the wing in flight shows much white.

Notes. — An abrupt cackling, 'krek, 'krele, 'krele, krek, kük, 'k'kh (Nuttall). *Kik-kik-kik-kik-queah*, or, more rarely, *kik-kik-kik-kik-kik-kik-kik-kik-kik-queah* (J. H. Ames).

Season. — A rare migrant, April and May, September to November; recorded in December and June.

Range. — Chiefly eastern North America. Breeds from southern Mackenzie and southern Ungava south to Minnesota and Maine; winters in the Gulf States, rarely in California, Illinois and North Carolina; casual in Nevada, Utah and Bermuda.

HISTORY.

This little Rail is seen rather rarely in Massachusetts. Nuttall (1834) says that according to a Mr. Ives the bird is frequently found in marshes near Salem, Mass. I have met with it alive only once, but have seen a considerable number of specimens taken in Massachusetts, several of which were killed by the Boston taxidermist, Mr. C. I. Goodale, in Wakefield, Mass. It probably is more common in migration than is believed generally, as it is very small and its habits are

secretive. As it was found nesting in Maine by Boardman, it is not improbable that it may yet be known to breed in other New England States. It is even more reluctant than the other Rails to take wing; hence it is seen rarely, but is sometimes caught by dogs and cats. When forced to take wing it flies in the same hesitating, fluttering manner as the other Rails, but rather swifter and sometimes to a considerable distance. It can swim and dive well in case of necessity.

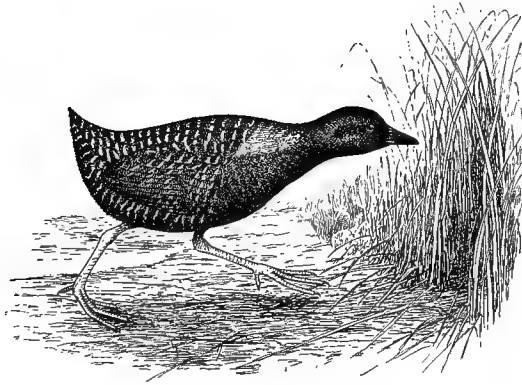
A Rail which was not seen, but often heard, near Cambridge, Mass., in 1889,¹ was believed to be the Black Rail. This peculiar note was heard by Brewster and other ornithologists in Concord, Sudbury, Falmouth and other localities at dates between 1889 and 1901, and the bird was believed to have bred in Cambridge in 1889. It was locally known as the "kicker," and, according to Brewster, it commonly cried *kik, kik, kik, quéeah; kik-kik-kik-ki-quéeah; kik-ki-ki-ki, ki-quéeah; kic-kic, kic-kic, kic-kic-ki-quéeah*. This does not agree with the notes given by Wayne, who actually saw and took both the male and female Black Rail in South Carolina, and listened to their cries for more than an hour. The notes given by Mr. J. H. Ames for the Yellow Rail rather closely resemble those credited to that ornithological mystery the "kicker." As Mr. Ames kept his Rail alive and saw it utter its notes, he cannot well be mistaken.

Wayne states that in South Carolina he found it nearly impossible to flush these birds with a dog when their only cover was short dead grass. His dog caught nine and flushed but one. Fresh-water snails were found in their stomachs.

¹ Brewster, William: Auk, 1901, pp. 321-328.

BLACK RAIL (*Creciscus jamaicensis*).

Common or local name: Little Black Rail.



Length. — About 5 inches.

Adult. — Head, chin, throat, fore and side neck, and lower parts dark slate or dusky; head darkest on top and nape, where it meets the brown of hind neck; back and hinder parts mainly rich brown; wings and tail brownish black, marked with white; back, wings, belly, flanks, tail coverts and tail barred with white.

Field Marks. — Smallest of all Rails and very dark; must not be confounded with the young of other Rails, which also are small and black.

Notes. — Probably *kik-kik-kik*, *queeah*, or *kik-ki-ki-ki*, *ki*, *queeah*, or variants (Brewster). *Chi-chi-cro-croo-croo* several times repeated in a sharp high tone, audible to a considerable distance (Marsh). Female, *Croo-croo-croo-o* repeated like the commencement of the song of the Yellow-bellied Cuckoo; male, *Kik-kik-kik-kik* or *Kuk-kuk-kuk-kuk* (Wayne).

Nest. — Of grasses, on ground in marsh.

Eggs. — Six to ten, 1.05 by .80, white speckled with rich reddish brown dots, more numerous at large end.

Range. — Eastern North America. Breeds from southern Ontario and Massachusetts south to Kansas, Illinois and South Carolina; winters through the Gulf States and south to Jamaica and Guatemala; casual in Bermuda.

HISTORY.

The Black Rail, the smallest Rail in America, is believed to be a very rare bird in New England, where it has been recorded only from Maine, Connecticut and Massachusetts, in which States it possibly breeds. So far as our present in-

formation goes, Massachusetts appears to be near the northern limit of its breeding range on the Atlantic coast, but it may go farther north. Eaton gives only five records of specimens actually taken in New York, and five more have been reported as seen at close range; but such records are received with caution, as the black, downy young of larger Rails are mistaken for Black Rails. Wayne appears to be the first observer who has actually seen the female Black Rail on her nest in the United States, and recorded it. The nest was in an oat field, and the standing grain where the nest was had been cut. The bird is so secretive that, as related by Wayne, two men and a dog searched four hours for the male in the oat field before it could be secured, although it was calling incessantly. This bird may not be as rare as it is rated.

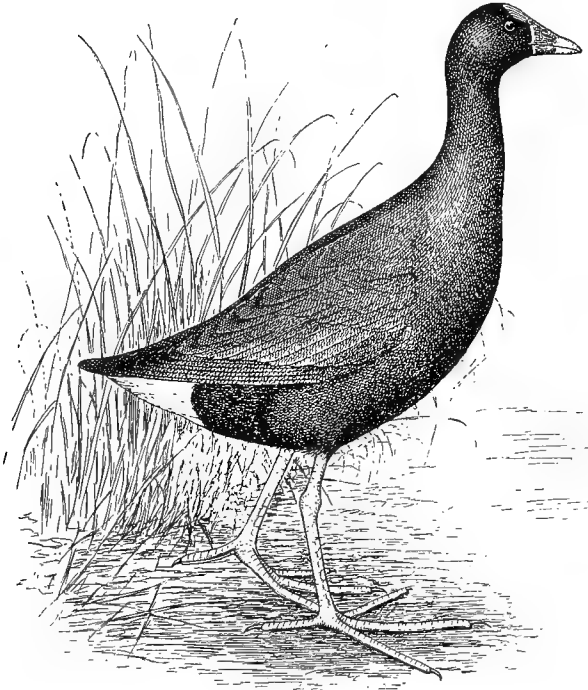
The Black Rail runs swiftly, like a mouse, through the herbage, and seldom flies, although in migration it has reached the Bermuda Islands. Gosse quotes a Mr. Robinson who says that in Jamaica it is so foolish as to hide its head and cock up its tail, thinking itself safe, when it is easily taken alive. The Massachusetts records given by Howe and Allen follow: A specimen was picked up dead in August, 1869, on Clark's Island in Plymouth harbor.¹ Another was found on the streets of Boston, by D. T. Curtis, September 20, 1874.² This record may not be authentic. Mr. Curtis evidently did not know the Rail, and he states that the bird was black and had long yellow legs. It might have been the young of some other Rail or Gallinule, as, so far as can be determined from the article in *Forest and Stream*, no ornithologist saw it. It was kept for a while and afterwards liberated. A pair was found with young at Chatham in July, 1884, and a nest with eggs in May, 1885.³ Howe and Allen also quote Mr. Robert O. Morris to the effect that the species bred in Hazardville, according to J. H. Batty.⁴ The latter record, however, should be credited to Connecticut, as Hazardville is near Enfield, Conn. A male was taken by Mr. Stanley Cobb at Milton, May 16, 1904.

¹ Purdie, H. A.: *Bull. Nuttall Orn. Club*, 1877, p. 22.

² Curtis, D. T.: *Forest and Stream*, Apr. 5, 1877, Vol. VIII, p. 129.

³ Allen, J. A.: *Revised List of the Birds of Mass.*, 1886, p. 236.

⁴ Morris, Robert O.: *Birds of Springfield and Vicinity*, 1901, p. 13.

PURPLE GALLINULE (*Tronornis martinicus*).

Length. — About 13.50 inches.

Adult. — Back bright shining olive green; wings deeper green, shaded with blue; head, neck and breast rich bluish purple; belly darker; frontal shield on forehead blue; under tail coverts white; bill carmine, tipped with yellow; feet yellow.

Young. — Browner above; mostly white below; no red on bill.

Notes. — Resemble the delicate whistling of the Blue-winged Teal (Audubon).

Range. — Tropical and subtropical America. Breeds from Texas, Tennessee, and South Carolina south to Ecuador and Paraguay; winters from Texas, Louisiana and Florida southward; irregularly north in summer to Arizona, Nebraska, Wisconsin, Ontario, Quebec, Nova Scotia and New Brunswick; accidental in England and Bermuda.

HISTORY.

This elegant Gallinule is a wanderer from the south, and probably straggles into all the New England States occasionally. Col. Nicolas Pike states that it was “formerly very

plentiful" on Long Island, but is "slowly passing away," and that he has not seen one for many years.¹ He collected birds on Long Island during the 30's and 40's of the last century. Giraud (1848) rates it as extremely rare there in his day. Eaton gives but three records of the species in New York, and Knight gives but three definite records for Maine. Howe and Allen give the following for Massachusetts: One was seen at Stoneham, November 27, 1837.² A specimen was taken at Swampscott, by S. Jillson, April 22, 1852.³ Another was obtained from Cape Cod by William Brewster, in April, 1870.⁴ One was killed at Hummock Pond, Nantucket, in October, 1872.⁵ One was shot at Rockport by Robert Wendel, April 12, 1875.⁶ One was sent to Faneuil Hall Market, Boston, in April, 1890, which had been caught in a trap.⁷ A female was taken at Plymouth, April 9, 1892 (C. C. Wood).⁸ One was caught in June, 1897, at Boxford; "another, supposed to be of the same species, and the mate were seen at the pond."⁷ Dr. Townsend gives the following additional records in his *Birds of Essex County*: A male, now in the Peabody Academy Collection, was taken at Saugus, May 10, 1875. A specimen in possession of Mrs. W. S. Horner, at Georgetown, was taken about 1891 at Byfield; reported by Mr. J. A. Farley.⁹ One was taken in West Newbury, in October, 1893, by J. W. Pray, and is now in the Peabody Academy Collection.¹⁰

This bird feeds on insects, worms, mollusks, snails and other small aquatic animals, and on fruit, seeds and other vegetable productions.

¹ Dutcher, William: *Auk*, 1893, p. 272.

² Peabody, W. B. O.: *Report on the Ornithology of Mass.*, 1839, p. 258.

³ Putnam, F. W.: *Proc. Essex Inst.*, 1856, Vol. 1, p. 224.

⁴ Baird, S. F., Brewer, T. M., and Ridgeway, R.: *Water Birds*, 1884, Vol. 1, p. 385.

⁵ Brewer, T. M.: *Proc. Bost. Soc. Nat. Hist.*, 1879, Vol. XX, p. 105.

⁶ Whitman, G. P.: *Amer. Nat.*, October, 1875, Vol. LX., No. 10, p. 573.

⁷ Farley, J. A.: *Auk*, 1901, p. 190.

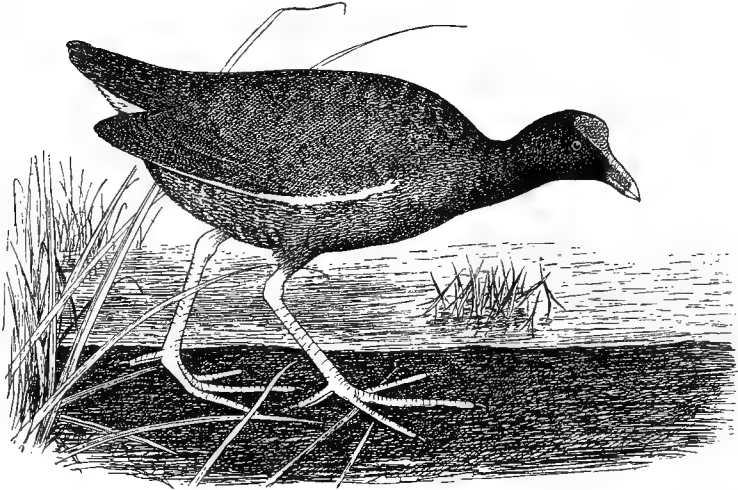
⁸ *Ornithologist and Oölogist*, May, 1892, Vol. XVII, No. 5, p. 72.

⁹ *Auk*, 1901, p. 398.

¹⁰ Townsend, C. W.: *Memoirs of the Nuttall Orn. Club, the Birds of Essex County, Mass.*, No. 3, p. 161.

FLORIDA GALLINULE (*Gallinula galeata*).

Common or local names: Mud-hen; Red-billed Mud-hen; Water-chicken.



Length. — 13.50 inches.

Adult. — Head and neck blackish slate; body slate gray, brownish on the back and washed on the belly with whitish; under tail coverts white; bill and plate on forehead bright red, the former tipped with greenish yellow; edge of wing and a stripe on flank white; *toes not lobed.*

Young. — Similar, but duller; whitish below; throat sometimes wholly white; bill and forehead brownish.

Field Marks. — The plate of bright red on front of head, the red bill and a white stripe on flank (sometimes covered or wanting) distinguish it from the Coot. Tail, when carried erect, shows a patch of white beneath it.

Notes. — *Chuck*, and many loud calls, suggesting a hen brooding or squawking.

Nest. — Like that of the Coot.

Eggs. — Eight to fourteen, 1.75 by 1.20, buff or brown, variable, spotted with dark brown.

Season. — Rare migrant and local summer resident; late April to early November.

Range. — Tropical and temperate America. Breeds from central California, Arizona, Nebraska, Minnesota, Ontario, New York and Vermont south to Chile and Argentina, and in Bermuda; winters from southern California, Arizona, Texas and Georgia southward; casual in Colorado, Quebec, Nova Scotia, New Brunswick and Maine.

HISTORY.

The name Florida Gallinule is rather a misnomer for this species, as it is a bird of temperate and tropical America generally. Josselyn in his two voyages to New England (1672) mentions Duckers or Moor-hens among the birds he found here; and Brewster opines that, as Josselyn also mentions the Coot, and as the Moor-hen of England closely resembles our Florida Gallinule, there can be little or no question that he referred to the latter. Peabody (1839) records a specimen shot in Fresh Pond, Cambridge. Since 1891 birds of this species have been seen frequently in Cambridge, one nest at least has been found there, and the bird has been reported from Nantucket, Norfolk, Essex, Worcester and Hampden counties, Mass. It is a fairly common summer resident in the larger marshes of central and western New York, and in the Ontario and St. Lawrence valleys, but apparently it is rather rare or local near the coast of New England and in the Hudson and Connecticut valleys. It seems to be rare now in New England generally, except in some favored localities. In habits and appearance, this Gallinule somewhat resembles the Coot. It keeps well out of sight, usually among the reeds and cat-tails, but at early morning and after sundown it sometimes may be seen moving about in open water, where it swims and dives well. This bird, like the Coot, is commonly known as the Mud-hen or Water-hen, and many of the hen-like clucks and calls that are heard in fresh marshes may be attributed to it.

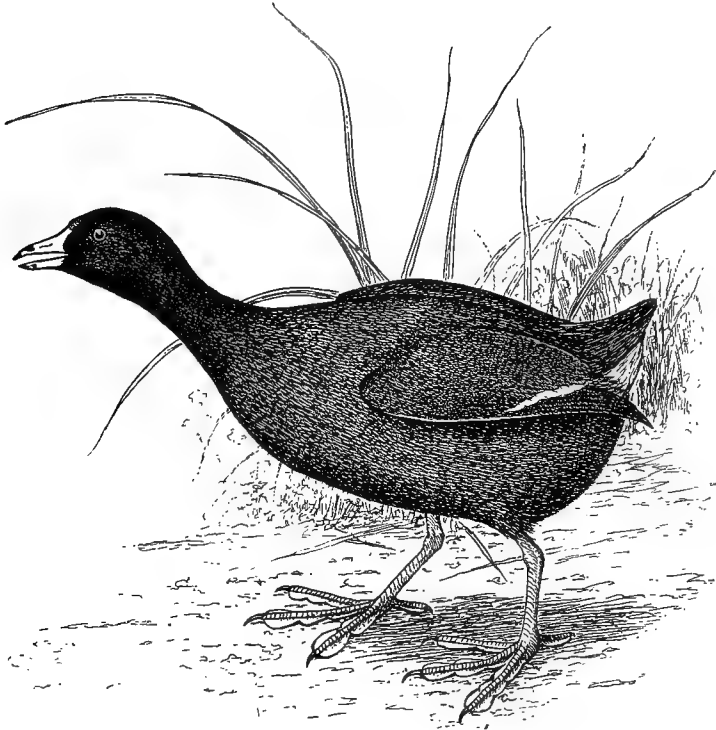
Wayne says that the eggs of this species and those of the preceding always are in different stages of incubation in the nest, and that consequently the young are hatched and take to the water while eggs still remain unhatched in the nest. Some of the young from one nest, he says, are from seven to twelve days older than others. Brewster has given in *The Auk* an excellent account of this species and its nesting habits in Massachusetts.¹

The Florida Gallinule feeds mainly on aquatic insects and other water animals, succulent water plants and seeds.

¹ Brewster, William: *Auk*, 1891, pp. 1-7.

COOT (*Fulica americana*).

Common or local names: White-billed Mud-hen; Mud-hen; Meadow-hen; Water-hen; Marsh-hen; Pond-hen; Crow-bill; Pond-crow; Blue Peter; Sea-crow; Pelick; Water-chicken.



Length. — 14 to 16 inches.

Adult. — Head and neck blackish; body, wings and tail slaty, paler below; wing when spread shows a narrow white edging; bill whitish marked with two dark spots near tip; frontal shield brown; feet rather livid or bright yellowish green, each toe with a broad membranous flap; claws black; iris carmine.

Young. — Similar, but much lighter below; bill dull flesh color.

Field Marks. — The white bill; size of Teal or larger. Nearly uniform slate color, and blackish head.

Notes. — A cuckoo-like call, *coo-coo-coo-coo*, the first note prolonged and on a much higher key (Hatch). Also, at intervals, a squawk somewhat resembling the quack of a duck, and other explosive and cackling notes.

Nest. — A hollowed heap of dead reeds, sometimes in the water.

Eggs. — Eight to sixteen, 1.75 to 2 by 1.20 to 1.35, glossy, clay color, spotted and dotted with dark brown and neutral tints.

Season. — Uncommon migrant; early April to mid May, mid September to December; a few breed.

Range. — North America. Breeds from central British Columbia, southern Mackenzie, Manitoba, Quebec and New Brunswick south to northern Lower California, Texas, Tennessee and New Jersey, and also in southern Mexico, southern West Indies and Guatemala; winters from southern British Columbia and Virginia south to Colombia; casual in Alaska, Greenland, Labrador and Bermuda.

HISTORY.

This is not one of the birds commonly called Coots in New England, which are really Scoters or Surf Ducks; nevertheless, it is the *real* Coot, — the only bird entitled to the name. This species was formerly one of the most abundant waterfowl on the fresh waters of North America. When Coots are feeding on the wild celery or on the rice fields of the south they are by no means despicable as a table delicacy; but ordinarily they are not considered fit to eat. Nevertheless, they have been slaughtered without mercy. Audubon says that a hunter on Lake Baratavia killed eighty at one shot. It was not uncommon in the old days in Florida to see a sportsman shoot into a mass of Coots, killing and wounding from twenty to forty birds, just to see the effect of the shot; not a bird was even picked up. As the supply of wild-fowl was depleted, the settlers began potting Coots for food in this manner wherever these birds were numerous, and "fried Coot" soon became a common dish on the settlers' table. The demand for them now has decreased their numbers until, where they were formerly exceedingly abundant, they are now only common, and where they were formerly common, as in southern New England, they are becoming rare. Mr. Robert O. Morris records the species as common at Springfield, Mass. (1901). Dr. Glover M. Allen, in his list of the Aves (1909), gives it as an uncommon migrant in Maine, New Hampshire and Vermont; a rare spring and uncommon fall migrant in Massachusetts; and a common migrant, mainly in fall, in Rhode Island and Connecticut. It is, as he states, occasionally

seen in summer in Massachusetts and Vermont, and may breed. Reports from Massachusetts observers for an average of about twenty-seven years, previous to 1909, representing every county in the State, show apparently that ten observers believe that this species has increased in their localities and that sixty-seven believe that it has decreased. Six of the ten who have seen an increase apparently are mistaken in the name, and refer to the Surf Ducks or Scoters, which are commonly known as Coots on our coast.

The Coot quite closely resembles the common or Florida Gallinule, but has not the red bill of that species, and its feet are lobed somewhat like those of the Grebes. Nevertheless, it is not so distinctly formed for swimming as the Grebes; its legs are rather long and placed well forward, and it seems to be a sort of connecting link between the land birds and the swimmers. It walks and runs on land as easily as a Rail, and yet it spends much of its time on the water. The French name, *Poule D'eau*, and the American name, Water-hen, give the general impression regarding this species. It is a good swimmer, but usually when swimming it moves its head forward with each stroke, as a hen often hitches her head forward when walking. It is a fine diver, and sometimes almost equals the famous Canvas-back in diving for the roots of the wild celery. It is fond of flooded meadows and savannas, sloughs, swamps, morasses, and swamp-bordered ponds, where, when danger threatens, it can flee to the shelter of the reeds or cattails, where it is as much at home as a Rail or a Gallinule. It is naturally a most innocent and unsuspecting bird. When wading waist deep in the flooded lands of Florida, for want of a more genteel method of Duck hunting, I often have been amused at the unsophisticated and foolish expression of the Coots which swam around me, often within easy gunshot, hitching forward on the water as if anxious to see what kind of an amphibious creature kept them company. In my boyhood I have seen ponds apparently entirely covered with a black mass of these birds. A sudden alarm would cause a tremendous uproar of flapping wings and splashing feet as the members of the vast flock hastened to cover, but in a few

minutes all alarm was past, and they gradually covered the surface of the pond again. The body of the Coot is narrow, and can be compressed so that, like a Rail, the bird can pass between reeds and the rigid stems of water plants, where a Duck with its wide flat body could not go. It can wade readily also in much deeper water than the Rails. It rises heavily, with much flapping of wings and paddling of feet, but when once well in the air it flies rather better than the Rails, rarely going far, however, except when migrating.

The Coot feeds very largely on succulent vegetable matter and seeds, as well as insects and other small forms of animal life.

PHALAROPES.

The great order *Limicolæ* comprises what are commonly called the shore birds, to distinguish them from the Ibises, Storks, Herons, Cranes, Rails, etc., which are collectively known as marsh birds. Such a distinction is merely arbitrary, however, as some of the *Limicolæ* rarely are seen on shore or marsh, and others commonly frequent the marsh.

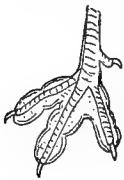
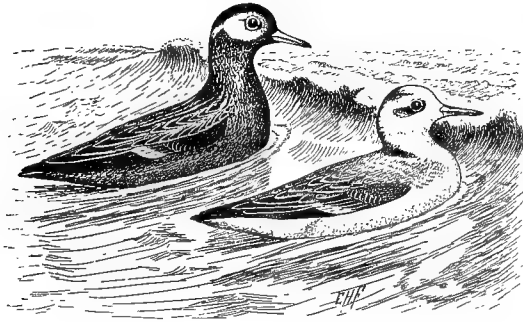


FIG. 12.—Foot of Red Phalarope.

In our present system of classification the Phalaropes (family *Phalaropodidæ*) come first, for their feet are lobed (Fig. 12), somewhat like those of the Coot but not so broadly. The membrane attached to the toes is sometimes scalloped along the edge, and the tarsus (that portion of the foot or so-called leg which connects the toes with the next joint above) is flattened, like that of the Grebes. They are small birds, with dense, Duck-like plumage. In this family the female is much the larger and handsomer, and does most of the wooing, while the male is more modest and retiring, and is said to incubate the eggs and rear the young. Two species migrate in numbers off the New England coast, sometimes near shore, but usually many miles from land, where they may be seen floating or swimming like little Ducks, and feeding among floating sea-weed.

RED PHALAROPE (*Phalaropus fulicarius*).

Common or local names: Bank-bird; Brown Bank-bird; Gulf-bird; Sea-goose; Whale-bird.



SUMMER.

WINTER.

Length. — 7.50 to 8.25 inches.

Adult Female in Summer. — Above mottled and striped with black and pale brown or buff; chin, region all around base of bill, forehead, top of head, nape and much of hind neck black; wing dark ash, with a white patch; cheeks and space above eye to black crown white; bill orange; sides and front of neck and other under parts reddish chestnut or wine red; tail black, gray and buff; legs and feet yellow.

Adult Male. — Duller; white on cheek less pure and defined, and top of head streaked with rufous or buff.

Fall and Winter Plumage. — Above mainly gray; head largely white; lower parts white; wings more or less black and white; bill blackish.

Field Marks. — Easily distinguished in breeding plumage, but in fall is known by its dagger-shaped bill, deep at base and tapering to near tip. The other species have slim bills.

Notes. — A musical *clink, clink* (Nelson).

Range. — Northern and southern hemispheres. In North America breeds from northern Alaska, Melville Island and northern Ellesmere Land south to mouth of the Yukon, northern Mackenzie, central Keewatin, Hudson Strait and southern Greenland; winter home unknown, but probably on the oceans, at least as far south as Falkland Islands; migrates along both coasts of United States; casual in the interior south to Colorado, Kansas, Illinois and Maryland.

HISTORY.

This species is probably a regular spring and fall migrant off the coast of Massachusetts, but on account of its habit of keeping well off shore it is noted only irregularly. It is called

the Brown Bank-bird by the fishermen, because of its color and the fact that it is found on the fishing banks, miles from shore.

In 1831, while about sixty miles off Nantucket, Audubon saw hundreds of this species feeding on a bank of floating seaweed. This is its common habit off our coasts. When seen on our shores it is common and sometimes abundant. It is met with occasionally in the Connecticut valley. In May, 1892, a remarkable flight was seen at Cape Cod and Nantucket.¹

The flight of the Phalarope resembles that of the Red-backed Sandpiper or the Sanderling. In winter plumage it resembles the Sanderling, being quite white in appearance. When it first appears in the spring it still retains its winter plumage, but begins to assume the summer or red plumage in May.

Sometimes this bird is seen just outside the surf, where it flies to and fro alighting on any temporary smooth spot amid the waves, and begins to feed. In such situations it is obliged to rise on the wing often, to avoid the curling waves which threaten to overwhelm it. Like the Northern Phalarope, it sometimes spins around as on a pivot when in pursuit of food. At such times the head and neck are carried erect to the fullest extent.

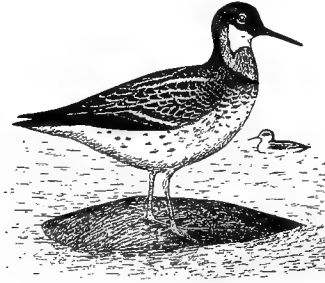
Individuals of this species are taken sometimes about inland lakes in New England. More commonly the flocks migrate at sea at a long distance from land. If the sea is calm they rest upon the water, and sometimes prefer to escape from the intruder by swimming rather than by flying. The habit of rising often, flying about and alighting on the water to feed is characteristic of these birds and distinguishes them from the Sandpipers. Sometimes in the interior they get their food by wading about in the shallow water.

Elliot says that in the northern seas it feeds on the "animalculæ" which form the food of the right whale, and so it follows that the whalers give it the name of whale-bird, because the presence of large numbers of these birds at sea usually signifies that whales may be expected.

¹ Mackay, George H.: *Auk*, 1892, pp. 294-298. See also Gerrit Miller, same page.

NORTHERN PHALAROPE (*Lobipes lobatus*).

Common or local names: Sea-goose; Mackerel Goose; Web-footed Peep; Bank-bird; White Bank-bird; Sea-snipe; Whale-bird.



Length. — 7 to about 8 inches; bill rather short (.80 to .88), very slender.

Adult Female in Breeding Plumage. — Above dark slaty gray streaked with yellowish brown on back; small crescents above and below eye white; wing dusky, marked with white; throat white; neck rich rust red or chestnut nearly all round; below white, marked on sides with slaty gray.

Adult Male in Breeding Plumage. — Similar but duller; more brown above; less chestnut on neck, which is more or less streaked; forehead largely white; crown marked with yellowish brown.

Adult Female and Male in Winter. — Forehead white; crown and other upper parts mainly gray, streaked with white; hind neck grayish; sides of head, throat and under parts white; a slate patch, surrounding the eye and its incomplete white ring, extends back over ear.

Young. — Similar, but with more black and yellowish brown on back.

Field Marks. — Difficult to distinguish from the Red Phalarope in winter plumage, but its bill is much more slender and needle-like.

Notes. — A low, chippering, clicking note (Chapman). A sharp metallic *tweet* or *twick* (Elliot).

Season. — Irregularly common migrant off shore spring and fall; April and May and August to November.

Range. — Northern and southern hemispheres. In North America breeds from northern Alaska, Melville Island and central Greenland south to Aleutian Islands (including Near Islands), valley of the Upper Yukon, northern Mackenzie, central Keewatin, southern James Bay and northern Ungava; winter home unknown, but probably the oceans south of the equator; in migration occurs nearly throughout the United States and in Mexico, Central America, Bermuda and Hawaii.

HISTORY.

The Northern Phalarope is the most numerous of the Phalaropes seen in autumn off our coast, but seldom comes ashore in any numbers, though it is not rare on occasion in some of the lakes and rivers of the interior when driven by storms to alight there.

On May 21, 1894, Mr. C. J. Smith, one of the drawtenders at the Craigie bridge over the Charles River between Boston and Cambridge, brought three freshly killed Northern Phalaropes to Mr. M. Abbott Frazar, the Boston taxidermist. These birds were in full breeding plumage. Mr. Smith stated that on the day previous to his visit fully one thousand of these birds were swimming in the Charles River between the Craigie and the West Boston bridges. The weather was very foggy and the birds stayed until noon, when they flew away seaward (Brewster).

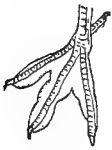
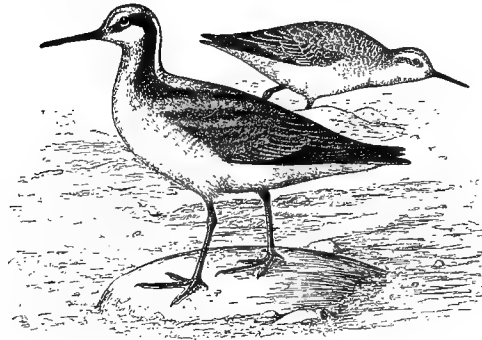


FIG. 13.—Foot of Northern Phalarope.

This bird is in full plumage probably for less than two months in the summer, and usually is seen off our coasts, sometimes in company with the Red Phalarope, feeding on floating seaweed. I have seen numbers of this beautiful species off the coast of British Columbia. When driven by storms at sea, or lost in the fog, it takes refuge sometimes in shallow ponds. It has a habit of spinning round in a circle. Chapman, who has observed it, says that it gives a rotary motion to the water that brings to the surface small forms of aquatic life, which the bird seizes, darting its bill into the water two or three times with each revolution.

Northern Phalaropes fly rapidly and often erratically, like the Wilson's Snipe. On the water they rest as lightly as a gull, and swim about alertly, with quick motions of the head, but are unsuspecting and easily approached.

Dr. Townsend gives some records made by Mr. A. F. Tarr, the head keeper of Cape Ann lights, the twin lighthouses on Thatcher's Island. Among them it is stated that on the night of September 2, 1899, an immense flock dashed against the light. One man picked up eight hundred dead, and Mr. Tarr estimated that one thousand were destroyed.

WILSON'S PHALAROPE (*Steganopus tricolor*).

SUMMER.

WINTER.

Length. — 8.25 to 9.50 inches.

Adult Female in Spring. — Above dark ashy gray, paler on the crown and rump and whitening on back of neck; throat, cheeks, line over eye and small crescent below it white; a dusky stripe from bill through and below eye, becoming black behind and extending down side of upper neck, where it changes to chestnut or dark wine red, widening there and extending down over side of neck, shoulders and back; a similar chestnut stripe below it just above wing; wings grayish brown; outer feathers (primaries) dusky; below white, the fore neck and breast tinged with pale chestnut, the latter slightly clouded on sides; bill long, slender, acute and black; legs, feet and iris dark.

Adult Male. — Similar, but smaller, duller, paler and not so strikingly marked; less black, light ash, white and chestnut; back and wings mainly brown, streaked with black.

Adult and Young in Fall. — General tone of plumage like that of the fall Sanderling; light ashy gray above, darkening on wings and tail; occasionally a few blackish feathers; upper tail coverts white; sides of head and neck white, with a dusky line from eye changing to cloudiness on sides of neck; below white; bill and eye dark; legs dull yellow. In summer the young are brownish black above, which soon gives way to fall plumage.

Notes. — A soft, trumpeting *yna, yna* (Chapman).

Season. — A rare transient in May, August, September and October.

Range. — North and South America. Breeds from central Washington, Central Alberta and Lake Winnipeg south to eastern California and northwestern Indiana; winters from central Chile and central Argentina south to Falkland Islands; casual in migration on Pacific coast from southern British Columbia to Lower California, and on Atlantic coast from Maine to New Jersey.

HISTORY.

Wilson's Phalarope is mainly an inland species, and always was considered a very rare migrant on our coast. Audubon records the capture of one near Boston, in the winter, but does not give the date. One was taken by Mr. George O. Welch at Nahant, on May 2, 1874, and is now in the collection of the Boston Society of Natural History.¹

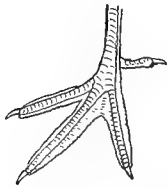


FIG. 14. — Foot of Wilson's Phalarope.

Another was taken by Mackay, August 31, 1889, on Nantucket.² I have seen several specimens that were said to have been taken on the Massachusetts coast, but could not verify this. This species has been taken in Maine, Connecticut and New York.

This bird, when on land or wading in water, moves about much in the manner of the Yellow-legs. It is more a wader and less a swimmer than the other two, and keeps mainly to the interior of the continent. Audubon killed several specimens near Lake Erie, and found their stomachs filled "with small worms and fragments of very delicate shells."

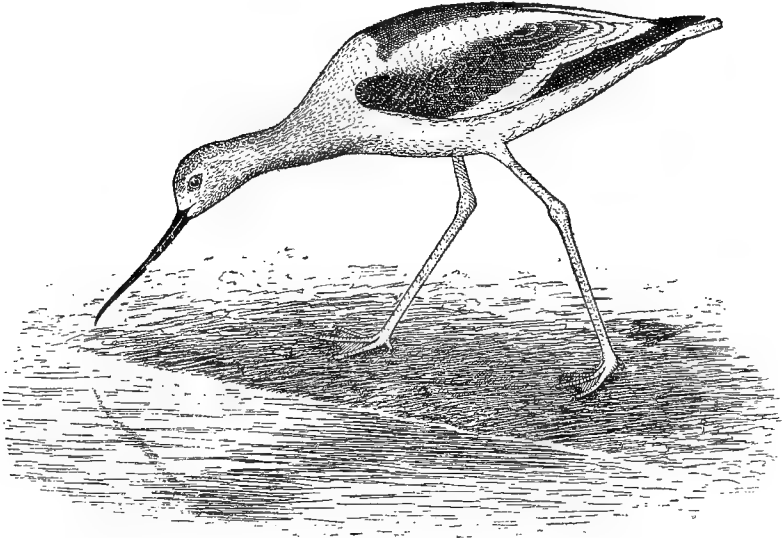
AVOCETS AND STILTS.

These birds comprise the singular family *Recurvirostridae*, so named because of the peculiar, flattened, upturned beaks of the Avocets. This is a small family in which the front toes are webbed or partly webbed and the legs, particularly in the Stilts, are exceedingly long and slender, but nevertheless the birds are handsome and graceful. The Avocets have the body flattened and the plumage thick and Duck-like.

The bills of Avocets seem to vary somewhat in form, if we may judge from dried skins and the drawings of ornithologists. Some have a clean upward curve; others have a slight double curve, as is represented in the illustration of the Avocet on the next page. Some Stilts have the bill nearly straight, while others show a distinct upward curve. The birds of this family have the feet more or less webbed, and swim well.

¹ Baird, S. F., Brewer, T. M., and Ridgway, R.: *Water Birds*, 1884, Vol. I, p. 338.

² Mackay, George H.: *Auk*, 1891, p. 120.

AVOCET (*Recurvirostra americana*).

Length. — Very variable, 16 to 20 inches; front toes webbed.

Adult. — Back and most of wings black; remainder of plumage white, excepting head and neck, which are mainly cinnamon brown in summer and pale gray in winter, and tail, which is pearl gray; legs blue, much of webs flesh color; bill black, long and upcurved; iris red or brown.

Young. — Similar to winter plumage of adult.

Notes. — A musical, loud *plēē-ēēk*, hurriedly repeated (Chapman). Click-click-click (Brewer).

Range. — North America. Breeds from eastern Oregon, central Alberta and southern Manitoba (rarely north to Great Slave Lake) south to southern California, southern New Mexico, northwestern Texas, northern Iowa and central Wisconsin; winters from southern California and southern Texas to southern Guatemala; casual from Ontario and New Brunswick to Florida and the West Indies, but rare east of Mississippi River.

HISTORY.

In the first years of the nineteenth century the Avocet was not uncommon on the Atlantic coast, where Wilson found it breeding in small numbers as far north at least as the salt marshes of New Jersey. Turnbull (1868) says that George Ord informed him that during his excursions to the coast with

Alexander Wilson the Avocet, Stilt and other waders, "which are becoming rare in our days were then quite plentiful." De Kay (1844) rates the Avocet as quite rare in New York State, and it is probable that it was never very common in New England, although it has been recorded north to the Bay of Fundy. Its large size, confiding nature and striking plumage made it a shining mark for the gunner, and it has long since disappeared as a breeder on the Atlantic coast, and now is regarded in New England as a rare straggler from the west. Two are said to have been taken years ago on the Lynn marshes.¹ One was taken at Lake Cochituate, Natick, October 19, 1880.² Three were shot at Ipswich, September 13, 1896, by Mr. A. B. Clark.³ There is one Maine record, but no others for New England. There are some museum specimens credited to New York, but no definite records.

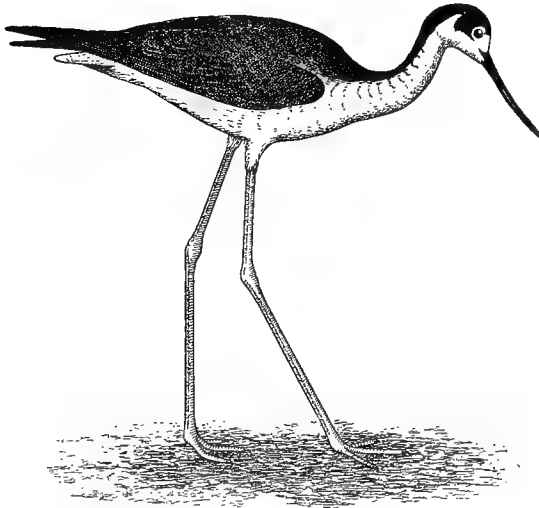
The long legs of the Avocet enable it to wade in deeper water than most birds, and its webbed feet fit it for swimming whenever it gets out of its depth. On the Atlantic coast it was found usually about salt marshes, and bred there. It feeds by immersing head and neck and probing in the ooze of the bottom with its curious bill. Its food while here was snails, marine worms and insects, according to Wilson. Elliot says that its food consists of insects, small crustaceans, etc. Henshaw found the larvæ of water insects in the crops of those examined.

The passing of this curious large and showy wader from the Atlantic coast is a matter of regret to all lovers of nature.

¹ Osgood, Fletcher: Shooting and Fishing, 1890, p. 11.

² Purdie, Henry A.: Bull. Nuttall Orn. Club, 1881, p. 123.

³ Kennard, F. H.: Auk, 1897, p. 212.

BLACK-NECKED STILT (*Himantopus mexicanus*).

Length. — About 15 inches; front toes half-webbed.

Adult Male. — Crown, back of head and neck, most of back and wings black; forehead, patch over eye, chin, throat, rump, tail and under parts white; eyes carmine; legs bright carmine, exceedingly long; bill black, slender and longer than head.

Adult Female. — Similar, but browner above.

Young. — Mantle ashy brown; feathers pale-edged.

Field Marks. — Large size, exceedingly long red legs and black or blackish upper parts distinguish it from all other shore birds.

Notes. — A sharp, rapid *ip-ip-ip* when flying; a hoarse *k-r-r-r-r-ing* note when on the ground (Chapman).

Range. — Temperate North America and northern South America. Breeds from central Oregon, northern Utah and southern Colorado to southern California, southern New Mexico, southern Texas, coast of Louisiana and in Mexico, and from central Florida and Bahamas to northern Brazil and Peru; formerly north to New Jersey; winters from southern Lower California, southern Texas, southern Louisiana and southern Florida south through Central America and the West Indies to northern Brazil, Peru and the Galapagos; casual north in migration to Nebraska, Wisconsin and New Brunswick.

HISTORY.

Wilson says that the Stilt arrives on the coast of New Jersey about the 25th of April, in flocks of twenty or thirty, and that six or eight pairs breed together. No doubt this was true in the early part of the nineteenth century, but it long ago ceased to be so. Audubon (1838) did not find it abundant anywhere, and said that it seldom was seen to the eastward of Long Island. De Kay (1844) said that the bird was then not a very common visitor to New York, and that it still bred in New Jersey and "possibly in New York [Long Island]," but appeared everywhere to be rare. Since then it nearly has disappeared from the Atlantic coast north of southern Georgia and Florida. C. J. Maynard (Massachusetts, 1870) says on the authority of gunners that it occasionally is seen along sandy beaches. This evidence may be taken for what it is worth. There is no record that the bird ever bred in Massachusetts, and possibly it never was much more than a wanderer to these shores from the middle States. Mr. Boardman states that it was seen occasionally but rarely at Calais, Me., and Dr. Brewer (1884) asserts that several specimens have been taken at Grand Manan, N. B., and that "occasional instances of its capture near Boston are known." There is but one record of the capture of a specimen in Maine. Dr. Allen records two specimens as taken in Massachusetts, which were found in Boston market.¹ There is a specimen in the Museum of Comparative Zoölogy at Cambridge, Mass., labeled Lynn.² There are no New York records for the past fifty years.

This large, handsome and striking wader has been brought to the verge of extermination along the Atlantic coast by spring and summer shooting, as have all the larger waders that once bred there.

¹ Allen, J. A.: Amer. Nat., 1870, p. 638.

² Howe, R. H., and Allen, G. M.: Birds of Mass., p. 34.



PLATE VII.—WOODCOCK ON NEST.

From a photograph obtained through the courtesy of the National Association of Audubon Societies.

SNIPES, SANDPIPERS, ETC.

This great family (*Scolopacidae*) contains birds widely different in size, shape and color, but they are mainly of small or medium size, never reaching the average size of the Herons. The bill usually is long and soft skinned in life, generally straight, roundish and slim, but sometimes curved up or down, and in one genus the end is spoon-shaped. The head is feathered to the bill; excepting a few species, they frequent moist lands or the shores of bodies of water. They inhabit all habitable lands.

WOODCOCK (*Philohela minor*).

Length. — 10 to 12 inches; bill nearly 3 inches.

Adult. — Upper parts brown and russet or buff, mixed with gray and marked with blackish; back of head black, barred with buff; dark line from eye to bill; under parts pale, warm brown, varying in intensity; tail black, tipped with white; eye large, well back and high.

Field Marks. — Larger than a Robin. The long bill and the whistling sound made by the wings in starting from the ground will identify the bird. It is rarely found in the open meadow or marsh where Snipe congregate, but rather in swampy woods or upland gardens and corn-fields.

Notes. — A nasal *peent* or *paip*, and a twittering whistle (Chapman). A curious *p'tul* (Hoffmann). *Chip-per, chip-per chip* (Samuels).

Nest. — On ground in moist land.

Eggs. — Three or four; large, averaging about 1.60 by 1.14, ash gray to light buff, with reddish brown or chocolate and stone gray markings.

Season. — March to November; rare in winter.

Range. — Eastern North America. Breeds from northeastern North Dakota, southern Manitoba, northern Michigan, southern Quebec and Nova Scotia south to southern Kansas, southern Louisiana and northern Florida; winters from southern Missouri, the Ohio valley and New Jersey (rarely Massachusetts) south to Texas and southern Florida; ranges casually to Saskatchewan, Keewatin, Colorado, Newfoundland and Bermuda.

HISTORY.

Dr. D. G. Elliot (1895), in his work on North American Shore Birds, states that the Woodcock is "gradually becoming scarcer within our limits." Dr. A. K. Fisher of the Biological Survey, in his report on Two Vanishing Game Birds, specifies the Woodcock and the Wood Duck as the species particularly

in danger of extinction. Writers on ornithology and sportsmanship generally agree in the belief that the Woodcock is diminishing in numbers, particularly near centers of population; but the danger of extirpating it is not now nearly as great as that which menaces several other species of migratory birds; as, owing to the writings of such men as Dr. Elliot and Dr. Fisher, the sportsmen of the United States have moved to secure better protective laws for Woodcock in many States, and this has helped to stay the destruction of the species.

Summer shooting, which formerly was legalized in many States where the Woodcock bred, almost exterminated the breeding birds in many regions. Winter shooting in the south was very destructive, and still is so in some States. Summer shooting in the north has been given up largely, and the fall shooting season has been so shortened that the birds are holding their own in many localities, and occasionally good fall flights are seen in New England.

Early in the last century Woodcock are said to have been so plentiful within twenty-five miles of Boston that during the long open season a good shot would average about fifty birds a day; but to one knowing present conditions this seems highly improbable. We have some records, however, which prove that sixty or seventy years ago very large bags were made in summer. Within my own lifetime the breeding Woodcock have been absolutely extirpated from alder swamps and runs which formerly harbored many pairs, but this has been done by excessive August and early September gunning, which is now prohibited. As one result of the shorter open season, Woodcock are now coming back to breed in localities from which they were absent for years.

The flights of birds from the north have not diminished in number so much as have the native birds. Occasionally a large flight stops here, as in early November, 1908, when Woodcock were plentiful here, and when some gunners in Connecticut secured from twenty to forty birds each in a day. This flight did not denote such an increase in the number of these birds, however, as generally was believed. The explanation is that they all came at once. The birds in Maine and the

provinces had a good breeding season, and they must have had a plentiful supply of food, for the autumn weather was mild and they mostly remained in their northern homes until nearly the first of November. Flight birds were rare in Massachusetts up to that time and the bags were small. The fall had been warm and dry; but on October 29 and 30 New England and the provinces experienced a severe northeast storm along the seaboard, followed by a cold northwest wind, which probably froze up the northern feeding grounds, if the storm had not already buried them in snow. Either or both of these conditions drove the Woodcock into southern New England. My correspondence shows that this flight landed in every county in Massachusetts, except Dukes and Nantucket. As usual, comparatively few were seen in Barnstable County. Connecticut harbored many Woodcock from about November 12 to November 20. There were many in Rhode Island, and the flight was noted as far south as Delaware.

My correspondence regarding the present status of the Woodcock in Massachusetts is interesting. Thirty-five Massachusetts correspondents report Woodcock, which breed here, as increasing, and one hundred and fifty note a decrease. Those who note an increase have observed it in recent years. These reports of increase are scattered over every county in the State excepting Nantucket, Dukes and Barnstable. The greatest number reporting an increase in one county is five, from Plymouth. The reports of decrease come from every county in the State, except Nantucket, where Woodcock rarely are found. They are distributed as follows: Dukes, one; Barnstable, eight; Bristol, thirteen; Plymouth, twenty-one; Norfolk, eight; Essex, twenty; Middlesex, twenty-four; Worcester, sixteen; Hampden, nine; Hampshire, six; Franklin, fourteen; Berkshire, four. Seven, including Boston residents, who hunt in the eastern counties, reported a decrease for eastern Massachusetts generally. From these reports it is safe to conclude that breeding Woodcock have decreased largely in the State, except in some favored localities, where formerly they were decimated, but under improved laws are now increasing.

Only twenty-seven correspondents report an increase of migrating Woodcock or flight birds, and one hundred and thirty-six note a diminution. Several of the former base their statements on the great flight of 1908, while the latter practically all speak from years of experience. Those who see an increase are mostly in the counties where the flight of 1908 was most marked, while those who record a decrease are scattered over the State, as follows: Dukes, one; Barnstable, seven; Bristol, nine; Plymouth, twenty; Norfolk, seven; Essex, seventeen; Middlesex, twenty-three; Worcester, ten; Hampden, nine; Hampshire, six; Franklin, twelve; Berkshire, six, and eastern Massachusetts generally, nine.

While the decrease of native Woodcock is regarded on the whole as larger than that of flight birds, on the other hand, a *recent* accession of breeding birds has been noted by more correspondents than those recording an increase of flight birds. Better laws and better law enforcement in the States south of us will help to increase our native Woodcock.

We have now gone very near to the limit in protecting Woodcock in Massachusetts; our open season of one month comes so late that our own gunners get little chance to kill native birds legally, and a month in which to shoot migratory birds is about as short a season as most gunners will be content with. There is nothing more that we can do for the Woodcock in Massachusetts, unless we limit by law the number of birds which the sportsman may take legally in a day, and still further reduce the shooting season.

The sportsmen's organizations of Massachusetts might have some influence upon legislation in the southern States if a limit to the size of the daily bag were required here. If the stories of sportsmen who hunt Woodcock in the south in winter are to be believed, the slaughter of these birds in certain sections is enormous. At times incalculable numbers of these birds from the north are closely crowded into a limited region, and may be killed by scores and hundreds. Mr. James J. Pringle gives a record of fifty-five Woodcock killed from 9 A.M. to 2 P.M. in Louisiana to his own gun. To prevent this the season there should be shortened and the bag limited.

A large part of this shooting is done by northerners, who never know when they have enough, and southern market hunters, black and white, who shoot mainly for the northern markets. If we of the north who prate about the great slaughter of Woodcock in the south would close our markets effectively against these southern birds, and uphold the efforts of those who are trying to better the laws of the southern States, southern shooting might be restricted within reasonable limits. Ever since the civil war we have been inclined to blame the south unjustly for both her deficiencies and our own. It is true that in Audubon's time, and for many years afterward, many Woodcock were killed in Louisiana by both negroes and whites. "Firelighting" was the usual method, but Louisiana now has better game laws and better enforcement than in the past.

Mr. I. N. De Haven of Ardmore, Pa., writes me that Woodcock are killed in great numbers near Cape Charles, Va. If there is a heavy snowstorm in December a gunner will get from four to seven dozen in a few hours. "The shooting," he says, "sounds like a fourth of July to us out on the bay shooting ducks. *They are shipped to New York and Boston.*" Are we enforcing our non-sale laws in the north?

The northern Woodcock are hardy birds and do not go very far south unless forced to do so by the freezing up of their feeding grounds. A sudden freeze in the south deprives them of food, and if this is followed by a severe snowstorm they are obliged to seek warmer quarters or perish. Great flights appear in the south at such times, and many birds are starved or frozen. Such a catastrophe occurred in 1892, another in 1895 and still another in 1899. Wayne records that on February 13 and 14, 1899, countless thousands of Woodcock came to the region about Mount Pleasant, S. C. Tens of thousands, he says, were killed by would-be sportsmen and thousands died of starvation and cold. Most of them were much emaciated and were unable to withstand the cold. One man killed four hundred in a few hours.¹ Mr. James Henry Rice, Jr., secretary of the Audubon Society of South Carolina,

¹ Wayne, Arthur T.: Auk, 1899, p. 197.

tells me that at that time he saw in Georgetown a line of wheelbarrows, loaded with Woodcock, brought into the market by negroes, but the birds were so emaciated that the dealers refused to purchase them. The Woodcock were so weak and bewildered that some were chased and caught, others were knocked down with sticks. They probably came to the sea-coast from higher or more northern lands, seeking food. Laws prohibiting the killing and sale of these birds in the south after January 1 would save many which now are slaughtered needlessly.

Some of my correspondents give no reason for the decrease of Woodcock, but the majority of the gunners attribute it to man, and mainly to overshooting; many of them, however, are inclined to blame their brothers of the north and south for the diminution of the birds. Mr. C. A. Clark, the Lynn naturalist, says "fifteen years ago woodcock were quite common in my locality, but have been falling off very fast since that time, and I have scarcely seen one here the past three or four years. They need a close season for at least five years." Mr. Lawton W. Lane of Lynn writes: "The woodcock is getting to be a bird of the past. In 1907 I kept a record of the birds which I started. I started forty-one, of which I killed thirty-eight. I write this not to tell of my great shooting, but to show the cause of the decrease of this bird. It is gunned all over the country in the same way, and is not a very hard bird to shoot, with a good dog." Dr. L. C. Jones of Malden writes that three men from Malden, on a trip to Maine, killed one hundred and eight, and that a gunner in Nova Scotia had killed two hundred and seventy-five. The sportsmen and gunners of southern New England and the middle States probably kill as many Woodcock north and south as any one; they certainly get their share. North Carolina now (1910) has a law limiting the bag of Woodcock to twelve a day.

The draining of swamps and swales, both north and south, is slowly but steadily decreasing the natural breeding places and cover for the Woodcock. Mr. Howard M. Douglas of Plymouth thinks that perhaps the making into cranberry bogs of many bog holes in Plymouth County where Woodcock

used to feed has a tendency to drive them away. Similar conditions now exist in Barnstable and Bristol counties. Mr. John S. Nicholson of Hyannis notes this fact; but as the Woodcock feeds on the worms and insects on cultivated lands not all its feeding grounds ever will be destroyed. Many good Woodcock grounds have been flowed in making reservoirs for water supply. Forest fires drive out or destroy breeding birds. In some cases they do not return for years after a fire. A deal of Woodcock cover has been cut off in recent years in eastern Massachusetts, and has not been allowed to grow up again; but, on the contrary, many isolated, abandoned farms in western Massachusetts have grown up to brush, and alders have been allowed to grow along the runs in the pastures, therefore the cutting of cover has affected the birds little except locally, mainly in eastern Massachusetts. The vast network of telephone, telegraph and trolley wires that is now stretched over the country is perhaps a greater menace to the Woodcock than to any other bird. Many years ago Audubon observed that the Woodcock migrated at night, and flew very low. Few birds, perhaps, except Rails and Cuckoos, habitually fly at so low a level. These birds fly at night and strike the wires. Probably, in time, those which barely touch these wires learn to avoid them, but those which strike them with the breast, neck or head never see daylight again; many hundreds of these birds have been picked up under the wires. Thousands of Woodcock undoubtedly perish in this way annually. Many correspondents speak of this. I have talked with old gunners, who have followed the wires in the marshes and picked up a number of birds; some have been brought to me dead, with characteristic wounds on head, neck or breast. One correspondent records that a friend *saw* a Woodcock strike a wire and fall dead. Let us hope that the Woodcock may learn in time to avoid these wires.

All these causes for the depletion of Woodcock have very little effect, however, compared with the continual hunting and combing out of the covers by sportsmen and gunners with dogs. I have killed Woodcock without a dog, but a man without a first-class dog will have difficulty in finding more

than a small proportion of the birds in a cover. So long as there is no bag limit the sportsman is inclined to shoot every bird he starts if possible. If he does not or cannot, the next man will if he can, and so the birds are wiped out.

So much has been written on the habits of this bird and its pursuit that there remains little to be added here. I have given some notes on its habits in *Useful Birds and their Protection*, but a few remarks that may be new to the general reader are appended.

The mother Woodcock's habit of flying off, when disturbed, with her young held in her feet, or between her thighs, has been noticed and recorded more than once; but Mr. William H. Leonard of East Foxborough informs me that Mr. George Hawes, when fishing in Trap Hole Brook, saw a Woodcock carry her three young across the brook, one at a time, by means of her toes and claws.

My experience in rearing young Woodcock on bread and milk, with a few worms and insects, which was finally ended by an accident, leads me to believe that these birds might be reared artificially, and experiments to this end should be made. The Woodcock, however, lays so few eggs that only the most rigid protection can prevent its decimation, and the hope of increasing its numbers artificially is not great.

A few notes about the migration of the Woodcock will be necessary to a proper understanding of the considerations which should govern legislation for its protection in Massachusetts. We do not know precisely when the native-breeding birds start on their southern migration, but gunners from some of the hill towns west of the Connecticut River claim that in the present open season (October 15 to November 15) they get no Woodcock shooting whatever, for the native birds all leave their localities in the Berkshire hills and go south or to the lower land by early October, and that the later flight birds (probably finding these hills cold and uninviting) do not stop there; but there are some towns favorably situated among the hills which are visited by the later flights, which come down the Connecticut valley. At the opposite end of the State the coast-line, always a highway of migration, offers

a chance to gain some knowledge of the flight. As Maine and the provinces lie well to the eastward, we might expect many of the southward-moving birds to follow the coast, or even to cross Ipswich Bay and the Bay of Fundy on their way, as other land birds do. But Woodcock fly largely on moonlit nights, and so low that it is probable that they do not often purposely start out to cross large bodies of water. They may be blown off shore occasionally by sudden gales, and this may account for a bag of Woodcock brought into a hotel in Provincetown in 1868, and reported to me by Mr. Alfred S. Swan. These birds probably were blown off the land by some northwesterly gale, and, being unable to make land anywhere else, reached the end of Cape Cod. Woodcock are not common there and probably rarely breed on that sandy soil. Those flight birds which follow the coast probably mostly cross Cape Cod below Plymouth, and turn westward into Rhode Island or Connecticut, or follow down the west shore of Buzzards Bay. Possibly some of them keep on down the shore of Cape Cod Bay as long as it trends southward, and thus land in Sandwich and even in Barnstable, crossing the Cape, as many birds do, at the most southerly indentation of its northern shore, that forms the entrance to Barnstable harbor,—the narrowest point of the arm of Cape Cod, where the towns of Barnstable and Yarmouth meet. Here at Yarmouthport Mr. Stephen W. Fuller reports that flight Woodcock pass through in August.

Counting Provincetown as the hand of Cape Cod, Truro forms the wrist. Mr. Willard M. Small states that a few flight Woodcock come there each year. This seems to indicate that a few are blown off the coast annually and find rest near the end of the Cape. Correspondents in all the other Cape towns, down the forearm to the elbow at Chatham, and from there to the middle of the arm at Yarmouth, report the Woodcock as very rare. From Yarmouth until we reach the mainland at Plymouth similar reports prevail, but at Hyannis, nearly south from Yarmouth on the south side of the Cape, two gunners, Mr. John S. Nicholson and Mr. Frank G. Thacher, report flight birds. Mr. Nicholson, who has had over fifty

years' experience, says that in some years quite a flight goes over in the evening. Some stop, but no large numbers. He says that he shot four or five in the fall of 1908, that several were shot in the fall of 1909 and that there was quite a flight in November, all of which seems to indicate that a part of the flight of Woodcock comes down the coast, crosses from the entrance of Barnstable harbor over Yarmouthport, steers southward to Hyannis and then follows the south coast of the Cape Cod peninsula westward. Those which come down from the outer arm of the Cape may cross here also. This seems to indicate that the movement of native Woodcock southward begins there in August, and the experience of western Massachusetts gunners indicates that the native birds have left there by early October, although some may remain later in the milder climate of the coast region.

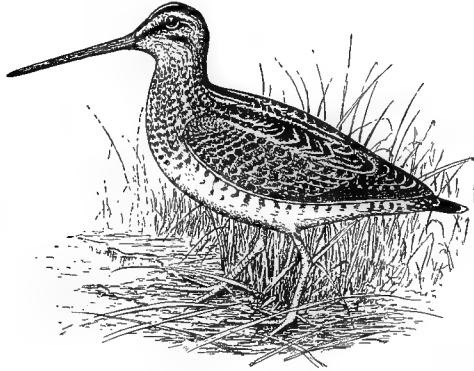
Our present law protects our own birds fairly well here, except from lawbreakers who hunt before "the law is off." Probably most of the Woodcock shooting that our gunners get now is furnished by birds from farther north and northeast.

The fate of the Woodcocks rests largely with the people of the United States, in which mainly it lives. Its range includes southern Canada, and recent information seems to indicate that it may penetrate as far west as Oregon; but it is chiefly a bird of the eastern United States. It is not disturbed by agriculture, and thrives well on rich and cultivated farms, provided there are a few boggy runs or small swamps where it can nest. Gardens and cornfields are favorite hunting grounds of this bird.

The food of the Woodcocks consists largely of earthworms and insects. The long sensitive bill is provided with nerves and muscles and forms a very effective tool for exploring soft ground or searching beneath the leaves, for in such situations the bird gets most of its food.

WILSON'S SNIPE (*Gallinago delicata*).

Common or local names: Snipe; English Snipe; Jack Snipe.



Length. — 11.25 inches; bill (average), 2.50.

Adult. — Crown dark brown or blackish, split along center by a light buffy line, and separated by a buffy stripe from a blackish line running from bill through eye; back and wings a mixture of dark brown or blackish and reddish brown, tan or buff, striped longitudinally with light buffy or whitish; wings brown and dusky, with light buffy markings on coverts; tail ending in a broad bar of reddish brown crossed near tip with blackish and tipped with whitish; outer tail feathers pale buff or whitish, barred with black; tail coverts barred; throat gray; neck and upper breast pale brown, mottled, and streaked with blackish; flanks gray, barred with black; lower breast and belly white; legs and feet very pale ashy green.

Field Marks. — A bird of fresh-water marshes mainly; may be known by its long bill and erratic flight.

Notes. — Call, heard when bird is startled and springs into flight, an unmusical squeak resembling the syllables 'scapel' 'scapel' Kuk-kuk-kuk uttered on the ground (Knight).

Nest. — A depression in grass or bog.

Eggs. — Usually four, pointed, olive brown, spotted and blotched with reddish brown mainly near larger end, about 1.55 by 1.08.

Season. — A common spring and fall migrant in April and early May, September, October and even November; a few breed and probably fewer still winter.

Range. — North America and northern South America. Breeds from northwestern Alaska, northern Mackenzie, central Keewatin and northern Ungava south to northern California, southern Colorado, northern Iowa, northern Illinois, Pennsylvania and New Jersey; winters

from northern California, New Mexico, Arkansas and North Carolina through Central America and West Indies to Colombia and southern Brazil; remains in winter casually and locally north to Washington, Montana, Nebraska, Illinois and Nova Scotia; accidental in Hawaii, Bermuda and Great Britain.

HISTORY.

The Snipe was very abundant formerly in the fresh-water meadows of New York and New England. There was excellent Snipe shooting from five to twenty miles out of Boston in the early years of the last century. Some of the tales and legends regarding it, told years ago by the older gunners, would receive little credit in the light of present conditions; but a good many Snipe are seen now in our meadows and good bags sometimes are made. Undoubtedly the general decrease in these birds and the destruction of the local breeders are due mainly to the increase of population, accompanied by spring shooting and excessive hunting.

Until recently the Snipe has been pursued at all seasons, and such pursuit was regarded as legitimate because the bird bred mainly in the north, beyond our limits. Each gunner or sportsman killed as many as he could while they were here. The destruction of Snipe in the south was phenomenal. Mr. James J. Pringle, a southern gentleman, has published the most painstaking record of Snipe shooting that I have ever seen. He was not a market hunter, but hunted for pleasure, and used his own birds, giving away the surplus to his friends and owners of the land over which he shot. His shooting was done in Attakapas County in the southwestern part of Louisiana, near Bayou Teche. As he did not make a business of Snipe shooting he did not shoot every day during the season, but only when it suited his convenience, and he kept a journal in which every bird that he shot was recorded, after all had been counted carefully by others as well as himself. No birds shot by his companions were counted, and the record is one that he could swear to in court. In shooting he used two men as beaters, one as a marker, and one or two dogs (kept at heel and used only to find dead birds), and a wagon and driver to help wherever it would be useful. He rarely was able

to kill more than one Snipe at one shot, but the record shows that in twenty years he killed sixty-nine thousand and eighty-seven Snipe and two thousand seven hundred and seventy-two other birds which were shot incidentally. At the end of the twenty years, 1867-68 to 1886-87, the shooting began to fail. On March 2, 1869, he killed sixty-nine Snipe in seventy-five minutes. In November, 1874, he killed one thousand four hundred and fourteen Snipe in six shooting days. In December, 1877, he killed one thousand nine hundred and forty-five in seven shooting days. His maximum days' score was three hundred and sixty-six Snipe in six hours.¹ Very likely no gentleman sportsman ever killed so many Snipe in twenty years as did Mr. Pringle, but others have exceeded many of his daily scores. Market hunters followed the sport as a business, day after day, wherever Snipe were numerous. I talked with one such expert, who had killed scores in one day in Massachusetts, who stated that he had yet to find the man who was willing to stop shooting while the "birds were plenty."

Mr. Edmund Blood of East Groton, Mass., says that the Snipe bred commonly there fifty years ago. Undoubtedly they once bred in some numbers in Massachusetts. Nuttall states that his friend Mr. Ives of Salem told him that a few pairs bred in that vicinity. Samuels (1870) says the Snipe has been known to breed here. There are now several instances on record where young Snipe have been shot here or old birds taken in the breeding season. Mr. A. W. Sugden of Hartford writes me that when he was a boy Fairfield swamp and its vicinity and the meadows in Weathersfield and Rocky Hill, Conn., were alive with Snipe, and many nested there. "Since the prohibition of spring shooting in this State," he says, "a few Snipe remain here in summer and probably breed in some of our meadows."

Mr. George M. Bubier of Lynn saw a Snipe on a telegraph pole in Lynnfield on May 22, 1907, evidently apprehensive for the safety of her eggs or young, for she continued to utter cries of alarm. The habit of alighting, during the nesting season, on trees, fences and other objects above

¹ Pringle, James J.: *Twenty Years of Snipe Shooting*, 1899, p. 301.

ground is common to several species of this order. Mr. D. T. Cowing of Hadley writes that quite a flock was raised in 1906 on the Oxbow, a tributary of the Connecticut River; that one man killed one hundred and thirty birds there, and that a few have been seen since (1908).

About one-half my correspondents in Massachusetts have either not seen or recognized the Snipe in their localities. Nine report it as increasing in number in their neighborhoods, — one each in Hampden, Worcester and Plymouth counties and six in Barnstable County. One hundred and nine report it as decreasing: two in Hampshire County, two in Hampden, six in Worcester, twenty-one in Middlesex, twenty-one in Essex, six in Norfolk, eighteen in Plymouth, six in Bristol, sixteen in Barnstable, two in Dukes and four in Nantucket. Five report it rare in eastern Massachusetts generally. We must make some allowance for the fact that most gunners do not now watch the spring flights, when the larger numbers appear, for spring shooting is prohibited. In some of the localities where I shot Snipe thirty to forty years ago not one is ever seen now. This may be owing in part to the building up of the region; but I believe that along the Charles River meadows, where I shot as a boy, the birds have decreased since about one-half.

The reports seem to show that there are very few Snipe in Berkshire, Hampshire and Hampden counties, except along the Connecticut River or its tributaries. Near Springfield Mr. Robert O. Morris does not see any great decrease. Much of the territory of the western counties is not fit for the Snipe, and it probably never was very common anywhere there, except along the river valleys. Several correspondents, however, regard the bird as having decreased ninety per cent. Throughout Worcester County the same condition exists. The Snipe is almost unknown in the wooded hill towns where the Woodcock is common, but here and there it crops up, though mainly in decreasing numbers.

The tales of the decimation of this bird that come from many parts of the State are rather pathetic. We would not expect to find many Snipe among the hills of northern Worcester County; but in the valley of the Blackstone, south of

Worcester, we might reasonably look for a few. Nevertheless, Mr. Henry T. Whitin of Northbridge says, "practically extinct; have not seen one in years." One might anticipate finding them common east of Worcester, on the meadows near the sources of the Sudbury and the Assabet, but Hon. Joseph S. Gates of Westborough says laconically, "very few left." Mr. Elmer M. Macker of North Grafton says, "a few years ago one was shot occasionally but for the last four or five years not one has been seen." In the eastern counties, as we approach the sea-coast and the fresh-water marshes and meadows along the rivers, the numbers of Snipe increase a little, but even there many people find them rapidly disappearing. On Cape Cod, where Woodcock generally are rare, Snipe sometimes are common, though usually decreasing and never very abundant. The Snipe naturally supplements the Woodcock by occupying the country where the Woodcock is absent. The Woodcock is a bird of timbered runs on the hills and wooded swamps in the valleys, while the Snipe occupies mainly open meadows and marshes.

On Nantucket, where there are practically no Woodcock, Snipe sometimes are found in some numbers, although the island is far out in the Atlantic. In one day recently one man killed sixty Snipe on Nantucket, all in one meadow or marsh. He was an old hunter, an excellent Snipe shot, knew the ground perfectly and killed every bird that he could. It will probably be some time before any one will kill sixty birds in a day again on that island. This shows the necessity of a daily bag limit. Had he been obliged to go six days, or even three, to that spot to kill an allowance of ten or twenty birds per day, some of them would have gotten safely away, — or some other gunner would have had a chance.

In scanning my reports from other regions it would seem that while Snipe still are plentiful in many parts of the south their numbers are decreasing from Canada to Texas, and in many States the depletion appears to be about as steady as in New England. Wayne, in his *Birds of South Carolina*, just published (1910), says that he doubts if there is a State in the Union where the Snipe is found in larger numbers. This looks

hopeful. But Mr. James Henry Rice, Jr., who is in charge of game preservation in that State, says that while Snipe still are plentiful, they have decreased 75 per cent. within his recollection. Mr. A. S. Eldredge tells me that Snipe are holding their own fairly well in southeastern Texas; but Mr. J. D. Mitchell, whose experience over southern Texas is much wider and longer, says that they have decreased seventy-five per cent. in forty-four years.

That great Snipe shooter, Mr. James J. Pringle, states that for the first twenty years of his shooting in Louisiana he generally saw every day on the marshes not only great numbers of Snipe but also great flocks of Ducks, and many otters, alligators, raccoons, deer and birds and game of all kinds peculiar to that locality. The diminution in the number of Snipe after twenty years' shooting was accompanied also by a similar decrease in game of all kinds, and a few years later the shooting broke down altogether and was given up. This falling off of the shooting, and its final complete failure on these grounds, he says was due to various causes. He believes that the disappearance of the birds was due largely to the enclosure and draining of the grounds, also to the improvements in and cheapness of firearms; to the extension of railroads, which brought the grounds within reach of the markets, and to the increase of gunners, not only in this region, but all through the continent, so that there were not so many Snipe nor other game birds in the world at the end of the twenty years as at the beginning. Altogether, there was a sad decrease of all kinds of birds and beasts, and the Attakapas country, which was a great game region when he first began to shoot over it, had lost the game which once formed its chief attraction for him and his friends. During the last years of his shooting, the Ducks, raccoons, otters and alligators disappeared, and he seldom saw any.

The cause given by most correspondents for the depletion of the Snipe is overshooting or spring shooting. In four cases the draining of meadows or the drawing off of water for manufacturing purposes is spoken of, and at Scituate the breaking in of the ocean at North River by a storm is noted, changing

the character of the feeding ground by flooding the meadows with salt water. The diminution of the Snipe may have been exaggerated, but such reports have been coming in for many years from all over its range. They cannot be ignored. What are we going to do about it? Birds like the Snipe and Woodcock, which rear small broods, cannot recover so rapidly from overshooting as can Grouse, Bob-whites or Ducks, all of which rear large broods. The very least that should be done is to stop the spring shooting of Snipe in every State within its range, and forbid summer shooting wherever it breeds. In co-operation with Canada and Mexico we can readily protect and increase this valuable bird.

The fact that flights of this Snipe frequently land near the tip of Cape Cod and all along its outer arm, and also at Nantucket, indicates that it strikes boldly out to sea in migration, thus taking a short cut to the south. Snipe land on Bermuda in considerable numbers, and some winter on the Antilles. This leads to the inference that there is a regular fall flight of Snipe from regions north of us, which put out to sea like some of the well-known shore birds, and steer directly to the West Indies, some stopping at Bermuda on the way. Thus we may account for the fact that the fall flight of Snipe, in eastern Massachusetts and Rhode Island at least, is much smaller ordinarily than the spring flight. Most of the fall birds from the north possibly land here only when driven in by storms, and the spring birds come back by land; otherwise, considering the effect of shooting, etc., the spring flight would be the smaller. Prof. W. W. Cooke speaks of a hunter near Newport, R. I., who secured scarcely a third as many birds in the fall, for a period of eight years, as he did in the spring.

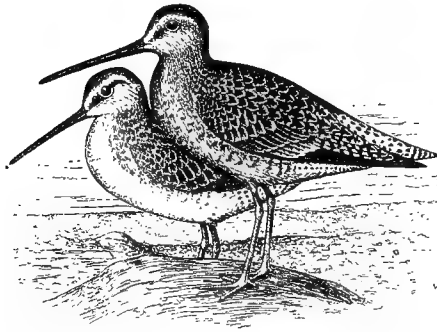
It is noted often that during easterly storms numbers of Snipe are seen on our meadows, and that fewer are seen in fine weather. This is due no doubt in part to their being blown inshore by adverse winds, but it is partly due also to the fact that the Snipe feed largely at night, or in dull, cloudy or foggy weather, which often is the best for Snipe shooting, and like to hide in some chosen retreat to sleep away the best hours of a sunny day. The Snipe migrate at night. I have

heard Snipe flying about the meadows on moonlit nights, and have heard them apparently coming in during a storm at night. Wet weather which soaks the marshes makes favorable conditions for Snipe; hence they are not likely to appear in such numbers during a dry September as in a wet one. Dry seasons make favorable conditions in the interior for shore birds generally, but not for Snipe and Woodcock. Like the Woodcock, Snipe cannot live long where the ground is frozen, and, therefore, sudden drops in autumn temperature north of us start them along. Like the Woodcock, also, a few birds remain in winter in Massachusetts near unfrozen springs. I have found the Snipe in January near Worcester, and several instances are known where they have wintered near Lynn and on Cape Cod; but most of the birds seen here are migrants.

The habits of this bird are too well and widely known to need much mention here. Snipe are attracted to burnt ground or to meadows where the grass has been mowed. In the south they sometimes frequent plowed lands, and even seem to follow the plow in search of worms and grubs. They frequent meadows also where hogs have rooted, and sometimes in the north large numbers are seen about market gardens, all of which indicates that they prefer land where worms and insects are abundant and easily accessible. Wherever they find a liberal supply of food they congregate, and many may be found in such spots, while few will be seen on ground apparently equally attractive but not supplied with food. The birds continue feeding in light rains, and congregate together, but when the rains continue heavily, and the grounds become flooded, they fly to higher land, where they are very restless and wild. A meadow with deep, moist, black loam or mold, with very little sand, seems to be most attractive to the Snipe. Their food consists largely of insects, including grasshoppers, locusts, cutworms and beetles, with such others as may be picked up from cultivated fields and marshes. Earthworms, leeches, seeds of smartweed and other plants, together with roots and other vegetable matter, have been found in their stomachs. Enough is known of their food habits to place them among the beneficial species.

DOWITCHER (*Macrorhamphus griseus griseus*).

Common or local names: Brown-back; Driver; Robin-snipe; Red-breasted Snipe.



FALL.

SPRING.

Length. — 10 to 11 inches; bill 2.05 to 2.55.

Adult Male in Spring. — Upper parts mixed black and buffy or cinnamon; lower back, rump and tail white; rump spotted and tail barred with black and light tan or pale buff; general tone of closed wing brownish gray, in contrast to reddish tone of body, blackening toward tip; two whitish wing bands; sides of head and under parts reddish buff or pale cinnamon, finely marked and sparsely spotted (and barred on flanks) with black, becoming white on belly; bill greenish black; legs and feet greenish brown; iris very dark.

Adult Male in Fall. — Head and upper back feathers slate gray, with dark centers and lighter edges; wings dark gray, spotted and marked with dusky and whitish; sides of head, throat and breast whitish; a dusky line from bill through eye; sides of breast clouded with brownish gray, with which the neck and head are more or less mottled; below white, spotted behind with black; rump and tail white spotted with black.

Adult Female. — Paler and lighter.

Young. — Hinder parts spotted above and below; similar to winter adult above; below washed with buff and indistinctly speckled with dusky.

Field Marks. — Size of Wilson's Snipe, but its dark back and the whitish appearance of its lower back, rump and tail distinguish it. The rump does not appear so white in flight as that of the Yellow-legs. Frequents sand bars and mud flats.

Notes. — A shrill quivering whistle, similar to that of the Yellow-legs, something like 'tē-tē-te, tē-tē-te- (Nuttall).

Season. — Rather uncommon fall migrant; rare in spring, late May and early June; early July to late September.

Range. — Eastern North and South America. Breeding range unknown, but probably northern Ungava; winters from Florida south to northern Brazil; in migration regularly on the Atlantic coast and occasionally in Illinois, Indiana and Ontario; accidental in Greenland, Bermuda, Great Britain and France.

HISTORY.

The Brown-back, as the Dowitcher is called on Cape Cod, is one of the most interesting of all waders. Unsuspecting and gentle, it may be approached easily and closely studied. It was one of the birds which was found on the Atlantic coast in enormous numbers when the country was first settled, and which possibly summered in small numbers all along the coast. Scott found it not rare in summer on the coast of Florida, McIlhenny notes it the year round in Louisiana, and Wayne rates it as a resident in South Carolina, where he finds non-breeding birds in June.

Its breeding range is not well known. Many writers describe its nest and eggs, but the probability is that those described belong to the next species. Howe in his *Study of *Macrorhamphus** gives the breeding range of this bird as extending on all sides of Hudson Bay, except to the south, and reaching across Melville Peninsula, Ungava and about half way up Baffin Land.¹ W. W. Cooke² says that the nest and eggs are unknown to science, nor has the species been seen in summer at any place where it was probably breeding. He finds by a study of the records of arctic explorers and naturalists that all known arctic regions are eliminated as breeding places for this bird, except the eastern coast of Hudson Bay and the interior of Ungava, in the northern part of the peninsula of Labrador, — regions which hardly have been explored by naturalists. It does not seem probable, at first sight, that a species which formerly appeared on our coasts in such great numbers could have had so limited a breeding ground. Nevertheless, Professor Cooke says that there are no records of the occurrence of this bird north of Ungava, except one in Greenland, and if the species breeds in Baffin

¹ Howe, Reginald Heber: *Auk*, 1901, pp. 157-163.

² *Distribution and Migration of North American Shore Birds*, 1910, pp. 26, 27.

Land or any of the islands in the northern ocean it has escaped his notice. He gives but one record for Prince Edward Island and but one for Nova Scotia. Mr. E. T. Carbonnell and Prof. S. N. Earle write that although this bird is not seen now on Prince Edward Island, it "used to be plentiful" there; and Mr. Harold F. Tufts writes from Wolfville, N. S., that it has decreased there fifty per cent. in fifteen years, indicating that some still remain. The early arrival of this species on our coast gives color to the belief that it nests in the Labrador Peninsula. In this it agrees closely with the Least and Semipalmated Sandpipers, both of which have been found breeding in Labrador. Alexander Wilson, the father of American ornithology, believed that this bird bred not far north of the United States, judging by the lateness of the season when it leaves in the spring, the development of the eggs in the ovaries of the females at that time and the early arrival of the birds on their return.

Individual Dowitchers are seen returning southward in migration early in July all along the coast, from Massachusetts to South Carolina. The bird crosses the Provinces of Ontario and Quebec in a direct line from its summer home to New England. Formerly it was plentiful along the Atlantic coast, and is still not uncommon in New Jersey, common in Virginia and abundant on the coast of South Carolina. Some individuals apparently reach South America by way of Florida and the Antilles, though many winter on the south Atlantic and Gulf coasts. It is not impossible that individuals of this species which winter in South America take the long flight from Nova Scotia to the West Indies; of this, however, I have seen no reliable evidence, and am inclined to believe that this bird habitually migrates up and down the Atlantic seaboard. It does not come up the Mississippi valley in the spring. A part of the flight seems, however, to leave the coast of the Carolinas in the fall and fly direct to the Lesser Antilles. There seem to be good reasons to believe that the majority of this species migrate directly south and perhaps a little east of south until they reach the coast, and if, as seems probable, they breed along the eastern coast of Hudson Bay and in the

territory between that coast and the east coast of Ungava, between the 70th and 80th parallel, those in the eastern part of its breeding range would thus reach Nova Scotia, New England and New York, where we now find it in its southern migration. Those in the western part of its range, travelling directly south overland, would thus reach the coast of South Carolina. One would naturally expect the South Carolina migrants to return along the Atlantic coast, but apparently they do not, for Wayne says that between May 1 and 15, when the tide is low in the afternoon, in a light southerly wind, flock after flock may be seen migrating to the northwest. He says that he never saw a flock migrating northward along the coast. The northwest direction may be taken to allow for an eastward drift of the wind (as all birds allow for the deflection of the wind), their course being due north for Hudson Bay. These birds do not stop on the coasts of New England, as accounts generally agree that fewer Brown-backs are seen here in the spring than in the fall. The above remarks on the migration of this species are preliminary to what follows regarding its decrease in New England.

The following brief extracts from the writings of New York and New England ornithologists indicate the Dowitcher's reduction in numbers in this region: As they often settle near each other great numbers are shot down (Peabody, 1839). About the middle of July they return in great numbers to our coast (De Kay, 1844). Congregate in immense flocks in salt marshes (Lewis, 1850). Found in small numbers in marshes along our coast spring and autumn (Samuels, 1870). Not uncommon during migration (Maynard, 1870). Rather common spring and autumn (J. A. Allen, 1879). The birds will come back at call and alight among the decoys, until the last survivor is shot (Samuels, 1897). At present, flocks along the Atlantic coast are few and far between (Sanford, Bishop and Van Dyke, 1903). Rare spring and uncommon fall migrant (G. M. Allen, Massachusetts, 1910).

Only two correspondents in Massachusetts report the Dowitcher as increasing, and they are both in Dukes County. Sixty-one say that it is decreasing. Most of the correspond-

ents never see the bird now, and practically all the older gunners state that the bird is "nearing extinction," "almost gone" or "a bird of the past." Apparently the species has disappeared from the inland lakes and ponds, where it formerly was seen occasionally, and is not now common on the Massachusetts coast, except in a few favored localities. Mr. E. W. Eaton of Newburyport says he believes that it has decreased ninety per cent. in thirty years; twenty years ago the first of the season he could see sometimes four to eight flocks a day, with from five to twenty-five in a flock; he has not seen a flock in 1908 or 1909; shot a single bird in 1907. Mr. William P. Wharton of Groton has seen very few in several years. His uncle tells of its abundance at Ipswich thirty years ago. Mr. Neil Casey of Melrose says, "I think this bird has decreased faster than any other shore bird." Notes of others in brief follow: "Decreasing eighty to ninety per cent." (Ralph C. Ewell, Marshfield). "Only one seen occasionally" (Francis B. Osborn, Hingham). "Have seen a few; they decrease rapidly" (H. M. Douglas, Plymouth). "Decreased ninety per cent. in last ten years" (H. W. Bartlett, Plymouth). "Twenty-five years ago one hundred or more of these birds was not considered remarkable on Cape Cod; I heard of one bag this summer (1908) of eighteen or twenty, which was considered exceptional" (Dr. L. C. Jones, Malden). "A steady and marked decrease the past fifteen years" (George L. Haines, Sandwich). Mr. Carl Zerrahn of Milton says, "my records at Chatham show a small but steady decrease each year."

My correspondents from Maine, New Hampshire, Vermont, Rhode Island and Connecticut find similar conditions. I get no reports of this bird as common except from Chatham, Cohasset and Yarmouthport. Mr. Alfred Swan says that he shot "quite a lot" at Chatham in 1908. The shooting record at Chatham Beach Hotel shows that there were but three days, while it was kept (from 1897 to 1904, inclusive), when the number of Dowitchers shot by all hands neared a score. July 15, 1897, nineteen were killed; August 8, 1901, twenty were killed; and on August 9 twenty-six were taken, with thirteen men shooting. In 1897 one hundred and seven were

taken during the season; in 1898, fifty-seven; in 1899, fifty-eight; in 1900, fifty; in 1901, one hundred and thirty; in 1902, fifty-four; in 1903, seventy-two; in 1904, forty-five. The number of men shooting each day varied from one to twenty-six. In 1909 I frequented the haunts of this bird but saw only three during the summer.

The conclusions resulting from the foregoing may be summed up in three propositions, thus: (a) The Dowitcher, formerly numerous in New England, is now growing rare. (b) It is numerous still in the southern States. (c) The present main flight to the southern States does not touch New England.

Practically all correspondents who assign a cause for the decrease of this bird attribute it to spring shooting or overshooting. The Dowitcher is naturally so unsuspecting that it is about the last shore bird to fly from an approaching gunner. There are some "educated" birds, but the above statement is true in the main. It will come readily to the call of the concealed gunner and alight to his decoys, leaving him to shoot whenever he can get the birds at the greatest disadvantage. The survivors will fly when the flock is shot into, but often can be called back to their killed and wounded comrades, until in many cases a single expert market gunner or sportsman has killed the whole flock. When spring shooting was allowed those of this species which reached the Atlantic coast in New England had little chance ever to return, and thus most of the individuals which regularly migrated down this coast were killed off annually. Probably we now get but a few stragglers from the stream of migration which normally passes west of us, without stopping on this coast. It is probable, also, that our shooting has cleaned up most of the birds in the eastern section of their breeding grounds, and that others spreading into the unoccupied ground from the westward take the old migration route, and so continue to straggle along our coasts, but this is merely conjecture.

Something must be done to protect this species or it will join the Dodo and the Great Auk, and will be known only by specimens in museums. Its comparative abundance in the south will save it for a time, for sportsmen will hardly go

south to shoot it in July and August. But winter shooting will follow it there. Absolute protection in the north, or the abolition of all summer shooting for a series of years, is the only possible chance for its salvation.

The Dowitcher is a bird of the inner beach and still waters, the tidal flat and the salt marsh; it frequents margins of fresh-water ponds near the coast when the water is low, and fresh marshes, where the mud flats are bare. It formerly flew, and sometimes alighted, in immense compact flocks, thereby exposing itself needlessly to the deadly discharge of the scatter-gun. These flocks when startled often rose high in air and circled about rapidly, with loud whistled cries, performing startling aerial evolutions with the precision of drilled soldiery. This species sometimes mingles with flocks of Summer Yellow-legs, whose notes slightly resemble its own, but it readily may be distinguished by the shorter legs, longer bill and the less amount of white on the rump and upper tail coverts. It is fond of sea-worms and other forms of marine life, for which it probes with its long bill.

LONG-BILLED DOWITCHER (*Macrorhamphus griseus scolopaceus*).

Length. — 10.75 to 12.05 inches; bill 2.20 to 3.25.

Adult in Spring. — Very similar to the Dowitcher, but slightly larger; bill longer; more rufous below, and sides more heavily barred.

Adult in Fall, and Young. — Indistinguishable from the Dowitcher, "except those surpassing the maximum size of the latter."

Notes. — A lisping, energetic, musical *peet-peet*; *pě-ter-wěe-too, wěe-too*, repeated (Nelson).

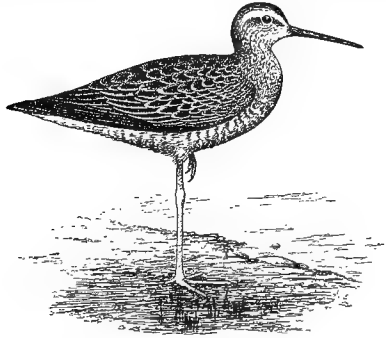
Range. — Western North America and South America. Breeds from Arctic coast to Yukon mouth and east to northwestern Mackenzie; winters from Louisiana, Florida and Mexico south, probably to South America; in migration most abundant in western Mississippi valley; casual on Atlantic coast from Massachusetts southward and on northern coast of eastern Siberia.

HISTORY.

The Long-billed Dowitcher is supposed to be a western sub-species. It occurs regularly in New York, but is rated as a mere straggler in Massachusetts; in fact, we know very little about it here, as it requires an expert to distinguish it.

STILT SANDPIPER (*Micropalama himantopus*).

Common or local names: Bastard Yellow-leg; Stilt; Mongrel.



Length. — 8.25 inches; bill 1.55; fore toes webbed at base.

Adult in Breeding Plumage. — Above tawny or bay, streaked and blotched with black or blackish, feathers more or less white edged; wings and tail grayish; side of head below eye and over ear and faint line at back of head chestnut; upper tail coverts white, barred with dusky; line over eye and lower parts white, often tinged with reddish; fore neck spotted and streaked with dusky, lower parts elsewhere barred with dusky; bill, long slender legs and feet greenish; legs and feet lighter and more yellowish than bill.

Adult in Fall and Winter. — Upper parts brownish gray or ash gray; dusky streak from bill through eye; wide line over eye and under parts white; neck streaked with brownish gray; barred below as in spring but not so strongly; tail and upper tail coverts white, marked with dusky; bill, legs and feet darker than in spring.

Young. — Similar, but upper parts more blackish, the feathers bordered with buff; below white; legs and feet greenish yellow.

Field Marks. — Long, slim, greenish legs; long, slim, slightly curved bill.

Notes. — When disturbed it utters a sharp *tweet tweet* before flying (Nuttall).

A double or triple whistle (C. W. Townsend).

Season. — A rather rare or local irregular fall migrant coastwise, sometimes not uncommon; very rare in spring, usually in May; early July to early October.

Range. — North and South America. Breeds near coast of Mackenzie and probably south to central Keewatin; winters in South America south to Chile; casual in winter in southern Texas and Mexico; occurs in migration in western Mississippi valley, West Indies and Central America; less common on Atlantic coast; casual in British Columbia, Newfoundland and Bermuda.

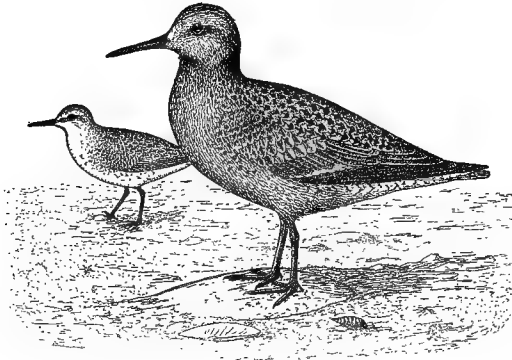
HISTORY.

Little seems to be known of the history of the Stilt Sandpiper in New England before the last quarter of the nineteenth century. Since then it has been rated as a rare or uncommon migrant in the coastal States of New England. Coues early predicted that it would be found here. Brewster secured two specimens at Rye Beach, N. H., in 1868 and 1869. Since then the bird has been taken and seen with more or less regularity and frequency, and as the numbers of ornithologists have increased in New England, and the means of publishing their records have multiplied, our knowledge of this species has increased until records of its occurrence are no longer considered unusual. It seems not uncommon at times on Cape Cod. The Chatham Beach Hotel record shows two hundred and fifteen birds shot in seven years, but one hundred and three of these were taken in 1901. In Giraud's time the bird was common enough on Long Island to be known to the gunners there as the Bastard Yellow-leg. It resembles the Yellow-legs so much that it probably was overlooked in New England until Brewster "discovered" it. From what we know of the history of this bird it is safe to assume that it always has occurred in New England since the settlement of the country, and that it was more common in the early part of the history of these States than it is to-day.

The Stilt Sandpiper easily is mistaken for the small Yellow-legs, particularly in fall, when its gray plumage, long legs and the whitish look of rump and tail present a similar appearance to that of the Yellow-legs. But the legs always have a greenish tint, and are never as bright yellow as those of the Yellow-legs. It has a habit of immersing its bill in the sand and holding it there for some time, as if sucking up something. Sometimes the head also is immersed when the bird is feeding in the mud at the bottom. Its habits otherwise resemble those of the Yellow-legs. Audubon found small worms, small shell-fish and vegetable matter in the stomachs of several birds of this species.

KNOT (*Tringa canutus*).

Common or local names: Red-breast; Red-breasted Plover; Buff-breast; Blue Plover; Silver Plover; Silverback; Grayback; Robin-snipe.



FALL.

SPRING.

Length. — About 10.50 inches; bill about 1.50.

Adult in Spring. — Above light gray, marked with black and reddish brown; rump and upper tail coverts lighter; tail gray, edged with whitish; sides of head, fore neck and under parts brownish red, to lower belly, which is white; dark line through eye; iris hazel; bill dark; legs and feet dull yellowish green.

Adult in Fall. — Above ashy gray, feathers margined with black and cream white; rump and base of tail white, marked with dusky or black; below white marked with dusky.

Young and Immature. — Upper parts as in fall adult; under parts white; throat, breast and flanks clouded with grayish and streaked with dusky. Several years are required to reach full plumage; all plumages have a dusky line through eye. (Judging from descriptions, the colors of the legs and feet vary from greenish yellow to black.)

Field Marks. — Distinguished from the Dowitcher by its shorter bill. Upper parts usually light gray; hinder parts whitish, but not conspicuous.

Notes. — Like the soft *whit whit* one uses in whistling a dog back (Hoffmann). A soft *wah-quoit* and a little *honk* (Mackay). *Waquit* (Knight).

Season. — A rather common migrant coastwise, rare inland; mid May to June 10; mid July to mid October.

Range. — Northern and southern hemispheres. Breeds from northern Ellesmere Land south to Melville Peninsula and Iceland, also in Siberia; winters south to southern Patagonia, and in Africa, India, Australia and New Zealand; casual in winter on Atlantic coast of United States; in migration occurs on Atlantic coast of North America and over most of eastern hemisphere; rare in interior of North America and on Pacific coast.

HISTORY.

This is the largest of the beach Sandpipers. Its breeding grounds almost encircle the pole, and it is known on the shores of every continent. No bird undertakes a more extensive annual pilgrimage than this species, for it has been found in northern Grinnell Land, at latitude $82^{\circ} 44'$, and it goes south to the Straits of Magellan, not far from Cape Horn. It migrates principally along the Atlantic coast, both spring and fall, but in the spring, numbers of the species arrive in Texas, Louisiana and other southern States, going north through the Mississippi valley region, and they are found in migration on the Pacific coast. August is the principal month of autumnal migration along the Atlantic coast. The adult birds appear first, in July, and the young follow. This is the general rule with shore birds. In migration this species formerly reached the shores of New England in immense numbers.

The following abridged extracts indicate its decrease: They seem like a diminutive army marshalled in rank and spreading their animated lines (Nuttall, Massachusetts, 1834). Seen in large flocks (Peabody, Massachusetts, 1839). Common spring and autumn (Turnbull, eastern Pennsylvania and New Jersey, 1869). Seen on shore in flocks of eight or ten (Samuels, New England, 1870). Common spring and autumn (J. A. Allen, 1879). A common bird on New England shores spring and autumn (Chamberlain, 1891). An uncommon migrant along coast (Howe and Allen, Massachusetts, 1901). Now annually seen in fewer numbers (Knight, Maine, 1908).

The Knot had decreased considerably near Boston before the middle of the last century. Mackay states that before 1850 they were more numerous at Chatham, Nauset, Wellfleet and Billingsgate on Cape Cod, and on the flats around Tuckernuck and Muskeget islands, than in all the rest of New England combined. Their numbers were so large on Cape Cod that estimates were useless. There was then no railroad to the Cape. The birds were slaughtered in great numbers at night by "fire-lighting." Thoreau refers to this in his Cape Cod. One man, carrying a lantern prepared for the

purpose, directed its light on the flocks as they rested on the flats, while the other, keeping him company, seized the birds one at a time, killed them by biting their necks, and placed them in the bag. Mackay was credibly informed that six barrels of these birds thus taken were seen at one time on the deck of the Cape Cod packet bound for Boston, and that in hot weather barrels of spoiled birds were sometimes thrown overboard when the vessel reached Boston. The birds brought but ten cents per dozen in the market. Turnstones and Black-bellied Plover, which keep company with the Knots, were often taken and mixed with them. Beside the Red-breasts destroyed by fire-lighting on Cape Cod, great numbers were shot later, when the railroad opened up the region to sportsmen, and this was true all along the Atlantic coast. Everybody shot the Knot, both fall and spring, for it was in demand for the table, brought a good price in the market, decoyed easily, and flew in such flocks that many could be killed at a shot. Sometimes, as in the case of the Dowitchers, one or two skilful gunners annihilated a flock.

Mackay says (1893) that they are much reduced in numbers and are in great danger of extinction. Mr. S. Hall Barrett informed him that in "old times" he had seen as many as twenty-five thousand of these birds near Billingsgate Light in one year, and that for the five years previous to 1893 he had seen only about one hundred birds a year there. Mr. C. L. Leonard of Marshfield was then seeing about eleven hundred birds during a season, and Mr. Mackay himself reports on good authority that for twelve years the average number on Tuckernuck had not exceeded fifty.¹

In time the old birds grew more shy, and sometimes avoided the danger spots along the coast, but the young were easy victims. The numbers of this bird have decreased tremendously all along the Atlantic coast within the last seventy-five years. Up to about 1900 they were still very plentiful in the Carolinas. Brewster has been informed that they are seen there still in considerable numbers. Wayne (1910) says of the Knots near Charleston, S. C., that they used to

¹ Mackay, George H.: Observations on the Knot, Auk, 1893, pp. 28-30.

be abundant, but that now very few are to be seen. Most of my Massachusetts correspondents never see the bird now. It no longer appears in the interior at any point, so far as I can learn, and is rare or wanting on most of our coast. Three observers record a slight increase at certain points on Cape Cod during the past few years. One notes that they have increased "very much" at Chatham, and one tells of an increase on Martha's Vineyard. Forty say they are decreasing.

The causes of decrease as given by most correspondents are overshooting and spring shooting. One attributes a local decrease to a "lack of feed." Mr. William B. Long of Boston states that these birds are so tame when they arrive on the feeding grounds that any one can kill almost a whole flock. The following brief extracts tell the story: "Used to be shot here; scattering; have not seen or shot one for two years" (E. W. Eaton, Newburyport). "Decreased eighty per cent. in twenty-eight years; we took quite a few this autumn (1908)" (Thomas C. Wilson, Ipswich). "Rather a common bird on Cape Cod twenty-five years ago; now comparatively rare, though there is an occasional good flock; decreased seventy-five per cent. in twenty-five years" (Dr. L. C. Jones, Malden). "A very few only" (G. W. Holbrook, Wellfleet). "Decreased seventy-five per cent. in eighteen years" (N. A. Eldridge, Chatham). "Decreased ninety-five per cent. in thirty-four years; comparatively a rare bird" (Alfred S. Swan, North Eastham). "None here" (Willard M. Small, North Truro). "Used to be plenty; very few now" (William H. Allen, Dartmouth). "Not more than a dozen killed in last three years" (Richard J. Sharrock, Westport). The above are mainly experienced gunners who live near the shooting grounds.

Some few sportsmen seem to find occasional flocks. The following notes tell the other side of the story: Dr. Albert H. Tuttle says he shot about thirty in one day in 1903. "Increasing twenty-five per cent.; took fourteen in one day on Martha's Vineyard (1908)" (Lewis W. Hill). "Holding its own; in September, 1907, observed several large flocks at Chatham and shot eighteen in six days" (C. O. Zerrahn, Milton).

“About as plentiful to-day as twenty-five years ago” (Charles R. Lamb, Cambridge). “We get more at the Cape I think” (Samuel E. Sparrow, East Orleans).

The species seems to be doing as well at Chatham as anywhere along our coast. The shooting records of the old Chatham Beach Hotel will give an idea of the numbers taken there. They are as follows: 1897, one hundred and fifty-three; 1898, one hundred and fifty; 1899, one hundred and sixty-one; 1900, one hundred and eighty-eight; 1901, one hundred and sixty-one; 1902, one hundred and twenty-three; 1903, two hundred and sixty-seven; 1904, one hundred and sixty-seven. The year 1903 seems to have brought an unusual number, as fifty were killed in one day with sixteen men shooting; another day nineteen were taken with seven men after them. In 1900, on another record day, twenty-eight birds were killed by three men.

All my correspondents outside of Massachusetts, from Maine to Florida, tell a sad story of the decrease of these birds, except Mr. Harry W. Hathaway of Providence, who says that there are many small flocks of young birds on Block Island in September. Even on the southwestern coast of Florida Mr. Charles L. Dean says that they have decreased fifty per cent. in twenty years. Dr. Leonard C. Sanford of New Haven says that this decrease is due largely to spring shooting on the coast of Virginia and North Carolina, and Mr. George H. Mackay tells of heavy spring shooting in Virginia. The decrease is probably due, however, to shooting both spring and fall all along our coasts, and possibly to some extent in South America. Evidently we are doing more than driving the Red-breast off our coast, and while the utter extinction of such a cosmopolitan bird is not imminent, its extirpation from the Atlantic coast of North America is one of the possibilities of the near future.

This bird frequents the ocean beach, the tidal flat and more rarely the salt marsh. On the beach it plays back and forth, following the receding waves and retreating before their advance. When the surf pounds upon the sandy shore it is the Red-breast's harvest time. Then the surge constantly

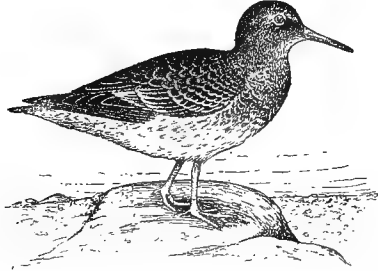
washes up the sand, bringing small shell-fish to the surface of the beach, as a placer miner washes out gold in his pan, and the birds, nimbly following the recession of the wave, rapidly pick up the exposed shells ere the return of the surge. They are fond of the spawn of the horsefoot crab, which, often in company with the Turnstone, they dig out of the sand, sometimes fighting the former birds before they can claim their share. With the flow of the tide, which drives them from the flats or the tide-washed beach, the Knots seek either the beach ridge, some shoal above high-water mark or the salt marsh. They are prone to alight on outer half-tide ledges, where they find small crustaceans and other forms of marine life among the seaweed. They are so attracted to such places and to beaches where sea-worms are plentiful that they will return to them again and again in the face of the gunners' fire, and this habit accounts in part for their diminution.

Mackay says that they eat the larvæ of a cutworm, which he has found in their throats, and that their food is similar to that of the Black-breasted Plover, with which they often associate. Most authors, both in this country and Europe, state that their food, both on the flats and on the beach, consists of very small mollusks of several species. Dr. Townsend says that small periwinkles (*Littorina*) and mussels (*Mytilus edulis*) almost always are found in their stomachs.

The Red-breasts are decoyed easily by imitating their note or that of the Black-breasted Plover. The ease with which they may be taken will prove their bane unless all spring shooting can be stopped on the Atlantic coast.

PURPLE SANDPIPER (*Arquatella maritima maritima*).

Common or local names: Winter Snipe; Rock-snipie; Rock-bird; Rock-plover.



Length. — About 9 inches; bill 1.40.

Adult in Winter. — Above very dark gray or bluish ash, with purple or violet reflections, each feather of back and wing with a lighter border; throat and breast bluish ash; belly, under side of wing and wing bar white; sides and upper breast streaked or spotted with dark gray; legs, feet and base of bill orange or yellow, rest of bill blackish.

Adult in Spring. — Similar, but with a general rusty tinge above.

Young. — Similar; feathers of back light tipped; under parts mottled with ashy and dusky.

Season. — A not uncommon winter visitant on rocky islands coastwise; September to April. Dr. C. W. Townsend gives July 30 and May 11 as unusual dates in Essex County, Mass.

Range. — Northern parts of northern hemisphere, mainly. Breeds in high latitudes; in North America, chiefly in northeastern parts, from Melville Island, Ellesmere Land and northern Greenland south to Melville Peninsula, Cumberland Sound and southern Greenland; winters from southern Greenland and New Brunswick to Long Island, N. Y.; casual to the Great Lakes, Georgia, Florida and Bermuda, and in the eastern hemisphere south to Great Britain and the Mediterranean.

HISTORY.

This bird is unique among the Sandpipers. It is not a bird of the August sun and the light airs of summer. The "rock-weed bird" comes late in autumn, or when the winter wind blows cold. It is a bird of the Arctic, and only takes refuge in this more moderate clime when the frosts have sealed up the waters of its northern home. It migrates regularly only about as far south as Martha's Vineyard and Long

Island. The following notes exhibit the former abundance of the Purple Sandpiper and its decrease: Very abundant, nowhere more so than in Boston harbor; sold in Boston market in autumn and winter; some in New York market; rarely seen farther south (Audubon, 1827). Abounds in autumn, and is sold in the market in Boston (Peabody, 1839). Not uncommon in spring and autumn flights (Samuels, 1870). In Massachusetts this bird is rather uncommon, seen only in small groups of three or four (Chamberlain, 1891). Only four Massachusetts correspondents note an increase of this species, and twenty-one record a decrease.

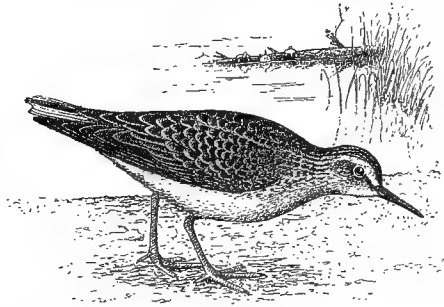
It is no longer "very abundant" in Boston harbor, as it was in Audubon's day, but small numbers still frequent the outer ledges in winter. And it may be seen at that season on the rocky wave-washed shores of Nahant, where its little companies enliven the winter scene along this stern and rugged coast.

Its form is peculiar for a Sandpiper. It is short, thick, wide, squat and sturdy. It stands firmly on its short strong legs and is not at all timid. Often it will allow one to approach within a few yards. It never has needed to practice dodging the summer gunners, for it never sees them nor they it. It is very rarely seen on beach or marsh when with us, but frequents outlying rocky islands and ledges, where the sea washes the mantle of rockweed back and forth. It may be found sunning itself contentedly when the thermometer registers near the zero mark. Small flocks may be seen even in a storm, resting at high tide, face to the wind, or chasing one another in play. It is met with sometimes in numbers on the rocky islands of Essex County, Mass., but is rarer farther south. Usually most of the Purple Sandpipers have left the New England coast for their arctic homes in March, but some are seen in April.

This species is said to feed on mollusks, insects and seeds gleaned largely from the salt rockweed. Dr. Townsend states that its food consists chiefly of mollusks, especially the edible mussel (*Mytilus edulis*).

PECTORAL SANDPIPER (*Pisobia maculata*).

Common or local names: Grass-bird; Brownie; Brown-back; Marsh-plover; Krieker; Squatter.



Length. — About 9 to 9.50 inches; bill about 1.10.

Adult in Fall. — Above brown in general effect, the centers of feathers brownish black, the edges ashy, buffy, white and dark chestnut red; top of head chestnut, streaked heavily with black; a light streak over eye and a more or less distinct dark line through it; middle tail feathers dark, longest, pointed, outer ones light ash with white edges; throat white; sides of head, neck and breast dull buff, *streaked* with dusky; rest of under parts white; bill yellowish at base, rest black; feet and legs dull yellowish olive.

Adult in Spring, and Young. — Similar. (The differences between spring or summer and fall or winter plumages appear to be inconstant.)

Field Marks. — Usually found in pairs or small flocks on salt marshes or meadows and rarely on mud flats or beaches. This and its general brown appearance and absence of conspicuous streaks on the back, as well as absence of a white rump, should distinguish it from other Sandpipers of this size. It looks as if it might be a great, overgrown Least Sandpiper.

Notes. — A grating whistle, *creak, creak*; song, a hollow, resonant, musical *tōō-ū*, repeated eight times, made after filling œsophagus with air until it is puffed out to size of body (Nelson). Heard only on its northern breeding grounds.

Season. — April and May, July to October.

Range. — North and South America. Breeds on the Arctic coast from the Yukon mouth to northeastern Mackenzie; winters in South America from Peru and Bolivia to northern Chile, Argentina and central Patagonia; in migration very rare on Pacific coast south of British Columbia, except in Lower California; common in fall migration on Atlantic coast and in Mississippi valley, rare in spring; casual in northeastern Siberia, Unalaska and Greenland; accidental in Hawaii and England.

HISTORY.

Formerly this bird arrived on our coasts in great flocks, and was extremely abundant in our meadows. In olden times it was not much noticed or hunted, for there was an abundant supply of larger and better game, but for the past fifty years, during the growing game scarcity, most gunners found the little Grass-bird one of the most numerous species commonly met with in the meadows and marshes, and it was much sought for the market. It is still one of the common birds found in the salt marsh at times, particularly during storms in August and September, but its numbers have decreased greatly, and since the decline of the Curlews, Godwits, Willets and larger Plover this little fellow has come to be reckoned with as one of the "big birds" which helps to make out a bag. Now not even a "Peep" is too small to shoot.

The following abridged extracts from the writings of ornithologists throw light on the history of the species: In the neighborhood of Boston more abundant than elsewhere (Audubon). Have been killed in abundance on shores of Cohasset and other parts of Massachusetts Bay, and brought to markets in Boston (Nuttall, 1834). More abundant on the shores of Massachusetts Bay than in any other part of the country (Peabody, 1839). Quite plentiful on Long Island (Giraud, 1844). A few remain in spring, but the greater number come from August to November; occasionally occurs in great numbers along the coast of the State; some years very scarce (De Kay, New York, 1844). Common migrant on marshes (Maynard, eastern Massachusetts, 1870). Common in migration (J. A. Allen, 1879). Generally not uncommon, occasionally abundant (Hoffmann, New England and New York, 1904). Transient autumn; formerly not uncommon (Brewster, Cambridge region, Mass., 1906). Rare spring and common fall migrant (G. M. Allen, Massachusetts, 1909). Seven Massachusetts correspondents report an

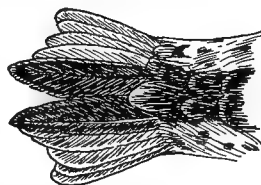


FIG. 15.—Tail of Pectoral Sandpiper. (After Cory.)

increase of this species and forty-four report a decrease. Mr. Frank A. Brown of Beverly thinks that its decrease has been more marked than that of any other marsh bird. On the other hand, Mr. Lewis W. Hill says that it was abundant at Martha's Vineyard from 1905 to 1908. Mr. Robert O. Morris states that it formerly was seen sometimes in large flocks in the Connecticut valley. From Nova Scotia to New Jersey all correspondents outside of Massachusetts who mention this species report a serious decrease in its numbers.

The Grass-bird usually comes in the night, in flocks of twenty-five to fifty birds, and scatters in small parties in the salt marshes, particularly those on which the grass has been cut and where little pools of water stand. It seems to prefer the higher portions of the salt marsh, where the "black grass" grows, and it is sometimes common in the fresh-water meadows near ponds in the interior. In such places it collects worms, grubs, insects and snails, such as are commonly found in the marsh. The grass pattern and shading of its back furnish such complete protection from the eye of man that it can conceal itself absolutely by merely squatting in the short grass. Where it has not been shot at or disturbed it becomes exceedingly tame and confiding, but old experienced birds are wild, and fly so swiftly and erratically that some of the gunners call them "Jack Snipe" because of a fancied resemblance in their flight to that of Wilson's Snipe. Sometimes they are found in fresh meadows near the salt marsh, and more rarely on the ocean beach, where they follow the retreating wave like the Sanderling or any other beach bird.

While here in autumn the Pectoral Sandpiper is an extremely fat, gluttonous bird, apparently intent only on filling its stomach, but in early summer in its far northern breeding grounds in Alaska or on the shores of the Arctic Sea it is quite a different being. During the mating season the male develops a great pouch, formed of the skin of the throat and breast, which he is able to inflate until it is nearly as large as the body. He now becomes a song bird, and flutters upwards twenty or thirty yards in the air, as if emulating the famous Skylark, and, inflating his great pouch, glides down again to

the ground; or he flies slowly along close to the ground, his head raised high and his tail hanging straight down, uttering a succession of booming notes. As he struts about the female his low notes swell and die away in musical cadences, which, as Nelson describes them, form a striking part of the great bird chorus of the northern wilds.

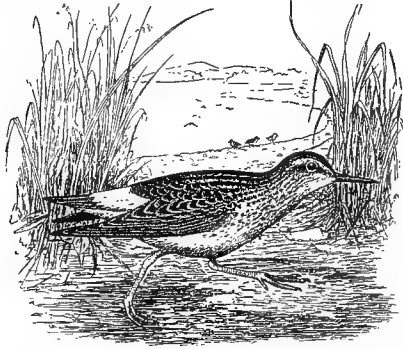
As this bird apparently breeds along most of the Arctic coast from Alaska to Ungava, and as it follows the general southeastern direction, which so many northern birds take in the fall, it must always reach the coast of the Maritime Provinces and New England in large numbers, unless it decreases largely on its breeding grounds. It is believed that birds of this species from northern Siberia which migrate east cross to Alaska and continue southeasterly to the Atlantic coast,¹ for it is found in the Aleutian Islands, but is uncommon farther south on the Pacific coast, and is almost unknown in California. It reappears in Lower California (Brewster), but no one knows how it gets there. The old birds start south in July, and by the end of August a few have reached Argentina. The young birds begin to leave their arctic homes late in August and early in September. Most of the birds of this species killed in Massachusetts are taken between August and November 1. In winter the species dwells in South America. In Argentina and Chile it visits both mountain and plain, and is by no means confined to the sea-coast.

Insects, shell-fish and vegetable matter have been found in stomachs of this species. Crickets, grasshoppers, ground larvæ and earthworms are commonly taken by those which feed inland.

¹ Cooke, W. W.: Distribution and Migration of North American Shore Birds, Bull. No. 35, Biol. Surv., 1910, p. 35.

WHITE-RUMPED SANDPIPER (*Pisobia fuscicollis*).

Common or local names: Bull-peep; Sand-bird.



Length. — 6.75 to 8 inches; bill about 1.

Adult in Spring. — Above black and brownish buff; the back feathers have black centers and buff margins arranged in stripes; top of head darkened with fine black streaks on buff ground, much like Pectoral Sandpiper, but upper coverts at base of tail pure white; middle tail feathers dark, outer ones light ashy; throat and most of under parts white; sides of head, neck and breast buffy and streaked with lines of distinct dusky spots.

Adult in Fall. — Above plain ashy or brownish gray, often showing patches of the black and brown of spring plumage; a white line over eye and a dark line through it; breast faintly and *indistinctly streaked*.

Young. — Similar to spring adults, but less distinctly marked; feathers of back tipped with white and edged with reddish brown; breast grayish.

Field Marks. — The large *pure white patch* just above the tail, conspicuous in flight, distinguishes this bird.

Notes. — A rather sharp piping, *weet, weet* (Goss); and a lisping note.

Season. — Rather uncommon spring and fall migrant coastwise; very rare inland; May and mid July to October.

Range. — North and South America. Breeds along the Arctic coast from northwestern Mackenzie to Cumberland Island; has occurred in summer west to Point Barrow and east to Greenland; winters from Paraguay to southern Patagonia and the Falkland Islands; in migration most abundant in the Mississippi valley, less so on the Atlantic coast; casual in Bermuda, Great Britain, the West Indies and Central America.

HISTORY.

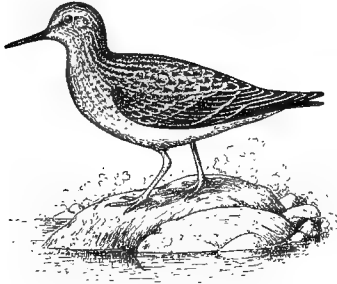
The White-rumped Sandpiper was known formerly as Bonaparte's or Schintz's Sandpiper.

Dr. Coues (1874) calls it a very abundant bird along the whole Atlantic coast, from Labrador to Florida. It is not so to-day. Warren rates it as rare in Pennsylvania. Stone (1908) calls it apparently rather scarce on the New Jersey coast, and Wayne (1910) rates it as a rare transient on the coast of South Carolina, and he has seen it but once in autumn. It is significant that Dr. Coues spent considerable time in earlier days on the coast of South Carolina as well as on other parts of the Atlantic coast. The bird is still common in migration in fall on parts of the Massachusetts coast, and occasionally so inland, particularly along the Connecticut River. Eaton (1910) calls it common on Long Island and less so in New York.

Stearns says that it is the common Sandpiper of Labrador, where it is called the Sand-bird. As it does not now visit our shores in large numbers, the majority probably fly by us at sea on their way to South America. This bird seems to be more numerous in Maine than here, but many are found here at times about the little ponds and sloughs in our salt marshes, where they are confounded sometimes with the Grass-birds by the gunner. When found on the shore they are seen most often along rocky beaches. They are quite gentle little birds and very tame where they are undisturbed. On the beaches they are found in company with the Semipalmated Sandpiper, which is the common Peep of the beach. When disturbed by the gunner they fly rapidly, circling about and turning first the upper parts and then the under parts to view. At such times the white under bodies flash and gleam in the sunlight, and then the darker backs are turned, showing the white upper tail coverts to the observer. On the mud flats they wade often breast deep into the flowing tide, and are driven from the flats only when the water becomes too deep for them. At high tide they collect with other species on ledges above water, on the higher parts of the beach, or on the drift grass and seaweed in some corner of the marsh, where they

often snuggle down to rest and bask in the sunshine. While this is largely a bird of the sea-coast with us, it is found also not rarely in the interior.

Notwithstanding various statements regarding the breeding grounds of these birds, I know of no definite authentic record of eggs found except that recorded by MacFarlane near the coast of Franklin Bay and on the barren grounds in that region. Prof. W. W. Cooke believes that during the breeding season the species is crowded into the belt of tundra extending from near the mouth of the Mackenzie east to the southern extremity of Baffin Land. From this region the southeasterly summer and fall migration brings it down through the Hudson Bay country, Ungava and Labrador directly to the Atlantic coast of New England. In July and August it traverses almost the entire length of the Atlantic coast of both continents, as it has been taken at Cape Horn on September 9, but it is sometimes taken in Massachusetts after September 15. As this species appears to be very rare in the Carolinas in fall, it must pass out to sea, and very likely follows a route somewhat similar to that followed by the Eskimo Curlew. In the spring it is a late migrant; remaining in Brazil until May, when it is seen also in South Carolina and Florida. Apparently the larger numbers pass north through the Mississippi valley region and south by the Atlantic coast. The wonderful flight of this species over almost the entire length of the western continents has not yet been fully traced and mapped.

BAIRD'S SANDPIPER (*Pisobia bairdi*).

Length. — About 7.50 inches; bill .90 to 1 inch.

Adult. — Above grayish buff, varied with dusky; stripe over eye white; middle tail feathers dusky, others gray; breast tinged with buff, streaked with dusky; below white; bill and feet black; resembles Pectoral Sandpiper, but smaller, and fore neck and breast less heavily streaked.

Young of the First Winter. — Closely resemble young of White-rumped Sandpiper, but upper parts paler; back feathers conspicuously margined with white, and rump not white.

Field Marks. — Only a little larger than Semipalmated Sandpiper or Sandpeep, but has a darker breast.

Notes. — *Pect-pect*; a shrill trilling whistle, like that of Semipalmated Sandpiper (C. W. Townsend).

Season. — Rather rare fall migrant; late July to early October.

Range. — North and South America. Breeds along Arctic coast from Point Barrow to northern Keewatin; winters in Chile, Argentina and Patagonia; occurs regularly in migration from Rocky Mountains to Mississippi River, and in Central America and northern South America, and irregularly in autumn on Pacific coast from Alaska to Lower California, and on Atlantic coast from Nova Scotia to New Jersey; casual in summer in Guerrero, Mex.; accidental in England and South Africa.

HISTORY.

This bird is considered rather rare in New England but may be more common than it is generally believed to be. On our coasts it is mistaken often for the Pectoral Sandpiper, which it resembles, or is lumped with it under the name of Grass-bird. Jillson found this species very abundant in Essex County, Mass., in 1852. It is not very rare in some parts of New York.

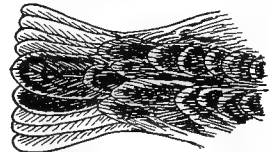
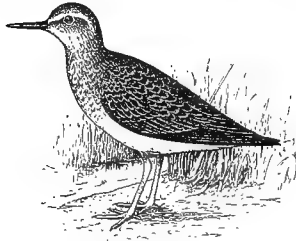


FIG. 16. — Tail of Baird's Sandpiper.
(After Cory.)

LEAST SANDPIPER (*Pisobia minutilla*).

Common or local names: Peep; Mud-peep.



Length. — 5.50 to 6 inches; bill about .75.

Adult in Spring. — Feathers of upper parts black centered, edged with gray, rusty or chestnut; sides of head, neck and breast streaked with brown; belly white; legs and feet dusky greenish or yellowish green.

Adult in Fall. — General tone of upper parts ashy.

Young. — Upper parts much as in fall adult; breast dusky, very indistinctly streaked with darker; rest of under parts white; legs greenish yellow.

Field Marks. — The smallest Sandpiper; like Semipalmated Sandpiper, but feet *not webbed at all* and breast more streaked; *legs greenish or yellowish*.

Notes. — *Peep-peep.* A simple and trilling whistle (Townsend).

Season. — Common to abundant spring and fall migrant coastwise, less common inland; late April to early June; early July to early October; formerly summered on our coast.

Range. — North and South America. Breeds from northwestern Alaska, southern arctic islands and northern Ungava to Yakutat Bay, Alaska, valley of Upper Yukon, northern Mackenzie, central Keewatin, southern Ungava, Nova Scotia and Sable Island; winters from California, Texas and North Carolina through West Indies and Central America to Brazil, Chile and Galapagos; in migration occurs throughout United States and west to northeastern Siberia and Commander Islands, north to Greenland, and in Bermuda; accidental in Europe.

HISTORY.

The little Peep, the “baby” among the shore birds, is probably the most abundant of them all throughout the land; but in recent years its numbers have diminished sadly along the coast of New England. Formerly it rarely was hunted except by small boys. A gunner now and then shot into a large flock when larger birds failed to occupy his attention; but these “pot shots” usually were made merely to see how

many he could kill, and no real sportsman ever thought of pursuing the little birds. Now all is changed. In the present scarcity of shore birds "Peeps" form a principal object of pursuit in some localities, and it is not uncommon to see three or four summer gunners chasing about the same number of "Peeps," and sometimes even a single bird is the object of their pursuit.

The following extracts explain themselves: The most common and abundant species in America; when they arrive [about Boston] in company with the Semipalmated Sandpiper the air is sometimes clouded with their flocks (Nuttall, 1834). Abundant in migration (Maynard, eastern Massachusetts, 1870). Abundant during migration (J. A. Allen, 1879). The Peeps still throng our shores (Chamberlain, 1891). "Peeps" are with us in but a small percentage of their former multitudes (Sanford, Bishop and Van Dyke, 1903). Common migrant on our coast (Hoffmann, 1904). Abundant transient (C. W. Townsend, Essex County, 1905). Formerly abundant, still very common (Brewster, Cambridge region, Mass., 1906). Seven Massachusetts observers in 1908 reported that this species had increased in their localities within their recollection, and seventy-three reported a marked decrease.

Wondrous tales are told of the quantities of these birds killed out of the great flocks in past centuries. Old gunners tell of killing "a peck" of the poor little things with two shots, or of taking a bushel in a few minutes. Two charges fired into them as they passed the gunner opened two holes in the middle of the flock. The numerous survivors soon closed ranks and came sweeping back over their dead and wounded comrades, when the gunner, having reloaded, tore two more clean holes in their formation, and so the slaughter went on. Sometimes the flocks were "raked" when massed together on the ground, and thus most of the larger scores were made. Samuels says that in old times he once brought down ninety-seven at one discharge of a double-barreled gun. This must have been near the middle of the nineteenth century. Bourne states that a century ago in Maine the "Sandbirds or Peeps" were as numerous as the Wild Pigeons. They were killed

easily, he says, not manifesting the shyness that they show to-day. It was not uncommon for the boys of that date to take fifty or more at a shot. John Bourne one morning filled his bag with them, then took off his pants, tied up the legs, filled them full and trudged home, well satisfied with his morning's work. Think of this, ye Peep shooters of the twentieth century, and forsake the unmanly occupation of chasing little Peeps on beach and marsh. Let the beautiful, harmless birdlings enjoy their lives in peace. If the present rate of destruction is kept up the Peeps eventually will go the way of some of their larger relatives, despite their great numbers and wide dispersion over the continent.

This is one of the shore birds which formerly remained all summer on the Massachusetts coast, but there is no evidence that it ever bred here. Maynard saw some at Ipswich on June 18, 1868. Dr. Townsend says that a few birds may be found between early June and early July.

This species breeds across most of the upper part of the continent and migrates southward through it. Apparently, however, some birds from the northeastern part of their breeding range cross the sea to the Antilles and South America. Formerly when the species was very abundant along the Atlantic coast, it was a common visitor at the Bermudas in the fall migration. To reach Bermuda these little birds must have flown over seven hundred miles across the sea if they went straight east from the coast of South Carolina, but as the flocks visited the island annually in the fall migration and never in spring, it is reasonable to believe that they followed the route taken by several other species, and flew directly over the ocean from Labrador or Nova Scotia to Bermuda and the Antilles. The fact that the advance guard arrives at the Lesser Antilles about the middle of July lends color to this theory, for that is only a few days or a week later than their usual arrival in New England. The species winters in Chile, Peru, northern South America, Central America and Mexico, the West Indies and the more southern States. It goes north mainly through the interior of North America, but some migrate up the coast.

The Peep is naturally tame and confiding. Where it is undisturbed, it pays little attention to man. Along the shores and in the marshes it runs about among the larger shore birds and Ducks, and they seem to tolerate the little ones and seldom disturb them. This species seems to prefer the salt marsh, the mud flat and the shallow muddy shores of ponds and rivers to the sea beach; hence the name Mud-peep. It is by no means confined to the mud, however, but is also not uncommon on the sands. It is fond of poking about among masses of eelgrass and seaweed cast upon the strand by the waves. Here it finds sand fleas, flies and many other small forms of life on which it feeds. It is a great insect eater, particularly in the interior, where its flocks sometimes devour great quantities of grasshoppers and locusts.

DUNLIN (*Pelidna alpina alpina*).

Adult. — A little smaller than the Red-backed Sandpiper; resembling it almost exactly in coloration but a little duller; bill shorter. For description of the Red-backed Sandpiper see next page.

Range. — Eastern hemisphere. Winters south to North Africa, India, etc.; accidental in eastern North America, District of Columbia, Long Island, New York, and Massachusetts.

HISTORY.

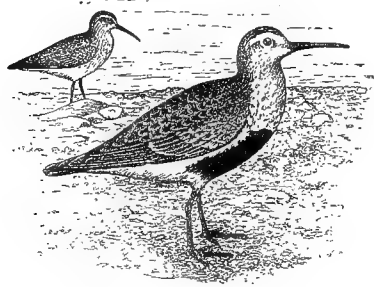
The Dunlin is an accidental wanderer here from the Old World. Mr. Charles J. Paine, Jr., reported the capture of a female taken at Chatham, Mass., August 11, 1900, by Mr. J. S. Cochrane. It is now in the Brewster collection at Cambridge. This is the only record for Massachusetts.¹ Mr. Curtis C. Young of Brooklyn secured a specimen, September 15, 1892, at Shinnecock Bay, Long Island, N. Y. This specimen was identified by Mr. F. M. Chapman, of the American Museum of Natural History.²

¹ Howe, Reginald Heber, and Allen, Glover M.: Birds of Massachusetts, 1902, p. 41.

² Auk, 1893, p. 78.

RED-BACKED SANDPIPER (*Pelidna alpina sakhalina*).

Common or local names: American Dunlin; Brant Bird; Redback; Simpleton; Stib; Crooked-billed Snipe; Crooked-bill; California Peep; Little Blackbreast; Lead-back.



FALL.

SPRING.

Length. — About 8 inches; bill 1.50 to 1.75.

Adult in Spring. — Back largely rusty or chestnut red, marked slightly with black and whitish; head (except crown, which is rusty and black), neck, breast and tail light gray, shading into white below and to ashy on tail; head, neck, breast and flanks slightly spotted and streaked; wings gray or ashy, with a white bar; upper belly black; bill long and down-curved.

Adult in Fall. — Above ashy gray or brownish gray; top of head and streak through eye darker; a light streak over eye; below white; neck and upper breast tinged with gray and streaked with dusky; streaks continued on flanks.

Young. — Back similar, the feathers bordered with rusty; head and neck buffy, streaked with dusky; breast shading to buffy white streaked with black; belly white, *spotted with black*.

Field Marks. — Birds showing the red back and black belly not often seen in Massachusetts either in spring or fall. The long curved bill and the mouse-colored back distinguish fall birds. In flight a white line shows on the wing.

Notes. — *Peurr* (Hoffmann). When frightened or flying, a hoarse grating note; a contented peeping chatter (Eaton). When disturbed a *kük*.

Season. — Rare spring and common autumn migrant coastwise; April to early June, and September to November; formerly a few summered here.

Range. — North America and eastern Asia. Breeds on northern coast of Siberia west to mouth of Yenisei, from Point Barrow to mouth of Yukon, in Boothia and Melville peninsulas and northern Ungava; winters on Pacific coast from Washington to southern Lower California and from New Jersey (rarely Massachusetts) south to Louisiana and southern Texas, and in Asia from China and Japan to Malay Archipelago; rare in migration in interior of United States, except about southern end of Lake Michigan.

HISTORY.

Although this bird is found often in the interior of North America, in New England it is confined mainly to the neighborhood of the sea and largely to the salt marshes, but also frequents sand bars and mud flats. It is an active little bird usually keeping in companies, which run about nimbly and fly very rapidly, performing varied evolutions in concert, as if drilled to act together. In the breeding season it has a rather musical flight song, which never is heard except in its northern home so far as I know.

The following notes throw some light on its history: Abundant in autumn and winter along the whole length of coast on sandy or muddy shores from Maine to mouth of Mississippi (Audubon, 1835). These birds, with several others, sometimes collect in such flocks as to seem at a distance a large cloud of thick smoke (Wilson). Collect in such flocks as to seem at a distance like a moving cloud (Nuttall, 1834). Quite abundant in September; fifty-two killed with two barrels (Giraud, Long Island, 1844). Abundant in spring and autumn migration; on June 18, 1868, saw and shot several on Ipswich Beach (Maynard, 1870). Abundant on our shores (Samuels, New England, 1870). Rare spring and not uncommon autumn migrant (Hoffmann, New England and New York, 1904). Rather local in October, very rare in spring (Knight, Maine, 1908). Only four Massachusetts correspondents note an increase of the Red-backed Sandpiper and forty-nine have observed a decrease. Mr. E. W. Eaton of Newburyport says that he shot about one hundred out of one flock about 1893, but in 1908 saw "only three or four bunches." Reports all along the Atlantic coast, from Nova Scotia to Virginia, corroborate the above.

There seem to be two well-defined migration routes of the Red-backed Sandpiper, one from Alaska and Siberia down the Pacific coast of North America, and one from Hudson Bay, Ungava and the lands to the north down the Atlantic coast. A large part of the flight which concerns the gunners of Massachusetts comes down the west coast of Hudson Bay in the

fall and crosses from there to the Atlantic coast, where it joins the birds from Ungava and the eastern shore of Hudson Bay. The Atlantic birds winter mainly in the United States, and the Pacific birds are common in winter only as far south as southern California. The future of this species, therefore, is in our hands. It can be protected or exterminated by the people of the United States and Canada. In spring the migration passes more to the westward, and the species appears in numbers on the Great Lakes, becoming rare to the northeast of Massachusetts. It is usually common on our coast in autumn, between September 1 and November 1, and much less common in May.

No one yet knows where the great majority of these birds reach the Atlantic coast, but from the fact that numbers are seen on the shores of the Great Lakes and in New York and Pennsylvania, and from the other fact that the numbers of the species seen on the coast of South Carolina are much greater than those now seen on the coast of New England, we may surmise that the great body of birds from the Hudson Bay region crosses the country via the Great Lakes and reaches the coast in the south. It seems probable that the majority of these birds which pass down the New England coast are reared east of Hudson Bay, and that, as in the case of the Knot, overshooting along the Atlantic coast must have reduced greatly the birds that breed in that region.

The Red-backed Sandpiper feeds largely on worms, crustaceans and insects.

CURLEW SANDPIPER (*Erolia ferruginea*).

Length. — About 8.50 inches; bill, average, 1.50, slender, and a little curved beyond the middle.

Adult in Summer. — Above mottled black, gray and rusty; wings and tail ash gray; tail coverts pale buff barred with black; below chestnut.

Adult in Winter. — Above plain grayish brown; upper tail coverts white; below white; breast with a few indistinct streaks of gray.

Young. — Like adult in winter, but feathers above margined with buff or whitish; rump dusky; neck streaked with brown.

Field Marks. — Resembles the Knot or Red-breast, but smaller and bill proportionately longer and more curved.

Range.— Chiefly eastern hemisphere; occasional in North and South America. Breeds in Yenisei delta and on Taimyr Peninsula, Siberia; winters in Africa, India, Malay Archipelago and Australia; in migration occurs from Great Britain to China and the Philippines; occasional in North America; Alaska (Point Barrow), Ontario, Nova Scotia, Maine, Massachusetts, New York and New Jersey, and in the West Indies and Patagonia.

HISTORY.

The Curlew Sandpiper is a straggler from the Old World. It has been recorded six times at least in Massachusetts, as follows: A specimen was taken in the autumn of 1865 on Cape Ann.¹ A specimen in the collection made by Mr. Baldwin Coolidge (now in possession of the city of Lawrence) was killed at Nahant about 1869.² A female in the collection of the Peabody Academy at Salem was killed at Ipswich, October 2, 1872, by R. L. Newcomb.³ Another was taken at East Boston in May, 1876.⁴ Another specimen in the collection of Mr. John Fottler, Jr., was taken at Cape Cod about May 10, 1878.² A male was taken at Chatham, August 26, 1889, and came into the possession of Mr. Gordon Plummer.⁵ One specimen is on record for Maine and another one at Grand Manan, N. B.,⁶ which has been erroneously credited to Maine. The earlier records from New York are rather indefinite, but the probability is that at least a dozen specimens have been taken in that State.⁷

Elliot says that the Curlew Sandpiper resembles the Red-backed Sandpiper in its habits, and that it is an active little bird, fond of associating with other species of waders. It runs rapidly upon the shore, carrying the head down, and flies rather high and fast, showing the back and breast alternately as it wheels in its course.

Its food, he says, consists of small mollusks, crustaceans, insects, etc., and it is said to swallow the roots of marsh plants, to eat small ground fruits and to feed much at night.

¹ Samuels, E. A.: Ornithology and Oölogy of New England, 1867, p. 444.

² Deane, Ruthven: Bull. Nuttall Orn. Club, 1879, p. 124.

³ Townsend, C. W.: Memoirs of the Nuttall Orn. Club, No. 3, Birds of Essex County, 1905, p. 177.

⁴ Brewster, William: Bull. Nuttall Orn. Club, 1876, pp. 51, 52.

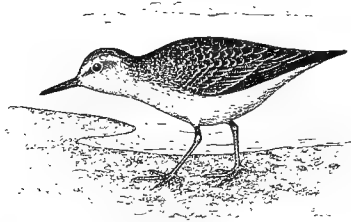
⁵ Ornithologist and Oölogist, July, 1890, Vol. 15, No. 7, p. 110.

⁶ Knight, Ora W.: The Birds of Maine, 1908, p. 167.

⁷ Eaton, E. H.: Birds of New York, 1910, p. 316.

SEMIPALMATED SANDPIPER (*Ereunetes pusillus*).

Common or local names: Peep; Sand-peep; Black-legged Peep; Sand Oxeeye.



Length. — 6.30 inches; bill of male, .66 to .75; female, .80 to .92. Foot with two evident webs.

Adult in Spring. — Above variegated with black, pale bay and ashy or white; a dark line through eye and a white line above it; below white; breast usually rufescent and speckled with black; rest of lower parts white; legs and feet black.

Adult in Fall. — Upper parts grayer; breast with specks faint or obsolete.

Young. — Upper parts mostly ashy gray; under parts white; a slight dusky wash across the unspotted breast; legs and feet greenish black.

Field Marks. — Distinguished from the Least Sandpiper in autumn by its black legs and unspotted breast.

Notes. — A quailing call, like 'to-weet, 'to-weet; a shrill clattering whistle (Nuttall).

Season. — Common migrant early May to mid June; early July to October. Non-breeding birds occur in summer.

Range. — North and South America. Breeds from Arctic coast of North America south to Yukon mouth and to southern Ungava; winters from Texas and South Carolina through the West Indies and Central America to Patagonia; migrates mainly east of Rocky Mountains; casual in British Columbia, Pribilof Islands and northeastern Siberia; accidental in Europe.

HISTORY.

The Semipalmated Sandpiper was one of the smaller species, the great abundance of which is described by the earlier writers in the days when twelve score were taken "at one shoot." Authors give some of its history as follows: Sometimes seen near Boston in large flocks (Nuttall, 1834). Exceedingly abundant in winter, spring and autumn from Florida to Maine (Audubon, 1838). Appears here in May, and many remain with us during the whole summer and late in autumn (De Kay,

New York, 1844). Abundant (Maynard, eastern Massachusetts, 1870). Abundant in migration; few sometimes seen in summer (J. A. Allen, 1879). Still abundant in New England, but flocks not so numerous as formerly (Chamberlain, 1891). Common migrant on coast (Hoffmann, 1904). Formerly abundant (Brewster, Cambridge region, Mass., 1906). Seven Massachusetts observers who reported in 1908 recorded an increase in the numbers of this species, and seventy-three noted a decrease. The species, though greatly reduced in numbers, is still common and often locally abundant in New York and New England.

Much that has been said of the Least Sandpiper will apply quite as well to the Semipalmated. Its former abundance and its present diminution parallel that of the latter. Its habits are much the same, and usually it is confounded with the Semipalmated Sandpiper.

This bird, however, is more of a sand bird and less of a mud bird than its smaller companion. It often is very tame and confiding, but sometimes is rendered shy by sad experience. It is called easily and thus enticed to the slaughter. Its breeding grounds lie mainly farther north than those of the Least Sandpiper, and it migrates farther south, even to Patagonia. It winters in a large part of eastern South America, Central America, Mexico and the West Indies and on the Gulf coast of the United States. It is noted in numbers all along the Atlantic coast of the United States in fall, but is rather rare there in spring. Formerly it summered in some numbers in Massachusetts and some other northern States, and a few have remained here in recent years, but they were non-breeding birds.

These smaller Sandpipers are chased and taken sometimes by Hawks, but although I have seen some long and persistent pursuits I never saw one caught. Once as I drifted with the wind in a canoe, watching a flock feeding on the shore of a quiet bay, a crippled bird standing on one leg amidst its companions tucked its head into the feathers of its back, as if napping. Soon a Sharp-shinned Hawk swooped at the little birds, but the cripple was wide awake and away in an instant,

and the Hawk quickly gave up pursuit. In Florida I have seen the swift Pigeon Hawk chase large flocks of Sandpipers back and forth for a long time, but they were too swift for him. His persistent efforts stirred up about all the "Peeps" over a large expanse of flats, and as they swirled and sped away in writhing, twisting evolutions, back and forth in panic, it was evident that they realized the danger that they were exerting all their powers to avoid. The apparent ease with which they evaded their swift enemy indicates great speed and dexterity of flight. One who has seen the Duck Hawk overtake and strike down Ducks going at full speed cannot help admiring the speed and skill displayed by these little birds in avoiding the attacks of an enemy which seems to possess as much speed and prowess, in proportion to its size, as the Duck Hawk.

The following interesting account of the notes of this bird is taken from Dr. Townsend's *Birds of Essex County*: "Their call note is very much like that of the Least Sandpiper but is shriller and less musical. A harsh rasping note and a peeping note are sometimes heard. A low, rolling, gossipy note is often emitted when they approach other birds. This latter note often is imitated with success by gunners. In the spring, however, the bird is delightfully musical on occasions, and his flight song may be heard on the beach and among the bogs of the dunes. Rising on quivering wings to about thirty feet from the ground, the bird advances with rapid wing beats, curving the pinions strongly downward, pouring forth a succession of musical notes, — a continuous quavering trill, — and ending with a few very sweet notes that recall those of the Goldfinch. He then descends to the ground where one may be lucky enough, if near at hand, to hear a low musical *cluck* from the excited bird. This is, I suppose, the full love flight-song, and is not often heard in its entirety, but the first quavering trill is not uncommon, a single bird, or a member of a flock singing thus as he flies over. I have seen birds chasing one another on the beach with raised wings, emitting a few quavering notes, and have been reminded of a Long-billed Marsh Wren. I have also heard them emit at this time a sharp grasshopper-like sound."

WESTERN SANDPIPER (*Ereunetes mauri*).

Length. — Same as that of Semipalmated Sandpiper, except bill, which is longer, .80 to .95 in the male and 1.00 to 1.20 in the female.

Adult in Summer. — Similar to Semipalmated Sandpiper, but bill longer; plumage richer in color and more rusty above, with stronger markings.

Adult in Winter. — Distinguished in the winter from the Semipalmated Sandpiper only by the greater length of bill and tarsus; some specimens may have more rusty on the upper parts.

Notes. — A soft *wee-wee*; song uttered on the wing on its northern breeding grounds "a rapid, uniform series of rather musical trills" (Nelson).

Season. — Rare fall migrant; mid July to late September.

Range. — North and South America. Breeds along the Alaska coast; winters from North Carolina to Florida and from southern Lower California to Venezuela; in migration occurs mainly west of Rocky Mountains, but also on Atlantic coast as far north as Massachusetts, and in the West Indies.

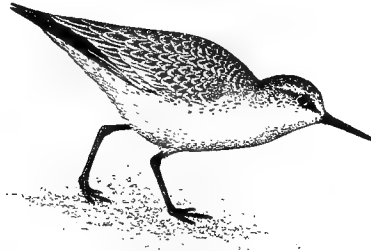
HISTORY.

The Western Sandpiper is considered a rare bird in New England and New York, but it has appeared abundantly on Long Island and may be more common at times than the records show, as in fall, when it comes here, it resembles the Semipalmated Sandpiper so closely that it can be identified only by measurement.

This little Sandpiper performs a remarkable feat of migration. Its breeding range appears to be a narrow strip along the coast of Alaska, and from this region it seems to move southeasterly across the country to the coast of the south Atlantic States. A little of the northern edge of its migration apparently laps over into Massachusetts, and it becomes more common from New Jersey southward, particularly on the coast from North Carolina to Florida. The peculiar part of the history of its migration is that apparently it is rare in the Mississippi valley region and in a great part of the interior of the continent. Just how the main flight reaches the southern coast is yet to be learned. Probably it reaches Venezuela by sea from the south Atlantic coast of the United States. The close resemblance of this bird to the Semipalmated Sandpiper causes it to be mistaken for that species, and possibly that accounts for the scarcity of inland records.

SANDERLING (*Calidris leucophæa*).

Common or local names: Beach-bird; Whitey; Beach Plover; Bull-peep.



Length. — 7.50 to 8 inches; bill averages about .77; no hind toe.

Adult in Spring. — Head, back, sides of neck and upper breast varied with rufous, brown and black, the feathers largely centered with black, edged with pale rufous and tipped or frosted with grayish white; rump dark brown; tail grayish brown; under parts white; wings grayish, marked with whitish, showing a band of white on secondaries when spread.

Adult in Fall. — Above pale gray, the shaft lines of each feather black; below pure white.

Young. — Gray above, spotted with black and white; hind neck dusky white; throat and breast washed with buff or dusky, rest of under parts white; wings as in adult; iris hazel; bill, legs and feet always dark.

Field Marks. — In fall the general whitish appearance and the black bill. Sand beaches.

Notes. — A short *chit* (Hoffmann). A rasping note and a peeping note, sometimes also a sharp grasshopper-like sound. The flight song in spring a quavering trill.

Season. — Common spring and fall migrant coastwise, and rare winter resident; rarer in interior; most common in late May, early June, July, August and September; non-breeding birds formerly summered here.

Range. — Northern and southern hemispheres. Breeds from Melville Island, Ellesmere Land and northern Greenland to Point Barrow, Alaska, northern Mackenzie, Iceland and in northern Siberia; winters from central California, Texas, Virginia and Bermuda to Patagonia, and casually to Massachusetts and Washington; also from the Mediterranean, Burma and Japan to South Africa and various Pacific islands, including Hawaii.

HISTORY.

It is half tide on Cape Cod. Great waves heave high their tossing heads, which, curling, break and thunder down in sheets of snowy foam that overwhelm the beach, charging forward and upward across the sloping sands almost to the very

foot of the dunes. The sea bellows and roars. It pounds the shifting sands until the very earth trembles with the impact, and the salt spray, blown from the wave crests, drifts in clouds across the beach. The flotsam and jetsam of the sea are tossed and washed upon the beach amid the froth and spume; bits of rockweed, seaweed, sponge, cork, bamboo and driftwood, floating wreckage which was once a part of the hull or cargo of some ship overwhelmed at sea or wrecked on the treacherous sands, — all are cast high on the sands or washed back by the returning wave. Many small forms of marine life are torn from their ocean bed and thrown upon the beach.

Here the little Sanderlings are in their element. With nimble, ready step they follow the back-wash down and retreat before the rush of the incoming wave. Sometimes in their eager pursuit of some unusually tempting morsel they run so far down the beach that they are met by the returning surge coming too fast for their little flying feet to escape its overwhelming rush. Then with ready wings they mount and flutter beyond its reach. If disturbed they rise and gather into a rather compact flock, then, wheeling out over the surf, they fly up or down the beach, now fluttering low in a great sea hollow, now skimming the crest of a foaming breaker, soon to alight again on the sands.

The Sanderling is well-named "Beach-bird," for in all countries the beach is its habitat and the sea its refuge. It seeks not only the outer shore, where the surf continually roars, but also the strand of the quiet bay, where the swell gently washes on sunny sands. In August, when the water is low in the ponds and lakes of the interior, it may be found there sometimes along the exposed bars or beaches.

Since the days when Morton shot between four and five dozen "sanderlins" "at one shoot," near his home at Merry-mount, the numbers of this bird have not fallen off quite so much, perhaps, as those of most of the other shore birds. The following abridged extracts give some idea of its decrease in numbers: Extremely abundant on coast in autumn and spring from Maine to Florida (Audubon, 1835). Occurs on coast in small numbers in May, again in large flocks about middle of

August (De Kay, New York, 1844). Abundant on sea-coast spring and autumn (Turnbull, eastern Pennsylvania and New Jersey, 1869). Abundant in migrations (Maynard, eastern Massachusetts, 1870). Abundant on shores in autumn (Samuels, New England, 1870). Stragglers sometimes seen in summer (J. A. Allen, Massachusetts, 1879). Common migrant (G. M. Allen, Massachusetts, 1909). Only four of my Massachusetts correspondents had seen an increase of the species in their localities up to the year 1908, and fifty-five report a decrease. Mr. Alfred E. Gould says that large numbers frequented Nahant many years ago, but he saw one only in 1908. Mr. William P. Wharton reports great numbers at Plum Island in 1901, and "not seen in abundance since;" but he says that large numbers were seen in Provincetown in 1908; and Mr. Benjamin F. Curtis writes that Sanderlings were more numerous that fall on Plymouth and Duxbury beaches than he ever has seen them there in his long experience. Mr. Fred B. Lund also states that they have been numerous at Duxbury (1908) "for the past few years." Mr. Lewis W. Hill states that they are numerous at Edgartown. Outside of Massachusetts I get no reports of their abundance along the Atlantic coast (except one from Florida) other than in places where they are protected from gunning, on the beaches of public parks and private preserves.

The Sanderling breeds so far to the north that it has nothing to fear from man in the breeding season. This is its best protection. Possibly no bird is a greater wanderer or is distributed more widely over the surface of the globe. Its breeding grounds surround the pole, and it is known to occur in the southern portions of all the continents, except perhaps Australia, and in many isolated islands in the Pacific. Many linger in the south until late in spring. They have been taken in Chile in May and in southern Florida on May 25, and they remain commonly along the New England coast and on the Great Lakes until about the first week in June. They breed in the arctic lands in June and July. They leave their summer homes in July and August, and travel by land and sea to their winter quarters in South America. The Sanderling appears to

migrate through the interior as well as on the coast, and it traverses almost the length of both American continents. In the spring migration it begins to come northward in March, and sometimes arrives in New England by the latter part of the month, but after that its movement toward the pole is slow and it does not reach its breeding grounds in the north until the first week in June.

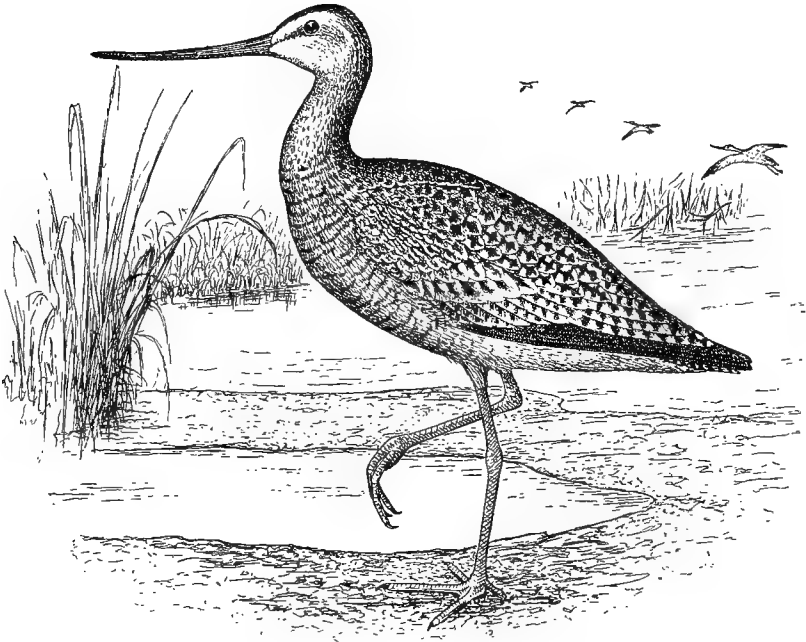
Sanderlings associate sometimes with flocks of other shore birds, particularly the Semipalmated Sandpipers, but, ordinarily, they are found in small flocks, unaccompanied by any other species. Early comers from the north in July sometimes are ruddy on the back, throat and breast. This is the remains of the spring plumage, which gradually disappears as winter comes on. The young birds begin to appear during the latter part of August; they may be distinguished from the old birds by the black spots on the back and the strong contrast between the white line on the wing and the black primaries. Dr. Townsend records that Mr. F. H. Allen found in a gunner's bag at Ipswich Beach a Sanderling with a rudimentary hind toe. This is the only instance of this kind on record for Massachusetts, so far as I am aware. The Sanderling, like the Plovers, ordinarily has no hind toe.

The Sanderling is naturally a very unsuspecting bird, paying little attention to man unless it has learned to do so by painful experience. The flocks move well together, but fly rather steadily and usually low, directing their course along the beach. They are not much given to those graceful uniform evolutions which are performed by flocks of other species, during which the upper and under parts are alternately exposed to view. At high tide they resort to the higher parts of the beach or to some exposed sand bar, where they rest and often sleep, with the head thrust into the feathers of the back.

The Sanderling often feeds on beaches or flats by plunging its bill into the sand in search of worms. At such times Audubon found sea-worms, minute shell-fish and gravel in the stomachs of birds which he dissected; when they were seen following the receding waves and wading in the returning waters he found that they had eaten "shrimps and other crustacea."

MARbled GODWIT (*Limosa fedoa*).

Common or local names: Marlin; Brown Marlin; Red Curlew; Badger Bird.



Length. — 16 to 22 inches; bill 3.50 to 5.50.

Adult. — Head and neck pale buff or pale cinnamon, streaked with blackish; prevailing color above dull reddish buff, varied with black; a broad whitish stripe from bill over eye; a narrow dark stripe below it; throat whitish; below pale rufous or buffy, varying in individuals; breast, flanks, rump and tail barred with brownish black; bill pinkish, black toward tip; legs and feet slaty.

Field Marks. — Largest shore bird except the Long-billed Curlew, which it resembles in color. Conspicuous by its light reddish tone; bill curved slightly upward. *No white patch at base of tail.*

Season. — Now a very rare migrant, formerly more common; May, mid July and August.

Range. — North America. Breeds from valley of Saskatchewan south to North Dakota; winters from southern Lower California, Louisiana, Florida and Georgia to Guatemala and Belize; casual in California in winter; in migration occurs on Pacific coast north to British Columbia, and on Atlantic coast to Maritime Provinces (formerly) and south to Lesser Antilles; accidental in Alaska.

HISTORY.

This is one of the largest shore birds. Only the Long-billed Curlew and the Oyster-catcher equal or exceed the great Godwit in size and weight. Probably it never was very abundant on the coast of New England. As it breeds in the interior of the country (formerly as far south as Nebraska, Iowa and Wisconsin at least, and still from northern North Dakota to the valley of the Saskatchewan) its southeasterly fall migration would not be likely to bring it here in large numbers; but a good many individuals formerly migrated almost directly east, and appeared in the Maritime Provinces and in New England, and from there moved down the coast, increasing in number by accessions from the interior until Florida was reached. Apparently it also goes almost directly west from its breeding grounds to the Pacific coast. This is a remarkable departure from the usual route of the shore birds, and seems to be unique. Probably this bird's breeding range extends much farther north than its principal summer home, as it has been found both on Hudson Bay and in Alaska. While Wayne states that this species winters as far south as Argentina, the weight of evidence seems to show that it winters mainly farther north. Some individuals winter, or formerly did so, in southern California, Georgia and Florida. Audubon observed it in great flocks in Florida, but now it rarely is seen except in small companies, or a pair or single individual here and there on the Atlantic coast, and is rare north of Florida. Cape Cod, it is said, was formerly a favorite stopping place, but the bird is very rare there now.

The following notes indicate its decrease: Passes in spring from Florida along the coast to Massachusetts, in immense flocks (Audubon). In August they appear in large numbers, and many are shot for table (Peabody, Massachusetts, 1839). Around May greater part go north to breed; return in large flocks in August; remain until November (De Kay, New York, 1844). Not uncommon spring and autumn (Turnbull, eastern Pennsylvania and New Jersey, 1869). Flocks of from ten or a dozen to one hundred birds in marshes of Massachusetts sea-

coast, hunted with great activity (Samuels, 1870). Very rare migrant (Maynard, 1870). Rare in migration (J. A. Allen, 1879). A rare bird in New England (Stearns and Coues, 1883). Hovers around the wounded, and the pursuer sometimes bags the entire flock; the great and increasing army of sportsmen will probably exterminate the bird before many years have passed (Samuels, 1897). This and the Long-billed Curlew probably show evidence of relentless persecution more than any others of our shore birds; in places where flocks of thousands were not an uncommon sight, now rare (Sanford, Bishop and Van Dyke, 1903). Mr. Alfred E. Gould writes (1908) that he saw great flocks of this species in the Lynn marshes more than forty years ago, and three correspondents claim to have killed one or two within thirty years in Massachusetts. All but two of my Massachusetts correspondents who mention this bird say that it has decreased in numbers in New England and New York.

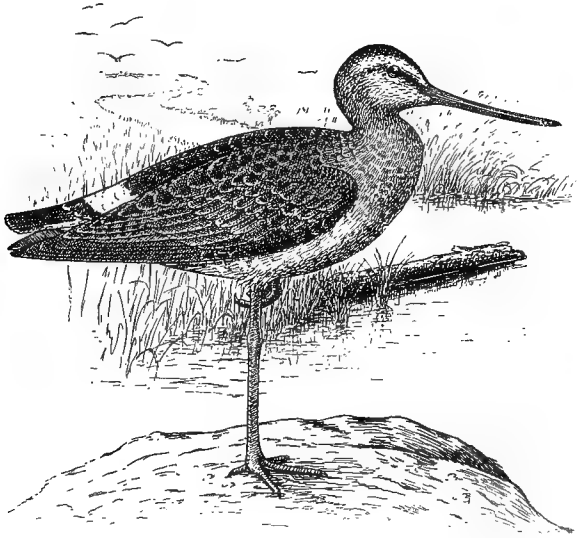
Its large size and its excellent quality for the table fully explain its present scarcity. Also, it has a very tender feeling for its companions, and if one be wounded its fellows hover about it in distress, until the gun has decimated their ranks. Ordinarily, however, it is very wary and difficult of approach. Like most of the large shore birds it is in great danger of extinction. Elliot says that, like all the waders, they are met with yearly on our eastern coast in diminished numbers. While with us it is a bird of the salt marsh and the borders of ponds.

Since the above was written reports have been received regarding a flock of fifty or more large birds, apparently Godwits, that was seen at Chatham, Mass., in 1910. Undoubtedly these birds were not of this species but were Hudsonian Godwits, as Mr. S. Prescott Fay records a flight of that species in August and September, 1910. Reliable records were secured of twenty-five birds shot on seventeen different dates. Single birds were seen or taken; two were seen in one case, and in other cases ten and thirty or thirty-five were seen. These birds were all Hudsonian Godwits, an unusual flight.¹

¹ Fay, S. Prescott: *Auk*, 1911, pp. 257, 258.

HUDSONIAN GODWIT (*Limosa haemastica*).

Common and local names: Goose-bird; Black-tail; Spotrump; Whiterump; Ring-tailed Marlin.



Length. — 14 to 16 inches; bill 3.20, slightly up-curved.

Adult in Spring. — Blackish above, mottled with buff; head and neck rufous, streaked with dusky; rump blackish; *upper tail coverts mostly white*; tail black, white at base, tipped slightly with white; under parts chestnut, barred with dusky and white; bill reddish or flesh color, black toward tip; legs and feet slaty.

Adult in Winter. — Upper parts unmarked brownish gray, white spot still conspicuous; buffy whitish or dingy white below; breast grayer.

Young. — Lower parts similar to winter adult; upper parts brownish gray.

Field Marks. — Much smaller than the Marbled Godwit. The white spot just below the black rump and at the base of the black tail is conspicuous in flight.

Season. — A very rare spring and irregular but less rare autumn migrant coastwise.

Range. — North and South America. Breeds from lower Anderson River southeast to central Keewatin; winters in Argentina, Patagonia and Falkland Islands; in migration occurs principally east of the Great Plains, most commonly on Atlantic coast in autumn and in Mississippi valley in spring; casual in Alaska.

HISTORY.

This bird undoubtedly was common here formerly in migration, particularly on Cape Cod, where it once appeared in large flocks. It seems more common in eastern than in western North America, although it occurs in practically all of North and South America at different seasons of the year.

The following abridged extracts will give some idea of the history of this bird: Less abundant than Marbled Godwit, seldom see more than half a dozen on our coast in one season; uncommon in eastern States (Nuttall, 1834). Not common here (Peabody, Massachusetts, 1839). Not as common as Marbled Godwit; often found associated with it (De Kay, New York, 1844). Rather scarce (Turnbull, eastern Pennsylvania and New Jersey, 1869). Very rare migrant (Maynard, Massachusetts, 1870). Rare in migration (J. A. Allen, Massachusetts, 1879). In some seasons fairly common in New England (Stearns and Coues, 1883). I know of no other part of the United States where this bird can more surely be found during migrations than upon some portions of the Massachusetts coast, though in no part of the country is it a common species, so far as I can ascertain (Gurdon Trumbull, 1888). Less common every year, one time abundant (Cory, 1896). Rare spring and irregularly common autumn migrant on coast (Howe and Allen, Massachusetts, 1901). Rare spring and fall migrant (G. M. Allen, Massachusetts, 1909). Twenty-five Massachusetts observers report a decrease of this species and only one an increase. Messrs. George M. Bubier and Lawton W. Lane report a flock of about fifty birds at Ipswich on August 26, 1908, of which several were killed. This is the largest flock seen there in recent years.

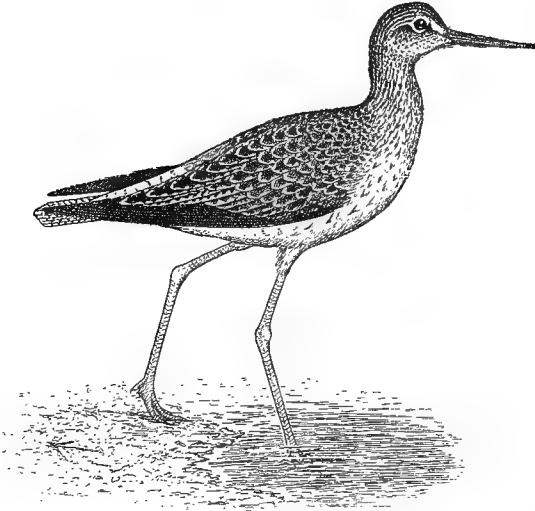
During my boyhood I frequently heard old gunners about Boston tell their tales of the Goose-bird which was well and favorably known all along our coast. But it is impossible now to tell with certainty whether these tales referred to one or both of the Godwits. The Hudsonian Godwit is now less rare than the larger species, but few are seen or taken regularly on the Massachusetts coast. It is shy, like its larger relative,

but a good bird caller finds no difficulty in luring it to his decoys.

The breeding range and migration of this species are more or less shrouded in mystery. The eggs have been found once by MacFarlane in the Anderson River region, which proves that the birds breed near the coast of the Arctic Sea, and that is about all we know of its breeding range, except that it summers in Keewatin. Audubon was informed that this species bred in the Magdalen and Prince Edward islands, and Mr. Fletcher Osgood believes that once it bred on the Lynn Marshes in Massachusetts, but there is no conclusive evidence that it ever bred in New England or the Maritime Provinces. It formerly appeared rarely on the coast of Maine and more commonly in Massachusetts, Rhode Island and New York (Long Island). Farther south it appears always to have been rather rare in the United States. We must assume that the species goes to South America by sea, like the Eskimo Curlew, and lands on Cape Cod and Long Island in numbers only when driven there by storms. It was considered rare by Wilson and Audubon, as it probably never was seen on the coast of the middle and southern States in any numbers unless driven in by a severe storm. On August 13, 1903, a large flight occurred on the Long Island coast, and many were killed, but little was heard of them to the southward. The only flight of Godwits that is shown on the record of Chatham Beach Hotel for seven years is in August, 1903. No birds were taken on the 13th, when the great flight appeared on Long Island, for at Chatham the weather apparently was fair, with a west wind. One bird, perhaps a straggler from the Long Island flight, was picked up on the 20th, after a southeast wind had blown for two days. On the 26th a northeast wind set in, and it blew from the east or northeast for six days. On the 29th seven Godwits were killed. During the seven years for which the record was kept Godwits were taken only singly or in pairs, with the above exception, and the record shows forty-two killed all told. Twenty-four were taken during east, north or northeast winds; eight in northwest winds; six in southwest winds; two in west winds, and only one in a south wind.

GREATER YELLOW-LEGS (*Totanus melanoleucus*).

Common or local names: Winter Yellow-leg; Winter; Cucu; Large Cucu; Big Yellow-leg; Greater Tell-tale; Tell-tale Godwit; Tattler.



Length. — 12.50 to 15 inches; bill 2 to 2.20.

Adult in Spring. — Blackish and light gray above, speckled with white; tail white, barred with blackish; basal half of the tail and upper tail coverts mainly white; under parts white, streaked on throat and neck with dusky, and on breast and sides spotted and barred with same; iris brown; bill black or greenish black; legs long and slender, chrome yellow.

Adult in Winter, and Young. — Similar, but without the blackish above; below streaked only on the neck and upper breast; legs yellow.

Field Marks. — Long, slender yellow legs; white or whitish tail and upper tail coverts. Easily recognized by its manner of flight, alternately scaling and flapping, curving its dark wings downward.

Notes. — A soft, flutelike whistle, *weu, weu, weu, weu, weu, weu, weu, weu* (Chapman). A prolonged rolling call or a succession of quick calls (C. W. Townsend).

Season. — Common migrant, mostly coastwise; early April to mid June and early July to November; a few non-breeding birds occur, or formerly occurred, in summer.

Range. — North and South America. Breeds from Alaska and southern Mackenzie to southern British Columbia, Ungava, Labrador and Anticosti Island; winters from southern California and Georgia, casually in North Carolina, south to Patagonia; occurs in Bermuda in migration.

HISTORY.

Few if any shore birds have a wider and more general distribution in America than the Winter Yellow-legs. It does not go as far north as some species, but it ranges southward over the greater part of both the American continents. Although this species is hunted much, and has diminished greatly in numbers in most parts of the Union, it is still a rather common bird in the migrations along the coast of New York and New England, and sometimes appears in considerable numbers, particularly in spring. Only nine of my Massachusetts correspondents saw an increase in this species up to 1908, and ninety-one a decrease. A recent increase is recorded in portions of Plymouth and Barnstable counties, where large flights are noted from 1906 to 1908, also in some parts of Essex and Norfolk counties; but this species, which is generally common in the interior of the continent, seems to appear here mainly on the coast or not far from it.

Spring protection in Massachusetts, Rhode Island and Connecticut has shown good results. Many of the flocks keep well off shore during the fall migration, and so escape the gunner, except where they come ashore to feed. Thus the diminution of this species has been lessened. The bird is suspicious and noisy, and often alarms other birds by its cries and warns them of the presence of the hunter, but it is easily deceived by a good bird caller, and sometimes can be called back to the decoys after it has been shot at, and so it falls an easy prey to the hidden and skilful sportsman.

The Greater Yellow-legs migrates north and south over the greater part of the United States to the Antilles, and up and down both coasts of South America. It winters mainly in the southern part of South America and north to Georgia and the Carolinas. This is one of the species that no doubt was once common along our coast all summer, although it probably never bred there. Non-breeding individuals still summer in South America and along the south Atlantic coast of the United States. Those which once summered here were mostly destroyed long ago by the gunner. The migration of

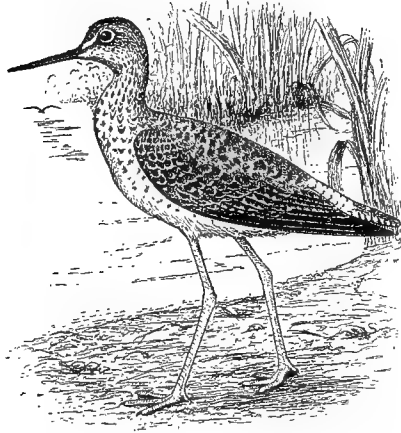
this species along our coast presents some extreme variations in numbers from year to year. Evidently the large migration in fall which goes south by sea does not come on to the coast of Massachusetts unless driven there by strong adverse winds or storms. Great numbers of these birds are seen in flight, miles at sea, and they have been reported as resting on the water at times. This is one of the species that now comes to Cape Cod in large numbers on some of the spring flights. The inaccessibility of the breeding grounds of this bird and the protection that it receives on Anticosti Island have done much to keep up the numbers of those which migrate through New England.

The Winter Yellow-legs is a bird of the meadow, marsh and the muddy shores of fresh-water streams and ponds. When alighting it often raises its wings and folds them slowly, then nods its head, teetering its whole body up and down and uttering its sweet whistling cries. The flocks fly compactly, and, like many other shore birds, they turn, and rise or fall, as if at the word of command.

In spring at low tide this bird frequents the pools and streams in the salt marshes of Cape Cod, where it picks up little minnows and other aquatic forms of life. It seems to be very fond of both land and water insects, and must do considerable good as an insect eater.

YELLOW-LEGS (*Totanus flavipes*).

Common or local names: Summer Yellow-leg; Summer; Little Yellow-leg; Small Cucu.



Length. — 10 to 11 inches; bill 1.40.

Adult. — Closely resembles the Greater Yellow-legs, but is about one-third smaller.

Notes. — A call like that of the Greater Yellow-legs, but usually composed of fewer syllables, sometimes only one, often only two.

Season. — A rare spring but common fall migrant locally and irregularly for brief periods; early May to June and early July to October.

Range. — North and South America. Breeds from Kotzebue Sound, Alaska, northern Mackenzie, central Keewatin and southern Ungava to valley of Upper Yukon, southern Saskatchewan and northern Quebec; winters in Argentina, Chile, Patagonia, and casually in Mexico, Florida and Bahamas; in migration occurs mainly east of Rocky Mountains (rare in spring on Atlantic coast) and in Pribilof Islands, Greenland and Bermuda; accidental in Great Britain.

HISTORY.

The Lesser Yellow-legs formerly was one of the most numerous of all the shore birds of North America, and still holds its numbers better than many other species. Mr. William P. Wharton states that his uncle killed a bushel basket full of this species one day at Ipswich more than thirty years ago. Its decrease is exhibited in the following abridged notes:

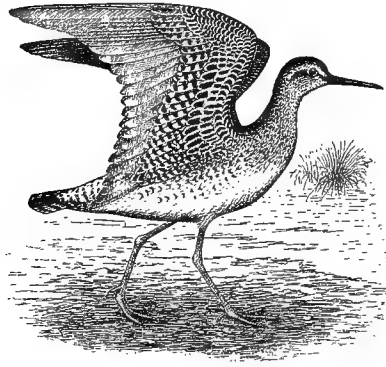
A plentiful species, and great numbers are brought to market in Boston, New York and Philadelphia, particularly in autumn (Wilson, 1813). Florida to Maine, autumn and spring; very abundant in the interior at other seasons (Audubon, 1835). In certain sections may be considered the most abundant bird of the family in North America (Nuttall, 1834). In August and September they appear in large flocks in their southern migration (De Kay, New York, 1844). One hundred and six killed by one discharge of a double gun (Giraud, 1844). Abundant spring and autumn and many remain during summer (Turnbull, eastern Pennsylvania and New Jersey, 1869). Summer resident; common migrant; perhaps breeds; have seen it at Ipswich all summer (Maynard, eastern Massachusetts, 1870). Common; rare in summer (J. A. Allen, 1879). More abundant in west than the Greater Yellow-legs, but on Atlantic shores seldom seen in spring and not very common in fall (Chamberlain, 1891). Being driven from many of the old-time resorts, and may easily become rare (Sanford, Bishop and Van Dyke, 1903). Rather common fall migrant; very rare in spring (Hoffmann, 1904). Formerly common in late summer and early autumn; now rare at all seasons (Brewster, Cambridge region, 1906). Rare spring and common fall migrant (G. M. Allen, Massachusetts, 1909).

Only nine Massachusetts observers in 1908 reported an increase in Yellow-legs and in most cases the increase was recent and perhaps temporary. Eighty-seven have noted a serious decrease within an average of thirty years. Mr. Gardiner G. Hammond saw a bunch of fifty or sixty in 1908 on Martha's Vineyard, and Mr. Gilbert R. Payson saw a flock of about fifty, and they are reported as numerous in the marshes about Newburyport, Cohasset, Duxbury and in Barnstable County; elsewhere reports of decrease are almost unanimous.

No longer ago than 1870 the flocks were quite numerous about some of the inland ponds and lakes in Massachusetts in August, particularly in dry seasons, when the ponds were low. I remember that they were always watchful, but they were readily attracted by a whistled imitation of their call, and if even one was shot out of the flock the others hovered about

until many had paid the penalty of their sympathetic concern. Of late years at those same ponds a single bird or a pair is seen occasionally, but the flocks are gone, perhaps never to return. Unlike its larger relative this species is seen very rarely within our limits in the spring. Sometimes in fall the flight along Cape Cod is very large, but in spring most of the birds of this species go north through the interior. The fall flight seems to trend mainly southeastward, in the direction of South America. Large flights pass out to sea, no doubt following the route of the Golden Plover, some possibly going directly from Nova Scotia to the Lesser Antilles. Others, perhaps, pass down the coast to the southern States, and from there, undertake a shorter flight to the southern continent. But the numbers of those taking this route have been so decimated that they are now comparatively few. Greater flights pass the Bermudas, where they formerly sometimes landed if beset by adverse winds. These flights probably do not land on our coasts except when driven here by easterly winds. Strong westerly or northwesterly winds sometimes seem to bring to our shores a flight from farther west. The Summer Yellowlegs once remained here all summer, but was not known to breed. Its habits are similar to those of the Greater Yellowlegs, and it feeds largely on insects, including ants.

SOLITARY SANDPIPER (*Helodromas solitarius solitarius*).



Length. — 8 to 9 inches; bill slender, nearly straight, 1.15.

Adult in Spring. — Upper parts dark, lustrous olive brown, sparsely speckled with white; head, neck and flanks streaked or otherwise marked with dusky and white; two central tail feathers, mainly dark; all upper tail coverts, outer tail feathers, under wing coverts and axillars *white, barred with black or dusky*; belly white; legs dark greenish.

Adult in Fall. — Similar, but upper parts dark grayish or ashy brown, less speckled with white; head and front of neck less streaked.

Young. — Upper parts brownish gray; head more uniform grayish; everywhere speckled with buff or yellowish white; sides of head and neck dusky; rest of under parts white; tail as in adult.

Field Marks. — Larger and darker than the Spotted Sandpiper. The striking barred black and white outer tail feathers show in flight, which is less erratic than that of the Spotted Sandpiper; more regular wing beats and less sailing. Frequents mainly inland lakes and woodland streams.

Notes. — Low whistling and sharp alarm notes somewhat similar to those of the Spotted Sandpiper.

Season. — A rather common migrant inland; less common on coast; a few formerly summered in Massachusetts; late April and May, and second week in July to late October.

Range. — North and South America. Summers from central Keewatin, northern Ungava and Newfoundland south to Nebraska, Illinois, Indiana, Ohio and Pennsylvania; probably breeds regularly in northern part of its range, locally and casually in southern part; winters from the West Indies to Argentina; recorded from Greenland, Bermuda and Great Britain.

HISTORY.

This is the only Sandpiper in New England which apparently is more common in the interior than on the coast. Although it sometimes frequents salt marshes and the shores of tidal streams, it is not commonly met with on the sea beach. It is a bird of inland ponds and streams, and frequents the shores of small wooded creeks. While it is not as solitary during migration as its name implies, it rarely flocks, and, usually, only a pair or a few individuals are seen in the same neighborhood. During the breeding season this bird is met with rarely in Massachusetts, and though it sometimes summers as far south as Pennsylvania, very little is known of its breeding habits. It is said that it nests on the ground, and also in the abandoned nests of other birds in trees. Mr. Gerald H. Thayer tells me that formerly it summered on Mount Monadnock, in southern New Hampshire. At that season it appears, indeed, to be most solitary, as it is rare to find more than one bird in a locality, even in those northern States where undoubtedly it breeds.

The decrease of this bird has not been as noticeable as that of many other Sandpipers because of its rather solitary habits and its preference for sylvan retreats. The shore gunner rarely sees many, and the pot-hunter ordinarily has little chance to get more than one bird at a shot. Nevertheless only five Massachusetts observers report an increase of the species, while one hundred and thirty-eight note a decrease.

When the ponds are low in August we may look for the Solitary Sandpiper on the exposed shores and sand bars. It goes south mainly through the interior, and although it is the eastern form of the species, it has been taken in Mexico. Still, it may cross the Mexican Gulf and the Caribbean Sea, as it has been noted in Porto Rico and Vera Cruz. It probably visits a large part of northern and eastern South America; it may even reach the Pacific coast of that continent, as it is noted from Lower California.

This bird has a curious habit of balancing its body and nodding its head, like the Spotted Sandpiper, but the action

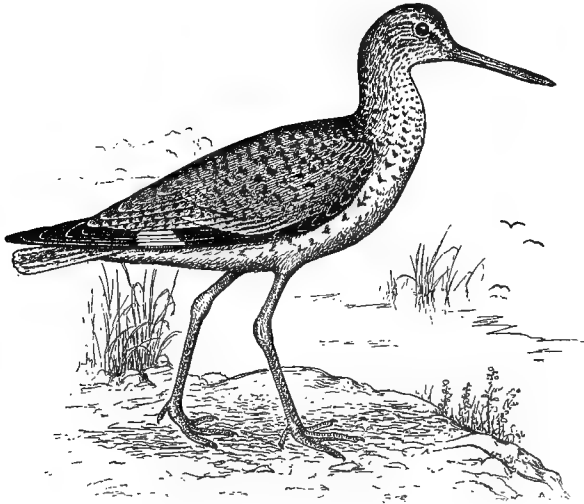
is not so rapid and pronounced as that of the latter; it is confined more to nodding, and there is less movement of the hinder parts. The bird is graceful and elegant in shape, moves lightly and flies swiftly and easily. Often, when alighting, it holds its long wings straight up and closes them slowly, as is shown in the cut, exhibiting the beautiful markings of the under wing coverts and axillars. When the ponds and lakes of the interior are low, after a long drought in August or September, this bird may be seen about the sand bars searching for its favorite food. Often it wades into the water up to its belly, but I never have seen it swim.

In the fall, on its return from the north, it has a habit of wading into the water in stagnant ditches or ponds, where it advances one foot at a time, and by rapidly moving the forward foot stirs up the vegetation at the bottom ever so slightly. This motion is so swift and delicate that the leg seems to be merely trembling, as if the bird were chilled by contact with the water, but it is done with intent to disturb insects among the algæ at the bottom without roiling the water, and the eager bird, leaning forward, plunges in its bill and head, sometimes to the eyes, and catches the alarmed water insects as they dart away. I have watched this carefully with a glass while lying in the grass only ten or twelve feet from the bird. It is easy by stirring the bottom slightly with a stick to cause a similar movement of the water insects, but I never could agitate it so delicately as to avoid clouding the water with sediment from the bottom.

Audubon states that he has found stomachs of this species filled with aquatic insects, caterpillars of various kinds and black spiders. Professor Aughey examined the stomachs of two birds; one contained nine locusts and thirty-four other insects, the other a grasshopper and forty-three other insects. Dr. Warren examined eleven stomachs and found in ten of them "worms," beetles or other insects and one contained "small shells."

WILLET (*Catoptrophorus semipalmatus semipalmatus*).

Common or local names: Humility; Pied-wing Curlew.



Length. — 15 to 16 inches; bill 2 to 2.50; feet partly webbed.

Adult in Summer. — Above brownish gray or ashy, speckled and barred more or less with blackish; below white, sometimes with a brownish tinge; fore neck and upper breast streaked with dusky, flanks barred; wing blackish below, browner above, showing, when spread, large conspicuous white markings; basal part of the tail and its upper coverts white, rest light ashy to whitish, sometimes barred with blackish.

Adult in Fall and Winter. — Above ash gray; below white; wing as in summer; axillars black at all seasons.

Young. — Brownish gray above, tinged with buff; white patch above tail, as in adult; sides tinged with buff, finely mottled with gray; wings as in adult; bill, feet and eyes dark at all ages.

Field Marks. — Large size, extensive white on wing and white rump. Resembles the Hudsonian Godwit in fall plumage (in which we usually see it), but the Godwit lacks the great white wing markings of the Willet. The Willet's notes also are distinctive.

Notes. — *Pill-will-willet*, repeated, loud and clamorous; also a single note, loud, rasping, suggestive of a giant Catbird (C. W. Townsend).

Nest. — A hollow scooped out in a tuft of grass and lined with grass.

Eggs. — Four to five, about 2.05 by 1.50, brownish or greenish olive, spotted and blotched with dark brown or various shades of brown.

Season. — Very rare transient visitor coastwise; formerly a common migrant and summer resident; May, June, August and September.

Range. — North and South America. Breeds from Virginia (formerly Nova Scotia) south to Florida and Bahamas; winters from Bahamas to Brazil and Peru; accidental in Bermuda and Europe.

HISTORY.

This large, handsome, showy bird is one of the few greater shore birds which formerly bred all along the Atlantic coast, from Nova Scotia and New England to the Gulf of Mexico. Dr. Coues (1874) states that it breeds anywhere in the United States in suitable resorts, and that he has found it wherever he has been in this country, but this statement includes the Western Willet, which had not been separated and described at that time. Like all game birds which nest in the eastern United States, the Willet has lately deserted many of its former haunts. It has vanished as a breeding bird, not only from Nova Scotia and New England, but also from the Atlantic coast north of Virginia. This is one of the inevitable results of the spring and summer shooting so long permitted in all the Atlantic coast States, and still practiced in many of them.

Another factor in the extirpation of the Willet was the destruction of its eggs. The eggs were large and well flavored and were considered a great delicacy by the baymen. The nests were robbed continually and the birds were shot during the breeding season.

It seems probable that the eastern Willet practically has disappeared from New England, and that most of the birds now taken are referable to the succeeding form, the young of which are hardly distinguishable from those of the present species. Little is known of the breeding of the Willet here in early times. In the last century it bred in large numbers in Nova Scotia; also on Muskeget Island and near New Bedford, Mass., and in Connecticut.

The following notes show its former abundance and its recent decrease: Breeds in great numbers on shores of New York, New Jersey, Delaware and Maryland (Wilson, 1813). Known to breed not far from New Bedford (Audubon, 1835). Breeds here (Linsley, Connecticut, 1843). Breeds from

Louisiana to Massachusetts; many remain along the shore of this State (New York) to breed, and loiter with us until November (De Kay, 1844). Common migrant April to October (Turnbull, eastern Pennsylvania and New Jersey, 1869). Not very abundant on shores of New England as a summer visitor and resident; taken in considerable numbers in autumn (Samuels, 1870). Sometimes breed (J. A. Allen, Massachusetts, 1879). Known to nest in suitable plains of interior and coast from Florida to Halifax, N. S. (Brewer, 1884). One of the few species of the family which regularly and plentifully summer in some portion of New England (Stearns and Coues, 1888). Rare spring and autumn migrant along the coast (Howe and Allen, Massachusetts, 1901). A few years ago bred commonly on coast of Virginia and New Jersey (Sanford, Bishop and Van Dyke, 1903). A mere straggler on Maine coast (Knight, 1908). Rare migrant, mainly coastwise (G. M. Allen, New England, 1909). Flights comparatively rare in recent years (Eaton, New York, 1910). Only two of my Massachusetts correspondents report an increase, while thirty-one note a decrease.

There is a great migration of Willets in fall from northwest to southeast, and formerly many of these birds reached the coast of New England. Many wintered and some still winter in the Carolinas, Georgia and Florida. Eaton gives the Willet as a former winter visitant in the interior of New York. It winters, however, as far south as southern Peru at least, and reaches the Amazon on the Atlantic coast. It follows the interior route in spring, but the following extract from a letter received from Hon. George Bird Grinnell suggests that some may take an outside route: "We often hear of the journey of two thousand miles which some of the shore birds make from the coast of Labrador or Nova Scotia south to the Lesser Antilles, or even to South America, and two years ago (1907), while coming back from France the end of May, I saw something that had a bearing on this matter, and which greatly interested me. We were passing the Newfoundland Banks one fine morning, when the sea was absolutely calm. We ran into a great body of birds scattered over the water, apparently

in flocks of from a dozen to fifty. Farther away were what looked like great rafts of these birds, I should suppose several thousands easily within sight. The birds appeared to be resting on the water, and acted as if they were occasionally picking something from its surface. The ship passed near a number of small groups, and as they rose on the wing — for they were not very tame, and none of them were within gunshot — I watched them with a glass, and recognized that all of them seemed to be Willets. This confirms what, of course, has been said many times, that these migrating shore birds, on their long journey toward the south, often stop and rest, and, of course, must find food on the journey.” This is not the first record from the vicinity of Newfoundland, for Reeks records it there, and it is said to have bred there about ponds at some distance from the sea-shore. The Willet’s half-webbed feet equip it for swimming well at sea.

The Willet is a shy bird, easily alarmed, and it takes wing with loud cries at the least indication of danger; but during the breeding season its nature undergoes a change, and in its solicitude for its nest and young it seems to forget its own danger. Screaming in alarm if disturbed, it circles around its nesting place, and so exposes itself to the miserable lawbreaker, who reckes not of time or season so long as he secures a victim for the pot. Wayne watched a nest in which the young were hatching. The parents became much alarmed, and he saw one of the old birds take a young one and fly with it across three creeks and some marsh land to an island a quarter of a mile away; all the young were taken in the same manner to the same place. He believes that they were held between the thighs of the parent bird, as the Woodcock is known to carry its young.

The Willet eats grasses and roots when on inland lakes and rivers, also small fish and fish fry. Along the coast it takes many small mollusks, crabs, etc. In South Carolina it visits the rice fields, and is said to feed on the grain.

WESTERN WILLET (*Catoptrophorus semipalmatus inornatus*).

Length. — Averaging larger than the Willet; bill longer and more slender 2.25 to 2.75 inches.

Adult in Summer. — Like Willet, but markings above “fewer, fainter and finer,” on a lighter ground; less heavily marked below.

Adult and Young in Winter. — Similar to Willet; can be distinguished only by measurement.

Field Marks. — Sometimes much grayer than the Willet, but cannot be distinguished with certainty in the field.

Season. — Fall migrant mainly coastwise.

Range. — Western North America. Breeds from central Oregon, southern Alberta and southern Manitoba south to northern California, central Colorado, southern South Dakota and northern Iowa, and on coasts of Texas and Louisiana; winters from central California, Texas, Louisiana and Gulf coast of Florida to Mexico (Lower California, Tepic and Guerrero); in fall migration occurs in British Columbia and on Atlantic coast from New England south.

HISTORY.

The Western Willet, a subspecies of the Willet, comes here occasionally, if not regularly, in the fall flight. The following note from Mr. A. C. Bent, of Taunton, Mass., who has been investigating the status of this species, is pertinent here. “This bird is increasing. There was a very heavy flight this year (1908). I believe all, or practically all, of the Willets shot in Massachusetts during the past few years have been Western Willets; all that I have examined are referable to the western form. I believe that many of the western-bred shore birds and Ducks have been forced to migrate farther eastward, owing to the settling of the middle west and the draining and destruction of their feeding grounds in the Mississippi valley, and that they seek the Atlantic coast by the shortest route rather than make the long overland flight to the Gulf of Mexico.” Mr. Bent’s belief may be warranted by his observations, but to my mind it seems more probable that such flights of western birds to the east always have occurred, but have not been so much noted until the eastern birds began to decrease. Since then the increase in the number of such competent ornithologists as Mr. Bent has resulted in a more accurate knowledge of these flights.

RUFF (*Machetes pugnax*).

Length. — 10 to 12 inches.

Adult Male. — Face bare in front of eye, with reddish warts; colors varying much, probably no two specimens exactly alike; a large shield-like erectile ruff about the neck, conspicuously barred, and the colors vary from chestnut and glossy black streaked with reddish to mottled reddish and buff streaked with buffy white and barred with pure white; sides of rump usually white; bill brown; legs yellow.

Adult Female. — No ruff; head fully feathered; plumage banded with black and buff, white or reddish; the lower abdomen or ventral region usually pure white.

Young. — Back and shoulders brownish black; feathers usually bordered with buff; crown yellowish, streaked with black; lower parts unspotted, white before and buff behind.

Range. — Eastern hemisphere. Breeds from Arctic coast south to Great Britain, Holland, Russia and Siberia; winters throughout Africa, India and Burma; strays occasionally to western hemisphere, from Ontario and Greenland south to Indiana, North Carolina, Barbados and northern South America.

HISTORY.

The difference in the appearance of the sexes of the Ruff is so great that in Europe the male is known as the Ruff on account of the ruff about his neck, while the female is named the Reeve.

The bird is an accidental visitor to Massachusetts, perhaps blown here on the wings of some storm or wandering from its habitat in the Old World. The Massachusetts records follow: Mr. Gordon Plummer of Brookline secured a fine young male taken in Chatham, September 11, 1880, which is recorded as the ninth specimen for North America, the third for New England and the second for Massachusetts. The other two New England specimens were females, one taken at Newburyport, Mass., in 1871,¹ and the other taken at Upton, Me., in 1874; both now in the Brewster collection.² Later, another was taken by Mr. Alfred Dabney, on Nantucket, Mass., late in July, 1901, and is now in the collection of Hon. J. E. Thayer, at Lancaster, Mass.³

¹ Brewster, William: *American Naturalist*, May, 1872, p. 306.

² *Forest and Stream*, October 7, 1880, Vol. XV, No. 10, p. 186.

³ *Auk*, 1906, p. 98.

Twenty-four or more specimens of this species have been recorded from North America; three of these are from Maine and two from New York (Long Island). Baird's statement that the Ruff has been "frequently killed on Long Island" is not substantiated by available records. Nevertheless, the bird is likely to occur in New York or New England at any time and should be looked for.

UPLAND PLOVER (*Bartramia longicauda*).

Common or local names: Bartramian Sandpiper; Uplander; Field-plover; Grass-plover; Pasture-plover.

Length. — 11.50 to 12.75 inches; bill 1.15.

Adult. — Above a mixture of black, buffy brown, brownish gray and whitish, blackish prevailing on crown and back, lighter colors on neck, sides of head and wings; primaries blackish, outer one barred with white; outer tail feathers barred with white, black and reddish brown; tail reaching considerably beyond the tips of wings; neck, breast and flanks buffy, marked with dusky streaks and arrow heads or irregular bars, the former mainly on neck, the latter on breast and sides; throat, belly and under tail coverts whitish; legs yellowish; bill yellowish at base and below, dusky toward tip. (See Frontispiece).

Field Marks. — Large size, long neck and bill and general buffy brown color and absence of marked white. Found mainly in pastures and old fields away from water, even at the sea-shore.

Notes. — Alarm, *quip-ip-ip-ip quip-ip-ip-ip* (Langille). *Quitty-quit-it-it* (Knight). A soft bubbling whistle; song, a prolonged, weird, mournful, mellow whistle, *chr-r-r-r-ee-e-e-e-e-oo-o-o-o-o-oo* (Langille). *Wh-o-e-e-et-et-e-e-e-e-o-o-o-ooo* (Richard).

Nest. — Built of grasses and weeds on ground.

Eggs. — Usually four, averaging 1.75 by 1.28; pale clay color with spots of amber, yellowish brown, reddish brown and black, most numerous and blotchy toward the large end.

Season. — Rare or uncommon migrant and very rare local summer resident; formerly common; early April to September.

Range. — North and South America. Breeds from northwestern Alaska, southern Mackenzie, central Keewatin, central Wisconsin, southern Michigan, southern Ontario and southern Maine to southern Oregon, northern Utah, central Oklahoma, southern Missouri, southern Indiana and northern Virginia; winters on pampas to Argentina; in migration occurs north to Newfoundland and in Europe; accidental in Australia.

HISTORY.

Among all the impressions of my boyhood, which will remain with me while life shall last and reason maintain her sway, none is more vivid, none brings back a greater flood of recollections, than the memory of the hours of darkness spent in listening to the notes of the birds passing overhead when the warm south winds of May brought the great tide of bird migration which flooded the fields and woods of New England and passed on toward the north. Chief among the notes heard on such occasions, falling from the far spaces of the darkened night, came the soft but penetrating flight call of the Upland Plover. Mingling with the faint notes of Warblers, Thrushes, Cuckoos, and Yellow-legs, it always fell clear and distinct to the ear. There is no richer music among all the songsters of the grove than the long, mellow, rippling whistle of this lovely bird. In those days it nested in the fields back of our house, within the limits of the city of Worcester, and was well known to the farmers of Worcester and the western counties. It was plentiful, particularly in the migrations along our coast and in the Connecticut valley.

What a change has occurred in forty years! The fields and hills that once knew this dove-like bird know it no more, and its note, then commonly heard in most parts of the State, is now rare. We listen for it in vain. The Grass-plover once came in multitudes to the prairies of the west in spring, but is growing rare as far west as Minnesota, South Dakota and Texas, and is really common now only in some of the States west of the Mississippi valley. It never was as plentiful here as in the prairie States, for New England was originally a wooded country. No doubt this bird increased in numbers at first when the woods were cut off and many of our uplands were made over into fields, pastures and gardens, but its decrease began when the larger game had been killed off and the shotgun took the place of the rifle. The following notes from authors indicate its decrease: One of the most common birds along the sea-coast of Massachusetts; found throughout the continent according to season; common in Worcester

County, Mass., in summer (Nuttall, 1834). Common on sea-coasts but not confined to them; extends into the country (Peabody, Massachusetts, 1839). About middle of August very plentiful on Shinnecock Hills (Long Island) and Montauk; common in Massachusetts, Rhode Island and New Jersey, (Giraud, 1844). Breeds from Maryland north; in July and August appears in large flocks on its way south; much esteemed game bird (De Kay, New York, 1844). Quite common in western part of State (Zadock Thompson, Vermont, 1853). Not uncommon summer resident; common in migration (Maynard, eastern Massachusetts, 1870). Not abundant as summer resident, breeds sparingly in all New England States (Samuels, 1870). Common summer resident (J. A. Allen, Massachusetts, 1879). Moves in large flocks, and as it breeds through the country may be met with from Canada to the southern States; considered one of the best game birds; eagerly sought by all lovers of the gun (Murphy, 1882). Abundant spring and fall (Stearns and Coues, New England, 1888). Still abundant in New England; some breed here (Chamberlain, 1891). Not as abundant in eastern Pennsylvania and New Jersey as in Wilson's day (Abbott, 1895). Now occurring chiefly as uncommon migrant (Howe and Allen, Massachusetts, 1901). Was formerly abundant in New England, on Long Island and through the country west to the Rocky Mountains (Huntington, 1903). Within my recollection nested plentifully in Worcester County, Mass., and southern Maine and New Hampshire; few localities in New England where one can be sure of finding the birds now (Brewster, 1906). Transient, not common; breeding very rarely; formerly common migrant and summer resident (Stone, New Jersey, 1908). Rare spring and uncommon fall migrant; rare local summer resident (G. M. Allen, Massachusetts, 1909). Six of my Massachusetts correspondents report an increase of this bird in their localities, while seventy-six report a decrease.

About 1880, when the supply of Passenger Pigeons began to fail, and the marketmen, looking about for some other game for the table of the epicure in spring and summer, called for Plover, the destruction of the Upland Plover began in earnest.

The price increased. In the spring migration the birds were met by a horde of market gunners, shot, packed in barrels and shipped to the cities. There are tales of special refrigerator cars sent out to the prairie regions, and parties of gunners regularly employed to follow the birds and ship Plover and Curlews by the carload to the Chicago market. These may not be based on facts, but we know that the birds came to market in great quantities. In the eastern breeding grounds of the Uplander, in New England and the middle States, gunners pursued them in July, as soon as the young were large and well-feathered enough to be fit for market. Less than ten years of such market hunting sufficed to reduce the numbers of the species tremendously, and but for the wary nature of the bird it would have been extirpated from the east before the close of the nineteenth century. All sorts of stratagems were resorted to to approach it or to lure it within call of the gunner. A horse and wagon were used commonly in the west to drive over the fields and prairies. The birds, having become accustomed to farmers driving their teams afield, were not much alarmed at the approach of the gunners in this fashion. In the east, where the fenced lands prohibited the use of the vehicle, other means were resorted to. Some gunners have been very successful in circumventing this wary bird, which holds forth every inducement for its capture, as it is considered a delicious morsel on the table, and brings a high price. Probably the Uplander would have become practically extinct already had not many western States passed laws prohibiting the spring shooting of Plover and the export of game, while several New England States later began protecting it by law at all times. The position of the bird is still precarious, however, and unless perpetual protection is given it in every State it will disappear.

In the west it has not yet become so wary as in the east, where it tests the skill of the hunter to the utmost. In the breeding season it loses its habitual caution and seems concerned mainly for the safety of its young. It will use every artifice known to a bird to draw the invader away from their vicinity, and cases have been known in the west where it has flown directly at the intruder. In the east it circles round

him, complaining loudly. Like many others of its tribe it has a habit of extending its long wings high above the back when alighting, and then folding them slowly down. This bird, although a Sandpiper, resembles the Plovers in habits.

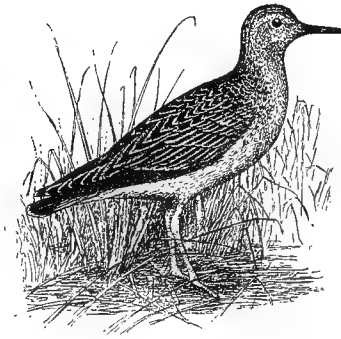
The southward migration of this species begins before the middle of July and is in full swing in August. It moves south both through the interior and along the coast, and there is some reason to believe that individuals put out to sea from the south Atlantic and Gulf coasts, for it is one of the species which commonly visits Barbados, the most easterly of the Lesser Antilles. It passes through both the Greater and Lesser Antilles, but in the Bahamas, Porto Rico and Jamaica it is so rare that many must reach the more easterly islands by a sea route. Probably it also crosses the Gulf of Mexico, flying south from Louisiana and Texas to southern Mexico, for it is found in its fall migration in Nicaragua and Costa Rica, and some birds which probably go by land, taking the western route, are seen in western Mexico. It winters on the pampas of South America.

In spring it arrives in Louisiana on the average about March 14, before it reaches Florida or the plains of Texas. As Professor Cooke reasons, this seems to indicate that it makes a direct flight across the Gulf. Formerly it came in immense flights to Louisiana and Texas, and from northern Texas to North Dakota multitudes remained to breed. Apparently there are no records of this species in spring east of Cuba, which suggests the probability that about all the individuals come north through Central America, some going east through Yucatan, Cuba and Florida, while the majority cross the Gulf and go up the Mississippi valley.

This bird is a valuable ally of the farmer. It feeds on locusts, grasshoppers, cutworms and other enemies of grass and other crops. During the Locust invasions in Nebraska Professor Aughey found this species among the most useful in destroying the insects and saving the crops, for at that time it was abundant and correspondingly useful. It came in large flocks in spring and did great service on locust-infested farms.

BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*).

Local name: Hill Grass-bird.



Length. — 7.50 to 8 inches.

Adult. — Colored similarly to the Upland Plover, but smaller, rather paler and less marked on breast and sides; dark brown or blackish above; feathers edged with brownish yellow, giving the bird a general tawny appearance; primary and secondary wing feathers dusky brown, darkening toward tips and light tipped; tail shading like that of the Upland Plover from the dark brown middle feathers to the light brownish yellow outer ones, all with a subterminal bar of blackish and tipped with whitish; below light buff; slightly spotted on sides of breast; iris dark brown; bill blackish; legs greenish or yellowish.

Field Marks. — The general tawny color of the bird and its buff under parts. When in hand the primaries (inner webs) and the secondaries are seen to be curiously marbled with black and white. Like the Upland Plover it is seen usually on dry upland fields and rarely on the shore.

Season. — Rare migrant July to September.

Range. — North and South America. Breeds along Arctic coast from northern Alaska to northern Keewatin; winters in Argentina and Uruguay; most abundant in migration in Mississippi valley; occasional on Atlantic coast in fall; casual on Pacific coast north to St. Michael, Alaska, and to northeastern Siberia; straggles to Bermuda and western Europe.

HISTORY.

The Buff-breasted Sandpiper is rather a rare bird upon the Atlantic coast, and possibly always has been, as it breeds in northern Alaska and its main migration route does not touch the Atlantic coast. It seems probable that the birds of this species which appear in Massachusetts are members of strag-

gling parties that follow the flight of other shore birds which normally come down the Atlantic coast. It appears that the regular fall migration route of the Buff-breasted Sandpiper trends southeast from Alaska to the western shores of Hudson Bay, and from there south through the Mississippi valley region. It moves south rapidly, and appears in Colombia, South America, in September. Apparently it crosses the Gulf of Mexico from Texas, and, reaching Central America, crosses the South American continent southeasterly to Argentina. There are no very recent records of its occurrence on the Atlantic coast south of Long Island, and the older records may be open to doubt. This and the fact that a few records have been made of the species in the Antilles give color to the belief that the individuals of the species which reach the north Atlantic coast put out to sea, following the fall route of some other shore birds to South America. I know of no spring record of this species on the Atlantic coast. It follows the interior route northward.

The following notes seem to show that the Buff-breasted Sandpiper was once not uncommon here: Not uncommon in markets of Boston in August and September (Nuttall, 1834). With us not a very common bird (Giraud, Long Island, N. Y., 1844). Rare spring and autumn (Maynard, eastern Massachusetts, 1870). Not abundant on shores of New England, but by no means rare in August and September; seldom seen in spring (Samuels, 1870). Rather uncommon migrant (J. A. Allen, Massachusetts, 1879).

Formerly it was very abundant in Texas, and still is common there, but decreasing. The reports of its decrease in the west are very impressive. Apparently it is on the way to extinction.

It is usually a very gentle and confiding bird and pays little attention to the hunter. It is valuable as an insect eater, particularly in the west, but in its pursuit this fact is overlooked and its food value only is considered. Dr. Hatch found it living upon crickets, grasshoppers, ants and their "eggs," and other insects, and on minute mollusks taken from the shores of shallow ponds in the warmest part of the day.

SPOTTED SANDPIPER (*Actitis macularia*).

Common or local names: Teeter; Teeter-peep; Tip-up; Sand-lark.

Length. — About 7.50 inches; bill .95.

Adult. — Above light brown, with a faint greenish luster, and lightly marked with blackish; a whitish line above eye from bill to hind head; below white, marked with rounded spots of blackish, larger in female; a row of white spots on wings show in flight as a white line; outer tail feathers barred with white; iris dark brown; bill yellowish and black; legs and feet grayish olive.

Young. — White below, *unspotted*; washed on breast with grayish.

Field Marks. — The only Sandpiper which has large and distinct spots on the under parts. Sails about borders of streams and ponds with wing tips bent down, *wings showing a white line*; almost always teeters when alarmed.

Notes. — A loud *peet, weet*, or *weet, weet*, beginning high and gradually declining into a somewhat plaintive tone.

Nest. — Of dried grasses, etc., on ground.

Eggs. — Three to five, large for the bird, about 1.30 by 1, creamy, buffy or clay colored, pointed, blotched with blackish and neutral tints.

Season. — Common summer resident and migrant; mid April to mid November.

Range. — North and South America. Breeds from tree limit in northwestern Alaska and Newfoundland south to southern California and northern South Carolina; winters from California and South Carolina to southern Brazil and central Peru; straggles to Great Britain and Helgoland.

HISTORY.

This is the most common of all Sandpipers in the interior, and the only one which still breeds commonly in Massachusetts and the greater part of New England. It is well known everywhere and readily is distinguished from all other summer residents by its habit of teetering, or bobbing the head and elevating the hinder parts, often turning about to all quarters of the compass. This habit of extravagant balancing attracted the attention of an Irish immigrant many years ago, who christened it the "steelyard bird" from its habit of "weighin' th' wurrums."

Unlike the Solitary Sandpiper it frequents the sea-shore quite as much as the interior, and nests along the sea beach and on islands off shore. It sometimes makes its nest near a



PLATE VIII.—SPOTTED SANDPIPER, YOUNG.

From Bird-Lore.



PLATE IX.—SPOTTED SANDPIPER, ADULT.

From Collier's Weekly. (Photographs by Howard H. Cleaves.)

cornfield or a potato field. Often as a boy while hoeing in the field I found its antics much more interesting than my work.

The Spotted Sandpiper has not diminished in numbers so much within my experience as have those species which frequent mainly the sea-shore. Nevertheless, there are many places in eastern Massachusetts where it formerly was common and where now it rarely is seen. Only fifteen of my Massachusetts correspondents report an increase of this species in the State, while fifty-nine write of a decrease.

This bird frequents the uplands away from the water more than most of the Sandpipers, and it does not wade much when feeding along the shore. Still, at need, it does not hesitate to wade, swim and dive. Dr. Warren notes that a young bird when wounded took to the water in a shallow stream, went to the bottom like a stone, ran across on the bottom, and coming up on the other side endeavored to conceal itself by submerging its body and pushing its head among long grass growing at the water's edge. In September, 1876, I saw a wounded bird of this species when pursued, dive into deep water from the shore of the Charles River and fly off under water, using its wings somewhat as a bird would use them in the air. All its plumage was covered with bubbles of air, which caught the light until the bird appeared as if studded with sparkling gems as it sped away into the depths of the dark river.

In the mating season the male struts before the female, puffing out the breast as if to display his importance and beauty.

This Sandpiper shows its characteristic motions to the best advantage when it fears that its young are in danger. It balances along the top of a wall or fence, displaying the utmost activity and alarm, rapidly uttering its cries of *peetweet*, *peetweet*, and bobbing about from one side to the other. It is more or less a land bird during the breeding season, but is fond of the shores of lakes and the banks of streams during the migrations. It flies along the rivers usually in half circuits, going out over the water and returning to the shore with short nervous strokes. Sailing sometimes with down-bent wing tips, it veers from side to side, and then alighting bobs about near the brink. Sometimes in early spring it is very quiet,

and unless alarmed exhibits few of the motions for which it is famous.

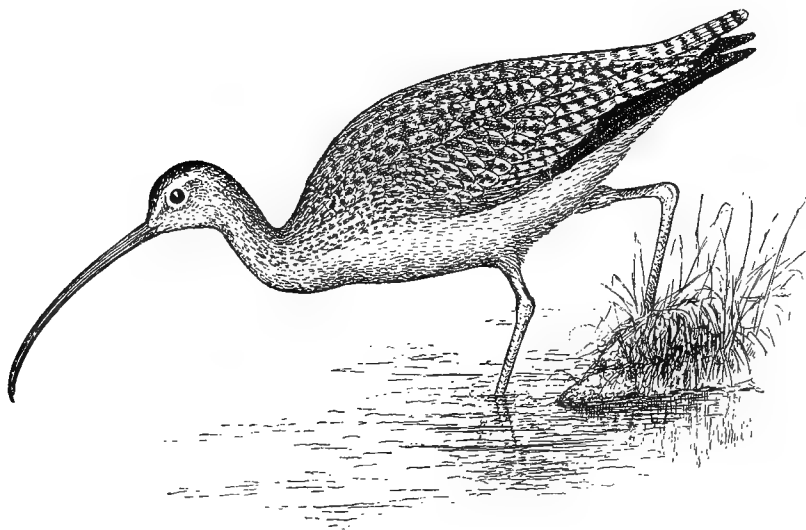
The following, regarding its habits on the sea beach, is taken from Dr. Townsend's *Birds of Essex County*: "It is particularly fond of nesting on islands. I used to find the eggs at Kettle Island off Magnolia, in the late seventies, and Mr. W. A. Jeffries notes the finding of eleven nests with eggs and one with young at Tinker's Island, off Marblehead, on June 8th, 1878. Four nests were in the short grass on high land, 'while others were all found more or less far under the rocks, scattered over the grass or along the shore.' Nuttall speaks of their nesting at Egg Rock, off Nahant, 'in the immediate vicinity of the noisy nurseries of the quailing Terns.' The young birds, while still covered with the natal down, run very fast and when hard pressed, take to the water and swim rapidly and easily. On the beach, the Spotted Sandpiper rarely strays beyond the dry sand, often in the beach grass, where he hunts for insects and occasionally perches on an old root or piece of wreck. They are particularly fond of pebbly beaches."

There seems to be good reason to believe that it migrates by sea as well as by land in the fall, as formerly it was common in Bermuda at that season. In winter it ranges south to southern Brazil, passing through Mexico and Central America as well as the Antilles. In spring it arrives usually in northern Florida earlier than it appears in southern Louisiana. This seems to indicate that the species comes north by way of the Antilles and Florida, but as it is taken in Mexico and Lower California in migration, it may reach Louisiana from the westward, or cross the Gulf of Mexico from Yucatan or Central America. Eaton states the belief that this species comes to central and western New York by the Mississippi route, as it arrives there seven to ten days earlier than on the coast.

The food of the Tip-up consists largely of insects and earthworms. The bird apparently is harmless and very beneficial, and, except along the sea-shore, where it is shot with other Sandpipers for the table, it is killed mainly for sport.

LONG-BILLED CURLEW (*Numenius americanus*).

Common or local names: Sicklebill Curlew; Sicklebill; Old-hen Curlew; Hen Curlew.



Length. — 20 to 25 inches; bill from 3 (in some young birds) to 8, but commonly 5 to 6; toes webbed at base.

Adult. — Plumage similar to that of Marbled Godwit; generally reddish in tone, varying in intensity in individuals; top of head dark, and variegated with blackish, whitish and reddish, with *no distinct central light line*, as in the Hudsonian or Jack Curlew; upper parts a mixture of brownish black, tawny or buffy and cinnamon brown; lower parts reddish, cinnamon or buffy, varying in intensity, usually deepening under wings; fore neck and breast with dusky streaks which tend to arrowheads on the sides, iris brown; bill black turning to fleshy brown toward base; legs and feet grayish blue.

Young. — Similar to adult, but bill shorter.

Field Marks. — The great size and the extremely long curved bill serve to identify the adults. The young, which have shorter bills, can be distinguished with certainty from the Jack Curlew when in the hand by the smaller size of the latter, its striped head and the comparatively rufous and unmarked wing linings and axillars of the Sicklebill. (See Fig. 17.)

Note. — A “loud scream” (Maynard).

Season. — Now a very rare or accidental migrant, formerly more common; usually August and September.

Range. — North America. Breeds from central British Columbia, southern Saskatchewan and Manitoba to northeastern California, northern New Mexico and northwestern Texas; winters from central California and southern Arizona south to Guatemala, and on Atlantic coast from South Carolina to Florida, Louisiana and Texas; formerly migrated north to Massachusetts and rarely to Newfoundland; now a straggler east of the Mississippi, north of Florida; casual in West Indies.

HISTORY.

Probably the Long-billed Curlew was common in migration, irregularly if not annually, on the coast of New England as late as the earlier part of the last century. Old gunners who have now "passed over the divide" have told me that the bird was plentiful in the days of their youth, and a few are still living who say that they have seen it common here. Mr. John R. Floyd of Rowley assures me that the bird was common in 1840 on Plum Island River in Essex County, and Mr. Charles L. Perkins of Newburyport says it was common there in his

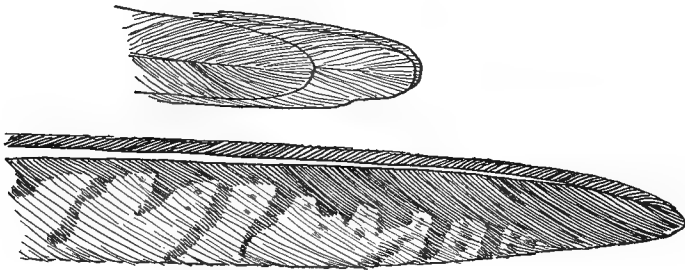


FIG. 17. — First primary and axillars of Long-billed Curlew (after Cory).

youth. Mr. Thomas C. Wilson of Ipswich has not seen one in his thirty years' experience, but the older gunners there tell him that it frequently was seen at times during the 60's and early 70's. Old gunners say that it was common on the marshes of South Sandwich about 1850. Mr. James P. Hatch of Springfield says that about forty years ago (1868) it was common on the plains from Eastham to South Wellfleet, Cape Cod, but he has seen none for thirty-five years. There is always much liability to error in these statements, as some adult specimens of the Hudsonian Curlew have a longer bill

than the young of the Sicklebill, but some of the older gunners, who had handled, watched and shot both species, were quick to learn the difference in their notes, flight and markings, and are not likely to have been often mistaken. Mr. Lewis Stone of Ipswich told me (1908) that he killed many Sicklebills "about forty years ago;" when he first went gunning he killed them often. Mr. John M. Winslow of Nantucket never has seen the species very numerous there; he states that years ago he saw about one hundred in a flock, but usually saw only a few at a time. Linsley (1843) found it at Stratford, Conn., and Colonel Pike told Mr. Dutcher that "sixty years ago" (perhaps about 1840) it was plentiful on Long Island, N. Y. The only record that I have from the interior of the State is that of one seen by Prof. F. E. L. Beal of the Biological Survey, in Leominster in 1898. I have received many reports of birds seen or killed on the coast of Massachusetts within the past forty years, but as no specimen was preserved in any case, and as the Hudsonian Curlew often is mistaken for the Sicklebill, I hesitate to record any of them.

The following notes abridged from standard authors show the former abundance of this bird and its decrease, on the Atlantic coast: One or two pairs remain in salt marshes of Cape May all summer (Wilson, 1813). Dr. Brewer tells me that he has seen large flocks at Nahant, and that they are offered for sale in the markets of Boston at close of summer (Peabody, 1839). Regular visitor at Egg Harbor and Long Island in spring and summer; in latter place seen as late as middle of November (Giraud, 1844). Not uncommon during migrations but very shy (Maynard, eastern Massachusetts, 1870). Not very abundant on coast in spring and fall on northern side of Cape Cod; most abundant in autumnal flight, when it appears in flocks of fifteen or twenty; much sought after for markets (Samuels, 1870). In New England appears to be rather uncommon (Coues, 1874). Not very common (J. A. Allen, Massachusetts, 1879). Not now a common species in New England or north of New Jersey, and noticeably less common in New Jersey, Delaware, Maryland and Virginia than in former years (Gurdon Trumbull, 1888).

At one time very abundant on Atlantic coast during migrations; becoming less common every year (Cory, 1896). Becoming more scarce every year, and ornithologists believe its extinction is only a question of time (Samuels, Massachusetts, 1897). Now a very rare or even accidental migrant (Howe and Allen, Massachusetts, 1901). A bird of the past, threatened with extinction; flocks along the Atlantic coast utterly destroyed; twenty years ago abundant in late fall on coast of Virginia and North Carolina, now practically unknown; in Florida, where great numbers wintered, now rare (Sanford, Bishop and Van Dyke, 1903). Very rare, accidental transient visitor (C. W. Townsend, Essex County, Massachusetts, 1905). A casual visitor (Knight, Maine, 1908). Now an accidental migrant (G. M. Allen, New Hampshire, Massachusetts, Rhode Island and Connecticut, 1909). A rare or accidental visitor (Eaton, eastern New York, 1910).

Not one of my Massachusetts correspondents reports an increase of this species, while thirty-eight report a decrease. Within my own recollection, less than forty years ago, the Long-billed Curlew was abundant in the Carolinas and Florida where now it has almost disappeared, and I see no reason to doubt that a somewhat similar condition once existed on our own shores. Massachusetts was a little out of the line of its great migration from its breeding grounds in the northwest to the Atlantic coast, and while probably it was never so plentiful here as in the south, its decrease there merely followed and paralleled its disappearance here.

This Curlew is the largest of all our shore birds, and had the quality of its flesh been equal to its size it would have been extinct ere now. On the western plains, where it feeds largely on insects and berries, its flesh is quite palatable. When it reaches the Atlantic coast, and begins to feed on marine food, it soon becomes fishy and more or less unpalatable. Therefore it was not sought by epicures, and did not bring so high a price pound for pound as did the Eskimo Curlew. Nevertheless, its great size rendered it a good target. It readily was attracted by decoys. It sailed steadily in toward them, presenting an imposing mark, easy to hit, and it was so solicitous

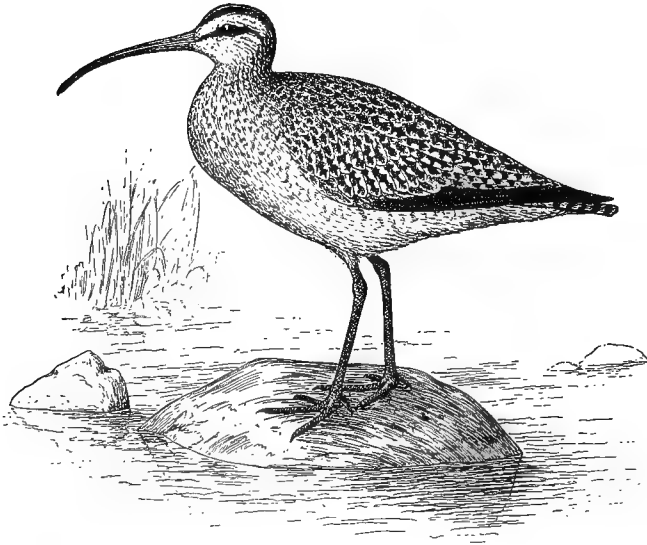
of the safety of its companions that when one or two were shot down, the rest, though greatly alarmed, returned and flapped about above their stricken comrades, diving toward them and urging them to flight, until so decimated by the gunner that only a remnant of the flock remained alive. This explains the destruction of this bird, along the Atlantic coast. There are very few gunners who, in the excitement of a scene like this, would fail to shoot so long as a bird remained within range, and it is to this lack of self-restraint on the part of the gunner, and to the settlement of its prairie breeding grounds, that we owe the destruction and approaching extinction of this great and curiously formed wader. It is decreasing fast in the interior, where it breeds, and on the Gulf coast of Texas, where it still winters. As it is not known to visit South America, the American people alone are to blame for its destruction. Its future is in our hands. Soon it will disappear from the Atlantic seaboard.

Unless we take immediate action to save this Curlew, it will be unknown to our children's children. It will be shameful if this generation permits the extermination of this great, unique, harmless and useful bird! It should be protected throughout the United States and Canada. Nothing less than this will restore it to the shores of the Atlantic, or prevent its rapidly approaching extinction. Nothing more than this can be done by legal enactment; and it is probable that this never will be done unless the protection of all migratory birds is put in the hands of the federal government, where it should have been placed long ago. Anything that can be done with voice and pen to bring about that consummation will tend to secure sufficient protection for this and many other waders which are doomed to extinction under the haphazard methods of legislation and law enforcement which now prevail in many States.

Wilson says that the long bill of this bird is used in probing into the holes of the small crabs, on which it feeds, and that it takes worms and sea snails, such as are found in marshes; also berries and insects, and that it is very fond of bramble-berries, for which it searches the fields and uplands.

HUDSONIAN CURLEW (*Numenius hudsonicus*).

Common or local names: Jack Curlew; Jack.



Length. — About 17 inches, *variable*; bill about 4, twice length of head.

Adult. — Top of head blackish, with a sharply defined central whitish stripe; line over eye whitish; line through eye blackish brown; rest of upper parts and tail brown, varied with blackish and grayish white; *inner webs of flight feathers or primaries barred with buffy*; throat and belly white; neck and breast thickly streaked with dusky; iris dark brown; bill flesh colored toward base and black toward tip; legs grayish blue.

Field Marks. — General tone of plumage more grayish and less reddish than that of the Sicklebilled Curlew; *long curved bill sometimes longer* than that of the *young Sicklebill*; a light central crown stripe, bordered by blackish stripes, distinguishes it from the other American species, but this can be seen only at close range.

Notes. — Call note *pip-pip-pip-pip*; in spring a sweet *Kur-lew* (Hoffmann).

Season. — Usually a rare migrant, but irregularly and locally common coastwise; early July to late September.

Range. — North and South America. Breeds on coast of Alaska from mouth of Yukon to Kotzebue Sound, and on coast of northern Mackenzie; winters from Lower California to southern Honduras, from Ecuador to southern Chile, and from British Guiana to mouth of Amazon; migrates mainly along Pacific and Atlantic coasts; rare in the interior; casual on Pribilof Islands and in Greenland and Bermuda; accidental in Spain.

HISTORY.

In this species, which is practically the only Curlew now left to us, we have a peculiar instance of the survival of the fittest. While probably decreasing in numbers, apparently it is holding its own in many localities, and even increasing in recent years. This increase may be more apparent than real, for as time goes on, and birds become fewer, our standards change, and the Hudsonian Curlew, which once was regarded as uncommon for a Curlew when compared at that time with the abundance of the other large shore birds, is considered now as

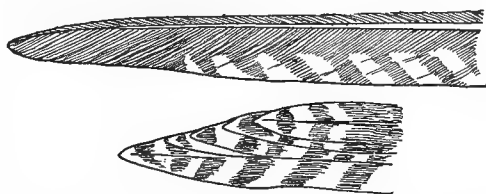


FIG. 18.—First primary and axillars of Hudsonian Curlew (after Cory). Note barring of the inner web of primary.

common locally, when contrasted with the present scarcity of the other species. It is probable that the extinction of the Eskimo Curlew has provided more nesting places and more food for the Hudsonian Curlew and that recently it has begun to increase locally, and is now occupying some of the northern breeding and feeding grounds formerly in possession of the smaller species.

The following quotations, abridged from standard authors, seem more or less contradictory, and show that there is some question regarding the status of the species: Arrives in large flocks on the coast of New Jersey early in May; few seen in June; some in July (Wilson, 1813). On island in Piscataqua, near Plymouth, N. H., dense flock, covering several acres (Nuttall, 1834). Plentiful spring and autumn (Turnbull, eastern Pennsylvania and New Jersey, 1869). Rare in New England (Samuels, 1870). Rare in the migrations (Maynard, eastern Massachusetts, 1870). Appears much less abundant in United States than either of the others; according to all observers, rare in New England (Coues, 1874). Rare migrant spring and fall (J. A. Allen, Massachusetts, 1879). Abundant every year in Massachusetts in fall; barren birds found on

Atlantic coast from May to August (Brewer, 1884). While on my way through these marshes (between Cobbs Island and the mainland in the spring of 1885), frightening into the air clouds of these big birds, more in a minute than I had seen before in my whole life, it impressed me oddly to hear my boatman complaining over yearly decrease (Trumbull, 1888). Cannot be considered a common bird; more frequent than the Long-bill (Stearns, New England, 1887). Becoming fewer in number every year (Samuels, 1897). Uncommon migrant on coast (Hoffmann, New York and New England, 1904). Rare spring and uncommon fall migrant (G. M. Allen, Massachusetts, 1909).

Mackay (1892), who has published the best account ever written of the habits of this species, states in *The Auk* that reliable accounts show that in the summer of 1833 some fifteen hundred of these birds passed the season on the islands of Nantucket and Tuckernuck, while for the seventeen years previous to 1892 he never saw more than one hundred on the average annually, and in the later years even this number had decreased.

Twenty-two of my correspondents in Massachusetts have seen a decrease of this species within their experience, and seven find it increasing in their localities. Its increase seems to be greatest on Cape Cod. The main reason for its preservation is plain. Though formerly a tame and unsuspecting bird, it has developed a remarkable faculty of taking care of itself, and there is no shore bird to-day more difficult to take and of which fewer are killed according to its numbers. Young birds of the first year sometimes may be approached readily, but the adult birds are so shy that few gunners find that it pays to hunt them. They are indifferent food at best, and for this reason there is little market demand.

This species migrates the entire length of both continents, from the Arctic Ocean to the Straits of Magellan; it is common in Patagonia. It frequents mainly the wilder places, little inhabited by man, breeds in the far north and so perpetuates its race.

This species breeds, as did the Eskimo Curlew, on the

Barren Grounds and the treeless lands about the Arctic Sea. In migration the birds often fly in flock formations, similar to those of Geese and Ducks. Apparently they cross the country west of Hudson Bay, flying from the shores of the Arctic Sea direct to New England. Some are said to pass through southern Labrador, but they are almost unknown on the barren east coast. Probably the birds from the most easterly breeding grounds are those which reach New England and from here pass on down the Atlantic coast, where they join and follow the main flight, which does not come here but reaches the coast farther south. The adult birds come to Massachusetts from the north in July and the young first appear toward the last of August. There is a large migration south through the Mississippi valley region and another on the Pacific coast. The "Jack" is seen now on the coast in increasing numbers in spring. The cessation of spring shooting in many States and provinces probably accounts in a measure for this.

In Massachusetts, according to Mackay, these birds feed largely on fiddler crabs, grasshoppers, large gray sand spiders (*Lycosa*), June beetles (*Lachnosterna*), other beetles (*Scarabæidæ*) and huckleberries, which they pick from the bushes. When flying to or from their feeding grounds they usually pass about thirty yards high, except on windy days, when they fly close to the ground or water. They feed mainly either in the fields or pastures, where they find insects and berries, or among the beach grass, where they find the fiddler crabs and spiders. They also frequent marshes and mud flats and feed to some extent on worms.¹ When feeding they usually scatter about over the ground, moving slowly and sedately, except when in pursuit of some particularly lively prey. Berries they pick from the bushes with their bills, and presumably they probe the holes or hiding places of the fiddlers with their long mandibles.

¹ Mackay, George H.: Auk, 1892, pp. 347, 348.

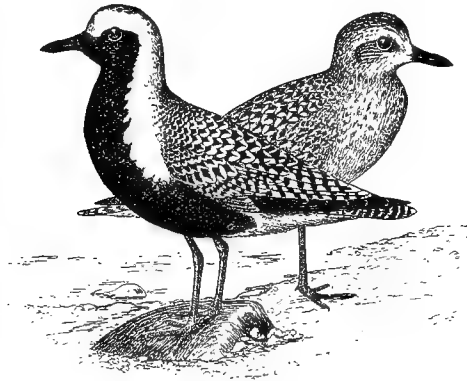
PLOVERS.

The Plovers, family *Charadriidæ*, form a large family of shore birds, many of the members of which, however, are not by any means confined to the shore. The bill usually is short, never longer than the head, and resembles that of a Pigeon. The body is plump and well rounded, neither depressed as in the Phalaropes nor compressed as in the Rails. The legs are medium in length and the feet partially webbed. The hind toe is wanting usually, but not always. Some species are crested but those of North America are not. The members of this family run and fly very rapidly, and the voice is usually a mellow whistle. The sexes generally are similar in form and color, but there are great changes with age and season in many species. Often the young are so dissimilar in color to the adult birds that they commonly are regarded as different species.

Five species of plover once were abundant here, — two breeding commonly, one on the coast and the other mainly in the interior. It is a sad commentary on the destructive tendencies of the American people that only two are common here now, and those only in migration, and that already we have come very near exterminating the breeding species, which, however, are now protected by law at all times in Massachusetts. These beautiful dove-like birds are so attractive and interesting that they should be protected throughout the summer months and allowed to roam unmolested on beach, marsh, meadow and upland. Such protection would save those which normally breed here and would give the people a chance to become acquainted with the migrating species which would swarm here in the summer months if the State could be made a safe place for them to rest in. Birds like the Plovers, which commonly lay no more than four eggs in a season and rear but one brood, cannot stand excessive shooting during a long open season. They have had practically no protection until recent years. If the Plover season were reduced to one month (September) all over the United States, these birds might have some chance to recover their former numbers. If they could be protected and increased they would be valuable to agriculture.

BLACK-BELLIED PLOVER (*Squatarola squatarola*).

Common or local names: Blackbreasted Plover; Blackbreast; Beetle-head; Bull-head
Chuckle-head; Bottle-head; Gump.



ADULT (SPRING).

YOUNG (FALL.)

Length. — About 11 inches; bill 1.10; usually has a small hind toe.

Adult in Spring. — Above varied with blackish and ashy white; hind head and back black, spotted and marked with white; tail white, barred with brownish black; wings showing a band of white in flight; sides of head, fore neck, throat, breast and upper belly black, bordered broadly by white on each side, from forehead to lower breast; axillary feathers (showing under the raised wings) black; legs and feet dusky lead color; adult spring female smaller, duller and with less pure black.

Adult in Late Summer and Fall. — Upper parts dark brown, profusely speckled with white; under parts white, with an occasional black feather; tail and wings as in spring; black breast sometimes retained until fall.

Young. — Upper parts lighter and with a golden shade on each feather; under parts whitish; breast streaked with gray.

Field Marks. — Whitish tail and upper tail coverts, and *white band in the wing plainly seen* when bird is in flight; *black axillaries seen on sides of body under raised wing*, which is white beneath, in strong contrast to axillaries.

Distinguishing Marks. — When in hand the small hind toe (other Plovers have none) and basal web between outer and middle toes.

Notes. — Not unlike the *toor-a-wee* of the Bluebird, but lower in pitch, more prolonged and mournful (Hoffmann).

Range. — Nearly cosmopolitan. Breeds on Arctic coast of North America, from Point Barrow to Boothia and Melville peninsulas, and also on Arctic coast of Russia and Siberia; winters from the Mediterranean to South Africa, in India and Australia, and from California, Louisiana and North Carolina to Brazil and Peru; in migration occurs throughout the United States, in Greenland and Bermuda; accidental in Hawaii.

HISTORY.

This cosmopolitan species is a large bird, of fine, imposing and almost distinguished appearance in its black and white nuptial dress. The shape of its head and beak seems to indicate force of character, and its large, dark, beautiful eyes are full of intelligence. Its wild, plaintive call is one of the sweetest notes heard on our storm-beaten coast.

The plumage of the adult is so different from that of the young that it is not to be wondered at that gunners often regard the Beetle-head as another species than the Black-breast; but the former is the young of the latter.

Nelson (1877) believed that the birds which remained in Illinois during the summer bred there¹ but of this there is no direct evidence. This is one of the species which, according to Audubon, once passed the summer here, and bred in New England and as far south as Pennsylvania, but it is believed that he was mistaken in this, as the eggs he describes resemble those of the Upland Plover. Nuttall (1834) says that the Black-breast rears but one brood in Massachusetts, where it rarely breeds; but the bird does not breed here now, and probably never did, although formerly it was seen here all summer, and a few have been reported within recent years. Howe and Allen give dates of June 18 and July 8. Dr. C. W. Townsend found a pair on Ipswich Beach on June 25, 1903. This bird still possibly summers as far south as Florida, where Scott and Worthington reported it on June 14, July 4 and July 26, and it summers in South Carolina, where it is a permanent resident.² A few remain there all summer, but do not breed (Wayne). The June birds seen there are in winter or immature plumage.

The American breeding grounds of this species are little known, but it is believed to breed mainly on the coast and islands of the Arctic Ocean, from Hudson Bay to Alaska and on the Barren Grounds. It migrates apparently over practically the same route in both spring and fall, and is found in migration

¹ Nelson, E. W.: Bull. Essex Inst., 1876, Vol. 8, p. 122.

² Wayne, Arthur T.: Birds of South Carolina, 1910, p. 58.

not only on the Atlantic and Pacific coasts, but in the interior from Ohio at least to the Dakotas and Texas. The southward movement begins early in July. Dr. Townsend records an arrival in Essex County, Mass., on July 15. The adult birds come first and sometimes reach Massachusetts the latter half of the month; but their greatest wave of migration reaches here and passes Cape Cod in August. The young begin to arrive about September 1, accompanied by some adults. September is the month of greatest plenty, and the birds often continue to come in numbers well into October. The records of the Chatham Beach Hotel show this plainly. Three were killed on Monomoy in December, 1872, supposedly wintering. The latest migration dates recorded are Essex County, November 10; Cape Cod, November 14.

This Plover was once very abundant here in migration. Nuttall (1834) says that flocks of more than one thousand gathered by the middle of September on the Chelsea (now Revere) marshes, near Boston. The following condensed notes record their decrease: Appears the last of September; collects in great flocks (Peabody, 1839). Early in autumn very abundant at Montauk (Giraud, Long Island, N. Y., 1844). Generally abundant during migrations; sometimes not even common (Maynard, eastern Massachusetts, 1870). More or less common in spring and fall (J. A. Allen, 1879). The constant gunning of the past few years has decreased their numbers in this location (Monomoy) and on Long Island (Sanford, Bishop and Van Dyke, 1903). Still common, but few remain in comparison with the hosts of former days (C. W. Townsend, Essex County, Mass., 1905). Sixty-eight of my Massachusetts correspondents find this bird decreasing; twelve find it increasing.

As the birds of this species which go down the Atlantic coast in the fall apparently retrace the same route in the spring, the abolition of spring shooting in a few of the Atlantic coast States has stayed the depletion of their numbers somewhat, and they have held their own in Massachusetts better than has the Golden Plover, which on its return north through the Mississippi valley region in spring has been subject to tremendous slaughter. If spring shooting were prohibited in all

the Atlantic States the species undoubtedly would increase. Indeed, it is believed that even now the birds are coming to parts of Cape Cod in the spring in much larger numbers than before the spring shooting of shore birds was prohibited.

In May, 1909, I learned from Mr. J. A. Farley that a great flight of Blackbreasts was passing Sandy Neck, Barnstable, and through the kindness of Mr. Vaughan D. Bacon I am able to present some notes on this flight: "May 14, lots of Plover, even way up in cranberry bogs. May 20, M. G. reported three thousand Yellow-legs and Plover. May 22, marshes full of birds. May 23, northeast storm; plenty of birds. May 24, M. H. reported flats covered with Plover and Yellow-legs at low tide. May 27, harbor and marshes full of birds; saw three thousand Blackbreasts rise in one flock from Phyllis Island. May 29, at Sandy Neck, bunches of Plover flying all day; fifteen to twenty in a bunch. May 30, Plover still flying in bunches, like Coot. May 31, plenty Blackbreasts all along shore; flats covered at low tide. June 1, Blackbreasts fewer but still plenty. June 2, wind southwest; only a few Blackbreasts. June 3, Blackbreasts fewer. Last birds seen on the 8th."

Such flights as these seem like the days of old, and go to prove that more and more birds are finding refuge in Massachusetts in spring. I am told that this Plover comes to Connecticut in larger numbers and stays longer since spring shooting has been prohibited.

The experienced adult birds are very wary, and where they are not molested in spring they are likely to return year after year. During the fall these old and "educated" birds will not stop often or stay long where they are much hunted. The fall flights seen here consist very largely of the young or immature birds, called Beetle-heads, Chuckle-heads, etc., by gunners.

In New England this bird is found mainly along the coast, and is seen usually in greatest numbers on Cape Cod, where it feeds along beaches, sand bars, salt marshes and flats left bare by the tide. It often seeks its food in the foam. Sometimes it goes to the uplands, particularly when the tide is in, feeding

on berries and grasshoppers, like the Golden Plover. Formerly it fed more on the hill pastures along these shores and the islands near them, but continual shooting in spring and fall drove it from some of these feeding grounds, to which it never has returned.

Favorite resorts of these birds on Cape Cod during the days of their greatest plenty were the flats and marshes of the harbor of Barnstable, along Sandy Neck, the Dennis marshes, the flats near Chatham, and marshes near Hyannis and Wellfleet. Nantucket, Tuckernuck and Martha's Vineyard also were favorite feeding grounds. The earliest date I find given for this Plover in spring in Massachusetts is April 18 (Mackay), but they do not usually come in numbers much before the 15th of May. Their numbers commonly decrease about June 1, and by June 5 to June 8 they practically have disappeared, as few ever remain for the summer.

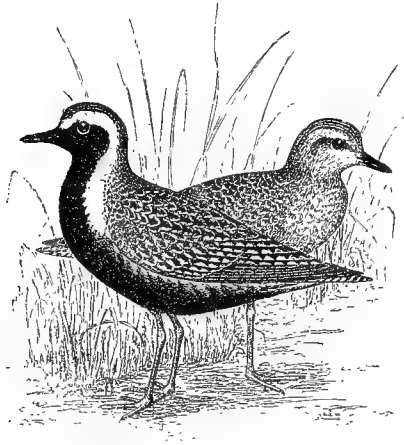
A careful review of all the available records of the flight of this species in the different States of the Union leads to the following conclusions: (1) The records show conclusively that the species has decreased very much over the continent during the last seventy-five years, except, perhaps, on the Pacific coast, where there are few early records. (2) It never collected in such large flights as did the Golden Plover. (3) It now appears to be more numerous on the Atlantic coast, particularly on Cape Cod, than in the interior.

In the west the Blackbreast is partial to ploughed fields, where it feeds on earthworms, grubs, cutworms and beetles. Prof. Samuel Aughey had two of these birds sent him from Sarpy County, Neb., and found their stomachs crammed with the destructive Rocky mountain locust and very few other insects. Mackay in his excellent paper on this bird says that in the Massachusetts marshes it feeds on the larvæ of a cutworm, and that it eats the large, whitish, maritime grasshopper (*Edipoda maritima*), also marine insects and very small shellfish, which constitute a very large part of their food during their flight along the coast of Massachusetts.¹

¹ Mackay, George H.: Auk, 1892, p. 146.

GOLDEN PLOVER (*Charadrius dominicus dominicus*).

Common or local names: Green Plover; Green-head; Green-back; Toad-head; Field Bird; Pasture Bird; Brass-back; Pale-breast; Pale-belly; Muddy-breast; Frost Bird; Three Toes.



ADULT (SPRING).

YOUNG (FALL).

Length. — About 10.50 inches.

Adult in Breeding Plumage. — (Almost never seen in Massachusetts.) Generally black above, spangled with bright yellow and white; tail dark grayish brown, barred with white, tinged with yellow; linings of wings ashy; a wide white stripe from forehead passes over eyes down side of head and neck, broadening on the side of breast; black below from chin to tail.

Adult in Late Summer and Fall. — As seen here, upper parts as in spring, but duller, little white, and the yellow is golden or greenish; below white, mottled with grayish brown; linings of the wings grayish ash, as in spring.

Young. — Dusky above, mottled with dull whitish spots, becoming yellow on the rump; below ashy, especially on lower neck and breast; generally greener in tone than the adult.

Field Marks. — Young birds may be distinguished from the young of the Black-bellied Plover (Beetle-head) by the absence of the whitish tail, rump or upper tail coverts and the absence of the white in the outspread wings. This species bobs its head frequently, the Black-bellied Plover rarely.

Notes. — A plaintive *too-lee-e*; song, a marvellously harmonious succession of notes (heard only on their breeding grounds) (Nelson). A bright whistle, *queep-quee-lee-leep*; a note like the syllable *queedle*; a *chuckle* (Townsend). A *coodle* (Mackay).

Season. — A rather rare or local fall migrant coastwise, formerly abundant; August to mid October.

Range. — North and South America. Breeds from Kotzebue Sound along Arctic coast to mouth of the Mackenzie, and from Melville Island, Wellington Channel and Melville Peninsula south to northwestern Hudson Bay; winters on pampas of Brazil and Argentina; migrates south across Atlantic from Nova Scotia and New Brunswick; a few pass south through Mississippi valley, and all migrate north by this route; in migration to California, Greenland and Bermuda.

HISTORY.

Of all the species of wading birds which formerly, in migration, swept in flocks from the arctic seas down the two American continents, the Golden Plover seems to have been the most numerous. The Eskimo Curlew made a great show in Labrador, where a large part of its numbers concentrated in August, but the fall flight of the Golden Plover swept over a great part of the continent as well. From their breeding grounds on the arctic coasts and islands, extending from Bering Sea to Hudson Bay and far toward the pole, they moved southeasterly, probably crossing the continent diagonally, and reached the Atlantic not only in Labrador but at many points. Thence by sea or along shore they followed down the coasts of North and South America to the plains of Argentina. Some also went down the Mississippi valley to the Gulf.

Professor Cooke says that they are apparently unrecorded at all seasons from Ecuador, Colombia, Panama, Nicaragua and Honduras, although a few have been noted in Costa Rica, Guatemala and eastern Mexico. He advances what is probably a true explanation of this line of flight. Birds follow the shortest route that furnishes an abundant food supply. The Plover, a bird of treeless regions, summers on the northern tundras and winters on the pampas. It cannot return in spring by the sea route as the food supply in Labrador is not ready; therefore it goes north through the interior, migrating through the treeless regions of the Mississippi valley and the Saskatchewan, where insects and seeds are plentiful. It might be added that as the Atlantic seaboard was mainly forested

before its settlement, it possibly did not originally furnish sufficient food in the fall migration for the great body of the Plover, and so, therefore, many of them took the shortest route to South America, which was by sea.

In the spring they probably leave the pampas, and passing in one flight over the forested regions of interior South America, cross the Gulf of Mexico and land on the plains of Louisiana and Texas. When they land they are no longer fat. They then move slowly northward over the prairies of the Mississippi valley region. Very few stragglers are recorded authentically at that season anywhere on the Atlantic coast. Before the settlement of the west the Plover practically were unmolested there by man, and they landed in such enormous flocks on the prairies of Louisiana and Texas in the spring that in those days of muzzle-loading guns the gunners killed great numbers. Audubon states that on the 16th of March, 1821, he was invited by some French gunners to accompany them to the neighborhood of Lake St. John, near New Orleans, to observe the flight of thousands of these birds. These gunners, who were familiar with the route that the Plover would take, gathered in parties of from twenty to fifty, and, sitting on the ground equi-distant from each other, imitated the whistle of the birds so accurately that the Plover came within a few yards, and were slaughtered unmercifully. Several times he saw a flock of a hundred or more reduced to a few individuals. This was continued all day, and at night the gunners were as intent to kill as in the morning, when they arrived. Dogs were used to bring the birds to their masters after a considerable number had been killed. One man killed sixty-three dozen, and Audubon having reckoned the number of gunners in the field at two hundred, estimating each to have shot twenty dozen birds, concluded that forty-eight thousand Golden Plover fell there that day.¹

Somewhat similar scenes were enacted in the fall on the prairies of Illinois, when apparently the birds were moving southeasterly toward the coast. The following notes exhibit a part of this bird's history: Green Plover are here very com-

¹ Audubon J. J.: Ornithological Biography, Vol. III, p. 624.

mon (Lawson, Carolina, 1709). Caught in great numbers in nets at daybreak (Nuttall, Massachusetts, 1834). Quite abundant (Giraud, 1844). Appears in large flocks on the open plains of Long Island in fall, searching for grasshoppers and other insect food (De Kay, New York, 1844). Common on our coast both spring and autumn; great numbers taken in nets (Peabody, Massachusetts, 1839). Pass throughout New England; in 1865 immense flocks seen a few miles at sea flying south in fall; few alighted ashore (Samuels, 1870). Common spring and autumn migrant (J. A. Allen, 1879). Shot numbers of these birds in marshes of Back Bay, Boston, where the Public Library now stands (Samuels, 1897). Not unusual in northern Illinois in 1890 for one gun to kill from one hundred to one hundred and fifty Golden Plover a day by walking up to birds; decoy often two or three times to the decoys and whistle, until sometimes the greater part lie dead upon the grass; wing-tipped birds are tied out among the flock by market hunters; dead birds also put out on sticks; in northern Illinois two hundred a day, one thousand a week, may be killed over decoys; Isaac McLellan, veteran sportsman, says that in years past they were found in countless numbers over the grassy slopes of Montauk Point (Long Island, N. Y.), and the hillsides of Gardiner's Island, but in later years, for some unknown cause, they have forsaken their old haunts, and flown to fresh fields and pastures new (Leffingwell, 1890). Excellent sport with these birds when Snipe shooting on western prairies in spring; once so abundant as to seem to need no legislation; seen no more in some places where very abundant a few years ago; in Illinois and Indiana their number was remarkable (Huntington, 1903). In late September, young used to frequent Back Bay marshes, Boston, which I considered splendid Plover ground; now a thing of the past (Herbert K. Job, 1905). In 1886 could go within eight miles of Chicago (April) and see thousands; now seen chiefly in small flocks (Parker, 1890). At one time abundant in New England in early fall; decreased greatly in past few years (Cory, 1896). Becoming steadily rarer (Hoffmann, 1904).

Before the settlement of the west, and up to and beyond

the middle of the nineteenth century, great flights of Golden Plover sometimes passed over New England in the fall migration. Severe easterly storms checked their flights or drove them inland from the sea, and they occasionally settled and fed in our fields. They were exceedingly abundant at times along the Connecticut River valley and on the hills of Worcester County, Mass.

Such flights as these may have come direct from the northwest, but the greatest flights which landed here were those of the main body of birds which came down the coast from the arctic regions, or crossed Labrador and took flight thence, by the sea route direct for South America. A great part of the species came down the Atlantic from Labrador, Newfoundland or Nova Scotia, and sometimes, leaving the land in fair weather, they met a circular cyclonic storm at sea coming up the coast, and were buffeted, driven back and carried over toward the coast by that westerly motion of its border known as a northeaster or a southeaster, according to its direction, which, blowing with irresistible force, landed them on the shores of New England. A tempest with thunder, lightning and a heavy downpour of rain often had the same effect. Under such conditions they were driven to our coasts in immense numbers, and tales are told still, among the natives of Cape Cod, of the enormous flights of Plover which their fathers and grandfathers saw. Some of these flocks are remembered still by living witnesses. Mr. John M. Winslow of Nantucket tells me that Mr. Peter Folger, one of his former shooting companions, awaking one morning in the 40's found a great storm raging, and it seemed to him as he looked out from his window that it was "raining Plover." He and Deacon David N. Edwards loaded up with ammunition, dividing a bag of shot between them. Three times during that forenoon they were obliged to go down to the pond and wash out their guns. They shot until 3 p.m., and killed Plover enough to fill a tip cart two-thirds full. The captain of a cod-fishing vessel then in the harbor, bound for New York, agreed to take the birds to New York for them, and to give them half of what he received. He returned them twenty-five dollars. Mr. Edwards said

that he never knew before that the people of New York would eat Plover. Mr. M. M. Boutwell records a great flight of the Golden Plover which came to Clark's Hill, Lunenburg, Mass., near Fitchburg, in 1851. This is a large, high hill, and the birds came there in the fall after a hard easterly storm. They stayed about the hill feeding for a few days, and Mr. Boutwell and a hunting companion, George Smith, shot many of them at two different trips. Firing into the flocks did not seem to disturb them much, for they would simply rise in the air, make a wide circle and alight again only a few rods from their starting place. Mr. Boutwell says that there were so many that he could not even attempt to estimate their numbers. Mr. Lewis Stone of Ipswich says that about the last of August 1852, a tremendous flight of Golden Plover landed on the coast. They came over the hills in such numbers and so fast and low that any one who went there seemed in danger of being struck by birds in full flight. A three days' rainstorm was blowing. On the first day the wind was northeast, the second day east and the third day southeast. The next day was Sunday, and on Monday the Boston market was so overstocked with birds that the marketmen would give only five cents apiece for them, and a Mr. Newell of Ipswich, a market hunter, gave up gunning for a time, because there was no sale for birds. Mr. Henry Shaw tells me that "soon after 1860," a great flight of these birds swarmed over the fields and hills south of Worcester. On the first day he and one other hunter alone found them, but on the second day nearly every man and boy who heard of it and could secure a gun was out shooting. This probably was a part of the great flight of 1863. Mr. Winslow of Nantucket well remembers this flight (August 29, 1863), when Golden Plover and Eskimo Curlews landed on the island in such numbers as to "almost darken the sun." Between seven and eight thousand of these birds were killed on the island and on Tuckernuck. All the powder and shot on Nantucket were expended, and the gunners had to send to the mainland for more. After that the wind changed to the southwest, and there was good shooting for two weeks. September 5, 1863, an immense flight landed on Cape Cod and

along the shores of Massachusetts. No such great flight has occurred on that coast since that time. Considerable flights have landed, notably in 1867, 1870, 1873, 1881, 1882, 1883 and 1886, but their numbers diminished until by 1904 they had almost disappeared. A potent reason for this condition, as given by Mackay, was the continual persecution the poor birds suffered whenever and wherever they landed on our coasts. Having undergone such experience they afterwards passed over or by, keeping out to sea, landing only when absolutely forced to do so, and leaving again the moment clearing weather appeared. The persecution which they suffered at all times all along the Atlantic coast, from Labrador to the Carolinas, must have had some effect by this time in reducing their numbers, but the most destructive force was spring shooting in the Mississippi valley region, which developed and increased with the settlement of the country. As the west became settled and the railroads made the great markets accessible, they were flooded during the spring, from New Orleans to Chicago and St. Louis, with thousands of Golden Plover. From 1860 to 1880 the species gradually diminished all over the United States. The decrease of the Passenger Pigeon in the markets about 1880 caused an excessive demand in spring for game to take its place, and as the demand was partially met with the Eskimo Curlew, so it was also in part met by the Golden Plover, which continued to decrease throughout its range. It was marketed in large numbers in the east whenever the western market was glutted, until about 1890 or 1891. In 1890 alone two Boston firms received from Nebraska, Missouri and Texas *forty barrels* closely packed with Eskimo Curlew, Golden Plover and Upland Plover (see page 427).

The Golden Plover almost disappeared from New England, falling off about ninety per cent. in fifteen years. It also grew rapidly less in the west, but was saved from the fate of the Eskimo Curlew by the passage of laws in many western States prohibiting spring Plover shooting, and forbidding the sale of game or its shipment out of the State.

Since these laws have gone into effect we have seen a slight increase in the numbers of this bird on the Atlantic coast, and

for at least four years, greater numbers have been seen or killed than for some previous years. Nevertheless, the Golden Plover is still in danger of extinction. Only four of my Massachusetts correspondents (1908) report an increase of this species in the State, while fifty-four report a marked decrease.

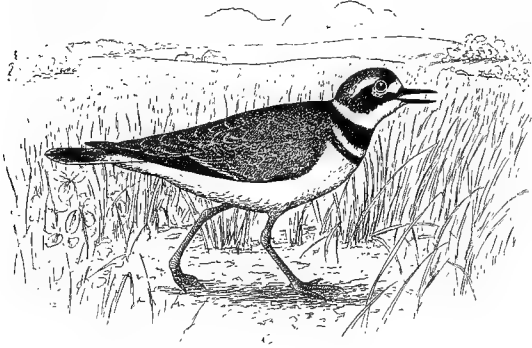
The food of the Golden Plover consists largely of insects, *Orthoptera* being well represented. They are fond of grasshoppers and locusts, but Mackay says that on Nantucket he has never seen them eat any, and that the stomachs that he has examined have been filled with crickets, (which seem their principal food), grass seeds, and a little vegetable matter like seaweed. In Labrador they feed on the crowberry (*Empetrum nigrum*). Formerly their vast flocks, visiting the ploughed lands of Ontario in the fall, gleaned great numbers of insects from the fields. All over their migration range in the west they did great service in ridding the fields and prairies of wireworms, cutworms and other destructive insects exposed by the plough. On the prairies of Manitoba they followed the prairie fires, picking up the half-burned insects and those that had escaped the flames among the grass roots.¹ This being the character of their food, they are found principally where it is plentiful, on ploughed lands, marshes, old fields, prairies and pastures, particularly where the grass is short, as they seem rather to dislike tall grass. The marshes and the common pasture about Newburyport, the hill pastures and shores of Ipswich, the sandy hills and fields of Cape Cod, and the pastures of Tuckernuck, Nantucket and Martha's Vineyard were favorite feeding grounds of this bird.

Every farmer knows, or should know, that the grasshoppers, locusts, crickets, white grubs, cutworms and wire worms which the Plover eat are reckoned among the most destructive of all pests in the hayfield, grain field or garden, and it must be evident to all thoughtful people that the immense flocks of Golden Plover which formerly swept north and south over the fertile plains of this country would have done great service to agriculture had they been protected during their flights up and down the continent.

¹ Nash, Charles W.: Birds of Ontario, 1909, p. 24 (Bull. 173, Ontario Dept. of Agr.).

KILLDEER (*Oxyechus vociferus*).

Common or local names: Killdeer Plover; Killdee.



Length. — 9 to 10.50 inches; bill .80.

Adult. — Top of head and entire back brown; chin, throat and ring entirely around neck white; forehead and sides of head black and white before eye, passing to brown and buffy behind it; lower parts white; a black collar, widening in front, and a narrow black band across breast a little below it; wings show contrast of dark and white when spread; rump and base of tail vary from orange brown to light chestnut or cinnamon; tail variegated with cinnamon or chestnut brown, black and white and their gradations; bill, iris, legs and feet blackish.

Young. — Similar, but the black bands replaced by gray; feathers of upper parts marked with rusty brown.

Field Marks. — One of the larger Plovers, with a white ring on neck and two black bands on breast. When facing the observer it shows *four black bands*, two on head and two on breast. Wings long and narrow; cinnamon rump and white of wings show plainly in flight.

Notes. — A high-pitched, noisy *kildee, kildee, kildee* and similar notes, in a complaining tone.

Nest. — In grass or among pebbles, usually near water, sometimes in fields.

Eggs. — Usually four, about 1.50 by 1.10, varying from drab to cream, and marked with blackish or dark brown in endless variations.

Season. — A rare migrant and very rare local summer resident; formerly more common; about March 1 to mid November.

Range. — North and South America. Breeds from central British Columbia, southern Mackenzie, central Keewatin and central Quebec south to Gulf coast and central Mexico; winters from California, Arizona, Texas, Indiana, New Jersey and Bermuda south to Venezuela and Peru; casual in Newfoundland, Paraguay and Chile; accidental in Great Britain.

HISTORY.

Undoubtedly the Killdeer once bred commonly in suitable localities throughout southern New England. Old people in Berkshire, Hampden, Worcester, Middlesex and Barnstable counties spoke of this bird years ago as nesting commonly there in their youth, and it has bred not uncommonly in Barnstable, Hampden and Dukes counties within the memory of men now living. Dr. Townsend says that undoubtedly it once bred in Essex County, and Brewster speaks of a nest found long ago in what is now Back Bay Fens in Boston.

The following abridged notes, showing the former abundance and later decrease of this bird, are interesting: Known to almost every resident of the United States, being a common and pretty constant resident (Wilson, 1813). Breeds in middle and western States and farther north (Audubon, 1835). A common bird; there is hardly any time when it is worth the trouble of shooting (Peabody, Massachusetts, 1839). To most persons residing in the country this species of Plover is familiarly known as the Killdeer (Giraud, Long Island, N. Y., 1844). A rare summer resident; said to have been locally common (Maynard, eastern Massachusetts, 1870). Pretty generally distributed through New England as a summer resident (Samuels, 1870). A not common summer resident (J. A. Allen, 1879). Throughout New England general distribution, nowhere common (Brewer, 1884). At one time not uncommon in New England, but of late years quite rare (Chamberlain, 1891). A rare summer resident in southeastern Massachusetts (Hoffmann, 1904). I have received no report of any increase in this species in Massachusetts, while fifty-one of my Massachusetts correspondents report a decrease.

In November, 1888, after a southern hurricane, great numbers of these birds appeared on the New England coast. Probably they were carried to sea on the edge of the cyclone, and brought ashore here by an easterly wind, having been swept around the circumference of the storm. They were seen in numbers all over Nantucket, as well as on the mainland near the coast. Many of them remained until they were

shot by gunners, and the next season the species was as rare as before.

Notwithstanding the facts that the flesh of the Killdeer is of little value as food, and that it is one of the most useful insectivorous birds of the garden and field, it has been almost exterminated in Massachusetts by shooting in spring, while it was preparing to nest, and in summer before the young were able to fly. Quite a colony of Killdeers was in existence near Springfield until after the beginning of this century; but it was exterminated by shooting in July and August. Massachusetts has presented to the world the singular spectacle of legalizing the extermination of a beautiful and useful species of practically no food value. It was lawful to shoot this bird in spring until recent years and in summer until 1909, when it had become nearly extinct in the State. Then the passage of a law protecting it at all times was secured. This, together with a statute for the protection of wild-fowl in spring, which was passed the same year, may save the bird from extirpation in the Commonwealth. Within the past two years a few instances of its breeding in Hampden, Middlesex and Bristol counties have been reported. This year (1910) a pair of Killdeers built a nest almost under the walls of a gunning stand and reared a brood unmolested. This species still breeds in some numbers in New York and New Jersey, and even in Connecticut and Rhode Island, where it has been better protected by the farmers than in Massachusetts. This Commonwealth is well within its range, for it breeds north to Quebec, and there is hope that if it is protected at all times by law in Massachusetts for a long term of years it may become common again on our farms and gardens.

The Killdeer is one of the most beautiful and attractive of the Plovers, and, contrary to the general rule among shore birds, it is more numerous in the interior than along shore. As soon as the ice breaks up in the rivers and lakes the Killdeer's cry is heard — the harbinger of spring. It makes its home on low-lying farms. It frequents meadows and cultivated lands, where it feeds on destructive insects and worms. In some localities it is recognized among the farmers, as one of

their best and most constant friends in garden and field, and if fully protected and left unmolested in its occupancy of the fields it becomes as common a feature of the country home as is the Lapwing in England. So far as its food habits are now known it seems to be utterly harmless and very beneficial — a beautiful and desirable bird to protect and cultivate.

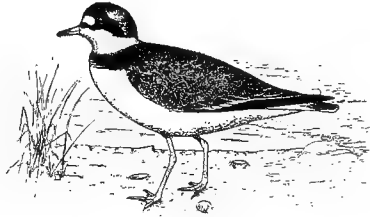
In the middle States and in the south it often builds its nest in tilled fields, and follows the instruments of cultivation, gleaned worms and insects from the furrow, like the Robin or the Blackbird. When disturbed or alarmed its wild cry, *killdee dee dee deer*, rings on the air as it flies rapidly away or circles about, exhibiting in turn the bright contrasting markings of its breast and the lovely and striking hues of its back, wings and tail. Its large, intelligent, carmine eyes seem to fit it for nocturnal activity. In the fields of the south I frequently have started it from its feeding grounds at night, and listened to its weird and plaintive cry as it swept and circled about in the moonlight. Like other species of Plover it often stands quite still in the field, with head drawn in, uttering a plaintive cry when approached. The hunter is not fond of it, for its cries alarm other game.

Prof. Samuel Aughey examined the stomach contents of nine of these birds taken from May to September in Nebraska, and found 258 locusts and 190 other insects. Only one had taken grain, and of that only a few waste kernels. Nash states that its food consists of earthworms and insects, of which small beetles form the greater part, and that a brood of these birds and their parents will relieve a farm of an enormous number of insects daily. He has known stomachs of this species to be completely filled with weevils taken from orchards.¹ Eaton found it feeding on grasshoppers, beetles, caterpillars and a few water insects. Throughout the country, wherever the Killdeer is found, it is very destructive to weevils, some species of which cost the farmers of the United States millions of dollars annually. The Killdeer takes weevils from ploughed fields as well as from orchards, and it is one of the enemies of the Mexican cotton boll weevil.

¹ Nash, C. W.: The Birds of Ontario, 1909 p. 25 (Bull. 173, Ontario Dept. of Agr.).

SEMIPALMATED PLOVER (*Ægialitis semipalmata*).

Common or local names: Ring-neck; Little Ring-neck.



Length. — 6.76 inches; bill .50; feet partly webbed.

Adult. — Forehead white, bordered all around by a black band that also surrounds the eye and extends below and behind it; spot behind eye, chin, throat and ring around neck white; a black collar around base of neck; rest of upper parts grayish brown; under parts white; legs and feet pale flesh color; base of bill orange or yellow, tip black.

Young. — No black markings; white of forehead reaches bill and eyes, and is prolonged over latter, neck ring and stripe behind eye gray; upper parts with slight whitish or rusty edgings of the feathers; bill mostly black.

Field Marks. — One black ring around neck. This bird is the color of wet sand, while the Piping Plover, which is about the same size, is the color of dry sand.

Notes. — A simple, sweet, plaintive call. *Chee-wee* (Hoffmann).

Season. — Common spring and autumn migrant coastwise, rare inland; late April to mid October.

Range. — North and South America. Breeds from Melville Island, Wellington Channel and Cumberland Sound to valley of Upper Yukon, southern Mackenzie, southern Keewatin and Gulf of St. Lawrence; winters from southern Lower California, Louisiana and South Carolina to Patagonia, Chile and the Galapagos; casual in Siberia, Greenland and Bermuda.

HISTORY.

This common and handsome little Plover is known almost universally as the Ring-neck. It is one of the small birds which rarely was shot by the earlier settlers or by sportsmen up to the latter half of the nineteenth century; but since the great depletion of the larger shore birds this little one has become a common target. It is regarded now as legitimate game, and its numbers have decreased rapidly of late. Only six

of my Massachusetts correspondents report an increase of this species in their localities, while seventy-one report a decrease.

It formerly was very abundant and familiar all along the coast of New England. Usually a pair or a few pairs are now seen together or associated with the smaller Sandpipers. Sometimes as many as forty or fifty are seen in a flock, flying in loose order, though occasionally they move more compactly. At such times the fortunate gunner makes a "killing." When they alight they usually scatter and run about with their heads up, occasionally bobbing their heads or snatching up some food. Sometimes at high tide they may be found huddled together above high-water mark fast asleep, with heads drawn in, although some are usually on the watch. They frequent sandy or pebbly shores, bared by the flowing tide, and may be seen singly, in pairs or in small flocks on salt marshes and mud flats.

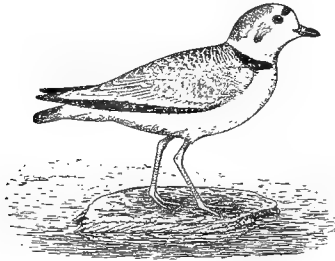
Ordinarily this Plover is a rather silent bird, unless alarmed, and stands quietly when approached, but runs so swiftly when apprehensive of danger that it seems almost to glide over the ground. It is quite an adept at concealment, and when hidden behind a few stalks of grass it is almost invisible. When standing or squatting on the wet sand or among wet rocks its color so perfectly matches its surroundings that the eye hardly can find it.

Dr. Brewer says that a few Semipalmated Plovers have been known to summer and probably to breed on Grand Manan; but I know of no recent instance of the summering of this species in New England.

Its food on the coast consists largely of small crustacea, mollusks, eggs of marine animals, and insects, which it sometimes gleans from ploughed fields. In the interior it feeds on locusts, other *Orthoptera* and many other terrestrial insects. Professor Aughey examined the stomach contents of eleven Ring-necks taken in four counties of Nebraska between April, 1865, and July, 1875, and found all of them filled with insects. Eight stomachs contained from forty to sixty Rocky Mountain locusts each, and in all but one of the eleven there were other insects.

PIPING PLOVER (*Ægialitis meloda*).

Common or local names: Clam-bird; Mourning-bird; Beach-plover; Ring-neck.



Length. — 6.50 to 7 inches; bill .45 to .48.

Adult Male. — Forehead, chin, throat and ring around neck white; band across forward part of crown, between eyes, black; a partial black collar on lower neck, almost always broken both front and back, in rare cases complete; upper parts mainly pale ash; tip of tail black; below white; base of bill orange, tip black; legs and feet orange yellow.

Adult Female. — Similar, but the black tending to brownish, and less distinct.

Young. — Resembles female, but no trace of dark color on head and little, if any, on sides of neck; feathers of upper parts with pale or rusty edgings; bill mainly black.

Field Marks. — This is the only *pale* Ring-neck on the beach. In flight the wings show much marked dark brown and white.

Notes. — A plaintive piping whistle, repeated. *Queep, queep, queep-o* (Langille).

Nest. — A hollow in the sand or shingle of the beach.

Eggs. — 1.20 to 1.30 by .95 to 1, clay color or creamy white, sparsely marked with chocolate specks.

Season. — Uncommon migrant; uncommon and very local summer resident along coast; formerly common. Early April to mid September.

Range. — Eastern North America. Breeds locally from southern Saskatchewan, southern Ontario, Magdalen Islands and Nova Scotia south to central Nebraska, northwestern Indiana, Lake Erie, New Jersey (formerly) and Virginia; winters on coast of United States from Texas to Georgia, and in northern Mexico; casual in migration to Newfoundland, Bahamas, Greater Antilles and Bermuda.

HISTORY.

This lovely little bird is a resident of the sandy shores of the sea. It formerly was abundant, and bred in colonies on all the sandy outer beaches from Nova Scotia to Virginia.

Now it almost has disappeared as a breeder from great stretches of sea-coast, from Maine to New Jersey at least, although still seen locally, but rarely in numbers exceeding two or three pairs. In the migrations, however, it is more or less common locally. The following notes give convincing evidence of its former abundance and recent decrease: Very abundant on the low sandy shores of our whole sea-coast during the summer (Wilson, 1813). Common inhabitant of our sea-coast from New Jersey to Nova Scotia (Nuttall, 1834). Breeds on all the eastern coast of the United States that is adapted to its habits (Audubon, 1835). Found along our whole coast in summer (Peabody, 1839). Common summer resident; breeds abundantly on sandy shores (Maynard, eastern Massachusetts, 1870). Pretty abundantly distributed along coast of New England as summer resident (Samuels, 1870). Common summer bird of New England coast (Coues, 1874). Common summer resident along coast (J. A. Allen, Massachusetts, 1879). From many of our beaches in New England and New Jersey this Plover has been driven (Brewer, 1884). Formerly common in August and September (Brewster, Cambridge region, 1906). Formerly breeding on west coast of Maine, now rare migrant (Knight, 1908). Uncommon migrant and summer resident coastwise (G. M. Allen, Massachusetts, Rhode Island and Connecticut, 1909). Common on Long Island in Giraud's time; now limited as a breeder to a few localities (Eaton, New York, 1910).

Only four of my correspondents find the species increasing anywhere, and the increase given is slight, except by one man in Barnstable County, who finds an increase of fifty per cent. since the law was passed in Massachusetts protecting this bird at all times. Forty find it decreasing. Most of the others never have seen it. Legalized shooting of shore birds after July 15 in several of the Atlantic coast States is responsible largely for the great diminution and the threatened extinction of this species on this coast. In August I have seen the downy young, only a few days from the egg, running along the beach, while men and boys who ought to have "known better" were engaged in the pleasant (and then

lawful) recreation of shooting the solicitous parents, whose anxiety for the little ones brought them within gunshot. Even the half grown young were legitimate targets (and still are in some States). They are the game of boys and some foreign gunners.

This bird is said to raise two broods in a season, but I never have seen any evidence of this except July and August broods, which may have been the result of an attempt to raise young after the first brood had been destroyed. The eggs are laid in a mere hollow in the sand or pebbles of the lonely barren beach, or among the scattering beach grass near the foot of some sand dune. Sometimes they are washed away by an unusually high tide and sea. The young are able to run about as soon as they are hatched. Like their parents they match the color of dry sand. On the approach of danger they squat, close the eyes and remain motionless. I once saw one hide in this way, and, keeping my eye upon it, walked to it and took it in hand. I then let it go, thinking to see if it could conceal itself effectually on the open beach. It ran a few steps, then disappeared behind a little rise, and although I followed it immediately I never saw it again. The parents, ordinarily rather suspicious and shy, become emboldened by their solicitude for their young, and with cries of alarm follow the intruder on their breeding grounds. The call of this Plover is wild and pensive, but melodious withal. Dr. Townsend names it "the call of a dying race." When alarmed on its breeding grounds at night-fall, it follows the disturber of its peace until daylight has faded, and, pillowed on the sand, I have been lulled to sleep by its wild and mournful cries as they mingled with the ceaseless roar of the pounding surf.

This species feeds, according to Dr. Warren, on insects, crustacea, mollusks and the eggs of marine animals. Professor Aughey found the stomachs of four birds from Nebraska filled with insects, and two of them had eaten locusts.

WILSON'S PLOVER (*Ochthodromus wilsonius*).

Length. — 7 to 8 inches; bill long and large for a Plover, .80 to .90; outer toes half webbed.

Adult Male. — Above ashy gray or brownish gray; forehead white, white extending over eye; top and sides of head, and nape brownish gray, blackening at upper edge of forehead; a blackish stripe from bill to below eye, not meeting its fellow above base of bill, as white of forehead comes down to bill; below white, with a broad black half collar on fore neck and upper breast, not extending to back of neck; but white of neck so extends; wing quills dark; white wing bar; tail darkening in the middle toward tip, but end and edges whitish; iris dark brown; bill black; legs flesh colored.

Adult Female. — Like male, but the black marks replaced by dark or brownish gray, often tinged with reddish; the breast band tinged with buff.

Young. — Similar to adult female, but without black marks on head; a broad band of the color of back across front of neck.

Field Marks. — The large, long, thick bill and the larger size of the head distinguish it from the smaller Ring-necks.

Season. — Accidental summer visitor.

Range. — Southern North America. Breeds from Texas eastward along Gulf coast, and from southeastern Virginia (formerly New Jersey) south to northern Bahamas; winters from southern Lower California, Texas and Florida south to southern Guatemala and probably to West Indies; casual in Nova Scotia and New England, and at San Diego, Cal.

HISTORY.

This bird is an accidental visitor from the south. There are two tenable Massachusetts records, namely, a specimen taken at the Gurnet, Plymouth, August 22, 1877, by Arthur S. Fiske,¹ and one taken from a gunner's bag at Ipswich by Dr. C. W. Townsend, May 8, 1904.² Linsley records it at Stratford, Conn., and Eaton gives eight records for New York. Peabody states in his report on the Birds of Massachusetts (1839) that the species was abundant at Nahant in 1838. "This record," says Dr. C. W. Townsend, "was believed to be on the authority of Dr. Brewer, who later refuted the statement."

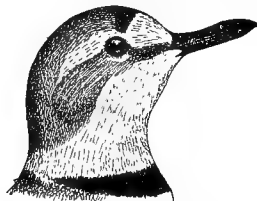


FIG. 19.—Wilson's Plover.

¹ Coues, Elliott: Bull. Nuttall Orn. Club, 1882, p. 59.

² Townsend, C. W.: Memoirs, Nuttall Orn. Club, No. III., The Birds of Essex County, Mass., 1905, p. 199.

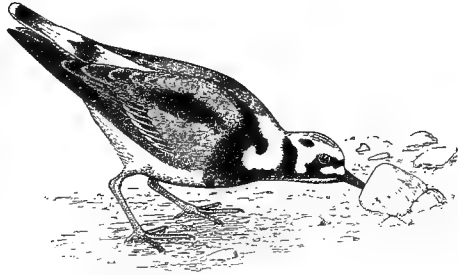
Dr. Brewer himself says, in reviewing Dr. J. A. Allen's list of Massachusetts birds, that in his opinion this species is not to be anticipated in Massachusetts. Nevertheless, as two records have been made since his opinion was promulgated, the Wilson's Plover may be confidently looked for as a straggler at least in Massachusetts. It formerly bred north to New Jersey and probably visited New England during the late summer, as at that time birds are given to wandering, and some species from the southern States occasionally reach New England. Like all the shore birds which formerly bred along the Atlantic coast, it has been reduced much in numbers and extirpated from the more northern part of its breeding ground, where spring and summer gunners are numerous, and, like the other species, it will disappear from the Atlantic coast unless such gunning is prohibited on all coasts within its breeding range. This bird may be distinguished at once from the Ring-neck by its larger size, its large head and its *large black bill*. It feeds on insects, crustaceans, etc.

TURNSTONES.

The Turnstones (Subfamily *Arenariinae*) somewhat resemble the Plovers, but they have four toes, and the bill, which is shorter than the head and quite straight, is very hard, and tapers from about the middle to a sharp point. The legs are rather short and stout, and the toes are not webbed but narrowly margined. Turnstones are distributed generally over the globe. The few species are known everywhere by their peculiar habits. Only one inhabits the eastern coast of North America. This species, so long sought by gunners and sportsmen, has been saved from extinction because it breeds in the far north, on the coasts and islands of the Arctic Ocean, where it is comparatively safe from mankind during the breeding season; but it will continue to decrease in numbers unless better protected. The very least that should be done for its conservation is to prohibit spring shooting all along the Atlantic coast of the United States.

RUDDY TURNSTONE (*Arenaria interpres morinella*).

Common or local names: Turnstone; Chicken-plover; Chicken-bird; Chicken; Brant-bird; Redlegs; Sparked-back; Streaked-back; Creddock; Sea-quail.



Length. — 8 to 9.50 inches; bill .80 to .90.

Adult. — Pied above with black, white, brown and chestnut red or rufous; the white top of head streaked with black; upper breast, fore neck and region about eye black; white showing on back and wings in flight; below mainly white, except breast; legs and feet orange red or coral red; bill blackish.

Young. — Upper parts brown, streaked with gray or mottled with black and paler brown; in flight, lower back, wings and tail appear similar to those of adult; sides of throat and breast dark brown, mottled; rest of under parts white.

Field Marks. — In flight three longitudinal stripes of white show on back, the middle one interrupted by a patch of black at base of tail. In adult plumage the black upper breast, reddish-brown back and red feet may be distinguished by the use of a glass.

Notes. — When flying, a loud twittering note (Nuttall). Call note a chuckling whistle (Hoffmann). A clear whistle of two or three notes, deep, melodious.

Range. — North and South America. Breeds on Arctic shores from Mackenzie River east, probably to Melville Peninsula, and north to Melville Island; winters from central California, Texas, Louisiana and South Carolina to southern Brazil and central Chile.

HISTORY.

This bird, which is known quite generally among the older shore gunners of Massachusetts as the Chicken-plover or chicken, is known on Nantucket as the Creddock. It formerly was very abundant, and was one of the first shore birds named in the game laws of Massachusetts, when, in 1835, a law was

passed to protect the Plover, Curlew, Dough-bird and Chicken-bird at night.

It was considered of much economic importance then because of its numbers and food value. Although its flocks were never very large, they were numerous all along the coast, and it was found on the shores of inland rivers in the fall migration, though never very common away from the salt water, except, perhaps, on the large lakes of the interior. Notwithstanding its numbers on our coasts have decreased greatly, it is still rather common, except in certain localities, where it seems to have become rare. This probably was one of the shore birds which formerly remained here through the summer, for Mr. N. B. Moore found several non-breeding birds in Florida throughout the months of June and July, and according to Wayne it still summers on the coast of South Carolina, but does not breed.¹ Emmons (Massachusetts, 1833) regards it as breeding "in this climate," but while a few may have summered here at that time there is no specific evidence that it ever bred here.

The Turnstone received its name from its habit of turning over pebbles, oyster shells and other objects that it found on the beach. I often have observed it at work on the pebbly beach of Buzzards Bay and on the shores of Cape Cod. It loves the foot of a rocky cliff or a beach with great stones partly submerged by the tide, but is common also on sandy beaches near the pounding surf, and on bars bared by the tide. Sometimes it is seen in marshes or along the banks of tidal creeks. It prods the sand with its beak, follows the retreating wave, raises pebbles from their beds, oftentimes squatting, heaving and working hard to dislodge them. Sometimes it pushes with its breast against a stone or shell in the effort to overturn it, or even digs beneath to undermine it when it is too firmly imbedded to be moved otherwise. It turns over bundles of seaweed, and "roots" out weeds and sea mosses, as Dr. Townsend says "like a little pig." These labors are undertaken in the hope of finding something eatable beneath such objects, and the little laborer often is rewarded. Dawson states that

¹ Wayne, A. T.: Birds of South Carolina, 1910, pp. 61, 62.

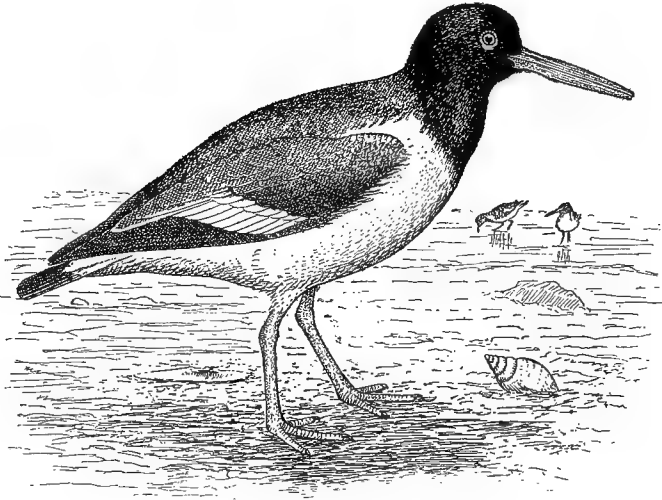
near the shores of Lake Erie he has seen it on the ploughed lands turning over clods bigger than itself with such force as to roll them a foot or more. This habit of turning objects is not constant, however, with this bird, and is sometimes the exception, as I have watched it when it seemed to be occupied entirely in probing the sand, or searching for food, like a sand-piper, along the strand.

The bright variegated plumage of the Turnstone, with its strong contrasts of black, white and chestnut, places it among the most attractive birds of the sea-shore. The flight is rather low and swift at times and then the white of the plumage is very striking. In flight it often alternates scaling and flapping, and sometimes gives a curious chattering or rattling note as it passes. I have heard, too, the rapidly repeated *kŭk*, *kŭk*, *kŭk*, which a pair uttered as they flew by overhead, but as a rule I have found them rather silent, and never have heard the variety of calls which they undoubtedly give.

The Turnstone can swim well at need, and like some other species loves to bathe in the wash of the waves that roll up on the sands, where it shakes off the water like a little dog. It feeds on the spawn of the great crab, known locally as the horsefoot or horseshoe; also on insects, worms and small crustaceans. Audubon noticed that in northern Florida the Turnstone fed on the oyster beds at low tide, picking at oysters that had been killed by the heat of the sun; also breaking the shells of small, thin-shelled bivalves.

OYSTER-CATCHERS.

The Oyster-catchers (family *Hamatopodidae*) may be known at once by their large size, striking appearance and the peculiarly shaped bill, which is about twice as long as the head, much compressed or flattened on the sides, cut off at the end like the blade of a screwdriver, sharp edged and contracted at the nostrils. It is a very efficient weapon for opening the shells of bivalve mollusks or prying barnacles off the rocks. Each toe has a narrow membrane on each side, and the middle and outer ones are connected by a web toward the base.

OYSTER-CATCHER (*Hematopus palliatus*).

Length. — 17 to 21 inches; bill 3 to 4; no hind toe, outer and middle toes slightly webbed.

Adult. — Head and neck black; back, wings and end of tail dark brown; rump, broad wing bands, base of tail and under parts white; bill vermilion, long, stout, compressed toward tip; feet, legs and eyelids pale red.

Young. — Head and neck more brown than black; feathers of upper parts more or less edged with buff, bill dull rather than bright.

Notes. — A loud shrill whistling, *wheep — wheep — wheo* (Wilson).

Nest. — A mere depression in marsh or beach.

Eggs. — Two or three, about 2.20 by 1.55, bluish white or buff, marked with blackish and various shades of brown and neutral tints.

Season. — Formerly summer resident; late April to August.

Range. — Sea-coasts of temperate and tropical America from Virginia, Texas, Louisiana, south on both coasts of Mexico and South America to southern Brazil and central Chile; formerly to Labrador; breeds probably throughout its range; its place is taken from Lower California to Alaska by the Black Oyster-catcher.

HISTORY.

The American Oyster-catcher is a candidate for the list of extirpated species as it no longer breeds in the northeast, and there are only two records of its capture or occurrence in Massachusetts since Audubon's time; but it may yet occur here

as a straggler from the south. This bird was known early in our history, but was confounded with the Old World species until it was separated and described by Temminck. Oyster-opener would have been a better name for it, for as Dr. Coues remarks, "Oysters do not run fast." No doubt the Oyster-catcher once inhabited the entire eastern coast-line from the Gulf of Mexico to Labrador, and bred upon the coast of Massachusetts, as a large part of this coast is eminently suited to its habits, and provides quantities of its chosen food (sea-worms, mollusks, crustaceans, etc.) Nevertheless, there is no definite record to substantiate this statement. The Oyster-catcher was one of those beach-loving species that practically was extirpated as a breeding bird along the Massachusetts coast before ornithological records were made in America. The colonists, and later the market hunters and eggers of our coast, probably destroyed or drove off this bird, as they did the Cormorants, Eider Ducks and other Ducks, the Willets and other large shore birds and the larger Gulls, which once spent the summer in numbers along our coasts and undoubtedly bred here. Champlain found the Black Skimmer in flocks "like the pigeons" about Nauset harbor on Cape Cod between July 19 and 25, 1605.¹ As this was in the breeding season, the Skimmer may have bred there; but, like the Oyster-catcher, it has been long regarded as a mere straggler in Massachusetts.

This bird and the Oyster-catcher probably were extirpated from the shores of New England by the same causes that since then have driven both from Long Island and the middle States. Audubon establishes the fact that the Oyster-catcher once bred on the Bay of Fundy and as far north as Labrador; but since his definite statement has been questioned by Dr. Brewer,² who seems to think that he must have been misled in some way, I quote Audubon's exact words: "Our Oyster-catcher has a very extensive range. It spends the winter

¹ Champlain, Samuel de: Pub. Prince Soc., 1878, Vol. 2, p. 87.

² Since Dr. Brewer wrote, Audubon's Journals have been published, and in his Labrador Journal, under date of July 6, 1833, when he was in the vicinity of Cape Whittle, he says, "Coolidge and party shot two Oyster-catchers; these are becoming plentiful." Probably had Dr. Brewer read this definite statement he would not have doubted that Audubon found Oyster-catchers in Labrador.

along the coast from Maryland to the Gulf of Mexico, and being then abundant on the shores of the Floridas, may be considered a constant resident in the United States. At the approach of spring, it removes toward the middle States, where, as well as in North Carolina, it breeds. It seems scarcer between Long Island and Portland, Maine, where you again see it, and whence it occurs all the way to Labrador, in which country I found that several were breeding in the month of July. . . . In Labrador, I met with it farther from the open sea than in any other part, yet always near salt-water. . . . On the coast of Labrador, and in the Bay of Fundy, it lays its eggs on the bare rock. When the eggs are on sand, it seldom sits on them during the heat of the sun; but in Labrador, it was found sitting as closely as any other bird. Here, then, is another instance of the extraordinary difference of habit in the same bird under different circumstances. It struck me so much that had I not procured a specimen in Labrador, and another in our Middle Districts, during the breeding season, and found them on the closest examination to be the same, I should perhaps have thought the birds different. Everywhere, however, I observed that this bird is fond of places covered with broken shells and drifted sea-weeds or grasses, as a place of security for its eggs, and where, in fact, it is no very easy matter to discover them."

This is not hearsay evidence. Audubon saw these things with his own eyes, for he says again: "I have seen it probe the sand to the full length of its bill, knock off limpets from the rocks on the coast of Labrador, using its weapon sideways and insinuating it between the rock and the shell like a chisel." The mere fact that the Oyster-catcher has disappeared since then from Labrador, Nova Scotia and all New England should not in any way discredit Audubon's statement. We do not allow its disappearance from Long Island and the middle States to discredit the evidence that it once was found there. Even without Audubon's testimony there is presumptive evidence that the bird once bred here. Wilson asserts that "though nowhere numerous, it inhabits every sea-shore." Giraud (1844) says that on Long Island it is rather scarce,

although "during summer a few are found on almost every beach along the whole extent of the sea-coast." De Kay (1844) says (probably following Audubon) that it breeds from Texas to Labrador. The Oyster-catcher breeds throughout its range in temperate America. Durnford found it breeding at Tombo Point, Patagonia, and its Pacific prototype, the Black Oyster-catcher, still ranges up the coast from Lower California to Alaska, and breeds there. In Puget Sound I have seen its eggs laid on the rocks, and the bird sitting upon them, as Audubon saw our Oyster-catcher incubating her eggs in Labrador. Oyster-catchers are not confined normally to warm climates. Wilson tells of a specimen that was sent him prior to 1813, killed from a flock near Boston harbor. Linsley (1843) says "the Oyster-catcher is now rare here [Stratford, Conn.], but fifteen years ago they were not very uncommon in autumn." Dr. Brewer himself says that a pair of these birds was procured by Daniel Webster at Marshfield in the summer of 1837 and presented to the Boston Society of Natural History, that it was not uncommon to see specimens in the Boston market, and that Boardman informed him that the Oyster-catcher was seen occasionally at Calais, Me. Probably it was common in early times about the sandy beaches and rocky headlands guarding Boston harbor.¹

The Oyster-catcher, being a shy bird except when it has young, was probably killed off in the breeding season in the country within reach of summer gunners near Boston before it was extirpated from the rest of the northeast coast and that of the middle States, and for that reason it was rare here in Audubon's time. It has disappeared now from Labrador, the Maritime Provinces, New England and the middle States, and in the United States it is found only as a straggler, except on the southern Atlantic and Gulf coasts. It is growing rare even on some of the shores of Florida and Texas, where once it was numerous. It is destined to extermination wherever the coast is settled, for it lays its eggs on the bare sand or rocks or among beach grass, where they are exposed to the eggers,

¹ Prof. W. W. Cooke states that Mr. W. H. Osgood saw a flock of about twenty July 20, 1897, at Digby, N. S., but these must have been wanderers from the South. (See Bull. No. 35, Biol. Surv., p. 99.)

who consider them a great delicacy and its large size and conspicuous plumage assure its destruction by gunners who shoot in summer when the young are unable to fly.

The Oyster-catcher is a bird of lonely open beaches and rocky shores by the sea. It may be found about inlets and lagoons in the south, but never far from the salt water. Its large size, striking plumage and loud cries make it a very conspicuous bird, and it is easily alarmed and difficult to approach, except in the breeding season, when its solicitude for its eggs or young lead it to discard its customary caution. It formerly wintered from Maryland to the Gulf, and was seen at that season in flocks. The flocks moved in lines, wheeling and turning with the precision of trained soldiers on parade. At such times they presented a striking picture, their black and white plumage flashing in the sun.

There has been some discussion as to whether this bird really eats oysters. Wilson and some other ornithologists doubt that it ever eats them; Audubon avers that it eats the small "raccoon" oysters that grow on bars in shallow water in the south, where the ebb tide uncovers them. Oysters in such situations cannot exist long in the north, because the frost kills them at low tide in winter. Therefore in the north our bird was never seen to eat oysters, although it may have taken a few occasionally in shallow water. I frequently have seen the Oyster-catcher acting the part assigned him. Once near Mosquito Inlet on the Halifax River on the Florida coast one of my companions shot one of these birds which, when held up by the legs, emitted from its mouth quite a quantity of "coon oysters." Maynard records a similar occurrence. The bright peculiar beak is shaped somewhat like an oyster knife, and the bird plunges this sharp weapon into an incautious and partly opened bivalve, and, swiftly cutting the closing muscle, opens the oyster like a professional oyster-opener. Wayne says "I have seen these birds open raccoon oysters by inserting the bill into the gaping shell, like a wedge, when the shell at once opens." These little oysters, however, are of no commercial value, and the bird was never known to trouble oysters which are grown for commercial purposes on beds in

deeper water. The Oyster-catcher does not dive except when hard pressed, but gets its food on or near the surface, although it can dive and swim well at need. The bill often is much worn by hard usage and sometimes bent to one side. The bird is not by any means confined to an oyster diet, and inhabits coasts where oysters are never found. Its knife-shaped beak is used in opening mussels, in knocking or chiselling limpets off the rocks, in opening sea urchins and even in catching a few small fish. Audubon says that it eats crabs, seaworms, shrimps and "razor-handles" or solens. He watched it with an excellent telescope and saw it pat the sand with its feet to "force out insects."

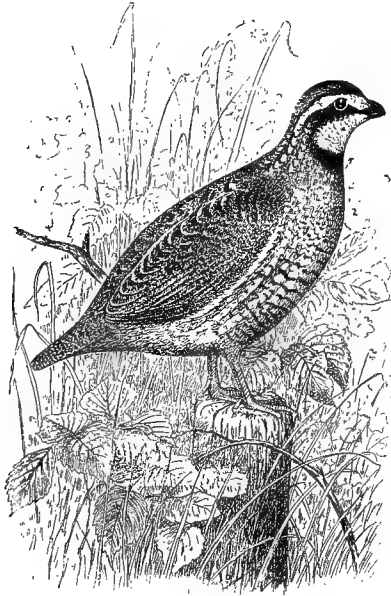
The Oyster-catcher gets its food from the ocean and its shores, and harms no man. It is a handsome creature, whose alert presence and harmonious cries once lent to our beaches a charm now gone forever. Its extirpation in New England has served no good purpose, but merely adds another item to the accounting that shall put "our race and time to shame in the age to come."

BOB-WHITES.

The American Partridges (family *Odontophoridae*) are small in size, with the head usually well feathered and sometimes crested. They are distinguished from the Grouse by the small size, lack of feathers on the tarsi or toes, and by the naked scale which covers the nostrils. There is much variation in plumage among the different species, which are well represented in the southwestern United States and in subtropical America. The Bob-whites occupy the temperate and tropical regions of America and are not found elsewhere. There is but one species in eastern North America, with a subspecies in Florida which is much smaller than the northern bird and somewhat darker. The species ranges over the greater part of the eastern United States, mainly in open country, and is one of the most prized of all American game birds. The elegant, plumed and crested Quails or Partridges belong mainly to the mountain regions of the west and the Pacific slope. Some species have been introduced in the east but have not become acclimated.

BOB-WHITE (*Colinus virginianus virginianus*).

Common or local name: Quail.



Length. — About 10 inches.

Adult Male. — Upper parts mainly reddish brown, with dark streaks and light edgings; forehead and broad line over eye white, bordered with black; throat patch white, bordered with black; tail short, gray; crown, upper breast and neck all round brownish red; breast and belly whitish, narrowly barred and marked with crescent-shaped, irregular black marks; flanks reddish brown.

Adult Female. — Similar, but duller, with very little black on head, and the white mainly replaced by buff.

Young. — Resemble female.

Notes. — A ringing, whistled *Bob-white* or *buck-wheat-ripe*; a conversational *quit-quit* and a whistled call and reply, repeatedly uttered when the individuals of a flock are separated; also many low conversational clucks and twitterings.

Nest. — On ground, among bushes, grass or grain.

Eggs. — Eight to eighteen or more, averaging 1.20 by .95, white, often stained with brown.

Season. — Resident throughout the year, but now rare in the northern part of Massachusetts and in Maine, New Hampshire and Vermont, where it is found only in the lower latitudes and altitudes.

Range. — Upper Sonoran and southern half of Transition zones of eastern North America from South Dakota, southern Minnesota, southern Ontario and southwestern Maine south to eastern and northern Texas, Gulf coast and northern Florida, west to eastern Colorado; introduced in central Colorado, New Mexico, Utah, Idaho, California, Oregon and Washington.

HISTORY.

The cheery, interrogative call of Bob-white was one of the first distinctive sounds of the open field that, as a child, I knew and loved among the hills of New England. It was as well known among the country folk as the morning carol of the Robin in the orchard, the drumming of the Ruffed Grouse in the woods or the reiterated plaint of the Whip-poor-will on the moonlit doorstone. Bob-white was ever an optimist, for even if, as the farmers stoutly maintained, his call sometimes presaged a storm, the prophecy "more wet" was delivered with such vim, in such a cheerful frame of mind, and in such a joyous, happy tone as to make rain seem the most desirable thing in life. It appears that this cheerful, brisk and busy little fellow is fain to express in the brief ringing notes *bob, white*, or *bob, bob, white*, his love, his longings, his impetuous desires, his joy in life, his appreciation of the warm sunshine and the fragrant sensuous breeze, his abundant content with his lot and his defiance to all his rivals. What other sound in nature is so heartening? And now, as ever, in the grassy fields of New England, in the wide rolling lands of the west, or under a burning southern sky, wherever that call is heard it gladdens the hearts of men. Psychologists may tell us that the bird is merely wound up like a clock and set to run for a certain time, or until the sexual impulse runs down, but there is in his call the gladness of spring days, a quality unmistakable and unquenchable, and "all the world" loves it.

Perhaps there is no bird to which the American people are more deeply indebted for both æsthetic and material benefits. He is the most democratic and ubiquitous of all our game birds. He is not a bird of desert, wilderness or mountain peak, which one must go far to find. He seeks the home, farm, garden and field; he is the friend and companion of mankind; a much needed helper on the farm; a destroyer of

insect pests and weeds; a swift flying game bird, lying well to a dog; and, last as well as least, good food, a savory morsel, nutritious and digestible.¹

There can be no doubt that Bob-white has decreased in numbers in New England since the days when Morton wrote that he saw "sixty Quails" in one tree; but doubtless the species increased much in this region during the time of settlement. It could not have been so numerous in the primeval forests that covered most of New England as it became later, when much of the forest had been cleared away. When civilization and settlement extended, and grain raising became almost universal among the farmers, the Bob-white must have multiplied throughout southern New England. The cultivation of the soil increased the size and productiveness of many weeds, the seeds of which form a large part of the food of this bird; the grain scattered among the stubble provided a new and abundant food supply, and the area over which this supply extended constantly increased as the forests were cleared away and farming began. There was no lack of excellent cover among the rank growths that sprang from a virgin soil, and the smaller game birds were little hunted by the settlers so long as deer, turkeys, pigeons, wild-fowl and grouse were plentiful.

Under these favorable conditions the Bob-white became common, if not abundant, over most of Massachusetts, Rhode Island, Connecticut, much of New York, southern New Hampshire, Vermont and southwestern Maine. It was most plentiful along the coast and up the river valleys, and rare or absent on the higher elevations. In New Hampshire, Vermont and Maine it is now (1911) practically gone, except where it has been imported. In New York it is now a rare bird, except on Long Island, in the lower Hudson valley and in the Delaware valley. In Massachusetts, Rhode Island and Connecticut it is found now only in the most favorable localities, or where it has been introduced from other States. It was never common in Berkshire County, Mass., except locally, and is now nearly

¹ Part of this history of the Bob-white was written originally for a leaflet published in *Bird-Lore* by the National Association of Audubon societies.

extinct there as well as in northern Worcester County. Mr. Clinton G. Gilmore says that Mr. William C. Whitney stocked his preserve on October Mountain, but the Bob-whites all left it for the valley, and later disappeared. In Nantucket the native Bob-white is extinct, but there are a few introduced birds left. Bob-whites were very plentiful during the latter part of the eighteenth century and the early part of the nineteenth. Mr. George Linder of Boston says that he once knew of the killing of ninety-six by two men in two days. Some large bags have been made within fifty years; but the species always had its "ups and downs," owing largely to occasional severe winters. I have no record, however, of the fluctuations in numbers in early times, and all the available information to be had on that subject has been gathered within the past century.

Mr. Henry H. Fay writes me that there was a very severe snowstorm on Cape Cod sometime in the 50's, possibly in 1857. The snow was heavy and damp, and falling on the "evergreens" bent their branches to the ground. The Quail sought the cover of the down-bent branches as a refuge from the storm. The snow covered them, and then the weather turned cold, freezing the snow hard and imprisoning the birds beneath it, where they all starved. Their remains were found in numbers under the trees the succeeding spring, and the species appeared to be absolutely extinct on the Cape. Mr. Fay states that his father, who had been in business in the south, imported a number of birds from some southern State and turned them out. A resident, who watched the result, said that the reproduction of the Bob-white in that district was due to that importation, and that the introduced Quail were smaller than the native birds. Mr. Lyman Pearson writes from Newbury that there were no Quail left there in 1865, but that they increased up to the 70's, when a severe winter killed them off again. Since then several such storms have occurred, wiping out most of the individuals of the species in New England. Many instances have been reported to me where, locally, after such a season, gunners with bird dogs have exterminated every bird.

Until recent years we have filled the places of the birds thus extirpated by introducing others from the south. People who have watched the result say that these southern birds cannot survive severe northern winters, but that if they are introduced in spring and breed successfully, their young are more hardy than the parents, and do well if the succeeding winter is not too severe. It is believed that the many southern birds introduced have so interbred with the few native birds left as to produce a smaller and less hardy race than the northern Bob-white, — one which cannot withstand so well a severe winter. Most of them die during a hard winter when the snow is deep, even if they are not frozen under.

In 1898 the destruction of most of the Quail from New Hampshire to Cape Cod was reported. Afterward they increased somewhat, but the very severe winter of 1904-05 destroyed fully ninety per cent. of the birds throughout the State; two hard winters followed, and the gunning which was allowed in those years exterminated the birds in many localities. Many sportsmen stopped shooting them during the succeeding years; but others continued to kill every bird that could be found. This and the impossibility of procuring birds from other States, which has put an end to the practice of restocking with southern birds, accounts for the extermination of the species in large areas where it was once common. There must have been a section on Cape Cod where the winter of 1904-05 was not so destructive as elsewhere, for Mr. George H. Tripp writes that about West Harwich the season of 1906 was the best that he ever saw for Quail, and several correspondents from the lower end of the Cape note a large increase. Mr. Fred F. Dill of North Eastham attributes this to mild winters and the fact that the foxes were killed off. Two hundred and thirty-two of my correspondents reported in 1908 that the Bob-white had decreased in numbers in the years of their experience, but twenty-six, mainly from southeastern Massachusetts, recorded an increase.

Snow and cold are important factors in the destruction of the Bob-white in the north. Given mild winters, a very short open season and the prohibition of sale and shipment, with

strict enforcement of the law, and this bird holds its own fairly well. The past three winters have not been severe, and now (1911) the Quail is increasing locally in southeastern Massachusetts, and parts of Rhode Island and Connecticut in territory where very few birds have been available for restocking. A few have been turned out here and there, which no doubt have swelled the total somewhat.

Much may be done to preserve the Bob-whites during winter by feeding (see page 581), but if they are at large during a heavy storm, when the snow above them freezes hard in the night, nothing can save them, as they will starve and freeze in a few days, or, if they break out before death ensues, they are so weak that they cannot escape cats, dogs and hawks.

The belief is held quite generally in southeastern Massachusetts that this bird rears two broods. Mr. E. J. Boyle of Boston says that he has shot the old birds in October and afterward found their young so small that they could be caught under a hat. Many witnesses tell similar tales. Such stories are the best possible argument for a later open season.

Bob-white comes in close contact with the crops on the farm year after year, yet seldom appreciably injures grain or fruit. Through the investigations of the Bureau of Biological Survey of the United States Department of Agriculture, it is now well known that Bob-white ranks very high as a destroyer of many of the most destructive insect pests. Large numbers of these pests are eaten. I have devoted several pages in *Useful Birds and their Protection* to the food and habits of Bob-white, but some recent experiments with captive birds by Dr. C. F. Hodge and Mrs. Margaret Morse Nice have given us further interesting facts. Mrs. Nice gives the following as eaten by captive birds. Each number of insects given represents the largest number eaten during a single meal by one bird. Chinch bugs, one hundred; squash bugs, twelve; plant lice, two thousand three hundred and twenty-six; grasshoppers, thirty-nine; cutworms, twelve; army worms, twelve; mosquitoes, five hundred and sixty-eight; potato beetles, one hundred and one; white grubs, eight. The following

records are taken from a list which she gives to show the number of insects eaten by Bob-white in a day, each number given representing the insects eaten by one individual in a day: Chrysanthemum black flies, five thousand; flies, one thousand three hundred and fifty; rose slugs, one thousand two hundred and eighty-six; miscellaneous insects, seven hundred (of which three hundred were grasshoppers); and insects, one thousand, five hundred and thirty-two (of which one thousand were grasshoppers). Mrs. Nice gives a list of one hundred and forty-one species of insects eaten by the Quail, nearly all of which are injurious, and Dr. C. F. Hodge remarks that a bird which eats so many injurious insects is welcome to the beneficial ones as well. We cannot assume that birds at liberty, having their choice of food, would accept the same diet offered these birds in captivity; but the above experiments may indicate their taste in the matter.

As a destroyer of weeds Bob-white shines pre-eminent. Mrs. Nice gives a list of one hundred and twenty-nine weeds the seeds of which are eaten by this little gleaner. These seeds are digested, and the germs thus destroyed. The number of seeds taken by one bird at a single meal varies from one hundred and five of stinkweed or four hundred of pigweed to five thousand of pigeon grass or ten thousand of lamb's-quarters, while the number taken by one bird in a day varies from six hundred of burdock to thirty thousand of rabbit-foot clover. By a careful computation Dr. Sylvester Judd of the Biological Survey reached the conclusion that the Bob-whites of Virginia consume annually, from September 1 to April 30, five hundred and seventy-three tons of weed seeds.

If we take as our measure the quantity of weed seeds and insects eaten by captive Quail, as given by Mrs. Nice, we find that a family consisting of two adult birds and ten young would consume seven hundred and eighty thousand nine hundred and fifteen insects and fifty-nine million seven hundred and seven thousand eight hundred and eighty-eight weed seeds in a year, in addition to their other food. The annual loss due to insects in the United States is believed to reach nearly one billion dollars, and the annual injury to farm

crops by weeds in this country is estimated at many millions. How much of this loss might be saved by the conservation of Bob-white!

GROUSE.

The Grouse (family *Tetraonidae*) is a large and interesting one. The true Grouse are confined to the northern hemisphere, and the family reaches its highest development in North America, which is particularly well supplied with species. Grouse are chiefly birds of northern or temperate regions. The various species have become so well adapted to varying conditions that treeless arctic wastes, barren mountains, deep forests, brushy plains, prairies, fertile cultivated lands and sandy deserts all have their Grouse. They are found in most of North America, except in the more southern parts and in regions where they have been extirpated by man.

Birds of this family have the head feathered, excepting usually a bare patch, strip or "comb," over the eye, and often crested; the legs, and often the feet, more or less feathered; the sides of the neck often with modified, ruffed or crestlike feathers, or bare spaces of skin, or both. The plumage is commonly subdued in tint, for the most part, and the sexes are usually, but not always, similar in color. All things considered, Grouse are the choicest of our game birds, and they now furnish the greater part of our upland shooting. The two species which are native to the Atlantic seaboard are regarded as the most valuable of the family in America.

CANADA SPRUCE PARTRIDGE (*Canachites canadensis canace*).

Common or local names: Spruce Partridge; Swamp Partridge; Black Grouse.

Length. — 15 to 17 inches.

Adult Male. — Barred with black and gray above in transverse wavy crescents; throat and breast black; rest of under parts black; many of the feathers bordered or tipped with much white; tail black, tipped with reddish brown or deep orange yellow; a line of bare skin above the eye, bright red.

Adult Female. — Smaller; barred with black, gray and pale rusty above; general tone rufous brown; whitish below, barred with black.

Field Marks. — Very dark, smaller than the Ruffed Grouse; tail shorter, much rounded. No other Grouse has the large, conspicuous white spots on breast, flank and lower tail coverts.

Nest. — On ground.

Eggs. — Six to sixteen, 1.71 by 1.22, buffy or pale brownish, more or less speckled or spotted with deep brown (Ridgway). Col. John E. Thayer, who has taken the nest of this bird in Maine, found but six eggs, and says that the guides tell him that they rarely see more than six or seven young in a brood.

Range. — Manitoba, southern Ontario and New Brunswick south to northern parts of Minnesota, Wisconsin, Michigan, New York and New England.

HISTORY.

The Canada Spruce Partridge is a small wood Grouse of the northern evergreen forests. In early days it may have been not uncommon among the spruce and hemlock forests and in the tamarack swamps, which were then found in the Berkshire Hills and in northern Worcester County, Massachusetts. I cannot find any definite reference to it, however, in the chronicles of the early Massachusetts writers. There are but two records of its occurrence in the State, one at Roxbury, in the 60's,¹ and another recorded by Prof. F. W. Putnam, who states that it was found in the hemlock woods of Gloucester September, 1851.² It was once common, however, in the spruce and tamarack woods of northern New England and New York, from most of which it has disappeared, and it is now found in large numbers only in the fastnesses of the coniferous forests of Canada. I can remember when it was common in some of the Maine woods, and when it was seen not uncommonly in Massachusetts markets. Knight (1908) states that it still occurs as a rare resident in the more wooded and less inhabited parts of Maine. Eaton (1910) says that it was formerly common in the Adirondack woods, but is now threatened with extermination in New York. Much more evidence of its destruction and decrease might be given. In destroying this bird we have not even the excuse that it is a table delicacy, for its flesh is strongly impregnated with the taste of spruce buds; nor the other stock excuse that it was

¹ Allen, J. A.: Amer. Nat., February, 1870, Vol. III., No. 12, p. 636.

² Putnam, F. W.: Proc. Esscx. Inst., 1856, Vol. I, p. 224.



PLATE X.—RUFFED GROUSE, DRUMMING.

Photograph from life by Prof. C. F. Hodge.

injuring our crops, for it never touched them. It was extirpated because it was tame and confiding and an "easy mark," giving the gunner or the backwoods loafer a chance to unload his gun and kill something. Formerly this bird sometimes assembled in great flocks. Mr. Manly Hardy of Brewer, Me., is quoted by Dr. Bendire as saying that a pack of many thousands was utilized by a tribe of Indians in Nova Scotia to "feed the whole village."

The male has a curious habit of "drumming" in flight or while climbing the leaning trunk of a tree. The female sits so closely on her eggs that she will almost allow herself to be taken from the nest by hand. Mr. Watson L. Bishop of Kentville, N. S., has succeeded in domesticating this bird.

In summer the Spruce Partridge feeds much on the foliage of spruce and fir, and on berries and insects; the winter food consists largely of the buds of the evergreen trees among which it lives. This Grouse, therefore, is much more palatable in summer and early fall than in winter, which may account in part for its decrease.

RUFFED GROUSE (*Bonasa umbellus umbellus*).

CANADA RUFFED GROUSE (*Bonasa umbellus togata*).

Common or local names: Partridge; "Partridge;" Birch Partridge.

Length. — 16 to 18 inches.

Adult. — Above variegated reddish brown, yellowish brown or grayish brown; large ruffs of glossy black or brown feathers on sides of neck; tail long and broad, brown, reddish brown or gray, lightly barred and mottled with lighter and darker shades; a broad dark band near tip; throat buffy; rest of lower parts white, tinged with buffy, barred and otherwise marked with darker shades.

Young. — Similar to adult. (The Canada Ruffed Grouse is grayer than the Ruffed Grouse, has a *grayer tail* and is more distinctly marked below).

Field Marks. — A broad black band near tip of long tail. Large size and crested head.

Notes. — Besides the drumming of the male, which is not vocal, he has a series of vocal clucks and calls. The female when disturbed with her young often squeals much like a rabbit.

Nest. — Of leaves, etc., on ground.

Eggs. — Eight to fourteen, rarely more, creamy buff to creamy white, sometimes dotted or speckled with minute brown spots.

Season.— Resident entire year.

Range.— The Ruffed Grouse occupies the eastern United States from Minnesota, Michigan, southern New York and southern Vermont south to eastern Kansas, Virginia and the mountain ranges of northern Georgia. The Canada Ruffed Grouse occupies the spruce region from central Keewatin, southern Ungava and Nova Scotia, south to Manitoba, New Brunswick, Maine and northern New Hampshire, Vermont and New York, running into western Massachusetts and northern Connecticut on the mountain ranges, and west to and into the mountains of Oregon, Washington, British Columbia and Idaho; but not to the Pacific coast, where its place is taken by the Oregon Ruffed Grouse (*B. u. Sabini*).

HISTORY.

How well the memory retains the first impressions of childhood when later and more important happenings have faded and grown dim. I can still recall, as if it had chanced but yesterday, my affright and sudden alarm when, as a boy of eight, I stood for the first time in the woods of West Roxbury, with my eye on the spot where my first Ruffed Grouse had just vanished. A hair-raising roar of wings, a whirl of dead leaves, a plunge through foliage and branches, and the bird was gone! There were deep woods then where houses stand to-day. Then the Grouse drummed, the Cottontail fled away from my approach, and the Wild Pigeon called where the House Sparrow chatters now.

New England is the home of the Ruffed Grouse, and here it is known everywhere by the name of Partridge or "Partridge." In the middle and southern States it is called the Pheasant, but it does not even belong to the same genus as either species of which it is the namesake. It is a true Grouse and is regarded by American sportsmen as the king of game birds. It is introduced in this volume under two subspecific names, because the two varieties both occupy New England, and individuals more or less intermediate between the two are found in Massachusetts; but the Ruffed Grouse (*B. u. umbellus*) is the bird usually taken in southern New England. We may judge how numerous it was in Massachusetts in the days of old when Morton says that he saw forty in one tree. Nuttall (1834) believed that it was more plentiful in Massachusetts and New England during the early part of the

nineteenth century than in any other section of the United States, and that it was then greatly thinned in the most populous parts of the Union. Maynard says that it was so numerous here formerly, and was so injurious to orchards, that the town authorities in some towns paid a bounty on its head. He states (1870) that it is still common in the wilder sections of eastern Massachusetts, but that in localities where it was abundant ten or fifteen years ago there is not one today. I can remember when a market hunter going out from the city of Worcester by train each day, walking to the covers and returning at night, killed from ten to fifteen birds daily. Dr. F. H. Saunders of Westfield tells me that years ago, when snaring was allowed, he is informed that two men in that vicinity took one hundred and twenty of these birds from snares in one day; but he does not know whether they were all caught in twenty-four hours. Mr. Edward F. Staples of Taunton states (1908) that he has hunted for forty-seven years, and that the last "real good" year was about twenty-five years ago. In the old days, he says, about a thousand birds were killed in a season on about twenty thousand acres over which he ranged. Mr. William H. Leonard of East Foxborough states that five men in Foxborough snared Grouse prior to 1888, and Mr. Eugene E. Morse says that these men averaged about one hundred birds a week, and that the game dealers, George Austin & Sons, did not at that time care for birds which had been shot. Others bought shot birds. Mr. George Hawes, who shot for market about that time, marketed three hundred and ninety-eight birds in one shooting season. Mr. C. Harry Morse of Belmont tells of an old-time hunter friend who killed from three hundred to four hundred and twenty Grouse in a season. These instances may serve to give some idea of the former abundance of this species in Massachusetts.

Practically all the older hunters and sportsmen among my correspondents admit that, while no bird has any better protection than this Grouse, it has decreased greatly in numbers since the years of their early experience, and that the decrease has been progressive for many years, although the numbers

fluctuate much from year to year. Mr. James P. Hatch of Springfield says that there is an unusual scarcity of the birds about once in eight years, and that this has occurred three times in his experience of thirty years. Mr. George H. Haines of Sandwich says that for about twenty-five years the decrease has fluctuated, but that it has been most marked in the past ten years. Mr. William P. Wharton, who interviewed gunners of long experience in Groton, found that their estimates of the decrease of this bird varied from eighty per cent. in fifty years and seventy per cent. in fifteen years to fifty per cent. or sixty per cent. within six or seven years. Dr. Hugh Cabot of Boston states that most of the country that he once shot over contains no birds now. Mr. Henry W. Harwood of Barre asserts that up to 1880 the decrease was not very marked each year; but that since then it has been greater year by year. He has hunted and been much in the woods since 1857. Mr. William N. Prentiss of Milford says that the decrease has been greatest in the past ten years. Twenty years ago he could find fifty where now he sees five; but he finds the decrease less where gunners are fewer. The above notes were received at the close of the year 1908. Two hundred and thirty-five observers reported that the Ruffed Grouse had decreased in numbers within their experience, and nineteen reported a recent increase. The diminution of this noble game bird is well known and generally attested. It practically has disappeared from several States and from large regions in others, but it is more or less common still in New England in most of the region where formerly it was abundant. According to Eaton, it probably is now extirpated from Richmond, New York and Kings counties, N. Y. There is not one left on Nantucket, Mass., and several other neighboring islands, and it has disappeared from some of the territory near the end of Cape Cod and from a few towns and cities near Boston; elsewhere in Massachusetts it still exists, although in reduced numbers.

The most marked decrease of this bird in recent years was in 1907. A sudden drop in numbers occurred then over nearly all its range, from Ontario to Pennsylvania and from Maine to Michigan. It was all the more marked coming, as it did,

after a year of plenty. Grouse were reported as more abundant than usual at the close of the shooting season of 1906 throughout most of their range in the east. Soon after the shooting season of 1907 opened, complaints of a scarcity of birds began to come in and soon it became evident that some unusual calamity had overtaken them. I had been much in the field during the spring and summer of 1907, and had noted that very few young birds were reared in the region with which I was familiar. An investigation showed that a similar condition was widespread. Sportsmen's journals began to publish communications showing that few Grouse were reared in New England, New York, Long Island, New Jersey and Pennsylvania, in New Brunswick and other provinces, and as far west even as Minnesota.

While investigating the cause of this dearth of Grouse I went to Albany, where I met Mr. E. Seymour Woodruff of the Forest, Fish and Game Commission of New York, and found that he was engaged in a similar investigation. He kindly gave me a copy of his conclusions, which he since has published. In brief, his conclusions, supplemented by my own, are as follows: During the winter of 1906-07 a great flight of Goshawks appeared in the northern and eastern States. They usually winter farther north, and may have been driven south by an unusual scarcity of hares or Ptarmigan, on which they feed in the fur countries. Finding Grouse plentiful here, they lived largely upon them. Twenty-eight out of forty-eight of these Hawks, dissected by Angell & Cash, the Providence, R. I., taxidermists, were found to have the flesh of Ruffed Grouse in their stomachs. Mr. C. A. Clark of Lynn, Mass., states that he saw a pair of Goshawks near his place one of which had a Grouse in its claws, and from the feathers and signs on the snow he read the story of the destruction of thirteen Grouse by Goshawks in his neighborhood. Many observers in other States saw these Hawks and found them killing Grouse during that season, from late October to March. These Hawks must have destroyed a very large number of Grouse, all of which were full-grown birds, most of which probably would have bred the succeeding spring had they lived and found mates.

Such a flight of Goshawks is very unusual in this region; and, so far as I can learn, this is the greatest flight of these birds on record.

Following this disaster to the Grouse, came a very cold, backward spring, with cold rains and late frosts. The weather conditions in New England in April were more like those that usually prevail in March. May was very cold and backward, with snow in the country about Boston on the 11th. New York had the coldest April since the climatological service was established; in New England and in Pennsylvania the average April temperature was the lowest for eighteen years; in New Jersey it was the lowest for thirty-one years, and in Michigan it was the lowest since 1874. Exceptionally cool weather in May was followed by unseasonable weather during the first half of June, with killing frosts in many localities.

All poultrymen know that a hard winter with much snow, so that fowls cannot get the usual amount of exercise, followed by a cold backward spring, with its lack of insect life and green food, will render the stock less vigorous. There will be fewer fertile eggs and more weak chickens than after a mild winter; and many chickens will be too weak to withstand such adverse conditions.

In the spring of 1907 Grouse were in a similar condition. Exhausted by the hard winter, they found the season late and cold, and much of their usual insect and vegetable food wanting. If the females left their nests long enough to get a liberal supply of food the eggs probably were chilled. If they remained constantly on the nests they died from exhaustion, starvation and cold or disease, as sitting hens often do. Very many deserted nests were found with the eggs unhatched, — some addled, others frozen, — and some female birds were found dead on their nests. In many cases some of the eggs hatched; but the young disappeared later.¹ Probably many of these birds were weak when hatched, and like feeble chickens they soon succumbed to wet, cold, disease or the attacks of insects. Wood ticks were noted as prevalent in many localities. These

¹ In Rhode Island many broods were late in hatching, and the young had fine weather during the latter part of June; but most of them never reached maturity.

ticks bury themselves in the heads of the young birds and weaken or kill them. Foxes were reported as unusually numerous, and many hunters believed that they caught the young birds; a few claim to have seen the fox in the act.

When the shooting season opened, it was discovered that nearly all the birds killed by hunters were adults, and that most of them were males. This was the case throughout most of the region affected. Dr. F. H. Saunders of Westfield writes me that in 1906, when the birds were plentiful, ninety per cent. of those killed in his region were old cocks, and that in 1907 about seventy-five per cent. were cocks, but that in 1908 the sexes were about equal.

I have not heard of such a disparity of the sexes elsewhere in 1906, but it was commonly noted in 1907. This may be accounted for by the fact that in this species the male does not assist the female in nest building, incubation or the care of the young, hence he is care-free and can take food at any time, seek shelter during storms and keep in better condition than the female, who is exposed to storms and is deprived of sufficient food. If, by reason of unseasonable weather, she was obliged to stay constantly on the nest until weakened by starvation and exposure, she fell an easy prey to disease or to her enemies. We know that the female of this species is very devoted to her eggs and young, and is loath to leave them until fairly forced to do so. It is said to be a fact well known to all gamekeepers, that an excess of male gallinaceous birds prevents successful breeding, as the unmated cocks constantly persecute the sitting hens, and prevent them from nesting and rearing young.

We have no means of knowing what part disease played in the destruction of the females and young; but judging from their weakened condition and from the number of apparently diseased birds, both old and young, reported as found dead in the woods, it seems probable that disease was responsible to some extent for the decrease, at least locally. Many young birds died when two-thirds grown, and many that were found dead seemed to have died from an enteric disease similar to the "blackhead" of Turkeys (see page 540). In one place one

old bird and thirteen young were found. In another, seven young birds were found.

In the early part of the last century the Grouse of England and Scotland were swept away by an attack of the "grouse disease." The Bob-whites on a large preserve in North Carolina were nearly exterminated in 1907 by a disease that was introduced among them by the importation of Bob-whites from Alabama. If some such disease appeared among our Grouse in 1907 it probably was a secondary and more or less local cause of their destruction, the prime cause being the unfavorable breeding season following a hard winter. This unfavorable season and the flight of Goshawks are the only adverse conditions known to have been prevalent over most of the great area in which the destruction of the birds was apparent.

Grouse did not breed well in many localities in 1908, and although they have increased quite generally in number since then, they are uncommon or rare still in many localities. Such a combination of adverse conditions as obtained in 1906-07 probably happens rarely, but it is likely to occur again at any time.

We must seek some other cause for the general and continued diminution of the species during the past thirty years. One hundred and six of my correspondents attribute it largely to the increase of gunners, and since most of them are gunners themselves, and know whereof they speak, we must concede that they are right, but many of them believe that illegal hunting and snaring are responsible for the decrease.

I have written much on the habits of this Grouse in *Useful Birds and their Protection*; its conservation is considered in Part III of this volume.

NOTE. — The Willow Ptarmigan or Willow Grouse, a bird of the arctic and subarctic wilderness, is accidental in New England and New York. One was taken in Manchester, Essex County, Mass., May 10, 1859;¹ another was collected in Watson, Lewis County, N. Y., on May 22, 1876, by Romeyn B. Hough;² and still another at Kenduskeag, Penobscot County, Me., April 23, 1892.³

¹ Coues, Elliott: Proc. Essex Inst., 1863, Vol. V, p. 289.

² Coues, Elliott: Bull. Nuttall Orn. Club, 1878, p. 41.

³ Merrill, Harry: Auk, 1892, p. 300.

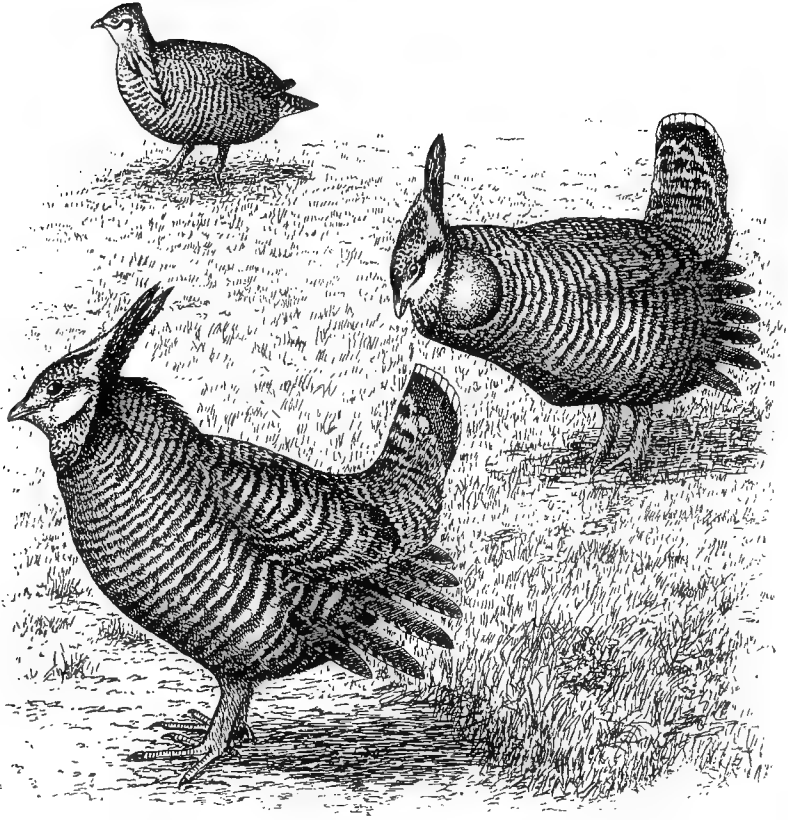


PLATE XI.—THE HEATH HEN.

Once abundant in southern New England, New York and the Middle States; now extinct, except on the island of Martha's Vineyard, Mass. Upper figure, female. Middle figure, male, tooting. Lower figure, male, strutting.

(Drawn by W. I. Beecroft. From photographs of the living birds taken by Dr. George W. Field.)

HEATH HEN (*Tympanuchus cupido*).

Length. — About 18 inches; legs feathered to toes.

Adult Male. — Above light reddish brown, barred with black and buff; under parts rusty white, barred with brown; chin, throat, cheeks and line over eye buffy; sides of neck with tufts of less than ten stiff, rather long black feathers, obtusely pointed; tail grayish brown, without bars, except a whitish tip; large orange air sacs on each side of neck and a small orange comb over each eye.

Adult Female. — Similar, neck tufts shorter; tail barred with buff or light brown.

Field Marks. — Size of Ruffed Grouse, with shorter tail, and plumage generally barred.

Notes. — Male, a peculiar toot, repeated, resembling the whistle of a distant tugboat in a fog; a laughing cackle given in the mating season; a peculiar short crow and a startled clucking when alarmed (Field). Female, a hen-like cluck and a low call, resembling that of a hen calling her young.

Nest. — On ground.

Eggs. — Drab, unmarked, about 1.65 by 1.35.

Season. — Resident the entire year.

Range. — Island of Martha's Vineyard, Mass.; formerly, suitable portions of southern New England, New York and the middle States.

HISTORY.

The eastern Pinnated Grouse or Heath Hen formerly was distributed along the Atlantic seaboard from Cape Ann, Mass., to Virginia, and especially was abundant in suitable regions in Massachusetts, Connecticut, Long Island, New York and New Jersey. Belknap (1792) said that it was rare in New Hampshire, and Audubon (1835) asserted that it was met with in his day on Mt. Desert Island and near Mar's Hill in Maine, where it was confused with the Willow Grouse. I find no other references to the species northward or eastward of Massachusetts. Many early American writers speak of this bird, and it is designated by some of them as the "grouse," "pheasant," "Heathcocke" or "Heath Hen." Thomas Morton in his *New English Canaan* (1632) says of the "pheasants" that they are formed like the Pheasant Hen of England, and that they are delicate meat, "yet we seldome bestowe a shoote at them." Wood in his *New Englands Prospect* (1629-34) says, "Heathcockes and Partridges bee common; hee that is a husband,

and will be stirring betime, may kill halfe a dozen in a morning." Nuttall (1834) states that according to Governor Winthrop this Grouse formerly was so abundant on the bushy plains in the neighborhood of Boston that laborers and servants stipulated in agreements with their masters that they should not have it "brought to table oftener than a few times in the week."

As the Heath Hen is not primarily a forest bird, the settlement of the land and the clearing away of the forests favored its increase, and had it been properly protected it might have been plentiful now in southern New England; but this was not to be. In early times it probably was confined mainly to the more open lands along the coast and to the river valleys; but the settlers cleared land and sowed grain and grass, thereby adding largely to its feeding grounds and increasing the supply of seeds and insects. This naturally would have increased the numbers of the species; but it was pursued, trapped and shot at all seasons; the young were destroyed by dogs and cats, and thus the Heath Hens soon were reduced in numbers and driven to dense thickets which hunters and dogs found it difficult to penetrate. In such regions this Grouse persisted in considerable numbers until the nineteenth century. It never has been adequately protected by law until recent years, for, although some States passed laws for its protection, such laws rarely were enforced. Nuttall (1834) asserts that it is still met with in New Jersey, Long Island, Martha's Vineyard and at Westford, Conn. Peabody (1839) states that it is found in Massachusetts only on Martha's Vineyard and one small island near it, and the same year Lewis rated it as "very rare and almost extinct in the northern and middle states; but within a few years quite abundant in portions of Long Island. . . . A few," he says, "are still found on the Jersey Plains," and "every year we hear of the extermination of a small pack." Giraud states (1844) that on Long Island it is very nearly if not quite extinct, and that occasionally it is seen near Schooly's Mountains, New Jersey, and in Pennsylvania and Kentucky. According to William Dutcher the last specimen recorded from New York was killed in the Comac

Hills in 1836. Turnbull (1869) says, "It is now very rare; a few are still met with in Munroe and Northampton Counties, Pa.; within the last year or two it has been found on the Jersey plains."

The Heath Hen seems to have been exterminated earlier in the neighborhood of Boston than elsewhere; but Brewster quoting notes of a conversation with Mrs. Eliza Cabot, states that the assertion is made that Mrs. Cabot saw a "prairie grouse" in Newton in her youth (probably about the beginning of the nineteenth century), and another (on Cape Cod), after her marriage (probably about 1812). Judd, in his history of Hadley, quotes the statement of Levi Moody of Granby to the effect that the Heath Hen had not been seen on the plains of Springfield for about fifty years. This would fix the date of its disappearance from that part of the Connecticut valley at about 1812 or 1813. Dr. Timothy Dwight published the statement in 1821 that the Grouse was no longer common in New England. Between that date and 1840 it disappeared from the mainland of Massachusetts. Audubon (1835) quotes Mr. David Eckley, who says that "fifteen or twenty years ago" it was common to see as many Heath Hens in a day on Martha's Vineyard "as we now see in a week." The Heath Hen was introduced by the Forbes family on the island of Naushon, where it was not native, and it soon disappeared. About 1888 Mr. E. H. Thompson told me that he had seen the species in his early days at Falmouth, on the mainland, and that his father killed two, which were preserved and presented to Col. E. B. Stoddard of Worcester, Mass. Mr. William Brewster, however, believes that these birds were introduced Prairie Chickens. In 1876 Minot asserted that the Heath Hen was found no more on Naushon and probably was extinct on Martha's Vineyard. Subsequent inquiry proved that it was still extant. In 1877 foxes and raccoons were introduced on the island and probably helped to reduce the numbers of the Heath Hen. Brewster estimated in 1890 that there were from one hundred and twenty to two hundred birds on Martha's Vineyard left over from the previous winter. Mr. C. E. Hoyle asserts that in 1892-93 men who had watched the birds closely stated that

they had decreased seventy-five per cent. during the previous few years. Since then the species narrowly has escaped extinction. In 1894 a fire swept over practically all the breeding grounds, and Mr. Hoyle states that in the fall of that year he spent two weeks going over the ground, and found the skeletons of many birds destroyed in the fire; that where he had started a hundred birds the previous fall, he failed to start five. He says that in 1897 he again went over the ground with a good bird dog and did not start a bird. Since then the foxes and raccoons are believed to have been exterminated. In 1902 three specimens of the Prairie Chicken (*Tympanuchus americanus americanus*) were liberated on Martha's Vineyard, but whether or not they survived is not known. A fire swept over the breeding grounds in 1906 and very few birds were reared that year; but, under protection, the birds have increased slowly. On May 2, 1907, the Commissioners on Fisheries and Game could find only twenty-one birds on the island. On January 11, 1908, the number was between forty-five and sixty.

The exceptional conditions on the island, which have been partly responsible for the preservation of the Heath Hen, are: (1) its isolation, the island having no railroads and no trolley line into the interior; (2) the ground inhabited mainly by the Heath Hen is very sparsely settled; (3) wolves, foxes, raccoons, lynxes and other natural enemies, except cats, are extirpated or rare on the island, and a bounty is paid on bird Hawks by the county commissioners; (4) the soil, vegetation and cover are exactly suited to the bird; (5) the snowfall on the island is light; (6) there is some local pride in preserving the Heath Hen. It would thrive wherever such conditions existed if it were undisturbed by poachers, but unfortunately as it grew rarer its skins and eggs were sought by museums and collectors, and this furnished an added incentive to the hunters, a few of whom I am assured still shoot the birds wherever they can find them regardless of law or any other consideration.

The history of legislation to protect the Heath Hen is interesting. I have found no record of any laws or regulations regarding it in any town or city, or in the Commonwealth

generally, until 1831, when it had become very rare if not extinct on the mainland. Then the Legislature passed a special act to protect it *during the breeding season only*, from March 1 to September 1, with a penalty of *only two dollars*. Under this act the Heath Hen had been nearly, or quite, exterminated from the mainland, when in 1837 a close season of four years was declared, with a penalty of two dollars and a forfeit of the same sum to the landowner. This close season was extended five years more in 1841, but these acts permitted any town to suspend the law within its own limits by vote of any regularly called town meeting. Some towns took advantage of this, *thus nullifying the law in the only towns where the birds still existed*. On May 6, 1842, for example, the Tisbury town meeting voted to allow the townspeople (hunting without dogs) to take, kill or sell Grouse or Heath Hens from December 1 to December 10. In 1844 the close season was extended for five years more; but the birds evidently had decreased in their last stronghold on Martha's Vineyard, for on April 1, 1850, the town of Tisbury voted to suspend the law so as to allow hunting only on the "12th and 13th of November next." In 1855 all protection was removed, but for five years the Heath Hen existed without it. In 1860 it was protected again by law at all times; but in 1870 the period of protection was limited to five years. Thus, under periodical juggling of the statutes, the species managed to exist, protected most of the time until the year 1907, when Mr. John E. Howland of Vineyard Haven, finding it in imminent danger of extinction, agitated the question of establishing a Heath Hen reservation. Owing to the cordial and energetic co-operation of Dr. George W. Field, chairman of the Massachusetts Commission on Fisheries and Game, a protector was located in the breeding grounds of the birds. Dr. Field secured contributions from public-spirited citizens for the purchase of land for a reservation. The towns of Tisbury and West Tisbury contributed to the good work and the sum of \$2,420 was collected. A bill was introduced into the Legislature by Representative Mayhew of Martha's Vineyard, placing under the control of the Commissioners on Fisheries and Game such lands as might be leased, given or

otherwise acquired for the purpose, and authorizing the commissioners to take not more than one thousand acres in the name of the Commonwealth. The bill was advocated by the Audubon Societies and sportsmen's organizations, and was passed with an appropriation of two thousand dollars for carrying out its provisions. The commissioners soon secured sixteen hundred acres, by donation and purchase, which has now (1911) been increased to over two thousand. Fire stops were made, the birds were guarded carefully and fed, and by the year 1909 they had increased in number to about two hundred. They then began to wander over the island, encroaching on the farms of the different towns, and from that time to the present their numbers have not increased much. This check to their increase, I believe, is in part owing to a large number of Marsh Hawks, which apparently were feeding on the young in 1909; in part to poaching by law-breaking gunners, and in part to both wild and domesticated house cats, which are known to be very destructive to the young Heath Hens.

The history of the Heath Hen in Massachusetts shows clearly the ineffectiveness of partial and belated legislation, and the effectiveness of the reservation plan, backed by law enforcement, to save a species in imminent danger of extinction. If we expect to preserve the Heath Hen and increase its numbers, however, we must do very much more than we have yet done to that end. More wardens or gamekeepers must be employed; other State reservations must be secured, and the birds introduced and protected upon them until it becomes possible to exchange birds between different localities and thus add new vigor to the breeding stock. All the money expended by the State authorities in rearing Pheasants and other foreign game birds might far better have been used in re-establishing this hardy native game bird in its original haunts from Cape Cod to the Connecticut valley.

The Heath Hen belongs to this country. It has been fitted by the natural selection of centuries to maintain itself abundantly in southern New England. It is superior in every way to any foreign game bird that we are likely to introduce.

As the forests are cut off and the land thus unfitted for the Ruffed Grouse it becomes better fitted for the Heath Hen. Why have we so long neglected the opportunity to propagate and multiply this indigenous species? The survival of the Heath Hen upon the island of Martha's Vineyard, after it has been extirpated elsewhere, leaves its fate in the hands of the people of Massachusetts. Let us hope that they will accept this trust and spare no pains to preserve this noble game bird and restore it to its former range.

This eastern Grouse was not distinguished from the western Pinnated Grouse or Prairie Chicken until 1885, when Brewster described and named the eastern form from specimens taken on Martha's Vineyard. Some authors appear to regard the Heath Hen as a woodland bird, but I have found it pre-eminently a bird of almost treeless or bushy plains, although it is seen occasionally in the woods. The experience of most observers agree with my own. To-day on Martha's Vineyard it is mainly an inhabitant of open lands and shrubby growths. It is not partial to heavy timber or pine coverts, such as the Ruffed Grouse prefers, but frequents dry, sandy or gravelly lands, covered by low-growing vegetation. It sometimes goes to the more sheltered portions of the oak groves during late autumn and in winter, after heavy snowfalls, for the sake of the acorns that it finds there. The region which it now mainly inhabits on Martha's Vineyard (some forty square miles) has been stripped of most of its timber by fire and the axe. This tract is more or less surrounded by, and occasionally interspersed with, farms or cleared lands. The soil is chiefly sandy and dry, and generally rather level, with some low rolling hills and low ridges. Oaks of several species, bayberry, dwarf sumac and other shrubby vegetation (all more or less dwarfed) are characteristic of its chosen haunts; and small pitch pines are scattered over the plains. The Heath Hen formerly inhabited somewhat similar "barrens" on Long Island and in New Jersey. It also frequents grass fields and open cultivated lands. It is an adept at concealment in such situations, and in case of danger the members of a flock will squat so closely, with heads and necks drawn in or stretched along the ground, that

it is almost impossible to distinguish them. In fall and winter they gather into bands containing twenty-five or more birds. In the fall of 1910 I saw a flock of more than fifty individuals. When flushed they do not rise high, but often fly half a mile or more, sometimes wheeling and quartering, until they have chosen a place to alight. In flight the wings are beaten rapidly and then set while the bird sails. This alternate fluttering and sailing is continued somewhat after the fashion of the flight of a Meadowlark. I am told by natives of the island that individuals or flocks fly several miles, at times going from one township to another, and that in winter they sometimes alight and plume themselves on the roofs of isolated farmhouses, as the Prairie Chicken was wont to do of old. In early spring the males indulge in their peculiar antics. At daybreak many males meet at certain places that they seem to choose for their dancing grounds, where they run, jump and flop about, cackle, blow and toot until the sun gets high, when they fly away. Sometimes two males engaged in this performance run toward each other, dancing and blowing as they go, but on approaching quite close they squat, and remain motionless from two to five minutes. Sometimes they fight a little, but usually expend most of their energy in puffing and blowing, or "tooting." The sound produced is described by Dr. Field as like that made by the distant whistles of tugboats in a fog, but all on the same pitch. Each call extends over a period of two seconds. The bird first runs forward about three feet, with short, mincing steps, and then sounds its call. It raises its tail erect, spreads it, lowers its wings a trifle, leans forward, erects the peculiar pinnates or "neck wings" above its head in the form of a V, and inflates the peculiar orange-colored air sacs on the neck to the size of a small orange (as shown in the plate facing page 385). The tooting seems to be produced by the inflation of the air sacs, after which the air is expelled suddenly. Audubon, however, believed that the sound was made by expelling the air, and he found that the bird was unable to toot after these sacs had been punctured by a pin. Another call, according to Dr. Field, resembles a single syllable of the hoot of a Barred Owl.

The Hens build their nests on the plain among the scrub oaks. The young leave the nest soon after they are hatched and the mother broods them beneath her wings wherever night overtakes them. During the heat of the day in warm weather these birds appear to delight in "dusting" in the sandy roads, in ploughed land or wherever they find dry earth. All gallinaceous birds have this habit, but the Heath Hen seems to be particularly addicted to it as a means of ridding itself of vermin. So far as is known, however, the dust bath seems to be the only bath that it takes, for it avoids water and does not appear to drink or bathe in the brooks. Apparently it gets water only from rain or dewdrops which it drinks from the vegetation.

The food of the Heath Hen in summer consists largely of insects, such as grasshoppers, crickets and beetles, also spiders and worms; the leaves of low-growing plants, such as sorrel and clover, and berries, including wild strawberries, blueberries and the partridge berry, of which it is very fond; cranberries and their leaves, and the leaves of various other plants; the seeds of weeds, grasses and other low-growing plants, and acorns. In winter and early spring, acorns, buds, green leaves, bayberries and sumac berries form a part of the food. During severe winter weather it eats even the buds of cone-bearing trees. Occasionally it does some injury to crops of peas, and it sometimes attacks corn in the shock, and also newly sown grain, but it is useful as an insect destroyer, seeking freshly ploughed lands at morning and evening for the insects and worms to be found there.

PIGEONS AND DOVES.

The Pigeons and Doves (family *Columbidæ*) are represented now in New England by but one species, and this, the Mourning Dove, is placed by Sharpe and other British authorities in a separate family (*Peristeridæ*), which includes the Ground Doves and their allies. The general characteristics of the Doves and Pigeons are well known, as exemplified in the domesticated birds. The differences in plumage between our

only remaining wild species and the Passenger Pigeon (now probably extinct), will be seen by comparing their descriptions, and the figures on Plate XIX, facing page 460.

MOURNING DOVE (*Zenaidura macroura carolinensis*).

Common or local names: Turtle Dove; Wild Dove; "Wild Pigeon."

Length. — 11 to nearly 13 inches.

Adult Male. — Above mainly light grayish brown, shaded with olive and turning to bluish on wings and tail, which show blue when spread; forehead, sides of head and neck pale pinkish brown; sides of neck also iridescent with reddish, golden and greenish reflections; hind head and neck bluish; a black spot below ear and a few black spots on shoulder and wing; tail, particularly middle feathers, elongated and rather pointed, all except middle tail feathers bluish with a black subterminal bar and a white tip; chin pale yellowish or whitish; breast pale reddish brown, sometimes purplish, lightening to yellowish or whitish on belly and under tail coverts; legs and feet coral red seamed with white.

Adult Female. — Similar, but smaller, duller and tail shorter.

Young. — Similar to female, but tail shorter; feathers light-edged.

Field Marks. — Much smaller than the Passenger Pigeon, but generally mistaken for it; may be distinguished by the lighter and more brownish tone of its plumage. The Passenger Pigeon is darker and more blue, and the male has a redder breast; the black spot on the side of neck is distinctive of the Mourning Dove and lacking in the Passenger Pigeon. The Mourning Dove makes a whistling noise as it rises, which the Pigeon never made.

Nest. — A frail platform of twigs or straws, usually at a moderate height, in a tree, rarely on rocks, stumps or the ground.

Eggs. — Two, rarely three or four, white, usually about 1.08 by .80.

Season. — March to December; may winter sometimes in New York.

Range. — North America. Breeds chiefly in Sonoran and Lower Transition zones from British Columbia, Saskatchewan, Manitoba, Ontario and southern Nova Scotia south throughout the United States and Mexico, and locally in Lower California and Guatemala; winters from southern Oregon, southern Colorado, the Ohio valley and North Carolina to Panama; casual in winter in middle States.

HISTORY.

The familiar pensive moan of the Mourning Dove has in it a quality of sadness that is almost "akin to pain," and yet it is a soothing and attractive call, for it is the love note of the male cooing to his mate. Happily it may be heard still in

the groves of New England, where the voice of the Passenger Pigeon has so long been silent.

There is some evidence in old chronicles that the "Turtle Dove" was once abundant in New England, but it is so frequently confused with the Passenger Pigeon that nothing of any value can be deduced from these old accounts. Even today the same confusion regarding the two species exists in the minds of the people, and the Mourning Dove is now known as the "Wild Pigeon" in sections of southern New England. Within my recollection this Dove has decreased in numbers in many parts of Massachusetts. Fifty-nine of my correspondents reported in 1908 that it had been decreasing for years, but since the law protecting it at all times was passed in 1908, it evidently has increased in a portion of the Connecticut valley and on some parts of Cape Cod. Thirty-three observers noted such an increase.

The Mourning Dove is somewhat widely, though rather locally, distributed through southern New England and New York, but is rare or wanting at elevations above one thousand feet, and in the northern portions of the region. It is a social species, assembling sometimes in large flocks, but I have never seen more than twelve together in Massachusetts, although others have been more fortunate. The Dove is quite prolific though ordinarily it lays but two eggs in a set. It has two or more broods, and eggs may be found in the nest from May to September. The nest is so frail and so carelessly built that it seems as though the slightest blow would scatter it. The twittering or whistling sound that this bird makes as it rises from the ground appears to come from the wings; but once I distinctly heard a Dove make this sound while sitting on a branch with its wings motionless.

The Mourning Dove is fond of small grains, particularly of buckwheat. It sometimes does some injury to newly sown grain fields, but is very destructive to weed seeds. Eaton says that he took several thousand seeds of foxtail or pigeon grass from the crop of a Dove which he shot from a flock of thirty which were flying from an oat field. He computes that the members of this flock had just picked up about two quarts of

weed seeds from that field of oats, or elsewhere, for their afternoon meal. It is evident that Doves feeding on the newly sown fields may do more good by destroying weed seed than harm by eating grain. Prof. F. E. L. Beal of the Biological Survey reports that nine thousand two hundred seeds of common weeds were found in the stomach and crop of a Mourning Dove; he found seven thousand five hundred seeds of the yellow wood sorrel (*Oxalis strictor*) in another stomach and six thousand four hundred seeds of barn grass in another. The examination of the contents of two hundred and thirty-seven stomachs showed over ninety-nine per cent. of vegetable food. Small grains were found in one hundred and fifty of the stomachs, and constituted thirty-two per cent. of the food contents; but three-fourths of this was waste grain picked up from the ground after harvest, or from the roads or stockyards. The principal and almost constant diet is weed seed, which constitutes sixty-four per cent. of the annual food supply. These seeds vary in size from the largest to the most minute; some are so small as to seem beneath the notice of so large a bird as the Dove. This useful bird should be protected at all times in New England.

NOTE. — A specimen of the little Ground Dove (*Columbigallina passerina terrestris*) was taken by Dr. George Bird Grinnell in October, 1862, near New York City, and was identified by J. W. Audubon. Dr. Grinnell states that he saw another in New York possibly twelve years later.¹ So far as I am aware this southern species has never been noted in New England.

¹ Eaton, E. H.: Birds of New York, Memoir 12, New York State Museum, 1910, pp. 389, 390.

PART II.

A HISTORY OF THE GAME BIRDS AND OTHER
BIRDS HUNTED FOR FOOD OR SPORT,
WHICH HAVE BEEN DRIVEN OUT OF
MASSACHUSETTS AND ADJACENT
STATES, OR EXTERMINATED,
SINCE THE SETTLEMENT
OF THE COUNTRY.

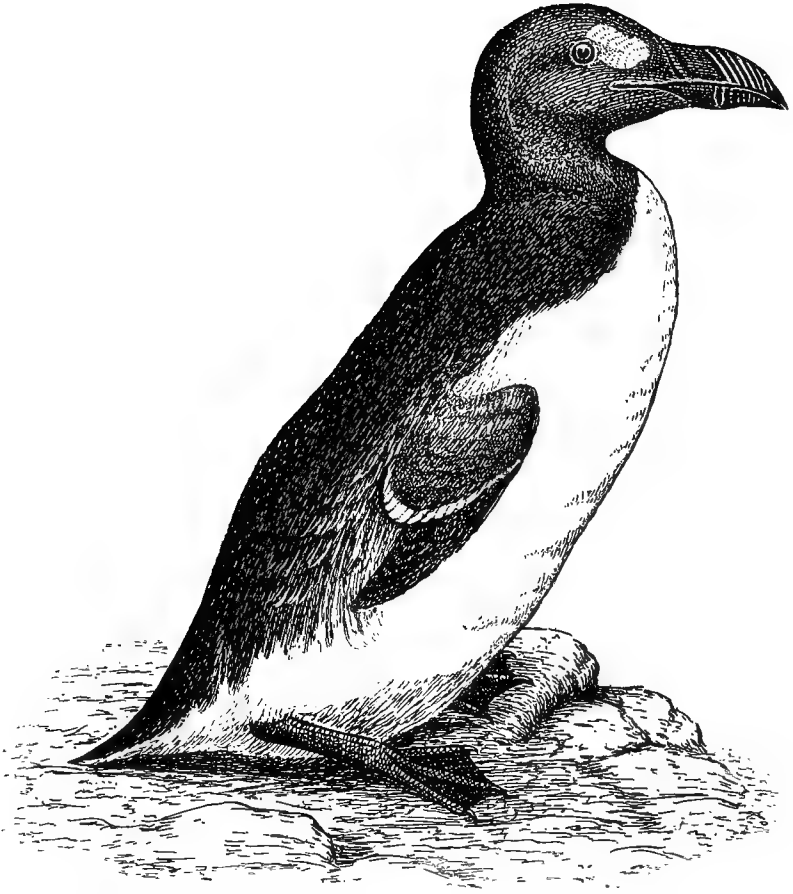


PLATE XII.—GREAT AUK.

Once probably an abundant summer resident on the New England coast ; now extinct.

PART II.

SPECIES EXTINCT OR EXTIRPATED.

Those species of Massachusetts birds which formerly were important as a source of food supply, and which have become extinct since the settlement of the State, or which have been extirpated within its borders since the Pilgrim fathers landed at Plymouth, are of primary importance in a work of this kind, because the history of their extirpation will throw light on the dangers that menace all birds which are killed for food or sport.

Naturalists regard a species as extinct only when it has disappeared from the earth; but a bird may be extirpated or rooted out from one State or country, while it still exists in others. The history of the extinct species is here given first, and that of the extirpated species follow.

EXTINCT SPECIES.

THE GREAT AUK (*Plautus impennis*).

Common or local names: Penguin, Wobble or Garefowl.

Length. — About 30 inches; wing, 6; tail, 3.

Adult. — Blackish above; large white patch before the eye; white wing-bar along the tips of secondaries; sides of throat and neck dark brown; rest of under parts white.

Eggs. — Laid on ground or rock. Pyriform-ovate; pale olive or buff, marked with brown or black, in patterns like those of the Razor-billed Auk; measuring about 3 by 5.

Season. — Formerly in Massachusetts waters throughout the year.

Range. — In Europe, from the British Isles north to Iceland; in America, from the southern part of the east coast of Greenland to northern Florida.

HISTORY.

Very little is known about the migrations of this bird in America. I have seen no record of the occurrence of the species at sea beyond soundings; but if it passed in migration

from Greenland to Iceland, or from Greenland to the North American continent, it must have crossed the open sea. It may seem improbable that a flightless bird could swim in one season from Labrador to Florida and back; but fish make similar migrations, and the Auk was a faster swimmer than the fish on which it fed. When we read that a boat propelled by six oars was unable to overtake an Auk, and that the bird finally escaped its would-be captors, the performance of this long migration appears not improbable. It seems possible also that the species may have had one or more breeding places in Massachusetts. Birds bred here would not have had to journey more than twelve hundred miles to reach northern Florida.

The Great Auk was not a bird of the arctic regions. There is no record of its occurrence within the arctic circle. It is believed to have lived in Greenland at a time when the climate there was much milder than it is to-day, but not within the last three hundred years. It inhabited the temperate zone. It probably never bred in any numbers on the mainland of Europe. Being flightless, it was obliged to seek outlying reef-environed islands, where it would not often be endangered by man or predatory animals. It may have lived in prehistoric times off the coast of Denmark, as its bones have been found in Danish as well as in Scotch shell-mounds, and one instance of the supposed occurrence of the living bird in Denmark has been recorded.¹

It is believed to have occurred in considerable numbers about seaward portions of the British Isles, also; but it was extirpated from Great Britain and the continent so long ago that few records of its presence remain. Within a century it frequented St. Kilda, possibly Shetland, Faroe, the three Garefowl rocks off the southern coast of Iceland, and a few other isolated isles. It suffered continual persecution on its nesting grounds. The last specimen recorded at St. Kilda was killed in 1821; and the last at Eldey, off Iceland, in 1844. This may have been the last living Great Auk.

The history of the bird along the Atlantic coast of the

¹ Grieve, Symington: *The Great Auk or Garefowl*, London, 1855, p. 27.

North American continent, so far as its relations to civilized man were concerned, began in 1497 or 1498, when the adventurous French fishermen commenced fishing on the banks of Newfoundland. Until that time the Auks, breeding as they were on outlying reef-guarded islands, were comparatively safe from man's interference, for the Indians found a plentiful supply of other birds along the coast, and did not often dare the dangers of these remote and rocky islands in their frail canoes; but the hardy fishermen, coming in from the sea, immediately sought the bird islands for a supply of fresh eggs and meat. At that time these birds were so plentiful that it was unnecessary to provision the vessels, for the fleet could secure all the fresh meat and eggs wanted, without visibly affecting the supply.

The first available record of a breeding place of the Great Auk in America is that given by Jacques Cartier (first voyage to Newfoundland, 1534). He writes: "Upon the 21 of May the winde being in the West, we hoised saile and sailed toward North and by East from the cape of Buona Vista until we came to the Island of Birds, which was environed about with a banke of ice, but broken and crackt: notwithstanding the sayd banke, our two boats went thither to take in some birds, whereof there is such plenty, that unlesse a man did see them, he would thinke it an incredible thing: for albeit the Island (which containeth about a league in circuit) be so full of them, that they seeme to have been brought thither, and sowed for the nonce, yet are there an hundred folde as many hovering about it as within; some of the which are as big as jayes, blacke and white, with beaks like unto crowes: they lie alwayes upon the sea; they cannot fie very high, because their wings are so little, and no bigger than halfe ones hand, yet they do fie as swiftly as any birds of the aire levell to the water; they are also exceeding fat; we named them Aponath. In lesse than halfe an houre we filled two boats full of them, as if they had bene with stones: so that besides them which we did eat fresh, every ship did powder and salt five or sixe barreles full of them."¹ This evi-

¹ Burrage, Henry S., ed.: *Early English and French Voyages*, Am. Hist. Asso., 1906, p. 5.

dently refers to the Great Auk, although there are some discrepancies in the account, which may have been due in part to lapse of memory and in part to the translator; a later passage evidently refers to Murres, Razor-billed Auks and Gannets. Funk Island, apparently the location referred to, was probably the principal breeding place of the Great Auk in America, situated some thirty miles off the northeast coast of Newfoundland. Cartier also gives evidence of having met with the Great Auk in large numbers, at the Bird Rocks in the Gulf of St. Lawrence on May 25, 1534;¹ but there seems to be no other record of the occurrence of this bird at those islands. In 1535 he again called at Funk Island. In his account he gives its latitude and longitude, and says: "This Island is so full of birds, that all might easily have bene fraighted with them, and yet for the great number that there is, it would not seeme that any were taken away. We, to victuall ourselves, filled two boats of them."²

In 1536 Capt. Robert Hore records another "Penguin Island" to the southward of Newfoundland. From the course steered from Cape Breton, the island must have been Penguin Island, off Cape La Hume.³

Evidently the bird became known very early among the fishermen and fowlers as the Penguin (French *Pingouin*). Professor Newton says that he considers it probable that this name might have been derived from Pinwing, a name until recent years used in Newfoundland, and denoting a pinioned or flightless bird. The name "Penguin" appears to have been applied originally to the Great Auk, and later to the group of birds in the southern hemisphere now known as Penguins. There are several islands known as Penguin islands near Newfoundland, one in particular off Cape Freels, on the eastern coast.⁴

Anthonie Parkhurst, writing in 1578, speaks of "one island

¹ Burrage, Henry S., ed.: Early English and French Voyages, Am. Hist. Asso., 1906, p. 13.

² *Ibid.*, p. 38.

³ *Ibid.*, p. 107.

⁴ In Hakluyt's Voyages, third volume, there is a statement made by Sir George Peckham, in his account of Sir Humphrey Gilbert's voyage to Newfoundland, which gives credit to Madock ap Owen Gwyneth for the discovery, and naming of "Penguin Island" in "the yeere of our Lord God 1170." If this is founded on fact, the Welshman long antedated Columbus, and the name Penguin may be of Welsh origin.

named Penguin where wee may drive them [Great Auks] on a planke into our ship as many as shall lade her."¹

Capt. Edward Haies, in his narrative of the "Voyage of Sir Humphrey Gilbert," in 1583, states that the French fishermen about Newfoundland carried little provisions, but depended on the flesh of the "Penguin," which they salted.²

In 1593 Richard Fisher speaks of "Pengwyns" seen at Cape Breton during the "Voyage of the ship called Marigold."³

In Archer's account of Gosnold's voyage to Cape Cod, in the *spring* and *summer* of 1602, "Penguins" are mentioned as among the birds seen and taken. Penguins were seen south of Cape Cod on the shoals between Monomoy and Nantucket.

Champlain, in 1604, found another island well stocked with Great Auks, situated near the shore of the southwest end of the peninsula of Nova Scotia, which seems to have been overlooked by the historians of this bird.⁴ This was in May, and possibly the birds may have bred there. These are evidently the Tusket or Tousquet Islands, off Pubnico Head, ten or twelve miles from where the wharves of Yarmouth are now situated, and nearly in the latitude of Portland, Me. This leads us to the statement of John Josselyn, who was located at Black Point (Scarborough, near Portland, Me.). He mentions the occurrence of the Great Auk, or "Wobble," as he calls it, in the spring. His *New England's Rarities Discovered* was published in 1672.

During all this time the slaughter of the Auks went on at all the islands frequented by them. At first they were killed by the fishermen, — mainly for their flesh. Later, this great and apparently inexhaustible source of food supply was used as a bait to lure colonists to Newfoundland; and for years the islands were visited by settlers, and the birds killed and salted for winter use. It was in 1622 that Sir Richard Whitbourne published his oft-quoted dictum regarding the bird, — that "God made the innocency of so poor a creature to become an admirable instrument for the sustenation of man."

¹ Hakluyt's *Voyages*, 1600, Vol. III, p. 133.

² *Ibid.*, pp. 143-161.

³ *Ibid.*, pp. 191, 193.

⁴ Champlain, Samuel de: *Voyages*, Pub. Prince Soc., 1878, p. 13.

Undoubtedly during this period the Great Auk was plentiful about Newfoundland and off the shores of New England. Professor Lucas, who reported at some length the history of this bird, and procured quantities of its remains in 1887, says that millions must have died on Funk Island.¹ When they were plentiful there, some of these millions must have passed along our coast.

Steenstrup believes that this Auk probably occurred at Cape Cod.²

It is perhaps a little more than seventy miles from Portland, where Josselyn probably saw the Great Auk, to Ipswich Bay; and there Prof. F. W. Putnam states that great numbers of the bones of the Great Auk have been found in the shell-heaps of Ipswich and Plum Island, Mass. They were found also at Marblehead.³

Miss Hardy points out that these shell-heaps were made by the aborigines in spring and summer.⁴

Josselyn speaks of the "Wobble" among the birds of New England as an ill-shaped fowl, having no feathers in its pinions, and unable to fly. He says that *in spring* they are very fat or oily, and tells of his experience in roasting them at that time. Audubon states that an old gunner residing at Chelsea Beach (Revere) told him that he well remembered the time when the Penguins were plentiful about Nahant and some islands in the bay. This must have been some time after 1750.

J. Freeman, in a topographical description of the town of Truro on Cape Cod (1794), gives the "Penguin" as one of the sea-fowl that were then "plenty on the shores and in the bay."⁵

Grieve marks Cape Cod on his map as one of its breeding places.

In a rather careful search through Massachusetts historical papers, I have found thus far but one other reference which points toward the breeding of this bird in Massachusetts in

¹ Lucas, F. A.: Report National Museum, Washington, 1888, pp. 493-529.

² Videnskabelige Meddelelser, 1855, Nos. 3-7, p. 96.

³ Putnam, F. W.: Amer. Nat., 1869, Vol. III, p. 540.

⁴ Hardy, Fanny P.: Auk, 1888, pp. 380-384.

⁵ Coll. Mass. Hist. Soc., Vol. III, 1st ser., p. 199.

the early days, and that seems to have been overlooked by ornithologists. Davis (1815) says in his *History of Wareham, Mass.*: "Hog Island, so termed, and which is very small, is appendant to this town. It may, perhaps be pertinent here to notice, that in early colonial annals, there appears to have been several little islands in Manomet Bay, on the Sandwich side, some of them, marsh islands, probably, within its necks, thus denominated; Panoket (little land) Chup-pateest, (coney island or neck) Squannequeest and Mashne; while Unset and Quanset were little bays or coves on the Wareham side. . . . It is but a mile across, from a part of the Wareham shore, to Manomet River, on the back shore of Sandwich. That rivulet was visited by Gov. Bradford as early as 1622, to procure corn, and was the *Pimesepoese* of the natives. This compound phrase signifies 'provision rivulet.' What a remarkable coincidence between the aboriginal name and the colonial voyage! We do not assume this explanation without substantial and tenable grounds. The first part of the phrase, *pime*, is, in its uses, 'food', 'provision;' the latter, 'little river.' . . . The shores of this secluded and pleasant little bay, indented by many necks and inlets, and embosoming islands, must have been the chosen haunt of aquatic birds. The waders yet seek it, tracing up its marshy creeks. On the Sandwich side was Penguin River, where that singular bird resorted, in the breeding season, in great numbers. The manner in which the natives took them was, to erect stakes, or a weir, across an inlet, drive them into it, and when the tide receded, strike them down with clubs. This bird, it is well known, dives at a flash: hence its significant name, Wuttoowaganash, 'ears', that is, they 'hear quick.' The English settlers, it seems, without knowing the meaning of this name, have used and transmitted the plural termination only, Wagans, which has no meaning, but a plural merely. We shall seek this bird now, at this spot, in vain; but it appears and is taken, now and then, in the salt ponds, near Ellis' tavern, Plymouth. The name given this bird, with trifling addition, is a watch word, or an alarm; as much as to say, hark! listen!"¹

¹ Davis, S.: *History of Wareham, 1815*, Coll. Mass. Hist. Soc., Vol. IV., 2d ser., pp. 289-292.

The method used here by the Indians to capture the Auks seems to favor the hypothesis that the birds thus taken were not breeders; otherwise, the Indians would have been able to kill them with less trouble on their breeding grounds, unless, indeed, the birds had learned by experience to nest close to the water, so that they could reach it quickly at the least alarm. It is possible that the weirs were built for fishing and used incidentally to catch the Auks.

In the summer of 1868 Prof. Louis Agassiz, Prof. Jeffries Wyman and Colonel Theodore Lyman examined the shell-heaps in East Wareham, on the shore of which are the bays referred to by Davis, and they found there the bones of the Great Auk.¹

Thus we have the best of evidence that the Great Auk was found in summer at the head of Buzzards Bay, at the junction of the Cape Cod peninsula with the mainland.

As some readers of this volume may not know the origin of the shell-mounds along our coast, it may be well to explain that they were made by the aborigines, some of whom camped, during the warmer months of the year, at suitable places for taking clams, oysters and other shell-fish, and thus in time formed these mounds, which consisted mainly of the shells of shell-fish, with bones and other remains of the native feasts, mixed with ashes and charcoal from the fires, and various indestructible parts of utensils, etc., which had been thrown broken upon the heap. The finding of the bones of the Great Auk in these shell-heaps indicates that the birds were taken during the warmer months, which constitute their breeding season. The Auk evidently lived at sea or in the water most of the time, except during the nesting time, and, no doubt, slept on the waves. A bird which could dive at the flash of a gun and escape the charge ought to find little difficulty in avoiding the spears or arrows of an Indian hunter, but the question as to how the Indians were able to take them has been answered already.

Manomet Bay is at the head of Buzzards Bay, and its western portion is now known as Onset Bay. Manomet

¹ Wyman, Jeffries: Report Peabody Mus. Arch. and Eth., 1869, p. 17.

River is now named Monument River, near which the former home of Grover Cleveland is situated. There is no doubt that the bird referred to by Davis as the Penguin was the Great Auk. It was remarkably quick of hearing, and was readily frightened by the least sound. Buzzards Bay and its tributaries were once famous spawning grounds for many species of fish, and the Auks on their northward migration, entering Buzzards Bay and following the shore to the northeast, would have found themselves embayed there, and might have bred on an island at the mouth of Manomet Bay. There is a regular spring migration of Loons, Geese and other water-fowl here, which come up the bay and across the peninsula of Cape Cod at this point. Loons and Mergansers formerly bred here. If the Great Auk bred here, the whites must have extirpated it, even if the Indians, when furnished with guns, did not. It is possible that the Auks which frequented this bay in summer might have been infertile birds which summered south of their usual breeding place.

In August, 1910, in company with Mr. C. Allan Lyford, I explored the region at the head of Buzzards Bay in a search for remains of the Auk. By elimination we concluded that Penguin River must have been what is now known as Back River. Back River lies south of the Buzzards Bay station, in what is now known as the town of Bourne, and the railroad to Woods Hole crosses it. There are shoals here where the waters are very low at low tide, and where the Indians might have trapped the birds in a weir. On the bank of an inlet of what is now known as the Mill Pond, which connects with this river, there is a small shell-mound. Excavations here show no signs of bones. We learned from old residents that formerly there were other mounds about the bay, but one of them apparently has been buried under a railroad embankment, and others probably have been covered by the filling in which has been done along the shores where cottages of summer residents now stand. If the Auk bred in this locality, it must have nested on Mashne Island, which on the north side has several acres of low, flat land. There seems to be no other island fitted for its breeding place.

Catesby (1754) gives the "Penguin" among the European water-fowl which he had observed to be "also inhabitants of America, wintering in Carolina, though most of them return north to breed."

The finding of two of the left humeri of the Great Auk in a shell-mound near Ormond, Fla., one by Prof. W. S. Blatchley and the other by Prof. C. H. Hitchcock, in 1902, indicates that the bird went much farther south than has been generally believed.¹ As this shell-mound was on the bank of the Halifax River, and several miles from the inlet, the Auks may have entered this shallow inlet for the fish which were once plentiful there.

Miss Hardy says that "it will yet be conclusively proved that the Great Auk was a resident the year round on the coasts of New England;" and Mr. Hay regards it as probable that we shall yet learn that it was a permanent resident along our coast considerably farther south than Cape Cod; but it will be difficult now to secure such absolute proof. The only possibility lies in unearthing some long-forgotten record from the mass of historical papers now extant.

The above citations cover practically all the available evidence of the breeding of the Great Auk on the coast of the United States; and there seems to be no conclusive evidence of a breeding place except at Funk Island, where many skeletons and portions of egg shells have been found. It seems improbable, however, that the myriads of these birds that have been seen on so many islands and in so many waters in America could all have bred on this one small island, and we may yet find proof that they bred on several others.

All through the latter part of the seventeenth century the banks fishermen salted down Auks by the ton. Later, the merchants at Bonavista sold them to the poor by the hundredweight, instead of pork.²

The taking of the birds and their eggs for food was followed by a demand for their feathers, and this is what finally led to their extermination. Probably the bird was nearing

¹ Hay, O. P.: Auk, 1902, pp. 255-258.

² Tocque, Philip: Newfoundland as it Was and Is, 1877, p. 486.

extinction in North America during the latter part of the eighteenth century, for Cartwright (July 5, 1785) says that several crews of men lived all summer on Funk Island, for the sole purpose of killing the birds for their feathers. He says that the destruction was incredible; and that, unless the practice could be stopped, the whole breed would be diminished to almost nothing, as Funk Island was then "the only island they had left to breed upon."

When Prof. F. A. Lucas, to whom we owe much of our knowledge of *Plautus impennis*, visited this island in 1887, there were still standing the remains of several buildings or camps, and the stone enclosures or "pounds" into which the birds had been driven for slaughter, and killed with clubs. Thus at their last place of refuge uncounted millions of these birds went to their death. They were thrown into kettles of hot water to scald them sufficiently to start the feathers easily, and the fat bodies of those that had been plucked were added as fuel to the fires.

Tocque, in Newfoundland as it Was and Is, says that the Great Auk was very plentiful "about seventy years ago." As his book was published in 1877 the Auk must have been abundant in the earlier years of the nineteenth century.

Mr. George A. Boardman questioned a Methodist missionary, who was stationed on the coast of Newfoundland not far from Funk Island from 1818 until 1823, who said that he saw the Penguins during his whole stay on the island.¹

When Audubon visited Labrador, in 1832, he was told by many persons that fishermen still called at an island off the Newfoundland coast, and took great numbers of the young of these birds for bait. It is probable that even then the birds were nearly extinct; but Audubon states that a brother of his engraver, Mr. Henry Havell caught one with a hook off Newfoundland.²

Dr. J. A. Allen (1876) quotes Mr. Michael Carroll of Bonavista, Newfoundland, who in early life was often a visitor

¹ Brewer, Thos. M. (Baird, Brewer and Ridgway): The Water Birds of North America, Vol. II, p. 471, Mem. Mus. Comp. Zool., Vol. XIII.

² Audubon, J. J.: Ornithological Biography, 1838, Vol. IV, p. 316.

to Funk Island and a witness of the destruction of the Great Auks there. Mr. Carroll stated that the birds were very numerous on Funk Island and were hunted for their feathers about forty-five to fifty years before 1876, but that soon after that time they were wholly exterminated. This would place the extermination of the birds there in the decade between 1830 and 1840.¹

Singular as it may seem, the destruction of these birds went on so much faster in America than in Europe that the species probably was extirpated first on this side of the Atlantic.

Mr. Ruthven Deane published in the *American Naturalist* (Vol. VI, 1872, p. 368) the statement that a specimen of the Great Auk was found in the vicinity of St. Augustine, Labrador, in November, 1870; but Dr. Coues, in his *Key to North American Birds*, says that there appears to be some question respecting the character, date and disposition of this alleged individual; and it seems very improbable that the species lived down to 1870.

To-day there are about eighty mounted specimens of the bird, and about seventy eggs, in the museums of the world.² Little is known about the habits of the Great Auk. Toward the last it was difficult to shoot, as it had learned to dive at the flash of a gun. It seems to have been easily frightened by noise, but not so much by what it saw; for Grieve tells us that in 1812, near Orkney, one was enticed to a boat by holding out fish, and was killed with an oar. The Auk swam with head lifted, but neck drawn in, ready to dive instantly at the first alarm. Its notes were gurgles and harsh croaks. On its island home it stood or rather sat erect, as its legs were far back. It laid but one egg. It never defended its egg, but bit fiercely when caught.

Its food is believed to have been mainly fish; but Fabricius found, in the stomach of a young bird, rose root (*Sedum rhodoriola*) and other littoral vegetation, but no fish. Rose root grows in the crevices of sea cliffs. Grieve, however, doubts whether the bird taken by Fabricius was of this species.

¹ Allen, J. A.: *Amer. Nat.*, 1876, Vol. X, p. 48.

² Grieve, Symington: *The Great Auk*, supplementary note, 1897, p. 261.

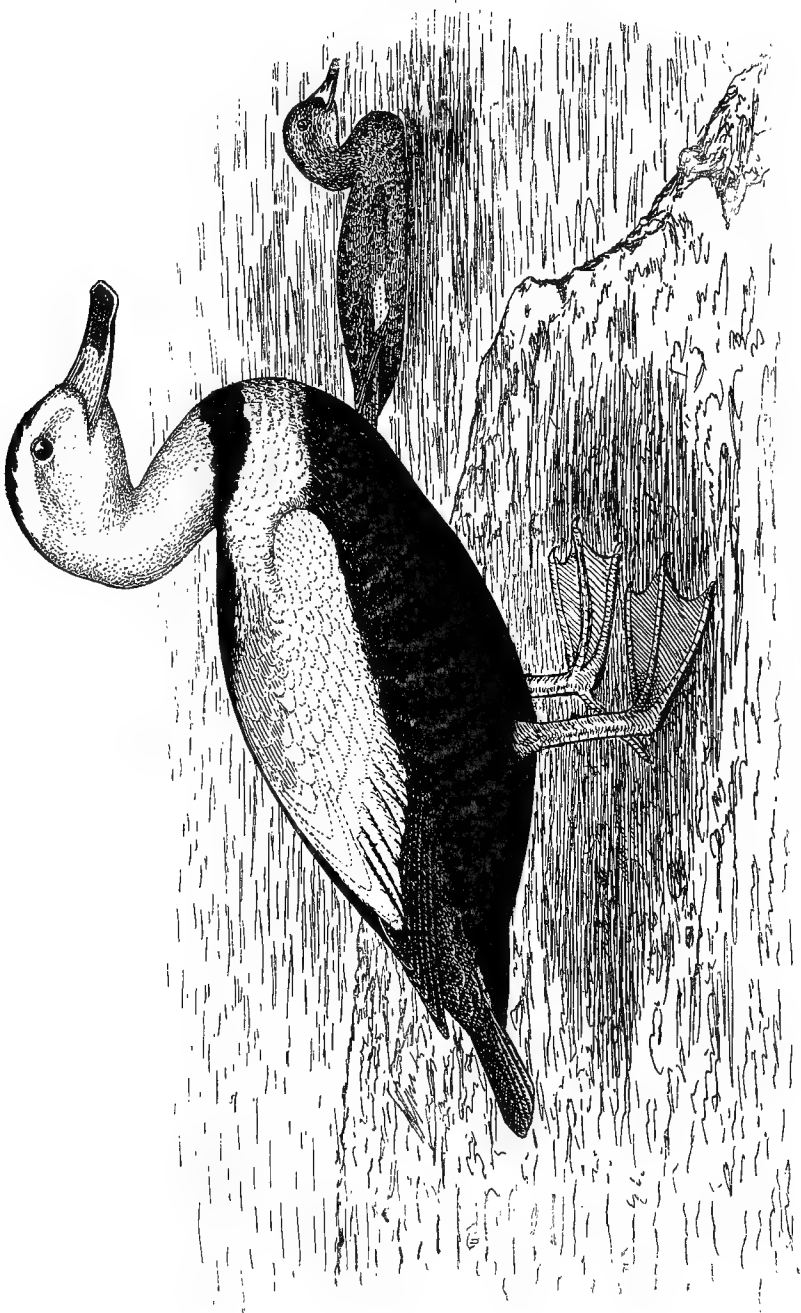


PLATE XIII.—LABRADOR DUCK.

Once a migrant on the New England coast; now extinct.

LABRADOR DUCK (*Camptorhynchus labradorius*).

Common or local names: Pied Duck; Sand Shoal Duck; Skunk Duck.

Length. — 18 to nearly 20 inches.

Adult Male. — Head, neck, breast, scapulars and wings, except primaries, white; long scapulars pearl gray; tertials black-edged; other parts of body, stripe over crown, ring around neck, and primaries, black; bill mainly black, with orange at base and along edges; iris reddish brown; feet and legs grayish blue.

Adult Female. — Lower plumage ash gray, brown-spotted; upper parts bluish gray; several secondaries and sides of forehead white.

Young Male. — Similar to female, but chin and throat and sometimes breast white.

Season. — Formerly late fall, winter and early spring.

Range. — The Labrador Duck is believed to have been an inhabitant of the Labrador coast. I have seen no records of its occurrence in the Hudson Bay country or within the Arctic Circle; but according to Audubon it migrated southward in winter to Chesapeake Bay.

HISTORY.

The Labrador Duck has a brief history, for very little is known about it. It was first described by Gmelin (*Syst. Nat.*, 1788, Vol. I, Part 2, p. 537.)

It is supposed to have bred only along the Labrador coast, and, although the evidence of its breeding there seems to have been gathered mainly from settlers and Indians, some color is given to their statements by the fact that it has not been reported in summer from any other part of North America. Nevertheless, there are no definite records.

John W. Audubon was shown deserted nests at Blanc Sablon, Labrador, that were said to be those of this species, but he saw no birds.¹

Professor Newton asserts that this bird, like the Eider Duck, bred on rocky islets, and that it was commonly found in summer about the mouth of the St. Lawrence and the coast of Labrador until about 1842; but he does not state where he obtained this information.²

Major King writes: "The Pied Duck or Labrador Duck

¹ Audubon, J. J.: *The Birds of America*, 1843, Vol. VI, p. 329.

² Newton, Alfred: *Dictionary of Birds*, 1893-96, p. 221.

is common in the Gulf of St. Lawrence, and breeds on its northern shore, a short distance inland." He says that the bird derives its name from its Magpie-like plumage; that its flesh is dry and fishy, and that as an addition to the bag it is not worth shooting. All these statements would apply to the Labrador Duck.¹ As King had spent three years shooting and fishing about the Gulf of St. Lawrence and in Canada previous to 1866, when his book was published, and as he evidently was familiar with the water-fowl, his statement perhaps is entitled to as much credence as was that of the settlers who showed Audubon the supposed nests of this Duck.

Dr. Coues, in his notes on the Ornithology of Labrador, made in 1860, says: "I was informed that, though it was rarely seen in summer, it is not an uncommon bird in Labrador during the fall."² This is the only intimation that I have been able to find that this bird ever bred to the northward of Labrador; but it is too indefinite to have much weight.

Audubon regarded the Labrador Duck as a very hardy species, for it remained off the coasts of Maine and Massachusetts during the winter and was unknown south of Chesapeake Bay. It must have migrated in some numbers to the coast of Long Island and New York as late as the first half of the nineteenth century, for DeKay (1844) says that it was well known to the gunners on that coast, but that on the coast of New Jersey it was "not very abundant."³ But Giraud, writing about the same time of Long Island, says: "With us it is rather rare."⁴

Probably the Labrador Duck in its migrations was once common along the New England coast. Morton, writing of the birds noted by him in New England between 1622 and 1630, speaks of "pide Ducks, gray Ducks and black Ducks in greate abundance."⁵ It seems probable that some of the "pide Ducks" were of this species, for this is the one Duck that best merits the name of pied Duck, because of its being

¹ King, W. Ross: *The Sportsman and Naturalist in Canada*, 1866, p. 235.

² Coues, Elliott: *Proc. Acad. Nat. Sci., Phila.*, 1861, p. 239.

³ DeKay, James E.: *Nat. Hist. of New York, Part I, Zoölogy, Ornithology*, 1844, p. 326.

⁴ Giraud, J. P., Jr.: *Birds of Long Island*, 1844, p. 327.

⁵ Morton, Thomas: *New English Canaan*, Pub. Prince Soc., 1833, p. 190.

marked "like a Magpie," and it was so named by the earlier writers and ornithologists. Morton lived at Merrymount, now Wollaston, in Quincy, Mass., and shot wild-fowl about Boston Bay. He probably found this bird common there in his time, for, although considered a "sea-fowl," it entered the bays and tidal rivers along the coast. Audubon never saw the bird alive. The specimens from which his drawings of the species were made were shot by Daniel Webster at Martha's Vineyard, Mass., and are now in the collection of the National Museum at Washington, D. C.

Freeman (1807) includes the Shoal Duck as one of the species found on Martha's Vineyard.¹

Dr. D. G. Elliot says that between 1860 and 1870 he saw a considerable number of these birds, mostly females and young males, in the New York markets, and that a full-plumaged male was then exceedingly rare; but no one then imagined that the species was approaching extinction.²

Maynard (1870) records the Labrador Duck as rare during the winter on the Massachusetts coast.³

The extermination of this bird never has been satisfactorily accounted for; but Newton considered that the wholesale destruction of eggs and nesting birds on the Labrador coast, as witnessed by Audubon, could have had no other effect.⁴

If this bird's breeding range was limited to the southern and eastern coast of that peninsula, and if it bred, as is stated by Newton, only on the small, rocky islands off the coast, or, as King says, on the mainland near it, the wholesale slaughter that went on for many years by eggers, feather hunters and Eskimos may have been a chief factor in its extinction. Audubon's story of the Labrador eggers, as published in his *Ornithological Biography*, graphically exhibits a terrible destruction among the sea birds of the Labrador coast; but long before his time a forgotten yet still greater slaughter of wild-fowl occurred on those coasts to supply the

¹ Freeman, J.: A Description of Dukes County, Coll. Mass. Hist. Soc., Vol. III, 2d ser., p. 54.

² Elliot, D. G.: Wild Fowl of North America, 1898, pp. 172, 173.

³ Maynard, C. J.: Birds of Eastern Massachusetts, Appendix to Naturalists' Guide, 1870, p. 148.

⁴ Newton, Alfred: Dictionary of Birds, 1893-96, p. 222.

demand for feathers and eider-down for beds. Amos Otis, in his Notes of Barnstable (Mass.) Families, says that Josiah and Edward Child in early life went on "feather voyages." This must have been about 1750 to 1760, when vessels were fitted out for the coast of Labrador for the express purpose of collecting feathers and eider-down. Otis states a well-known fact that at a certain season of the year (presumably July or August) some species of wild-fowl shed a part of their wing feathers and can fly little if at all. He asserts that thousands of these birds congregated on barren islands on the Labrador coast; the crews of vessels surrounded them, drove them together and killed them with short clubs, or with brooms made of stiff branches. "Millions of wild-fowl," he says, were thus destroyed, and a few years later their haunts were so broken up by this wholesale slaughter and their numbers were diminished so much that feather voyages became unprofitable and were given up.¹ Feather hunting in the breeding season is doubly destructive, because the helpless young are hunted down as well as the old birds. The killing of birds for their eggs, flesh and feathers has been continued by fishermen and the natives of the Labrador coast ever since.

It seems probable that the only Ducks breeding in large numbers on islands along the Labrador coast were Eiders, Labrador Ducks and possibly Scoters. The Labrador Duck is believed to have been a maritime species, and its breeding range appears to have been as restricted as that of the Great Auk. If the Labrador Ducks were unable to fly in July they probably were reduced greatly in numbers by the feather hunters long before their existence was known to naturalists. A somewhat similar case is that of the Great Cormorant (*Phalacrocorax perspicillatus*), which became extinct in the North Pacific somewhere about 1850, and which was formerly abundant about Bering Island. It is said to have been killed for food. Dr. C. W. Townsend informs us that the fishermen and Eskimos still wantonly destroy the nesting birds on the Labrador coast in spring and summer; and the same wholesale killing which has so reduced many other

¹ Otis, Amos: Genealogical Notes of Barnstable County, 1885, Vol. I, p. 187.

breeding species in that region, may have hastened the extinction of the Labrador Duck.

When the Magdalen Islands were discovered, great herds of walrus resorted there; but to-day the fact that the walrus was once numerous in the Gulf of St. Lawrence is almost forgotten. We do not know the cause of the extermination of the species there, but practically, it is certain that it was extirpated by man. The fact that the Labrador Duck was well known to gunners, and was found in some numbers in the markets, indicates that many were once shot along our coasts. Col. Nicolas Pike relates that in November, 1844, while paddling in his sneak boat covered with salt hay at the south end of Plum Island, Ipswich Bay, he saw three of these birds, two males and a female, feeding on a shoal spot near a sand spit. He shot them all.¹ This indicates that the birds were taken easily by an expert gunner.

Dr. Elliot says that no satisfactory explanation of the extinction of the Labrador Duck can be given, and yet he says, on the same page: "While we marvel at the disappearance of this bird from our fauna, similar or equally forcible methods are at work, which in the process of time, and short time too, will cause many another species of our water fowl to vanish from our lakes and rivers, and along the coasts of our continent. Robbing the nests for all manner of purposes, from that of making the eggs an article of commerce to posing as specimens in cabinets, slaying the ducklings before they are able to fly, and have no means of escape from the butchers, together with the never-ceasing slaughter from the moment the young are able to take wing and start on their migration, at all times, in all seasons and in every place, until the few remaining have returned to their summer home, all combined, are yearly reducing their ranks with a fearful rapidity, and speedily hastening the time when, so far as our water fowl are concerned, the places that now know them, and echo with their pleasant voices, shall know them no more forever."²

¹ Dutcher, William: *Auk*, 1891, p. 206.

² Elliot, Daniel Giraud: *The Wild Fowl of North America*, 1898, p. 174.

This extract seems to indicate that Dr. Elliot looks upon it as probable that man had much to do with the extinction of this species. Positive proof of this, however, always will be wanting, for the early history of the bird is unknown; but it seems very probable that the extinction of the species was due to the advent of the white man in North America.

The last Labrador Duck of which we have record died by the hand of man near Long Island, New York, in 1875; and, according to Dutcher's excellent summary, there are but forty-two preserved specimens recorded as still existing in the museums and collections of the world.¹

Very little is known about the habits of this bird. Giraud says that it feeds on shell-fish, and Audubon says that a bird-stuffer at Camden had many fine specimens which he said were taken by baiting hooks with the common mussel. The name Sand Shoal Duck indicates that the bird was partial to such shoals, and was found feeding in the shallow water near them.

ESKIMO CURLEW (*Numenius borealis*).

Common name: Doe-bird; Dough-bird.

Length. — 12 to 14.50 inches; bill, about 2.10.

Adult. — General ground color, warm buff; upper parts streaked and mottled with very dark brown or dusky, so much so that the back often appears blackish; head and neck streaked, rather than mottled. The effect of the distribution of the markings gives the sides of the head and neck, and particularly the under parts, a much lighter appearance than the back; the top of the head, however, is darker, and there is a rather light line over the eye; no whitish stripe in center of crown. Primaries or flight feathers plain, not spotted or barred; tail barred with dusky brownish black; bill black; base of lower mandible pale or yellowish; legs grayish blue.

Notes. — A soft, melodious whistle, *bee, bee*; a squeak like that of Wilson's Tern, but finer (Mackay); and a low, conversational chatter (Coues).

Season. — August to November.

Range. — Eastern North America and South America, breeding on the Barren Grounds of northwestern Canada; wintering in Argentina and Patagonia.

¹ Dutcher, William: Auk, 1894, p. 176.

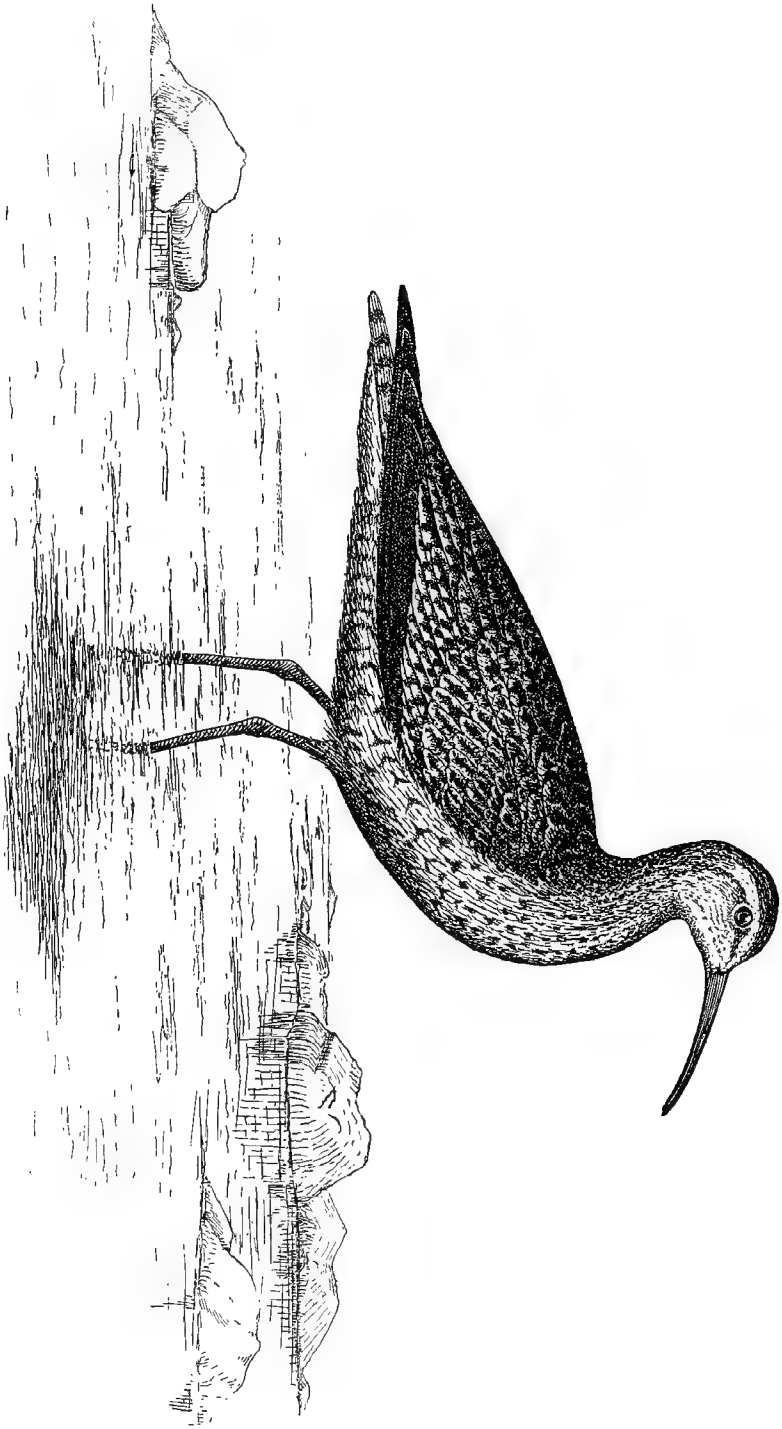


PLATE XIV.—ESKIMO CURLEW.

Formerly so abundant on the New England coast that its flocks resembled those of the Passenger Pigeon; now believed to be extinct.

HISTORY.

The Eskimo Curlew is placed in the list of extinct species to call attention to the fact that this bird, the flocks of which resembled in appearance and numbers the multitudes of the Passenger Pigeon, is now practically extinct. As in the case of the Passenger Pigeon, it is not improbable that a few more small flocks or single specimens may yet be seen or taken; but it is too late to save the species. Its doom is sealed.

Most of the so-called "Dough-birds" taken in recent years have proved to be Hudsonian Curlews, which have a light stripe along the top of the crown. The Eskimo Curlew may be distinguished at once by its unstriped dark crown, its small size, unbarred primaries, and small, slender bill.

The history of this bird, so far as it is known to us, began in the eighteenth century. It was described by Forster in 1772 (*Philos. Trans. Royal Soc., London, 1772, Vol. LXII, pp. 411, 431*); but sixty-three years earlier Lawson (1709)

mentions three "sorts" of Curlews that were found in "vast numbers" in Carolina, of which this, possibly, was one; and Hearne (1795) spoke of two species that were abundant about Hudson Bay (1769-72), the smaller of which undoubtedly was this bird, although, following Pennant, he gives the name "Eskimaux Curlew" to the larger.

The Eskimo Curlew was unknown to Wilson. The bird which he described as the "Esquimaux Curlew" was the Hudsonian. The Eskimo Curlew was found breeding by Richardson at Point Lake in 1822,¹ and it bred abundantly in the Barren Grounds. Its breeding range extended from Alaska to Labrador. In the fall migration its swarming myriads massed in Labrador, from there crossed the Gulf of St. Lawrence, landed at Newfoundland and Nova Scotia, and then put out to sea, heading for South America. If southerly storms

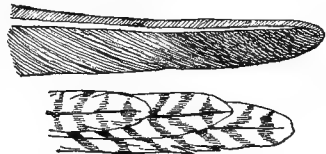


FIG. 20. — Axillars and first primary of Eskimo Curlew (after Cory).

¹ *Fauna Boreali-Americana*, 1831, Vol. II, p. 378.

occurred during their migrations, great numbers landed on the Bermuda Islands. Easterly storms brought similar flights to the coast of New England, and less frequently, perhaps, to the shores of the middle and southern States, where, ornithologists believe, they were rarely if ever as abundant as in Massachusetts.

We know nothing definite of their migrations in the early days of the colony, but since the beginning of the nineteenth century comparatively few have been seen on our shores in fair weather. Whether they kept at sea, resting on the ocean when weary, or continued their flight until they reached that great mass of floating weed called the Sargasso Sea, where seafaring birds find food, we can only conjecture; but in some way they reached the West Indies and later South America, where they spread over the continent, sweeping on even to Patagonia, thus coursing nearly the length of two continents. Returning in spring, they were seen rarely if ever on the Atlantic or its coasts; but they reappeared in Texas and other gulf coast States in March and April, and swarmed over the prairies and through the Mississippi valley region, reaching the fur countries by the interior route. They were accompanied in their migrations by the Golden Plover. The name "Dough-bird" applied to this Curlew is an old one, antedating American ornithologists, and was used to denote an extremely fat and delicious fowl. It was given occasionally to species of similar habits, as the Godwits; but the Eskimo Curlew is the true Dough-bird of New England.

Cape Cod and Nantucket often were overrun by Dough-birds, and they landed in enormous numbers all along the Massachusetts coast. The shores and islands of Boston harbor were favorite resorts. During the first years of the nineteenth century Noddle Island (now East Boston) was owned by Mr. H. H. Williams, who often invited his friends there to shoot; and Mr. William H. Sumner (1858) says that he has seen "that kind of Plover called Dough-birds," from their superlative fatness, alight upon the island "fifty years ago" in a northeast storm, in such large flocks and so weary that it was "as difficult for them to fly as it is for seals to run."

Mr. Williams told him, he asserts, that when the birds arrived in this condition they were chased by men and boys, who knocked them down with clubs as they attempted to rise. If the August storm passed, and these birds did not land on the island, very few would be seen in the markets that year.¹ Mr. Sumner says that these birds were so fat that if shot when flying they burst open when they struck the ground. It is well known that this was their condition when they left Labrador.

We have some records of the immense flights of these birds that appeared periodically on our coasts during the early days of the last century, but we can only surmise what was their abundance when the country was first settled. The flights may have decreased in Massachusetts even before the settlement of the west, and the beginning of the destructive spring shooting there.

Audubon says that on July 29, 1833, while he was near the harbor of Bras d'Or, Labrador, these Curlews came from the north in such dense flocks as to remind him of the Passenger Pigeon. Mr. E. W. Tucker (1838) writes that Curlews in vast flocks were exceedingly abundant on the Labrador coast.² Dr. A. S. Packard was there in 1860, and notes a flock which was perhaps a mile long and nearly as broad. He describes the sum total of their distant notes as resembling the wind whistling through the rigging of a ship. At times it sounded like the jingling of many sleigh bells.

The Dough-birds continued so plentiful until long after the middle of the nineteenth century that the fishermen of Labrador and Newfoundland made a practice of salting them down in barrels. A Newfoundland correspondent, quoted by Hapgood in *Forest and Stream*, says that they reached that island in millions that darkened the sky. "Millions" of these birds and Golden Plover arrived in the Magdalen Islands in August and September. There they went to the high beach to roost in such masses that on a dark night a man armed with a lantern to dazzle their eyes and a stick to

¹ Sumner, Wm. H.: *History of East Boston*, 1858, p. 53.

² Tucker, E. W.: *Five Months in Labrador and Newfoundland in 1838, 1839*, p. 110.

strike them down could kill enormous numbers.¹ It is a well-known fact that thousands of shore birds were killed on Cape Cod by similar methods in early days.

Mr. W. J. Carrol quotes Mr. C. P. Berteau, who says that he does not remember getting less than thirty or forty brace of these birds in a two hours' shoot when he was in Labrador; and that the Hudson Bay Company's store at Cartwright sometimes had as many as two thousand birds, as a result of a day's shooting by twenty-five or thirty men.²

Up to the middle of the nineteenth century, and even later, great flights of Eskimo Curlews continued to come to Massachusetts. Old gunners say (1908) that, "sixty or seventy years ago," so many Dough-birds and Golden Plover alighted on Nantucket that the inhabitants used all the shot on the island, and had to stop shooting until more could be obtained from the mainland.

The greatest flight within the memory of men now living occurred on Nantucket, August 29, 1863, but it was composed of much greater numbers of Golden Plover than of Curlews.

Haggood describes a flight that occurred a few days later, September 3, 1863, on Cape Cod, when a party of several gunners killed two hundred and eighty-one Eskimo Curlews and Golden Plover in a little over one day.³

Mr. Elbridge Gerry tells me that "about 1872" Dough-birds came in a great flight to Cape Cod and Nantucket. They "were everywhere," and were killed in such numbers on the Cape that the boys offered them for sale at six cents each. Two market hunters killed three hundred dollars' worth at that time.

Mr. John M. Winslow of Nantucket states that in 1882 he and Peter Folger of that town killed eighty-seven Dough-birds there one morning, and there were probably five hundred birds in the pasture where these were killed. Mr. Lewis W. Hill writes that his grandfather, Mr. W. W. Webb, killed about seventy at Cape Pogue, Martha's Vineyard, about the same time.

¹ Haggood, Warren: Forest and Stream Series, No. 1, Shore Birds, 1885, p. 17.

² Carrol, W. J.: Forest and Stream, Vol. 74, March 5, 1910, p. 372.

³ Haggood, Warren: Forest and Stream Series, No. 1, Shore Birds, 1885, pp. 22, 23.

The Rev. Herbert K. Job records a flight of Eskimo Curlews and Golden Plover on Cape Cod, August 30, 1883, and remarks (1905) that such a flight "may never be seen again."¹ His words were prophetic. That was the last great flight that landed on the Cape.

A "cloud" of them was seen on the Magdalen Islands in 1890.² This was perhaps the last large flock of the Eskimo Curlew that has been recorded in the east, although the fishermen of Labrador reported smaller flights for a few years longer.

The decrease of the Dough-birds in Massachusetts during the last century may be explained in part by the continual persecution that they suffered here. The arrival of these birds was the signal for every gunner and market hunter on the coast to get to work. The birds were rarely given any rest. Nearly all that remained on our shores were shot, and only those that kept moving had any chance for their lives. As a consequence of this continual persecution, the birds probably learned to avoid the New England coast; and most of those that were driven to land by storms left the moment the weather was favorable for a continuance of their flight. Often they came in at night and went in the morning.

Peabody (1839) regarded the bird as "sufficiently common in Massachusetts," and says that it is "valued as game;" and Giraud (1844) says that it is seen every season in New York, New Jersey, Rhode Island and Massachusetts. The great flights about Boston disappeared early in the nineteenth century. Sumner writes (1858): "None are now to be seen where once they were so abundant, and even the market offers but few at fifty cents apiece." Turnbull (1869) gives it as a rather rare transient (eastern Pennsylvania and New Jersey). C. J. Maynard (1870) says that it is not uncommon in Massachusetts during migration. E. A. Samuels (1870) states that it visits New England, but only in small numbers. Dr. Elliott Coues (1874) states that it migrates through the Missouri region in immense numbers in May; and that in

¹ Job, Herbert K.: *Wild Wings*, 1905, pp. 207, 208.

² Sanford, L. C., Bishop, L. B., and Van Dyke, T. S.: *The Water-fowl Family*, 1903, pp. 445, 446.

Labrador it is seen in flocks of from three birds to three thousand.

Dr. J. A. Allen (1879) considers it a common migrant in Massachusetts. Gurdon Trumbull (1888) says that this species appears on the more eastern uplands of Cape Cod in August or September, "and if severe storms prevail, it arrives in very large numbers." This should have been written in the past tense.

At first sight it may seem difficult to reconcile all these statements with that of Sumner, made in 1858; but his assertion referred mainly to Boston harbor, with the conditions of which he was familiar, and Curlews were still fairly common on less frequented parts of the coast long after the great flocks had disappeared from the neighborhood of Boston. In 1888, however, Stearns and Coues considered it "singular" that this species was not common in New England.

A diminution of the species was noticed next in the west. The birds no longer came in their usual numbers. A warning note was sounded by Charles B. Cory (1896), who said: "It is becoming less common every year." This diminution had been gradual and progressive for years, but attracted little attention until it became rapid and marked. Mr. J. D. Mitchell, who is familiar with southern Texas, writes: "They used to visit the prairies in immense flocks, but it has been many years since I have seen a flock." Pressed for details, he writes that his earliest recollections of these birds date back to 1856. From that time to 1875 they came every spring in immense flocks on the prairies; after that they disappeared. In 1886 he saw several small flocks in Calhoun County, and in 1905 he saw three birds feeding with four Black-breasted Plover in Victoria County. These are his last records. Mr. A. S. Eldredge says that this Curlew came through the region about Lampasas, Tex., in 1890, in flocks of fifteen or twenty. In 1902 he killed one bird, — the only one that he saw. Prof. Geo. H. Beyer writes that the Eskimo Curlew disappeared very gradually in Louisiana. The last records he has for the species are March 17 and March 23, 1889. Prof. W. W. Cooke knows of no record of the species

in Oklahoma since the spring of 1884. Prof. Thomas J. Headlee sends me a copy of a letter from Mr. Richard H. Sullivan, president of the Kansas Audubon Society, who has gathered information from well-known and trustworthy informants, who report as follows: Mr. James Howard of Wichita says that the last time that these Curlews were killed there in any numbers was in the springs of 1878 and 1879. A good many were taken in 1878, but they were much reduced in 1879. They decreased rapidly afterward, and were not seen in numbers in the markets after 1878. Mr. Fred G. Smyth of Wichita says that the Curlews disappeared rather rapidly, and that the last bird was shot in the spring of 1902; this is corroborated by his brother, Charles H. Smyth. Mr. Charles Payne, a naturalist, says that there were still a few Eskimo Curlews in the markets of Kansas in the early 90's. All these gentlemen believe that there are living Curlews still in western Kansas and Oklahoma, but as no one has been able to secure a specimen of the Eskimo Curlew for the museums, it is probable that the birds now seen are Hudsonian Curlews. Prof. Myron H. Swenk states that during the 60's and 70's this bird passed through Nebraska in spring in immense flocks, and was known commonly as the Prairie Pigeon, because of the resemblance of its flocks to those of the Passenger Pigeon. This name also was applied to the Golden Plover (see page 340). They were the victims of tremendous slaughter. In eastern Nebraska they began diminishing rapidly in the early 80's, or even earlier, and disappeared during that decade. There is not a specimen recorded there for the past fifteen years. There are occasional reports of the birds from western Nebraska, but no specimens are forthcoming to substantiate them. The indications are that its decrease was gradual. Mr. Charles E. Holmes of Providence, R. I., found the bird common locally in the hills of central Nebraska, about forty miles south of Ainsworth, in 1889. It was noticeable that if one was wounded and cried out, others came from all directions, until thirty or forty were fluttering over their wounded companion. They were then decreasing and many were killed by cowboys. In 1892 he saw about six in the Bad Lands of South Dakota, and in 1893

he saw two there, — the last that he ever saw, although he resided in South Dakota until recently. The reports of all my correspondents in Kansas indicate that the bird has been rare there for about thirty years, and has disappeared. In Missouri, where the Curlew formerly flew in countless thousands, we find it rated in 1907 as a rare transient. A flock of one hundred was reported in 1894; a flock of ten, in 1902; and none afterwards.¹ Mr. Otto Widmann writes me that it was irregularly common in the markets of St. Louis during the last two decades of the century. In Iowa the species disappeared gradually, but rather suddenly at the last. The last record that I have is that of a specimen taken at Burlington, April 5, 1893, by Paul Bartsch. Cory (1902) says, in his *Birds of Illinois and Wisconsin*, that the Eskimo Curlew may still occur during the migrations, but is becoming very rare and apparently is disappearing fast; also that it formerly was abundant, and as late as 1895 was not uncommon in some localities. Dr. Walter B. Barrows writes that there is no Michigan specimen extant so far as he knows, and that the latest authentic record of the taking of a specimen was at St. Clair flats in the spring of 1883. Prof. Lynds Jones says that the latest record of the capture of the Eskimo Curlew in Ohio is September, 1878. Prof. H. L. Ward says that this Curlew appears to have been rare in Wisconsin for at least half of a century, and that he has no recent record. Not one of my correspondents from Alberta, Manitoba or western Canada ever has seen the bird alive, as their experience in the country does not date back much over ten years. All believe that it has disappeared. Mr. H. P. Attwater saw flocks of small Curlews, which he believes were of this species, near San Antonio, Tex., as late as the year 1900. All these reports taken together seem to indicate a gradual decrease of the species in the west, accelerated at the last.

The fishermen of Labrador noted the change about 1886 or 1887. There the decrease was more rapid. Dr. Henry B. Bigelow, who visited Labrador in 1900, was satisfied that the bird was nearing extinction. He saw only five birds while

¹ Widmann, Otto: *A Preliminary Catalogue of the Birds of Missouri*, 1907, p. 75.

in Labrador during the month of September. He was told by the settlers that the Curlews appeared in numbers until about 1892, after which no large flocks were seen. Townsend and Allen (1906) quote Captain Parsons to the effect that the birds were abundant in Labrador until thirty years ago (1876). He often shot a hundred before breakfast and the fishermen killed them by thousands. There was, he said, a great and sudden falling off in numbers about 1886. Mr. William P. Nye at Cape Charles, Labrador, told a similar story, but placed the sudden decrease at about 1891. Dr. W. T. Grenfell says that they became scarce in Labrador in the 80's, and that in 1892 he saw only two flocks of any size. In 1906 he heard of a few dozens being killed, but did not see one.¹

At last ornithologists awoke to the fact that one of the most useful, valuable and highly esteemed game birds of America was disappearing. For the last five years all my correspondents who mention this species have reported it as either extinct or nearly so. Preble says (1908): "It has become practically exterminated, although formerly enormously abundant and fairly common up to 1890."²

Stone (1908) says: "Now apparently almost extinct."³

Mr. Harry Piers, curator of the Provincial Museum of Halifax, Nova Scotia, writes me that during a period of close observation of birds from 1888 to the present time he has made but one record, a specimen in the Halifax market, September 11, 1897, which apparently has been lost. He has been unable to secure a specimen for the Provincial Museum.

Ornithologists have found the bird rare or wanting everywhere in North America since 1900.

The diminution of this species on the Massachusetts coast during the latter part of the nineteenth century may be seen by the records furnished by Mr. George H. Mackay. These refer in part to Cape Cod and in part to Nantucket, including, in some years, the birds taken or seen on Martha's Vine-

¹ Townsend, C. W., and Allen, G. M.: Birds of Labrador, Proc. Bost. Soc. Nat. Hist., Vol. XXXIII, 1906-07, pp. 356, 357.

² Preble, E. A.: North American Fauna, No. 27, Biol. Surv., U. S. Dept. Agr., 1908, p. 332.

³ Stone, Witmer: Birds of New Jersey, An. Rept., N. J. State Mus., 1908, p. 142.

yard and Tuckernuck Islands. These notes, condensed from various numbers of the Auk, follow:—

- | | |
|--|--|
| <p>1858 to 1861. — Some birds each year.</p> <p>1862. — No birds.</p> <p>1863. — An immense flight.</p> <p>1864. — No birds.</p> <p>1865. — No birds.</p> <p>1866. — A few; no flight.</p> <p>1867. — No flight.</p> <p>1868. — A few; no flight.</p> <p>1869. — A few; no flight.</p> <p>1870. — A few scattering birds.</p> <p>1871. — No birds.</p> <p>1872. — Two flights; fifty birds seen in one flock on Nantucket.</p> <p>1873. — Some birds.</p> <p>1874. — No birds.</p> <p>1875. — No birds on Nantucket, a few on Cape Cod.</p> <p>1876. — Some birds.</p> <p>1877. — A flight; 300 birds seen.</p> <p>1878. — Over 100 birds seen.</p> <p>1879. — No birds.</p> <p>1880. — A few shot on Nantucket.</p> <p>1881. — Some landed; fifty seen.</p> <p>1882. — About twenty-five birds.</p> | <p>1883. — A large flight, August 26.</p> <p>1884. — A few landed.</p> <p>1885. — Eight shot on Nantucket.</p> <p>1886. — A few landed.</p> <p>1887. — A few shot on Nantucket.</p> <p>1888. — A number landed; one shot.</p> <p>1889. — A number landed September 11, a few shot later.</p> <p>1890. — Fifteen birds reported.</p> <p>1891. — Small flocks seen on Nantucket and Tuckernuck.</p> <p>1892. — Ten birds killed on Nantucket and Tuckernuck, eight in Prince Edward Island.</p> <p>1893. — One shot on Nantucket.</p> <p>1894. — No birds. One in Boston market.</p> <p>1895. — No birds.</p> <p>1896. — None in markets, and none on Massachusetts coast.</p> <p>1897. — None killed; eight seen on Nantucket.</p> <p>1898. — Two seen.</p> |
|--|--|

There has been much speculation regarding the cause of its disappearance, and all sorts of reasons except the real one are advanced by gunners. The usual explanations, that the birds had “changed their line of flight,” or that they “do not come any more,” for various trivial local reasons, have been put forward.

Dr. C. W. Townsend writes: “About fifteen years ago the Curlews in Labrador rapidly diminished in numbers, and now [1906] a dozen or two or none at all are seen in a season. The fishermen there thought that the shooters were not to blame for this, but that the birds had been poisoned by the farmers in the west, because they ‘troubled their cornfields.’” This tale, no doubt, arose because of the fact that the western farmers, years ago, poisoned blackbirds in their cornfields by

wholesale; but when were the Curlews ever known to eat corn? Poisoned corn probably would not affect them.

There is no need to look for a probable cause for the extermination of the Eskimo Curlew, — the cause is painfully apparent. The bird was a great favorite with epicures; it was exterminated by the market demand.

Trumbull (1888) says that as a table dainty he considers it superior to all other birds, and that the gunners got from seventy-five cents to a dollar apiece for them.¹ The price had doubled within thirty years.

The extermination of this bird was foreshadowed by Mr. George H. Mackay (Auk, 1897, p. 214), when, for some years, it had been coming into the eastern markets by the ton in barrels from the Mississippi valley in spring. Mr. Mackay tersely asked, "Are we not approaching the beginning of the end?" In 1891 he wrote that spring shipments of Golden Plover, Eskimo Curlews and Upland Plover to Boston markets began "about four years ago" (1887), and had increased to date. Two firms received at one shipment eight barrels of Curlews and twelve barrels of Curlews and Golden Plover, with twenty-five dozen Curlews and sixty dozen Plover to the barrel. With such shipments going out of the west to many firms in the great markets, the remark made by Mr. Mackay, that, "while we may not be able now to answer the question are they fewer than formerly, we shall be ably fitted to do so in a few years" (Auk, 1891, p. 24), was prophetic. The end is here. The destruction of this bird was mainly due to unrestricted shooting, market hunting and shipment, particularly during the spring migration in the United States. When the Passenger Pigeon began to decrease rapidly in numbers, about 1880, the marketmen looked about for something to take its place in the market in spring. They found a new supply in the great quantities of Plover and Curlews in the Mississippi valley at that season. Less than thirty years of this wholesale slaughter in the west practically exterminated the Curlews. They were shot largely for western markets at first; they began to come into the eastern markets in numbers about

¹ Trumbull, Gurdon: Names and Portraits of Birds, 1888, p. 203.

1886, according to Dr. C. W. Townsend. They decreased rapidly in Labrador from about 1886 to 1892. By 1894 they were practically gone, although straggling parties were seen for ten years afterward. The Golden Plover lasted longer, and has been saved for the time being by the passage and enforcement of better laws; but its turn will come, unless conditions are still more improved.

There was, of course, some shooting of these birds in South America; but the South Americans had not the population or the market demand that we have here. The opening of the great west to settlement, and the unrestricted slaughter that followed, which destroyed first the bison and other large animals, then the Wild Turkey and the smaller game birds, exterminated the Curlew as it did the Passenger Pigeon and the Carolina Paroquet. The Curlew was one of the first to go, because it was easy to kill and brought a high price, and because it had practically no protection. The season was open while the bird was here, and closed when it was out of the country.

Prof. W. W. Cooke brings forward as a "simple explanation" of the probable cause of the extinction of the Eskimo Curlew the fact that its former winter home in Argentina and its spring feeding grounds in Nebraska and South Dakota have been settled and cultivated; but he does not explain why this has not exterminated the Golden Plover, which had to meet the same conditions in the same regions. The mere settlement and cultivation of the feeding grounds would not have exterminated the birds. It provided more food for them, as both species were fond of insects and earthworms, which are increased by cultivation, and both are known to have gleaned worms and insects on ploughed land and cultivated fields. Settlement and cultivation then would have tended to increase their numbers, as it provided them with a greater food supply. We must assume that Professor Cooke means to assign the destruction of the species to the shooting, market hunting and other adverse influences that always follow settlement. Thousands of people can testify that these were the destructive causes in the western States.

It has been suggested that possibly toward the last some great storm at sea may have hastened the end. No storm ever blew that was far-reaching, severe or continuous enough to have threatened the extinction of these birds when they were numerous, and bred from Hudson Bay to Alaska, when their flights passed down the Atlantic coast in August and September, with stragglers continuing until after the middle of November. Their numbers were too great, and they were extended over too large a part of the earth's surface, to be swept out of existence at one fell stroke. There is no evidence that this species ever was overwhelmed by any storm. It seems to have been well fitted to cope with the elements at sea. The species that are most exposed to storms on the ocean are the two Phalaropes, which migrate almost entirely at sea. By breeding mainly in high latitudes and keeping mostly off shore in their migrations they have escaped the gunner, and have held their own better than other birds of this order. If storms at sea exterminated the Curlews, why have they not destroyed the Phalaropes, which are far more exposed to them, and the Golden Plover, which travelled with the Curlews? There could have been no possibility of the destruction of the Dough-bird by a storm until it was reduced to a remnant of its former numbers, and driven by inhospitable man to seek a refuge at sea. But if such a catastrophe had happened, it would have made no difference in the end. The bird was doomed. It was merely another victim to man's rapacity and greed, as all large shore birds eventually must be, unless protected by law and public sentiment from their otherwise inevitable fate.

In addition to the notes given by Mr. Mackay, there are a few more eastern records made within the last twenty years:—

1890. — A flock of about twenty, at Eagle Hill, Ipswich, autumn; nearly all killed by T. C. Wilson (C. W. Townsend, Birds of Essex County).
1890. — One shot by Alfred Swan at North Eastham, September 28; specimen preserved. Species seen or taken in New York State every year from 1885 to 1891 except 1888 (E. H. Eaton, Birds of New York).
1893. — One seen at Ipswich by Walter Faxon (C. W. Townsend, Birds of Essex County).

1895. — Two killed by William H. Spaulding at Chatham (N. A. Eldredge).
1896 (about). — Last record for New York State (E. H. Eaton, Birds of New York).
1897. — August, one shot and eaten, Chatham Beach (Herbert K. Job).
1898. — Last seen at Dennis, Mass. (William N. Stone).
1899. — Three killed at Chatham Beach, Mass. (Chatham Beach Hotel Shooting Record).
1899. — One female killed at Chatham, Mass., September 5 (in J. E. Thayer collection).
1900. — One killed at Eastham (Rev. E. E. Phillips).
1900. — One killed at Chatham Beach, September 13 (Chatham Beach Hotel Shooting Record).
1900. — One killed on an island in the Gulf of St. Lawrence (Dr. L. C. Sanford).
1901. — Last one killed on Prince Edward Island (E. T. Carbonnell).
1901. — One shot at Ipswich (C. W. Townsend, Birds of Essex County).
1901. — One female shot by Louis A. Shaw, Pine Point, Me., September 23 (in J. E. Thayer collection).
1902. — Two obtained by Dr. L. C. Jones of Malden in Boston market in October. One killed in Massachusetts; the other came in with some western birds (in J. E. Thayer collection).
1902. — Dr. Jonathan Dwight, Jr., has the head of a specimen from Sable Island believed to have been taken in 1902 (J. H. Fleming).
1906. — Male taken, Magdalen Islands (Stanley Cobb), September 6; specimen preserved. (See also *Auk*, 1906, p. 459.)
1908. — Two said to have been killed by A. B. Thomas at Newburyport. One of these now in J. E. Thayer collection (*Auk*, 1909, p. 77).
1909. — One taken at Hog Island, Hancock County, Me., September 2 (O. W. Knight). (*Auk*, 1910, p. 79.) Now in collection of the University of Maine.
1909. — Another at Hog Island, September 14, by Ira M. Stanley (Curator, C. S. Winch). Specimen preserved.

As this goes to press, Dr. Wilfred T. Grenfell writes that the species has not been noted in Labrador for three or four years.

The habits of the Eskimo Curlews were much like those of the Golden Plover. They frequented the same localities, often fed on the same food, and whenever large numbers of the Curlews were seen in migration, flocks of Golden Plover usually followed them. The Curlews were very strong and high flyers, and it has been estimated that they ordinarily flew at the rate of one hundred miles an hour, and at nearly twice

that speed with a high wind. These estimates were possibly excessive. Nevertheless, this bird's power of flight was so great that it would not take long, under favorable conditions, for it to cross the vast expanse of ocean lying between Labrador and the lesser Antilles, which it visited in its southern flight. This Curlew was able to rest on the sea, like the Golden Plover or the Willet,¹ and it may have done so, as all shore birds can swim. If it could travel with a fair wind even one hundred miles an hour, it could go from Labrador to the lesser Antilles or about two thousand miles, in twenty hours. It is improbable that it could make so quick a passage; but it seems possible that it often arrived at the Antilles without landing on the way.

Apparently a large part of the individuals of this species concentrated in Labrador in August, although many went south through the Mississippi valley region. Some of those that bred in Alaska must have made a journey of more than two thousand miles to reach the Labrador coast. As it is about seven thousand miles from the shores of the Arctic Ocean, where they bred, to Patagonia, where some of them spent the winter, their wonderful annual flight over land and sea must have covered at least fourteen thousand miles, and if some individuals bred in Alaska they may have travelled over sixteen thousand miles.

About the last week in August or sometimes a little earlier the migration from Labrador began. As they rarely alighted on the Massachusetts coast in great numbers except when blown off their course by a storm, and as they were then tired, wet and storm-beaten, they readily were approached by the gunner. When driven to take wing by the death-dealing charge, they started off swiftly; but, being of an affectionate disposition, they often returned to their struggling, wounded companions, and hovered solicitously over them until another storm of shot again tore through their thinned and broken ranks. They were decoyed easily by the gunner, who could give a close imitation of their call. They were much too innocent and confiding for their own good. As

¹ Mackay, George H.: *Auk*, 1896, p. 90.

one old Prince Edward Island gunner remarked, "They would not go out of a field until they were all killed." He might have added, — and not even then, unless carried out. In later years, on the Massachusetts coast, this species was not always so tame; but most of those which remained for any time upon these shores were gathered in by the gunner sooner or later. In flight the smaller flocks sometimes assumed a V-shaped formation, but the great flocks were simply masses or extended lines. These flocks often performed beautiful evolutions, swinging about as if at command, sometimes in "open order," again compactly massed. They always appeared to follow some temporary leader; and Nelson says that the small flocks frequently were led by a single Hudsonian Curlew, as small shore birds sometimes are preceded by one of a larger species, the little fellows seemingly depending on its superior sagacity and watchfulness to keep them from danger. When driven in by a storm, the Eskimo Curlews usually alighted facing the wind on the sheltered side of a grassy hill or in the open field, sometimes on the beach or in the marsh; but they were attracted particularly by hill pastures near the coast.

In Massachusetts their food consisted very largely of terrestrial insects, beetles, grasshoppers, crickets and ants; also earthworms. They were among the most useful of birds in their migrations in the west, as they were very destructive to the young of the Rocky Mountain locust, formerly the scourge of the plains. Dr. Coues says that while feeding the great flocks kept up a conversational chattering, like a flock of Blackbirds. In Prince Edward Island they have been seen following the furrow and searching for worms, as they did in the west.¹

In Labrador they gathered to feed on the wild berries, chief of which was the *Empetrum nigrum*, called curlewberry or "gallowberry" by the natives, but generally known as the crowberry. There they also fed on snails; and Mr. Berteau states that they ate "sea lice and infusoria found on sandy beaches."

¹ Mackay, George H.: Auk, 1896, p. 182.



PLATE XV.—THE LAST PASSENGER PIGEON.

The only living specimen now known to exist. The long, elegant tail feathers have been broken off in the cage. This is a female in the Cincinnati Zoölogical Garden. (From a photograph made and copyrighted by Enno Meyer, Cincinnati, O., 1911.) The immense hosts of the Passenger Pigeon, formerly one of the greatest zoölogical wonders of the world, are now extinct.

PASSENGER PIGEON (*Ectopistes migratorius*).

Common name: Wild Pigeon.

Length. — 15.50 to 16 inches.*Male.* — Eye orange, bare space surrounding it purplish flesh color; head, upper part of neck and chin bright slate blue; throat, breast and sides reddish and hazel; part of neck and its sides resplendent changeable gold and green metallic lusters; upper parts mainly dull blue; lower parts reddish or chestnut fading toward tail; back and parts of wings tinged with olive; shoulders and upper wings black-spotted; long wing feathers and long middle tail feathers blackish; outer tail feathers white or bluish, their inner webs black and chestnut near the base.*Female.* — Much duller above and bluish or gray beneath.*Young.* — Duller still, the feathers of upper parts with whitish edgings and the wing feathers with rufous edgings.*Nest.* — A frail platform of twigs in a tree.*Eggs.* — One, rarely two, about 1.50 by 1.12; pure white.*Notes.* — *Coo-coo-coo-coo*, much shorter than that of the domestic pigeon; and *kee-kee-kee-kee*, the first loudest, the others diminishing (Audubon). See also Craig, Auk, 1911, pp. 408-427.*Season.* — In Massachusetts, formerly March to December.*Range.* — North America, from the high plains of the Rocky Mountain region to the Atlantic, ranging from the fur countries to the Gulf States; one specimen recorded from Cuba. Casual in Mexico and Nevada.**HISTORY.**

More interest is evinced in the history of the Passenger Pigeon and its fate than in that of any other North American bird. Its story reads like a romance. Once the most abundant species, in its flights and on its nesting grounds, ever known in any country, ranging over the greater part of the continent of North America in innumerable hordes, the race seems to have disappeared within the past thirty years, leaving no trace. Men now living can remember its appearance in countless multitudes in the western States, but the fact that similar immense armies once ranged over the Atlantic seaboard is almost forgotten. Nevertheless, this was a most important part of its range, and its vast legions roamed over the country from the Carolinas to the Maritime Provinces of Canada, and even to the Barren Grounds and Hudson Bay.

The Passenger Pigeon was described by Linné in the latter

part of the eighteenth century (Syst. Nat., 1766, ed. 12, Vol. I, p. 285); but it was well known in America many years before. In July, 1605, on the coast of Maine, in latitude $43^{\circ} 25'$, Champlain saw on some islands an "infinite number of pigeons," of which he took a great quantity.¹

Many early historians, who write of the birds of the Atlantic coast region, mention the Pigeons. The Jesuit Fathers, in their first narratives of Acadia (1610-13), state that the birds were fully as abundant as the fish, and that in their seasons the Pigeons overloaded the trees.²

Passing now from Nova Scotia to Florida, we find that Stork (1766) asserts that they were in such plenty there for three months of the year that an account of them would seem incredible.³

John Lawson (1709), in his History of Carolina, speaks of prodigious flocks of Pigeons in 1701-02, which broke down trees in the woods where they roosted, and cleared away all the food in the country before them, scarcely leaving one acorn on the ground.⁴

The early settlers in Virginia found the Pigeons in winter "beyond number or imagination."

Strachey (1612) says: "A kind of wood-pidgeon we see in winter time, and of them such numbers, as I should drawe (from our homelings here, such who have seene, peradventure scarce one more than in the markt) the credit of my relation concerning all the other in question yf I should expresse what extended flocks, and how manie thousands in one flock, I have seene in one daie . . . but there be manie hundred witnesses."⁵

Hamor (1615) says: "My selfe haue seene three or foure houres together flockes in the aire, so thicke that euen they haue shaddowed the skie from vs."⁶

Professor Kalm found the Pigeons in numbers "beyond

¹ Champlain, Samuel de: Pub. Prince Soc., 1878, Vol. II, pp. 68, 69.

² Thwaites, R. G., and others: Jesuit Relations and Allied Documents, 1896, Vol. I, p. 253.

³ Stork, William: An Account of East Florida, 1766, p. 51.

⁴ Lawson, John: History of Carolina, 1860, pp. 232, 233.

⁵ Strachey, William: The Historie of Travaile into Virginia Brittannia, printed for the Hakluyt Soc., 1849, p. 126.

⁶ Hamor, Raphe: A True Discourse of the Present Estate of Virginia, 1615, p. 21.

conception" in the middle States and in Canada.¹ He states, in his monograph of the Passenger Pigeon, that there are certain years "when they come to Pennsylvania and the southern English provinces in such indescribable multitudes as to appal the people."² The year 1740 was one of the years when they came to Pennsylvania and New Jersey in incredible multitudes. He also states that Dr. Golden told him that he had twice seen similar great flights between New York and Albany.

G. H. Hollister, in the *History of Connecticut* (1855), says that pigeons were innumerable in spring and autumn and were started from the thickets in summer.³

Massachusetts authors make brief but numerous references to the species.

Wood (1629-34) records the migration through eastern Massachusetts in the following words: "These Birds come into the Countrey, to goe to the North parts in the beginning of our Spring, at which time (if I may be counted worthy, to be beleaved in a thing that is not so strange as true) I have seene them fly as if the Ayerie regiment had beene Pigeons; seeing neyther beginning nor ending, length, or breadth of these Millions of Millions. The shouting of people, the rattling of Gunnes, and pelting of small shotte could not drive them out of their course, but so they continued for foure or five houres together: yet it must not be concluded, that it is thus often; for it is but at the beginning of the Spring, and at Michaelmas, when they returne backe to the Southward; yet are there some all the yeare long, which are easily attayned by such as looke after them. Many of them build amongst the Pine-trees, thirty miles to the North-east of our plantations; joyning nest to nest, and tree to tree by their nests, so that the Sunne never sees the ground in that place, from whence the Indians fetch whole loades of them."⁴ This nesting must have been somewhere near the coast of Essex, or, as

¹ Kalm, Peter: *Travels into North America, 1770* (first English ed.), Vol. II, pp. 82, 311.

² Kalm, Peter: *A Description of the Wild Pigeons which visit the Southern English Colonies in North America during Certain Years in Incredible Multitudes*, translated by S. M. Gronberger from *Kongl. Vetenskaps-Akademiens Handlingar för år 1759*, Vol. XX, Stockholm, 1759; now published in the *Auk*, 1911, pp. 53-66.

³ Hollister, G. H.: *History of Connecticut, 1855*, Vol. I, pp. 33, 34.

⁴ Wood, William: *New England's Prospect*, Pub. Prince Soc., 1865, pp. 31, 32.

Dr. Townsend puts it in his *Birds of Essex County*, in the Essex woods.

The following is an extract from a letter written by Governor Dudley to the Countess of Lincoln, March 12, 1630: "Upon the eighth of March from after it was fair daylight, until about eight of the clock in the forenoon, there flew over all the towns in our plantations, so many flocks of doves, each flock containing many thousands and some so many that they obscured the light, that it passeth credit, if but the truth should be written."¹

Higginson, writing of Salem about this date, apparently makes the same statement in nearly the same words. In Charles Brooks's *History of Medford, Mass.* (p. 37), we find the following occurrence recorded on March 8, 1631: "Flocks of wild pigeons this day, so thick they obscure the light." Apparently these were the first large flights of pigeons of which we have definite record in New England.

The Plymouth colony was threatened with famine in 1643, when great flocks of Pigeons swept down upon the ripened corn and beat down and ate "a very great quantity of all sorts of English grain." But Winthrop says that in 1648 they came again after the harvest was gathered, and proved a great blessing, "it being incredible what multitudes of them were killed daily."²

Roger Williams (1643) says that the Pigeons bred abundantly in Rhode Island in the "Pigeon Countrie." Josselyn (1672), who had a general acquaintance with the New England colonies, and who lived in Massachusetts and Maine for some years, states that of Pigeons there were "millions of millions; I have seen," he asserts, "a flight of Pidgeons in the spring, and at Michaelmas when they return back to the Southward for four or five miles, that to my thinking had neither beginning nor ending, length nor breadth, and so thick that I could see no Sun."³ . . . But of late they are much diminished, the English taking them with Nets."

The latter statement shows that the extirpation of these

¹ Coll. Mass. Hist. Soc., Vol. VIII, 1st ser., p. 45.

² Winthrop, John: *The History of New England from 1630 to 1649*. James Savage, editor, 1825-26, Vol. II, pp. 94, 331, 332.

³ Josselyn, John: *Two Voyages to New England*, 1665, p. 79.

birds began in New England within fifty years after the first settlement at Plymouth. It went on for more than two hundred years. Nevertheless, they were still quite numerous about the beginning of the nineteenth century.

Lewis and Newhall, writing of those early days in the *History of Lynn* (1866, p. 45), state that a single family "has been known to have killed one hundred dozens of these birds with poles and other weapons."

Belknap (1792), in his *History of New Hampshire*, says they "come in the spring, from the southward, in large flocks, and breed in our woods, during the summer months." Richard Hazzen, who surveyed the Province line in 1741, remarks: "'For three miles together, the pigeons nests were so thick, that five hundred might have been told on the beech trees at one time; and could they have been counted on the hemlocks, as well, I doubt not but five thousand, at one turn round.' This was on the western side of the Connecticut River and eastward of the Deerfield River [and probably extended into Massachusetts]. Since the clearing of the woods the number of pigeons is diminished."¹

One of the earliest settlers at Clarendon, Vt., stated that immense numbers of Pigeons nested there. The trees were loaded with nests, and the noise made by the birds at night was so troublesome that the traveller could get no sleep. Settlers often cut down trees, and gathered a horse-load of squabs in a few minutes.²

In the *History of Wells and Kennebunk, Me.*, it is stated that from the first settlement to 1820 Pigeons in innumerable numbers haunted the woods near the sea. In their season they furnished food for many families.³

Isaac Weld, Jr. (1799), relates that a resident of Niagara, while sailing from that town to Toronto (forty miles), saw a great flight of Pigeons coming from the north which continued throughout the voyage, and the birds were still coming from the north in large bodies after he reached Toronto.⁴

¹ Belknap, Jeremy: *History of New Hampshire*, 1792, Vol. III, pp. 171, 172.

² Williams, Samuel: *The Natural and Civil History of Vermont*, 1809, Vol. I, p. 137.

³ Bourne, Edward E.: *History of Wells and Kennebunk*, 1875, pp. 563, 564.

⁴ Weld, Isaac, Jr.: *Travels through the States of North America*, etc., during the years 1795, 1796, 1797, London, 1800, Vol. II, p. 43.

The Baron de Lahontan, in a letter dated May 28, 1687, from Boucherville, describing a flight of these birds in the vicinity of Lake Champlain, says: "One would have thought, that all the Turtle-Doves on Earth had chose to pass thro' this place. For the eighteen or twenty days that we stayed there, I firmly believe that a thousand Men might have fed upon 'em heartily, without putting themselves to any trouble. . . . The trees were covered with that sort of fowl more than with leaves."¹

These great flights of Pigeons in migration extended over vast tracts of country, and usually passed in their greatest numbers for about three days. This is the testimony of observers in many parts of the land. Afterward, flocks often came along for a week or two longer. Even as late as the decade succeeding 1860 such flights continued, and were still observed throughout the eastern States and Canada, except perhaps along the Atlantic coast.

W. Ross King (1866) speaks of a flight at Fort Mississauga, Canada, which filled the air and obscured the sun for fourteen hours. He believes that the flight must have averaged three hundred miles in length by a mile wide. An immense flight continued for several days thereafter.²

Wild Pigeons are not mentioned in Hampshire County, Mass., records until after 1700, but undoubtedly they were there when settlement began. They had a breeding place near the line between Hampshire County and Vermont, and their nests on the beech and hemlock trees extended for miles. They were noted in Hampshire County before 1740, and many were shot. Levi Moody is given by Judd as authority for the statement that they were caught in such numbers in Granby that not all could be sold or eaten, and after the feathers had been plucked from them, many were fed to the hogs. Pigeon feathers were much used for beds. In August, 1736, Pigeons were sold in the Boston market at twopence per dozen, and many could not be sold at that price. In Northampton, from 1725 to 1785, when they could be sold,

¹ Lahontan, Baron de: *Some New Voyages to North America*, 1703, Vol. I, pp. 61, 62.

² King, W. Ross: *The Sportsman and Naturalist in Canada*, 1866, p. 121.

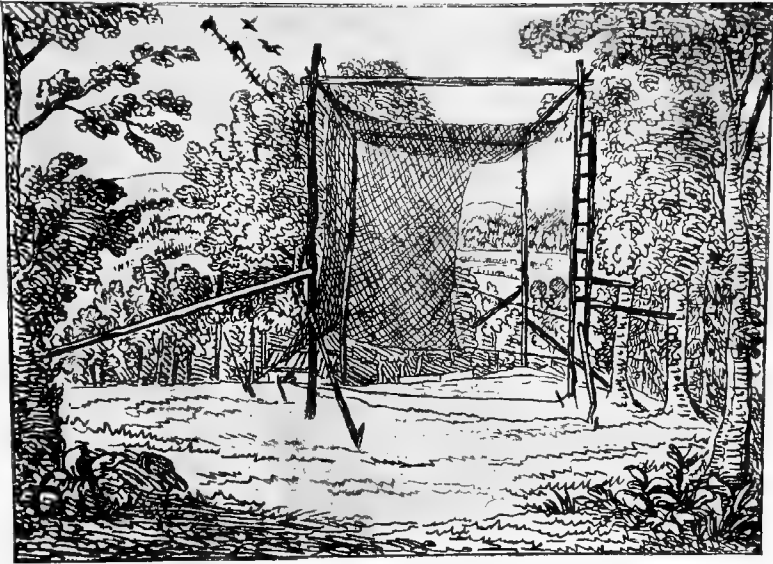


PLATE XVI.—PIGEON NET.

Taken from an old etching. (Reproduced from *The Passenger Pigeon*, by W. B. Mershon.)

they brought usually from threepence to sixpence per dozen. In 1790 they brought ninepence per dozen, and a few years after 1800, one shilling, sixpence. After 1850 they were sold at from seventy-five cents to a dollar and a half a dozen.¹

In the History of the Sesqui-centennial Celebration of the Town of Hadley, Mass., it is stated that before 1719 Wild Pigeons in their migrations roosted in countless numbers in the oak and chestnut groves on the plains.

Thompson states that when the country was new there were many of their breeding places in Vermont; also, that they were much less abundant (1842) than formerly; "but," he says, "they now, in some years, appear in large numbers."²

Great nestings became few and far between in the east, as the Pigeons decreased; but there were many small breeding places regularly occupied during the first half of the nineteenth century, and scattered pairs bred commonly. Mr. Clayton E. Stone sends an account of the nesting site of a flock of Passenger Pigeons, furnished by his father, Mr. Stillman Stone, who was well acquainted with the birds. It was situated on the side of Mt. Sterling, in the towns of Stowe and Hyde Park (formerly Sterling), in the northern part of Vermont. Mr. Stone was acquainted with it from 1848 to about 1853. It occupied a tract of twenty acres or more of old-growth maple and yellow birch. There were often as many as twenty-five nests in a tree, and sometimes more. The usual number of eggs in one nest was one or two, usually one. Most of the time during the nesting season large flocks of these birds could be seen coming and going in all directions to and from the nests. The people from this and neighboring towns went to the place with their teams to take up the squabs that had fallen to the ground; they took them away by cartloads. The squabs were distributed free, to be used as food by all their friends and neighbors.

In 1848 Mr. Stone and Madison Newcomb sprung a net over forty-four dozen, or five hundred and twenty-eight birds, at one cast, and they thought that only about one bird in four

¹ Judd, Sylvester: History of Hadley, 1905, pp. 351, 352.

² Thompson, Zadock: History of Vermont, 1842, p. 100.

of the flock was taken. Many escaped while they were taking out the forty-four dozen. Pigeons were abundant in that locality until the fall of 1865, when a man could shoot in half a day all that he could use. Mr. Stone says that hawks ravaged the birds continually. He left Vermont in 1866, and does not know how long afterward the Pigeons continued plentiful. At that time there were still many Pigeons in Massachusetts. There were bough houses and roosts erected for shooting Pigeons, "Pigeon beds," nets and stool Pigeons in almost every town. Old men remember this even now. Thoreau speaks of the arrangements for Pigeon shooting in Concord in the 50's.

Mr. Warren H. Manning writes me of a method of taking Pigeons which I have not seen described. He sends a sketch of

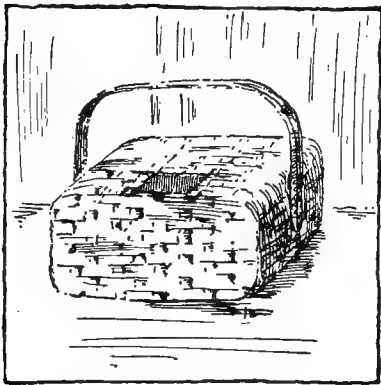


FIG. 21.—Pigeon basket.

a Pigeon basket (see Fig. 21) which was used by Lucinda Manning and her sisters at the Manning Manse in Billerica, Mass. This basket was used as a receptacle for the Pigeons after they had been taken. Mr. Manning states that these sisters had a Pigeon "bower" and snares in the valley in sight of the house, in the edge of what was then pine woods. "The snaring of Pigeons,"

he says, "must have represented quite an income to these sisters and their family before them." The old house was used as a tavern for more than one hundred years, and the tavern book, kept there from 1753 to 1796, is now in existence. Frequent references to the sale of Pigeons are made therein.

There are not many exact records of the flights of Pigeons in Massachusetts during the early part of the nineteenth century. They were of such regular occurrence that no one thought of recording them. Dr. Samuel Cabot told Mr. Brewster that from 1832 to 1836, while he was in college at

Cambridge, Pigeons visited the town regularly, both in spring and autumn, sometimes in immense numbers.¹

Mr. Clayton E. Stone writes that Mr. M. M. Boutwell, brother of the late Governor, George S. Boutwell, knew of a nesting place of the Passenger Pigeon in the northern part of Lunenburg, Mass., from his earliest recollection until 1851 or 1852. He states that an old gunner, Samuel Johnson, used to visit this place every year to get squabs. It was situated in the northern part of the town, on a tract of land which up to 1840 or 1845 was almost an unbroken forest for miles. It is said to have comprised something like five acres. Mr. Boutwell says that anywhere in any fall, until the year 1860, a man could get in an hour all the Pigeons he could use.

Mr. James W. Moore of Agawam, Mass., states that after 1850 great flocks of Pigeons still visited that region; and that as a boy he was sent to drive them from the rye, when it had been sown but not harrowed in. "We boys," he says, "had Pigeon beds, and caught them in nets."

About this time indications of the disappearance of the Pigeons in the east began to attract some notice. They became rare in Newfoundland in the 60's, though formerly abundant there. They grew fewer in Ontario at that time; but, according to Fleming, some of the old roosts there were occupied until 1870.

Mr. C. S. Brimley states that they were seen in some numbers near Raleigh, N. C., up to about 1850. For thirty years he has not seen one, which would fix the date of their disappearance there about 1880. Mr. Witmer Stone believes that they became rare in New Jersey about that time.

During the ensuing decade they became very rare in Massachusetts; but Mr. August B. Ross states that the Pigeons were "quite plenty" in rye fields on the plains at Montague, Mass., about 1879; and Mr. Robert O. Morris says that a small flock was seen in Longmeadow in the spring of 1880; but there is no authentic record of a Pigeon seen or taken in that vicinity since 1884. This seems to mark approxi-

¹ Brewster, William: *Memoirs*, Nuttall Orn. Club, No. IV, Birds of the Cambridge Region of Massachusetts, 1906, p. 176.

mately the time that the bird disappeared from the Connecticut valley.

Brewster records a flock of about fifty Pigeons on September 2, 1868, in Cambridge; and he states that a heavy flight passed through eastern Massachusetts between September 2 and September 10, 1871, and that he was assured that thousands were killed, and that the netters in Concord and Reading used their nets as of old.¹

My first experience with the Pigeons was in 1872. Many flocks went through Worcester County during the fall of that year, and I saw small flocks passing rapidly over the northern end of Lake Quinsigamond. Friends saw them in Spencer, Mass., and in other towns near Worcester. At that time the Pigeons were still breeding in Pembroke, N. H., about five miles south of Concord, where I passed the summer.

In 1872 a flock came into a cherry tree at Lanesville, Mass., under the shade of which Gen. Benjamin F. Butler stood delivering an address to a gathering of some two thousand people. Birds alighted "on every part of the tree."²

I have found no records of any considerable flights of Passenger Pigeons in Massachusetts since 1876. Hundreds of thousands of Pigeons then appeared in the Connecticut valley.³

Maynard (1870) considered the Pigeon as a common bird in localities, but growing less so every year.⁴

In 1870 Samuels stated that the Passenger Pigeon had become "of late years rather scarce in New England."⁵

In 1876 Minot wrote that in many places the Pigeons were then comparatively rare. He stated also that in a low pine wood within the present limits of Boston, flocks of several hundred have roosted every year.⁶

During the decade from 1880 to 1890 the Pigeon seems to have disappeared from Massachusetts. A good many birds

¹ Brewster, William: *Birds of the Cambridge Region*, 1906, p. 177.

² Leonard, H. C.: *Pigeon Cove, Mass.*, 1873, p. 165.

³ Morris, Robert O.: *Birds of Springfield and Vicinity*, 1901, p. 17.

⁴ Maynard, C. J.: *List of the Birds of Massachusetts, Naturalist's Guide*, 1870, Part 2, p. 137.

⁵ Samuels, Edward A.: *Birds of New England*, 1870, p. 374.

⁶ Minot, Henry D.: *The Land Birds and Game Birds of New England*, 2d ed., ed. by William Brewster, 1895, p. 396.

were seen and shot as late as the year 1878; after that they were scarce. The bird was seen by Mr. C. E. Ingalls at Winchendon, Mass., in 1889; and several were reported by Mr. Ralph Holman at Worcester in August, September and October. He also reports one killed by a Mr. Newton, janitor of the Worcester high school, on September 23, 1889. The last published authentic record of a Passenger Pigeon taken in Massachusetts is given by Howe and Allen as 1889;¹ but Mr. Neil Casey of Melrose has an adult female bird mounted, which he shot there on April 12, 1894; and he says that two days later a friend saw another, apparently its mate, in the same woods.²

Many observers report that they have seen the Passenger Pigeon in Massachusetts since that time, but no later authentic record of a specimen actually taken here is available. My correspondence with many hundreds of people throughout the State has resulted in no evidence of the occurrence of the species here, that would be accepted by ornithologists, since the beginning of the present century.

Unfortunately, there is no detailed published account of the migrations or the nesting of the Passenger Pigeon in Massachusetts or New England in the times when they were numerous; and to get any adequate idea of their numbers, their habits and the causes of their disappearance, we must turn to the writings of Wilson, Audubon and others, who observed the bird in the south and west.

Kalm (1759) says that on the 11th, 12th, 15th, 16th, 17th, 18th and 22d of March, 1740, such a multitude of these birds came to Pennsylvania that a flock alighting to roost in the woods filled both great and little trees for seven miles, and hardly a twig or branch could be seen which they did not cover. On the larger limbs they piled up in heaps. Limbs the size of a man's thigh were broken off by their weight, and the less firmly rooted trees broke down completely under their

¹ See also Thayer, H. J.: *Forest and Stream*, Vol. XXXIII, Oct. 31, 1889, p. 288.

² According to Perkins and Howe a few were to be seen near Essex Junction, Vt., and about Fort Ethan Allen each season up to the date of their publication (1901), and Dr. Perkins wrote me in 1910 that he believed that there were a few still about Stratton Mountain in that State where formerly they nested in great numbers, but no one has been able to obtain a specimen. See Perkins, Geo. H., and Howe, C. D.: *A Preliminary List of the Birds found in Vermont, 1901*, p. 17.

load.¹ This reads like the tale of a romancer; but similar occurrences all over the land are recorded by many credible witnesses.

Alexander Wilson, the father of American ornithology, tells of a breeding place of the Wild Pigeons in Shelbyville, Ky. (probably about 1806), which was several miles in breadth, and was said to be more than forty miles in extent. More than one hundred nests were found on a tree. The ground was strewn with broken limbs of trees; also eggs and dead squabs which had been precipitated from above, on which herds of hogs were fattening. He speaks of a flight of these birds from another nesting place some sixty miles away from the first, toward Green River, where they were said to be equally numerous. They were travelling with great steadiness and rapidity, at a height beyond gunshot, several strata deep, very close together, and "from right to left as far as the eye could reach, the breadth of this vast procession extended; seeming everywhere equally crowded." From half-past 1 to 4 o'clock in the afternoon, while he was travelling to Frankfort, the same living torrent rolled overhead, seemingly as extensive as ever. He estimated the flock that passed him to be two hundred and forty miles long and a mile wide, — probably much wider, — and to contain two billion, two hundred and thirty million, two hundred and seventy-two thousand pigeons. On the supposition that each bird consumed only half a pint of nuts and acorns daily, he reckoned that this column of birds would eat seventeen million, four hundred and twenty-four thousand bushels each day.

Audubon states that in the autumn of 1813 he left his house at Henderson, on the banks of the Ohio, a few miles from Hardensburgh, to go to Louisville, Ky. He saw that day what he thought to be the largest flight of Wild Pigeons he had ever seen. The air was literally filled with them; and "the light of noonday was obscured as by an eclipse." Before sunset he reached Louisville, fifty-five miles from Hardensburgh, and during all that time Pigeons were passing in undiminished numbers. This continued for three days in

¹ Auk, 1911, pp. 56, 57.

succession. The people were all armed, and the banks of the river were crowded with men and boys, incessantly shooting at the Pigeons, which flew lower as they passed the river. For a week or more the people fed on no other flesh than Pigeons. The atmosphere during that time was strongly impregnated with the odor of the birds. Audubon estimated the number of Pigeons passing overhead (in a flock one mile wide) for three hours, travelling at the rate of a mile a minute, allowing two Pigeons to the square yard, as one billion, one hundred and fifteen million, one hundred and thirty-six thousand. He estimated, also, that a flock of this size would require eight million, seven hundred and twelve thousand bushels of food a day, and this was only a small part of the three days' flight.

Great flights of Pigeons ranged from the Alleghenies to the Mississippi and from Hudson Bay to the Gulf of Mexico, until after the middle of the nineteenth century. Even two decades later, enormous numbers of Pigeons nested in several States.

Their winter roosting places almost defy description. Audubon rode through one on the banks of the Green River in Kentucky for more than forty miles, crossing it in different directions, and found its average width to be rather more than three miles. He observed that the ejecta covered the whole extent of the roosting place, like snow; that many trees two feet in diameter were broken off not far from the ground, and that the branches of many of the largest and tallest had given way.¹

The birds came in soon after sundown with a noise that sounded "like a gale passing through the rigging of a close-reefed vessel," causing a great current of air as they passed; and here and there, as the flocks alighted, the limbs gave way with a crash, destroying hundreds of the birds beneath. It was a scene of uproar and confusion. No one dared venture

¹ Audubon's statement that trees were broken off by the birds has been questioned, but it is corroborated by others. James Mease (1807) quotes a Rev. Mr. Hall who saw a hickory tree more than a foot in diameter bent over by the birds until its top touched the ground and its roots were started, and he states that brittle trees often were broken off by them. (Mease, James: A Geological Account of the United States, 1807, pp. 348, 349. Kalm and Lawson also observed this long before the time of Audubon.)

into the woods during the night, because of the falling branches.

The nesting places sometimes were equal in size to the roosting places, for the Pigeons congregated in enormous numbers, to breed in the northern and eastern States. When food was plentiful in the forests, the birds concentrated in large numbers; when it was not, they scattered in smaller groups. Mr. Henry T. Phillips, a game dealer of Detroit, who bought and sold Pigeons for many years, states that one season in Wisconsin he saw a nesting place that extended through the woods for a hundred miles.¹

The last great nesting place of which we have adequate records was in Michigan, in 1878. Prof. H. B. Roney states, in the *American Field* (Vol. 10, 1879, pp. 345-347), that the nesting near Petoskey, that year, covered something like one hundred thousand acres, and included not less than one hundred and fifty thousand acres within its limits. It was estimated to be about forty miles in length and from three to ten miles in width. It is difficult to approximate the number of millions of Pigeons that occupied that great nesting place.

Audubon, who described the dreadful havoc made among these birds on their roosting grounds by man, says that people unacquainted with them might naturally conclude that such destruction would soon put an end to the species; but he had satisfied himself, by long observation, that nothing but the gradual diminution of the forests could accomplish the decrease of the birds, for he believed that they not infrequently quadrupled their numbers during the year, and always doubled them. The enormous multitudes of the Pigeons made such an impression upon the mind that the extinction of the species at that time, and for many years afterwards, seemed an absolute impossibility. Nevertheless, it has occurred.

How can this apparent impossibility be explained? It cannot be accounted for by the destructiveness of their natural enemies, for during the years when the Pigeons were the most abundant their natural enemies were most numerous. The extinction of the Pigeons has been coincident with the

¹ Mershon, W. B.: *The Passenger Pigeon*, 1907, p. 107.

disappearance of bears, panthers, wolves, lynxes and some of the larger birds of prey from a large portion of their range.

The aborigines never could have reduced appreciably the numbers of the species. Wherever the great roosts were established, Indians always gathered in large numbers. This, according to their traditions, had been the custom among them from time immemorial. They always had slaughtered these birds, young and old, in great quantities; but there was no market among the Indians, and the only way in which they could preserve the meat for future use was by drying or smoking the breasts. They cured large numbers in this way. Also, they were accustomed to kill great quantities of the squabs in order to try out the fat, which was used as butter is used by the whites. Lawson writes (1709): "You may find several Indian towns of not above seventeen houses that have more than one hundred gallons of pigeon's oil or fat."¹

But it was not until a market demand for the birds was created by the whites that the Indians ever seriously affected the increase of the Pigeons. Kalm states, in his monograph of the Pigeon, that the Indians of Canada would not molest the Pigeons in their breeding places until the young were able to fly. They did everything in their power to prevent the whites from disturbing them, even using threats, where pleading did not avail.

When the white man appeared on this continent, conditions rapidly changed. Practically all the early settlers were accustomed to the use of firearms; and wherever Pigeons appeared in great numbers, the inhabitants armed themselves with guns, clubs, stones, poles and whatever could be used to destroy the birds. The most destructive implement was the net, to which the birds were attracted by bait, and under which vast numbers of them were trapped. Gunners baited the birds with grain. Dozens of birds sometimes were killed thus at a single shot. In one case seventy-one birds were killed by two shots.² A single shot from the old flint-lock single-barreled gun, fired into a tree, sometimes would procure

¹ Lawson, John: History of Carolina, 1860, p. 78.

² Leffingwell, W. B.: Shooting on Upland, Marsh and Stream, 1890, p. 228.

a backload of Pigeons. The Jesuit Relations of 1662-64 tell of a man who killed one hundred and thirty-two birds at a shot.¹ Kalm states that frequently as many as one hundred and thirty were killed at one shot. Shooting in the large roosts was very destructive. Osborn records a kill of one hundred and forty-four birds with two barrels. An engine of destruction often used in early times was an immense swivel gun, loaded with "handfuls of bird shot." Such guns were taken to the roosts and fired into the thickest masses of Pigeons, killing at one discharge "enough to feed a whole settlement."

As cities were established in the east, the Indians, now armed with guns and finding a market for their birds, became doubly destructive; but as the white man moved toward the west he destroyed the Indian as well as the game, until few Indians were left in most of the country occupied by the Pigeons.

The Pigeons were reduced greatly in numbers on the whole Atlantic seaboard during the first two centuries after the settlement of the country, but in the west their numbers remained apparently the same until the nineteenth century. There was no appreciable decrease there during the first half of that century; but during the latter half, railroads were pushed across the plains to the Pacific, settlers increased rapidly to the Mississippi and beyond, and the diminution of the Pigeons in the west began. Already it had become noticeable in western Pennsylvania, western New York, along the Appalachian Mountain chain and in Ohio. This was due in part to the destruction of the forests, particularly the beech woods, which once covered vast tracts, and which furnished the birds with a chief supply of food. Later, the primeval pine and hemlock forests of the northern States largely were cut away. This deprived the birds of another source of food, — the seed of these trees. The destruction of the forests, however, was not complete; for, although great tracts of land were cleared, there remained and still remain vast regions more or less covered by coppice growth sufficient to furnish

¹ Thwaites, R. G., and others: Jesuit Relations and Allied Documents, 1896, Vol. 48, p. 177.

great armies of Pigeons with food, and the cultivation of the land and the raising of grain provided new sources of food supply. Therefore, while the reduction of the forest area in the east was a large factor in the diminution of the Pigeons, we cannot attribute their extermination to the destruction of the forest. Forest fires undoubtedly had something to do with reducing the numbers of these birds, for many were destroyed by these fires, and in some cases large areas of forest were ruined absolutely by fire, thus for many years depriving the birds of a portion of their food supply. Nevertheless, the fires were local and restricted, and had comparatively little effect on the vast numbers of the species.

The main factors in the extermination of the Pigeons are set forth in a work entitled *The Passenger Pigeon*, by W. B. Mershon (1907), which will well repay perusal, and in which a compilation is made of many of the original accounts of the destruction of the Pigeon during the nineteenth century. From this volume many of the following facts are taken.

In early days the Allegheny Mountains and the vast region lying between them and the Mississippi River were covered largely by unbroken forest, as was also much of the country from the Maritime Provinces of Canada to Lake Winnipeg. The only inhabitants were scattered bands of Indians. The Pigeons found a food supply through all this vast region, and also nesting places which were comparatively unmolested by man; but as settlement advanced, as railroads were built, spanning the continent, as telegraph lines followed them, as markets developed for the birds, an army of people, hunters, settlers, netters and Indians found in the Pigeons a considerable part of their means of subsistence, and the birds were constantly pursued, wherever they appeared, *at all seasons of the year*. They wandered through this vast region, resorting to well-known roosting places and nesting places, containing from a million or two of birds to a billion or more; and there were many smaller colonies. Wherever they appeared, they were attacked immediately by practically all the people in that region. At night their roosts were visited by men who brought pots of burning sulphur, to suffocate the

birds and bring them to the ground. An assortment of weapons was brought into service. When the birds nested in the primeval birch woods of the north, the people set fire to the loose hanging bark, which flamed up like a great torch, until the whole tree was ablaze, scorching the young birds, and causing them to leap from their nests to the ground in their dying agonies.

At the great nesting places both Indians and white men felled the trees in such a way that the larger trees, in falling, broke down the smaller ones and threw the helpless squabs to the ground. The squabs were gathered, their heads pulled off, their bodies thrown into sacks, and large droves of hogs were turned in, to fatten on those which could not be used.

Sometimes, when the Pigeons flew low, they easily were knocked down with poles and oars swung in the direction of their flight or across it, and in early days thousands were killed with poles at the roosts. Pike, on a trip from Leech River to St. Louis, on April 28, 1806, stopped at a Pigeon roost, and in about fifteen minutes his men knocked on the head and brought aboard two hundred and ninety-eight Pigeons.¹

As soon as it was learned in a town that the Pigeons were roosting or nesting in the neighborhood, great nets were set in the fields, baited with grain or something attractive to the birds. Decoy birds were used, and enormous numbers of Pigeons were taken by springing the nets over them; while practically every able-bodied citizen, men, women, children and servants, turned out to "lend a hand" either in killing the Pigeons or in hauling away the loads of dead birds.

Wherever the Pigeons nested near the settlements, they were pursued throughout the summer by hunters and boys. Kalm, in his account of the species (1759), states that several extremely aged men told him that during their childhood there were many more Pigeons in New Sweden during summer than there were when he was there. He believed that the Pigeons had been "either killed off or scared away." In either case their decrease was evident at that early date.

¹ Pike, Zebulon Montgomery: *The Expeditions of, during the years 1805-07, by Elliott Coues, 1895, Vol. I, p. 212.*

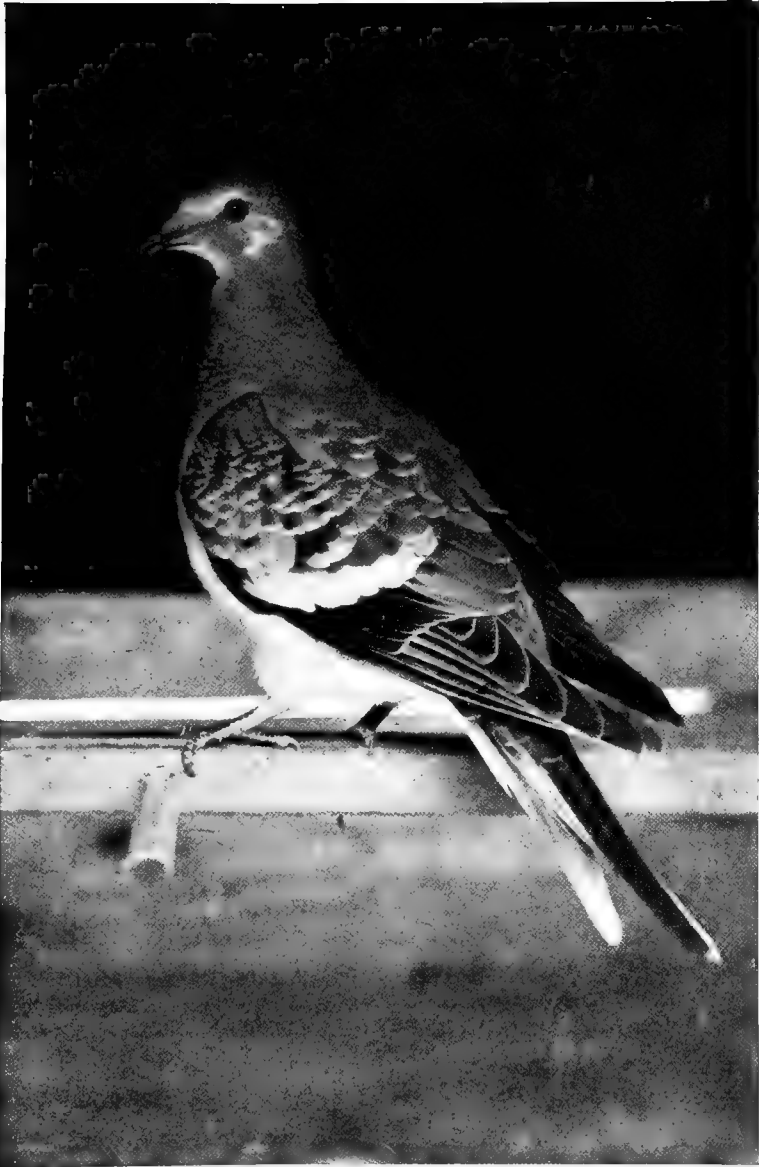


PLATE XVII.—YOUNG PASSENGER PIGEON.

Photograph by Prof. C. O. Whitman. This illustration was first published in W. B. Mershon's work, *The Passenger Pigeon*.

The net, though used by fowlers almost everywhere in the east, from the earliest settlement of the country, was not a great factor in the extermination of the Pigeons in the Mississippi valley States until the latter half of the nineteenth century. With the extension of railroads and telegraph lines through the States, the occupation of the netter became more stable than before, for he could follow the birds wherever they went. The number of men who made netting an occupation after the year 1860 is variously estimated at from four hundred to one thousand. Whenever a flight of Pigeons left one nesting place and made toward another, the netters learned their whereabouts by telegraph, packed up their belongings and moved to the new location, sometimes following the birds a thousand miles at one move. Some of them not only made a living, but earned a competency, by netting Pigeons during part of the year and shooting wild-fowl and game birds during the remainder of the season. In addition to these there were the local netters, who plied the trade only when the Pigeons came their way.

From the time of Audubon and Wilson, even before the railroads had penetrated to the west, there was an enormous destruction of Pigeons for the markets. Wagonloads were sent to market, where the birds were sold at from twelve cents to fifty cents per dozen, according to the exigencies of supply and demand. Audubon tells of seeing schooners loaded in bulk with Pigeons in 1805 that were killed up the Hudson River and taken to the New York market. He says that from ten to thirty dozen were caught at one sweep of the net. In the early days the farmers destroyed large quantities of Pigeons for salting, and people were employed about the roosts plucking the birds for their feathers (which were used for beds), and salting down the heaps of bodies which were piled on the ground. Birds and beasts of prey got their share. Audubon in describing a great roost in Kentucky, says that the birds took flight before sunrise, after which foxes, lynxes, cougars, bears, opossums and polecats were seen sneaking off, and the howlings of wolves were heard; while Eagles, Hawks and Vultures came in numbers to feast on the dead or disabled

Pigeons which had been slaughtered during the night. He states that in March, 1830, the Pigeons were so abundant in New York City that piles of them could be seen on every hand.

Great nesting places of Pigeons occasionally were established in the eastern States after the middle of the nineteenth century, when vast numbers were killed for market. In 1848 eighty tons of these birds were shipped from Cattaraugus County, New York.

Mr. E. H. Eaton, in his *Birds of New York* (Vol. I, p. 382), says that the last great nesting in New York was in Allegany County, in 1868, extending about fourteen miles, and crossing the Pennsylvania line. He states also that there was an immense roost in Steuben County in 1875.

Possibly the last great slaughter of Pigeons in New York, of which we have record, was some time in the 70's. A flock had nested in Missouri in April, where most of the squabs were killed by the pigeoners. This flock then went to Michigan, where they were followed by the same pigeoners, who again destroyed the squabs. The Pigeons then flew to New York State, and nested near the upper Beaverkill in the Catskills, in the lower part of Ulster County. It is said that tons of the birds were sent to the New York market from this nesting place, and that not less than fifteen tons of ice were used in packing the squabs.¹

The wholesale slaughter in the west continued to increase until 1878. There were very large nestings in Michigan in 1868, 1870, 1872, 1874, 1876 and 1878. In 1876 there were at least three of these great breeding places in the State, one each in Newaygo, Oceana and Grand Traverse counties.² The great killing of 1878 in Michigan is said to have yielded no less than three hundred tons of birds to the market. Various figures are given regarding the number of birds killed in a few weeks at this great nesting place near Petoskey, Mich. Professor Roney estimates that a billion birds were destroyed there. This is evidently a very excessive approximation.

¹ Van Cleef, J. S.: *Forest and Stream*, 1899, Vol. 52, p. 385.

² Mershon, W. B.: *The Passenger Pigeon*, 1907, p. 77.

Mr. E. T. Martin, one of the netters, gives what he calls the "official figures" of the number marketed as one million, one hundred and seven thousand, eight hundred and sixty-six. His "figures" are largely estimates, but he states that one and a half millions would cover all the birds killed at the Petoskey nesting that year. This is apparently a very low estimate. Mr. W. B. Mershon shows that some of Mr. Martin's figures are very far below the actual shipments.

Professor Roney watched one netter at the Petoskey nesting place, who killed eighty-two dozen Pigeons in one day; and who stated that he had killed as many as eighty-seven dozen, or ten hundred and forty-four birds, in a day. The law regarding shooting and netting the birds at their nesting places was ignored. Professor Roney states that the sheriff drove out four hundred Indians from the Petoskey nesting in one day, and turned back five hundred incoming Indians the next; and that people estimated that there were from two thousand to twenty-five hundred people at this nesting place, engaged in the business of trapping, killing and shipping Pigeons. Mr. H. T. Phillips, a grocer and provision dealer at Cheboygan, Mich., says that from 1864 until "the Pigeons left the country" he handled live Pigeons in numbers up to one hundred and seventy-five thousand a year. He asserts that in 1874 there was a nesting at Shelby, Mich., from which one hundred barrels of birds were shipped daily for thirty days. At forty dozen birds to the barrel, this would total one million, four hundred and forty thousand birds.

During the 70's most of the Pigeons concentrated in the west. They often passed the winter in Texas, Arkansas, Missouri, the Indian Territory and contiguous regions, and the summer in Michigan and adjacent States and in the Canadian northwest. At this time some very large nets were used, grain beds were made, and the birds were allowed to come and feed there until from two hundred to two hundred and fifty dozen were taken sometimes at one haul. Mr. Mershon gives many records of large catches, and the largest number caught at one spring of the net (thirty-five hundred birds) is attributed to E. Osborn; but Mr. Osborn himself

says that it was two hundred and fifty dozen, or three thousand birds. It was made by fastening three large nets together, and springing all of them at once; sometimes one hundred dozen were taken in a single net. Mr. Osborn states that his firm alone shipped in 1861, from a roost in the Hocking Hills, Ohio, two hundred and twenty-five barrels of birds. Sullivan Cook asserts, in *Forest and Stream* (March 14, 1903), that in 1869 for about forty days there were shipped from Hartford, Mich., and vicinity, three carloads a day, each car containing one hundred and fifty barrels, with thirty-five dozen in a barrel, making the daily shipment twenty-four thousand, seven hundred and fifty dozen. Evidently there is a typographical error here, as it would require fifty-five dozen in a barrel to make the daily shipment twenty-four thousand, seven hundred and fifty dozen, or eleven million, eight hundred and eighty thousand birds for the season. Thirty-five dozen domestic Pigeons would fill an ordinary sugar barrel; and possibly it required fifty-five dozen Passenger Pigeons to fill a sugar barrel, as they were not as large as the domestic Pigeons. Mr. Cook's figures seem to be based on fifty-five dozen to a barrel. In three years' time, he says (which may mean three years later), there were shipped nine hundred and ninety thousand dozen. In the two succeeding years it is estimated that one-third more than this number, or fifteen million, eight hundred and forty thousand birds, were shipped from Shelby, Mich. These estimates were made by men who killed and marketed the Pigeons. The figures may be excessive, but, if reduced one-half, they still would be enormous.

It is claimed by Mr. C. H. Engle, a resident of Petoskey, Mich., that "two years later" there were shipped from that point five carloads a day for thirty days, with an average of eight thousand, two hundred and fifty dozen to the carload, or fourteen million, eight hundred and fifty thousand birds. Mr. S. S. Stevens told Mr. William Brewster that at least five hundred men were netting Pigeons at Petoskey in 1881, and thought they might have taken twenty thousand birds each, or ten million Pigeons. Still, people read of the "mysterious" disappearance of the Passenger Pigeon, wonder what caused

it, and say that it never has been satisfactorily explained. The New York market alone would take one hundred barrels a day for weeks, without a break in price. Chicago, St. Louis, Boston and all the great and little cities of the north and east joined in the demand. Need we wonder why the Pigeons have vanished?

Most of the above calculations are founded on statements derived from Mr. Mershon's work. A little volume entitled *Etna and Kirkersville*, by Gen. Morris Schaff, gives some of the history of the destruction of the Pigeons in Ohio; and there are many short articles on this subject in the sportsman's papers, particularly in *Forest and Stream* and the *American Field*. The birds that survived the slaughter at Petoskey in 1878 finally left the nesting place in large bodies and disappeared to the north, and from that time onward the diminution of the Pigeons was continuous. Some of the netters asserted that this great flight was swallowed up in Lake Michigan, and that the Pigeons then became practically extinct. This statement had no foundation in fact, as will presently appear. It is probable that when they left Petoskey in 1878 they retired into inaccessible regions of Canada, beyond reach of the rail and telegraph, to breed again. In April, 1880, they again passed through Michigan. Prof. Walter B. Barrows quotes John Sims, county game warden, to the effect that on that date "millions" of Pigeons passed over Iosco, going westward, but were never seen there afterward.

It has been stated that the Wild Pigeon "went off like dynamite." Even the naturalists failed to secure sufficient specimens and notes, as no one had an idea that extinction was imminent. Practically the same thing has been said about the extermination of the Labrador Duck, the Great Auk and the Eskimo Curlew, which, if not extinct, is now apparently on the verge of extinction.

People never realize the danger of extirpating a species until it is too late; but the apparent sudden diminution and extermination of the Passenger Pigeon was, like that of the other species, more seeming than real. Prof. Walter B. Bar-

rows of the Michigan Agricultural College, who has collected many data regarding this bird, says that it was abundant in Michigan until 1880, fairly common from 1880 to 1890, but steadily decreasing in numbers, and was by no means rare in 1891, 1892 and 1893. Then it rapidly became scarce, and disappeared. There were many smaller nestings for years after the Petoskey nesting of 1878, but the records are meager, for apparently no naturalist visited them. The Petoskey nesting of 1878 was unusually large for that time, for the reason that the birds at three large breeding places in other States or regions were driven out by persecution, and joined the Petoskey group. After this the birds exhibited a tendency to scatter to regions where they were least molested. There seem to have been two great nestings in Michigan in 1881. Brewster quotes Mr. S. S. Stevens of Cadillac, Mich., as saying that the last nesting of any importance in Michigan was in 1881, a few miles west of Grand Traverse. It was perhaps eight miles long. Pigeons were common in Iowa in 1884 (Anderson: *Birds of Iowa*). Mr. A. S. Eldredge writes that he saw a flight of Pigeons near Lampasas, Tex., in the winter of 1882-83, that was three and one-half hours in passing; and that he saw a roost among the post oaks where every tree was loaded with the birds.

Our Canadian records of the species at this time are meager. Mr. Ernest Thompson Seton says that it bred in Manitoba in considerable numbers as late as 1887; but he also says (*Auk*, 1908, p. 452) that the last year in which the Pigeons came to Manitoba "in force" was in 1878; next year they were comparatively scarce, and each year since they have become more so. In 1881 McCoun saw large flocks there, and shot large numbers for food; and the eggs of this species were taken by Miles Spence at James Bay as late as 1888. The species was recorded in Montreal and other localities in east Canada in 1883, 1885, 1886, 1888 and 1891.¹

In 1882 Widmann saw several large flocks, February 5 and 6, going northward at St. Louis. (*Birds of Missouri*, p. 84.)

Up to 1886 live Pigeons came into the Chicago market in

¹ McCoun, John: *Catalogue of Canadian Birds*, 1900, Part 1, pp. 215, 216.

large numbers, and were shipped all over the country for Pigeon "shoots." In 1881 twenty thousand live Passenger Pigeons were killed at one trap-shooting tournament on Coney Island, held under the auspices of the New York Association for the Protection of Fish and Game. Many of these birds were too young or too exhausted to fly. Thus, sportsmen who could not participate in the slaughter of the birds on their nesting grounds had them brought alive to the doors of their club houses, and unwittingly shared in exterminating the species. Mr. Ben O. Bush of Kalamazoo, Mich., states that the last Pigeons which he saw used for this purpose were obtained by John Watson of Chicago. They came from the Indian Territory in 1886; but this did not end the traffic. It seems probable that a good many birds still gathered in inaccessible regions of that territory during the winter.

In the spring of 1888, Messrs. William Brewster and Jonathan Dwight, Jr., visited Michigan in search of the Passenger Pigeon, and found that large flocks had passed through Cadillac late in April, and that similar flocks had been observed in nearly all the southern counties. This flight was so large that some of the netters expressed the belief that the Pigeons were as numerous as ever; and Brewster himself expressed the opinion that the extermination of the species was not then imminent, and that it might be saved, but considered it unlikely that effectual laws could be passed before its extinction. The birds moved somewhere to the north to breed, and were not seen nesting in any numbers in Michigan. One of the netters brought intelligence of a flock at least "eight acres" in extent, and many other smaller flocks were reported. Many birds were found scattered about in the woods; but no large nesting place was seen anywhere. After that date comparatively few birds are recorded at any one locality.

Many birds were sent to the eastern markets from the southwest during the decade from 1878 to 1888, and even later. Prof. George H. Beyer writes me that he saw several large flocks of Passenger Pigeons at Rayne Station, La., in 1888, from which he killed three birds.

Mr. H. T. Phillips of Detroit states that he used to see and kill Pigeons every spring, "up to ten years ago," from the middle of March to the middle of April, on the Mississippi bayous. This must have been in the latter years of the nineteenth century, at the time when the Pigeons were on the verge of extinction.

A flock was seen in Illinois in 1895, from which two specimens were taken. At that time the netting of the birds had been practically given up, and most of the dealers had seen no Pigeons for two seasons. It finally ceased, on account of the virtual extinction of the birds. How many barrels of Pigeons were shipped to the markets during these final years? At least one shipment of several barrels was condemned in New York City as late as November, 1892 (J. H. Fleming: *Ottawa Naturalist*, 1907, Vol. XX, p. 236), and several hundred dozens came into the Boston market in December, 1892, and in January, 1893. I saw some Pigeons in barrels there in 1892 or 1893, which probably were some of the lot recorded by Brewster and noted by Fleming, who records the New York shipment. All of these were from the Indian Territory.

Messrs. W. W. Judy & Co., marketmen of St. Louis, wrote Mr. Ruthven Deane, in 1895, that the last Pigeons which they received came from Siloam Springs, Ark., in 1893; they had lost all track of the Pigeons since that time, and their netters were lying idle.

The above paragraph epitomizes the history of Pigeon destruction. Judy & Co. were perhaps the largest dealers in Pigeons in the United States. The story of where their netters worked after 1878, how many birds they took and what markets they supplied, would explain only too well the so-called "mystery" of the disappearance of the Passenger Pigeon. It is evident from the foregoing that, although the business of Pigeon netting was reduced much after 1878, there were still some who followed it for at least fifteen years thereafter. They pursued the birds as long as they could find a flock so large that they could make a "killing."

I have tried to get some information regarding the netting of Pigeons by Judy & Co. Mr. Otto Widmann of St. Louis,

who kindly undertook to learn what he could about the Pigeon shipments, sends an interesting letter, from which the following extracts are taken: "In reply to your letter of September 9, I am sorry I could not get what you wanted. The firm was W. W. Judy & Co. Judy died twenty-five years ago, and the firm was dissolved. One of the partners, Mr. Farrell, died eight years afterwards, and there is at present only one of the partners living, Mr. Dave Unger. The only information that could be gotten from him was the interesting statement that the Wild Pigeons have flown to Australia. While trying to get the desired information, a game dealer, F. H. Miller, stated that eight years ago [1902] he received twelve dozen Wild Pigeons from Rogers, Ark., for which he paid two and one-half dollars a dozen, and sold all to an eastern firm for five dollars a dozen. His last Wild Pigeon, a single individual, among some Ducks, was received four years ago [1906], from Black River, Mo. As he is an old game dealer, who has handled many Pigeons, there is no doubt about the species; but exact dates were not obtainable." This closes the history of the Passenger Pigeon in our markets. For the rest we must look to the millions of shotguns in the United States, the natural enemies of the Pigeons, and the accidents of migration. For every Pigeon that was shot and recorded during the last part of the nineteenth century, probably a hundred (perhaps a thousand) were shot and eaten. Who was there to record them? Ornithologists may be rather numerous in some of our cities, but they are very rare in our western forests. We read in the press that only a few years ago the mountaineers of the south killed hundreds of Pigeons, and made pot pies of them. This may or may not be true; but for all practical purposes the close of the nineteenth century saw the end of the Passenger Pigeon. We are now trying to save it, and rewards aggregating thousands of dollars are offered for the undisturbed nest and eggs; but without result. They come twenty years too late.

A campaign of publicity has been conducted for two years, under the energetic management of Prof. C. F. Hodge of Clark University at Worcester, Mass.; the large rewards

offered have been published widely in the press of the United States and Canada, and a great public interest in the search has been aroused. Passenger Pigeons have been reported in numbers from many parts of North America, but investigation of these communications has not resulted in producing so much as a feather of the bird. This merely shows the unreliability of such statements, and how easily people may be mistaken. There are three reports in 1911 that seem promising. In each case a single bird was seen and watched for some time at very close range; but all assertions regarding large flocks at this late date probably are based on observations of Mourning Doves or Band-tailed Pigeons. The only Passenger Pigeon now (1911) known to exist is the lone captive whose likeness faces page 433.

A large correspondence and a careful search through some of the literature of the latter part of the century leads to the belief that the Pigeons were common and in some cases abundant in portions of the west from 1880 to 1890, though gradually decreasing. After 1893 the reports became more vague and less trustworthy, except in a few cases. Small flocks were seen and specimens taken in the last decade of the nineteenth century in Canada, and in Wisconsin, Nebraska, Illinois, Indiana and other western States, and even in some of the eastern States. Chief Pokagon reported a nesting of Pigeons near the headwaters of the Au Sable River in Michigan in 1896. In 1898 a flock of about two hundred birds was said to have been seen in Michigan; one was taken; and in 1900 about fifty birds were reported.

While the big nestings of 1878 and 1881 in Michigan were the last immense breeding places of Passenger Pigeons on record, the species did not become extinct in a day or a year; they were not wiped from the face of the earth by any great catastrophe; they gradually became fewer and fewer for twenty to twenty-five years after the date set by the pigeoners as that of the last great migration.

Such records as I find of the last specimens actually taken (not merely seen) in the States to which they refer indicate how the species finally dropped out of sight:—

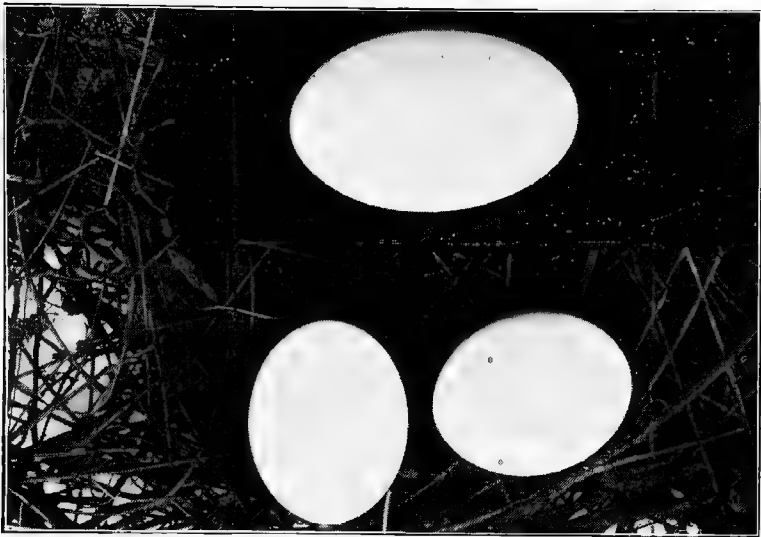


PLATE XVIII.

Upper figure, egg of Passenger Pigeon. Lower figure, eggs of Mourning Dove, commonly mistaken for those of Passenger Pigeon. (Photograph by Prof. C. F. Hodge.)



PLATE XIX.—PASSENGER PIGEON AND BIRDS COMMONLY MISTAKEN FOR IT.

Mounted specimen of Band-tailed Pigeon, left; Passenger Pigeon, center; and Mourning Dove, right. (Photograph by Prof. C. F. Hodge.)

- 1882-83. — Texas, a flight seen in winter of 1882-83 near Lampasas that was three and one-half hours in passing. Many killed. No recent record (A. S. Eldredge).
1885. — New Hampshire, Concord (G. M. Allen, *Birds of New Hampshire*).
1885. — South Carolina, immature female, November 21 (Arthur T. Wayne, *Auk*, 1906, p. 61).
1886. — Rhode Island, specimen taken by Walter A. Angell in 1886 or 1887. T. M. Flanagan took about a dozen at Warwick in 1885 or 1886 (John H. Flanagan).
1889. — District of Columbia, October 19 (W. W. Cooke, *Proc., Biological Society of Washington*, 1908, p. 116); specimens not taken.
1889. — Connecticut, Portland, young male, October 1 (John H. Sage); specimen preserved.
1889. — Province of Quebec, Tadousac, specimen taken July 20, 1889; now in collection of Dr. Jonathan Dwight, Jr., New York (J. H. Fleming, *Ottawa Naturalist*, Vol. XXII, 1907, p. 236).
1893. — Indiana, pair and nest taken by C. B. Brown of Chicago in spring of 1893 at English Lake; nest and eggs preserved in his collection (Ruthven Deane, *Auk*, 1895, p. 299).
1893. — Arkansas, Siloam Springs, last shipment live Pigeons to W. W. Judy & Co., St. Louis (Ruthven Deane, *Auk*, 1895, p. 298).
1893. — Manitoba, Winnipeg, adult male taken; specimen mounted by Geo. E. Atkinson, Lake Winnipegosis, April 14 (J. H. Fleming, *Auk*, 1903, p. 66).
1894. — North Carolina, Buncombe County, female taken by J. S. Cairns, October 20 (C. S. Brimley).
1894. — Massachusetts, an adult female killed by Neil Casey at Melrose, Mass., April 12, 1894; specimen preserved and mounted; now first recorded.
1895. — Louisiana, Mandeville, near New Orleans, January 26, 1895, two taken out of a flock of five by Dr. J. H. Lamb; one an immature male (Prof. Geo. E. Beyer).
1895. — Illinois, Lake Forest, August 7, young female in collection of John F. Ferry (Ruthven Deane, *Auk*, 1896, p. 81).
1895. — Nebraska, Sarpy County, one killed out of fifteen or twenty, November 9, by Hon. Edgar Howard of Papillon, five miles southeast of that place (Lawrence Bruner, *Nebraska Birds*, p. 84).
1895. — Pennsylvania, Canadensis, Munroe County, specimen shot, October 23, by Mr. Geo. Stewart of Philadelphia, and now in his possession (Witmer Stone).
1896. — New Jersey, Englewood, June 23, immature female taken by C. Irving Wood and mounted by J. Ullrich (F. M. Chapman, *Auk*, 1896, p. 341).
1896. — Wisconsin, Delavan Lake, N. Hollister killed an immature male September 8, 1896 (*Auk*, 1896, p. 341); last Wisconsin record backed by a specimen.

1896. — Missouri, Attic, pair killed from flock of fifty by Chas. H. Holden, Jr., December 17; in collection of Ruthven Deane (*Auk*, 1897, p. 317).
1897. — Iowa, Lee County, September 7, William G. Praeger shot a lone immature male (R. M. Anderson, *Birds of Iowa*, 1907, p. 239).
1898. — Michigan, Chestnut Ridge, Wayne County, immature bird, mounted by C. Campion, Detroit, September 14 (*J. H. Fleming, Auk*, 1903, p. 66). Probably the same reported by Mr. Ernest Thompson Seton as taken by J. G. Rosser, September 13 (*Auk*, 1908, p. 452).
1898. — Kentucky, Owensboro, immature male, now in the Smithsonian Institution, July 27 (*J. H. Fleming, Auk*, 1908, p. 237).
1900. — Ohio, Sargents, March 24 (Dawson and Jones, *Birds of Ohio*, Vol. II., p. 427); specimen shot by a boy and mounted by a Mrs. Barnes.
1900. — Wisconsin, Babcock, September, specimen not preserved, killed by Neal Brown while hunting with Emerson Hough (W. B. Mershon, *The Passenger Pigeon*, p. 154). The accuracy of this record has been questioned.
1902. — Arkansas, F. H. Miller of St. Louis received twelve dozen from Rogers, Ark. (Otto Widmann).
1904. — Maine, one killed at Bar Harbor, mounted by J. Bert Baxter of Bangor (Harry Merrill). Recorded by Glover M. Allen in his *List of the Aves*, 1909, *Fauna of N. E.*, II., Bost. Soc. Nat. Hist.
1906. — Missouri, Black River, F. H. Miller of St. Louis received one bird at his market in St. Louis, shipped from Black River. (It will be noted that the last previous record for Missouri was in 1896.)
1907. — Province of Quebec, one bird taken by Mr. Pacificque Couture of St. Vincent, P. Q., September 23, 1907. The bird was mounted by Mr. A. Learo, taxidermist of Montreal, and identified by him. (I have been unable to find Mr. Couture and get further particulars, as he is no longer at St. Vincent. This record may not be authentic.)

The records from 1898 to 1907 appear to be authentic, but in the few cases where the specimens were preserved I have been unable to locate them. We have no record since 1898 that can be substantiated by a specimen preserved in any museum.

It is only just to state that many Passenger Pigeons probably were seen at later dates than some of those given. Where flocks or single birds were watched by competent observers for hours through a glass, as they were in more than one instance, there can be no question of their identity; but the taking of the specimen is the only tangible proof that satisfies the ornithologist in such a case as this, and for that

reason the above records are confined mainly to those cases where at least one bird was taken. I cannot leave this subject without referring to various canards, some of which have been taken seriously by too many intelligent people.

Efforts have been made to account for the supposed sudden disappearance of the Pigeons by tales of cyclonic sea disturbances or lake storms, which are supposed to have drowned practically all of them. Undoubtedly thousands of Pigeons were destroyed occasionally, during their flights, by storms or fogs at sea or on the Great Lakes. There are many rather unsatisfactory and hazy reports of such occurrences. The earliest of these is recorded by Kalm, who says, in his account of the Passenger Pigeon, referred to on page 435, that in March, 1740, about a week after the disappearance of a great multitude of Pigeons in Pennsylvania and New Jersey, a sea captain named Amies, who arrived at Philadelphia, stated that he had seen the sea covered with dead Pigeons, in some cases for three French miles. Other ship captains, arriving later, corroborated this tale. It was said that from that date no such great multitudes of Pigeons were seen in Pennsylvania. Kalm published this in 1759, but after that date the Pigeons again came to Pennsylvania in great numbers; which shows that the drowning of this multitude had no permanent effect on the numbers of the birds. This story in some form has cropped up at intervals ever since.

Giraud, in his *Birds of Long Island* (1844), states that he has "heard" of great numbers of Pigeons floating on the water which were seen by shipmasters. The old legend regarding the dead Pigeons drifting ashore near Cape Ann, from which occurrence Pigeon Cove is supposed to have received its name, is possibly authentic; for the birds probably crossed Ipswich Bay in their flight to the coast of Maine, and may have been overtaken by a fog, become confused and fallen into the water, or they may have been blown to sea and drowned. Nevertheless, this catastrophe did not wipe out the entire species, for it had too wide a range. Schoolcraft (1821), while walking along some parts of the shore of Lake Michigan, saw a great number of the skeletons and half-consumed bodies of Pigeons,

which he says are overtaken often by tempests in crossing the lake, and "drowned in entire flocks." Vast numbers of Eagles and Buzzards were seen feeding upon them.¹

Brewster was informed by Mr. S. S. Stevens of Cadillac, Mich., that on one occasion an immense flock of Pigeons became bewildered in a fog while crossing Crooked Lake, and, descending, struck the water and perished by thousands. This might easily happen to young birds. They might become bewildered in a fog on a large body of water, and fly about until, weary and exhausted, they fell into the water; but Mr. Stevens says that the old, experienced birds rose above the fog, and not one was drowned.

Mr. E. Osborn states that he has seen "big bodies of Pigeons" which were drowned off Sleeping Bear Point while trying to cross Lake Michigan.

Capt. Alexander McDougall of Duluth writes, February 8, 1905, that, while he was captain of the steamer "Japan" on Lake Superior, in 1872, the exhausted Pigeons in foggy weather and at night used to alight on his boat in great numbers. He remembers having caught several by hand.

Mr. Ben O. Bush states that at the last Petoskey nesting, in 1881, when the nests were built and the eggs were laid, a big wind storm with sleet came up just at dusk; the birds left, and he believes that they were swallowed up by a fog and storm on Lake Michigan. At any rate, they did not return. He says that he has "heard tell of the beach being strewn for miles with dead Pigeons." He supposes that the storm wiped them out, and that the netters afterwards cleaned up what were left.

Mr. C. H. Ames of Boston advances the theory that the Pigeons went south, and were overwhelmed by a storm on the Gulf of Mexico; and states that years ago he read an account, either in or quoted from a New Orleans newspaper, giving the story of several ship captains and sailors who had sailed over "leagues of water covered with dead Pigeons."

The following story was very likely derived from the same source. Mr. G. C. Tremaine Ward says (1901) that Mr. S. D.

¹ Schoolcraft, Henry R. L.: Narrative Journal of Travels from Detroit Northwest, 1821, p. 381.

Woodruff of St. Catherines, Ont., Can., asserts that several shipmasters say that immense numbers of Wild Pigeons perished in the Gulf of Mexico, "being exhausted by contrary winds and dense fogs." This gentleman also avers that Mr. Woodruff states that several shipmasters saw myriads of Pigeons alight on their vessels, and had to cast them off into the sea. (Auk, 1901, p. 192, —no names or dates given.) This is too indefinite to be of any value as evidence. Also, there is no authentic record that the Passenger Pigeon ever crossed the Gulf of Mexico. This species did not go so far south, and, although there is a single record of its occurrence in Cuba, it has not been seen in great numbers near the Gulf coast for forty years. The Pigeons which once commonly crossed these waters from Florida to Cuba in large numbers, belonged to another species, the White-crowned Pigeon (*Columba leucocephala*). Such tales about the drowning of birds in the Gulf of Mexico may have referred to some of the Plovers, or "Prairie Pigeons," as they were called in the west, which crossed the gulf annually in large numbers.

The Passenger Pigeon was not exterminated, or nearly exterminated, by drowning, soon after the nesting at Petoskey in 1881; for, as hereinbefore stated, there was an immense flight in Texas the ensuing winter, a large flight crossed Michigan to the north in 1888, and they were seen and taken in numbers in many places in the United States and Canada for years subsequent to the date of the Petoskey nesting of 1881. The statement recently published in a magazine article, that the Pigeons have gone to South America, is absolutely without any foundation in fact. This bird is unknown on the South American continent. The statement that they have gone to Australia is hardly worth refuting.

The stories of the wholesale destruction of the Pigeons by snowstorms in the north possibly have some foundation. Northward migrations of Pigeons often occurred very early in the year, and the first nesting of a season was sometimes completed while snow still remained. On March 25, 1830, a flight of Pigeons was overtaken by a high wind and snowstorm near Albany, N. Y. Twenty-eight inches of snow fell, and the

birds were overwhelmed, and taken "in great abundance" by the people.¹

Some of the Pigeons may have been driven by persecution to the far north to breed, in the latter part of the nineteenth century, and they may have been destroyed by unseasonable storms, for many species are subject to periodical reduction by the elements; but the whole history of the last thirty years of the existence of the Passenger Pigeon goes to prove that the birds were so persistently molested that they finally lost their coherence, were scattered far and wide, and became extinct mainly through constant persecution by man. While they existed in large colonies, the orphaned young were taken care of by their neighbors. Mr. E. T. Martin, in a pamphlet entitled *Among the Pigeons*, which was published in full in the *American Field*, January 25, 1879, states that one of his men shot six female Pigeons that came to feed a single squab in one nest. (Comment on this shooting is unnecessary.) This communal habit of feeding preserved the species so long as the birds nested in large colonies; but when they became scattered the orphaned young starved when their parents were killed.

The Passenger Pigeon was not a suspicious bird, as birds go; it was easily taken. It reproduced slowly, laid but few eggs, and when its innumerable multitudes were reduced and its flocks were dispersed, the end came rapidly.

It often is asked how it was possible for man to kill them all. It was not possible, nor was it requisite that he should do so, in order to exterminate them. All that was required to bring about this result was to destroy a large part of the young birds hatched each year. Nature cut off the rest. She always eliminates a large share of the young of all creatures. The greater part of the Pigeons taken in summer and fall were young birds. The squabs were sought because they brought a high price in the market. The flock mentioned by Mr. Van Cleef (see page 452), which nested in Missouri, Michigan and New York the same year, was followed by the pigeoners, who destroyed about all the squabs at each nesting. The young when out of the nest were less experienced than the adults,

¹ Munsell, Joel: *Annals of Albany*, 1858, Vol. IX, p. 206.

and therefore more easily taken. Sometimes the Pigeons were so harassed that all their nestings were broken up, and few young were raised that season; thus the natural increase was practically cut off, and constant diminution was assured. Extermination must have resulted under such conditions, even if no man ever killed an adult Passenger Pigeon. The Pigeons were not immortal. Even if undisturbed by man, they "gave up the ghost" in a few years; but they were not undisturbed. No adequate attempt to protect them was made until they practically had disappeared. Whenever a law looking toward the conservation of these birds was proposed in any State, its opponents argued before the legislative committees that the Pigeons "needed no protection;" that their numbers were so vast, and that they ranged over such a great extent of country, that they were amply able to take care of themselves. This argument defeated all measures that might have given adequate protection to this species, as it has since defeated proposed laws for the conservation of wild-fowl and other migratory birds. That is why extinction finally came quickly. We did our best to exterminate both old and young, and we succeeded. The explanation is so simple that all talk of "mystery" seems sadly out of place here. (Since the above history was written, Mr. Albert Hazen Wright has published a compilation of Passenger Pigeon notes from early writers, many of which are not included here.¹)

Ornithologists believe that the migrations of this Pigeon were made mainly in pursuit of food, and with little reference to the seasons of the year. Undoubtedly, however, the tendency was to migrate north in the spring and south in the fall, like other birds of passage.

Some of the pigeoners say that the Pigeons nested in the southern States in winter; but of this there is no authentic record.

Lawson (1709), in his *History of Carolina*, says that the Pigeons came in great numbers *in the winter*: and he was told by the Indians that they nested in the Allegheny Mountains.²

¹ Auk, 1910, pp. 428-443; 1911, pp. 346-366, 427-449.

² Lawson, John: *History of Carolina*, 1860, p. 231.

They nested as far south at least as Pennsylvania, Tennessee and Kentucky, but usually most of them bred in the north.

The accounts of the early settlers in Massachusetts show that there was a northward migration of Pigeons through New England in March, and they sometimes lingered about Hudson Bay until December, feeding on the berries of the juniper. The roosts of the Pigeons were so extensive and the birds frequenting them were so numerous that it was necessary for them to fly long distances daily in order to secure food enough for their wants. In migration their flight was very high and swift. Audubon estimates that they flew a mile a minute, and others have asserted that they sometimes travelled one hundred miles an hour. This was probably an exaggeration.

I remember standing, as a boy, on the shore of an arm of Lake Quinsigamond, when a small flock of Pigeons, crossing the water, made directly for me. I never had killed a Pigeon, and intended to secure a specimen; but the flock, in its arrow-like flight, descending directly toward me, passed over my head with inconceivable velocity, and reached the woods behind me before the gun could be brought to bear.

In searching for food in a country where it was plentiful, the birds flew low, and, upon reaching good feeding ground, swung in large circles while examining the place. Some flocks were composed of young birds, others were mostly males, and still others almost entirely females.

Their roosting places were preferably in large and heavy timber, sometimes in swamps. In most of the larger roosts, the trees, undergrowth and all vegetation on the ground were soon killed by a heavy deposit of guano. About sunset the Pigeons in all the country for many miles around began to move toward the roost, and soon after sundown they commenced to arrive in immense numbers, some from a distance of one hundred miles or more. Birds poured in from all directions until after midnight, and left the roost again at sunrise.

Audubon says that a messenger whom he sent out from a Pigeon roost reported to him that the uproar of the birds arriving could be heard three miles away. A most remarkable

attribute of the Pigeon was its disregard of the presence of human beings in its roosting and nesting places. Any one who entered quietly one of these spots when the birds were there would be surrounded by the unsuspecting creatures in a few minutes. The nests formerly were placed in trees of great height, in some locality near water, where food was plentiful; but after the primeval forests were cut off, the Pigeons nested sometimes in low trees. This contributed to their doom. The best description of the nesting of these birds that I have seen is given by Chief Pokagon, in the *Chautauquan* (November, 1895, Vol. XXII, No. 20). He was a full-blooded Indian, and the last Pottawottomi chief of the Pokagon band. His account as quoted by Mr. Mershon, follows:—

It was proverbial with our fathers that if the Great Spirit in His wisdom could have created a more elegant bird in plumage, form, and movement, He never did. When a young man I have stood for hours admiring the movements of these birds. I have seen them fly in unbroken lines from the horizon, one line succeeding another from morning until night, moving their unbroken columns like an army of trained soldiers pushing to the front, while detached bodies of these birds appeared in different parts of the heavens, pressing forward in haste like raw recruits preparing for battle. At other times I have seen them move in one unbroken column for hours across the sky, like some great river, ever varying in hue; and as the mighty stream, sweeping on at sixty miles an hour, reached some deep valley, it would pour its living mass headlong down hundreds of feet, sounding as though a whirlwind was abroad in the land. I have stood by the grandest waterfall of America and regarded the descending torrents in wonder and astonishment, yet never have my astonishment, wonder and admiration been so stirred as when I have witnessed these birds drop from their course like meteors from heaven.

. . . About the middle of May, 1850, while in the fur trade, I was camping on the head waters of the Manistee River in Michigan. One morning on leaving my wigwam I was startled by hearing a gurgling, rumbling sound, as though an army of horses laden with sleigh bells was advancing through the deep forests toward me. As I listened more intently, I concluded that instead of the tramping of horses it was distant thunder; and yet the morning was clear, calm and beautiful. Nearer and nearer came the strange commingling sounds of sleigh bells, mixed with the rumbling of an approaching storm. While I gazed in wonder and astonishment, I beheld moving toward me in an unbroken front millions of pigeons, the first I had seen that season. They passed like a cloud through the branches of the high trees, through the underbrush and over the ground, apparently overturning

every leaf. Statue-like I stood, half-concealed by cedar boughs. They fluttered all about me, lighting on my head and shoulders; gently I caught two in my hands and carefully concealed them under my blanket.

I now began to realize they were mating, preparatory to nesting. It was an event which I had long hoped to witness; so I sat down and carefully watched their movements, amid the greatest tumult. I tried to understand their strange language, and why they all chatted in concert. In the course of the day the great on-moving mass passed by me, but the trees were still filled with them sitting in pairs in convenient crotches of the limbs, now and then gently fluttering their half-spread wings and uttering to their mates those strange, bell-like wooing notes which I had mistaken for the ringing of bells in the distance.

On the third day after, this chattering ceased and all were busy carrying sticks with which they were building nests in the same crotches of the limbs they had occupied in pairs the day before. On the morning of the fourth day their nests were finished and eggs laid. The hen birds occupied the nests in the morning, while the male birds went out into the surrounding country to feed, returning about 10 o'clock, taking the nests, while the hens went out to feed, returning about 3 o'clock. Again changing nests, the male birds went out the second time to feed, returning at sundown. The same routine was pursued each day until the young ones were hatched and nearly half grown, at which time all the parent birds left the brooding grounds about daylight. On the morning of the eleventh day, after the eggs were laid, I found the nesting grounds strewn with egg shells, convincing me that the young were hatched. In thirteen days more the parent birds left their young to shift for themselves, flying to the east about sixty miles, when they again nested. The female lays but one egg during the same nesting.

Both sexes secrete in their crops milk or curd with which they feed their young, until they are nearly ready to fly, when they stuff them with mast and such other raw material as they themselves eat, until their crops exceed their bodies in size, giving to them an appearance of two birds with one head. Within two days after the stuffing they become a mass of fat — "a squab." At this period the parent bird drives them from the nests to take care of themselves, while they fly off within a day or two, sometimes hundreds of miles, and again nest.

It has been well established that these birds look after and take care of all orphan squabs whose parents have been killed or are missing. These birds are long-lived, having been known to live twenty-five years caged. When food is abundant they nest each month in the year.

It seems improbable, however, that they bred in winter. The nesting usually occupied four to five weeks. The female, when sitting, never left the nest until the flight of males returned, when she slipped away, just as her mate reached the

nest. Thus the eggs were kept covered all the time. The adult birds never ate the nuts and acorns in the immediate vicinity of the nesting place, but went to a distance for their food, and left the mast in the neighborhood for the young to feed on when they came out of the nest. It is said that for miles around there were no caterpillars or inchworms in the oak woods for several years after a nesting, as the adults secured practically all of them for the young, thereby protecting the forests against their insect enemies. When the young were first pushed out of the nest by the parents, they went to the ground and fed mainly in the lower parts of the woods until they became expert in flying. They passed over the ground, the lower ranks continually flying over those in front, scratching out all the edible material, those flying overhead striking off the nuts as they flew by. The young birds were able to reproduce their kind in about six months.

Chief Pokagon asserts that while the old birds were feeding they always had guards on duty, to give an alarm in case of danger. The watch bird as it took flight beat its wings together in quick succession, with a sound like the roll of a snare drum. Quick as thought each bird repeated the alarm with a thundering sound, as the flock struggled to rise, leading a novice to imagine that a cyclone was coming.

In feeding, the birds were very voracious. They scratched among the leaves and unearthed every nut or acorn, sometimes almost choking in their efforts to swallow an unusually large specimen. During the breeding season they were fond of salty mud and water, and the pigeoners, learning of this, were accustomed to attract the birds to their death by salting down "mud beds," to which the poor Pigeons flocked in multitudes, and over which, when they were assembled, the pigeoners threw their nets.

The food of the Pigeons consisted mainly of vegetable matter, except for the grasshoppers, caterpillars and other insects, worms, snails, etc., which they ate, and which they fed to their young. Acorns, beech nuts and chestnuts, with pine and hemlock seeds, were among their principal staples of supply. They also fed on the seeds of the elm, maple and other forest

trees. Buckwheat, hempseed, Indian corn and other grains, cherries, mulberries, hollyberries, hackberries, wild strawberries, raspberries and huckleberries, and tender shoots of vegetation, all attracted them. They sometimes went to the Barren Grounds in the far north in vast numbers, to feed on blueberries. They often descended upon the fall-sown wheat and rye fields in such numbers that the farmers had to watch their fields, or lose their crops. Oats and peas were favorite foods. No doubt they also fed largely on the seeds of weeds, as the Mourning Doves, Bob-whites and many other terrestrial feeders do; but I find no record of this. They were fond of currants, cranberries, and poke berries, and no doubt of many other kinds of berries, and rose hips. We know little of their food habits, for no scientific investigation of their food ever was made.

EXTIRPATED SPECIES.

TRUMPETER SWAN (*Olor buccinator*).

Average Length. — About 63 inches.

Adult. — Bill longer than head; feathers of forehead ending in semi-elliptical outline; nostrils in basal half of bill; extent of wings about 8 feet, rarely near 10; plumage white, occasionally a rusty wash on head; iris brown; bill, lores and feet black.

Immature in Winter. — Gray; rusty on head and neck; bill dusky, or black varied with purplish and flesh color; legs and feet yellowish brown; claws blackish; webs blackish brown.

Nest. — Of grass, leaves, down and feathers, on dry ground.

Eggs. — Five to seven, 4 to 4.50 by 2.50 to 3; chalky white, granulated.

Notes. — A resonant trumpeting.

Season. — Formerly spring and fall.

Range. — Formerly the North American continent, rare in Alaska, breeding from the northern United States to near the Arctic Ocean, and from the Rocky Mountains to Hudson Bay, and wintering mainly in the southern States and south to lower California. Now found only in the interior; still breeds in interior British Provinces.

HISTORY.

This splendid bird, the largest of North American wild-fowl, is believed to have visited Massachusetts and other seaboard States in some numbers during their early history. Some of the settlers wrote of Swans that were met with on the

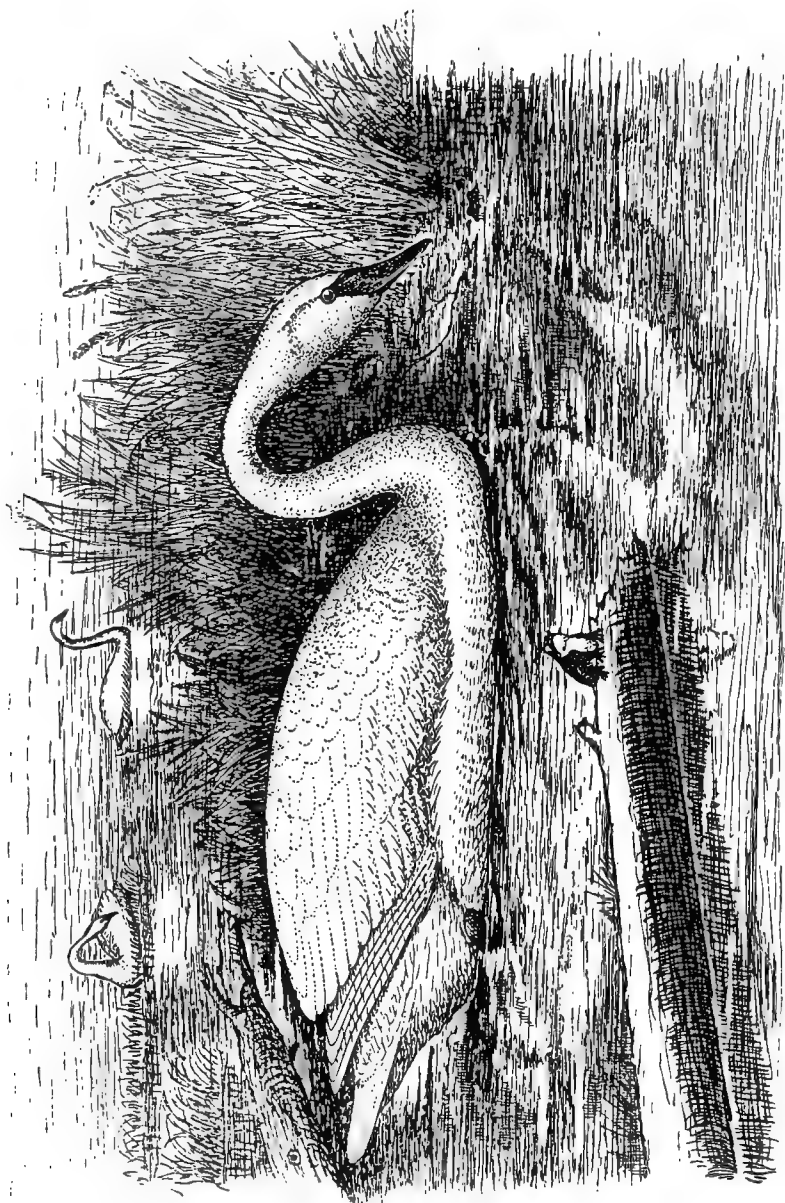


PLATE XX.—TRUMPETER SWAN.

Formerly migrated through New England; now extirpated and nearly extinct.

Atlantic seaboard, but few of them distinguished between the species.

Lawson (1709) writing of the natural history of Carolina, states that there were "two sorts" of Swans. One they called "trompeters, because of a sort of trompeting noise they make." These were the larger, and came in great flocks in the winter, keeping mostly in the fresh rivers. The others they called "hoopers" (in remembrance of the English Whooping Swan), and these were smaller and kept more in salt water.¹

Turnbull (1869) includes the Trumpeter among the birds of east Pennsylvania and New Jersey, "on the authority of reliable sportsmen who have shot it on Chesapeake and Delaware Bays." Thus it seems that the Trumpeter, now considered a bird of the interior, was taken on the Atlantic coast as late as the latter half of the last century.

In the Representation of the New Netherland (1650), a paper signed by twelve prominent citizens, the statement is made that the Swans of the country are "full as large" as those of the Netherlands, and they are named among the abundant birds of this region near the mouth of the Hudson.²

In the seventeenth century great flocks of Swans frequented the Atlantic seaboard from New England as far south as Georgia, some of which were undoubtedly of this species. The Trumpeter is noted by Dr. C. Hart Merriam as probably formerly occurring in the vicinity of East Windsor Hill, Conn., where an old hunter, who knew the bird well, reported that he had seen a flock once, and had heard their notes on another occasion. Belknap (1792) records it as a migrant in New Hampshire. He says "it is certain that our swan is heard to make a sound resembling that of a trumpet."³ "One of them," he asserts, "has been known to weigh 36 lb. and to be six feet in length from bill to the feet when stretched." Here the size alone would seem to identify the bird.⁴

¹ Lawson, John: History of Carolina, 1860, p. 240.

² Narratives of New Netherland, edited by J. Franklin Jameson, 1909, p. 297.

³ Belknap, Jeremy: History of New Hampshire, 1792, Vol. III, p. 167.

⁴ *Ibid.*, p. 166.

Undoubtedly the Trumpeter passed in migration from Long Island Sound and the mouth of the Hudson into Canada and the Hudson Bay country, where it bred, going through some of the New England States on the way north or on its southward migration. So late as the sixth decade of the nineteenth century it was still to be met with in Ontario, Can., where, so Fleming states, Professor Hincks described a supposed new species of Swan in 1864, which proved to be the young of the Trumpeter, and between 1863 and 1866 he was able to get six local birds to examine.¹

Morton (1632) stated that there was "greate store" of Swans at their seasons in the Merrimac River and in other parts of the country. Some of the Swans mentioned as frequenting the fresh-water ponds and rivers probably were of this species, and several small bodies of water in Massachusetts have derived their names from the Swan. A place called "Swan Holt" by the first settlers of Carver, Mass., probably denotes the visits of this species. Here, before the ice was broken up in the ponds, the Swan, "the earliest harbinger of spring," found an open place among the osier holts.² The Trumpeter was noted because of its early appearance in spring. It often appeared in March, before ponds were open.

In the History of Harvard, Mass., it is stated that the Swan occasionally was seen in colonial times, and gave name to the long swamp where Still River has its source.³

The Trumpeter Swan long ago disappeared from the New England seaboard, except as a mere straggler; so long ago that there is no specimen extant from New England, and no definite record or date of the capture of a specimen here. (Dr. G. H. Perkins informs me that a bird of this species was taken recently at Lake Champlain, but I have not yet seen the specimen.) The bird formerly was common from New York west to the Pacific coast States. It bred in Indiana, Missouri, Nebraska, Montana and Idaho, and the northwest provinces, and probably in Minnesota, Iowa and farther east before the time of ornithological records. De Kay

¹ Fleming, James H.: Auk, 1906, p. 446.

² Coll. Mass. Hist. Soc., Vol. IV, 2d ser., p. 274.

³ Nourse, Henry S.: The History of Harvard, Mass., from 1732 to 1893, ed. of 1894, p. 73.

writes that hunters informed him that Swans remained all through the year in the remoter portions of New York State. If this were true they probably were Trumpeters, as the Whistling Swan summered in the far north. David Pieterzoon De Vries, the Patroon, settled on Staten Island. In April, 1639, he went in his sloop to Fort Orange (now Albany), where he arrived April 30, and left on his return May 14. In his account of the trip he states that there were great numbers of Turkeys and water-fowl, such as Swans, Geese, Teal, etc., all along the river.¹ If Swans were seen in numbers upon the river in May, they must have been either non-breeding birds or breeding in that region. All accounts agree that Swans came very early in spring, that the Whistling Swan moved north as fast as the ice broke up, and that only the Trumpeter Swan ever remained to breed in that latitude.

The Trumpeter has succumbed to incessant persecution in all parts of its range, and its total extinction is now only a matter of years. Persecution drove it from the northern parts of its winter range to the shores of the Gulf of Mexico; from all the southern portion of its breeding range toward the shores of the Arctic Ocean; and from the Atlantic and Pacific slopes toward the interior. Now it almost has disappeared from the Gulf States. Mr. A. S. Eldredge, who has a ranch at Lampasas, Tex., writes that eighteen years ago there were flocks of seventy-five to one thousand there. Not one has been seen for three years.²

A Swan seen at any time of the year in most parts of the United States is the signal for every man with a gun to pursue it. The breeding Swans of the United States have been extirpated, and the bird is pursued, even in its farthest northern haunts, by the natives, who capture it in summer, when it has molted its primaries and is unable to fly. The Swan lives to

¹ Munsell, Joel: *Annals of Albany*, 1858, Vol. IX, p. 126.

² The Trumpeter is disappearing or has disappeared from the Pacific slope as well as from the Atlantic. It was once the prevailing Swan in California and was plentiful in Oregon and Washington. Suckley in 1853-54 saw immense flocks on the Columbia River (*Pac. R.R. Surv.*, Vol. XII, Part 2, p. 249). Newberry also saw them there (*Ibid.*, Vol. VI, Part 4, p. 100). Murphy (1882) states that they were so common on the Columbia that he doubts if one would bring more than fifty or seventy-five cents (Murphy, John Mortimer: *American Game Bird Shooting*, 1882, p. 231). It is now stated that there is no well-authenticated instance of the recent occurrence of a Trumpeter in the State of Washington (Dawson and Bowles: *Birds of Washington*, 1909, p. 841).

a great age. The older birds are about as tough and unfit for food as an old horse. Only the younger are savory, and the gunners might well have spared the adult birds, but it was "sport" to kill them and fashion called for swan's-down. The large size of this bird and its conspicuousness have served, as in the case of the Whooping Crane, to make it a shining mark, and the trumpeting that were once heard over the breadth of a great continent, as the long converging lines drove on from zone to zone, will soon be heard no more. In the ages to come, like the call of the Whooping Crane, they will be locked in the silence of the past.

At the approach of the frost king, the Trumpeter leaves its breeding grounds in the northwest and moves southward in triangular flock formation. The flocks move on like those of the Canada Goose, led by some old male, who, when tired of breasting the full force of the air currents, calls for relief, and falls back into the ranks, giving way to another. In migration they fly at such immense heights that often the human eye fails to find them, but even then their resonant, discordant trumpeting can be plainly heard. When seen with a glass at that giddy height in the heavens, crossing the sky in their exalted and unswerving flight, sweeping along at a speed exceeding that of the fastest express train, traversing a continent on the wings of the wind, their long lines glistening like silver in the bright sunlight, they present the grandest and most impressive spectacle in bird life to be found on this continent. When at last they find their haven of rest they swing in wide, majestic circuits, spying out their landfall, until, their spiral reconnoissance ended and their apprehensions quite allayed, they sail gently down to the grateful waters, to rest, drink, bathe and feed at ease.

Fifty years ago in the far west great flocks of these birds, a quarter of a mile in length, were seen massed like blankets of snow on the river banks. On the water they move lightly and gracefully. Their long necks and great size, taken in connection with the mirage effects, sometimes seen in their haunts, deceive the eye, until in the distance they present the appearance of a fleet of ships under sail.

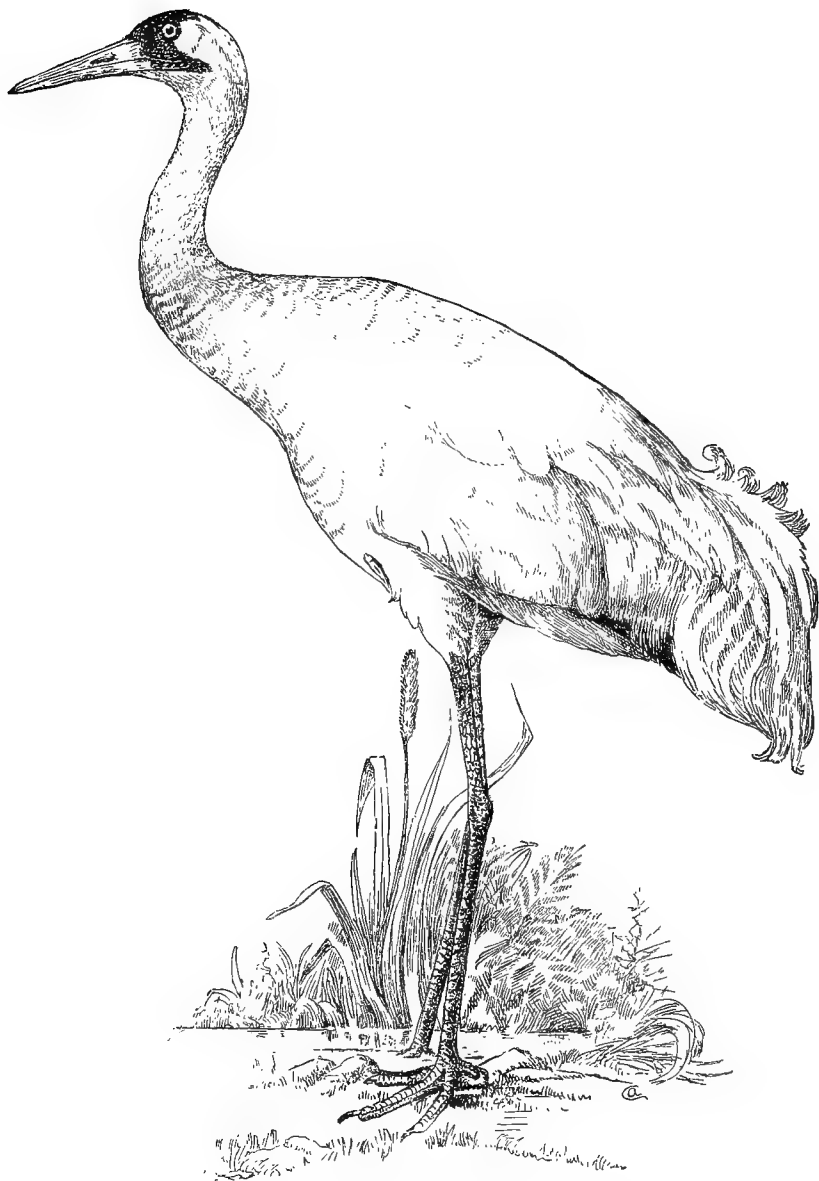


PLATE XXI.—WHOOPING CRANE.

Once a migrant through New England, now extirpated and nearly extinct. (From a drawing by Annie E. Chase.)

The Trumpeter is well able to protect itself and its young from the smaller prowlers, for it can deliver a terrible blow with its powerful wing. Although it lays five to seven eggs, some mortality must overtake the young, for comparatively few young birds of the year are seen in the fall flights. The Bald Eagle sometimes surprises it in flight, and, hurtling from above, strikes it to the earth; otherwise it seems to have few natural enemies powerful and swift enough to destroy it.

Little is known definitely about the food of the Trumpeter. Dr. Hatch says that it feeds chiefly on vegetation, both aquatic and terrestrial. It feeds like all Swans, by immersing its head and neck and taking its food from the bottom. Its food consists largely of water plants, but it also takes shell-fish and crustaceans.

WHOOPING CRANE (*Grus americana*).

Length. — 50 inches or more; extent of wings about 90.

Adult. — Bill stout and slightly curved; head bare and red on top and on each side to below the eyes, except for scattering hairs; plumage pure white, with black primaries and primary coverts; bill waxy yellow; iris yellow; legs and feet black. This is one of the largest North American birds, far exceeding in size the Great Blue Heron.

Immature. — Head feathered, portions that finally become naked indicated by dark feathers; general plumage whitish, stained with rusty brown.

Nest. — On ground in marsh or prairie.

Eggs. — Two or sometimes three, about 4 inches in length; light brownish drab, rather sparsely marked, except at great end, with large irregular spots of dull chocolate brown and lighter reddish brown, and other pale obscure shell markings; shell rough.

Season. — Possibly this species formerly resided in Massachusetts throughout the spring, summer and fall, but probably came here only irregularly in the spring and fall migrations.

Range. — Formerly the greater part of North America, breeding from the northern United States northward, is now found only in the interior of the continent far from the shores of any ocean, sparsely and irregularly distributed; formerly migrated along the Atlantic seaboard, from Florida to New England at least. It followed up the valley of the Hudson, and was common about the Great Lakes and from there to the fur countries. It wintered in the southern States, from Florida to Texas and Mexico, and still winters in some of them. It is now nearing extinction.

HISTORY.

The Whooping Crane was named and described by Linné in the eighteenth century.¹ Previous to that time all three American species were lumped together as Cranes.

Many of the narratives of the early voyagers and settlers tell of Cranes migrating and nesting along the Atlantic coast. During the first century after the discovery of the country, Cranes evidently were more or less numerous all along this coast, from Florida to New England, but the word has been used so frequently to denote the larger Herons that one might be inclined to place little faith in the statements of sailors and colonists were it not for two facts: (1) In those days Cranes were well known and conspicuous birds in England and other countries of which these voyagers were natives, or which they had visited, and undoubtedly they were familiar with these birds, and could distinguish them from Herons. (2) In the lists of birds given by these early adventurers Herons, "Hearnes" and "Hernshaws" or "Heronshaws," "Bitterns" and "Egrets" or "Egrepes" are also referred to, showing that they distinguished the Cranes from the Herons. The common European Heron was a large species (resembling the Great Blue Heron of America) which, at that time, was called the *Hernshaw*, *Hearnshaw* or *Heronshaw*. It is often impossible to determine which species of Crane was referred to in these early narratives and lists of birds, as usually no description is given; but now and then we find a reference to a bird that must have been the Whooping Crane. Since this bird is now a bird of the interior, some of the evidence of its former abundance on the Atlantic coast is here given.

The first unmistakable reference to the Whooping Crane is made by Capt. Arthur Barlowe in describing a voyage to America with Capt. Philip Amadas in 1584. They reached Wokokon (one of the islands enclosing Pamlico Sound) in July, and there climbed a hill. He says, "having discharged our *harquebuz*-shot, such a flocke of Cranes (the most part white) arose under us, with such a cry redoubled by many

¹ *Syst. Nat.*, 1758, ed. 10, Vol. I, p. 142.

echoes, as if an armie of men had showed all together.”¹ These birds probably were breeding there, as otherwise they would not have been there in such numbers at that season. The great cry described could have been produced only by Cranes.

Lawson (1709), in his History of Carolina, wrote that Cranes “use the savannas, low ground and frogs;” and that they “are above five feet high, when extended; are of a cream color, and have a crimson spot on the crown of their heads.”² This description of the Whooping Crane is unmistakable. A hundred years later Wilson found the species in South Carolina.

Latham (1775) says that the Whooping Crane appears at the mouth of the Savannah, Aratamaha and other rivers in spring, going north to breed, like the Common Crane.³

Wilson and Nuttall say that formerly it wintered near Cape May, N. J. (probably about the last of the eighteenth century), but its great size and conspicuous plumage made it a tempting mark, and it was driven away.

Audubon says that in his time it seldom was seen in the middle States and was unknown to the eastward of these States, but Nuttall states that it was met with in almost every part of North America.

Turnbull (1869) asserts that this Crane may be said to have disappeared from east Pennsylvania and New Jersey, not even a straggler having been seen for some years.⁴

David Pieterszoon De Vries (1633-43), writing of the birds in New Netherland, speaks of White Cranes and Gray Cranes. These are given in a list of the birds which are found near the entrance of the Hudson River and the Achter Col (“the Back Bay,” *i.e.*, Newark Bay), or in the vicinity of what is now New York City and Newark.⁵ He tells also of white Herons and gray ones, which shows that he distinguished them from the Cranes.

¹ Early English and French Voyages, 1534-1608, edited by H. S. Burrage, 1906, p. 229.

² Lawson, John: History of Carolina, 1860, p. 239.

³ Latham, J.: General History of Birds, 1821-24, Vol. IX, p. 44.

⁴ Turnbull, William P.: Birds of East Pennsylvania and New Jersey, 1869, p. 49.

⁵ Narratives of New Netherland, Am. Hist. Asso., edited by J. Franklin Jameson, 1909, p. 221.

We have now traced the Whooping Crane along the Atlantic Coast from the Carolinas to the borders of New England.

W. Hubbard, in his General History of New England, 1610, gives Cranes among the birds of Long Island.¹

In Roger Wolcott's account of John Winthrop's Agency, 1751-54, Cranes are given among the birds of Connecticut.²

William Wood of Massachusetts, writing of New England in 1629-34, says: "The Crane although hee bee almost as tall as a man by reason of his long legges, and necke; yet is his body rounder than other fowles, not much unlike the body of a Turkie. I have seene many of these fowles, yet did I never see one that was fat, I suppose it is contrary to their nature to grow fat; Of these there be many in Summer, but none in winter, their price is two shilling."³

Unless Wood exaggerated he must have referred here to the Whooping Crane, for that is the only bird in North America that can be described as "almost as tall as a man." The Whooping Crane stands about five feet high when stretched to its full height, but being white it appears taller, while the Sandhill Crane is not so conspicuous on account of its color and does not appear so large. The Sandhill Crane actually is smaller, but Wood probably referred to both species, as they were confounded by early writers. Even Audubon and Wilson considered both Cranes to be of one species, and regarded the Sandhill Crane as the young of the Whooping Crane.

Morton (1632), who lived at Merrymount (Mount Wollaston), near Boston, says: "Cranes there are greate store, that ever more came there at S. Davids Day [March 1], and not before: that day they never would misse. These sometimes eate our corne, and doe pay for their presumption well enough; and serveth there in powther, with turnips, to supply the place of powthered beefe, and is a goodly bird in a dishe and no discommodity."⁴

¹ Coll. Mass. Hist. Soc., Vol. VI, 2d ser., p. 672.

² *Ibid.*, Vol. IV, 1st ser., p. 270.

³ Wood, William: New England's Prospect, Pub. Prince Soc., 1865, pp. 31, 32.

⁴ Morton, Thomas: New English Canaan, Pub. Prince Soc., 1883, p. 192.

Emmons, in his list of Massachusetts birds, published in 1833, marks the Whooping Crane as a rare but regular visitant, breeding in this climate.¹ In his list this is generally taken to mean that the bird breeds in Massachusetts, and possibly it may have bred here in earlier years, but there is no reason to believe that it bred here at the time Emmons's list was made, although it then bred and has since summered in several States to the westward. I am told by Mr. Ralph Holman that an old hunter living near Worcester, Mass., claimed to have killed a Whooping Crane in Worcester County in his early youth, but as the bird was not preserved, and as all witnesses are dead, it is impossible to investigate the statement.

De Kay (1844) includes it in his list of birds of New York, but says that he never saw it in the State.²

Whether some of the Cranes that were found by the early explorers along the coasts of Massachusetts and Maine were of this species it is impossible now to determine definitely, but Champlain (1615) found this species in the region about the eastern part of Lake Ontario, for he says, "there are also many cranes, white as swans."³

Dr. Thompson, in his *Natural History of Vermont* (1842), says that this bird is known in Vermont only by being seen occasionally during its migrations, but that it is common in summer in the fur countries, where it breeds.⁴

Cranes were found about Hudson Bay by the early explorers, and this seems to indicate that their line of flight in the east was from Hudson Bay to New England, and from there down the Atlantic coast. The White Crane may never have bred in Massachusetts and may never have existed in the State in large numbers.

Dr. J. A. Allen, who has made a study of the history of the birds of Massachusetts, says that this bird was "perhaps" formerly an inhabitant of the State. Whether or not it ever bred here there can be no doubt that it passed through this region in migration.

¹ Hitchcock, Edward: Report on the Geology, Mineralogy, Botany and Zoölogy of Massachusetts, 1833, p. 549.

² De Kay, James E.: *Natural History of New York, Part I, Zoölogy, Ornithology*, 1844, p. 218.

³ Champlain, Samuel de: *Voyages*, Pub. Prince Soc., 1882, Vol. III, p. 126.

⁴ Thompson, Zadock: *History of Vermont, 1842, Part 1, p. 103.*

Probably there were few Cranes inhabiting Massachusetts when the Pilgrim Fathers landed at Plymouth, except along the coast, on the islands and on the meadows and marshes of the river valleys, for most of the State was then covered with primeval forest; and while Cranes are sometimes found in open woods, they are shy and wary birds, and prefer the open country, where they can discern their enemies from afar.

The statements of Wood and Morton probably refer to both this species and the Sandhill Crane. Both would naturally appear from the south in spring, but it is probable that the Sandhill Crane was the one that remained in largest numbers through the summer, for while the Whooping Crane is known to have bred in this latitude in the western States, it does not seem probable that it summered in any numbers in a forested region like Massachusetts.

The fact that, as Morton states, they sometimes ate the corn proves that they were actually Cranes, not Herons, and also helps to explain their early disappearance from Massachusetts. They paid with the death penalty for eating the corn. Also, as these birds occupied the only natural open lands, — those that were first sought by settlers, — they were driven out within a few years after settlement began. Even had they not attacked the corn they must soon have succumbed, because of their large size, their white color and their general conspicuousness. In the early days the Indians used to steal upon the Cranes and shoot them with arrows. Now the few survivors of this species in the west will hardly come knowingly within a mile of the white man.

Lawson says that Cranes are sometimes “bred up tame,” and are excellent in the garden to destroy frogs and other vermin.¹

This bird is long lived and grows wary as the years go by; it now frequents prairies, marshes and barren grounds, over which it stalks, always alert and watchful. It flies low, its wings sometimes almost brushing the grass tops, but in migration it rises to such tremendous heights that it may pass over a large region unnoticed by man. It feeds on frogs, fish, small

¹ Lawson, John: History of Carolina, 1860, p. 239.

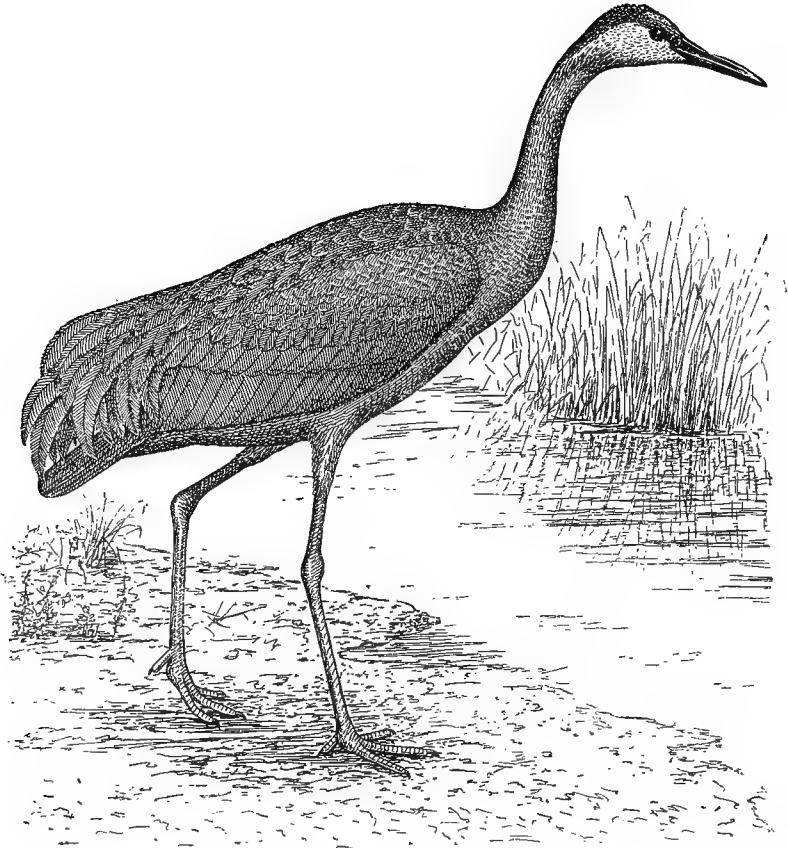


PLATE XXII.—SANDHILL CRANE.

Formerly common in New England; now extirpated.

mammals and insects, and is said to take corn and other cereals and the succulent roots of water plants.

Nuttall, describing the flights of the Whooping Crane up the Mississippi valley in December, 1811, says "that the bustle of their great migrations and the passage of their mighty armies fills the mind with wonder." It seemed, he says, as though the whole continent was giving up its quota of the species to swell this mighty host, and the clangor of their numerous legions, passing high in air, was almost deafening. His statement, that this great host of Cranes was passing nearly all night, will give some idea of the immensity of this great flight. What a change has come in a century!

The Whooping Crane is doomed to extinction. It has disappeared from its former habitat in the east and is now found only in uninhabited places. It can hardly be said to be common anywhere, except perhaps locally in the far north. Only its extreme watchfulness has saved thus far the remnant of its once great host.

SANDHILL CRANE (*Grus mexicana*).

Length. — 40 to 48 inches; wing, about 22; bill, 6.

Adult. — Bill compressed; top of head bare, with short, straggling black hairs; primaries dark plumbeous brown; rest of plumage bluish gray; cheeks, throat and chin sometimes whitish.

Nest. — On ground, made of grasses and weeds.

Eggs. — Two to four, drab brown with varied markings; average about 3.88 by 2.63. Closely resemble those of the Whooping Crane.

Season. — Formerly summer.

Range. — Temperate North America; now rare or casual east of the Mississippi, except in Florida; still common in the west and part of the south; breeds in the wilder parts of its range in the north, also in Louisiana and Florida.

HISTORY.

The Sandhill Crane, was described by Müller (Natur syst. Suppl., 1776, p. 110), and thus first became known to science long after it had become well known to the American colonists. Many of the Cranes found by the early explorers and settlers all along the Atlantic seaboard were of this species.

Possibly it formerly bred locally along the Atlantic coast from Florida to New England. It still breeds in Florida and

a few of the States of the middle west. In the far west its place is taken by the Little Brown Crane.

The first mention of Cranes in Massachusetts territory is found in the accounts of Gosnold's voyage, written by Archer and Brereton. Both mention Cranes and Herons among the birds found with young, May 21, 1602, on an island that they called Martha's Vineyard, but which appears to have been No Man's Land, lying south of that island.¹ Cape Cod and the marshes along the Atlantic coast of Massachusetts also undoubtedly were frequented by Cranes, most of which may have been of this species. Therefore Wood, who lived at Saugus, and Morton, who lived at Quincy, had good opportunities to see and shoot these birds.

There is presumptive evidence that Cranes bred in early days as far eastward as the Maine coast. In Rosier's narrative (1605) it is written that Captain Waymouth visited St. George's Islands in May, and there found a place where fire had been made; and about the place were very great egg shells, larger than goose eggs, and other remnants of a feast. These great eggs were probably Cranes' eggs, for he says again: "Here we espied cranes stalking on the shore of a little island adjoining, where we after saw they used to breed."²

In the account of Captain Levett's voyage in 1623, it is stated that on the shores of the Saco River they "had plenty of crane, goose, ducks and mallard, with other fowl, both boiled and roasted."³

This evidence, like all narratives of the early voyagers, is unsatisfactory and indefinite in regard to species. Nevertheless, it is all that we have.

Undoubtedly the Sandhill Crane was extirpated from New England long before it was driven out elsewhere, for it was destroyed or driven away from the Atlantic coast very early in the history of settlement.

The learned Professor Kalm, when at Swedesboro, N. J., writes that a Swede more than ninety years old assured him

¹ Coll. Mass. Hist. Soc., Vol. VIII, 3d ser., pp. 76, 87.

² *Ibid.*, p. 133.

³ Coll. Me. Hist. Soc., 1847, Vol. II, p. 82.

that in his youth hundreds of Cranes came to that region during the spring, while "now" (1748) "they are very few."¹ Again he says (1749): "cranes (*Ardea canadensis*) were sometimes seen flying in the day-time, to the northward. They commonly stop here early in spring, for a short time, but they do not make their nests here, for they proceed on more to the north. Certain old Swedes told me, that in their younger years, as the country was not yet much cultivated, an incredible number of cranes were here every spring, but at present they are not so numerous."² The time to which he refers when the Cranes were found in incredible numbers must have been in the latter half of the seventeenth century, soon after the settlement of the country.

C. Lowell, writing of the birds of Lancaster, N. H. (1814), mentions the Crane (*Ardea canadensis*), which was the name then given to this species, among the birds found in the town at that time. As he also lists Herons, it is quite probable that his statement is based on fact.³

The most recent record of the occurrence of this bird in New England is at Lovell's Pond, Wakefield, N. H., where, according to Brewster, a specimen was obtained in 1896 or 1897, and is now preserved in the State Agricultural College collection at Durham.⁴

I well remember when, in my boyhood, on an expedition to Florida, I first heard the raucous, resounding note of the Sandhill Crane. It filled the spaces of the piney woods with its hollow reverberations as the great birds sprang up beyond gunshot and flapped slowly away. This species ordinarily flies low, but in the west in the nesting season they may be seen flying and sailing in wide circles high in the air, until lost to view, where, even at that great height, their powerful, penetrating cries still fall clear, but mellowed by distance, to the listening ear.

In the mating season these birds assemble in some open spot, where they hold their dances and indulge in various

¹ Kalm, Peter: Travels in North America, 1770, Vol. I, p. 290.

² *Ibid.*, Vol. II, p. 72.

³ Coll. Mass. Hist. Soc., Vol. III, 2d ser., p. 101.

⁴ Allen, Glover M.: List of the Birds of New Hampshire, 1903, pp. 82, 83.

antics for hours at a time. The Whooping Crane has similar habits.

In Florida the nest usually is placed in the wet margin of a shallow grassy pond or in some savanna; but in the west it is sometimes built on the dry prairie. Before many weeks the young became such rapid runners that they will give one quite a chase to catch them, and it requires fast work to run down a broken-winged adult bird.

As an article of food no doubt the Sandhill Crane is very palatable if taken young, but my only experience of its gastro-nomic qualities was with an old bird, and I should have to be nearer starvation than I then was to repeat the experiment. This bird lives to a great age, and when old it is about as tough and stringy as an old Swan. If taken young it becomes very tame, and it is capable of defending itself against dogs, cats, foxes and other mammals. Dr. Hatch had one which, he asserts, repelled the attacks of the largest and most vicious dogs.

The bird when feeding keeps its head down for but a short period, and then, raising it high, sweeps the country with its wary eye. When the head is raised the hunter must be well concealed to avoid discovery.

Dr. Hatch writes that a young bird of this species which he kept in confinement swallowed almost anything that it could get hold of. All sorts of hard articles that had been picked up were afterwards regurgitated with the indigestible portions of the food.¹

This species usually swallows its food whole. Fish, frogs, snakes, shell-fish, field mice and other small mammals, birds and even eggs make up a portion of its animal food.

My friend Mr. William S. Perry of Worcester, flushed a Sandhill Crane from its nest on the Kankakee marshes and shot the bird. He found two large lumps in its gullet, and on opening it he found three eggs of the Sora Rail intact. The shell of the first was bright and glossy; the next was somewhat faded, and the shell of the third, which was nearest the stomach, had lost its smooth coating and some of its mark-

¹ Hatch, P. L.: Notes on the Birds of Minnesota, 1892, p. 100.

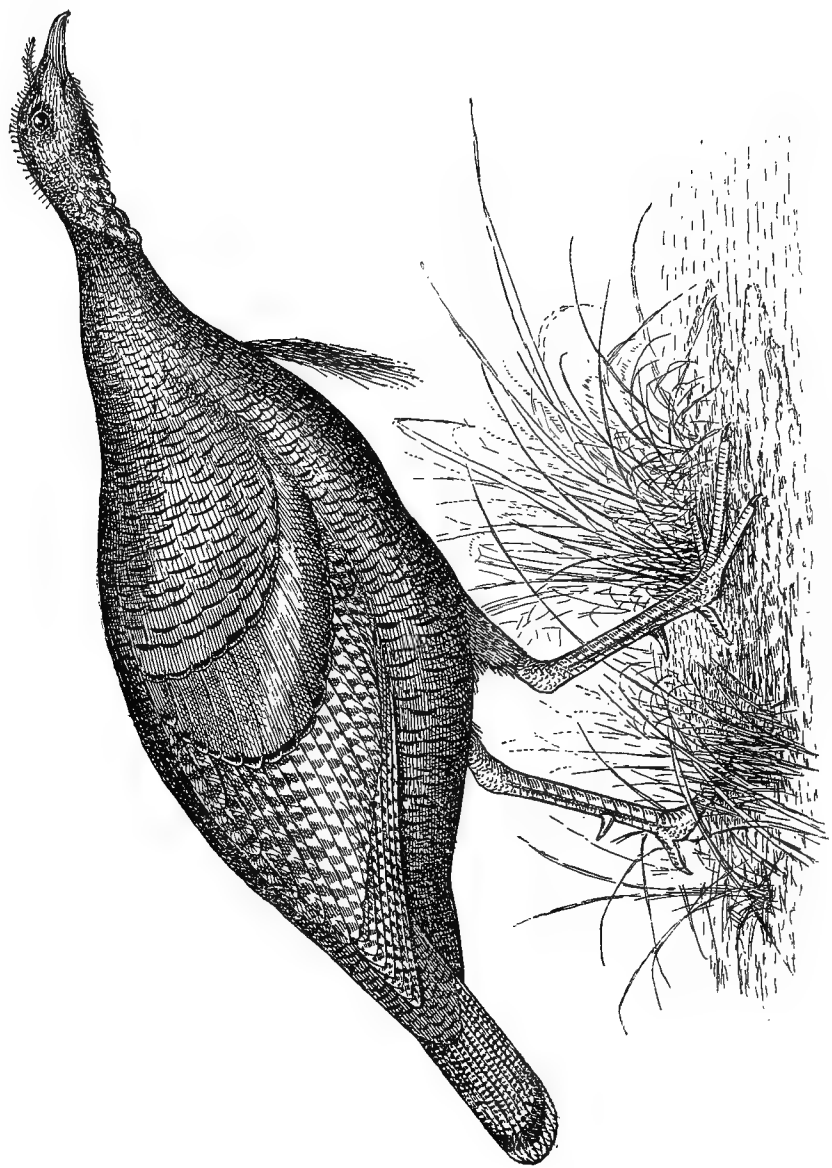


PLATE XXIII. — WILD TURKEY.

Once abundant in New England; now extirpated from the Northern States and Canada.

ings, apparently through the action of the digestive juices. The stomach was full, which prevented the eggs from passing down, but the first egg may have been attacked by the digestive juices in the gullet or œsophagus.

Probably the only safe method by which this long-billed bird could secure the entire egg contents was that of swallowing the eggs whole. Mr. Perry showed me the neck and head of this Crane, and the three eggs taken therefrom. He said that Rails were very numerous in the marsh, and all marsh animals fed upon them.

The vegetable food of the Sandhill Crane includes corn, potatoes and sweet potatoes. The destruction of these farm crops is one indirect cause for the disappearance of the bird from inhabited regions. It falls before the rifle of the farmer and hunter, and is shot from blinds as it flies over the prairies. It is killed at all seasons, and, like the Whooping Crane, it probably is doomed to extinction.

NOTE.—The Little Brown Crane (*Grus canadensis*) is a western species which probably never was more than casual here. The only record of its occurrence in New England is recorded by Brewster in *The Auk*. It was taken on the 8th or 9th of October by Mr. Benjamin Burlingame at Natick Hill, R. I., and was preserved for an educational collection in Natick. Mr. Brewster says, in recording it: "As far as I am aware this species has never previously been reported from any part of New England, although the Whooping and Sandhill Cranes are supposed to have occurred rather numerous in the early colonial days." This instance merely illustrates how large birds with great powers of flight sometimes wander far from their normal range.¹

WILD TURKEY (*Meleagris gallopavo silvestris*).

Length. — 48 inches; wing, 21; tail, 9.

Adult Male. — Body plumage generally brilliant, metallic bronze, with gold, green and red reflections; each feather tipped with a black band; wings black and bronze green; quills white-barred; rump black, with dark purple, metallic gloss; upper tail coverts chestnut, with metallic red reflections; tail chestnut, black-barred, tipped with a deep buff band and a subterminal black band; head and neck naked, red and variegated; a bunch of coarse bristles suspended from center of breast.

¹ *Auk*, 1890, Vol. VII, p. 89.

Female. — Smaller and duller, with little of the brilliant reflections of the male.

Nest. — On ground, usually under a log or bush.

Eggs. — Creamy white, finely spotted with light brown.

Notes. — Similar to those of domesticated Turkey.

Season. — Formerly resident entire year.

Range. — Formerly eastern United States and southern Ontario, mainly in forested areas, except in Florida, where its place is taken by another race, *Meleagris gallopavo osceola* (now confined to southern Florida). Now extinct in Canada and most of the northern States, and decreasing in the south and west.

HISTORY.

The Wild Turkey of eastern North America should not be confounded with a Mexican species (*Meleagris gallopavo gallopavo*), which was the progenitor of the domesticated Turkey. The Mexican Turkey was domesticated first by the Aztecs, and later was introduced into Europe by their Spanish conquerors. The Mexican Turkey is a fine bird, but the white spot on its rump rather detracts from its beauty. These white-tipped feathers of the rump and tail coverts usually occur in the domesticated birds of this species, and serve to distinguish them from the Wild Turkey of the United States.

The discoverers and early explorers of North America found this bird ranging almost the entire length of the Atlantic coast line, from Florida to Nova Scotia, where it roved in great flocks, and often migrated in multitudes in search of food. It seems to have been particularly numerous in Massachusetts and New England. The first settlers found it a vital asset of the land and a substantial source of food supply.

Champlain (1604) says that the Indians of the Massachusetts coast described a large bird that came to eat their corn. From their description he judged it to be a Turkey.¹ He landed on Cape Cod, and as the Cape was then well wooded, it doubtless was inhabited by this bird.

Capt. John Smith in 1622 reports "great flocks of turkies" in New England.

Thomas Morton (1632, Massachusetts) says: "turkies

¹ Champlain, Samuel de: Voyages, Pub. Prince Soc., 1878, Vol. II, p. 88.

there are, which divers times in great flocks have sallied by our doores; and then a gunne, being commonly in a redinesse, salutes them with such a courtesie, as makes them take a turne in the Cooke roome. They daunce by the doore so well.”¹ He asked his Indians what number they found in the woods, and they answered “neent metawna,” more than they could count, which Morton interprets as “a thousand that day.”

William Wood (1629–34, Massachusetts) writes: “the Turkey is a very large Bird, of a blacke colour, yet white in flesh; much bigger than our English Turkey. He hath the use of his long legs so ready, that he can runne as fast as a Dogge, and flye as well as a Goose: of these sometimes there will be forty, threescore, and a hundred of a flocke, sometimes more and sometimes lesse; their feeding is Acornes, Hawes, and Berries, some of them get a haunt to frequent our English corne: In winter when the Snow covers the ground, they resort to the Sea shore to look for Shrimps, & such smal Fishes at low tides. Such as love Turkie hunting, must follow it in winter after a new falne Snow, when hee may follow them by their tracts; some have killed ten or a dozen in halfe a day; if they can be found towards an evening and watched where they peirch, if one come about ten or eleaven of the clocke he may shoote as often as he will, they will sit, unlesse they be slenderly wounded. These Turkies remaine all the yeare long, the price of a good Turkie cocke is foure shillings; and he is well worth it, for he may be in weight forty pound.”²

Several Massachusetts town histories refer to the Turkey. Many hills and small streams of the Commonwealth have received their names from the Turkeys which once frequented them. We can form little idea to-day of the almost incredible abundance of these noble birds.

Lawson (1709) states that he has seen about five hundred in a flock.³

¹ Morton, Thomas: *New English Canaan*, Pub. Prince Soc., 1883, p. 192.

² Wood, William: *New England's Prospect*, Pub. Prince Soc., 1865, p. 32.

³ Lawson, John: *History of Carolina*, 1860, p. 244.

Dr. Lewis (1855) says that in former times they wandered in vast armies from one end of our country to the other; but even in his day scarce one was to be found on the whole northern Atlantic sea-coast.¹

In the west it was still numerous, however, for some time after the transcontinental railroads were built, and Col. W. F. Cody (Buffalo Bill), who acted as a scout for the United States army, speaks of a grand Turkey round-up, in which two or three hundred soldiers surrounded a grove of timber, where they killed, with guns, clubs and stones, from four hundred to five hundred of these birds.²

“Nessmuk” writes that on a long tramp in the woods of Michigan, which must have occurred some time during the middle of the last century, he met with droves of Wild Turkeys, and on one occasion saw a great army of these birds extending through the woods as far as he could see in front and on both sides.³

From these comparatively recent experiences in the west we may get some idea of the number of Turkeys that once lived in our Massachusetts woods. Turkeys were shot and trapped at all seasons.

Beverly (1720) writes: “they have many pretty devices besides the gun to take wild turkeys; and among others, a friend of mine invented a great trap, wherein he at times caught many turkeys and particularly seventeen at one time.”⁴

Shooting and trapping the birds at all times soon had its inevitable effect, and the Turkey retired rapidly before the advance of settlement, and soon it could be found only in the wildest parts of the country.

Josselyn (1672, Massachusetts) says: “I have also seen threescore broods of young Turkies on the side of a marsh, sunning of themselves in a morning betimes, but this was thirty years since, the English and the Indians having now destroyed the breed, so that 'tis very rare to meet with a wild Turkie in the Woods.”⁵

¹ Lewis, Elisha J.: *The American Sportsman*, 1855, pp. 120, 121.

² Huntington, Dwight W.: *Our Feathered Game*, 1893, p. 47.

³ Sears, George W. (Nessmuk): *Woodcraft*, 1891, pp. 124, 125.

⁴ Beverly, Robert: *History of Virginia*, 1855, p. 256.

⁵ Josselyn, John: *New England's Rarities*, 1865, p. 42.

In Massachusetts Turkeys were most numerous in the oak and chestnut woods, for there they found most food. They were so plentiful in the hills bordering the Connecticut valley that in 1711 they were sold in Hartford at one shilling four pence each, and in 1717 they were sold in Northampton, Mass., at the same price. From 1730 to 1735 the price of those dressed was in Northampton about one and one-half penny per pound. After 1766 the price was two and one-half pence, and in 1788, three pence. A few years after 1800 it was four pence to six pence a pound, and about 1820, when the birds had greatly decreased, the price per pound was from ten to twelve and one-half cents.

In the last part of the eighteenth century most of the Wild Turkeys had been driven west of the Connecticut River, but there were still a good many in the Berkshire Hills and along the Connecticut valley on both sides of the river.

Belknap (1792) says "they are now retired to the inland mountainous country."¹ In Connecticut in 1813 the last recorded bird was seen, and a few were still left in Vermont in 1842.²

De Kay (1844) wrote that the Turkey had disappeared almost entirely from the Atlantic States, but that a few were still to be found about Mt. Holyoke in Massachusetts, and in Sussex County, N. J., as well as in some of the mountainous parts of New York.³

Brewster states in his *Birds of the Cambridge Region*, that the Wild Turkey was not exterminated in Concord, Mass., only twenty miles from Boston, until after the beginning of the nineteenth century.

Emmons (1833) gives the Wild Turkey in his list as a rare resident in Massachusetts, "now become scarce and nearly extinct;" but in a footnote Dr. Hitchcock states that the bird is frequently met with on Mt. Holyoke.⁴

It generally is believed that the last specimen actually

¹ Belknap, Jeremy: *History of New Hampshire*, 1792, Vol. III, p. 170.

² Chamberlain, Montague: *Handbook of Ornithology, United States and Canada*, 1891, Vol. II, p. 21.

³ De Kay, James E.: *New York Fauna*, 1844, Part II, p. 200.

⁴ Hitchcock, Edward: *Report of the Geology, Mineralogy, Botany and Zoölogy of Massachusetts*, 1835, p. 531.

known to have been captured in Massachusetts was shot on Mt. Tom in the winter of 1850-51.¹

Thompson (1842) states that the Turkey had then become exceedingly rare in all parts of New England, but that it still bred on the mountains in the southern part of Vermont.²

Wild Turkeys are believed to have existed on Mt. Tom and Mt. Holyoke longer than anywhere else in Massachusetts. There was a flock on Mt. Tom in 1842, a few in 1845 and a single Turkey in 1851. Some remained on Mt. Holyoke nearly as long.³

In the History of the Sesqui-Centennial Celebration of South Hadley, the statement is made that a few Turkeys were left on Mt. Holyoke later than 1851. It is said that a year or two before the outbreak of the Civil War a party of hunters from Springfield and Holyoke went to Rock Ferry, and there divided, a part ascending the north peak of Mt. Tom and the others crossing the river to Mt. Holyoke, north and east of the well-known roosting place of the birds. The latter party beat the woods and drove the few surviving Turkeys to the southerly end of the mountain, whence they took flight for Mt. Tom, but before the poor creatures could alight, the guns of the ambushed hunters had exterminated them.

Wild Turkeys were reported as seen on Mt. Holyoke as late as 1863, when one was said to have been killed by a hunting party. A statement is made by Dr. T. M. Brewer that some were shot at Montague and other towns in Franklin County within a few years prior to 1874,⁴ but Mr. Robert O. Morris of Springfield, who has investigated the evidence, believes that these later Turkeys had escaped from domestication, and that the last of the native wild birds was that recorded as killed in 1851.

Since then the Wild Turkey has disappeared from Canada and from the Atlantic seaboard, although a few are still to be found in Virginia and other southern States, and it is still common in some western localities.

¹ Howe, Reginald Heber, and Allen, Glover Morrill: *Birds of Massachusetts*, 1901, p. 133.

² Thompson, Zadock: *History of Vermont*, 1842, p. 101.

³ Judd, Sylvester: *History of Hadley*, 1863, p. 358.

⁴ Baird, Brewer and Ridgway: *North American Land Birds*, 1905, Vol. III, p. 405.

The habits of this Turkey have been well described by Audubon, and no extended notice of them is necessary. Although it is a bird of the woods, where it roosts high in the tall timber, in the deep fastnesses of which it hides, it likes to come out in the open and search in the tall grass of field, meadow or prairie for insects of which it is fond. When discovered in such a situation it usually tries to steal away through the long grass; if followed it runs rapidly, and if closely pressed rises and flies, often a long distance, generally making for timber if possible, where it disappears like magic in the thickets. I well remember when I started my first old gobbler from the long prairie grass. The rising sun at my back was just throwing its level beams across the grassy sea as I emerged from the timber, between the bird and its retreat. At the sound of my gun the great bird rose resplendent from the grass, gorgeous with metallic reflections, its broad wings throwing off the sun rays like polished bronze and gold, — a sight, as it sailed away, to be long remembered.

At early morning the Turkey leaves its roost and often hunts about in the "scrub." The gunner who knows its habits arrives at its haunts before daybreak, and, taking his place quietly, remains immovable, awaiting his opportunity, which often comes before sunrise. Turkey hunters conceal themselves in trees in the mating season and imitate the note of the hen Turkey by drawing the breath through a "call" made from a wing bone of the bird. As the males are polygamous this call is calculated to attract them to their doom. This is a destructive method which should have been prohibited long since, as well as all killing of the bird in the breeding season, when the males are thin in flesh and hardly fit for food. Formerly the Turkey was one of the most unsuspecting of birds, and would sit on the trees and gaze at the hunter. Now it is one of the wildest of all the wild things of the woods.

In the mating season the males strut, gobble and fight in the manner of the domestic Turkey. The female steals away by herself to make her nest, and guards her secret carefully from her many enemies, of which the male is not the least, for

he will destroy the eggs or the young birds if he finds them. The young are very weak when first hatched and will hardly survive a good wetting; Audubon says that when the young have become chilled and ill the female feeds them the buds of the spicebush (*Benzoin benzoin*); but, however she manages, she often succeeds in rearing the brood. The fox and lynx are among her most dangerous enemies at this time, but later, when the young birds have learned to fly and to roost in the trees, the Great Horned Owl takes its toll from their numbers.

The Wild Turkey adapts itself to circumstances in regard to food, eating acorns, berries, buds, weed seeds, grass seeds and other vegetable food. It is also fond of grain, and this no doubt led to its extirpation in Massachusetts. The gunners watched in the cornfields, or laid long lines of corn in ditches, where they could rake the whole flock, or baited the birds into pens, in which whole broods were captured. But the birds, both young and old, often are useful to the farmer, for they are very fond of insects, particularly grasshoppers. Dr. Judd makes an excellent contribution to the literature on the food habits of the Wild Turkey, including an examination of sixteen stomachs and crops of Turkeys, made by the Biological Survey. These contained 15.57 per cent. of animal matter and 84.43 per cent. of vegetable matter. The animal food comprises insects, 15.15 per cent.; miscellaneous invertebrates (spiders, snails and myriapods), .42 per cent. Of the animal food, 13.92 per cent. consisted of grasshoppers. Beetles, flies, caterpillars and other insects made up the residue of 1.23 per cent. The list of animal and vegetable food as given by Dr. Judd is favorable to the Turkey, as it contains insect pests, wild berries and no vegetable food of value to mankind.¹

The varied food of this bird gives it the finest flavor of any fowl that I have ever tasted, and its great size and beauty contribute to make it, to my mind, the noblest game bird in the world. It is destined to vanish forever from the earth unless our people begin at once to protect it.

¹ Judd, Sylvester D.: The Grouse and Wild Turkeys of the United States and their Economic Value, Bulletin 24, Bureau of Biol. Surv., U. S. Dept. of Agr., pp. 49, 50.

PART III.

THE CONSERVATION OF GAME BIRDS, WILD-
FOWL AND SHORE BIRDS.



PLATE XXIV.—PROPAGATION.

A pair of Bob-whites as kept in a breeding cage by Prof. C. F. Hodge.
(Photograph by the Author.)



PLATE XXV.—PROTECTION.

This photograph, taken at Palm Beach, Lake Worth, Fla., shows how wild-fowl respond to perpetual protection. The Ducks shown are Scaups, commonly known as Bluebills or Creek Broad-bills. (From Bird-Lore.)

PART III.

CONSERVATION OF GAME BIRDS.

THE ECONOMIC VALUE OF GAME BIRDS, WILD-FOWL AND SHORE BIRDS.

Game is one of the natural resources of the State. When the game is exterminated a valuable asset is lost. When game is conserved it increases the material wealth of the State, gives value to waste lands, adds to the worth of farm lands, attracts sportsmen to the State and gives employment to many people.

An abundance of game birds is necessary to the prosperity of many great business interests. A very large part of the business of the gun makers and ammunition manufacturers depends on keeping up a supply of game birds. Makers of other sporting goods and clothing, breeders and trainers of dogs, manufacturers of boats, country hotel keepers, guides, marketmen, and a host of others, are dependent upon sportsmen or game for a part of their livelihood.

The economic value of game birds on the farm is so considerable that it is well worthy the attention of all farmers and owners of large tracts of land. The Bob-white ranks high among the most valuable destroyers of insects and weeds (see page 373). The Heath Hen, the Prairie Chicken, the Upland Plover and the Killdeer Plover, all of which formerly were common in many regions from which they since have been extirpated, or nearly so, rank almost equally high as destroyers of the insects of farm or field. A plentiful supply of such birds would free the fields of many insect pests. Birds also might be made to pay the taxes on the land. It is possible now for any farmer or association of farmers owning or controlling a large tract of land where game birds are plentiful

to let the shooting privileges on the property for a sum equal at least to the amount of the taxes; and the lessees, while paying for the shooting privileges, will see to it that the supply of game is kept up.

A succession of game birds rearing their young in the woods and fields is a perennial delight to the eye, and the good they do in destroying pests far exceeds any injury that they ordinarily cause to the crops.

The Woodcock, Snipe and Upland Plover are commonly included among game birds, but they are no better food than some other closely related species among the shore birds. The Sandpipers, Snipe and Plover all may be reckoned among the useful species. Most of those known to feed about marshes and pools probably destroy the young or larvæ of mosquitoes. Mr. W. L. McAtee, in a recent bulletin entitled *Our Vanishing Shorebirds*, published by the Bureau of Biological Survey, lists the Northern Phalarope, Wilson's Phalarope, the Stilt, Pectoral, Baird's, Least and Semipalmated Sandpipers, the Killdeer and the Semipalmated Plover among the birds now known to eat mosquitoes. Fifty-three per cent. of the food of twenty-eight Northern Phalaropes consisted of mosquito larvæ. The salt-marsh mosquito (*Aedes sollicitans*) is eaten commonly by shore birds. The State of New Jersey, where, as elsewhere, gunning has decreased the numbers of shore birds, recently has gone to great expense for the suppression of the salt-marsh mosquito.

The following passages from Mr. McAtee's paper will give some idea of the value of the shore birds as insect eaters:—

“Cattle and other live stock also are seriously molested by mosquitoes as well as by another set of pests, the horse-flies. Adults and larvæ of these flies have been found in the stomachs of the dowitcher, the pectoral sandpiper, the Hudsonian godwit and the killdeer. Two species of shorebirds, the killdeer and upland plover, still further befriend cattle by devouring the North American fever tick.

“Among other fly larvæ consumed are those of the crane flies (leatherjackets) devoured by the following species: northern phalarope (*Lobipes lobatus*); Wilson phalarope (*Steganopus*

tricolor); woodcock (*Philohela minor*); jacksnipe (*Gallinago delicata*); pectoral sandpiper (*Pisobia maculata*); Baird sandpiper (*Pisobia bairdi*); upland plover (*Bartramia longicauda*); killdeer (*Oxyechus vociferus*). Crane-fly larvæ are frequently seriously destructive locally in grass lands and wheat fields. Among their numerous bird enemies, shorebirds rank high.

“Another group of insects of which the shorebirds are very fond is grasshoppers. Severe local infestations of grasshoppers, frequently involving the destruction of many acres of corn, cotton, and other crops, are by no means exceptional. Aughey found 23 species of shorebirds feeding on Rocky Mountain locusts in Nebraska, some of them consuming large numbers, as shown below: 9 killdeer stomachs contained an average of 28 locusts each; 11 semipalmated plover stomachs contained an average of 38 locusts each; 16 mountain plover stomachs contained an average of 45 locusts each; 11 jacksnipe stomachs contained an average of 37 locusts each; 22 upland plover stomachs contained an average of 36 locusts each; 10 long-billed curlew stomachs contained an average of 48 locusts each.”

Nearly all shore birds are fond of grasshoppers and many species feed also on weevils, wireworms, leaf beetles and other pests of the fields. Along the shores large numbers of the marine worms which prey upon oysters are eaten by shore birds. Mr. McAtee says that commonly from one hundred to two hundred of these worms are eaten at a meal. We have been devoting too much of our time to shooting shore birds and not enough to protecting them.

The economic value of wild-fowl is as great as that of game birds. The term wild-fowl may include all wild birds, but as commonly used it denotes merely water-fowl which are hunted for food or sport. Wild-fowl were very important as a source of food supply during the settlement of this country, and later, when markets for game were opened, they became a valuable asset to the people, and yielded vast sums annually to settlers, hunters and marketmen. Even to-day, in parts of the west and south where the sale of game is still legal, the sums annually received by hunters from the marketing of

wild-fowl are very large. Mr. Frank M. Miller, chairman of the Fish and Game Commission of Louisiana, estimates that two and one-half million wild-fowl were killed in that State in the season of 1908-09. His estimate is based on the reports of gunners and game wardens, with a very liberal allowance for exaggeration. Had the wild-fowl of this country been conserved, they might have yielded a perpetual annual product worth many millions of dollars.

In the older parts of the country, where wild-fowl are now much diminished in numbers as compared with their former abundance, much of their economic value to the inhabitants consists in their attraction for sportsmen. Massachusetts sportsmen frequently have asserted that in the pursuit of Ducks and Geese they spend from five dollars to twenty-five dollars for every bird they kill, and were wild-fowl numerous throughout New England, large sums would be distributed annually by sportsmen to hotels, boatmen, farmers and guides, and the business of country merchants would be increased. Many species of wild-fowl, if properly conserved, would do good service to agricultural communities by destroying insects and weed seeds.

Loons are not beneficial in this respect. They are believed to feed mainly on fish and other aquatic animals, and therefore some people have regarded them as injurious to food fish. No thorough study of their food has been made; but it seems probable that they are beneficial rather than injurious to game fish. They feed on the natural enemies of the fish as well as on the fish themselves and thereby keep a healthful balance among the forms of aquatic life, and help to maintain rather than to decrease the numbers of food fish useful to mankind. The Mergansers or Sheldrakes, as they are commonly called, evidently perform a similar office. The Scoters, or so-called "Coots," are regarded by some short-sighted persons as detrimental to the shell-fisheries, because these birds are known to eat edible shell-fish; but they devour also some of the most destructive enemies of these shell-fish. The chief utility of the Scoters and Old-squaws lies in their ability to dive in deep water and feed on various forms of marine life,

thus assisting other forces to maintain the biologic balance in the waters of bays, estuaries and lakes.

Dr. George W. Field, chairman of the Massachusetts Commission on Fisheries and Game, informs me that mussels, which are the principal food of Scoters, or "Coots," and Eiders, are among the chief enemies of the common clam. They occupy clam flats to the exclusion of the clams, and are difficult to eradicate. The Scoters feed on starfish also, and Dr. Field says that they destroy the oyster drill (*Urosalpinx cinerea*). The starfish and the drill are the most destructive enemies of the oyster and the scallop, and are dreaded by the oyster growers. Dr. Field declares that these animals are certainly a hundred times as destructive to the oyster and scallop industries as are all species of water-fowl combined.

While the Scoters feed on sea clams (*Macra solidissima*), quahaugs (*Venus mercenaria*) and scallops (*Pecten irradians*), they take only the young or very small shell-fish,¹ and Dr. Field states his belief that, other things being equal, these birds select mainly those places where such shell-fish are most abundant. Young shell-fish in their beds are so crowded that were they not thinned out many would die from overcrowding or lack of food. Dr. Field states that he has found young clams set as thickly as two thousand to the square foot. In such cases the removal of all but a dozen or twenty to the square foot will be succeeded usually by a rapid increase in growth. Thus the thinning done by the birds saves shell-fish from the evils of overcrowding, and benefits the shell-fish industry by inducing a quicker and better growth of the marketable product. It seems probable that these birds are essential to the success of the shell-fisheries, and that any serious reduction in their numbers would be detrimental to the industry.

River Ducks require a large quantity of animal food in spring, and devour such destructive insects as army worms, cutworms, marsh caterpillars, grasshoppers and locusts. Aughey in his report on Locust-feeding Birds, made to the United States Entomological Commission in 1877, gives the

¹ A small bivalve commonly eaten by these birds is very similar to the quahaug and usually is mistaken for it. This is *Gemma gemma*, a favorite food of the Black Duck, which never grows to a marketable size.

following notes on the stomach contents of wild-fowl: Ten Mallard stomachs contained an average of twenty-two locusts and twenty other insects each; seven Pintail stomachs contained an average of eleven locusts and thirty-four other insects each; nine Green-winged Teal stomachs contained an average of four locusts and forty-eight other insects each; nine Wood Duck stomachs contained an average of fifteen locusts and twenty-three other insects each; four Buffle-head stomachs contained an average of ten locusts and forty-four other insects each. All these Ducks had eaten also some seeds and mollusks, but had not disturbed the farmers' crops.

The chief value of the wild-fowl to the people, however, is not to be found in the place that they occupy on our tables, nor in the sport that they afford. Even their utility to the farmer is secondary to their æsthetic value, which serves as an added attraction to any country. Their beauty and grace, their stirring calls and lively ways, their swift and winnowing flight make the land that they inhabit a more interesting place to live in. Game birds of all kinds have a very high educational value. As objects of observation and study with field glass or telescope they are of far greater service to the majority of outdoor people, and to those who seek needed recreation in the country, than they are to the gunner, the marketman or the sportsman. Those who love nature for her own sake, who take delight in the living bird, whose ears are attuned to resonant cry and whistling wing, who have that quality of mind which sees more value and more profit in the bird alive in its native element than in the bloody and bedraggled carcass hanging in the butcher's stall, must see to it that these birds are conserved.

Americans are turning to the country life. It is the life to which we as a people must resort to maintain and increase the vigor and virility of the nation. Our lakes and rivers have now lost much of their former attractiveness. It will never be fully regained until, as of old, they are again frequented by flocks of beautiful and lively water-fowl. The great army of outdoor people that is constantly recruiting — an army destined soon to far out-number all others interested in

birds — will hold our wild-fowl at a greater value in the coming age, and we may look forward confidently to the day when again, as of yore, Americans will see our lakes and rivers repopulated by their happy feathered inhabitants. Some, perhaps, will be missing, — exterminated in our day, — but the intelligent, educated people of our race will come in time to see the folly of exterminating these useful birds for the profit of the few. They will appreciate the many advantages of conserving them for the benefit of all mankind.

THE DECREASE OF GAME BIRDS IN MASSACHUSETTS.

The need of conserving the present supply of game birds, wild-fowl and shore birds on the Atlantic seaboard, is indicated by the following table, in which the results of my inquiries regarding the decrease of such birds in Massachusetts are set down, so far as they can be expressed in figures. The manner in which the reports were obtained from which these figures were taken is related on pages 33 and 34.

It should be noted that this table refers only to Massachusetts, and that, as stated on page 34, it represents an average period of twenty-seven years and three months prior to the year 1909. The number of years of experience credited to these observers may be averaged in another way, closely approximating the following tabulation:—

9	observers	have had about	5	years' experience.
27	observers	have had about	10	years' experience.
35	observers	have had about	15	years' experience.
48	observers	have had about	20	years' experience.
40	observers	have had about	25	years' experience.
41	observers	have had about	30	years' experience.
22	observers	have had about	35	years' experience.
23	observers	have had about	40	years' experience.
19	observers	have had about	45	years' experience.
19	observers	have had about	50	years' experience.
3	observers	have had about	55	years' experience.
4	observers	have had about	60	years' experience.

Two hundred and fifty-four of these observers have had from fifteen to sixty years' experience in the field. Most of

them are gunners, of whom a fair proportion might also be ranked as ornithologists, and the list includes some of the principal ornithologists of Massachusetts.

Table indicating the Decrease of Certain Game Birds, Wild-fowl and Shore Birds in Massachusetts.

[Average time of observation, 27 years, 3 months.]

	Number reporting Increase.	Number reporting Per Cent. of Increase.	Average Per Cent. given.	Number reporting Decrease.	Number reporting Per Cent. of Decrease.	Average Per Cent. given.	Number reporting holding its Own.	Number reporting Rare.	Number not reporting Species.
Merganser,	10	6	56½	39	23	53%	24	16	194
Red-breasted Merganser,	15	7	44½	34	25	47%	30	25	188
Hooded Merganser,	10	5	55%	31	16	47½	20	21	195
Mallard,	17	13	33%	63	39	63%	18	37	100
Black Duck,	40	22	41% ₁₁	126	95	41% ₄	33		175
Breeding Black Duck,	27	13	33	83	52	57½	10		
Baldpate,	9	7	36¼	34	25	65%	9	15	217
Green-winged Teal,	6	1	30	71	46	65% ₁₁	7	27	172
Blue-winged Teal,	8	3	33½	100	71	65½	9	21	148
Pintail,	6	3	13½	30	21	74%	7	21	223
Wood Duck,	13	3	37½	104	61	75	7		118
Redhead,	15	6	55%	34	15	55%	10	35	202
Scaup,	16	8	38½	43	27	62%	22	11	207
Lesser Scaup,	5	1	100	27	16	63½	14	6	241
Golden-eye,	10	8	50	62	43	30%	39	9	163
Buffle-head,	7	3	36%	53	36	67%	11	23	197
Old-squaw,	11	9	24½	47	33	50%	40	4	292
American Eider,	2	1	10	37	19	63%	24	5	223
Scoter,	7	2	17½	43	27	61	36	9	204
White-winged Scoter,	12	5	53%	52	35	53%	47	3	184
Surf Scoter,	11	4	47½	46	30	49	42	7	191
Ruddy Duck,	9	6	18½	55	35	59%	11	10	214
Canada Goose,	19	9	45% ₁₅	81	52	58% ₁₃	35	8	128
Brant,	15	6	37	41	29	58	15	11	163
Virginia Rail,	4	2	38	30	14	43% ₆	11	11	221
Sora Rail,	5	3	50	40	26	47% ₇	9	12	217
Coot,	10	6	25	67	40	71% ₅	28	23	165

Table indicating the Decrease of Certain Game Birds, Wild-fowl and Shore Birds in Massachusetts — Concluded.

	Number reporting Increase.	Number reporting Per Cent. of Increase.	Average Per Cent. given.	Number reporting Decrease.	Number reporting Per Cent. of Decrease.	Average Per Cent. given.	Number reporting holding its Own.	Number reporting Rare.	Number not reporting Species.
Woodcock (breeding), . . .	35	19	29 $\frac{1}{8}$	150	98	59 $\frac{3}{8}$	28		50
Woodcock (flight), . . .	27	14	39 $\frac{1}{6}$	136	92	52 $\frac{1}{4}$	25		63
Wilson's Snipe, . . .	9	3	18 $\frac{1}{3}$	109	67	63 $10\frac{1}{11}$	18	36	120
Dowitcher, . . .	2	-		61	37	69	5	11	210
Knot, . . .	5	2	17 $\frac{1}{2}$	40	20	67 $\frac{1}{6}$	4	8	223
Purple Sandpiper, . . .	4	1	25	21	12	67 $\frac{1}{8}$	2	7	244
Pectoral Sandpiper, . . .	7	4	62 $\frac{1}{2}$	44	25	62 $\frac{3}{7}$	3	5	205
White-rumped Sandpiper, . .	8	6	29	62	24	59 $\frac{1}{6}$	15	2	106
Least Sandpiper, . . .	7	7	47	73	48	59 $9\frac{1}{11}$	33	6	175
Red-backed Sandpiper, . . .	4	3	62	49	23	53 $\frac{1}{3}$	6	7	218
Sanderling, . . .	4	3	23 $\frac{1}{3}$	55	25	62 $\frac{2}{3}$	12	8	207
Marbled Godwit, . . .				39	17	75 $\frac{1}{7}$	1	9	242
Hudsonian Godwit, . . .	1	1	80	25	13	75	3	12	242
Greater Yellow-legs, . . .	9	3	60 $\frac{1}{2}$	91	61	50 $7\frac{1}{11}$	12	8	157
Yellow Legs, . . .	9	3	31 $\frac{1}{2}$	87	67	60 $4\frac{1}{10}$	14	20	146
Solitary Sandpiper, . . .	5	4	26	38	21	48 $\frac{1}{6}$	17	9	218
Willet, . . .	2			31	18	68 $\frac{3}{7}$	6	17	222
Upland Plover, . . .	6	4	57	76	54	79 $9\frac{1}{11}$	8	31	174
Spotted Sandpiper, . . .	15	11	40	59	38	55 $\frac{1}{6}$	46	4	160
Long-billed Curlew, . . .				38	15	77 $\frac{1}{7}$	2	7	217
Hudsonian Curlew, . . .	7	3	28 $\frac{1}{3}$	44	22	51 $\frac{1}{3}$	8	7	223
Eskimo Curlew, . . .			-	39	15	78	-	3	232
Black-bellied Plover, . . .	12	7	24 $\frac{1}{2}$	68	43	45 $\frac{1}{6}$	15	5	185
Golden Plover, . . .	4	1	100	54	38	73 $\frac{1}{6}$	9	11	200
Killdeer, . . .			-	53	23	80 $\frac{1}{6}$	6	12	213
Semipalmated Plover, . . .	6	4	95	71	46	56	21	6	288
Piping Plover, . . .	4	2	35	40	20	59 $\frac{1}{4}$	8	10	228
Turnstone, . . .	7	5	33 $\frac{1}{3}$	47	26	75 $\frac{1}{6}$	12	11	210
Bob-white, . . .	26	10	56 $\frac{3}{4}$	232	166	78	4		13
Ruffed Grouse, . . .	19	16	28 $\frac{1}{4}$	235	106	59 $\frac{1}{4}$	15		6
Mourning Dove, . . .	33	18	38 $\frac{1}{6}$	59	38	67 $\frac{1}{2}$		33	174

The average percentages of increase and decrease contained in this table should not be given too much weight, since in the nature of the case no estimate of this kind is authoritative except in the few cases where records of the number of birds seen have been kept annually for many years. The more conservative observers hesitate to attempt such estimates and some refuse to give any figures. Such as are given are averaged above for the reason that such an average will probably approximate the facts; but as very few observers have stated the exact time during which the increase or decrease of each species has been observed, it is unsafe to attempt to analyze the figures regarding each species or to make deductions from them. It should be noted that a decrease of fifty per cent. offsets a subsequent increase of one hundred per cent. In other words, if a species has been reduced one-half, or fifty per cent., in numbers, it must then double its numbers, or increase them one hundred per cent., to reach its original abundance. Therefore, in cases where birds have been diminishing for years it will require a very large percentage of increase to restore them to their former numbers. For this reason the percentages of increase in this table are not very significant.

Long hours of study of the original reports on which the above table is based lead me to believe that as it stands it leaves too optimistic an impression of the present status of game birds, shore birds and wild-fowl in Massachusetts. The reasons for this belief follow:—

1. Many of the names of the rarer birds were not included in the circular requesting information, hence they do not appear in the table, and we get no record there of their decrease.
2. There are reports of increase in the numbers of all species included in the circular except the Passenger Pigeon, Eskimo Curlew, Long-billed Curlew, Marbled Godwit and Killdeer Plover, all of which have been nearly and two quite extirpated from Massachusetts. Many of the other species are well known to be decreasing generally, and reports of increase must be owing to local and exceptional conditions.
3. The number of those who regard certain species as increasing or holding their own is larger than the facts will

warrant. (If all those who filled out the blanks had stated the time during which they had observed that each bird had increased or held its own it would have been possible to present this phase of the subject more satisfactorily.)

4. There was no space provided in the information blanks in which to record certain species as extirpated or extinct in the region reported on. Had such a space been provided, there is reason to believe it would have shown results.

5. The reports of decrease usually refer to long periods, while those of increase mostly refer to brief, recent periods, and, in some cases, they may record mere ordinary local fluctuations in numbers. There is nothing in the table to show this.

6. When a species is not reported there is no way in which to determine whether it is absent or merely overlooked. In nearly all cases the number not reporting each species is large. In general, this indicates that the species is not found, or is rarely found over a large part of the State, but there is no information as to whether it was found there formerly. Undoubtedly many of these species were found formerly where now they are absent, but the table does not show this.

The observers not reporting on the American Merganser, the Black Duck, the Blue-winged Teal and the Wood Duck number one hundred and ninety-four, one hundred and seventy-five, one hundred and forty-eight and one hundred and eighteen respectively. As these birds formerly were common throughout most of the Commonwealth, these negative reports are significant. On the other hand, the fact that two hundred and twenty-three observers do not report the Eider is not so significant, as the Eider always was rare inland.

The Ruffed Grouse is reported from nearly all parts of the State and by all but six correspondents, while all but thirteen report on the Bob-white. This is encouraging, as it shows that the reduced breeding stock is widely distributed, and that these popular game birds normally occupy most of the State.

An examination of the reports of those who find species increasing in numbers shows that twenty-seven come from men who have had less than ten years' experience. This is

too short a time to furnish authoritative data regarding the increase or decrease of a species, as fluctuations in numbers or local changes caused by an increase or depletion of the food supply may form the basis of such reports. "Hope springs eternal in the human breast," and a temporary increase or congestion of birds in a certain locality often is regarded as a significant increase of the species.

Many ornithologists who in their published papers have written of the numbers of certain species have been thus deceived, and should have written in the past tense when describing the abundance of certain birds. They have failed to realize how much conditions have changed. There are many people who believe that the Passenger Pigeon still exists somewhere in large numbers, and will come back. There are others who believe that they recently have seen this and other extinct species. It is difficult for the younger generation of gunners to realize that birds are decreasing or to admit it until the decrease has become very marked.

The Recuperative Powers of Nature.

The game preserver may be encouraged in his work by the fact that, however rapid the depletion of game, its restoration under natural conditions is sure and swift. Wherever a species is reduced much in numbers the conditions become more favorable for its increase. When birds become few the supply of food *per bird* is increased greatly, which stimulates the reproductive powers. The number of covers and suitable nesting places is larger in proportion, owing to the decreased numbers of the birds, and the competition for food and other necessities is decreased. Thus, unless a species is subject to undue persecution by mankind, a speedy increase commonly follows any sudden decrease, except, perhaps, in cases where the depletion has gone too far, when extermination results. With the game preserver it is never too late to restock. "While there is life there is hope."

The possible increase of a game bird under artificial propagation may be illustrated in the following manner: if we



PLATE XXVI.—ATTRACTING CANADA GEESE.

This remarkable illustration is introduced here to show how J. T. Miner of Kingsville, Ont., attracted three hundred Wild Geese into a pond near his house. (From a photograph obtained through the courtesy of P. A. Taverner.) (See page 570.)

assume that each pair of Bob-whites can produce ten young in a year, that each pair breeds only once in its lifetime, that the length of life of the species is ten years, and that the progeny of a single pair were all preserved to live until the tenth year we should have at the end of ten years twenty-four million four hundred fourteen thousand and sixty birds.

The increase of ten birds from each pair is a very moderate one, as a female Quail in confinement has been known to lay more than one hundred eggs in one season, nearly all of which were fertile, and the probability is that a pair of Quail will breed for several years, whereas our computation is based upon only one brood during the lifetime of each pair. The above increase in numbers merely gives possibilities. Whenever the mind of man solves the problem of propagation, some slight approach to such multiplication may be realized.

Man can assist the wonderful reproductive and recuperative powers of nature, and the time will come — and that soon — when he will have solved the problem of reproducing certain species of game in unlimited quantities. Patient, single-minded research, followed by applied science, will stock the world again with such species of game birds and mammals as will adapt themselves readily to the methods of the propagator.

There is no limit to the productive capacity of nature except the bounds set by nature herself, and man will learn eventually to so control conditions that even those bounds will be forced back. The time is coming when millions of game birds will be propagated in this country. But it is probable that comparatively few species will prove available for this purpose, and that all the other species will require stringent protection. Most of the species of the order *Limicolæ*, which includes the Snipe, Woodcock, Sandpipers and Plovers, rear but few young, and many species may soon require protection at all times to save them from extinction; while, on the other hand, we may be able to multiply indefinitely certain Grouse, Bob-whites, Ducks and Geese. First, as a basis for game protection, we must understand thoroughly the causes of game destruction.

THE CAUSES OF THE DECREASE OF GAME BIRDS.

What is regarded by my correspondents (mostly gunners) as the relative importance of the various agencies for the destruction of Ruffed Grouse may be inferred from the following tabulation, which shows the number who regard each of the designated causes to be important. No suggestion was made to any one of these observers and no leading questions were asked regarding the causes of the decrease of game birds. The information is voluntary, and the personal experience of the number of observers assigning a cause of decrease may be considered an index to the importance of that cause, provided that the observers are well qualified to judge, and that they have not been unduly influenced by the writings or the opinions of others. Those causes which relate to shooting are starred.

AGENCIES OF DESTRUCTION AND NUMBER REPORTING THEM.

*Increase of gunners and overshooting,	110
Foxes,	75
Cutting timber or brush,	56
Inclement weather and bad breeding seasons,	55
*Hunting with dogs,	30
Hawks,	29
Cats,	28
Snaring,	28
Forest fires,	25
Disease,	23
Skunks,	23
*Non-enforcement of laws,	21
Wood ticks,	15
*Pump and magazine guns,	14
*Long open seasons,	12
Owls,	9
Dogs running at large,	5
*Automobiles and electric cars,	3
Pheasants,	2
*Illegal sale of birds,	2
Brush fires and campers,	2
Gypsy moths (causing cutting of woodland),	2
Draining of swamps,	2
Crows,	2

Rats,	1
Raccoons,	1
Lack of restocking,	1
Weasels,	1
Snakes,	1
Hedgehogs,	1
Telegraph wires,	1
Intestinal worms,	1

The chief causes of the decrease of game are market hunting, spring shooting, the sale and export of game, overshooting generally and the destruction of the breeding places of birds by settlement, agriculture and lumbering.

All these destructive influences have been augmented by the great improvements in firearms, and their cheapness. The improvement and extension of means of transportation have widened considerably the activities of the gunner. Steamboat lines, railroads, electric cars and automobiles are tremendous factors in the destruction of game. The extension of the rail service and of the telephone and telegraph, combined with sportsmen's journals as a medium of advertising, have opened up the whole country, so that the gunner can get information from all parts of it and follow the game wherever it appears. Most settlers, many lumbermen and some farmers live more or less upon game.

Lumbering has had considerable effect in decreasing the Ruffed Grouse, by removing the cover and winter shelter afforded by the pines. The portable steam sawmill has cut away much of this cover in Massachusetts, to the great detriment of the birds. Some of the destructive influences are important enough to be considered in detail.

Market Hunting.

There is nothing more destructive to wild game of any kind than hunting, netting, trapping or snaring for the market. The skin, plume, feather, egg and meat markets are very largely responsible for the depletion and extirpation of birds. The high price paid for any game bird to-day is equivalent to a bounty on its head. We might as well offer bounties for the

destruction of our wild game as to allow it to be sold in the market. The wild birds which now stand in greatest danger of extinction are mainly those whose flesh or feathers bring the highest prices in the markets of the world. All that is necessary to insure the extermination of a species is to put a liberal price upon its head. It will then be pursued to the "uttermost parts of the earth." Laws will be broken, the officers of the law will be evaded or intimidated, or, if efficient, will be overpowered or murdered, and the demands of the market will be supplied so long as the birds last. The experience of centuries may be cited in proof of this statement. Market hunters are not necessarily villains or lawbreakers. In many cases they are "good fellows," upright, law-abiding citizens, respectable and respected; but in putting a price upon the heads of wild game we offer a premium to the idle, the vicious, the irresponsible and the criminal, who roam the woods, fields and shores for the reward they may gain by killing and selling game. The market hunter may not kill any more game in a day than some expert sportsman, but where the sportsman shoots occasionally the market hunter shoots continually. It is his business to kill as many as possible while the birds last, and to spare none. He feels that there is nothing reprehensible in this, for if he does not kill them "some other fellow will." Market hunting stimulates the use of devices for capturing game by wholesale. The snare, the net, the battery, the "swivel cannon," repeating and automatic guns, traps, live decoys and all devices for killing or capturing large numbers of birds are used to supply the market, and so long as wild birds can be sold legally, illegal and destructive methods will be used in procuring them.

It is difficult to enforce laws forbidding the use of such devices until the sale of wild game is prohibited and the incentive for market hunting thereby removed. Many a lawbreaker will kill birds from dawn to dark, in season and out of season, year in and year out, anywhere and in any way, so long as there is a market to which he can ship his game.

Mr. Edward L. Parker tells me that market hunters on the coast of Texas formerly were able to average more than

two hundred Ducks each daily, during the season. Some of them quit when the Ducks had decreased to such an extent that they could not get this number daily, as then they could earn more money at rice farming. He states that a wealthy man, who secured control of a lake frequented by wild-fowl, formerly shipped Ducks enough to return him from ten thousand to twelve thousand dollars a year. Mr. C. E. Brewster talked with a half-breed market hunter at High Island, Texas, in 1910, who, with his partner, had just come in to the railroad station with a day's bag of birds. They had killed two hundred and five Ducks that day. One of them said that for sixteen years he had hunted every week day during the season when the Ducks were there. He received \$872.30 for the game that he killed in the winter of 1909-10. These Ducks were mainly shipped to northern markets. He "loafed" during the remainder of the year. The sale of these birds was illegal, as the law forbade shipment out of the State, and it was illegal for any man to kill more than a limited number of birds in a day; but so long as markets for wild game are open, men will be found to supply them. This hunter said frankly that the diminution of the game was very marked, and that he believed that at the present rate of decrease the Ducks would be practically extinct within the next decade. Nevertheless, he was doing all that he could to exterminate them, because, by breaking the law, he could get more money with less exertion than in any other way. To-day, by means of automatic guns, live decoys and "batteries" or blinds, market hunters, under favorable conditions, sometimes make enormous kills. Mr. T. Gilbert Pearson, secretary of the National Association of Audubon Societies, informs me that in one week in November, 1909, two men killed fourteen hundred Blue-bills on Currituck Sound, and another shot four hundred from his battery in one day.

Mr. Henry T. Phillips of Detroit, Mich., a former market hunter, asserts that in his camp a party consisting of three men shot seventy-two pounds of powder in thirty days, and that two of them killed twelve barrels of Ducks in four days. He himself in one week shot one hundred and two, one hundred

and nineteen, one hundred and forty-two and one hundred and fifty-five Redheads on different days on the Detroit River. He hunted for fifteen years prior to 1894. It needs little imagination to see how destructive such a market hunter can become.¹

Dr. D. G. Elliot states that a game dealer in New York received twenty tons of Prairie Chickens in one consignment in 1864, and that some of the larger dealers sold from one hundred and fifty thousand to two hundred thousand birds in six months. Prof. Samuel Aughey, who gathered statistics regarding the destruction of Bob-whites and Pinnated Grouse, or Prairie Chickens, in Kansas from 1865 to 1877, asserts that about four hundred and fifty thousand of these birds were killed each year in thirty counties of Nebraska alone. Game Commissioner John H. Wallace, Jr., of Alabama states that before the present game laws of that State were passed no less than nine million Bob-whites were killed there in one season. All kinds of stratagems are used to evade the law and get birds to market. Tons of rabbits or hares have been shipped to market with Bob-whites stuffed into the cavity in each hare, from which the viscera had been removed. During a time when Prairie Chickens and Bob-whites could be sold legally in Massachusetts but could not be shipped lawfully from the west, the law was evaded by sending birds east in coffins. These birds finally reached our markets in Boston and New York City. In *Forest and Stream* of March 11, 1912, it is stated that on February 18 nine thousand Bob-whites in one shipment were seized by a sheriff and a game warden in Oklahoma. These birds were destined for the northern markets. Quantities of Ruffed Grouse have been marked as fish or chickens and illegally shipped to Boston fish or poultry dealers.

The tons of Prairie Chickens, Quail, Pigeons, Eskimo Curlews, Golden Plover and Upland Plover that once came into Boston and New York markets in barrels are of the past, and the marketmen are reaching out everywhere to find game. They are now getting wild-fowl, rabbits, guinea hens, or anything that can be legally sold. Mr. James Henry Rice, Jr., secretary of the Audubon Society of South Carolina, writes me that

¹ Mershon, W. B.: *The Passenger Pigeon*, 1907, p. 110.

he has seen five thousand Mallards and Black Ducks brought into Georgetown, S. C., for shipment to the north in one day. He states that one firm in Georgetown has marketed two hundred and forty thousand Rails and that seven hundred and twenty thousand Bobolinks have been shipped in one season. Probably millions of Robins have been sold in southern markets.

Notwithstanding the many restrictions on the marketing of native wild game, enormous quantities of game birds have been sold, and the laws protecting them have been violated by unscrupulous dealers. In 1903, forty-two thousand seven hundred and fifty-nine birds were found illegally in the possession of a cold-storage house in New York City, thirty-four thousand four hundred and thirteen of which were game birds, eighteen thousand and fifty-eight were Snow Buntings and two hundred and eighty-eight were Bobolinks.

The markets of the large cities draw their supplies from many parts of the country and from foreign lands. Game birds from European countries, from Siberia, Manchuria and the West Indies are now sold in our markets. Many species of Pheasant are now extinct or approaching extinction in their native lands. Game first becomes scarce near the large market centers and then at greater and greater distances from them, as the demand increases and extends.

The modern demand for game is unlimited. Formerly the market was sometimes glutted and the demand ceased. Now facilities for cold storage make it possible for the marketmen to preserve great quantities of game indefinitely. A firm in Boston has been holding about four hundred Upland Plover in cold storage for five years, during which time it has been illegal to sell them in Massachusetts. When the law forbidding the sale of all but foreign game and certain species raised on preserves went into effect in New York City, September, 1911, there were still one hundred and seventy-five thousand game birds in cold storage in New York City, mostly left over from the preceding year. August Silz, a large game dealer of that city, asserts, according to Dr. W. T. Hornaday, that he has sold a million game birds in one year. The markets of Chicago,

New York, Philadelphia and Boston are now the greatest game markets in this country. Dr. Hornaday states that from October 20 to March 1, inclusive, there were shipped from Currituck Sound to northern markets, via Norfolk, Va., between fourteen hundred and fifteen hundred Wild Geese, and from the Sound and its tributaries, approximately two hundred thousand Ducks were shipped by the same route. The main cause of the depletion of water-fowl is not far to seek. Dr. Hornaday says truly that the greatest value to be derived from any game bird lies in seeing it, photographing it and enjoying its living company. "Who," he says, "will love our forests when they become destitute of wild life?"

Probably less than one per cent. of the people are able to buy game in the market. Laws that permit the sale of wild game, that belongs to all the people, are directly against the interests of the great majority. The principle of the law that wild game belongs to the State has long been established. How much longer will the American people allow the wild game, which belongs to them, to be exploited for the interest of the few who hunt, kill and sell it?

The sale of all or a part of the native wild game is now (1911) prohibited in forty-three States and Territories, and in nearly all the Provinces of Canada. If the markets of New York, Boston, Philadelphia and Chicago could be closed to the sale of wild game, many of the market hunters of the south and west would be driven out of business, and millions of birds would be saved yearly to rear young.

The export of game from one State to another should not be permitted, for this makes it easy to evade the law by killing game legally in one State where its sale is prohibited, and selling it in another where its sale is legal. The prohibition of export saves the game of a State for the people of that State, and conserves the supply.

Spring Shooting.

In emphasizing the destructiveness of spring shooting it is well to reiterate here the fact that when North America was first settled, wild-fowl bred more or less numerously through-

out most of the region now known as the United States. Twenty-four species still nest within our borders, but they are now very few and far between in the east as compared to their former abundance, which they can never approach until market hunting and spring shooting are prohibited throughout the length and breadth of the land.

Audubon (1835) says that he found Wild Geese breeding sparingly about the lakes within a few miles of the Mississippi and Missouri rivers and their tributaries. He believed that they bred abundantly in the temperate parts of North America before the settlement of the country, and his opinion was founded on the statements of many old and respected citizens.

Gen. George Clark, one of the first settlers on the banks of the Ohio (about 1760), said that Wild Geese were then so plentiful *at all seasons of the year* that he was in the habit of having them killed to feed his soldiers, then garrisoned near Vincennes, Ind. Audubon's father corroborated this statement, and Audubon himself and many other persons residing at Louisville, Ky., well remembered that about the first of the nineteenth century it was quite easy to procure young Geese in the ponds of that district. He found the nests, eggs and young of the species near Henderson, Ky., as late as 1819.¹

Mr. A. W. Butler, in his *Birds of Indiana* (1898), states that "thirty years ago" it was not uncommon to find on the upland meadows of Franklin and other southern counties, where great flocks of Geese had stopped during the March migration, numbers of eggs dropped by them. Hon. George Bird Grinnell asserts that in years gone by the Wilson's Snipe and many species of water-fowl bred in all the northern tier of States in great numbers.² Prof. W. W. Cooke says that one hundred years ago the Canada Goose bred commonly in all the northern third of the Mississippi valley. It has been known to breed of late years in Tennessee and Kentucky. It formerly bred in Kansas and still breeds in Colorado and Utah.³ Even now wild-fowl nest in many parts of the country where conditions are favorable.

¹ Audubon, J. J.: *Ornithological Biography*, 1835, Vol. III, pp. 6, 7.

² Grinnell, George Bird: *American Duck Shooting*, 1901, p. 539.

³ Cooke, W. W.: *Bull. No. 26, Biol. Surv., U. S. Dept. of Agr.*, 1906, p. 72.

Rev. Herbert K. Job informs me that Canada Geese bred in Louisiana the past season (1909). Mr. Caspar Whitney, editor of *Outing*, stated some years ago that Teal bred in large numbers on club preserves in Currituck Sound, N. C., where they were protected in spring, and that many Black Ducks also bred on preserves there. In a special despatch to the newspapers in Waco, Tex., April 17, 1905, it is stated that in Refugio County, Wild Ducks lingered so late that they nested numerously, and it was expected that thousands of young Ducks would be hatched. Mr. Homer Wells of Waco stated that in 1904 many Ducks nested in the country about Midland, Tex.

Shooting and chasing the wild-fowl in the late winter while they were mating, and in the early spring when they had paired or nested, has resulted either in exterminating them or driving them out of nearly all the great regions in the United States where they formerly bred. Col. John E. Thayer says that he is positive that Mallards, Black Ducks, Gadwalls, Green-winged Teal, Blue-winged Teal, Shovellers and Pintails begin mating at Currituck Sound, N. C., by February 15, and are mated by March 1.¹ Audubon believed that all wild-fowl that nested in the United States were mated when they came north.

The question often is asked, "why is it more destructive to shoot birds in the spring than in the fall?" If this were properly put it would need no answer. The question should be, why is it more destructive to shoot birds in fall, winter and spring, thus denying them all protection, than to shoot them in the fall? (Those who desire to shoot birds in the spring expect the privilege of shooting them in the fall and winter also.) There are several answers that may be made to this question; (1) a long shooting season of eight or ten months, extending through the fall, winter and spring, gives the birds practically no protection, and is far more destructive than a fall season of only three or four months. (2) Fall shooting, if not excessive, merely destroys a part of the annual increase of the birds, most of which, if not shot, would succumb to the

¹ Cooke, W. W.: Bull. No. 26, Biol. Surv., U. S. Dept. of Agr., 1906, p. 12.

accidents of migration and to the attacks of their natural enemies. (3) Spring shooting destroys the naturally selected breeding stock, while mating or mated, and on the way to the breeding grounds, or in the very act of reproduction.

The value of protecting birds in spring on their northward migration and on their breeding grounds is shown in the cases of the American Robin, the Bobolink and the Red-winged Blackbird. All these birds have been shot in great numbers in the southern States in the fall for more than two centuries.

Millions of Bobolinks have been shipped to market in the southern and middle States. These birds are killed mostly in the late summer and fall. The slaughter of Bobolinks in the fall for so many years has not very greatly reduced their numbers in the north, where they are protected by law in their spring migration and in the breeding season. This protection perpetuates the species.

The wild-fowl which come north in spring have survived the hardships and dangers of the winter. They are in good condition, and nearly every pair is fitted to be the parents of strong, healthy young. To kill them then should be regarded as reprehensible. A Massachusetts gunner who had been accustomed to shoot Snipe in spring noticed something peculiar about a bird which he shot, opened it and found an egg in the oviduct, ready for laying. He never shot another Snipe in spring. Two gunners in Rhode Island had killed about a bushel of Winter Yellow-legs in spring. A friend who opened some of the females found eggs developing in their ovaries.

A Cape Cod gunner assured me that it was better sport shooting Ducks in spring than in fall, for when one bird was killed its mate would "hang around" and he could bag both. A worthy citizen of Massachusetts shot a pair of Wood Ducks (legally) in April. He was then a boy, and as the pair flew past him he shot and killed the wonderfully beautiful male, which fell into the stream. The little female circled about, came back and alighted beside her dead mate, remaining there until the boy reloaded his old single-barrelled, muzzle-loading gun and killed her. He afterwards learned that the pair had a nest and eggs in a hollow tree near by. Thus the

whole family was wiped out, and there was no law then on our statute books to prevent it. Five years ago, when spring shooting was permitted in Connecticut, Snipe shooters drove Black Ducks from their nests in the meadows and killed them as they rose.

Spring shooting exterminates the birds. Fall shooting, if not excessive, may be said to take only the annual interest of this great natural resource; but if shooting is continued in winter and spring it wipes out the principal. No one would think of advocating to-day a law legalizing the killing of the Grouse or Bob-whites in the winter, when they are struggling against the inclemency of the season, or in spring, when they are mating and breeding. If any man should propose such legislation his sincerity or his sanity would be doubted. Nevertheless, hundreds and thousands of gunners advocate and support similar legislation which, if enacted, takes away practically all protection from wild-fowl.

The argument often is made that it is futile for any one State to pass laws prohibiting spring shooting until other contiguous States pass similar laws. Experience with such laws, however, shows that the results of even the most local protection are often immediate and very marked. A gentleman in Rhode Island, who has a small pond on his place, prohibited shooting there, and Black Ducks came at once and bred there annually. Another in Massachusetts owns all the land on one side of a large pond, and allows no spring shooting. In August, 1909, I saw about seventy-five Black Ducks at one time on his side of the pond, all of which and probably more were reared there. By the first of September about two hundred birds were gathered there, but none could be found on the other side, where they were unprotected. In the San Luis valley, Col., protection given Ducks in a small enclosure about an artesian well resulted in the birds resorting to it in large and increasing numbers year by year.

A local law in Jefferson County, N. Y., prohibiting spring shooting and night shooting, soon showed its effect. Teal, Wood Ducks, Mallards and Black Ducks began breeding there at once. The increase and tameness of the Ducks and Geese

were very marked, and the shooting improved greatly in the fall. When spring shooting was forbidden by law in New York State the number of Black Ducks so increased on Fishers Island that the young which they raised provided good shooting there in the fall, while on the nearby shore of Connecticut where spring shooting was allowed at that time, there were practically no breeding Ducks. The cessation of spring shooting in the interior of New York soon resulted in a general increase of wild-fowl.

In 1907 the Connecticut Assembly passed a law protecting wild-fowl and shore birds between January 1 and September 1. The following extract from a letter from Mr. E. Hart Geer, secretary of the Fish and Game Commission of Connecticut, under date of February 19, 1910, shows the results secured under that law:—

“The encouraging conditions prevailing in Connecticut at the present time, as the direct result of stopping spring shooting, justify me in saying that the same conditions would obtain the entire length and breadth of the United States and Canada if uniform laws regarding spring shooting were enacted.

“During a period of nearly forty years of my own observation of wild-fowl on the Connecticut River, I have not for many years seen or heard of so many Ducks as have been on the river during the past year.

“Black Ducks have been more numerous and in larger flocks during the past year than I have known of for many years past. At one time last December eighteen Black Ducks were taken out of a flock of thirty-five with four barrels — two guns — in the hands of two hunters. This has been almost an impossibility for a number of years past to accomplish. Broad-bills were on the river in immense numbers all the time last fall, and I have seen flocks, estimated to contain more than one thousand, feeding within sight of my house.

“It is indeed gratifying to see the wild-fowl increasing in such numbers, and there is but one way to account for it, and that is that during the past two springs they have not been shot into and driven away from our shores when on their annual passage.

“Authentic reports come to this office of large numbers of Black Ducks being seen in their favorite feeding places after the close of the open season, January 1. It is estimated, by careful computation, that larger numbers of Black Ducks were shot and shipped from along the Connecticut River the past season than have been shot previously during a period of five years altogether.

“With all of these encouraging signs pointing to an abundance of wild-fowl again, which will afford opportunity for royal sport for four months of the year, we are not now hearing the clamor for a longer open season.

“Those who were, for selfish reasons, most persistent in asking our Legislature for a longer open season have had presented to their actual view an object lesson which cannot be disputed, and they are convinced of the wisdom of prohibiting spring shooting of wild-fowl for all time.”

Under this law similar conditions have been continued in Connecticut, although the dry seasons of 1910 and 1911 have been unfavorable for fall duck-shooting in the interior.

Mr. John H. Sage, secretary of the American Ornithologists' Union, writes as follows regarding the effect of prohibiting spring shooting in Connecticut:—

“In 1907 the General Assembly passed a wise and beneficent act, establishing an annual close season on Wild Ducks, Geese and Swans, from January 1 to September 1. Experience with such laws in other States had proved that their effect was to increase the number of the birds. The game commission of Minnesota made the following statement in 1906, after several years' experience with a similar law: ‘Every year our aquatic fowl are increasing, and this year we have had local Ducks breed in every slough where water is found.’ Two years' trial of this law in Connecticut has shown a good beginning toward a similar increase here. Black Ducks and Wood Ducks have begun breeding in unusual numbers. Wild Geese have alighted where they have not been seen before for years, and Mallards are reported to have bred within the State; also, the migratory wild-fowl, which remain along our coast in winter and spring, have increased in numbers.”

Mr. W. T. Payne of Boston writes me that in some Vermont marshes in which he is interested, and where spring shooting has been prohibited for years, practically all the wild Ducks are breeding, also Canada Geese. He names the Black Duck, Mallard, Widgeon, Shoveller, Blue-winged Teal, Green-winged Teal, Gray Duck, Wood Duck, Bluebill and Whistler. He says that the careful protection of these marshes during the spring and summer months has accomplished wonders in the numbers of Ducks reared there. Prior to the prohibition of spring shooting there were very few Ducks in these marshes on the opening of the season; now there are quantities of Ducks there, and also in the other near-by marshes, when the fall season opens on September 1. Others corroborate his statement.

Mr. W. S. Bogert writes me from northern New Jersey (1911) that during the past three years, since spring shooting was prohibited, he has noted a considerable increase in the number of Ducks in his vicinity. Previously they had decreased until very few came to his neighborhood in migration, and only a few Wood Ducks bred there. More were seen in 1909, still more in 1910, and two pairs of Black Ducks and one pair of Scaup bred near his place in 1911. He found Wood Ducks rearing their young as usual, also four pairs of Scaup, five pairs of Black Ducks and one pair of Whistlers. These Ducks and their broods remained all summer and fall in a marsh within a short ride of New York City, and in October a flock of fifty Ducks remained in the marsh for a long time, and large numbers came in at night and left at daylight. This increase of wild-fowl so near New York City probably cannot long continue, but it is significant.

On Long Island spring shooting has been prohibited nominally for years, but an unfortunate provision allowing the spring shooting of Brant has given the gunners an opportunity to shoot all kinds of wild-fowl under the pretense of Brant shooting. They were not slow to seize this opportunity, and spring shooting was common along the coast of Long Island until 1910, when spring Brant shooting was prohibited by law, leaving the gunner no excuse for being out with a gun

at that season. Among the results of the enforcement of this law are the protection of the migratory wild-fowl which pass north along these shores in spring and an immediate increase in the numbers of Black Ducks breeding locally. Dr. Frank Overton of Patchogue, N. Y., is given by Prof. T. Gilbert Pearson as authority for the statement that over three hundred Black Ducks remained last summer on the meadows near Moriches, and many were reported as nesting. The photograph reproduced on the opposite page shows about half of a flock of these birds seen in this locality this year (1911). This photograph was reproduced originally in *Bird-Lore*.

Massachusetts has now (1911) a law protecting all wild-fowl from January 1 to September 15. Though passed in 1909, it was placed on the statute books too late to have any effect that year, but during the winter and spring of 1910 increased numbers of several species of wild-fowl were seen along the coasts and in the streams and ponds. More Wild Geese than usual stopped here. Black Ducks and Wood Ducks bred in many localities where they had not nested for many years. If this law is allowed to remain in force for a few years longer its benefits will be plain to all.

Within the past twenty years most of the Provinces of Canada and many of the States of the Union have adopted regulations forbidding spring shooting. Already this has resulted in an increase in the number of birds breeding in many of these States and Provinces, and, as a result, the fall and spring flights along the Atlantic coast are beginning to increase. This increase, to which Massachusetts has as yet contributed very little, is now used by the advocates of spring shooting as an argument for permitting it here. They say virtually, "our neighbors have withheld their hands; they have protected and increased the birds, — so much the better for us. Let us now have an open season in winter and spring, kill all we can, and thus take advantage of the increase resulting from the forbearance of our neighbors who are foolish enough to protect the birds for our benefit." Comment on such reasoning is unnecessary.

The advocates of spring shooting also point to the fact



PLATE XXVII.

A result of stopping spring shooting. Three hundred resident Black Ducks at Moriches, Long Island. (Photograph taken September 8, 1911, by Dr. Frank Overton, and reproduced in Bird-Lore.)

that many more wild-fowl are killed in winter in the southern States than are killed here. Their principal argument is that we should permit spring shooting here because it still is allowed in the south. Even from a selfish standpoint this is the weakest possible argument for spring shooting. By killing wild-fowl in the fall we certainly can prevent them from falling into the hands of the southerners; but those which come back to us in spring have escaped both northern and southern gunners, if, indeed, they have been south at all. Why should we kill them then, when they are going to their breeding grounds, and when every mated pair killed cuts off the return to us in the coming autumn of perhaps six to a dozen young? Self-interest alone should prohibit spring shooting.

If the southern people were permitted by law to rob and kill those of our citizens who visit them in winter should we consider that a sufficient reason why we should plunder and murder those, who, having escaped the dangers of the south, return in safety to their homes in the north? Are we so short-sighted that we cannot see that spring protection works to our own advantage? When all is considered we find that the shooting in the south does not affect our supply of birds here nearly so much as is commonly supposed. The majority of the wild-fowl which are killed in the south are birds which never saw New England. They are bred in the northwest, and reach the south in winter by journeying south or southeast across the country, and never come here at all. Also, many of the species which are shot along our coasts are rarely hunted in the south. Wood Duck and Teal go far south, but many Black Ducks and some of the bay and sea Ducks rarely go very far to the southward of Massachusetts. The southern gunner does not consider the Scoters or "Coots" and the Mergansers or Sheldrakes worth the powder and shot necessary to kill them, and he rarely shoots them. These birds are shot mainly on the coast from Labrador to New Jersey, and they must be protected here if at all. Many Black Ducks, some Brant and many sea Ducks remain in winter off the coast of southern New England and New York, particularly in mild seasons, and if protection is continued here more will remain.

Some gunners, especially those on Cape Cod and Martha's Vineyard, claim that they have no chance to shoot certain species except in the spring. While this is not strictly accurate, still it has some foundation in fact, particularly on the island of Martha's Vineyard, where Geese appear more in spring, and are less difficult to take than in fall. Since spring shooting has been stopped, however, more Geese have appeared there in fall. This island, also, is a natural breeding ground for wild-fowl, and with spring shooting stopped there it should be possible to raise Geese enough on the island to attract others, and thus to afford the inhabitants good shooting in the fall. Every species of wild-fowl which comes up our coast in spring goes down it in the fall (there are a few, however, which are rarer in spring than in fall). The opportunity is open to all the people along our coasts to shoot these birds in the fall or in December. Those who are not able to avail themselves of this opportunity because of the cares of business, or peculiar local conditions, are in no worse case with spring shooting prohibited than are the great majority of gunners of the interior of the State who now get practically no wild-fowl shooting, and who never will have any unless spring shooting can be prohibited forever, that the birds may have a chance to come back to rest, feed and breed along the rivers, on the lakes and in the swamps of the State. All spring shooting should be prohibited, because no shooting should be allowed in the breeding season. Breeding birds must not be disturbed. When "the law is off" on one or more species many lawbreakers take advantage of this fact, and if they do not find what they seek they shoot something else. I have known reputable men who, failing to get Snipe in spring, shot Swallows on the meadows for practice. Irresponsible, lawbreaking gunners, when out shooting in spring or fall, will shoot at sight any large bird that they see, and many small ones, whether protected by law or not. Spring shooting should be stopped, that all useful birds may be protected in the nesting season. Then a shot fired in spring will be a matter of inquiry for every game warden, and nesting birds will have some peace.

There are gunners along the New England coast who deplore spring shooting, but who believe that they should be allowed to shoot during the months of January and February, which, they argue rightly, are not spring months; but wide experience has shown that our wild-fowl cannot be adequately conserved and increased in numbers unless they are protected from all shooting except during the fall migration. Prof. W. W. Cooke of the Biological Survey, who will be conceded by all who are conversant with the facts to be the foremost specialist on bird migration in the United States, says that the fall migration of wild-fowl ceases about December 1. If the autumn has been mild, and is followed by extreme cold, there may be later movements that are caused by the freezing over of the fresh waters, which drives most Black Ducks, Pond Sheldrakes, Whistlers, Broad-bills and other species farther south or to the salt water. Usually such frosts occur in December, and if the shooting season is prolonged until January 1, the shore gunner has an opportunity to hunt all these birds. The season should be closed then in order to protect during the inclement season all the Ducks which remain in our waters. It should be closed on all wild-fowl at that time, for the reason that if any exception is made all species of wild-fowl will be shot.

The killing of wild-fowl during January and February should be prohibited absolutely on any coast where the fresh waters become ice-bound during these months. Ordinarily in New England most of the fresh ponds freeze in December, and the pond and river Ducks are then driven to the salt water. Because of the inferior nature of the food that they find there their flesh soon loses its fine flavor, and they become more or less "sedgy" or "fishy" to the taste. In hard winters, when the flats are covered with ice, these Ducks are half starved. They soon become very thin and have little food value. In such winters Ducks of several species have been picked up dead from starvation and cold. They have enough to contend with at that season of the year, and no hunter should be allowed to disturb them or take advantage of their necessities.

When the ponds are covered with ice those fresh-water Ducks which remain in the north are compelled to go to the open springs, as they require fresh water to drink. Care for their safety compels them to remain at sea or in some open bay during the day, but at night necessity drives them to the springs. Here the gunner lies concealed to kill them. Some even cut holes in the ice to attract them. A gunner near Boston told me that during a "cold snap" he fired both barrels into a flock of Black Ducks on the ice, killing eleven, and found them so nearly starved as to be reduced to "skin and bones."

The following letter from Dr. George Bird Grinnell bears upon this point:—

"Ducks should not be shot after January 1, because many of these birds mate in January, and in February and in the following months are preparing for the nesting duties of early summer. The birds which are chiefly shot for the market are the non-diving Ducks, of which the Black Duck is the only one found in considerable numbers in Massachusetts. These birds in winter have the greatest difficulty in existing. The fresh-water ponds and spring holes, where they naturally feed and drink, are frozen, and the mud flats, where they might feed in cold weather, are often covered with ice, so that food is absolutely inaccessible. They cannot, like the sea Ducks, dive to great depths in search of shell-fish. They therefore seek out the few warm springs that may still be open, and congregate there, searching for food, and the gunner who learns of their presence at such a place may destroy the starving birds in great numbers.

"I learned my lesson on this subject in Connecticut in the winter of 1875-76. It was a very hard winter, and almost all the feeding and drinking places were closed by the cold, while the mud and sand flats were piled high with ice far out into the Sound. I learned that a flock of two hundred or three hundred Black Ducks came at night to an open warm spring, and going there shot two or three as they came in, and prepared to have great sport. When I got these birds in my hand I found them a mass of feathers and bones, for the breast

muscles had shrunk away from starvation, so that it hardly seemed that the birds could fly. I stopped shooting, and took the trouble to show the birds to a number of local gunners, all of whom agreed that it was a shame to shoot birds that were having so hard a time, and no local gunners shot Black Ducks again that winter.

“I believe that if the unprejudiced opinions of marketmen could be taken on this point they would agree that birds shot in New England in winter and spring are too thin in flesh and too fishy in flavor to be a popular food, and the average gunner — if the matter were brought to his attention and explained to him — has too much sense of fair play to wish to destroy the birds under such conditions.”

Even the diving Ducks, like the Old-squaws, sometimes are reduced greatly by starvation and cold during unusually cold seasons. At such times starving birds become reckless. Mackay states that during the winter of 1888, when the sea about Nantucket was covered with ice, two men covered themselves with sheets and lay down on the ice beside a crack near a jetty on the north shore, and there killed with fishing poles about sixty Old-squaws in a little over an hour. They found on examining the Ducks that they were valueless, except for their feathers, owing to their emaciated condition. Let all true sportsmen, then, join in the movement to close the shooting season on the first day of January, and let all men lay aside the gun then and give the birds a chance.

Summer Shooting.

Summer shooting is nearly as destructive to game birds, wild-fowl and shore birds as is spring shooting. No one now advocates the summer shooting of upland game birds, but many now living can remember when July and August Woodcock shooting was defended in the sportsmen's journals by both market hunters and sportsmen. As late as 1889 August Woodcock shooting was permitted by law in the enlightened Commonwealth of Massachusetts. It was not until the breeding Woodcock were nearly exterminated that laws finally were

passed prohibiting summer Woodcock shooting. All summer shooting should be forbidden; it is too destructive to the birds. In summer the schools and colleges are closed, and all the pupils and teachers are on vacation. Professional men, store clerks, office boys and thousands of employees in various industries take their vacations then. Where it is legal to shoot any game in July and August thousands of boys and men will be in the field with guns shooting the birds. The great majority of these people do not know the law. They only know that it is legal to shoot, and they shoot *ad libitum*. Many idle people camp out in summer and wander about with guns. Even the sheep and poultry suffer at the hands of such campers. I never yet have met a summer vacationist in the field with a gun who, when questioned, knew the law under which he was shooting, and not one in a hundred knows enough about the birds to be able to comply with the law if he knows it. They are largely boys and young men who, laboring under the impression that they are shooting Plover, chase Peeps, or who pursue Spotted Sandpipers supposing that they are shooting Upland Plover or Wilson's Snipe.

Many of these summer gunners come from other States, and have never taken the trouble to inquire what the game laws of Massachusetts require. They shoot any bird of large size, whether it is protected by law or not, and some of them indiscriminately slaughter small birds. Summer shooting gives an excuse for lawbreaking gunners, particularly the foreign element, to be out after game, and it is well known that these people kill birds of all kinds and their young. Summer shooting has already destroyed or driven away most of the shore birds which once bred or summered in New England. A good part of the summer shooting is done by campers along the shores and marshes of the sea-coast, or about the inland lakes and rivers. Such shooting tends to break up and destroy the breeding of Black Ducks and any other Ducks which may chance to summer here, and on this account alone it should be prohibited. Boys shooting in summer kill game birds of all kinds, old and young. Many native Ducks or their half-grown young are killed by these gunners.

Summer gunning along populous beaches, where little Peeps and Ringnecks are the principal game, is annoying and even dangerous to women and children who live there or go there for recreation or bathing. One lady relates that a young gunner shooting at some tiny Sandpipers on the beach wounded her with some of the shot. Another states that a charge of shot fired at a flying bird came into the window where she and her sister were sitting. Two women were rowing in a boat near the shore when a charge of shot was fired into the boat. Women and children have been injured and killed by these youthful gunners, and occasionally one shoots himself or one of his companions. The majority of the people who now summer on our beaches, and who do not shoot, prefer to see the little Sandpipers and Plover running unmolested on the sands, and to be spared the spectacle of boys afoot or men in automobiles pursuing, crippling and slaughtering such innocent little birds in the name of sport. The greater part of the birds which are killed in summer belong to these smaller species, which should be protected by law at all times. If they were protected in summer they would soon become common on our beaches throughout the warmer months. If they are not thus protected it requires no prophet to foresee their final extinction. There are so many chances for enjoyment in summer with the fishing, tennis, golf, motoring, sailing, boating and bathing that shooting privileges at that season are unnecessary.

Settlement and Agriculture as a Cause for the Decrease of Wild-fowl.

Notwithstanding the fact that the unrestricted killing of wild-fowl for the market at all seasons has been the chief cause of their decrease, the breaking up of their breeding grounds has assumed, in recent years, an importance almost as great. Formerly the northern tier of States and a large part of the Canadian northwest formed a great breeding place for wild Ducks, Geese and Swans; but within the past thirty years all this has changed.

The prairie regions of central Canada, including large portions of Manitoba, Saskatchewan and Alberta, join the north-eastern part of Montana, the northern half of North Dakota and the northwestern corner of Minnesota, all of which once was a paradise for water-fowl. At the close of the war of the rebellion this great region, two hundred miles wide by over four hundred miles in length, with its countless lakes, ponds, streams and marshes, was one great breeding colony of wild-fowl, where hundreds of thousands reared their young in security, almost unmolested by man. From this great colony the various species extended their breeding grounds in lesser numbers as far as South Dakota, southern Wisconsin, the Kankakee marshes of Illinois and Indiana, parts of southwestern Minnesota and the lakes of north-central Iowa. "In 1864," says Prof. W. W. Cooke, referring to southern Wisconsin, "every pond hole and every damp depression had its brood of young ducks."¹ Within the next fifteen years the farmers changed from grain raising to dairying. The marshes were drained and the breeding grounds for wild-fowl were gone. The birds disappeared with them. Regions in Illinois, Iowa and Minnesota, where a dozen or more species of duck commonly bred as late as 1885, were almost deserted by them in the year 1906. The great "duck paradise" was invaded by the railroads. The Northern Pacific cut across it in Minnesota and North Dakota. A line was built north to Winnipeg; other branches were built later, and the Canadian Pacific was pushed forward from Winnipeg to the Pacific, crossing the most extensive breeding grounds of wild-fowl on the continent.

From 1880 to 1900 the population of the States and Provinces crossed by these railroads increased many-fold. When in 1888 I passed through this vast region, via the Canadian Pacific, many of the great duck grounds near the railroad had become wheat fields, and most of the wild-fowl were gone. Trainloads of immigrants were coming continually. Since that time a flood of immigration from the United States has augmented that from the Old World. The agricultural ex-

¹ Cooke, W. W., U. S. Dept. of Agr., Biol. Surv., Bull. No. 26, 1906, p. 11.

periment stations of Canada have introduced and perfected wheat that will mature in the short summers of the north. Another railroad across the continent is projected and will be built. Surveys for railways to Alaska and Hudson Bay have begun. Steamboat lines have been established on the rivers of the north. In all this region the shallow marshes and depressions in the prairie will be drained wherever it is possible, and the birds will be driven out, until in time there will be no place left for them but the ponds in the Barren Grounds and the tundra of the far north. It is probable that many of the most valuable species are not hardy enough to breed in these arctic and sub-arctic lands. Within twenty-five years, therefore, there will be few great breeding colonies of some of the most highly prized food Ducks, such as the Canvas-back, the Redhead, the Shoveller and the Blue-winged Teal. The draining of swamps and marshes, and their reclamation for agricultural purposes, eventually will destroy many of the best breeding places for wild-fowl throughout this continent. The future supply must come largely from such small colonies and scattered pairs as may be allowed to nest and rear their young in favorable spots in settled regions.

Night Shooting.

There is good ground for the belief that night shooting at any time or place should be absolutely prohibited, for nothing is more certain to drive birds of any kind away from any locality where it is practiced. Inland ponds where night shooting is allowed are deserted by water-fowl eventually, and none can be attracted to them except by the use of live decoys. The Black Duck is one of the first to leave such ponds, and old gunners say that it will not return to ponds where it has been shot at in the night unless driven by necessity, as is the case sometimes in winter, when most of its drinking places are frozen over. If the birds are persecuted all day and all night they soon will leave for some other region, where they can find more safety and a chance to rest. Wild Ducks feed normally during the day and in the dusk of morning and

evening. They prefer to feed by daylight, although many species also feed on moonlit nights. The surface-feeding Ducks, however, can feed better at night than the diving Ducks, which must have a good light in order to see their food at the bottom. Fresh-water wild-fowl are harassed so much in the daytime in Massachusetts that many of them fly to the salt water by day, where, in the sounds or larger bays, or even at sea, they can find rest; or they hide in swamps or go to reservoirs, where they are protected. Under these circumstances they go to the fresh-water ponds, marshes or rivers mainly at night, or when driven in by storms in the daytime. If they are harassed at night in these retreats, and so deprived of the opportunity to feed and drink, they will desert our inhospitable coast and pass on to regions where, in the larger swamps and fresh-water bays, they may find a greater degree of safety.

Mr. E. T. Carbonnell writes that Geese were very plentiful in the spring of 1909 on Kildare River, P. E. I. Day shooting merely frightened them up or down the river; but one night a few shots were fired at them, and the next day not a Goose was seen the whole length of the river. The same thing happened in East River in the fall.

Mr. Tallett, president of the Jefferson County, N. Y., Sportsmen's Association, says that from his experience he believes that in no way can the Black Duck be driven away from a favorite breeding place more quickly than by night shooting. The great preponderance of testimony given by experienced gunners before legislative hearings in many States is against night shooting of water-fowl and game birds, and night shooting is now forbidden by law in many regions.

Audubon tells how night shooting where it was practiced drove out the Prairie Chicken. It slays the Grouse while budding and the roosting Wild Turkey, taking them at a disadvantage at a time when they should never be disturbed by the gunner.

Wherever night shooting has been prohibited for a series of years there is no difficulty in securing a bag of birds in daylight.

Pursuing Wild-fowl in Boats.

The use of boats in chasing wild-fowl and in shooting at them on their feeding grounds always results in driving them away, and wherever this is practiced continually the birds become scarce. This practice and night shooting have been responsible, in part, for the disappearance of most wild-fowl from the ponds and rivers of the interior of Massachusetts, and from certain bays and harbors along the coast, and so long as it is continued, we cannot expect numbers of wild-fowl to remain in such places during the shooting season. This fact was recognized early in the history of Massachusetts, and a law to prevent it was enacted in 1710; but this lapsed after the revolution.

The practice of shooting wild-fowl from sailboats is an exhilarating sport, and often is quite successful with sea-fowl in a stiff breeze and a choppy sea. Sometimes the birds are slow to leave the water under such conditions. They are obliged to rise against the wind, and if the boat is sailed down wind in approaching them they must rise toward it, and so give the gunner in a fast-sailing boat a close shot. I have driven a small sloop in a squall within a few feet of a Red-breasted Merganser. The excitement of handling the boat skilfully and smartly, snatching the gun at the right moment and shooting accurately from the unstable shifting deck, the tension necessitated in steering, the swift and accurate sweep down the tossing seas to pick up the dead birds — all tend to make this a sport for men. Nevertheless, nothing will so surely drive birds away from their feeding grounds, except chasing them with power boats. The use of sailboats, row-boats and canoes on ponds and rivers in pursuing and shooting at Ducks has a similar effect. On the other hand, a reasonable amount of shooting from the shore will not disturb them much if they are not pursued. It is largely due to a recognition of this fact, and to a special law prohibiting the pursuit of wild-fowl in boats, that Martha's Vineyard has now the best duck-shooting in Massachusetts. Formerly the gunners themselves observed an unwritten law forbidding the pursuit of

fowl on the ponds. One man (an outsider), defying public sentiment, succeeded in driving most of the Ducks out of one of the larger ponds in one day by pursuing them in a boat and shooting at them. A law resulted, prohibiting this pastime on the ponds of Martha's Vineyard.

The Use of Live Decoys.

The use of live decoys for attracting wild-fowl is a practice which, in America, seems to have originated in Massachusetts. It has become a Massachusetts institution which has many stalwart defenders, and much money has been invested in shooting stands where shooting over live decoys is practiced. Sir Charles Lyell (1842) speaks of a pond at East Weymouth where he saw a single live Goose anchored in the water with some wooden decoys. He here saw the industrious cobblers, each sitting at his labor, stitching brogans for the southern negroes, with his loaded gun lying by his side. The cobbler worked an hour or two on his shoes, which brought but twenty cents a pair, and then seizing his gun shot a Goose, which brought, in the market, the price of several pairs of brogans.¹

Shooting over live decoys has come into general use. It has spread over a considerable part of the Atlantic coast, and unless checked by law it is destined to extend over the entire country. As the game became less plentiful, and prices rose, elaborate blinds were built, larger numbers of stool birds were used and quarters were provided in the blinds where several cobblers could work. The shooting stand became a veritable fort, — each loophole supplied with its gun, and all screened and hidden by trees or bushes, weeds and brush, so placed as to disguise its purpose and construction. The men ate, slept, lived and worked in it during the shooting season. In some cases one man was kept busy much of his time watching and tending the birds, liberating and calling in the decoys, and in general caretaking. Finally, shoe machinery took away the cobbler's occupation, and since then a

¹ Lyell, Sir Charles: *Travels in the United States; Second Visit, 1849, Vol. 1, p. 99.*

change has occurred in stand shooting. As the birds became fewer and harder to obtain, sportsmen, perceiving the possibilities of these stands and decoys, began to invest their money in them, until now many are in the hands of wealthy or well-to-do sportsmen.

In some of these stands the keepers use electric signals to call the gunners from bed or board to the outer walls. In some cases more than a hundred live Geese or Duck decoys are used, some of which are trained to fly out over the lake, and so call the wild birds down and toll them in. The wild birds seem to lose most of their natural caution under such circumstances, and swim boldly up to the stand, even coming out upon the shore, at times, almost under its walls. When the greatest number of birds can be killed at one shot, all the gunners make ready and fire at the word of command.

In some stands a second volley is given the birds as they rise. In most of the stands the rule is to shoot only at the sitting birds. If the gunners succeed in killing the adult birds, the young, though frightened at the first discharge, may return again to the place where the bodies of their parents are still lying on the water, and give the sportsmen a chance for another volley. It sometimes happens that the entire flock is taken in this way. Huntington tells of watching a gunner with live decoys who killed all but one of a small flock of Geese, and finally got that one when it returned to investigate. Usually this stand shooting is a form of market hunting. The plan and purpose of the gunners seem to be to kill as many birds as possible. There is an intense rivalry among the stands at the different ponds, each seeking to outdo the other. In most of them, all the birds that can be marketed are sold, and if one of the owners wishes to take for his own use a bird that he has shot, he must pay for it. The game sold usually goes toward paying the expenses of keeping up the establishment.

An account of this kind of decoying at Silver Lake was published some years ago in *Forest and Stream*, by one of the participants, wherein it was stated that sixty-eight Geese were killed at one stand in twelve hours. Nothing is said

about how many were killed at the other stands, which also were firing similar volleys.¹

Night shooting is (or was) commonly practiced at these stands. Many correspondents seem to believe that stand shooting will exterminate all Geese and Ducks eventually, or drive them out of the country. They therefore protest against this kind of shooting.

Mr. Nathaniel A. Eldridge of Chatham writes: "I think the greatest enemy the Black Duck has is the pond shooters who use live Duck decoys, decoy them in to places which are practical forts, and then clean up whole flocks. Ducks have not the slightest chance."

Mr. Fred F. Dill of North Eastham writes: "I am a pot-hunter and make one-fourth of my living with my gun. I use live decoys and shoot on fresh water. If laws were passed prohibiting this it would cost me one hundred and fifty dollars a year, but the preservation of the game demands that it should be done."

Mr. Edward B. Robinson, Jr., of Cataumet says that more Ducks and Geese are killed by a few gunners at Snake Pond, John's Pond and Mashpee Pond by the use of live decoys than all the other gunners kill in that section of the Cape.

Mr. Jonathan H. Jones of Waquoit says that if the people of Massachusetts do not want to see all of the fresh-water wild-fowl killed or driven away the use of live decoys must be stopped. If the Black Ducks and Geese, he says, cannot go to the fresh-water ponds in safety at night to drink and wash up they will desert the region. He finds that now these birds are nearly all shot at the fresh-water ponds, or driven away, and that those which escape do not stop as they used to, but pass on. He has a small stand and a large number of live decoys, but is willing to give up all for the benefit of the sport.

Nevertheless, there is something to be said for the pond shooters. Most of them oppose spring shooting. Mr. B. H. Currier says that without live decoys it would be very difficult now to kill Ducks or Geese in these ponds, and that the pond gunners of eastern Massachusetts would have to close

¹ Grinnell, *George Bird: American Duck Shooting*, 1901, pp. 268-273.

up their stands and go out of business were the use of live decoys prohibited. As it is, many flocks never stop at all. Dr. John C. Phillips has kindly given me records from three stands which show the number of Ducks and Geese shot, the number alighting in the ponds and the number seen passing. These records do not show such destruction of birds as one might be led to expect from the accounts of those who do not participate in this kind of shooting. None of these records, however, would compare in numbers killed with those seen or shot at Silver Lake, or others of the larger ponds. In 1908 Dr. Phillips finds that only fourteen Geese were killed at Wenham Lake and ninety-six at Oldham Pond, while three hundred and twenty-five were shot at Silver Lake. There are many days when the pond gunner does not get a shot, and some seasons when he gets few birds. The sport is often a costly one, and the outgo probably far exceeds the income. Nevertheless, there can be no excuse for excessive shooting. Even birds have some rights, and they should be given a chance for their lives. They should have the opportunity to drink and feed in these ponds unmolested at night, and the sportsmen should see to it that any objectionable and unnecessary features of pond shooting are eliminated. If the sale of wild-fowl were prohibited by law it probably would reduce the number of birds killed by stand shooting.

The Elements: Storms and Cold.

Unseasonable storms and cold winters sometimes destroy tremendous numbers of birds, and their effect is felt periodically by the Woodcock and the Bob-white particularly. Cold and wet breeding seasons terribly deplete the game birds. Any species, the increase of which is destroyed every year by shooting, will soon disappear if unable to raise its young. A single cold, wet breeding season will reduce a species from a condition of abundance to one of scarcity, as was the case with the Ruffed Grouse in 1907. If the birds were unmolested by the gunners for a few years thereafter they would soon regain their former abundance; but if shooting is continued,

the increase in numbers comes more slowly, and the bird may never equal its former abundance.

In 1895 nearly all the Bluebirds of New England were destroyed by a great storm and cold wave in the south; but as they were protected by law at all times they became about as plentiful as ever a few years later, while the Woodcock, which was less affected by the freeze, but is shot in all the States, hardly has begun to approach its former numbers.

Every gunner knows that forest fires during the nesting season are destructive to game birds. This may be remedied by the public care of our woodlands, better protection against fires and the electrification of all our railroads. One of the chief sources of forest fires in this country is the coal-burning locomotive.

Epidemic Diseases.

There are rumors of disease among the Ruffed Grouse and Bob-white, and occasionally some disease appears among wild-fowl. A few years ago an epidemic was reported among wild-fowl on the St. Lawrence River, and now (1910) we are told that a disease exists in Utah which is said to affect Geese and Ducks of all kinds, the smaller Herons, the Plover, Snipe and nearly all birds. This disease was first noticed in the feeding grounds near or bordering the Great Salt Lake, and has gradually increased and progressed until the infected area includes the entire Salt Lake valley, and the infection includes practically all the birds there.

In a letter received by *Forest and Stream* from Dr. W. R. Stewart he says, "our native birds are practically all dead." This refers to birds of all kinds; even chickens that were fed on the viscera of dead Ducks died by hundreds. The infection is a diarrhoea or cholera, with a watery discharge from the eyes during its latter stages, and ends fatally in a few days. When sick birds were put in clean pens and given clean food and water most of them recovered.¹

This disease is believed to be what is commonly known as Duck cholera, which often affects domesticated water-fowl

¹ Stewart, W. R.: *Forest and Stream*, October 15, 1910, Vol. lxxv, No. 16, pp. 616, 617.

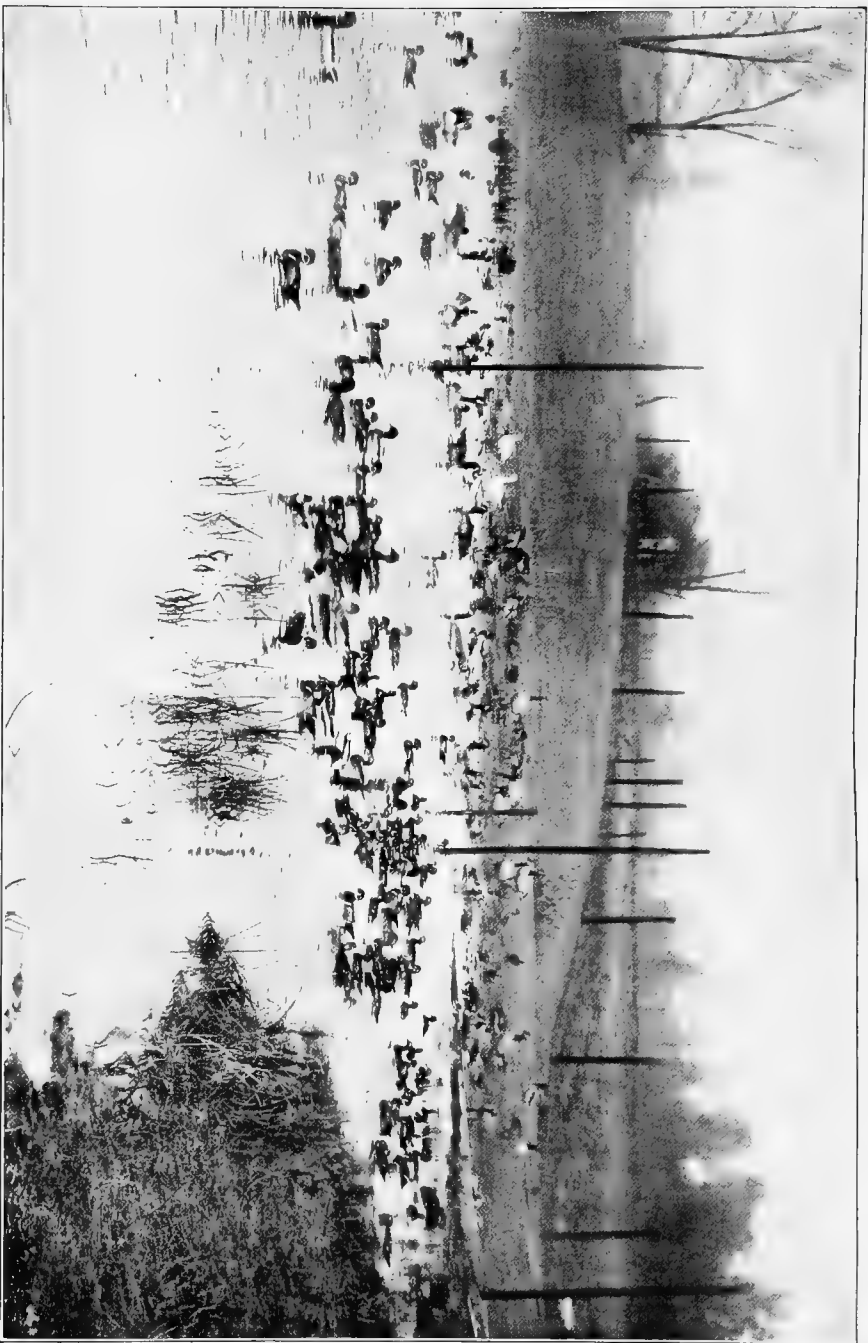


PLATE XXVIII.—WILD-FOWL ON A GAME FARM.

Wild Canada Geese, Snow Geese, Mallards, Wood Ducks and other wild-fowl on the game farm of Wallace Evans, Oak Park, Ill.
(Plate furnished by Mr. Evans.)

in summer when a sufficient supply of pure water is not available; it has been diagnosed as a form of coccidiosis, similar to, if not identical with, that which is believed to cause white diarrhoea in chicks and blackhead in turkeys, and is very fatal to Grouse and Bob-whites (see page 383). As poultry raising increases, the danger of contagious diseases among game birds is likely to increase also, as chickens and turkeys spread coccidiosis. Its spread in Utah may have been facilitated by a dry season and low water.

Natural Enemies.

Those who promulgate the belief that the depletion of native game birds is due to their native natural enemies are merely deluding themselves and injuring the cause of game protection. We know from the accounts of the early explorers and settlers that when this country was first settled, and game of all kinds was abundant, Hawks, Eagles, panthers, wolves, lynxes, raccoons, minks, weasels and other enemies of the game (some of which are now extirpated from our covers) were far more abundant than they are to-day, and we find now that where game is rare its natural enemies also usually are rare. The same cause that has swept away the game has destroyed its natural enemies also. Natural enemies of the game are necessary. The Hawk and the fox tend to keep the game in good condition. They break up the coveys, keep the birds alert and active, and compel them to exercise not only their muscles but their wits. They kill off the slow, the feeble, the diseased and the unfit, for these are most easily captured and killed. Probably they keep down the excess of male birds, which so often occurs on game preserves where the natural enemies have been killed off. All gamekeepers say that an excess of male gallinaceous birds tends to prevent breeding.

It is the mission of the native natural enemies to help preserve birds, to keep them up to full efficiency and at the same time to prevent their increase in numbers beyond the limit of safety. An increase beyond this limit would

exhaust the food supply of the game and bring about starvation. This the natural enemies of the game prevent by holding its increase within a safe limit. Here we see the working out of nature's laws for the conservation of the game.

The larger natural enemies befriend the game by holding in check the smaller enemies. The Hawk, Eagle and fox keep minks, weasels, rats, field mice, shrews and other small destructive mammals in check, which otherwise would destroy most of the eggs and young of game birds. The natural enemies of the game, therefore, are necessary to its prosperity. Where they are too numerous they should be reduced in number, but never exterminated. Hunters naturally kill game enemies, and therefore the numbers of so-called vermin are depleted as those of the game are reduced, and by the same cause. All the fur-bearing animals which are regarded as vermin by the sportsman and the gamekeeper are the game of the trapper, and furs now bring so high a price that these animals, including even the lowly skunk and muskrat, are growing scarce. The decrease of the game cannot be laid at their door. Nevertheless, these natural enemies, or vermin as they are called, certainly help to keep down the numbers of the game wherever man attempts to increase the game on a small area to numbers far beyond what nature provides, as on the game farm or preserve.

Many hunters regard the skunk as one of the most destructive game enemies because it sometimes steals the eggs or young of game birds; but the skunk is very useful on the farm, and feeds largely on mice, also on potato beetles, white grubs, grasshoppers, crickets, cutworms and other destructive insect pests, of which it destroys large numbers, and indirectly it is one of the chief protectors of young wild Ducks. The following statement by Dr. A. K. Fisher of the Biological Survey illustrates the close and intimate relations that diverse forms of animal life bear to one another, and how harm, rather than good, may sometimes result from the destruction of the natural enemies of birds. Skunks frequent the shores of lakes, rivers and sloughs in spring, and devour most of the turtles' eggs that are deposited there.

“An extensive marsh bordering a lake in northern New York formed a suitable home for numerous ducks, rails, snapping turtles, frogs and other aquatic life. The turtles deposited their eggs in abundance in the sand of the old beach. These delicacies attracted the attention of the skunks of the neighborhood, and their nightly feasts so reduced the total output of eggs that only a small percentage of the young survived to reach the protective shelter of the marsh. As time went on conditions changed. Skunk fur became fashionable and commanded a good price. The country boy, ever on the alert for an opportunity to add to his pocket money, sallied forth and captured the luckless fur bearer wherever found, so that within a comparatively short time the skunks almost wholly disappeared. When this check on their increase was removed, the snapping turtles hatched in great numbers, and scrambled off in all directions into the marsh. When their numbers had been properly controlled by the destruction of a large proportion of their eggs, their food supply was adequate, but when they had increased many-fold the supply proved insufficient. Finally, through force of circumstances, the turtles added ducklings to their fare, until the few ducks that refused to leave the marsh paid the penalty of their persistency by rarely bringing to maturity more than one or two young. It is not surprising that this great aggregation of turtles, containing the essential of delicious soup, should have attracted the attention of the agents of the marketmen and restaurant keepers. The final chapter, the readjustment of conditions, may be briefly told: The marsh became a scene of great activity, where men and boys caught the voracious chelonians, and bags, boxes and barrels of them were shipped away. There was also a depreciation in the value of skunk skins, with a corresponding loss of interest on the part of the trapper, so the progeny of the surviving skunks congregated at the old beach and devoured the eggs of the turtles that had enjoyed a brief period of prosperity. The broods of ducks now remained unmolested and attracted other breeding birds, with the result that the old marsh reverted to its original populous condition.”

The maintenance of the biologic balance between the many diverse forms of animal life cannot be adequately discussed within the limits of this volume; but a few observations on some of the natural enemies of game birds will not be out of place.

There are a few animals which are so sagacious as to be able to maintain themselves and become so numerous locally at times as to do too much injury to the game in spite of the ordinary hunter. Among these are the fox and the Crow.

Probably the fox is nearly as numerous now in Massachusetts as it ever was. Its chief food supply of insects, field mice and other small animals is abundant, for man does not hunt them, but protects them by killing the Hawks and Owls and other enemies that feed on them, and it can draw at need on poultry and game for additional supplies. We have destroyed the wolves and all other large natural enemies that were wont to prey on the fox, and now we discourage fox hunting and trapping by protecting and increasing the deer and prohibiting the use of scented bait. There are now so many deer in Massachusetts that many a hunter will not hunt foxes with dogs lest his dogs get on the trail of a deer, — a breach of the game laws for which he is likely to have his dogs shot by a game warden and himself haled into court and fined as a lawbreaker. As a result of these conditions foxes have so increased in parts of Massachusetts and other New England States that they have become a menace to the poultry raiser and a scourge to the game. I spent a day in the woods in the spring of 1910 in East Northfield, Hampshire County, near the Vermont line, in a fine Grouse country, and did not see a Grouse or hear one drum. I visited during the day two fox dens, and found feathers of the Grouse scattered about the entrance of each. Mr. A. O. Howard and other gunners there informed me that Grouse were then rare in a large section of that region, extending well up toward Brattleboro, Vt., and that foxes were abundant. Mr. Howard told me that in the winter he had seen traces showing where the foxes had caught Grouse in the snow, and showed me photographs exhibiting fox tracks and the remains of the feast. In

a country where foxes are so numerous and Grouse so scarce foxes must check the increase of the game. Complaints regarding similar conditions have come from many sections of the State, and poultry raisers complain loudly of damage to their business by foxes. The fox is useful as a mouse destroyer, but wherever its numbers are excessive the game will suffer.

The Crow, like the fox, is so astute that its numbers sometimes increase locally until it exercises a serious restraint upon the multiplication of game. It destroys both eggs and young of Grouse, Bob-whites, Ducks and other birds. Flocks of Crows have been known to attack and kill full-grown Grouse and hares. The Crow is useful as a destroyer of insects in the grass-land, but it is not a bird for the game preserver to protect.

The few bird-killing Hawks which inhabit Massachusetts are always fair game for the gunner, and are kept within reasonable bounds. The most pernicious enemies of birds come from the ranks of those animals which are introduced from foreign countries by man. In this list we may include the cat, the dog, the rat and the hog.

Cats which have run wild are known to be most mischievous. They roam the woods and fields in countless numbers. I have known fourteen, half fed, to be kept on one farm. Thousands are abandoned every year at summer homes in the country when the owners go back to the city. Cats are so destructive that their introduction to islands in the sea has been followed by the absolute extinction of certain birds, rabbits and other small animals. European gamekeepers say that nothing can be done on a game preserve until the cats are killed.

A gentleman in Massachusetts who undertook to raise Pheasants a mile from any village found that his gamekeeper was obliged to kill a great number of cats. The cat, being an introduced animal, is far more injurious to game than the native natural enemies, and should be eliminated so far as possible from the field.

Dogs, when allowed to run at large in the woods and fields in spring and summer, destroy numbers of birds' eggs and

young birds. Many farmers allow their dogs to roam at will. Such dogs often hunt singly or in pairs. Hounds and bird-dogs are given free range in spring and summer. Mongrel curs are allowed to run loose everywhere. Some people do not allow their dogs to eat meat, believing that meat has a bad effect, but they permit them to run at will in the woods and fields. One might as well turn out a ravening wolf among the nesting game birds as to let loose such a meat-hungry dog among them. Sometimes dogs catch full-grown Grouse and Bob-whites. Several sportsmen have told me that they have seen their dogs catch mature, unwounded Grouse, and a Grouse was brought to me which showed on dissection that it had been caught and killed by a dog. On inquiry it was learned that a bird-dog, hunting in the snow, brought it in. I once owned a dog that was seen to catch young Pheasants and full-grown gray squirrels.

On the northern breeding grounds of the wild-fowl, near the shores of the Arctic Sea, a short supply of fish results in the Eskimo dogs being turned out to seek their own living, with a consequent serious destruction of wild-fowl in the nesting season. The general introduction of reindeer for beasts of burden in arctic America would help in the preservation of our wild-fowl.

Rats are very destructive to the eggs and young of game birds during the summer. They roam a great deal in the woods and fields. They are particularly pernicious on game preserves where game birds are raised in large numbers, and they are, in many cases, the most destructive enemies of the game in such localities.

Hogs, when allowed to run at large, destroy many of the eggs of game birds, and when enclosed in a field they get all such eggs. The hog in New England, however, is not so destructive as in the south, where, in many cases, it still is allowed to run at large.

A few species of bird-killing Hawks are destructive to game, and any of the larger Hawks or Owls are likely to kill young game birds at times. Snapping turtles, large fish, such as pike, and large frogs often kill young ducklings. Whenever

game farming becomes established in this country all the enemies of the game will be well held in check, and their influence on the increase of game will be negligible.

Telegraph, Telephone and Trolley Wires and Other Obstructions.

Some of the improvements and inventions of this era cause much mortality among birds. Lighthouses, electric light towers and wires, trolley and telegraph wires, etc., maim or kill thousands of birds, which, in nocturnal flight, especially in migration, dash themselves against these obstructions erected in the air. Fortunately, most of the game birds seem to escape such collisions, but Rails and Woodcock, which fly low in their migrations, suffer severely. High wire fences, such as are used for deer parks, kill many Grouse, which dash against them, as they often do against the walls of houses situated among trees or near woods.

MINOR CAUSES OF THE DECREASE OF BIRDS.

There are many minor causes that are assigned for the depletion of upland game birds, some of which appreciably affect the numbers of birds. Among these are certain alterations in agricultural conditions, such as changes from grain raising to dairying, which have deprived these birds of a food supply that they formerly utilized. The use of the mowing machine and the early cutting of grass disturb their nests.

Lead poisoning is one of the minor causes of the decrease of wild-fowl and game birds which may in time assume considerable importance in localities where much shooting is done.

Lead Poisoning.

Hon. George Bird Grinnell, editor of *Forest and Stream*, called attention to this unexpected danger in 1894, when its effects were first noticed in America, although they were reported in England in 1902 among Pheasants and Partridges, and commented on in the *London Field*. Since 1894 cases of

lead poisoning have been reported from English preserves where game is raised in quantities and much shooting of driven game is practiced. Occasional articles have appeared in the press calling attention to a disease among wild Ducks called "croup," which is caused by lead poisoning. The Ducks are self-poisoned, and their condition is brought about by picking up and swallowing shot. There are some favorite shooting grounds where tons of shot have been fired at wild-fowl. Here the birds, in their search for sand and gravel as an aid to digestion, swallow quantities of shot, which have been scattered over the marshes, along the shores, and in the shallow waters, where Ducks feed. The shot is disintegrated in the stomach by trituration and attrition, and lead particles are absorbed into the tissues. The trouble is common in certain localities among Ducks, Geese and Swans. The symptoms are a rattling in the throat and the dropping of a yellowish fluid from the bill. The bird breathes hard, becomes weak and helpless and finally dies.

Dissection reveals pellets of lead in the stomach or gizzard, the lining of which becomes corroded and can be picked away in pieces. The intestines and rectum become inflamed and the liver is very dark. At Galveston, Stephenson Lake and Lake Surprise, Tex., at points on Currituck Sound, N. C., and at the Misqually Flats, Puget Sound, many Ducks have been found sick and unable to fly from the effects of this poisoning.¹

The Destruction of the Feeding Grounds.

Many correspondents attribute the decrease of wild-fowl and shore birds in Massachusetts to the destruction of their feeding grounds here. The gradual filling up of ponds and estuaries, the damming of streams for commercial purposes, the draining of swamps and meadows in the process of converting them into cranberry bogs, the drying up of small ponds as a result of cutting off the forest cover, the digging over of flats and bay bottoms in getting shell-fish, — all have more or less local effect on the numbers of birds. On Cape Cod the building

¹ Grinnell, George Bird: *American Duck Shooting*, 1901, pp. 598-600.

of cranberry bogs has resulted in some depletion of breeding Black Ducks, but the reservoirs established for the purpose of flooding these bogs have in part compensated the birds for the loss of their former feeding grounds. On the whole, while all these changes have produced a local decrease of some species, their influence has been very slight compared with that of excessive and unregulated shooting in the same localities and elsewhere.

ERRONEOUS OPINIONS REGARDING THE CAUSES OF THE DECREASE OF WILD-FOWL AND SHORE BIRDS.

A few correspondents in Massachusetts express the opinion that the wild-fowl and shore birds are still as plentiful as ever, but do not come this way now in their annual flights.

It is a common expression that the birds have "changed their line of flight." This saying is applied more often to those species which are approaching extinction. This popular opinion is rarely, if ever, founded on fact. It seems to have been formed in the mind of some one as a plausible explanation of the decrease of birds, and then passed from mouth to mouth until it has taken a strong hold of the popular mind. Wilson, Ord, Bonaparte and Turnbull seem to have been responsible for passing this idea down to their posterity. Turnbull, in his *Birds of East Pennsylvania and New Jersey* (1869, p. 48), voices this opinion in the following words: "Since the eastern provinces have become more densely populated, many of the larger and more wary species of birds have changed their course of migration, and now reach the arctic regions by a route taking them toward the interior of the continent." This statement is, I believe, based on a misapprehension of the facts. Practically all the species which go north by the interior route always went that way. A few of the larger species which also went up the Atlantic coast are not found here now, not because they have changed their line of flight, but because most of the eastern individuals have been exterminated. The few which remained may have followed their comrades to the west, for when the numbers of a species de-

crease it tends to contract its range, or to occupy only that portion of it that is most suitable to its purposes. The bird which Turnbull names to exemplify this change of flight is the Whooping Crane, which once inhabited the entire continent and migrated up and down the Atlantic coast as well as through the interior. The individuals along the Atlantic coast were first killed off, then those farther west, until now the species is nearing extinction. That is the manner in which the line of flight of the Whooping Crane was changed. It is of no avail to argue that the bird was so shy that it could not have been killed off, but must have been driven to the west. The fact remains that it is now so rare everywhere that it is exceedingly difficult to get a specimen for a museum or zoölogical garden. Nevertheless, there is no rule without some exception. The Passenger Pigeon was obliged, by its great numbers, periodical scarcity of food and constant persecution, to change its location and its flight line frequently. Cross-bills are very erratic in their flights, Robins are great wanderers, but I do not recall other remarkable exceptions to this rule among land birds. It is noted often that a certain species of Duck will be scarce in a locality for a year, or more. If this scarcity is quite general and only temporary, it is looked upon as probably the result of a poor breeding season; but if the scarcity continues, it usually is assigned by the gunner to a "change in the line of flight."

We get our idea of the flight of birds largely from the number which *stop* in our vicinity. Thousands of birds of a certain species may pass over or by us unseen and unnoticed. Wilson says that a vessel loaded with wheat was wrecked near the entrance of Great Egg Harbor, N. J. The wheat floated out in great quantities, and in a few days the "whole surface of the bay" was covered with Ducks of a kind unknown to the people and never seen by them before. The gunners of the neighborhood had great sport shooting these Ducks for three weeks, and they sold them at twelve and one-half cents each. They finally learned that the birds were Canvas-backs, which they might have sold for from four to six times that sum. Probably the Canvas-back passes near this coast every year,

but was unnoted by the inhabitants until it *stopped* on account of an unusual supply of food. The fact that it was seen there that year and not before or afterward does not indicate any change in its line of flight in that particular year. It is stated by George B. Sennett that an "unusual flight" of Swans occurred in northwestern Pennsylvania on March 22, 1879 (see page 197); but upon reading the account we find that a sleet storm brought them to earth. A large flight of Swans undoubtedly passes across the State twice every year in the migration from the fur countries to the south Atlantic seaboard and back. Probably they usually fly so high that they pass unnoticed. Here was no change in the "line of flight;" no "unusual flight," merely a stop at an unusual point. Probably there is little change in the annual direction of the flight pursued by any of these birds, except such as may be caused by scarcity or abundance of food or the accidents of migration. Early wild-fowl may frequent a certain river one spring because the ice breaks up earlier than in some other river. The conditions may change the next year. There are occasions when birds are overtaken by severe storms (which obscure their outlook), accompanied by high winds, which deflect the bewildered creatures sometimes hundreds of miles from their course. Hence the "flights" of shore birds, which sometimes land on the coast during northeast storms. They are drifted in by the gale, or are passing high overhead and, becoming confused, alight. Such storms sometimes drive salt-water fowl far inland. High winds from the west may sometimes send to our shores flights of shore birds which are crossing the country in their regular migration to or from the south Atlantic coast. It is a well-known fact that as the migration along the Atlantic coast has lessened in numbers, these flights on westerly winds have become more noticeable, and this often is advanced as another proof that the shore birds are not less numerous but have "changed their line of flight," and now usually pass to the west. This is an error. There always has been a great flight of birds from the great northwest to the south Atlantic and Gulf States. The flight on the Atlantic coast remains the same, except for the great diminution in

number and the practical extinction of some species from over-shooting.

This so-called change of flight is easily explained. A few families of Knots or Red-breasts, for example, reared in the same locality in the far north, start down the Atlantic coast in their migration. Gunners on the Bay of Fundy first decimate the birds, which then cross to Cape Cod, pass a blind occupied by an experienced gunner, who gets nearly all of them, and the next gunner a little farther down the beach kills what are left. There will be no more of those birds coming down the Atlantic coast from that nesting place for some time. This has happened all along the Atlantic coast.

Mr. William R. Sears tells of an instance where fourteen Summer Yellow-legs came to decoys where two men were shooting, and eleven were killed there, while the other three were shot by a gunner at another stand not far away. Mr. W. D. Carpenter of Nantucket tells me that one day he killed all the Teal there were in a pond, — fifteen in number.

I know of an instance where a market hunter who was very skilful called a "bunch" of shore birds and not one escaped. This is one explanation of the so-called change in their line of flight,—it is deflected into the pot,—but there is another. A few birds shot at, injured perhaps, but not mortally, manage to escape, and, recognizing the points where their comrades were slain, keep well off shore in the future, or fly high and perhaps induce their companions to do likewise. Fishermen and sailors often see or hear such flights off shore.

Undoubtedly the stream of migration widens or contracts somewhat with the fluctuations in the numbers of a species. A good breeding season in the northwest, or better protection of the birds there, may result in an extension of the migration wave to the eastward. Under such conditions wild-fowl increase in numbers in New England, while opposite conditions tend to contract the migration range of the species and narrow the stream of migration. Undoubtedly the killing off of certain species in the east has had the latter effect, and I believe that in this way only have any great or permanent changes in the

migration routes of wild-fowl and shore birds taken place in recent times. Nevertheless, during the winter and in the season of migration, birds in moving from day to day often change their daily "fly lines," sometimes making wide detours and avoiding places over which they formerly flew, or forsaking old feeding grounds for new ones. These movements, which in many cases seem inexplicable, rarely take the birds to such a distance from their regular migration route that they cannot readily recognize the familiar landmarks or shores. A deflection from their usual course of from ten to twenty miles either way, caused by the wind, will not take them out of sight of the familiar landmarks by which they travel.¹

The Destruction of the Eggs of Wild-fowl for Commercial Purposes.

A most "grotesquely fantastic explanation" of the decrease of wild-fowl was published years ago by the press of the country, and fathered by a society entitled the National Game, Fish and Bird Protective Association. A tale was told of enormous destruction of wild-fowl eggs in the northwest for commercial purposes. It was stated that millions, shiploads and trainloads of eggs were gathered in Alaska for shipment to points in the east, where they were manufactured into albumen cake.

This fantastic tale, like Banquo's ghost, will not down, and we now have one to match it in the east. The statement is gravely made that schooner loads of Ducks' eggs have been brought to T wharf in Boston from the coasts of Labrador and the islands in the Arctic Sea, where the nests of Ducks and Geese are rifled by thousands. These stories probably have arisen because of the former commercial use of the eggs of Murres and other sea birds.

In 1895 the management of Forest and Stream of New York undertook a thorough investigation of the first story, and found it to be absolutely unfounded.² Mr. James Henry

¹ Sea birds, which do not depend upon landmarks, but seem to be directed in storm or fog, as well as in clear weather, by the power which guides the planets in their courses, are extreme exceptions to any rule of migration which may be laid down with regard to land birds.

² Grinnell, *George Bird: American Duck Shooting*, 1901, pp. 576-581.

Rice, Jr., informs me that he has heard similar stories from lumbermen from the northwest, but I have been unable to get any definite and authentic information on the subject.

The Decline of Agriculture.

Many observers along the Massachusetts coast are prone to assign the decrease in the number of shore birds to the decline of agriculture. Many farmers have given up cutting the salt-marsh grass; sheep and cattle which formerly kept down the grass on the hill pastures are no longer kept; "pastures are growing up to brush;" and for all these reasons it is said that the birds "do not come any more." There is a little logic in this reasoning. Of course, all observing persons know that many birds prefer mowed meadow or marsh or close-cropped pasture to tall and uncut grass, bushes or young trees. We must admit that it makes some difference to the birds whether the grass is cut or not, but when we see the decline of agriculture put forward as a reason for the disappearance of such birds as the Eskimo Curlew and the Golden Plover, which have been killed off by market hunting and spring shooting in the west, until one of them is practically extinct and the other is in danger of extinction, the explanation loses force. If we consider for a moment the fact that there were no mowed meadows or cropped pastures when the first explorers came here, and that the coasts and river banks then swarmed with shore birds, such explanations of the diminution of the birds seem puerile. On the other hand, the diking of marshes to shut out the salt water might have a considerable effect on some species; but this practice has not become general as yet along the Massachusetts coast.

The Increase of Cottages and Camps.

The increase in the number of houses, cottages and camps on beaches, lake shores and river banks frequently is advanced as a reason for the decrease of game birds, shore birds and wild-fowl. This in itself, however, has very little effect on the birds, unless the houses cover and obliterate their feeding

grounds. Where birds are not molested or shot at they make themselves at home in man's neighborhood. In India, where animal life is held sacred by the greater part of the population, numerous birds, large and small, frequent cities, and build their nests about the buildings and in the yards and gardens. In some European cities the Storks build their nests on the housetops. The American representative of the Stork family, the Wood Ibis, has been extirpated from a large part of the United States and driven to the inaccessible swamps of the south. We can readily imagine what would happen to one of these great birds should it venture to even perch on one of our housetops. Birds have little fear of houses and people provided the people do not molest them. Wild-fowl come into ponds in cities where protected. Fish Hawks build their nests in farm-yards in Rhode Island. I once saw three Summer Yellow-legs about a puddle beside a street in the city of Somerville, Mass. Shore birds have increased very much in numbers on the populous, much-frequented beaches of Swampscott, Lynn and Nahant since shooting has been prohibited there. They would frequent them more than they now do were they not molested by dogs, cats and children. There are practically no houses on most of the salt marshes of Massachusetts, except a few gunning camps, and it is the shooting, more than the houses or the people, that drives the birds away.

If no shooting or molesting of beach birds were allowed in summer it would not be many years before large troops of Sandpipers and Plover would be seen running along the most populous beaches.

The Shortening of the Open Season.

A few of the older gunners and sportsmen attribute the decrease of game birds to the shortness of the present shooting season. They believe that the hunters so throng the woods in a short season that the birds have no chance. This theory lacks logic. It cannot apply to wild-fowl or shore birds, as the season for them always has been long. If carried to its

logical conclusion its advocates must believe that an open season of one week would be more fatal to the birds than a perpetual open season, with all protection withdrawn, — a proposition which hardly appeals to common sense. The short open season may be more destructive to the birds than the former extended hunting time, but if so it is because of the increased number of hunters, dogs and decoys, and because of the modern improvements in firearms, means of communication, and transportation, which make the gunner more destructive than formerly and put him quickly on the hunting grounds.

GUNS MOST DESTRUCTIVE.

It is impossible to consider the conservation of game birds apart from the sport or the business of hunting them. Any plan for increasing their numbers must take the shooter into account. In this connection we must recognize the fact that shooting will be continued so long as there is any game left. The birds must be conserved in spite of it.

The following statements cannot be successfully refuted: (1) American wild game is in danger of extinction unless effective measures for replenishing the supply are adopted and enforced throughout the land. (2) The decrease has gone on progressively ever since the country was settled, and is due to civilized man. (3) The most destructive agency generally employed by civilized man *to-day* is the gun. While there are other contributory causes of game destruction, any attempt to minimize the effect of shooting is an injury to the cause of game protection.

A few years ago experts of the Biological Survey estimated that there were then from two and one-half million to three million hunters in this country. Their estimate was based on the statistics of hunting licenses issued in the States where such licenses were then required. In 1910 the editor of the *American Sportsman* estimated that there were then five million hunters in the country, — an army much larger than all the troops that were enrolled on both sides during the American civil war.

An officer of a great ammunition company assures me that over nine hundred million loaded shotgun cartridges were sold in the United States in 1910, and about one hundred million in Canada. Only a small proportion of these were shot at clay pigeons, etc., for only thirty-six million of these inanimate targets were made here that year. We do not know how many loaded shells were shipped abroad or how many were imported into this country; we have no means of knowing how many shells were bought empty and loaded by the hunters; nor do we know how many rifle cartridges were used, or how many shots were fired at birds from muzzle loaders and other weapons, but nine hundred and sixty-four million probably approximates the number of shot charges actually fired at birds and other game in the United States and Canada in one year. If the increase of hunters, guns and ammunition continues, and the supply of birds continues to decrease, there will come a year when there will be ten cartridges made and loaded for every game bird in America.

If hunting is to be continued in this country it must be regulated everywhere, and the supply of game must be increased, otherwise shooting will come to an end eventually for want of game to shoot, and the manufacturers of guns and ammunition will have to find a market elsewhere or give up business. American manufacturers of guns and ammunition realize this and have formed a national association for the protection and propagation of game, to which they will contribute a large sum annually.

There are many excellent and humane people who believe that there is but one remedy for the present condition. They say, "if you want to save the birds you must stop killing them." If no game were killed by man in this country for a series of years, all game would increase in numbers. The recent rapid increase and spread of deer over southern New England, in regions where deer were extinct for many years, shows the value of the perpetual close season. Let us consider this matter, however, from the standpoint of the sportsman and the gunner.

The Viewpoint of the Hunter.

Were it possible to enforce a close season on all wild birds and animals certain species would become so numerous in time as to destroy the crops and drive human beings from the land. In India, where animal life is considered sacred by the natives, and where few people shoot animals or birds, hundreds of thousands of people have been killed by wild animals and venomous serpents. The progress of mankind has necessitated competition with the other animals for the possession of the land. There could have been no settlement of the prairie States, and no agriculture there, had not the vast herds of bisons been destroyed. They would have broken down the farmer's fences, ruined his crops and driven him from the country. In regions like New England where we have exterminated the natural enemies of the deer, and where we now protect deer at all times, they are increasing so much in number that eventually it may become necessary to kill many of them to protect the crops of the farmers. Unless this is done the deer may become so numerous that many will starve during our long winters. I once studied the conditions on an island where protected deer had increased so much that they had destroyed nearly all shrubbery and had eaten the foliage from the trees as high as they could reach. No crops could be raised there unless surrounded by a high wire fence, and many deer died each year from weakness or disease. It would have been better for all concerned had more of these deer been killed each year and utilized as food. Many elks die from cold and starvation on government game preserves.

No man can exist without destroying enormous numbers of the smaller forms of animal life during his lifetime. Theodore Roosevelt has said that no one, except a vegetarian, consistently can object to the killing of animals for food; nor can the vegetarian if he is shod or gloved with leather, or uses furs, glue, animal fertilizers, feathers or any of the many animal products which contribute to our comfort or welfare. Neither the vegetarian, the humanitarian nor any who abhor the taking

of animal life can escape indirect responsibility for the destruction of thousands of insects, mammals and birds. If we eat bread it is at the expense of the lives of the insects, birds and mammals which feed upon the grain, and which the farmer often is obliged to kill to protect his crops. Wild Geese are killed in large numbers in the west to protect the sprouting grain. Geese, Ducks, Blackbirds, Pigeons, Crows, Rooks, Grouse, Sparrows and other birds, and mice, rats, gophers, squirrels and other mammals, would destroy the grain crops of the world were they allowed to become too numerous; and the legions of insect enemies of grain must be fought continually. Ducks, Bobolinks and Blackbirds are killed in large numbers on the rice fields. Mice, squirrels, rabbits and certain birds are among the most destructive of fruit-tree pests. Squirrels are the pests of the nut grower, while marmots destroy garden vegetables. The vegetarian and the humanitarian, therefore, are not in a logical position to protest against the killing of animals, since of necessity much of their own food is procured at the expense of the lives of many creatures.

Therefore, let not those who shrink at the sound of a gun be too intolerant of the man who gets enjoyment and recreation in killing game legitimately, but let us devote our energies to so regulating the killing and production of game that no wild species will be exterminated, but that game will be so increased that a reasonable amount of gunning may be provided for those who find recreation in it. The killing of birds for mere sport is abhorrent to many people. Still there are many good and useful men who enjoy it. The hunting instinct is inborn in many who are among the most efficient men now in business life. It is inherited from a long line of hunting ancestry. Men who have the combative and destructive elements of their character fully developed are better fitted for the battle of life than those not so endowed, and such men often find their best recreation in hunting. I have known business men whose useful lives have been much prolonged by field sports, — men whom no other form of outdoor recreation could have so attracted. Many such men find that a moderate indulgence in field sports gives them an errand

afield, cultivates the love of nature, ensures a sufficient amount of outdoor exercise and greatly improves their health. Furthermore, a violent death is the natural end of most birds. Usually they are killed for food by their natural enemies if not by man. This is a much quicker and less painful end, on the whole, than the slower death which results from old age, disease or starvation and exposure that otherwise would be their fate. Legitimate hunting, then, if not carried to excess, is, from the sportsman's viewpoint, a benefit rather than an injury to the birds, particularly where the sportsman himself is instrumental in increasing rather than in diminishing the game which he hunts.

These are facts that the altruistic nature lover who decries field sports should consider; while, on the other hand, the sportsman should be similarly tolerant of the desires of the nature lover, that both may work together for the rational protection and increase of the game in which both are equally interested, even though they regard it from totally different viewpoints.

The perpetual close season should be and must be utilized to save those species which are now most in danger of extinction; but it is impracticable, if not impossible, to go farther than that. A perpetual close season on all game could not be enforced, as nearly all hunters and sportsmen who are now selfishly interested (if you will) in saving the game would lose their interest in game protection, and the poacher and lawbreaker would continue to hunt. The vast sum now derived from hunters' licenses in this country would be lost to game protection. State game commissions would be unsupported, and neither game laws nor bird laws would be so well enforced as at present. How, then, shall we maintain and increase our game?

A close season enforced on all game on a limited territory for a few years might make game plentiful there, but if that territory were again opened to shooting, gunners would swarm there and the last condition would be worse than the first.

If we look abroad we find that in countries that have been settled for many centuries game is far more plentiful than here. If we are to have birds numerous in our coverts and

abundant in our markets we must adopt some modification, at least, of the system that has been in successful operation in England for centuries.

The game in this country was amply sufficient for the wants of the red men. It furnished them an abundance of animal food. Only the tribes of Mexico and Central America, which were somewhat civilized and lived in cities, found it necessary to add to their meat supply by domesticating animals; but as conditions changed after the advent of the Europeans, and as civilization advanced, the people introduced foreign domestic animals to provide a meat supply, and foreign plants for a vegetable and fruit supply, but still depended upon nature to furnish a sufficient quantity of wild game for a vast and growing population. At the end of the nineteenth century we were less advanced in the propagation of game than was any other civilized country. We are hardly beginning yet to realize that the only way to produce a plentiful supply of game, sufficient for the needs of all, in a settled country is to encourage the individual ownership and propagation of game. If our people had elected to depend on the natural supply of native wild animals and plants for food the country never would have been settled as it is to-day. Even the Indians found it necessary to cultivate and store corn to tide them over times of famine in winter. It is only by the individual ownership and cultivation of plants and the propagation of domestic animals and birds for food that we have been able to feed our own people, and in the future we must look largely to individual ownership and propagation to supply our increasing population with game. When it is made legal and profitable for men to raise game and sell it in the markets, a supply will be forthcoming as regularly as the crops of corn or potatoes, or as the annual supply of shell-fish, eggs, poultry, hogs or cattle.

We are now sending millions of dollars to other countries for game that easily might be produced here, and many wealthy American sportsmen go abroad and pay enormous sums for their shooting. An economic problem that we now face is "how to keep at home the vast sum of money that goes abroad for shooting rights and game."

THE INTRODUCTION OF FOREIGN GAME BIRDS.

When civilization, the settlement of the country and the overshooting which accompanies it have extirpated the native game, it is folly to introduce imported game expecting it to thrive in a wild state under the same conditions that have brought about the destruction of the native game. If foreign game is fostered and protected at all times it may increase for a while, but whenever it is exposed to the same amount of shooting that extirpates native game, it vanishes like mist before the summer sun. Give the indigenous game the same care and protection that must be given to foreign game to establish it, and the results will be far more satisfactory. No naturalist would expect any introduced game bird to thrive better in this country than the native birds, which have become exactly suited to their environment by centuries of natural selection. Most of the attempts to foster foreign game birds here in a wild state have failed or are doomed to failure. Often apparent success deceives the importers for a few years, only to be followed by sudden failure. The only instance where unquestioned permanent success has followed such an introduction is that of the Ring-necked Pheasant in the coast region of Oregon, Washington and British Columbia, where the climate is very favorable to the species. In ninety-nine cases out of a hundred such introductions will fail in the end, unless the introduced birds are protected by law at all times, and even then many of them will fail. In the successful case there are chances that the foreign species will either drive out the native game birds or introduce some destructive disease among them.

Nevertheless, there are certain foreign game birds which, if artificially propagated, fed and cared for under conditions similar to those to which they have been accustomed in Europe, may thrive even better than native game birds under such conditions. In regions where the forests have been destroyed and practically all the land has been turned into well-cultivated farms, certain foreign game birds may be made to thrive where Ruffed Grouse, for example, will not



PLATE XXIX.

A breeding pen for Bob-whites established on a Connecticut game farm.
(Photograph by Herbert K. Job.)



PLATE XXX.

Group of Bob-whites in confinement. A part of the breeding stock at the Connecticut Agricultural College, at Storrs, Conn. (Photograph by Herbert K. Job.)

live. Those who are killing the game of this country must put back into the coverts at least two game birds for every one which they kill if we are to continue to have game, and this can be done only by means of artificial propagation on game farms and preserves.

GAME PRESERVING.

If we ask why game is still plentiful in the British Isles and some other long-settled European countries, the private game preserve answers the question. Game is plentiful because there are many persons interested in propagating, rearing, shooting and selling it, and many thousands of gamekeepers are devoting their lives to it. The birds which form the basis of game-bird preserving are the Ring-necked Pheasant, the English Pheasant and the Mallard Duck, all of which are not much more difficult to rear than domestic poultry. Pheasants have been reared by man since before the time of the Roman conquerors, and Mallards no man knows how long. These two birds may be depended upon to do well on preserves in this country. There is no difficulty in breeding them successfully in large numbers in New England, as has been demonstrated by the Thayers, at Lancaster, Mass., and others in this and other New England States. In addition to these birds the European Partridge may be reared successfully in this country, with proper care and feeding, on game farms. The Hungarian Partridge is recommended for this climate as it is believed to be more hardy than the English bird; but too much dependence should not be placed on foreign Partridges, for even in England, where the people have been propagating them for many years, there has been much complaint of a recent scarcity of the birds. Objections to the killing and sale of birds raised in this manner would apply also to the killing and sale of poultry, sheep and hogs, and laws should permit killing and sale of birds reared on game farms, everywhere, as in Massachusetts. Under present conditions (1911) it is not a profitable market industry. I asked a poultryman why he did not raise wild Ducks for the market, and he promptly

replied that he could make more money raising Pekin Ducks; but were both the sale of wild game and the importation of cheap foreign game prohibited; the demand for game would soon make the rearing of Pheasants, Mallards and Guinea Fowl an important industry. Undoubtedly it would be largely undertaken by well-to-do landowners of sporting proclivities, who would look to the sale of game to pay part of their shooting expenses. Even now the rearing of Pheasants, Mallards and Wood Ducks for propagating purposes is a profitable business for expert game farmers.

Success in game preserving depends mainly on the proficiency of the gamekeeper. Unless experienced gamekeepers can be secured from England or Scotland, the chances of immediate success are small, except, perhaps, with Guinea Fowl and Mallards. State game officials are experimenting in the propagation of game, and they will soon be able to advise others how to guard against costly mistakes.

Gamekeepers find that it is very important to control the natural enemies and diseases of the game, for nature resents any attempt to interfere with her laws. The gamekeeper, like the farmer, is working against nature, and, like the farmer also, he will find that the enemies of his undertaking will multiply whenever he attempts to raise on a certain piece of land more of any species of plant or animal than nature would grow there. Cats, Hawks, foxes and other "vermin" seek the gamekeeper's preserve as they do the poultry yard. The gamekeeper must go gun in hand. The disinfection of brooders, coops and ground also is important. Nevertheless, success in rearing both foreign and native game is assured to those who diligently follow right methods.

The European species most successfully preserved are those of the open land or the heath. Wood Grouse, like the Capercaillie and the Black Grouse, have become almost extinct on the British Isles, while the heath Grouse, Pheasants and Partridges are bred on farms and preserves in large numbers. Our limited experiments with native American game have given similar results. It seems not to be very difficult to rear Bob-whites and Prairie Chickens, but no one

has had marked success as yet with the Ruffed Grouse or any other of the woodland Grouse. Much may be done, however, by stocking game farms with the favorite food plants of these birds and protecting the birds from vermin.

Many game preserves already are established in this country. In some cases the lands of farmers owning or leasing contiguous farms are leased by an individual or a club for shooting purposes. This does not interfere with the cultivation of the land, and in some cases the lessee provides a gamekeeper to watch for poachers and to destroy vermin, a moderate amount of shooting is done and the game increases on the preserve, while the overflow makes better shooting in the surrounding country. Individuals and clubs have bought large tracts of land for preserves. Many game farms have been established along the Atlantic seaboard, varying in size from a few hundred acres to twenty-five thousand acres. These include preserves established solely for large game, and others maintained entirely for water-fowl. Some are devoted chiefly to native upland game birds, and others for the most part to the propagation of Pheasants and other foreign game birds. The propagation of game birds has only recently begun in this country, but large numbers of Pheasants have been reared, particularly in New Jersey. Some success has been attained already with native game birds. We have learned that we can propagate the Bob-white, Canada Goose, Wood Duck, Black Duck, Mallard and Blue-winged Teal, and in time we shall no doubt be able to produce these birds in large numbers. Prof. C. F. Hodge has reared the Ruffed Grouse in captivity, but only on a small scale.

Game farms provide a refuge for both game birds and song birds; they increase all useful birds. The owner has an interest in keeping up the stock, which also serves to replenish the depleted covers of the surrounding unprotected country.

The principal objections to game preserves are that they exclude the public and are unpopular. They are considered un-American, as they give a few people a monopoly on hunting privileges within their borders. Preserves increase and protect the game if properly managed. In this they are

un-American, for under the American plan of free shooting everywhere for everybody we destroy the game and do nothing to replenish the supply. There is so much land in this country that millions of acres might be spared for preserves and there would still remain enough for public hunting grounds, where the supply of game from native breeding birds and the overflow from the preserves would be greater than that which the whole country now maintains.

The prejudice against game preserves arises largely from the fact that too many preserves in this country are merely lands from which the public is shut out, and on which the owner enjoys exclusive opportunity of shooting wild game which is, in law, the property of the people. In many cases the landowner does nothing whatever to propagate the birds or to increase them; but, instead, attracts them to his preserve that he may shoot them. This is not the kind of game preserving which should be advocated. The public has some rights. The law should be so drawn that a person desiring to establish a game preserve should be required to make it a game farm. In that case he must secure his stock from some private source, — some breeder of game birds in his own or some other State, — and must engage in propagating the birds; then they are as much his own as are poultry or cattle under the same conditions, and there is no reason why he should not prohibit other people from shooting them on his land, nor is there any reason why he should not be allowed to sell them in the market under proper restrictions. All birds which escape from his land and run wild become public property, subject to the same laws as any other wild game, and thus he becomes a public benefactor. On the other hand, the public must recognize the justice of the trespass laws, and the fact that the landowner has the legal right to exclude trespassers from his holdings. The shooting public should be more considerate of the rights of the property owner. If they were more regardful of such rights far less land would be posted against trespassers. Any man who goes unbidden on the land of another should regard himself as a trespasser, and should take no undue liberty thereon.

The game farm is here to stay and in time will show beneficent results, but it cannot be depended upon alone to increase our game. Restrictive game laws will be doubly necessary to conserve the wild game wherever free shooting is allowed.

There is one serious objection to the introduction of foreign game birds, and that is the danger of introducing disease which may be extremely fatal to our native game birds. About the time that the European House Sparrow (*Passer domesticus*) was introduced into Rhode Island, an enteric disease called the blackhead appeared among Rhode Island Turkeys. No satisfactory preventive or cure for the disease has been found, and it almost has destroyed the Turkey industry in New England. Investigations made under Dr. Philip B. Hadley of the Rhode Island experiment station proved that over sixty per cent. of the English Sparrows about the station carried the germ of this disease. It was found also in chicks, Pigeons and some other birds, and now is distributed generally among poultry. The disease is ascribed by some authorities to a coccidium and by others to an amoeba, both of which are present in diseased birds. The disease is identical with a white diarrhoea of chicks, and is now quite generally distributed in the United States. It is extremely deadly to Ruffed Grouse and Bob-whites in confinement, and is carried by Pheasants as well as poultry. What effect this and certain bacterial diseases have had or will have on the native Grouse and Quail, in field and cover, can only be conjectured. Outbreaks of a "Grouse disease" are well known in England and Scotland. A very fatal Quail disease has appeared in the southern States. It seems probable, however, now that so many Pheasants and Partridges have been imported into this country, that the harm has been done, that their diseases are all here and that further importations can do no more than to add to their dissemination.

Another objection to foreign birds, which often is brought up, is that if they become too numerous they will drive out the native birds; that the European Partridge and the Pheasant will take the food that otherwise would support the Bob-white in winter; and that the Pheasants, where numerous,

will drive out both Bob-whites and Grouse; but there need be little fear of this, for short open seasons each year will prevent any undue increase of any game bird outside of the preserves. The main energy of the game preserver, however, should be directed toward the conservation of native game birds, which, from the sportsmen's point of view, are far superior to those of foreign origin.

What is called the "more game" movement, the exponent of which in this country is Mr. Dwight W. Huntington, editor of the *Amateur Sportsman*, has resulted in an increased interest in game farms and a large demand for birds for breeding purposes.

Among the many books on game and gamekeeping, Mr. Huntington's recent work *Our Wild Fowl and Waders* is particularly timely, as it deals largely with methods of preserving American water-fowl. The United States Department of Agriculture has issued some valuable papers on game preserving and game preserves which should be in the hands of every prospective game breeder.¹

The Game Preserve Increases Insectivorous Birds.

The question often is asked by bird protectors, "Why should we take an interest in conserving game birds?" And the complaint goes on. "We protect them, feed them and care for them, going to considerable trouble and expense, only to see them exterminated by sportsmen and market hunters during the next open season. The sportsmen, the market hunters, the marketmen, the gunmakers and the ammunition makers care nothing for the protection of birds. Their only interest in bird protection is that they may have more birds to shoot." There is a grain of truth here, but, nevertheless, the conservation of game birds is the most important of all bird protection. As hereinbefore stated, the highest value of birds to man is their æsthetic and educational

¹ The following bulletins bear on the subject: Pheasant Raising in the United States, by Henry Oldys, assistant, Biol. Surv., with a chapter on Diseases of Pheasants, by George Byron Morse, M.D., U. S. Dept. of Agr., Farmers' Bulletin No. 390; Introduction of the Hungarian Partridge into the United States, by Henry Oldys, from Year Book of Dept. of Agr. for 1909; Private Game Preserves and their Future in the United States, by T. S. Palmer, U. S. Dept. of Agr., Bureau of Biol. Surv., Circular No. 72.

value, and the game birds possess qualities and attributes which in this respect place them high among other species.

The hunting instinct will not down. It is in the blood of the European and the American. Game birds are among its legitimate objects. Exterminate the game birds and other species most certainly will follow. Protect and increase the game birds and those most concerned in killing them, the sportsmen, become the best friends of the nongame birds.

The greatest beneficiaries of an increased game supply and the establishment of game preserves are the birds themselves. They are well taken care of, well fed, and, as stated elsewhere, game preserving increases the numbers of both game and nongame birds.

Where the game birds are now most hunted they most need protection to prevent extinction. I say most emphatically to the bird protectionist, *conserve the game birds. Here is where all bird protection begins.* Game conservation will reduce the numbers of birds of prey, but it will not exterminate them, as all intelligent game preservers eventually learn that it is unwise to exterminate any bird.

Game conservation will increase the numbers of insectivorous birds because of the better conditions it makes for their protection. It gives them safe refuges from the hunter and reduces their natural enemies. The great number of small birds in the northwestern European countries — a much greater number relatively than is found in the United States — is in part the result of the system of game preserving, which so protects and increases the smaller birds that, in spite of the fact that millions of them are killed for food and sport in southern Europe, they still are produced annually in such enormous numbers that the slaughter in the south has no noticeable effect in the north. *The insectivorous birds are the chief beneficiaries of the system of game preserving.*

METHODS OF ATTRACTING WATER-FOWL.

Those who are accustomed to the presence of water-fowl find that the inland waters of New England have lost much of their attractiveness. They seem dreary and blank in their

lack of bird life. One may ride day after day through Massachusetts, by train or car, and rarely, if ever, see a wild Duck in inland waters.

This decrease of water-fowl is so unnecessary and so readily may be remedied that it seems anomalous that an intelligent civilized people should have allowed such a condition to continue so long.

When we have stopped spring shooting, night shooting and the pursuit of wild-fowl in boats, decoy Ducks and suitable food will bring back the birds to our inland waters. These two essentials are almost equally important. Wherever water-fowl are kept in a pond, wild-fowl will come in, provided they are not too much disturbed. As hereinbefore stated, Grebes never should be disturbed or shot, as they are worthless as food and make excellent call birds. A flock of domesticated Ducks of many colors is not usually effective in attracting the shy wild-fowl; but full-blooded wild Mallards or their descendants are excellent. Pinioned Black Ducks, gray call Ducks, a cross between the Mallard and Black Duck or any native wild Ducks or Geese make good call birds. It is essential to have a rather large flock of call birds to ensure success in attracting wild ones. With such a flock many wild Ducks or Geese may be lured to almost any country place where there is water, or even into a village.

In the spring of 1908 Mr. J. T. Miner of Kingsville, Ont., had thirteen tamed Canada Geese at a pond near his home in the village. Eleven wild birds came in and joined them. Although five of these were shot, the other six remained and became so fearless as to follow the tame Geese into a shed. On May 15 they flew very high in the air and left for the north. In March, 1909, thirty-two came, and only ten of these are known to have been shot, but two disappeared later, and on May 1 the flock left for the north. In March, 1910, eighteen came back, and two weeks thereafter there were about three hundred; thirty-six of these were shot. About April 16 between fifty and sixty left, and the next day the photograph represented in the accompanying illustration was taken. I am indebted to Mr. P. A. Taverner of the Geological



PLATE XXXI.

Wild rice in flower. (One-half natural size.)

Survey at Ottawa for the photograph and the facts connected with it. (See Plate XXVI, facing page 509.)

Wild-fowl may even be attracted into suitable ponds in the largest cities in this way, provided no shooting is allowed, as in Central Park, New York, and in the smaller ponds of Boston. Mr. Horace W. Wright has published in the *Auk* for 1910 a paper on "some rare wild Ducks wintering at Boston," in which he states that in Jamaica Pond, Willow Pond, Leverett Pond and Chestnut Hill Reservoir wild Ducks remain more or less through the winter. He illustrates his article with some excellent photographs of Canvas-backs, Baldpates and other wild-fowl taken in these ponds. Mr. Charlesworth Levey also has photographed many of these birds in these ponds and has published in *Bird-Lore* an article on the subject, with some illustrations. Some of his photographs are reproduced in this volume. Mr. C. J. Maynard publishes in his *Records* of January 20, 1912, a statement from Mrs. Levey and Charlesworth Levey that on December 26, 1911, there were two hundred and eighty-two Black Ducks, one Mallard, one male and two female Golden Eyes, and four male and one female Lesser Scaup, on Jamaica Pond, and that on Leverett Pond there was a fine male Baldpate. These birds have been attracted to the Boston ponds by Mallard Ducks placed there by park employees. Next to decoys, food is the best lure, as wild-fowl will not stay very long where they can find nothing to eat. Grain, such as corn, wheat or rice, scattered in shallow water where the Ducks can get it from the bottom, will attract nearly all species of river water-fowl; but there are many water plants, which are of no value to man, from which these birds will secure a large part of their sustenance, and where such plants are not present it is well to introduce them, provided conditions are favorable for their establishment and growth. Chief among these are wild rice (*Zizania palustris* and *Zizania aquatica*), wild celery (*Vallisneria spiralis*) and many water plants called pondweeds.

It is important to know these plants, where they may be obtained and under what conditions they will succeed. Most of them, when once established, require no further care, and

produce a perennial supply of duck food indefinitely. Some of them now grow commonly in our inland waters, and others have to be introduced.

The Biological Survey recently has issued a very useful circular written by Mr. W. L. McAtee, which describes and illustrates wild rice, wild celery and pondweeds of the genus *Potamogeton*. From this circular most of the information given below regarding these plants is taken.¹ Mr. McAtee finds by examining the stomach contents of many individuals of sixteen species of game Ducks, taken in different parts of the United States, that wild rice, wild celery and certain pondweeds collectively compose 25.31 per cent. of the total food. The percentage of these foods found in the stomachs of the different species is given in the following table:—

COMMON NAME.	Scientific Name.	Number of Stomachs examined.	PER CENT. OF TOTAL CONTENTS COMPOSED OF —			
			Wild Rice.	Wild Celery.	Pondweeds.	Total.
Mallard,	<i>Anas platyrhynchos</i> , . . .	209	17.13	2.48	12.67	32.28
Black Duck,	<i>Anas rubripes</i> ,	51	12.05	2.37	8.35	22.77
Gadwall,	<i>Chauliastmus streperus</i> , . . .	37			17.64	17.64
Baldpate,	<i>Mareca americana</i> ,	30	7.16	10.00	13.71	30.87
Green-winged Teal,	<i>Nettion carolinense</i> ,	126	4.56	.69	10.32	15.57
Blue-winged Teal,	<i>Querquedula discors</i> ,	86	3.46	.20	9.83	13.49
Shoveller,	<i>Spatula clypeata</i> ,	49			7.83	7.83
Pintail,	<i>Dafila acuta</i> ,	67	4.95	1.80	13.39	20.14
Wood Duck,	<i>Aix sponsa</i> ,	75	11.62	3.17	6.72	21.51
Redhead,	<i>Marila americana</i> ,	60	4.41	11.71	24.38	40.50
Canvas-back,	<i>Marila valisineria</i> ,	60	.33	23.71	42.35	66.39
Scaup, or bluebill,	<i>Marila marila</i> ,	67	1.25	14.46	23.20	38.92
Lesser Scaup, or bluebill,	<i>Marila affinis</i> ,	126	7.49	17.53	8.18	33.20
Golden-eye,	<i>Clangula clangula americana</i> ,	23		2.95	6.56	9.51
Bufflehead,	<i>Charitonetta albeola</i> ,	36	2.22	5.66	4.46	12.34
Ruddy Duck,	<i>Erismatyura jamaicensis</i> , . . .	41		9.54	12.56	22.10
Average,		—	4.78	6.65	13.88	25.31

¹ McAtee, W. L.: Three Important Wild Duck Foods, Bureau of Biol. Surv., U. S. Dept. of Agr., Circular No. 81, 1911.

The percentage of wild rice and wild celery taken seems rather low; but probably many of these Ducks were shot in places where no wild celery grows, or where there was little or no wild rice to be obtained. It seems probable, however, that the pondweeds, individually or collectively, are on the whole more generally distributed, and hence more important, throughout the United States than either wild rice or wild celery. The latter plants, however, are generally considered to be more attractive to wild-fowl than any other, and, though locally restricted in distribution, may be grown in suitable localities almost anywhere in the United States.

Wild rice is eaten in all stages of growth by one or more species of North American Ducks and Geese, and practically all of them feed on the seed. It is the main fall food of many Ducks in the marshes where it grows. Usually it is picked up by them from the mud under water, where its germination is sometimes delayed for at least eighteen months by various causes, and, consequently, sprouting grain may be found in the stomachs of wild Ducks at any time of the year. Many species eat the shoots; the leaves and stems are eaten by Geese, and the flowers have been found in the stomach of the Wood Duck. The Mallard, Black Duck and Wood Duck appear to be the greatest consumers of this plant.

Wild rice is a tall, round-stemmed, flat-leaved plant. The stem is hollow, with cross partitions between as well as at the joints. The base of the stem is stoutly hook-shaped, and from it extend numerous fibrous roots, which anchor it to the bottom. The flowers may be found from late July to November. The lower branches of the flower head which bear the male flowers are widely separated and stand out from the stem, but the upper branches of pistillate flowers are grouped together and erect. The grain (Fig. 22 A) is from one-half to three-fourths of an inch long, slender and uniform in diameter, with ends rounded or pointed. A perceptible rib runs along one side of the grain and a slight groove along the other. The husk of the seed (Fig. 22 B) has six grooves along it and a long pointed beard or beak, the whole grain and husk being sometimes more than an inch and a half in length.

Wild rice grows naturally from northern Lake Winnipeg to middle Florida and from northern New Brunswick to the Gulf coast in eastern Texas. It does not grow in every suitable place within its range, but in most cases it may be made to

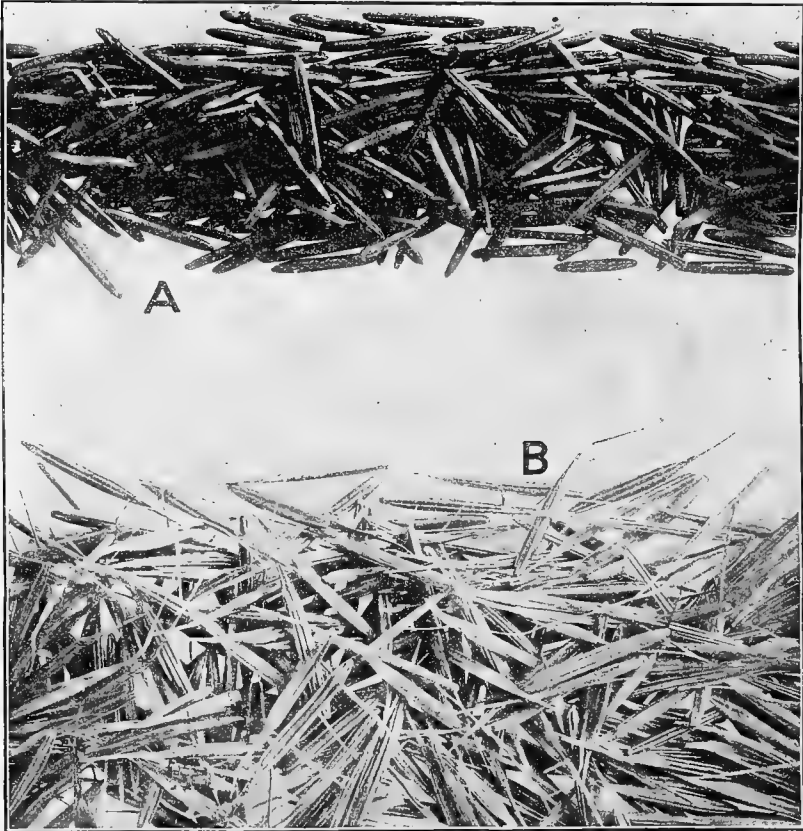


FIG. 22. — Wild rice. (From Circular No. 81, Bureau of Biological Survey, United States Department of Agriculture.)

do so by transplanting. It was transplanted often by Indian tribes, who used it as food. It usually will not succeed in small stagnant ponds or in the margins of swift running streams, but is readily established along the borders of marshy streams where the current is slow, and in large ponds where there is a slight current. It thrives best on a mud bottom,

although it may sometimes succeed in sand. It will grow in brackish tidewater, but will not thrive where the water is appreciably salty to the taste, nor in stagnant water anywhere. The seeds naturally fall into the water and mud about the parent plant, and, being slightly barbed, work gradually into the bottom.

Many people who have planted wild rice seed have been disappointed in the result; but failures have been due in most cases either to planting in unfavorable localities or to lack of vitality in the seed. Seed gathered by the Indians is either dried or baked and never germinates. The seed must be kept cool and moist from the time it drops from the plant until it is sown or planted. Seeds of wild rice ripen and drop off a few at a time; therefore, preparatory to gathering it, it is best to tie up the heads and thus save the seed on the stalk. When the seed is gathered it should be packed in damp moss, kept cool and sown broadcast as soon as possible in from one to three feet of water. There is a disadvantage, however, in planting seed in fall if any water-fowl frequent the locality, as they are likely to destroy a large part of it. If it is kept moist in cold storage at a temperature of from 32 degrees to 34 degrees F. until late spring, this danger will be minimized, and the effects of spring freshets will be avoided.

The method of preserving the seed has been carefully worked out by the Bureau of Plant Industry of the United States Department of Agriculture, and several reliable firms now offer the seed for sale, and will deliver it properly packed in good condition in either spring or fall. It should be sown as quickly as possible after removal from cold storage, and quite thickly, as the growing plants when near together support one another, and their root anchorage holds the mud in place.

Wild celery is the food that has made the Canvas-back famous; but many other Ducks feed upon it, and it betters the quality of their flesh. The Redhead, the Scaups and other diving Ducks easily can obtain the succulent buds of this plant; but none feeds on it so habitually as does the Canvas-back. The non-diving Ducks cannot, as a rule, secure the tender buds

and the rootstocks unless they steal them from the diving Ducks, but all parts of the plant are eaten by Ducks, and it is a very important duck food. Mr. McAtee found that even the Scoters, or so-called "Coots," on a Wisconsin lake in fall lived mostly on this plant, and the real Coot (*Fulica americana*) is fond of it and commonly dives for the buds. The non-diving Ducks feed mainly upon the leaves.



FIG. 23.—Wild celery. (Reduced from Reichenbach.) (From Circular No. 81, Bureau of Biological Survey, United States Department of Agriculture.)

Wild celery is found in some of the best ducking ponds of New England. It is a submerged plant, with long, flat, flexible leaves of light translucent green, from one-fourth to three-fourths of an inch in width. A leaf held up to the light shows numerous fine, straight, parallel veins running along its entire

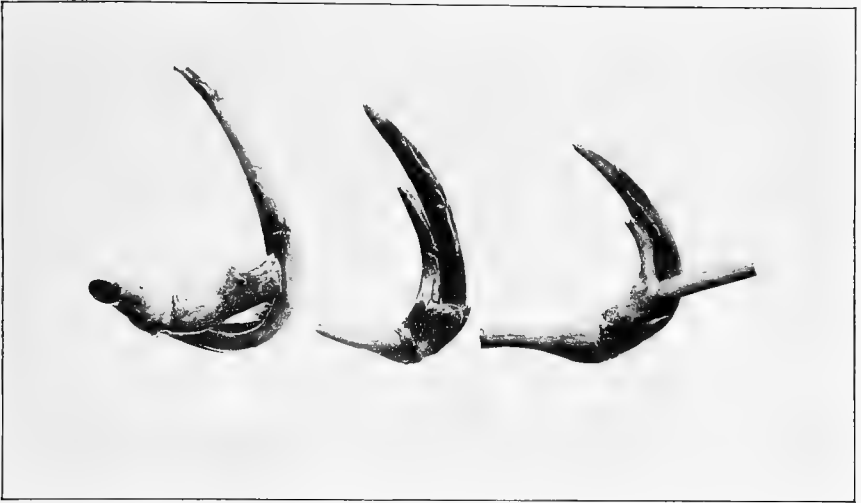


PLATE XXXII.
Winter buds of wild celery.



PLATE XXXIII.
Seed pods of wild celery.

length. There are also one middle vein and two veins near the edge, all of which are more prominent than the rest. These are connected at intervals by cross veinlets. Sometimes this plant is confused with eelgrass (*Zostera marina*), which grows in tidewater, but the leaves of wild celery grow in bundles from the rootstock, while those of eelgrass grow singly and alternately on opposite sides of the stem. Wild celery is sometimes confounded with pipewort (*Eriocaulon*), a fresh-water plant, and also with certain stages of arrow-head. The staminate flowers of the wild celery, attached at the base of the plant, shed pollen which floats on the water and fertilizes the pistillate flowers, which are attached to a long, slender, rounded stem. This stem assumes a spiral form, and by its contraction draws the flower under water after fertilization, where the seed pod is developed. This seed pod and its spiral stem distinguish this from all other fresh-water plants. The pod is more slender than a common lead pencil, is from three to six inches long and contains about fifty small dark seeds to the inch, embedded in a clear jelly within the pod.

Wild celery is not more difficult to plant than wild rice and may be grown anywhere in the United States under the requisite conditions. It may be propagated by seeds and by winter buds (Plate XXXII), or by fragments of the plant with a little of the rootstock attached. Buds, plants or seeds must not be allowed to dry or ferment before planting. The seed pods ripen from September to November and fall to the bottom, from



FIG. 24.—Leaves of wild celery, showing venation. (Natural size.)

which they may be collected by a rake or net on still days in late October or early November. Winter buds may be taken at the same season, or the plants may be taken up for transplanting as soon as they appear in spring. They may be kept in damp moss for a short time or in water in cold storage for longer periods. They may be planted on muddy or sandy bottoms, in from three and one-half to six and one-half feet of water. A sluggish current is best adapted to the growth of this plant, but it grows well in nearly stagnant fresh water.

If pods are used, they may be broken up into pieces half an inch long and sown broadcast, but not too thickly, as the plants spread rapidly. Winter buds or pieces of plants must be weighted by tying stones to them or embedding them in clay balls. Seed-pod sections also may be enclosed in clay balls. They may be sown in the fall, but buds or rootstocks or young plants should be kept in cold storage and sown in May or June.

Dr. R. V. Pierce, in *Forest and Stream* of December 16, 1911, states that he has been very successful in planting wild celery roots by using little rivet tongs with long handles. Two men stationed in the bow of a light boat do the planting, while another man in the stern furnishes the propelling power. With these tongs he says they can readily push the roots into the soft muddy bottom, in four or five feet of water, where they could not be so well planted by wading. Stakes are put up for guides, and the planting of the bottom is thoroughly done. It proved abundantly productive, and produced, he says, thousands of tons of these valuable plants. He has been successful in planting the sago pondweed (*Potamogeton pectinatus*) in the same manner.

Ducks appear to be fond of all pondweeds, and any pondweed would be a valuable attraction to any duck pond. There are no less than thirty-eight species of pondweeds of the genus *Potamogeton* in the United States, of which at least nine (see Fig. 25, and Plates XXXIV, XXXV) are distributed almost universally. The seed of a plant called widgeon grass by Cape Cod gunners has been identified for me by Mr. W. L. McAtee of the Biological Survey as that of *Potamogeton epihydrus*.

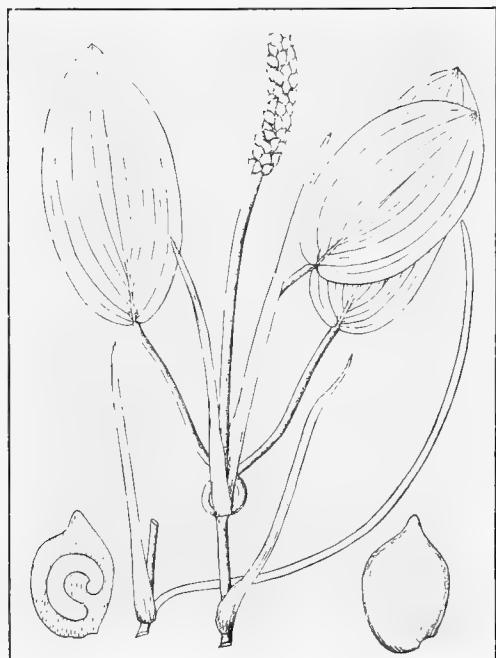


Fig. 1. — *Potamogeton natans*.

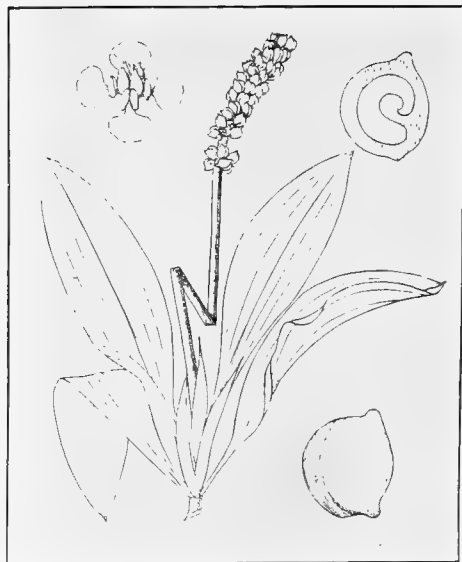


Fig. 2. — *Potamogeton lucens*.



Fig. 3. — *Potamogeton heterophyllus*.



Fig. 4. — *Potamogeton lonchites*.



Fig. 1.—*Potamogeton praelongus*.

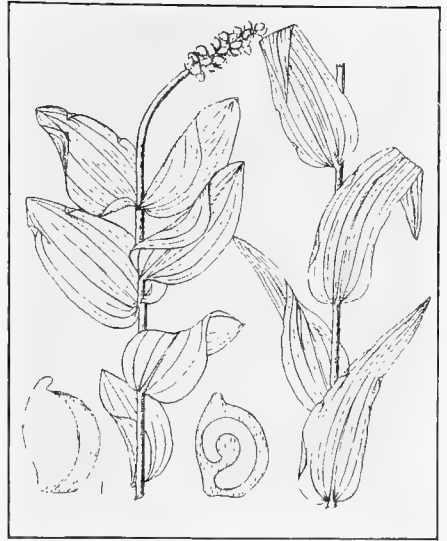


Fig. 2.—*Potamogeton perfoliatus*.

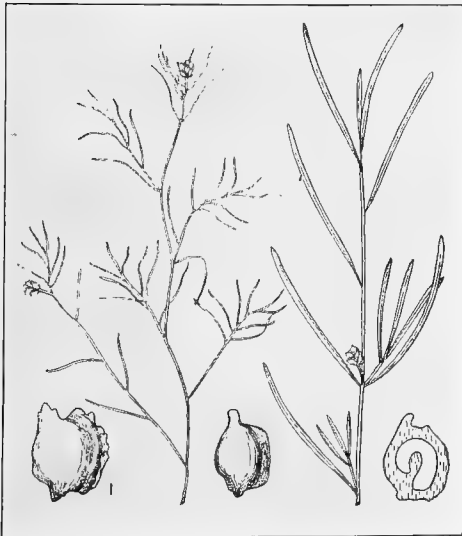


Fig. 3.—*Potamogeton foliosus*.

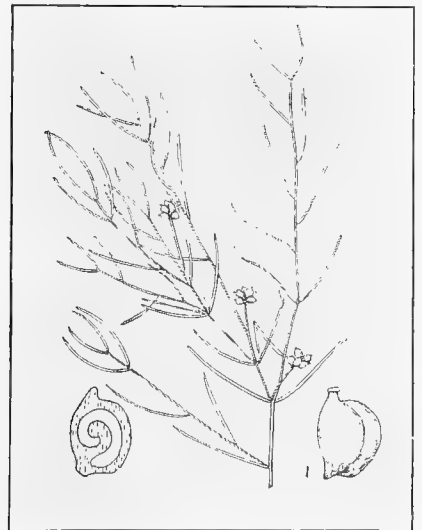


Fig. 4.—*Potamogeton pusillus*.

Wood Ducks and Black Ducks are fond of this pondweed and it grows commonly in some of the ponds of Massachusetts. The widgeon grass of the south Atlantic coast of the United States is quite a different plant, — the ditch grass (*Ruppia maritima*). The sago pondweed (*P. pectinatus*) (Fig. 25) appears to be the most important duck food, and in some cases it forms from sixty to eighty per cent. of the food of the Canvas-back. It is known sometimes as fox-tail grass. It is a submerged plant, like the other pondweeds, and, like them, bears small clusters of seeds or nutlets near the surface. They are formed somewhat like little bunches of grapes. They ripen at different times, but in the north may be looked for after August. Figs. 25 and 26 show the threadlike leaves, the slender rootstocks and the tubers.

Pondweeds may be planted by mowing them with the seeds attached and scattering them about the lake; or the seeds may be collected and sown broadcast or in clay balls. A mud bottom is preferable, but sago pondweed and redhead grass (*P. perfoliatus*) (Fig. 2, Plate XXXV) will grow in sand. Some species, including sago pondweed, will grow in brackish or even salt water. They will do well in water from two to six feet deep. They may be planted immediately after gathering, or the seed may be kept in cold storage until spring.

Deer, moose and cattle are rather fond of wild rice. Rails, Bobolinks and Blackbirds eat the seed. Muskrats eat and tear up all these plants. Some fish eat them, but the German carp is the most destructive of all agencies. It absolutely



FIG. 25.—Sago pondweed, a very important duck food. (Reduced.) (From Sunset Magazine, February, 1905.)

eradicates duck food and should never be introduced anywhere. It may be exterminated in small ponds by screening outlets and inlets and draining the ponds dry. In large lakes its extermination is impracticable.

In the western States the wappato is considered among the best of duck foods. It is a tuber-bearing plant, and although I have never had an opportunity to identify the western plant, this name is given to *Sagittaria latifolia*, an arrow-head or arrowwort. This and *Sagittaria teres* are found in ponds of Massachusetts, and probably are quite as attractive as a duck



FIG. 26.—Tubers of sago pondweed. (Natural size.) (From Circular No. 81, Bureau of Biological Survey, United States Department of Agriculture.)

food as is *S. latifolia* in the west. The Indians of Oregon use the tubers as food.

Mr. McAtee has identified for Dr. J. C. Phillips another duck food which grows in Wenham Lake, and which proves to be quillwort (*Isætes echinospora*).

Smartweeds (*Polygonum*) are eaten by many wild-fowl, and certain water grasses are favorite foods of some species. Mr. Wilton Lockwood, who has had much experience in rearing wild-fowl, recommends *Poa aquatica*, a European plant which grows naturally here. Probably *Glyceria grandis*, the reed meadow grass, which somewhat resembles *P. aquatica*, would be equally attractive. It grows along the banks of streams and in wet meadows.

Wild Geese eat the roots of certain reeds and are very



PLATE XXXVI.—A WINTER SHELTER AND FEEDING PLACE FOR QUAIL.
Constructed by the Connecticut Commission on Fisheries and Game.

fond of young and tender grass and grain. If a field, near a pond or river, is sown with winter wheat or winter rye, the young plants will attract Geese, because such plants offer them a supply of green food late in the fall and early in spring, when other green vegetation is not plentiful.

The Wood Duck sometimes may be attracted to nesting boxes made to resemble hollow limbs.

ATTRACTING UPLAND GAME BIRDS.

The Bob-white prefers a rich farming and grain-raising country to all others, but it is also very important to furnish this bird good cover, and in a thrifty truck-farming region, where clean cultivation prevails, there is little cover left for the Quail. Thickets along fences, bushy swamps, weed-grown fields or thick growths of cane, corn or other grains furnish desirable cover, but winter cover is most important. Grain raising helps fatten Bob-whites, as they pick up much waste grain in the fields, but weeds where plentiful will take the place of grain, as the Quail will thrive and fatten on weed seeds.

Severe winters are so destructive to the Bob-white that it will pay the game farmer to feed this bird well in winter. A Pennsylvania plan is that of catching coveys and keeping them confined during the severest part of the winter. This has worked very well. In Connecticut and Massachusetts shelters have been put up for feeding places, and goodly numbers of birds have been brought through the winter by this means. A shelter properly constructed will prevent the snow from drifting over the grain or chaff thrown out as food.

Nothing attracts this bird more surely than a field of buckwheat. The following list of food plants eaten by Bob-white is drawn largely from the publications of the Biological Survey, and shows what a wide range of food plants it affects. In addition to these, it feeds on dried grasses in winter and on the leaves of certain weeds which remain intact during a part, at least, of the inclement season.

FRUITS EATEN BY THE BOB-WHITE.

Apple,	<i>Pyrus Malus.</i>
Bastard pennyroyal,	<i>Trichostema dichotomum.</i>
Bayberry,	<i>Myrica carolinensis.</i>
Beggar-ticks,	<i>Bidens sp.</i>
Black alder,	<i>Ilex verticillata.</i>
Blackberry, high bush,	<i>Rubus sp.</i>
Blueberry,	<i>Vaccinium sp.</i>
Buttonweed,	<i>Diodia teres.</i>
Checkerberry,	<i>Gaultheria procumbens.</i>
Cherry: —	
Cultivated,	<i>Prunus sp.</i>
Ground,	<i>Physalis sp.</i>
Wild black,	<i>Prunus serotina.</i>
Climbing bittersweet,	<i>Celastrus scandens.</i>
Crownbeard,	<i>Verbesina sp.</i>
Dewberry,	<i>Rubus sp.</i>
Elder,	<i>Sambucus canadensis.</i>
Marsh,	<i>Iva ciliata.</i>
Everlasting,	<i>Anaphalis margaritacea and</i> <i>Gnaphalium sp.</i>
Flowering dogwood,	<i>Cornus florida.</i>
Grape, frost,	<i>Vitis sp.</i>
Greenbrier,	<i>Smilax sp.</i>
Haw,	<i>Crataegus sp.</i>
Black,	<i>Viburnum prunifolium.</i>
Holly,	<i>Ilex opaca.</i>
Honeysuckle,	<i>Lonicera sp.</i>
Huckleberry,	<i>Gaylussacia sp.</i>
Mulberry, red,	<i>Morus rubra.</i>
Nightshade,	<i>Solanum nigrum.</i>
Orange hawkweed,	<i>Hieracium aurantiacum.</i>
Palmetto: —	
Cabbage,	<i>Sabal Palmetto.</i>
Saw,	<i>Sabal serrulata.</i>
Partridge berry,	<i>Mitchella repens.</i>
Poison ivy,	<i>Rhus Toxicodendron.</i>
Ragweed,	<i>Ambrosia artemisiifolia.</i>
Great,	<i>Ambrosia trifida.</i>
Rib grass,	<i>Plantago lanceolata.</i>
Rose,	<i>Rosa sp.</i>
Sarsaparilla,	<i>Aralia sp.</i>
Sassafras,	<i>Sassafras variifolium.</i>
Solomon's seal,	<i>Polygonatum sp.</i>

Sour gum,	<i>Nyssa sylvatica.</i>
Strawberry,	<i>Fragaria sp.</i>
Sumach: —	
Dwarf,	<i>Rhus copallina.</i>
Scarlet,	<i>Rhus glabra.</i>
Staghorn,	<i>Rhus typhina.</i>
Sunflower,	<i>Helianthus annuus.</i>
Thimbleberry,	<i>Rubus occidentalis.</i>
Trumpet creeper,	<i>Tecoma radicans.</i>
Virginia creeper,	<i>Psedera quinquefolia.</i>
Wax myrtle,	<i>Myrica cerifera.</i>

SEEDS EATEN BY THE BOB-WHITE.

Acacia,	<i>Acacia sp.</i>
Ash,	<i>Fraxinus sp.</i>
Bean: —	
Lima,	<i>Phaseolus lunatus.</i>
Trailing wild,	<i>Strophostyles helvola.</i>
Pink wild,	<i>Strophostyles umbellata.</i>
Beech,	<i>Fagus grandifolia.</i>
Bindweed,	<i>Convolvulus sp.</i>
Black,	<i>Polygonum Convolvulus.</i>
Box elder,	<i>Acer Negundo.</i>
Carpetweed,	<i>Mollugo verticillata.</i>
Charlock,	<i>Raphanus raphanistrum.</i>
Chestnut,	<i>Castanea dentata.</i>
Chickweed,	<i>Stellaria media.</i>
Climbing false buckwheat,	<i>Polygonum scandens.</i>
Clover: —	
Bush,	<i>Lespedeza capitata.</i>
Creeping bush,	<i>Lespedeza repens.</i>
Hairy bush,	<i>Lespedeza hirta.</i>
Japan,	<i>Lespedeza striata.</i>
Red,	<i>Trifolium pratense.</i>
White,	<i>Trifolium repens.</i>
Corn cockle,	<i>Agrostemma Githago.</i>
Cranesbill,	<i>Geranium sp.</i>
Dock,	<i>Rumex crispus.</i>
Florida coffee,	<i>Sesbania macrocarpa.</i>
Grass: —	
Barnyard,	<i>Echinochloa crus-galli.</i>
Barbed panicum,	<i>Panicum barbulatum.</i>
Crab,	<i>Digitaria sanguinalis.</i>
Green foxtail,	<i>Setaria viridis.</i>
Sheathed rush,	<i>Sporobolus vaginæflorus.</i>

Grass — *continued.*

Slender finger-grass,	<i>Digitaria filiformis.</i>
Slender spike,	<i>Uniola laxa.</i>
Spreading panicum,	<i>Panicum dichotomiflorum.</i>
Tall smooth panicum,	<i>Panicum virgatum.</i>
Timothy,	<i>Phleum pratense.</i>
Witch,	<i>Panicum capillare.</i>
Yellow foxtail,	<i>Setaria glauca.</i>
Gromwell,	<i>Lithospermum officinale.</i>
Corn,	<i>Lithospermum arvense.</i>
Hog peanut,	<i>Amphicarpa monoica.</i>
Hornbeam,	<i>Carpinus caroliniana.</i>
Jewelweed,	<i>Impatiens sp.</i>
Knotweed,	<i>Polygonum aviculare.</i>
Locust tree,	<i>Robinia Pseudo-Acacia.</i>
Lupine,	<i>Lupinus perennis.</i>
Morning glory,	<i>Ipomœa sp.</i>
Oak: —	
Live,	<i>Quercus virginiana.</i>
Swamp,	<i>Quercus palustris.</i>
White,	<i>Quercus alba.</i>
Pea: —	
Cowpea,	<i>Vigna sinensis.</i>
Downy milk,	<i>Galactia volubilis.</i>
Garden,	<i>Pisum sativum.</i>
Partridge,	<i>Cassia Chamæcrista.</i>
Sensitive,	<i>Cassia nictitans.</i>
Persicaria,	<i>Polygonum lapathifolium.</i>
Pennsylvania,	<i>Polygonum pennsylvanicum.</i>
Pigweed,	<i>Chenopodium album.</i>
Rough,	<i>Amaranthus retroflexus.</i>
Pine: —	
Long-leaved,	<i>Pinus palustris.</i>
Scrub,	<i>Pinus virginiana.</i>
Prairie rhynchosia,	<i>Rhynchosia latifolia.</i>
Psoralea,	<i>Psoralea sp.</i>
Puccoon,	<i>Lithospermum canescens.</i>
Redbud,	<i>Cercis canadensis.</i>
Red maple,	<i>Acer rubrum.</i>
Rush,	<i>Scirpus sp.</i>
Sedge,	<i>Cyperus sp.</i>
Tussock,	<i>Carex stricta.</i>
Sida,	<i>Sida spinosa.</i>
Skunk cabbage,	<i>Symplocarpus fetidus.</i>
Slender paspalum,	<i>Paspalum setaceum.</i>

Smartweed,	<i>Polygonum Hydropiper.</i>
Spurge: —	
Flowering,	<i>Euphorbia corollata.</i>
Spotted,	<i>Euphorbia maculata.</i>
Sorrel: —	
Sheep,	<i>Rumex Acetosella.</i>
Yellow,	<i>Oxalis stricta.</i>
Texas croton,	<i>Croton texensis.</i>
Three-seeded mercury,	<i>Acalypha gracilens.</i>
Trefoil,	<i>Lotus sp.</i>
Tick,	<i>Desmodium nudiflorum.</i>
Tick,	<i>Desmodium grandiflorum.</i>
Vervain,	<i>Verbena stricta.</i>
Vetch,	<i>Vicia sp.</i>
Violet,	<i>Viola sp.</i>
Witch-hazel,	<i>Hamamelis virginiana.</i>

The only way in which a region can be made attractive to Grouse is to provide dense thickets and thick pine groves for shelter, and to cultivate or save from the woodman's axe the plants from which the Grouse get most of their food. The Ruffed Grouse will eat grain sometimes in winter, but is not often attracted by it.

A plentiful supply of winter berries, like the barberry, the sumach and others which hang long on the stem, with such evergreen plants as laurel and wintergreen, must be available.

The following list contains many of the food plants which are attractive to the Ruffed Grouse, and this bird is known to feed upon them all: —

FOOD PLANTS OF THE RUFFED GROUSE.

Acorns: —	
Scrub oak,	<i>Quercus ilicifolia.</i>
Scrub chestnut oak,	<i>Quercus prinoides.</i>
White oak,	<i>Quercus alba.</i>
Red oak,	<i>Quercus rubra.</i>
Arbor-vitæ,	<i>Thuja occidentalis.</i>
Aster,	<i>Aster sp.</i>
Avens,	<i>Geum sp.</i>
Azalea,	<i>Rhododendron (Azalea) sp.</i>
Barberry,	<i>Berberis vulgaris.</i>
Bayberry,	<i>Myrica carolinensis.</i>

Beech-drops,	<i>Epifagus virginiana.</i>
Beechnuts,	<i>Fagus grandifolia.</i>
Beggar-ticks,	<i>Bidens frondosa.</i>
Birch buds:—	
Canoe,	<i>Betula papyrifera.</i>
Black,	<i>Betula lenta.</i>
Gray,	<i>Betula populifolia.</i>
Yellow,	<i>Betula lutea.</i>
Bittersweet vine,	<i>Celastrus scandens.</i>
Black alder,	<i>Ilex verticillata.</i>
Blackberry (leaves),	<i>Rubus sp.</i>
Blackberry lily,	<i>Belamcanda chinensis.</i>
Black haw,	<i>Viburnum prunifolium.</i>
Black huckleberry,	<i>Gaylussacia bacata.</i>
Bloodroot,	<i>Sanguinaria canadensis.</i>
Blueberry (buds),	<i>Vaccinium sp.</i>
Blueberries,	<i>V. pennsylvanicum.</i>
Bunchberry,	<i>Cornus canadensis.</i>
Buttercup,	<i>Ranunculus bulbosus.</i>
Catnip,	<i>Nepeta Cataria.</i>
Chestnuts,	<i>Castanea dentata.</i>
Chickweed,	<i>Stellaria media.</i>
Cinquefoil,	<i>Potentilla argentea.</i>
Cockspur thorn,	<i>Crataegus Crus-galli.</i>
Cornel,	<i>Cornus paniculata.</i>
Cudweed,	<i>Gnaphalium purpureum.</i>
Cultivated plum,	<i>Prunus domestica.</i>
Domestic cherry,	<i>Prunus avium.</i>
Elder,	<i>Sambucus canadensis.</i>
Red,	<i>Sambucus racemosa.</i>
False goat's beard,	<i>Astilbe sp.</i>
Ferns (fronds),	<i>Dryopteris spinulosa.</i>
Feverwort,	<i>Triosteum perfoliatum.</i>
Flowering dogwood,	<i>Cornus florida.</i>
Frostweed,	<i>Helianthemum canadense.</i>
Greenbrier,	<i>Smilax sp.</i>
Hazelnuts,	<i>Corylus americana.</i>
Hemlock (seeds),	<i>Tsuga canadensis.</i>
Heuchera,	<i>Heuchera americana.</i>
High-bush cranberry,	<i>Viburnum Opulus.</i>
Hornbeam (seeds),	<i>Carpinus caroliniana.</i>
Horsetail rush,	<i>Equisetum sp.</i>
Jewelweed,	<i>Impatiens sp.</i>
Live-forever,	<i>Sedum sp.</i>
Manzanita,	<i>Arctostaphylos sp.</i>

Maple (seeds),	<i>Acer rubrum.</i>
Maple-leaved arrow-wood,	<i>Viburnum acerifolium.</i>
Mayflower (leaves and buds),	<i>Epigæa repens.</i>
Meadow rue,	<i>Thalictrum sp.</i>
Mountain ash (berries),	(<i>Sorbus</i>) <i>Pyrus americana.</i>
Mountain cranberry,	<i>Vaccinium Vitis-Idæa.</i>
Mulberry,	<i>Morus rubra.</i>
Nannyberry,	<i>Viburnum Lentago.</i>
Partridge berry,	<i>Mitchella repens.</i>
Pepperidge,	<i>Nyssa sylvatica.</i>
Persicaria,	<i>Polygonum pennsylvanicum.</i>
Pitch pine (seeds),	<i>Pinus rigida.</i>
Poisonous laurel,	<i>Kalmia latifolia.</i>
Poplar (young leaves),	<i>Populus balsamifera.</i>
Raspberry,	<i>Rubus strigosus.</i>
Black,	<i>Rubus occidentalis.</i>
Saxifrage,	<i>Saxifraga sp.</i>
Scarlet thorn,	<i>Cratægus coccinea.</i>
Sedges,	<i>Carex lupulina and Cy-</i> <i>perus sp.</i>
Silky cornel,	<i>Cornus paniculata.</i>
Smilax,	<i>Smilax glauca.</i>
Snowberry,	<i>Symphoricarpus sp.</i>
Solomon's seal:—	
Hairy,	<i>Polygonatum biflorum.</i>
Smooth,	<i>Polygonatum commutatum.</i>
Sorrel:—	
Sheep,	<i>Rumex Acetosella.</i>
Yellow,	<i>Oxalis stricta.</i>
Speedwell,	<i>Veronica officinalis.</i>
Sumach:—	
Dwarf,	<i>Rhus copallina.</i>
Scarlet,	<i>Rhus glabra.</i>
Staghorn,	<i>Rhus typhina.</i>
Tick trefoil,	<i>Desmodium sp.</i>
Vetch,	<i>Vicia caroliniana.</i>
Violet,	<i>Viola sp.</i>
Virginia creeper,	<i>Psedra quinquefolia.</i>
Wild black cherry,	<i>Prunus serotina.</i>
Wild crab apple,	<i>Pyrus rivularis.</i>
Wild grape,	<i>Vitis sp.</i>
Wild red cherry,	<i>Prunus pennsylvanica.</i>
Witch-hazel,	<i>Hamamelis virginiana.</i>
Withe-rod,	<i>Viburnum cassinoides.</i>

STATUTORY BIRD PROTECTION.

In the year 1907 I went over the statutes of Massachusetts, from the settlement of the Plymouth Colony to the beginning of the twentieth century, and scanned the enactments framed for regulating the destruction of game. These laws show that from the beginning until recent years the attention of the law-makers has been directed more toward granting special privileges, or monopolies, for the killing of game than toward protecting it. Certain places were reserved for certain people as fowling places, where nets were set. Penalties were provided for interference with these privileges. Laws were passed forbidding any one, except the owner of certain lands, to shoot thereon.

It was not until 1818 that the Ruffed Grouse and Bobwhite were protected during spring and summer, and neither these birds nor the Woodcock received adequate protection until after the beginning of the twentieth century. It was not until recent years that spring protection was given to shore birds, and water-fowl never have been adequately protected in Massachusetts. Spring shooting of wild-fowl was not prohibited, except for one year, until 1909. Wild Turkeys never were protected. Passenger Pigeons had no protection until they were practically extinct, and the Heath Hen had no protection until it was nearly extirpated from the mainland. Other States have been behind Massachusetts, as a whole, in the matter of bird protection, and some of them are still behind (1910), although many have advanced beyond her.

Those who have had experience in game legislation know that most persons who are persistent in introducing and pressing game laws are working for some special privilege or for their own profit, and not primarily for the public interest and the preservation of the game. Our people have failed to see the necessity of restrictive laws and to enact them in time. When this is considered, we need not wonder that the game laws have failed to protect the game. They have failed because necessary restrictions have not been enacted or enforced at all, or not until too late. It is useless to protect a bird per-

petually after it has become extinct, or to establish a close season of a few months each year to protect a bird that is nearing extirpation.

Again, our game laws have failed because they have had no uniformity and no stability; they are constantly changing. One State protects a certain migratory bird during stated months; another, near by, does not protect it at all at any time. It is only during recent years, through the co-operation of national bodies, such as the Biological Survey and the National Association of Audubon Societies, that some semblance of uniformity has been brought about in some of the northern States. Through these agencies, and the efforts of progressive sportsmen, game laws in the United States have been improved considerably in the last decade. Shooting seasons have been shortened; sale and export of game have been prohibited; hunters' license laws, which provide funds for the enforcement of game laws, have swept the country; game commissions have been appointed; game reservations have been established, and in many ways the situation has been much improved, but there is still great chance for improvement.

Much of the money collected for hunting licenses has been diverted to other uses than the protection of birds and the conservation and propagation of game. The system of appointing game commissioners and wardens is wrong. Under our present system a man need never hope to be a game commissioner unless he is an astute, capable politician, or has powerful political friends. The appointee may be a good game commissioner (many of them are), but he must be a keen politician first, last and all the time to secure and retain the place. Having obtained it, he must be constantly on guard, or he may lose it through some political change. The effect which such a system produces on the appointment of game wardens is well known.

The system of appointing game commissioners and wardens should be changed. Civil service principles should rule in appointments. The game laws never will be properly enforced until this is done, and until every good citizen who

is interested in the protection of game stands always ready to lend a helping hand in their enforcement.

This condition can be brought about only by constant, perpetual agitation and educational work, such as the Audubon Societies are carrying on. In the meantime it should be the aim of the game protective associations and game commissioners to initiate and advocate the propagation of game and the establishment of game farms and reservations, not alone for shooting purposes, but for the general increase of the game of the land. When we have, in addition to the force of game wardens in America, a hundred thousand gamekeepers, game will be far more plentiful than now and the laws will be far better observed.

Federal Supervision of the Protection of Migratory Birds.

Next to prohibiting the sale of wild game, this is the most important step to be taken. The Bureau of Biological Survey, which now has charge of federal game protection, should be given the power to regulate open and close seasons for migratory birds, and to make such other regulations for their protection as may be deemed necessary from time to time. The personnel of the Bureau is in a position to know the condition of the game throughout the country, to determine the amount and kind of protection necessary, to make regulations calculated to preserve and increase migratory game birds, and to co-operate with other American governments for the enforcement of needed regulations in the two American continents.

It is proper for each State to regulate the killing of resident birds, such as the Ruffed Grouse and the Bob-white, which pass their lives within its borders. All the conditions regarding these birds may be ascertained by the State authorities, and the State government advisedly may take measures for their protection. How different is the case of migratory birds!

As the matter stands now, the States, and, in some cases, the counties within the States, have laws and regulations differing so widely that a species that is protected at all times in

one State, through which it passes in migration, may have no protection at all in the next. Thus the State that desires to protect any bird effectively can do no less than protect it at all times, and even then its efforts for conservation may be neutralized by its neighbors. Even the majority of States working together for uniform protection will be unable to accomplish what all might attain under uniform regulations. What success could this country expect in repelling a foreign invader were the conduct of the war left to individual States, and were each State allowed to defend the government or not, as it might see fit? It is folly to imagine that the conservation of migratory animals can attain that success under the uncertain, ill-advised and constantly changing regulations of the individual States that it might attain under control or regulation by the federal government.

It is argued that such control is unconstitutional, but whenever the American people are satisfied that it is necessary and imperative, a way will be found to bring it about, and migratory birds will be protected uniformly.

Nevertheless, no protective efforts in any State should be relaxed in anticipation of federal regulation until such regulation has become an accomplished fact.

Public Game and Bird Reservations.

The quotation which follows is taken from my paper entitled *Statutory Bird Protection in Massachusetts*, which was published in 1907 in the annual report of the Massachusetts State Board of Agriculture:—

“Where all other measures promise only failure there is still one resource left, and that is the setting aside of tracts or reservations of woodland, lake, river or shore, within the limits of which all killing of birds by man may be prohibited, under heavy penalties. In such tracts or reservations the resident game and birds may breed unmolested, and thus replenish the surrounding country. Here migrants may find safety to stop and rest from their long journeys.

“A chain of such sanctuaries established along the Atlantic coast of North America probably would preserve our stock of

wild-fowl and shore birds indefinitely. The sanctuary has succeeded in Europe, and it is no new idea here. Already in Massachusetts we have been experimenting with it in a small way. One modification of the plan is to forbid the taking or killing of all wild animals or all birds within certain limits, after the plan adopted on Cape Ann in 1897 and in the town of Essex in 1899. In these cases a time limit of five years was set; but such an act might be made perpetual. Park commissioners are given police powers, and can prevent shooting within the limits of their reservations, as the Metropolitan Park Commission and many city park commissioners now do. In 1899, three thousand acres of land were set aside on Wachusett Mountain as a State reservation, and the commissioners in charge were given police powers; this should ensure a permanent game sanctuary for Worcester County. The enactment in 1907, by which the Commissioners on Fisheries and Game were empowered to take one thousand acres of land on Martha's Vineyard as a reservation for the protection of the Heath Hen and other birds, is an example of direct legislation for this purpose, more of which will, sooner or later, become necessary.

“The many bird reservations now established in this country by the United States government and by the National Association of Audubon Societies have been so successful as to demonstrate the fact that public reservations would solve the problem of game preservation if we could have enough of them. Failing in this, we must depend largely on private enterprise.”

A BRIEF SUMMARY OF NEEDED REFORMS FOR GAME PROTECTION.

If we are to increase the supply of game birds all or most of the following steps must be taken:—

Establish bird reservations for game birds, wild-fowl and shore birds.

Legalize the propagation and sale of such game as can be reared on game farms.

Stop the sale and export of wild game birds.

Secure federal protection of migratory game birds.

Prohibit the sale or use of ultra-destructive or silent guns.

Establish perpetual or long-term close seasons for all birds now in danger of extinction.

Require registration of all native hunters under a license system.

Establish a license fee for alien hunters so high as to be prohibitive.

Prohibit shooting of all wild game birds and wild-fowl in winter, spring and summer.

Limit the number of wild game birds that may be legally taken in a day.

Make game seasons uniform so far as possible, and shorten rather than lengthen them.

Prohibit night shooting and the pursuit of wild-fowl in boats.

Stop forest fires.

Establish a system of town bird wardens in addition to the State game officers.

Limit the number of wandering dogs and cats during the breeding season of the birds.

Educate the people to respect and obey the game laws and bird laws.

ENFORCEMENT OF THE GAME LAWS.

Everywhere we hear the complaint that the game laws are not enforced. In this country the popular idea of a remedy for any wrong condition seems to be legislation without enforcement. We are fond of securing the passage of laws, but feel that we are not concerned in enforcing them; our feeling of responsibility seems to end with the enactment of the statute. The rest is left to the officers of the law. Enforcement is their business, and we are inclined to hinder rather than help them to do their duty.

If any wrong is brought forcibly to our attention, we attempt to pass a law to right it. We make strenuous efforts

to enact a statute designed to correct an evil, and then we promptly go off and forget all about it. The law then is either repealed or becomes a "dead letter," known to few and soon forgotten; neither observed nor enforced.

There is little respect for the game and bird laws. Their enforcement is lax, and many gunners know little and care less about them. Many people consider it rather "smart" to break the game laws or the trespass laws. It is looked upon as rather the "sporting thing" to do. The feeling toward the laws, and the officers who are designated to enforce them, is quite different here from that prevailing in most parts of Canada or in England, where the game laws are respected, and the lawbreaker is looked down upon by decent people and is as much abhorred as a thief.

It is not the fault of game commissioners that game laws are neither enforced nor respected. It is the fault of the system, or, rather, our own fault as a people, for we have permitted and established the system. In criticizing it we are merely criticizing our own handiwork. The whole matter of game protection is in our hands. We do not take enough interest in the game or the game laws; we neither know nor care enough about them.

If every man applying for a hunter's license were obliged to pass an examination on the game and bird laws of his State, or to identify by name specimens of all the birds that the law allows him to shoot, and those that are protected under the law, very few hunting licenses ever would be granted. Are we to expect observance of the law when the gunners themselves do not know the law or the birds that are protected under it? I know of three cases where game wardens have, through ignorance, shot birds which were protected by law, and another warden arrested by mistake an innocent man, and haled him into court, only to find that the birds in his possession were not protected by law. If game wardens do not know the birds, what can be expected of the hunter?

Present conditions can be changed for the better by a movement to awaken public interest in living game birds, and to strengthen the sentiment for their protection.

•

Game protective associations should employ detectives to enforce the game laws, and to see that they are enforced by the game wardens.

Most gunners are too much interested in dead birds and too little in living ones. The most important work that can be done for bird and game protection, and law enforcement, is to teach, with both the spoken and the written word, the value of the bird to man, — its educational, æsthetic and recreative value. The study of the living bird will check the evils of the present day. All who become interested in the bird alive eventually become interested in its protection. We must popularize the study of birds, bird drawing and bird photography; stop legalized extermination, and enact and enforce laws that are designed not to protect the gunner but to protect the birds; we must promulgate the game laws and post them in all public places; foster such organizations as the Audubon Societies and other protective leagues that are striving to interest the people in the bird *alive*, and to teach popular ornithology.

Is it not far better, friend of the keen eye and ready hand, to pick a few difficult shots and go home with a light bag well earned, than to clean up all the birds, and not only spoil your own sport for the future but also that of your brother sportsmen? The ethics of sportsmanship should consist of something better and higher than the making of a record or the gratification of pampered stomachs. A photograph of the living bird in all its strength and beauty is a far better and more lasting trophy than the torn and mangled carcass of a feathered friend.

Some self-denial on the part of the sportsman and an aroused public interest and public sentiment, with liberality in encouraging the propagation of game birds, will bring about respect for the laws, and make the North American continent again the greatest game bird country in the world. If this volume shall contribute anything toward that end it will have served its purpose.

A LIST OF THE NAMES OF THOSE WHO FILLED
OUT THE BLANK FORMS FOR INFORMATION,
WHICH FORM THE BASIS OF THE ESTI-
MATES ON THE RECENT DECREASE
OF GAME BIRDS, WILD-FOWL
AND SHORE BIRDS.

LIST OF NAMES OF THOSE WHO FILLED OUT
BLANK FORMS FOR INFORMATION, WHICH
FORM THE BASIS OF THIS VOLUME.

Aiken, Judge John A.,	Greenfield, Mass.
Allen, Charles F.,	South Duxbury, Mass.
Allen, Thomas,	Montague, Mass.
Allen, William H.,	Dartmouth, Mass.
Ames, Willard,	West Bridgewater, Mass.
Andrews, Henry P.,	Hudson, Mass.
Appleton, John L.,	Nantucket, Mass.
Ashworth, John W.,	Gleasondale, Mass.
Aspinwall, Thomas,	Brookline, Mass.
Aspinwall, W. H.,	Chestnut Hill, Mass.
Austin, E. H.,	Gaylordsville, Conn.
Babson, Edward,	Gloucester, Mass.
Bacon, Vaughan D.,	Barnstable, Mass.
Bailey, Dr. John W.,	Arlington, Mass.
Baldwin, Frank F.,	Hopkinton, Mass.
Baldwin, William Ray,	Newton, Mass.
Banning, Frank,	Hadlyme, Conn.
Bartlett, Henry,	Acushnet, Mass.
Bartlett, Herbert W.,	Plymouth, Mass.
Bass, Charles E.,	Warwick, Mass.
Bassett, Bartlett E.,	Chathamspport, Mass.
Bassett, Joseph E.,	Bridgewater, Mass.
Bassett, Nathan A.,	Bridgewater, Mass.
Bates, Charles,	South Weymouth, Mass.
Bates, N. W.,	East Weymouth, Mass.
Bean, J. W.,	South Hadley Falls, Mass.
Belcher, William B.,	Holbrook, Mass.
Bemis, James E.,	South Framingham, Mass.
Bent, A. C.,	Taunton, Mass.
Besse, Freeman T.,	Wareham, Mass.
Bigelow, Henry B.,	Cambridge, Mass.
Binford, F. A.,	Hyannis, Mass.
Bird, Charles S.,	East Walpole, Mass.
Bishop, Dr. Louis B.,	New Haven, Conn.
Blood, Edmund,	West Groton, Mass.
Blossom, Irving L.,	Cohasset, Mass.
Boutwell, Micah M.,	Lunenburg, Mass.

Bowdish, B. S.,	Demarest, N. J.
Bowditch, James H.,	Boston, Mass.
Boyle, Edward J.,	Boston, Mass.
Bradway, O. E.,	Monson, Mass.
Brastow, Miss Amelia M.,	Wrentham, Mass.
Breck, C. A.,	Methuen, Mass.
Bremer, Theodore G.,	Boston, Mass.
Brett, Franklin,	North Duxbury, Mass.
Brimley, C. S.,	Raleigh, N. C.
Brocklebank, Oliver,	Georgetown, Mass.
Brooks, Clarence M.,	Keene, N. H.
Brown, Frank A.,	Beverly, Mass.
Bruen, Frank,	Bristol, Conn.
Bubier, George M.,	Lynn, Mass.
Buffington, Samuel L.,	Touisset, Mass.
Bullock, Alexander H.,	Worcester, Mass.
Burgess, John K.,	Dedham, Mass.
Burney, Thomas L.,	Lynn, Mass.
Burnham, J. A., Jr.,	Boston, Mass.
Burns, John, Jr.,	Boston, Mass.
Bursley, John,	West Barnstable, Mass.
Burt, Henry P.,	New Bedford, Mass.
Cabot, Dr. Hugh,	Boston, Mass.
Cahoon, Clement A.,	Harwich, Mass.
Campbell, Willis C.,	Agawam, Mass.
Carbonell, E. T.,	Charlottetown, P. E. I.
Carleton, Warren Elliot,	Plymouth, Mass.
Carter, Edwin A.,	Springfield, Mass.
Case, Rev. Bert,	Richmond Beach, Wash.
Casey, Neil,	Melrose, Mass.
Chase, Herbert F.,	Amesbury, Mass.
Cheney, Col. Louis R.,	Hartford, Conn.
Churchill, Winslow W.,	Cambridge, Mass.
Clark, A. B.,	Peabody, Mass.
Clark, C. A.,	Lynn, Mass.
Clark, George B.,	Boston, Mass.
Clarke, Dr. Charles K.,	Toronto, Ontario, Can.
Cleveland, Miss Lilian,	West Medford, Mass.
Clogston, Henry W.,	Bernardston, Mass.
Codman, Dr. Ernest Amory,	Boston, Mass.
Coffin, Dr. Rockwell A.,	Boston, Mass.
Colby, Francis T.,	Boston, Mass.
Coles, William E.,	Attleborough, Mass.
Converse, Irving O.,	Fitchburg, Mass.

Coulter, Charles Sidney,	Cambridge, Mass.
Cowing, D. T.,	Hadley, Mass.
Crafts, Clifford L.,	East Whately, Mass.
Cross, William J.,	Becket, Mass.
Crysler, H. Stanley,	Lowell, Mass.
Cummings, Benjamin,	New Bedford, Mass.
Cummings, W. W.,	Woburn, Mass.
Curtis, Benjamin F.,	Washington, D. C.
Daland, John, Jr.,	Salem, Mass.
Damon, Wiley S.,	Scituate, Mass.
Davis, N. A.,	Concord, Mass.
Davoll, Frank A.,	Dartmouth, Mass.
Day, Frederick B.,	Lynn, Mass.
Dean, Charles A.,	Boston, Mass.
De Haven, T. N.,	Ardmore, Pa.
De Meritte, Edwin,	Boston, Mass.
Denmead, Talbott,	Baltimore, Md.
Dexter, Charles R.,	Rochester, Mass.
Dill, Fred P.,	North Eastham, Mass.
Dolan, Edwin B.,	Agawam, Mass.
Douglas, Howard M.,	Plymouth, Mass.
Dutton, Harry,	Medford, Mass.
Dyke, Arthur C.,	Bridgewater, Mass.
Eaton, Edward W.,	Newburyport, Mass.
Edson, Edward E.,	Scituate, Mass.
Edwards, Vinal N.,	Woods Hole, Mass.
Eldredge, Albert H.,	Ware, Mass.
Eldredge, A. S.,	Lincoln, Mass.
Eldridge, Nathaniel A.,	Chatham, Mass.
Ellis, Elisha T.,	North Easton, Mass.
Emerson, Raymond,	Concord, Mass.
Enders, J. O.,	Hartford, Conn.
Ensign, Charles L.,	Newton, Mass.
Estabrook, F. B.,	East Northfield, Mass.
Estabrook, Henry A.,	Fitchburg, Mass.
Ewell, Ralph C.,	Sea View, Mass.
Fales, Lewis A.,	Attleborough, Mass.
Farmer, Walter B.,	Brookline, Mass.
Faunce, Carl C.,	Kingston, Mass.
Fay, Henry W.,	Boston, Mass.
Fessenden, Judge Franklin G.,	Greenfield, Mass.
Fish, Henry A.,	South Duxbury, Mass.

Fish, Thomas J.,	East Bridgewater, Mass.
Fisher, C. L.,	South Deerfield, Mass.
Flanagan, John H.,	Providence, R. I.
Floyd, John R.,	Rowley, Mass.
Fottler, John, Jr.,	Boston, Mass.
Francis, Eben W.,	Nantucket, Mass.
Fuertes, Louis Agassiz,	Ithaca, N. Y.
Fuller, Stephen W.,	Yarmouthport, Mass.
Gafney, J. H.,	Petersham, Mass.
Gardner, Howard S.,	South Swansea, Mass.
Gates, Hon. Joseph S.,	Westborough, Mass.
Gerrett, Hon. Frank,	Greenfield, Mass.
Gifford, John I.,	South Westport, Mass.
Gifford, Paul W.,	Duxbury, Mass.
Gill, Howard W.,	North Eastham, Mass.
Gilmore, Clinton G.,	Lenox, Mass.
Gould, Alfred E.,	Malden, Mass.
Green, Horace O.,	Stoneham, Mass.
Greenough, Henry V.,	Brookline, Mass.
Haines, George H.,	Sandwich, Mass.
Haines, George L.,	Sandwich, Mass.
Hales, Henry,	Ridgewood Village, N. J.
Hall, John A.,	Southbridge, Mass.
Hallet, Charles W.,	Barnstable, Mass.
Hallett, William F.,	Centerville, Mass.
Hamblin, A. J.,	West Falmouth, Mass.
Hammond, Charles F.,	Nantucket, Mass.
Hammond, Gardiner G.,	Boston, Mass.
Hammond, James L.,	Mattapoisett, Mass.
Harlow, W. A.,	Cummington, Mass.
Harrigan, T. F.,	Dighton, Mass.
Harvey, Myron E.,	Lunenburg, Mass.
Harwood, Henry W.,	Barre, Mass.
Hatch, James P.,	Springfield, Mass.
Hathaway, Harry S.,	So. Auburn, R. I.
Hayden, Albert F.,	Roxbury, Mass.
Herrick, J. T.,	Springfield, Mass.
Hill, Lewis W.,	Jamaica Plain, Mass.
Hills, Isaac,	Siasconset, Mass.
Hodder, James B.,	Blackstone, Mass.
Hodge, Dr. C. F.,	Worcester, Mass.
Holbrook, G. W.,	Wellfleet, Mass.
Holden, E. F.,	Melrose, Mass.

Holden, William,	Leominster, Mass.
Holmes, Clark W.,	Manomet, Mass.
Horsfall, Bruce,	Princeton, N. J.
Horton, Lawrence,	Canton, Mass.
Howard, A. O.,	East Northfield, Mass.
Howell, Benjamin F.,	Troy Hills, N. J.
Howland, George F.,	South Framingham, Mass.
Howland, William F.,	South Framingham, Mass.
Hoyt, William H.,	Stamford, Conn.
Hubbard, John S.,	Sturbridge, Mass.
Hylan, Rev. Albert E.,	Vineyard Haven, Mass.
Ide, Dr. Philip S.,	Wayland, Mass.
Ingalls, Charles E.,	East Templeton, Mass.
Jacobus, C. F.,	Turners Falls, Mass.
Jones, Jonathan H.,	Waquoit, Mass.
Jones, Dr. L. C.,	Malden, Mass.
Joyce, Edward F.,	Lawrence, Mass.
Judkins, Dr. F. L.,	Lynn, Mass.
Keene, Walton E.,	Bourne, Mass.
Keene, Warren P.,	Bourne, Mass.
Kelley, Walter F.,	Nantasket, Mass.
Kellogg, Dr. E. C.,	Swansea, Mass.
Kelsey, B. R.,	Waterbury, Conn.
Keniston, Allan,	Edgartown, Mass.
Keyes, Darwin T.,	East Deerfield, Mass.
Killum, Frank W.,	Topsfield, Mass.
Kinney, A. B. F.,	Worcester, Mass.
Klaiber, Sigmund,	Turners Falls, Mass.
Knight, Ora Willis,	Bangor, Me.
Lamb, Charles R.,	Cambridge, Mass.
Lane, Lawton W.,	Lynn, Mass.
Larkin, Walter A.,	Andover, Mass.
Latham, Charles R.,	Windsor Locks, Conn.
Law, J. Douglas,	Springfield, Mass.
Leonard, Cornelius H.,	Middleborough, Mass.
Leonard, Edwin,	Feeding Hills, Mass.
Leonard, William H.,	East Foxborough, Mass.
Leonard, Willis B.,	Pittsfield, Mass.
Lewis, Benjamin K.,	Lynn, Mass.
Linder, George,	Boston, Mass.
Long, William B.,	Boston, Mass.

Look, John E.,	Oak Bluffs, Mass.
Lovell, Orville D.,	Osterville, Mass.
Lovell, Shirley,	Yarmouthport, Mass.
Ludden, Dr. E. A.,	North Brookfield, Mass.
Luman, John F.,	Thorndike, Mass.
Lund, Fred B.,	Boston, Mass.
Lyman, A. M.,	Montague, Mass.
Lyman, George H.,	Boston, Mass.
Macfarlane, John,	Methuen, Mass.
Macker, Elmer A.,	North Grafton, Mass.
Macomber, S. H.,	Central Village (West- port), Mass.
Manning, Warren H.,	Boston, Mass.
Marsh, Dr. Franklin F.,	Wareham, Mass.
Martin, Dr. G. A.,	Franklin, Mass.
Maynard, C. J.,	West Newton, Mass.
Millard, George O.,	Blandford, Mass.
Miller, Fred H.,	Hingham, Mass.
Miller, Richard,	Turners Falls, Mass.
Mills, Harry C.,	Unionville, Conn.
Mills, James I.,	Ayer, Mass.
Milner, W. P.,	Concord, Mass.
Mitchell, J. D.,	Victoria, Texas.
Mixter, George,	Hardwick, Mass.
Moore, James W.,	Agawam, Mass.
Morris, Dr. M. A.,	Boston, Mass.
Morris, Robert O.,	Springfield, Mass.
Morse, C. Harry,	Belmont, Mass.
Morse, George F.,	South Lancaster, Mass.
Moseley, B. P.,	Boston, Mass.
Munn, Charles C.,	Springfield, Mass.
Nash, C. W.,	Toronto, Ontario, Can.
Nelson, George L.,	Groveland, Mass.
Nichols, Arthur M.,	North Adams, Mass.
Nicholson, John S.,	Hyannis, Mass.
Nims, Charles W.,	Greenfield, Mass.
Northup, L. J.,	Cheshire, Mass.
Noyes, A. S.,	Whitinsville, Mass.
Nye, Russell S.,	Falmouth, Mass.
O'Brien, D. H.,	Rowley, Mass.
Osborn, Francis B.,	Hingham, Mass.

Paige, Henry E.,	Amherst, Mass.
Paine, Charles J., Jr.,	Weston, Mass.
Paradise, George C.,	Fall River, Mass.
Parker, Edward L.,	Concord, Mass.
Parker, Harold,	Lancaster, Mass.
Payson, Gilbert R.,	Belmont, Mass.
Payson, Samuel C.,	Brookline, Mass.
Pearson, Lyman,	Byfield, Mass.
Pearson, T. Gilbert,	Greensborough, N. C.
Pease, Henry S.,	Middlefield, Mass.
Peckham, Dr. Fenner H.,	Providence, R. I.
Pennock, Charles J.,	Kennett Square, Pa.
Perkins, Charles L.,	Newburyport, Mass.
Perry, Dr. Elton, Jr.,	Austin, Tex.
Perry, Harry D.,	Marshfield Hills, Mass.
Perry, Nathan C.,	Pocasset, Mass.
Peters, George G.,	Boston, Mass.
Pettey, Arthur E.,	Central Village (West- port), Mass.
Phillips, E. E.,	Provincetown, Mass.
Phillips, Dr. John C.,	Boston, Mass.
Pierce, A. N.,	Greenfield, Mass.
Pierce, Edgar,	Boston, Mass.
Pitman, A. B.,	Siasconset, Mass.
Poland, George M.,	Wakefield, Mass.
Poole, Chester M.,	Chilmark, Mass.
Potter, Dr. William G.,	New Bedford, Mass.
Pratt, A. L.,	Belchertown, Mass.
Pratt, Herbert A.,	North Middleborough, Mass.
Prentiss, William N.,	Milford, Mass.
Ramage, Lawson,	Monroe Bridge, Mass.
Raymond, Fred,	Bourne, Mass.
Remick, John A., Jr.,	Boston, Mass.
Remington, Charles H.,	East Providence, R. I.
Rice, James Henry, Jr.,	Summerville, S. C.
Robbins, Willard W.,	Medfield, Mass.
Robinson, Edwin B., Jr.,	Cataumet, Mass.
Rodgers, John B.,	Barnstable, Mass.
Rogers, E. E.,	West Barnstable, Mass.
Ross, Augustus B.,	Millers Falls, Mass.
Sadler, Charles H.,	Auburndale, Mass.
Sanford, Dr. Leonard C.,	New Haven, Conn.

Saunders, Dr. Frederick H.,	Westfield, Mass.
Saunders, William E.,	London, Ontario, Can.
Sears, William C.,	Hyannis, Mass.
Sharrock, Richard J.,	Westport, Mass.
Shaw, C. E.,	East Weymouth, Mass.
Shaw, Gilbert M.,	South Weymouth, Mass.
Shaw, John H.,	Plymouth, Mass.
Sheldon, Israel R.,	Pawtuxet, R. I.
Sherriffs, William E.,	Hull, Mass.
Sibley, Myron E.,	Lynn, Mass.
Small, Reuben C.,	Nantucket, Mass.
Small, Willard M.,	North Truro, Mass.
Smith, Arthur E.,	Milford, Mass.
Smith, DeWitt,	Chester, Mass.
Smith, John B.,	Springfield, Mass.
Smith, William M.,	Winchester, Mass.
Soule, Guy L.,	Duxbury, Mass.
Sparrow, Samuel E.,	East Orleans, Mass.
Staples, Edward F.,	Taunton, Mass.
Stapleton, R. P.,	Holyoke, Mass.
Stone, Clayton E.,	Lunenburg, Mass.
Stone, William M.,	Dennis, Mass.
Storey, R. C.,	Boston, Mass.
Stratton, A. L.,	Gardner, Mass.
Struthers, Parke,	Alfred, Me.
Stubbs, Arthur P.,	Lynn, Mass.
Sturgis, Moses,	Hyannisport, Mass.
Sturtevant, Harry P.,	Bridgewater, Mass.
Sugden, Arthur W.,	Hartford, Conn.
Swan, Alfred S.,	North Eastham, Mass.
Taylor, George L.,	Gloucester, Mass.
Tenney, Judge Sanborn G.,	Williamstown, Mass.
Thacher, Frank G.,	Hyannis, Mass.
Thayer, Bayard,	Lancaster, Mass.
Thayer, Henry F.,	Bridgewater, Mass.
Tinkham, Horace W.,	Touisset, Mass.
Townsend, Charles W.,	Boston, Mass.
Treat, Willard E.,	Silver Lane, Conn.
Tribou, Charles E.,	Brockton, Mass.
Tripp, George F.,	West Harwich, Mass.
Trull, George W.,	Tewksbury, Mass.
Tuck, Herbert E.,	Bradford, Mass.
Tufts, Harold F.,	Wolfville, N. S.
Turner, Henry A.,	Norwell, Mass.

Tuttle, Dr. Albert H.,	Cambridge, Mass.
Tuttle, Harry E.,	Concord, Mass.
Tweedy, John E.,	Attleborough, Mass.
Underwood, A.,	West Falmouth, Mass.
Underwood, Loring,	Belmont, Mass.
Van Huyck, J. M.,	Lee, Mass.
Walker, Arthur L.,	Brookline, Mass.
Walker, Howard L.,	Leominster, Mass.
Ward, John,	Cambridge, Mass.
Watson, B. M.,	Jamaica Plain, Mass.
Watson, R. C.,	Milton, Mass.
Weekes, Charles H.,	Providence, R. I.
Weeks, W. B. P.,	Boston, Mass.
Weston, Francis M., Jr.,	Charleston, S. C.
Wharton, William P.,	Groton, Mass.
Wheeler, Wilfred,	Concord, Mass.
White, George E.,	East Carver, Mass.
Whitin, Henry T.,	Northbridge, Mass.
Whiting, Willard C.,	Plymouth, Mass.
Willard, George O.,	Blandford, Mass.
Williams, J. A.,	Northbridge, Mass.
Williamson, Barney P.,	Marshfield, Mass.
Wilson, Thomas C.,	Ipswich, Mass.
Wiltshire, Frank,	Kentville, N. S.
Wing, Henry P.,	Central Village (West- port), Mass.
Winslow, John M.,	Nantucket, Mass.
Wolfe, Philip W.,	North Weymouth, Mass.
Woodward, Dr. W. C.,	Middleborough, Mass.
Zeigler, F. R.,	Pittsfield, Mass.
Zerrahn, Carl O.,	Milton, Mass.

INDEX.

INDEX.

[The numbers in heavy-faced type refer to the pages in Parts I and II on which the species are described. All names of each species given in the text are indexed, — including most of those commonly used by New England gunners.]

- Abbott, C. C., 20, 21, 108, 317.
Actitis macularia, 322.
Ægialitis meloda, 354.
 semipalmata, 352.
 Agassiz, Louis, 406.
 Aix sponsa, 105.
 Allen, F. H., 293.
 Glover M., 62, 90, 136, 147, 162, 176, 182,
 206, 216, 218, 222, 234, 256, 263, 271, 281,
 292, 298, 304, 311, 317, 328, 332, 336, 355,
 425, 443, 461, 462, 485, 492.
 J. A., 44, 77, 84, 92, 96, 100, 108, 171, 176,
 184, 216, 234, 256, 263, 271, 279, 287, 292,
 296, 298, 304, 311, 317, 321, 327, 331, 337,
 343, 349, 355, 358, 376, 409, 410, 422, 481.
 William H., 265.
 Amadas, Philip, 7, 478.
 Ames, C. H., 464.
 J. H., 214.
Anas platyrhynchos, 71.
 rubripes, 76.
 tristis, 80.
 Anderson, R. M., 30, 462.
 Angell, Walter A., 331, 461.
Anser albifrons gambeli, 175.
 Archer, Gabriel, 9, 100, 403, 484.
Ardea canadensis, 485.
Arenaria interpres morinella, 359.
 Argal, Sir Samuel, 7.
Arquatella maritima maritima, 268.
 Atkinson, George E., 461.
 Attwater, H. P., 424.
 Audubon, J. J., 12, 13, 16, 19, 20, 21, 24, 26, 29, 42,
 43, 53, 62, 68, 72, 87, 92, 94, 101, 104,
 107, 114, 117, 132, 138, 149, 171, 173,
 176, 211, 222, 226, 230, 234, 239, 261,
 269, 271, 283, 286, 291, 295, 299, 304,
 308, 310, 336, 342, 349, 355, 361, 363,
 364, 365, 366, 367, 385, 387, 392, 404,
 409, 411, 412, 413, 416, 419, 433, 443,
 444, 445, 446, 451, 479, 480, 493, 494,
 517, 518.
 J. W., 53, 396, 411.
 Aughey, Samuel, 308, 319, 351, 353, 356, 499, 514.
 Auk, Great, 399.
 Razor-billed, 399 402.
 Auks, 2.
 Avocet, 230, 231
- Bacon, S. E., Jr., 142.
 Vaughan D., 338.
 Badger Bird, 294.
 Bagg, Egbert, 131.
 Baird, S. F., 218, 230, 315, 409, 492.
 Baldpate, 83, 84, 85, 86, 103, 571, 572.
 Bangs, Outram, 84.
 Bank-bird, 227.
 Barlowe, Arthur, 7, 478.
 Barnes, R. M., 54.
 Barrows, Walter B., 424, 455.
 Bartlett, H. W., 257.
Bartramia longicauda, 315.
 Bartsch, Paul, 424.
 Bates, F. A., 137, 156.
 Batty, J. H., 216.
 Baxter, J. Bert, 462.
 Beach-bird, 290.
 Beal, F. E. L., 327, 396.
 Bearse, Russell, 204.
 Beetle-head, 335, 340.
 Belknap, Jeremy, 184, 385, 437, 473, 491.
 Bendire, Charles, 377.
 Bent, Arthur C., 116, 136, 172, 199, 313.
 Bertheau, C. P., 420, 432.
 Beverly, Robert, 490.
 Beyer, George H., 422, 457, 461.
 Bigelow, Henry B., 97, 186, 424.
 Birds, causes of decrease of, 510, 547, 549.
 decrease of, 18, 32, 44, 47, 51, 61, 65, 68, 72,
 77, 82, 87, 92, 96, 104, 107, 114, 122, 125,
 130, 136, 140, 145, 149, 155, 164, 167, 171,
 173, 179, 184, 185, 195, 208, 211, 222, 232,
 234, 236, 237, 246, 248, 249, 250, 256, 257,
 263, 264, 265, 269, 271, 272, 275, 279, 280,
 283, 287, 292, 296, 298, 301, 304, 307, 311,
 316, 317, 321, 323, 328, 332, 337, 343, 349,
 353, 355, 362, 365, 372, 376, 379, 380, 386,
 387, 388, 395, 409, 410, 413, 414, 415, 421,
 424, 426, 436, 448, 456, 458, 475, 483, 491,
 492, 504, 505.
 erroneous opinions regarding decrease of,
 549-556.
 former abundance of game, 6, 14, 20, 30,
 44, 47, 65, 68, 72, 77, 96, 107, 130, 136, 142,
 149, 171, 173, 178, 184, 185, 195, 222, 236,
 246, 256, 263, 271, 275, 278, 279, 283, 286,
 291, 292, 310, 316, 331, 337, 341, 342, 349.

- Birds, causes of decrease of — *Con.*
 former abundance of game — *Con.*
 353, 354, 360, 364, 370, 378, 380, 385, 395, 401, 404, 405, 417, 420, 433, 444, 448, 452, 454, 469, 470, 473, 474, 475, 478, 483, 489, 490.
 increase of, 78, 89, 116, 119, 120, 122, 313, 331, 370, 371, 384, 390, 395, 504, 505, 509, 520, 521, 522, 523, 524, 568.
 large numbers killed, 14–22, 27, 28, 51, 52, 108, 140, 141, 149, 158, 179, 198, 211, 222, 238, 239, 240, 246, 247, 263, 264, 279, 280, 291, 342, 343, 344, 346, 379, 381, 402, 403, 405, 408, 409, 419, 420, 421, 427, 438, 439, 441, 448, 450, 454, 464, 513, 514, 515, 519, 521, 537, 539, 540.
 Bishop, Louis B., 29, 256, 279, 296, 304, 311, 328, 337, 421.
 Watson L., 377.
 Bitterns, 8, 9.
 Blackbird, 351.
 Blackbirds, 432, 579.
 Blackbreast, 335.
 Little, 282.
 Black-head, 16, 121.
 Black-tail, 297.
 Blatchley, W. S., 408.
 Blommaert, Samuel, 9.
 Blood, C. L., 206.
 Edmund, 247.
 Bluebill, Little, 124.
 Bluebills, 115, 121, 125, 130, 166, 523.
 Bluebird, 335.
 Blue Peter, 221.
 Blue-wing, 95.
 Boardman, George A., 51, 53, 62, 68, 128, 131, 133, 176, 214, 234, 365, 409.
 Boats, shooting from, 535.
 Bobolinks, 579.
 Bob-white, 1, 6, 22, 32, 33, 251, 367, 368, 384, 509, 514, 545, 546, 565, 567, 581, 590.
 fruits eaten by, 582.
 seeds eaten by, 583.
 Bogert, W. S., 523.
 Bonaparte, Charles L., 549.
 Bonasa umbellus togata, 377.
 umbellus, 377.
 Bottle-head, 335.
 Bourne, Edward E., 437.
 Boutwell, M. M., 345, 441.
 Bowles, J. H., 203, 204, 475.
 Boyle, E. J., 373.
 Brackett, Foster H., 203.
 Bradford, William, 405.
 Braislin, W. C., 199.
 Brant, 2, 8, 9, 15, 183, 523.
 Branta bernicla glauogastra, 183.
 canadensis, 177.
 hutchinsi, 182.
 leucopsis, 193.
 nigricans, 192.
 Brant-bird, 282, 359.
 Brant, Black, 189, 192.
 Brass-back, 340.
 Break Horn, 60.
 Brereton, John, 9, 484.
 Brewer, T. M., 135, 145, 176, 182, 211, 212, 218, 230, 231, 234, 311, 327, 332, 349, 353, 355, 357, 358, 363, 365, 409, 492.
 Brewster, C. E., 513.
 William, 41, 44, 51, 69, 77, 84, 87, 90, 92, 96, 108, 114, 125, 133, 134, 136, 157, 158, 162, 176, 203, 206, 207, 214, 215, 218, 220, 228, 261, 264, 271, 273, 279, 285, 287, 304, 314, 317, 349, 355, 387, 391, 440, 441, 442, 454, 456, 457, 464, 485, 487, 491.
 Brimley, C. S., 441, 461.
 Broad-bill, 166.
 Brooks, Charles, 436.
 Brown, C. B., 461.
 Chas. H., 89, 115, 116.
 Frank A., 272.
 Neal, 462.
 Brown-back, 253.
 Brown Bank-bird, 225.
 Brown, Marlin, 294.
 Browne, F. C., 206.
 G. E., 203, 206.
 Brownie, 270.
 Bruce, David, 58.
 Bruner, Lawrence, 30, 461.
 Bubier, G. M., 247, 298.
 Buffington, S. L., 88, 130.
 Buffle-head, 135, 168, 572.
 Bull-head, 335.
 Bull-peep, 274.
 Bureau of Biological Survey, 75, 159, 162, 196, 235, 273, 365, 373, 396, 494, 498, 518, 568, 572, 578, 590.
 Burlingame, Benjamin, 487.
 Burrage, Henry S., 7, 401, 402, 479.
 Burroughs, John, 200.
 Bush, Ben O., 457, 464.
 Butler, A. W., 517.
 Benjamin F., 442.
 Butter Ball, 135.
 Butter-bill, 153.
 Butter-nose, 153.
 Button, Sir Thomas, 22.
 Buzzards, 464.
 Cabot, Mrs. Eliza, 387.
 Samuel, 176, 440.
 S., Jr., 206.
 Hugh, 380.
 Cahoon, C. A., 92, 130.
 Cairns, J. S., 461.
 Calidris leucophæa, 290.
 Campion, C., 462.
 Camptorhynchus labradorius, 411.
 Canachites canadensis canace, 375.
 Cape Race, 57.
 Cape Racer, 57.

- Carbonnell, E. T., 97, 131, 188, 189, 200, 255, 430, 534.
 Carpenter, W. D., 552.
 Carroll, W. J., 420.
 Cartier, Jacques, 401, 402.
 Cartwright, George, 409.
 Casey, Neil, 257, 443, 461.
 Cash, Harry A., 381.
 Catesby, Mark, 408.
 Catotrophorus semipalmatus inornatus, **313**.
 semipalmatus, **309**.
 Chamberlain, Montague, 92, 96, 114, 199, 263, 269, 279, 304, 317, 349, 491.
 Champlain, Samuel de, 363, 403, 434, 481, 488.
 Chandler, Clarence, 201.
 Chapman, Frank M., 46, 61, 113, 129, 133, 135, 203, 205, 210, 227, 228, 229, 231, 233, 235, 281, 300, 461.
 Charadrius dominicus dominicus, **340**.
 Charitonetta albeola, **135**.
 Chase, H. F., 158, 172.
 Chauleasmus streperus, **81**.
 Chen, cærulescens, **174**.
 hyperboreus hyperboreus, **170**.
 nivalis, **173**.
 Cheney, L. R., 199.
 Chicken, **359**.
 Chicken-bill, **210**.
 Chicken-bird, **359**, 360.
 Chicken-plover, **359**.
 Chuckle-head, **335**, 338.
 Clam-bird, **354**.
 Clangula clangula americana, **129**.
 islandica, **133**.
 Clark, A. B., 232.
 C. A., 240, 381.
 C. H., 201.
 H. L., 77.
 Clayton, John, 8.
 Coburn, J. J., 110.
 Cochrane, J. S., 281.
 Cockawee, **139**.
 Cody, W. F. (Buffalo Bill), 490.
 Coffin, R. F., 172.
 Colinus virginianus virginianus, **368**.
 Columba leucocephala, **465**.
 Columbogallina passerina terrestris, 396.
 Colymbus auritus, **43**.
 holboelli, **41**.
 Cook, Sullivan, 454.
 Cooke, W. W., 72, 93, 132, 159, 189, 251, 254, 273, 276, 319, 341, 365, 422, 428, 461, 517, 518, 527, 532.
 Coolidge, Baldwin, 285.
 Coot, 157, 158, 220, **221**, 576.
 Black, **153**.
 Broad-billed, **153**.
 Brown, **163**.
 Bumblebee, **166**.
 Butterboat-billed, **163**.
 Creek, **166**.
 Gray, **163**.
 Coot — *Con*.
 Hollow-billed, **163**.
 Little Gray, **153**, 157.
 Patchpolled, **163**.
 Pied-winged, **160**.
 Pumpkin-blossom, **153**.
 Smutty, **153**.
 Uncle Sam, **160**.
 Whistling, **153**.
 White-winged, **160**.
 Coots, 111, 154, 155, 156, 165, 201, 500, 576.
 Copper-bill, **153**.
 Copper-nose, **153**.
 Cormorant, Great, 414.
 Cormorants, 7, 8, 363.
 Cory, C. B., 169, 192, 298, 328, 343, 417, 422, 424.
 Coturnicops noveboracensis, **213**.
 Coues, Elliott, 261, 275, 296, 298, 310, 311, 317, 327, 331, 355, 357, 363, 384, 410, 412, 416, 421, 422, 432, 450.
 Couture, Pacificque, 462.
 Cowing, D. T., 248.
 Crane, 485.
 Common, 479.
 Gray, 479.
 Little Brown, 484, **487**.
 Sandhill, 480, 482, **483**.
 White, 479, 481.
 Whooping, **477**, 486, 487.
 Cranes, 1, 3, 4, 6, 8, 9, 10, 24.
 Crechiscus jamaicensis, **215**.
 Creddock, **359**.
 Crow-bill, **221**.
 Cucu, **300**.
 Large, **300**.
 Small, **303**.
 Curlew, Eskimo, 331, 341, 345, **416**.
 Eskimaux, 417.
 Hen, **325**.
 Hudsonian, 325, 326, 327, **330**, 417, 423, 432.
 Jack, 325, **330**.
 Long-billed, 294, 295, **325**, 499.
 Old-hen, **325**.
 Pied-winged, **309**.
 Red, **294**.
 Sicklebill, **325**.
 Sicklebilled, 330.
 Curlews, 3, 8, 9, 18, 31, 271, 318, 417.
 Currier, B. H., 538.
 Curtis, Benjamin F., 292.
 D. T., 216.
 Dabchick, **46**.
 Dabney, Alfred, 314.
 Dafila acuta, **102**.
 Daland, John, Jr., 199.
 Damon, W. S., 172.
 Dapper, **135**, **166**.
 Davis, S., 51, 405, 406.
 Dawson, W. L., 45, 108, 200, 360, 462, **475**.
 Dean, Charles L., 266.

- Deane, Ruthven, 168, 285, 410, 458, 461, 462.
 De Haven, I. N., 239.
 De Kay, J. E., 82, 92, 96, 103, 141, 171, 184, 232, 234, 256, 271, 286, 292, 295, 298, 304, 311, 317, 343, 365, 412, 474, 481, 491.
 De Laet, Johannes, 8.
 Denmead, Talbot, 78, 92, 199.
 De Rasieres, Isaack, 9.
 Devil-diver, 43.
 De Vries, David Pieterszoon, 9, 475, 479.
 Didapper, 46.
 Dill, Fred F., 372, 538.
 Joseph, 193.
 Dipper, 46, 166.
 Dipper, Duck, 135.
 Diseases, 540.
 Diver, Red-throated, 57.
 Saw-bill, 67.
 Doe-bird, 416.
 Doppet, 135, 166.
 Dough-bird, 360, 416.
 Doughty, J. and T., 20.
 Douglas, H. M., 240, 257.
 Dove, Ground, 393, 396.
 Mourning, 393, 394, 460, 472.
 Turtle, 9, 394, 438.
 Wild, 394.
 Doves, 1, 393, 436.
 Dowitcher, 19, 253, 262, 264, 498.
 Long-billed, 259.
 Driver, 253.
 Duck, Baldpate, 86.
 Barrow's Golden-eye, 133.
 Black, 71, 73, 76, 153, 518, 528, 533, 565, 570, 571, 572, 573, 579.
 Buffle-head, 135.
 Bumblebee, 135.
 Canvas-back, 113, 114, 118, 550, 572, 575.
 Canvas-backs, 13, 14, 16, 17, 26.
 Creek, 81.
 Dipper, 135.
 Dusky, 76.
 Eider, 143, 146, 148.
 Gadwall, 81, 518.
 Golden-eye, 129.
 Gray, 71, 81, 102, 103, 412, 523.
 Harlequin, 144.
 Isles of Shoals, 148.
 King Eider, 151.
 Labrador, 411, 455.
 Mallard, 71, 515, 518, 523, 565, 570, 571, 573.
 Mandarin, 106.
 Masked, 169.
 Northern Eider, 147.
 Old Squaw, 139.
 Old Wife, 139.
 Pheasant, 102.
 Pied, 411.
 Pintail, 102, 518.
 Raft, 124.
 Redhead, 113, 572, 575.
 Red-legged Black, 80.
 Duck — *Con.*
 Ring-billed, 127.
 Ring-necked, 127.
 Ruddy, 166, 572.
 Sand Shoal, 411.
 Scaup, 121.
 Lesser, 124.
 Sea, 148.
 Shoal, 413.
 Shoveller, 99, 518, 523.
 Skunk, 411.
 Spoonbill, 99.
 Spring Black, 76.
 Squam, 148.
 Summer, 105.
 Summer, Black, 76.
 Wood, 68, 98, 105, 502, 565, 572, 573, 578, 581.
 Duck shooting, 17.
 Ducks, 8, 18, 24, 26, 27, 29, 32, 40, 55, 93, 109, 116, 119, 122, 130, 137, 140, 142, 150, 156, 165, 167, 169, 250, 251, 288, 333, 363, 484, 531, 545, 570, 573, 575, 576.
 Black, 122, 154, 515, 523, 530.
 Eider, 3, 147, 151, 152, 156, 363.
 Wood, 3, 31, 145, 235, 523.
 Dumb-bird, 166.
 Dunbird, 166.
 Dunlin, 281.
 Dutcher, William, 56, 107, 218, 327, 386, 415, 416.
 Dwight, Jonathan, Jr., 430, 457, 461.
 Timothy, 387.
 Eagle, Bald, 54.
 Eagles, 451, 464.
 Earle, S. N., 255.
 Eaton, Elon H., 58, 68, 80, 81, 82, 84, 87, 89, 91, 93, 95, 96, 98, 100, 118, 122, 129, 131, 132, 141, 142, 151, 158, 162, 166, 173, 176, 192, 203, 206, 207, 216, 218, 275, 282, 285, 311, 328, 355, 357, 376, 380, 395, 396, 429, 430, 452.
 E. W., 68, 199, 257, 265, 283.
 Eckley, David, 387.
 Ectopistes migratorius, 433.
 Edible birds, decrease of, 22.
 Edwards, David N., 97, 344.
 V. B., 104.
 Eider, King, 146.
 Eldredge, A. S., 172, 250, 422, 456, 461, 475.
 Eldridge, Nathaniel A., 265, 430, 538.
 Elliot, D. G., 29, 64, 88, 98, 100, 104, 113, 114, 118, 122, 132, 135, 140, 144, 153, 170, 173, 183, 186, 194, 201, 226, 227, 232, 235, 236, 285, 296, 413, 415, 416, 514.
 Emmons, Ebenezer, 360, 481, 491.
 Engle, C. H., 454.
 Ereunetes mauri, 289.
 pusillus, 286.
 Erismatura jamaicensis, 166.
 Erolia ferruginea, 284.
 Ewell, Ralph C., 257.

- Fabricius, O., 410.
 Farley, J. A., 193, 204, 218, 338.
 Faxon, Walter, 429.
 Fay, Henry H., 371.
 Fay, S. Prescott, 204, 296.
 Ferry, John F., 461.
 Field, George W., 385, 389, 392, 501.
 Field Bird, 340.
 Fisher, Albert K., 107, 235, 236, 542.
 Richard, 403.
 Fiske, Arthur S., 357.
 Fizzy, 153.
 Flanagan, John H., 461.
 Fleming, James H., 195, 198, 430, 441, 458, 461,
 462, 474.
 Floyd, John R., 326.
 Folger, Peter, 344, 420.
 Food plants for attracting wild-fowl, 569.
 Forbush, L. E., 63.
 Forester, Frank (Henry William Herbert), 13,
 18.
 Forster, J. R., 417.
 Fottler, John, Jr., 285
 Frazar, M. Abbott, 228.
 Freeman, J., 404, 413.
 Warren E., 193.
 Fuertes, L. A., 96, 119, 123.
 Fulica americana, 221.
 Fuller, S. W., 243.
- Gadwall, 81, 103, 572.
 Gallinago delicata, 245.
 Gallinula galeata, 219.
 Gallinule, Florida, 202, 219, 223.
 Purple, 217.
 Gallinules, 202.
 Game birds, quantities marketed, 514, 515.
 Game found by explorers and colonists, 6.
 Gannets, 402.
 Garefowl, 399.
 Gates, J. S., 249.
 Gavia arctica, 56.
 immer, 50.
 stellata, 57.
 Geer, E. Hart, 521.
 Geese, 3, 7, 10, 12, 13, 15, 24, 27, 31, 32,
 58, 169, 173, 176, 178, 181, 184, 185,
 190, 193, 333, 407, 475, 522, 531, 570,
 581.
 Canada, 3, 4, 184, 523, 570.
 Snow, 3, 14, 15, 30, 171.
 Wild, 9, 12, 13, 14, 26, 178, 181, 522, 524,
 580.
- Gerry, Elbridge, 185, 420.
 Gifford, P. W., 176.
 Gilbert, Sir Humphrey, 403.
 Gillmore, Parker, 15, 18, 19.
 Gilmore, Clinton G., 371.
 Giraud, J. P., Jr., 19, 107, 184, 218, 261, 271, 283,
 304, 317, 321, 327, 337, 343, 349, 355, 364, 386, 412,
 416, 421, 463.
 Glover, Thomas, 8.
- Godwit, Hudsonian, 296, 297, 309, 326, 498.
 Marbled, 294, 297, 325.
 Godwits, I, 8, 271, 296, 299, 418.
 Golden, Dr., 435.
 Golden-eye, 113, 129, 131, 133, 135, 572.
 Barrow's, 134.
 Goldfinch, 288.
 Goodale, C. I., 213.
 Goodwin, John, 58.
 Google-nose, 163.
 Goosander, 60.
 Goose, 180, 484, 489.
 Barnacle, 193.
 Big Gray, 177.
 Blue, 174.
 Canada, 177, 182, 476, 517, 565.
 Greater Snow, 173.
 Hutchins's, 182.
 Lesser Snow, 173.
 Little Gray, 182.
 Mackerel, 227.
 Mexican, 170.
 Mud, 182.
 Short-necked, 182
 Snow, 170.
 Southern, 182.
 White, 170.
 White-fronted, 175.
- Goose-bird, 297.
 Gorges, Sir Ferdinando, 12.
 Goshawks, 381, 382, 384.
 Goss, N. S., 274.
 Gosse, Philip H., 216.
 Gould, A. E., 172, 292, 296.
 Grass-bird, 271, 277.
 Grayback, 262.
 Greathad, 129.
 Grebe, Holboell's, 41.
 Horned, 43.
 Pied-billed, 42, 43, 46.
 Red-necked, 41.
 Grebes, 39, 44, 49, 223, 224, 570.
 Green-back, 340.
 Green-head, 71, 340.
 Greenough, Henry V., 115, 186.
 Green-wing, 91.
 Grenfell, W. T., 425, 430.
 Grieve, Symington, 400, 404, 410.
 Grinnell, George Bird, 13, 14, 16, 27, 68, 311, 396,
 517, 528, 538, 547, 548, 553.
 Gronberger, S. M., 435.
 Grouse, 385.
 Grouse, 1, 10, 20, 22, 24, 26, 30, 32, 33, 190, 251,
 367, 370, 375, 377, 381, 384, 386, 389, 391,
 404, 534, 545, 546, 585.
 Black, 375.
 Canada Ruffed, 377.
 Pinnated, 6, 21, 22, 23, 385, 391.
 Ruffed, 6, 20, 33, 109, 190, 369, 377, 391,
 510, 511, 514, 540, 565, 567, 585, 590.
 food plants of, 585.
 Willow, 384, 385.

- Grus, *americana*, 477.
 canadensis, 487.
 mexicana, 483.
 Guillemots, 39.
 Guinea Fowl, 564.
 Gulf-bird, 225.
 Gulls, 2, 9, 10, 52, 363.
 Gump, 335.

 Hadley, Philip B., 567.
Hæmatopus palliatus, 362.
 Haies, Edward, 403.
 Haines, George H., 380.
 George L., 257.
 Hairy Crown, 67.
 Head, 67.
 Hallett, Charles W., 104.
 Hammond, Gardiner G., 78, 88, 200, 304.
 Hamor, Raphe, 434.
 Hapgood, Warren, 183, 187, 190, 192, 419, 420.
 Hardy, Fanny P., 404, 408.
 John H., Jr., 74, 162.
 Manly, 377.
Harelda hyemalis, 139.
 Harwood, Henry W., 380.
 Hatch, James P., 326, 380.
 P. L., 14, 15, 53, 101, 102, 210, 221, 321, 477, 486.
 Hathaway, Harry W., 266.
 Hawes, George, 242, 379
 Hawk, Duck, 288.
 Pigeon, 288.
 Sharp-shinned, 287.
 Hawks, 47, 287, 381, 388, 440, 451.
 Marsh, 390.
 Hay, O. P., 408.
 Hazzen, Richard, 437.
 Headlee, Thomas J., 423.
 Hearne, S. A., 15, 22, 30, 72, 171, 417.
 Hearnes, 478.
 Hearnshaw, 478.
 Heath Hen, 9, 30, 385, 497.
 Heathcocke, 385.
 Hell-diver, 43, 46.
Holodromas solitarius solitarius, 306.
 Henshaw, H. W., 232.
 Herbert, H. W., 18.
 Hershaw, 478.
 Hershaws, 478.
 Heron, European, 478.
 Great Blue, 477.
 White, 479.
 Herons, 6, 32, 201, 224, 235, 478, 482, 485.
 Heronshaw, 478.
 Heroushaws, 478.
 Higginson, F. L., 10, 436.
 Hill, Alfred, 204.
 L. W., 96, 115, 119, 136, 265, 272, 292, 420.
 Hill Grass-bird, 320.
 Hills, Isaac, 172.
Himantopus mexicanus, 233.
 Hind, H. Y., 25.

Histrionicus histrionicus, 144.
 Hitecoek, C. H., 408.
 Edward, 481, 491.
 Hoard, W. D., 142.
 Hodge, C. F., 373, 374, 459, 565.
 Hoffmann, Ralph, 92, 96, 108, 235, 262, 271, 279.
 282, 283, 287, 290, 304, 332, 335, 343, 349, 352, 359.
 Holbrook, G. W., 265.
 Holden, Charles H., Jr., 462.
 Hollister, G. H., 435.
 N., 461.
 Holman, Ralph, 44, 443, 481.
 Holmes, Charles E., 423.
 Honker, 177.
 Hore, Robert, 402.
 Hornaday, W. T., 515, 516.
 Horner, Mrs. W. S., 218.
 Horsehead, 163.
 Horton, Lawrence, 96, 158.
 Hough, Emerson, 27, 462.
 Romeyn B., 384.
 Howard, A. O., 544.
 Edgar, 461.
 James, 423.
 Howe, C. D., 134, 443.
 Reginald Heber, 62, 90, 136, 147, 162, 176, 182, 206, 216, 218, 234, 254, 263, 281, 298, 311, 317, 328, 336, 443, 492.
 Howell, B. F., 78, 102, 104.
 Howland, John E., 389.
 Hoyle, C. E., 387, 388.
 Hubbard, William, 9, 480.
 Humility, 309.
 Hunnewell, Charles S., 201.
 Hunter, Alex., 15, 17.
 Huntington, Dwight W., 14, 16, 17, 18, 19, 27, 28, 185, 317, 343, 490, 537, 568.
 Hylan, A. E., 199.

 Ibises, 224.
 Ingalls, C. E., 78, 107, 158, 443.
Ionornis martinicus, 217.

 Jack, 330, 333.
 Jameson, J. Franklin, 8, 9, 473, 479.
 Jeffries, W. A., 174, 324.
 Job, Herbert K., 343, 421, 430, 518.
 Jones, Jonathan H., 66, 69, 538.
 L. C., 185, 240, 257, 265, 430.
 Lynds, 45, 200, 424, 462.
 Josselyn, John, 10, 22, 220, 403, 404, 436, 490.
 Judd, Sylvester D., 30, 374, 387, 438, 439, 492, 494.

 Kalm, Peter, 23, 24, 434, 435, 443, 445, 447, 448, 450, 463, 484, 485.
 Kennard, F. H., 204, 232.
 Killdee, 348.
 Killdeer, 348.
 King, W. R., 19, 411, 412, 438.
 Klaiber, Sigmund, 171.

- Knight, Ora W., 42, 62, 68, 80, 83, 89, 108, 123, 128,
 129, 132, 138, 145, 148, 151, 201, 218, 245, 262, 263,
 283, 285, 311, 315, 328, 355, 376, 430.
 Knot, **262**, 284.
 Knots, 264, 267.
 Krieker, **270**.
- Lahontan, Baron de, 12, 20, 438.
 Lamb, Charles R., 266.
 J. H., 461.
 Lane, L. W., 240, 298.
 Langille, James Hibbert, 315, 354.
 Lapwing, 351.
 Latham, J., 143, 479.
 Lawson, John, 7, 343, 417, 434, 445, 447, 467, 473,
 479, 482, 489.
 Lead-back, **282**.
 Learo, A., 462.
 Lebaron, J. F., 195, 206.
 Leffingwell, W. B., 14, 22, 184, 343, 447.
 Leonard, C. L., 264.
 Edwin, 172.
 H. C., 442.
 W. H., 242, 379.
 Levett, Christopher, 11, 484.
 Lewis, Alonzo, 10, 437.
 Elisha J., 13, 16, 19, 22, 211, 256, 386, 490.
 Limosa fedoa, **294**.
 hamastica, **297**.
 Linder, George, 199, 371.
 Line of flight, supposed changes in, 549.
 Linsley, J. H., 82, 205, 310, 327, 357, 365.
 Live decoys, 536.
 Lobipes lobatus, **227**.
 Lockwood, Wilton, 580.
 Long, W. B., 93, 97, 265.
 Long-tail, **139**.
 Loon, **50**.
 Black-throated, **56**.
 Little, **57**.
 Red-throated, **50**, **57**.
 Loons, 3, 32, 49, 407.
 Lophodytes cucullatus, **67**.
 Lord and Lady, **144**.
 Lovell, Orville D., 187.
 Lowell, C., 485.
 Lucas, Frederic A., 404, 409.
 Lund, Fred B., 292.
 Lyell, Sir Charles, 536.
 Lyford, C. Allan, 407.
 Lyman, Theodore, 206, 406.
- MacFarlane, R., 276, 299.
 Machetes pugnax, **314**.
 Mackay, Geo. H., 52, 140, 143, 154, 156, 162, 164,
 165, 226, 230, 262, 263, 264, 266, 267, 332, 333, 339,
 340, 346, 347, 416, 425, 427, 429, 431, 432.
 Macker, E. M., 249.
 Macrorhamphus griseus griseus, **253**.
 scolopaceus, **259**.
 Mallard, 4, 8, **71**, 76, 81, 102, 484, 564, 572, 573.
 Black, **76**.
- Manning, Warren H., **440**.
 Mareca americana, **86**.
 penelope, **84**.
 Marila affinis, **124**.
 americana, **113**.
 collaris, **127**.
 marila, **121**.
 valisineria, **118**.
 Marlin, **294**.
 Marsh, Othniel C., 215.
 Marsh-hen, **221**.
 Marsh-hen, fresh-water, **207**.
 Marsh-plover, **270**.
 Mayhew, Ulysses E., 389.
 Maynard, C. J., 77, 87, 92, 96, 103, 184, 195, 206,
 234, 256, 271, 279, 280, 283, 286, 292, 296, 298, 304,
 317, 321, 325, 327, 331, 337, 349, 355, 366, 379, 413,
 421, 442.
 McAtee, W. L., 159, 162, 165, 498, 499, 572, 576,
 578, 580.
 McCoun, John, 456.
 McIlhenny, F. A., 254.
 McLellan, Isaac, 343.
 Meadow-chicken, **210**.
 Meadow-hen, **221**.
 Meadowlark, 392.
 Mease, James, 445.
 Megapolensis, Johannes, Jr., 9.
 Meleagris gallopavo gallopavo, **488**.
 silvestris, **487**.
- Merganser, **60**.
 Buff-breasted, **60**.
 Hooded, **67**.
 Red-breasted, **60**, **62**, **64**.
 Mergansers, 58, 61, 159, 407, 500.
 Mergus americanus, **60**.
 serrator, **64**.
 Merriam, C. Hart, 82, 131, 136, 141, 473.
 Merrill, Harry, 384, 462.
 Mershon, W. B., 446, 449, 452, 453, 455, 462, 469,
 514.
 Micropalama himantopus, **260**.
 Miller, F. H., 459, 462.
 Frank L., 500.
 Gerritt S., Jr., 168, 203, 226.
 Milner, W. P., 172.
 Minot, Henry D., 387, 442.
 Mitchell, J. D., 172, 196, 250, 422.
 Mongrel, **260**.
 Moody, Levi, 387, 438.
 Moore, James W., 441.
 N. B., 360.
 Morris, George Spencer, 130, 136.
 Robert O., 61, 62, 88, 96, 104, 115, 125,
 126, 171, 199, 204, 206, 211, 216, 222,
 243, 272, 441, 442, 492.
 Morse, C. Harry, 379.
 Eugene E., 379.
 Morton, Thomas, 10, 92, 173, 178, 291, 385, 412,
 413, 474, 480, 482, 484, 488, 489.
 Moseley, B. T., 74.
 Mourning-bird, **354**.

- Mud-hen, **219, 221.**
 Red-billed, **219.**
 White-billed, **221.**
- Muddy-breast, **340.**
- Mud-peep, **278, 281.**
- Munsell, Joel, **466, 475.**
- Murphy, John Mortimer, **13, 14, 15, 16, 21, 317, 475.**
- Murres, **2, 402.**
- Nash, Charles W., **347, 351.**
- Natural enemies, **541.**
- Nelson, Edward W., **57, 144, 164, 225, 259, 270, 273, 336, 340, 432.**
- Nettion carolinense, **91.**
 crecca, **90.**
- Newcomb, Madison, **439.**
 R. L., **285.**
- Newell, **345.**
- Newhall, J. R., **11, 437.**
 Alfred, **411, 413.**
- Nice, Mrs. Margaret Morse, **373, 374.**
- Nicholson, J. S., **241, 243.**
- Night shooting, **533.**
- Nomonyx dominicus, **169.**
- Norton, A. H., **152.**
- Nourse, Henry S., **474.**
- Numenius americanus, **225.**
 borealis, **416.**
 hudsonicus, **330.**
- Nuttall, Thomas, **51, 65, 92, 132, 138, 162, 184, 213, 255, 260, 263, 271, 279, 283, 286, 287, 298, 304, 317, 321, 324, 331, 336, 337, 343, 355, 359, 378, 386, 479, 483.**
- Nye, William P., **425.**
- Ochtdromus wilsonius, **357.**
- Oidemia americana, **153.**
 deglandi, **160.**
 perspicillata, **163.**
- Old Injun, **139.**
- Old-squaw, **139.**
- Old-squaws, **2, 500, 529.**
 netted in the Great Lakes, **142.**
- Old Wife, **139.**
- Oldys, Henry, **31.**
- Olor buccinator, **472.**
 columbianus, **194.**
 cygnus, **201.**
- Ord, George, **231, 540.**
- Osborn, E., **453, 454, 464.**
 Francis B., **257.**
- Osgood, Fletcher, **232, 299.**
 W. H., **365.**
- Otis, Amos, **414.**
- Overton, Frank, **524.**
- Owl, Barred, **392.**
 Great Horned, **126, 494.**
- Oxyechus vociferus, **348.**
- Oyster-catcher, **295, 362.**
 Black, **365.**
- Oyster-catchers, **361.**
- Packard, A. S., **179, 419.**
- Paine, Charles J., Jr., **172, 281.**
 W. T., **523.**
- Pale-belly, **340.**
- Pale-breast, **340.**
- Parker, Edward L., **73, 512.**
 Foster, **82, 84.**
 J. G., **343.**
- Parkhurst, Anthonie, **402.**
- Paroquet, Carolina, **428.**
- Partridge, Birch, **377.**
 Canada Spruce, **375.**
 Hungarian, **563.**
 Spruce, **375.**
 Swamp, **375.**
- Partridges, **1, 9, 10, 12.**
 American, **367, 385.**
 European, **33, 563, 567.**
- Passer domesticus, **567.**
- Pasture Bird, **340.**
- Patch-head, **163.**
- Patterson, George, **204.**
- Payne, Charles, **423.**
- Payson, Gilbert R., **304.**
- Peabody, W. B. O., **141, 149, 184, 218, 220, 256, 263, 269, 271, 295, 298, 317, 327, 337, 343, 349, 355, 357, 386, 421.**
- Pearson, Lyman, **110, 371.**
 T. Gilbert, **18, 513, 524.**
- Pease, W. C., **204.**
- Peep, **275, 278, 286.**
 Black-legged, **286.**
 California, **282.**
 Sand, **286.**
 Web-footed, **227.**
- Pelicans, **7.**
- Pelidna alpina alpina, **281.**
 sakhalina, **282.**
- Penguin, **39, 399, 402, 407, 409.**
- Percy, George, **6.**
- Perkins, C. L., **172, 326.**
 G. H., **134, 443.**
- Perry, N. C., **93.**
 William S., **486, 487.**
- Peterson, W. C., **126, 185.**
- Phalacrocorax perspicillatus, **414.**
- Phalarope, Northern, **226, 227, 498.**
 Red, **225, 227, 228.**
 Wilson's, **229, 498.**
- Phalaropes, **201, 224, 226, 334, 429.**
- Phalaropus fulicarius, **225.**
- Pheasant, **378, 390, 515, 564, 565, 567.**
 Asiatic, **33.**
 English, **563.**
 Ring-necked, **563.**
- Pheasant, **385.**
- Phillips, E. E., **90, 104, 430.**
 Henry T., **446, 453, 513.**
 John C., **44, 58, 68, 85, 110, 125, 128, 167, 179, 206, 539, 580.**
- Philohela minor, **235.**
- Picket-tail, **102.**

- Pictured-bill, **163**.
 Pidgeons, **436**.
 Pierce, R. V., **578**.
 Piers, Harry, **425**.
 Pigeon, Passenger, **9**, **31**, **109**, **187**, **317**, **346**,
 394, **395**, **417**, **419**, **423**, **427**, **428**, **433**,
 550.
 Prairie, **423**, **465**.
 White-crowned, **465**.
 Wild, **22**, **279**, **378**, **394**, **395**, **433**, **436**, **439**,
 444, **455**, **459**, **465**.
 Pigeons, **1**, **4**, **9**, **10**, **334**, **363**, **370**, **393**, **434**.
 Band-tailed, **460**.
 Pike, Nicolas, **217**, **327**, **415**.
 Zebulon Montgomery, **450**.
 Pintail, **102**, **572**.
 Pisobia, bairdi, **277**.
 fuscicollis, **274**.
 maculata, **270**.
 minutilla, **278**.
 Plaster-bill, **163**.
 Plautus impennis; **399**.
 Plover, **1**, **3**, **18**, **31**, **334**, **360**, **418**, **427**, **431**, **465**,
 498.
 Plover, Beach, **290**.
 Black-bellied, **264**, **335**, **340**.
 Black-breasted, **267**, **335**, **422**.
 Blue, **262**.
 Golden, **31**, **305**, **337**, **339**, **340**, **418**, **420**, **423**,
 427, **428**, **429**, **430**, **431**.
 Grass, **316**.
 Green, **340**, **342**.
 Killdeer, **348**, **497**, **498**, **499**.
 Mountain, **499**.
 Piping, **354**.
 Red-breasted, **262**.
 Semipalmated, **352**, **499**.
 Silver, **262**.
 Upland, **315**, **320**, **336**; **346**, **427**, **497**, **498**,
 499, **515**.
 Wilson's, **357**.
 Plummer, Gordon, **285**, **314**.
 Podilymbus podiceps, **46**.
 Pokagon, Chief, **460**, **469**, **471**.
 Pond-hen, **221**.
 Porzana carolina, **210**.
 Praeger, William G., **462**.
 Prairie Chicken, **26**, **387**, **388**, **391**, **392**, **514**, **534**
 (see also Pinnated Grouse).
 Prairie Hen, **30**.
 Pray, J. W., **218**.
 Preble, E. A., **196**, **425**.
 Prentiss, William N., **380**.
 Price, Sir Rose Lambert, **17**.
 Prime, N. S., **185**.
 Pring, Martin, **9**.
 Pringle, J. J., **238**, **246**, **247**, **250**.
 Ptarmigans, **22**, **381**.
 Willow, **384**.
 Purchas, Samuel, **8**.
 Purdie, H. A., **203**, **206**, **216**, **232**.
 Putnam, F. W., **218**, **376**, **404**.
 Quail, **9**, **10**, **22**, **25**, **27**, **367**, **368**, **509**, **581** (see
 also Bob-white).
 Quandy, **139**.
 Querquedula cyanoptera, **98**.
 discors, **95**.
 Rail-bird, **210**.
 Rail, Black, **214**, **215**.
 Carolina, **210**.
 Clapper, **202**, **205**.
 King, **202**.
 Little Black, **215**.
 Long-billed, **207**.
 nocturnal notes of, **212**.
 Sora, **207**, **210**.
 Virginia, **202**, **203**, **207**, **211**.
 Yellow, **213**.
 Rails, **1**, **208**, **209**, **211**, **212**, **214**, **216**, **224**, **334**, **487**, **579**.
 Rallus crepitans crepitans, **205**.
 elegans, **202**.
 virginianus, **207**.
 Ralph, W. L., **131**.
 Reagh, A. L., **204**.
 Recurvirostra americana, **231**.
 Redback, **282**.
 Red-breast, **262**, **266**, **267**, **284**.
 Red-heads, **4**, **14**, **16**, **28**, **79**, **89**, **127**, **129**.
 Redlegs, **359**.
 Reed, C. A., **76**.
 Reeve, **314**.
 Remington, Howard, **88**.
 Rice, James Henry, Jr., **77**, **239**, **250**, **514**, **553**.
 Rich, W. E., **128**, **140**, **149**, **155**, **182**.
 Richard, William, **315**.
 Richardson, John, **417**.
 Ridgway, Robert, **218**, **230**, **409**, **492**.
 Ring-neck, **113**, **352**, **353**, **357**.
 Robbins, W. W., **141**.
 Robin-snipe, **262**.
 Robinson, Edward B., Jr., **538**.
 W. R., **216**.
 Rock-bird, **268**.
 Rock-plover, **268**.
 Rock-snipe, **268**.
 Rodgers, John G., **206**.
 Roney, H. B., **446**, **453**.
 Roosevelt, B., **107**.
 Theodore, **558**.
 Rosier, James, **11**, **484**.
 Ross, August B., **441**.
 Rosser, J. G., **462**.
 Ruff, **314**.
 Sage, John H., **461**, **522**.
 Samuels, E. A., **77**, **90**, **92**, **96**, **103**, **108**, **114**, **132**,
 136, **138**, **149**, **171**, **181**, **184**, **235**, **256**, **263**, **269**,
 283, **285**, **292**, **296**, **311**, **317**, **321**, **327**, **328**, **331**,
 332, **343**, **349**, **355**, **421**, **442**.
 Sand-bird, **274**, **279**.
 Sanderling, **226**, **272**, **290**.
 Sanderlins, **291**.
 Sand-lark, **322**.

- Sand Oxeve, 286.
 Sand-peep, 277.
 Sandpiper, 277, 499.
 Bartramian, 315.
 Bonaparte's, 275.
 Buff-breasted, 320.
 Curllew, 284.
 Least, 18, 278, 287, 288, 498.
 Pectoral, 270, 277, 498, 499.
 Purple, 268.
 Red-backed, 226, 281, 282.
 Semipalmated, 275, 277, 278, 279, 286, 293, 498.
 Shintz's, 275.
 Solitary, 306, 322.
 Spotted, 306, 307, 322.
 Stilt, 260.
 Western, 289.
 White-rumped, 274, 277.
 Sandpipers, 1, 18, 19, 31, 226, 263, 268, 269, 278, 287, 307, 319, 322, 323, 324, 353, 498.
 Sanford, L. C., 29, 116, 120, 199, 256, 266, 279, 296, 304, 311, 328, 337, 421, 430.
 Saunders, F. H., 379, 383.
 Savage, James, 158, 436.
 Scape-grace, 57.
 Scaup, 4, 113, 121, 126, 127, 572, 575.
 American, 122.
 Black-head, 125.
 Greater, 124, 125.
 Lesser, 121, 122, 124, 128, 571, 572.
 Ring-necked, 127.
 Schaff, Morris, 455.
 Schoolcraft, Henry R. L., 463, 464.
 Scoldenore, 139.
 Scolder, 139.
 Scoter, 111, 153, 161, 165, 166, 500, 501, 576.
 American, 153.
 Surf, 163.
 White-winged, 158, 160.
 Scott, W. E. D., 254, 336.
 Sea-crow, 221.
 Sea-goose, 225, 227.
 Sea Mouse, 144.
 Sea-quail, 359.
 Sea Robin, 64.
 Sears, Geo. W. (Nessmuk), 490.
 William R., 552.
 Sea-snipe, 227.
 Sennett, George B., 197, 198, 551.
 Seton, Ernest Thompson, 91, 456, 462.
 Sharples, J. J., 119.
 Sharrock, Richard J., 265.
 Shaw, Henry, 345.
 Louis A., 430.
 Sheldon, Israel R., 88, 104, 116, 136, 141, 161.
 Sheldrake, 59, 60, 63, 64, 66, 130, 500.
 Freshwater, 60.
 Hooded, 67.
 Long Island, 64.
 Mud, 67.
 Pond, 60.
 Sheldrake — *Con.*
 Spring, 64.
 Swamp, 67.
 Winter, 60.
 Wood, 67.
 Shelduck, 64.
 Shell-bird, 64.
 Shoveller, 95, 99, 572.
 Sicklebill, 325, 327.
 Silverback, 262.
 Simpleton, 282.
 Skimmer, Black, 363.
 Skunkbill, 163.
 Skunkhead, 163.
 Skunk-top, 163.
 Small, Willard M., 243, 265.
 Smith, Arthur, 206.
 John, 7, 15, 488.
 Smyth, Charles H., 423.
 Fred G., 423.
 Snights, 8.
 Snipe, 1, 3, 9, 19, 31, 245, 498.
 Crooked-billed, 282.
 English, 245.
 Jack, 245.
 Red-breasted, 19, 253.
 Wilson's, 19, 228, 245, 253, 272.
 Winter, 268.
 Snuff-taker, 163.
 Somateria dresseri, 148.
 mollissima, 147.
 borealis, 147.
 spectabilis, 151.
 Sora, 207, 210.
 South Southerly, 139.
 Sparked-back, 359.
 Sparrow, European House, 567.
 Sparrow, Samuel E., 266.
 Spatula clypeata, 99.
 Spaulding, William H., 430.
 Speckle-belly, 81.
 Spence, Miles, 456.
 Spinney, H. L., 155.
 Spoonbill, 99.
 Spotrump, 297.
 Sprigtail, 102.
 Squatarola squatarola, 335.
 Squatter, 270.
 Squealer, 144.
 Staples, E. F., 107, 379.
 Stearns, W. A., 275, 296, 298, 311, 317, 332, 422.
 Steenstrup, J. J. S., 404.
 Steganopus tricolor, 229.
 Stevens, S. S., 454, 456, 464.
 Stewart, George, 461.
 W. R., 540.
 Stib, 282.
 Stilt, 232, 260.
 Stilts, 230.
 Black-necked, 233.
 Stone, Clayton E., 439, 440, 441.
 Lewis, 327, 345.

- Stone, Stillman, 439.
 William N., 430.
 Witmer, 30, 68, 108, 275, 317, 425, 441, 461.
- Stork, William, 434.
- Strachey, William, 8, 434.
- Strater, Hermon, 116.
- Streaked-back, 359.
- Suckley, George, 475.
- Sugden, A. W., 247.
- Sullivan, Richard H., 423.
- Sumner, William H., 418, 419, 421.
- Surfer, 163.
- Swainson, W., 417.
- Swan, Alfred S., 104, 243, 257, 265, 429.
- Swan, Trumpeter, 472.
 Whistling, 194, 475.
 Whooper, 201.
- Swannes, 8.
- Swans, 3, 4, 8, 9, 12, 13, 58, 169, 193, 195, 473, 474, 475, 531.
 Destruction of, 196, 197, 198, 199.
 Dying song of, 200, 201.
- Swenk, Myron H., 423.
- Tarr, A. F., 228.
- Tattler, 300.
- Teal, 3, 4, 8, 9, 12, 17, 24, 93, 97, 221, 475, 518.
 Blue-winged, 28, 91, 92, 93, 94, 95, 97, 98, 99, 518, 523, 565, 572.
 Cinnamon, 98.
 European, 90.
 Green-winged, 28, 91, 93, 97, 502, 518, 523, 572.
 Mud, 91.
 Spoonbill, 99.
 Summer, 95.
 Winter, 91.
- Teeter, 322.
- Teeter-peep, 322.
- Temminck, C. J., 363.
- Thacher, F. G., 243.
- Thayer, Gerald H., 307.
 H. J., 443.
 John E., 69, 200, 314, 430, 518.
- Thomas, A. B., 430.
- Thompson, E. H., 387.
 Zadock, 317, 439, 481, 492.
- Thoreau, H. D., 58, 156, 263, 440.
- Three Toes, 340.
- Thrushes, 316.
- Thurlow, G. F., 199.
- Thwaites, R. G., 434, 448.
- Tinkham, Horace, 172.
- Tip-up, 322.
- Toad-head, 340.
- Toeque, Philip, 408, 409.
- Totanus flavipes, 303.
 melanoleucus, 300.
- Townsend, C. W., 55, 69, 73, 87, 92, 95, 103, 108, 114, 128, 136, 149, 172, 199, 203, 204, 218, 228, 260, 267, 268, 269, 277, 278, 279, 280, 285, 288, 293, 300, 309, 324, 328, 336, 337, 340, 349, 356, 357, 360, 414, 425, 426, 428, 429, 430, 436.
- Tringa canutus, 262.
- Tripp, George H., 372.
- Troop-fowl, 121.
- Trumbull, Gurdon, 167, 298, 327, 332, 422, 427.
- Tryngites subruficollis, 320.
- Tucker, E. W., 419.
- Tufts, H. F., 255.
- Turkey, Mexican, 488.
 Wild, 487.
- Turkeys, 1, 7, 8, 9, 10, 12, 21, 24, 25, 370, 383.
 Wild, 6, 10, 22, 23, 24, 26, 30.
- Turnbull, W. P., 77, 107, 136, 171, 184, 231, 263, 292, 295, 298, 304, 311, 331, 387, 421, 473, 479, 549.
- Turner, Obadiah, 11.
- Turnstone, Ruddy, 359.
- Turnstones, 264, 267, 358, 360, 361.
- Tuttle, Albert H., 88, 265.
- Tyler, L. G., 6.
- Tympanuchus americanus americanus, 388.
 cupido, 385.
- Ullrich, J., 461.
- Uplander, 315, 318.
- Van Cleef, J. S., 452, 466.
- Van Dyke, Theodore S., 29, 256, 279, 296, 304, 311, 328, 337, 421.
- Vibert, C. W., 45.
- Vickary, N., 193.
- Vivian, W. H., 199.
- Vultures, 451.
- Wallace, John H., Jr., 514.
- Wamp, 148.
- Warblers, 316.
- Ward, G. C. Tremaine, 464.
 H. L., 424.
- Warren, B. H., 42, 55, 138, 275, 308, 323, 356.
- Wassenaer, Nicolaes van, 8.
- Water-chicken, 219, 221.
- Water-hen, 221.
- Water-witch, 46.
- Watson, John, 457.
- Wayne, Arthur T., 68, 132, 204, 214, 215, 216, 220, 239, 249, 254, 256, 264, 275, 295, 312, 336, 360, 366, 461.
- Webb, W. W., 420.
- Webster, Daniel, 365, 413.
- Welch, George O., 203, 230.
- Weld, Isaac, Jr., 437.
- Wells, Homer, 518.
- Wendel, Robert, 218.
- Whale-bird, 225.
- Wharton, William P., 206, 257, 292, 303, 380.
- Whip-poor-will, 369.
- Whistler, 113, 129, 134, 523.
- White, Asher, 199.
- White-belly, 86.
- Whiterump, 297.
- Whitey, 290.
- Whitin, H. T., 249.
- Whiting, Willard C., 82.

- Whitman, G. P., 218.
 Whitney, Caspar, 518.
 Widgeon, 4, 9, 83, **86**, 523.
 American, **86**.
 Blue-billed, **121**.
 California, **86**.
 European, **84**.
 Southern, **86**.
 Stiff-tailed, **166**.
 Widmann, Otto, 30, 424, 456, 458, 462.
 Willet, 271, **309**, 311, 312, 363, 431.
 Western, 310, **313**.
 Williams, Edward, 8.
 H. H., 418, 419.
 Roger, 436.
 Samuel, 437.
 Williamson, B. T., 172.
 Wilson, Alexander, 19, 20, 23, 42, 51, 77, 87, 135,
 149, 167, 231, 232, 234, 255, 283, 299,
 304, 310, 327, 329, 331, 349, 355, 362,
 364, 365, 366, 417, 443, 444, 451, 479,
 480, 549.
 T. C., 206, 265, 326, 429.
 Winch, C. S., 430.
 Winslow, John M., 74, 97, 115, 123, 141, 149, 191,
 327, 344, 345, 420.
 Winthrop, John, 436.
 Wobble, **399**, 403, 404.
 Wolcott, Roger, 480.
- Wood, C. C., 218.
 C. Irving, 461.
 William, 10, 11, 171, 173, 178, 385, 435, 480,
 482, 484, 489.
 Woodcock, 20, **235**, 248, 249, 252, 312, 498, 499, 529,
 547.
 Wood-hen, 20.
 Wood-pigeon, 434.
 Woodruff, E. Seymour, 381.
 S. D., 464, 465.
 Worth, H. G., 149.
 Worthington, W. W., 336.
 Wren, Long-billed Marsh, 288.
 Wright, Albert Hazen, 467.
 Wyman, Jeffries, 406.
- Yellow-leg, Bastard, **260**, 261.
 Big, **300**.
 Little, **303**.
 Summer, **303**, 305.
 Yellow-legs, 19, 230, 253, 261, **303**, 316.
 Greater, **300**, 304, 305.
 Lesser, **303**.
 Winter, **300**, 301, 302.
 Young, Curtis C., 281.
 W. H., 15.
- Zenaidura macroura carolinensis, **394**.
 Zerrahn, C. O., 88, 257, 265.

