

SB995

M4



SB 995.M4

First annual report of the Division of O



3 1924 000 097 182

mann

Compliments of
The Commonwealth of Massachusetts

DEPARTMENT OF AGRICULTURE *a. H. Wright*

ARTHUR W. GILBERT, COMMISSIONER

81192
FIRST ANNUAL REPORT

OF THE

DIVISION OF ORNITHOLOGY

By EDWARD HOWE FORBUSH

BEING A REPRINT OF A PART OF THE ANNUAL REPORT OF THE
DEPARTMENT OF AGRICULTURE FOR THE YEAR
ENDING NOVEMBER 30, 1920

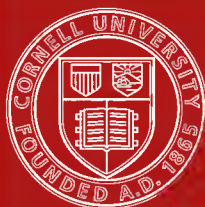


BOSTON

WRIGHT & POTTER PRINTING CO., STATE PRINTERS

32 DERNE STREET

1921



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.



Downy Woodpecker. (Photograph by Harry G. Higbee, Sharon, Massachusetts.)



Sapsuckers and their work. (Photograph by Harry G. Higbee, Sharon, Massachusetts.)

IT is now the policy of the state not to keep mailing lists, and publications are sent only on request. *If you wish the report for 1921, please sign this slip and mail it to the Division of Ornithology, 136 State House, Boston, Mass., otherwise you may not receive the report next year.*

Name.....

Town, street and number.....

State.....

The Commonwealth of Massachusetts
DEPARTMENT OF AGRICULTURE
ARTHUR W. GILBERT, COMMISSIONER

FIRST ANNUAL REPORT
OF THE
DIVISION OF ORNITHOLOGY

BY EDWARD HOWE FORBUSH

BEING A REPRINT OF A PART OF THE ANNUAL REPORT OF THE
DEPARTMENT OF AGRICULTURE FOR THE YEAR
ENDING NOVEMBER 30, 1920



BOSTON
WRIGHT & POTTER PRINTING CO., STATE PRINTERS
32 DERNE STREET
1921

PUBLICATION OF THIS DOCUMENT
APPROVED BY THE
SUPERVISOR OF ADMINISTRATION.

CONTENTS.

	PAGE
Publications of the Year,	5
Material in Preparation for Publication,	6
Matters regarding International Bird Protection in America,	6
Constitutionality of the Migratory Bird Treaty Act affirmed by the Supreme Court of the United States,	8
Constitutionality of the Migratory Bird Convention Act affirmed by the Supreme Court of Prince Edward Island,	8
Complaints of Lawbreaking,	9
Inquiries from Outside Massachusetts,	9
Special Investigations,	10
Sapsucker Work and Similar Work by Other Woodpeckers,	10
The Heath Hen,	23
Exhibitions,	23
The Bird Hospital,	23
Bird Days,	24
Bird Migrations observed during the Year,	24
December, 1919,	25
A Southward Movement of Wild Fowl,	25
Movement of Grebes and Jays,	25
January, 1920,	26
A Southward Movement of Land Birds,	26
Geese wintering,	27
February,	27
Birds destroyed by Storm and Cold,	28
Great Blue Heron and Cowbirds wintering,	28
Winter Land Birds moving Coastward,	28
March,	28
Bird Mortality,	29
The Northward Movement begins,	29
The First Great Bird Wave,	29
April,	30
A Retrograde Movement,	30
Northward Flights of Hawks and Other Land Birds,	30
May,	31
The Spring Movement of Warblers,	31
Passenger Pigeons reported,	32

	PAGE
Bird Migrations observed during the Year — <i>Concluded.</i>	
June,	32
The Migration continues,	32
July,	33
Autumnal Migration begins,	33
A Few Egrets move Northward,	34
An Increase of Gulls and Terns,	34
August,	34
Southward Flights,	34
September,	35
Early Migration of Geese,	35
A Large Flight of Shore Birds,	36
Hawks, Nighthawks, etc.,	36
October,	36
A Great Flight the First Nine Days,	37
November,	38
Great Flights of Geese and Ducks,	38
A Scarcity of Land Birds,	39
An Ornithological Survey,	39
Recommendations,	44
A report on the Birds of the Commonwealth,	44
An Assistant Ornithologist,	45
A Plan for Adequate Protection of the Ruffed Grouse,	45

FIRST ANNUAL REPORT OF THE DIRECTOR, DIVISION OF ORNITHOLOGY.

PUBLICATIONS OF THE YEAR.

The great interest in birds manifested by the people of this and other Commonwealths continue to increase. This accession of interest in the living birds, their utility and their protection is exhibited in numberless insistent inquiries in respect to these subjects and in the great demand for literature regarding them. Current literature on birds, issued by this office, is eagerly sought, and the demand increases for reports, circulars and leaflets, some of which have been out of print for years. To meet this want certain publications must be issued and reissued. Following is a list of the prints and reprints of the year: —

- Twelfth Annual Report of the State Ornithologist, December, 1919.
- Department Circular No. 2, Third edition, revised, February, 1920.
Food, Feeding and Drinking Appliances and Nesting Material to attract Birds. 33 pp., 10 half-tones, 21 line cuts.
- Department Circular No. 12, second edition, revised, February, 1920.
Outdoor Bird Study, Hints for Beginners. 51 pp., 4 half-tones, 26 line cuts.
- Arbor and Bird Day, April, 1920. Prepared by Edward Howe Forbush and Harris A. Reynolds. Approved by Payson Smith, Commissioner of Education. 12 pp., 2 half-tones, 8 line cuts.
- Department Circular No. 25, August, 1920. The Farmers' Interest in Game Protection. 11 pp. Supplants Circular No. 31, 1915.
- Department Circular No. 45, third edition, revised, August, 1920. The Starling. 23 pp., 3 half-tones.
- Nature Leaflet No. 14, sixth edition, August, 1920. Owl Friends. 6 pp., 3 line cuts.
- Department Circular No. 10, second edition, August, 1920. Bird Houses and Nesting Boxes. 28 pp., 12 half-tones, 29 line cuts.
- Economic Ornithology, Bulletin No. 4, October, 1920. Two Years with the Birds on a Farm. Second edition, 42 pp., 3 half-tones, 6 line cuts. Revised and reprinted from Fiftieth Annual Report of the State Board of Agriculture.

Material in Preparation for Publication.

The fourth edition of "Useful Birds and their Protection" was exhausted in 1919, and as the law under which it formerly was reissued was repealed when the Department of Agriculture was reorganized, further editions cannot be published without legislation for that specific purpose, although the demand for the work still continues. To fill this demand in part and to answer many questions of correspondents regarding the utility of birds, material has been collected during the past year for a bulletin on this subject. Material also has been gathered for a preliminary list of the birds of Massachusetts, with annotations, which, if published, will be the first paper from this office to deal with the distribution of the birds of this Commonwealth. In November, Dr. John B. May, who was temporarily employed as assistant in this office, prepared an index of the twelve reports of the State Ornithologist. Mr. Arthur J. Parker has prepared a list of officers and officials of Massachusetts organizations interested in the study or protection of birds.

MATTERS REGARDING INTERNATIONAL BIRD PROTECTION IN AMERICA.

There are few laws for the protection of birds in the Latin-American republics. It would be quite possible for the people of any one South American country to exterminate certain species of North American birds that pass through their country or winter there, and it seems imperative that something should be done to protect all such birds in those countries as soon as may be.

In 1919 the writer was named as a member of a committee appointed by the National Association of Conservation Commissioners. It was made the duty of this committee to bring influence to bear for the promotion of conventions with Central American and South American countries under which migratory birds might receive such protection in those countries as now is afforded them in the United States and Canada under the treaty of 1916 between the United States and Great Britain. On December 8, 1919, a letter was received by the

writer from the chairman of the committee, Hon. John H. Wallace, Commissioner of the Alabama Department of Conservation, asking that a paper be prepared bearing upon the migration of birds from the United States to the Latin-American republics. Such a paper was prepared at once, giving in brief a statement regarding the migration of many species of North American birds to or through these republics, and was forwarded to Chairman Wallace. This paper was used as an argument for international bird protection, and also was printed by Chairman Wallace and given wide circulation. On December 19 another letter was received from Mr. Wallace in which he said that he had received a communication from Senator Bankhead of Alabama, enclosing a letter from Senator Lodge, who asserted that the committee on foreign relations probably would report Senator Bankhead's resolution (No. 656) requesting the President to propose a treaty between the United States and the Latin-American republics for the protection of birds which migrate between the United States and such countries. On January 9, 1920, the United States Senate agreed to send to the President Senator Bankhead's resolution.

March 20, 1920, the resolution proposed by Senator Bankhead had received the attention of the President. On that day he sent a message to the Senate transmitting also the report of Frank L. Polk, acting Secretary of State, to whom he had referred the resolution for consideration. Mr. Polk not only gave his ideas on the matter, but also the views of the Secretary of Agriculture, to whom he had turned for further information. In brief, the Secretary of Agriculture stated that in view of existing conditions the time did not seem opportune to undertake the negotiation of a treaty for the protection of migratory birds with the Republic of Mexico, and that in the case of most of the republics of Central and South America such treaties are unnecessary at present. In the case of Brazil and Argentina, such treaties might be of advantage. But before the negotiation of conventions with these countries was undertaken, the Department desired more definite information than was then available; therefore, no further action on this matter will be taken by the Department of State at present. In the meantime, Dr. E. W. Nelson, chief of the United States

Biological Survey, has sent an agent to Argentina, Uruguay, Paraguay and southern Brazil for the purpose of securing needed information concerning the conditions relating to such of our migratory birds as winter in those regions.

Constitutionality of the Migratory Bird Treaty Act affirmed by the Supreme Court of the United States.

On January 12, 1920, a letter was received from Louis Marshall, Esq., of the firm of Guggenheimer, Untermeyer & Marshall of New York City, in which it was assumed that the writer was in favor of sustaining the constitutionality of the migratory bird treaty act, which under the treaty with Great Britain extends protection to our game and insectivorous migratory birds throughout the United States. Mr. Marshall, at the instance of the Association for the Protection of the Adirondacks, of which he was a trustee, had prepared a brief on this subject, to be presented before the Supreme Court of the United States on March 1, upholding the constitutionality of the migratory bird treaty act. He enclosed the proofs, in which he had quoted extensively from "Useful Birds and their Protection," and requested further information, particularly in regard to the insect food of wild fowl. The material for which he asked was furnished on January 23. On Patriots' Day, April 19, the Supreme Court of the United States rendered a decision sustaining the constitutionality of the migratory bird treaty act, thereby fully legalizing both Federal and international protection of migratory birds and bringing to an end a fight for such protection which had been waged for more than a decade by bird protectionists. It now remains to provide means for enforcing the Federal migratory bird treaty act, as the present appropriation for its enforcement is inadequate.

Constitutionality of the Migratory Bird Convention Act affirmed by the Supreme Court of Prince Edward Island.

On December 8, 1920, a letter was received from Commissioner J. B. Harkin of the Department of the Interior, Canada, enclosing a copy of a judgment given by the Supreme Court of Prince Edward Island, sustaining the constitutionality of the

migratory bird convention act, which in Canada performs a similar office to that of the migratory bird treaty act in the United States. This will tend to sustain in Canada the enforcement of regulations under the treaty similar to those now in force in the United States.

COMPLAINTS OF LAWBREAKING.

During the past year many complaints have been received that the State laws for the protection of birds and game and the migratory bird treaty act had been violated. Wherever there seemed to be good grounds for complaint the matter has been brought to the attention of both the State and Federal authorities and in most cases immediate action has been taken. It is suggested, however, that such complaints, requiring quick action, should go direct to the authorities who have the enforcement of the law in charge, *i.e.*, Mr. William C. Adams, director, Division of Fisheries and Game, 321 State House, Boston, Massachusetts, and Dr. E. W. Nelson, chief, Bureau of Biological Survey, Department of Agriculture, Washington, District of Columbia.

INQUIRIES FROM OUTSIDE MASSACHUSETTS.

Many inquiries come to this office not only from Massachusetts but from other States and other countries. Most of them relate to birds, but some have no relation to the work of this Division. In such cases the matters are duly referred to the proper authorities, but there seemed to be no official to whom to refer a request from the National Research Council at Washington. The executive secretary of the Division of States Relations, Dr. Albert B. Barrows, wrote on January 10, 1920, asking information on the present scientific functions of the State departments of Massachusetts and their relations to each other, to the government, to the Legislature and to educational institutions in the State. The information was desired particularly in view of the recent changes in the organization of State boards, commissions and departments in Massachusetts.

Considering the many duties laid upon this Division by law, it did not seem proper for us to undertake the inquiry, and

the request was turned over to Mrs. Angeline D. McKee, who has been employed not only by the Department of Agriculture but by other State departments from time to time, with the request that she secure the information and put it in shape for the use of the Council. On March 5 Dr. Barrows acknowledged the receipt of the report on the scientific work in progress in the various departments of the State government of Massachusetts, and expressed his great appreciation of the report submitted by Mrs. McKee.

SPECIAL INVESTIGATIONS.

During the year the assistance of the official observers connected with the Division of Ornithology has been enlisted in investigating some questions relating to bird life. The result of only one of these investigations can be reported here.

Sapsucker Work and Similar Work by Other Woodpeckers.

It might seem that there could be little in dispute at this late date in respect to habits of common birds, but such is not the case. There is a difference of opinion among ornithologists regarding the habits of common woodpeckers. Many assert that Sapsuckers of the genus *Sphyrapicus* are the only species that make transverse rings of small rounded punctures, such as are numerous on the trunks and limbs of apple and other trees. Others declare that the Downy Woodpecker is responsible for such borings, while still others believe that these pits are attributable to several species.

The writer is responsible for the following statement regarding the Downy Woodpecker, an assertion which has been questioned more than once:—

In many cases it perforates the bark of apple trees with small roundish holes less than an inch apart, disposed in parallel, horizontal rings.¹

Last year when asked to substantiate this assertion, the writer had to confess that while he had seen the Downy Woodpecker working on trees having fresh perforations, he had not seen the bird actually make a row of such holes. Recently in a search through old notes the only reference to the subject

¹ Useful Birds and their Protection, 1907, p. 251.



TYPICAL SAPSUCKER WORK ON WILLOW.

Such work may kill trees. (Sierra Sapsucker, *Sphyrapicus v. dagetti*.) (Photograph by J. G. Grinnell.) (From Biological Survey Bulletin No. 39, by W. L. McAtee.)

that could be found was a memorandum to the effect that Chester A. Reed had seen the bird in the act.

Sapsuckers are now known to decorate the trees with little round holes in the manner described above. This habit has been observed and recorded by many people. Within the past two years the following persons have noted this habit of the Yellow-bellied Sapsucker in Massachusetts and reported it to this office: Messrs. F. B. Currier, A. A. Cross, A. C. Bagg, C. A. Clark, Arthur J. Parker, H. A. Torrey, Mrs. Viola F. Richards, Miss Mabel R. Wiggin and Mrs. W. F. Eldredge. The principal object of the bird seems to be to eat the cambium¹ or to drink the sap. In "Useful Birds and their Protection" there appears the following sentence: "The holes made by the Sapsucker are different in shape, being square rather than round." This is an error, as the evidence shows that the Sapsucker makes both round and square holes. Many ornithologists defend the Downy and Hairy Woodpeckers, which often are called Sapsuckers by the country people, and assert that these Woodpeckers never take sap or eat cambium.

An inquiry was begun in 1919 and continued through the past year to determine whether both the Sapsucker and the Downy Woodpecker could be held responsible for the rings of small rounded punctures. The principal objects of the inquiry were to examine the evidence concerning sapsucking habits of other Woodpeckers than the Sapsuckers, to determine what nutriment was sought by these species and to learn whether any injury to the tree had been known to result from the habit.

Mr. W. L. McAtee was the first to assemble the published evidence regarding this and the sapsucking habits of Woodpeckers other than Sapsuckers. This information appears in Biological Survey Bulletin No. 39, "Woodpeckers in their Relation to Trees and Wood Products." Wilson, who is quoted by McAtee, says in regard to this habit of the Downy Woodpecker: —

In fall he is particularly fond of boring the apple trees for insects, digging a circular hole through the bark, just sufficient to admit his bill, after that a second, third, etc., in pretty regular horizontal circles round

¹ The cambium layer is the soft substance, underlying the bark, through which the sap flows.

the body of the tree; these parallel circles of holes are often not more than an inch, or an inch and a half, apart, and sometimes so close together that I have covered eight or ten of them at once with a dollar.¹

Nuttall says: —

These perforations made by our Sapsuckers, as the present [Downy] and Hairy species are sometimes called, are carried round the trunks and branches of the orchard trees in regular circles.

Nuttall followed Wilson and perhaps did not depend entirely on his own observations, for he says: —

The circles of round holes which it makes with so much regularity around the . . . trees are no doubt made for the purpose of getting at the sweet sap which they contain.

He says also: —

In the month of February, 1830, I observed these borers busy tapping the small live trunks of several wax myrtles (*Myrica cerifera*); and these perforations were carried down into the alburnum, or sap-wood, but no farther. . . . On examining the oozing sap I found it to be exceedingly saccharine, but in some instances astringent or nearly tasteless.²

Dr. Henry Bryant of Boston published the following in 1866: —

It has long been known that some of our smaller woodpeckers pick out portions of the sound bark of trees, particularly of apple trees, where there are no larvæ and apparently no inducement for them to do so. . . . They [the holes] are generally seen in circles round the limbs or trunks of small irregularly rounded holes, and in this vicinity are made almost exclusively by the downy woodpecker (*P. pubescens*) aided occasionally by the hairy woodpecker (*P. villosus*).³

Dr. J. A. Allen, in a memoir of the Boston Society of Natural History, says: —

The perforations made in the bark of trees by woodpeckers, forming transverse rings, and sometimes so numerous as to do serious injury to the trees, have of late been very commonly attributed almost solely to

¹ Wilson, Alexander, and Bonaparte, Charles Lucien: American Ornithology, or the Natural History of the Birds of the United States, 1832, Vol. I, p. 161.

² Chamberlain, Montague: A Popular Handbook of the Ornithology of the United States and Canada, based on Nuttall's Manual, 1891, Vol. I, pp. 453, 454.

³ Proceedings, Boston Society of Natural History, 1866, Vol. X, pp. 91, 92.

this species [Yellow-bellied Sapsucker], especially in the West, where it is so numerous. That it is, from this habit, often greatly injurious to fruit trees is not to be denied, but that this species — now commonly called the “true sapsucker”, to whose depredations it is said should be assigned the general ill repute attached to the whole family by most agriculturists — is the sole author of this work, which so often amounts to mischief, there is abundant evidence to disprove. In most parts of Massachusetts, particularly in the Connecticut valley, this species is so extremely rare that I have never seen more than half a dozen specimens in a year, and oftener none at all, and then always during its migrations; while other expert collectors have searched for it unsuccessfully for years; yet our orchards always present these perforations in profusion, though seldom to an injurious degree; and now and then a forest tree is observed so thoroughly girdled as to be thus destroyed. For this our spotted woodpeckers, *Picus pubescens* and *P. villosus*, are chargeable, being in many sections the sole authors of it; they may be, in fact, very often seen engaged in it. I do not, however, suppose their object to be the same as that assigned to the *Sphyrapicus varius*, that of sucking sap or feeding on the inner bark.¹

Dr. Allen writes on December 8, 1920, that he cannot now recall whether or not he actually saw either the Downy Woodpecker or the Hairy Woodpecker making these holes, and that he has not now any manuscript notes of his observations made half a century ago, but that he has perfect confidence that his statements as quoted above were based on thoroughly convincing evidence.

Minot, 1895, says of the Downy Woodpecker: —

. . . they extract wood-borers and other insects from the wood. For this purpose they dig out small circular holes of about the size made by a large awl, and with these often encircle a large tree.²

Miss Blanchan says of the Downy Woodpecker (1899): —

It has been surmised that he bores the little round holes close together so often seen with the idea of attracting insects to the luscious sap. . . . The Downy actually drills these holes in apple and other trees to feed upon the milky inner bark of the tree, the cambium layer.³

In American Ornithology (1903) Chester A. Reed makes the following statement: —

You have probably noticed rows of tiny holes extending nearly around some apple trees. These are the work of the Downy in his search for the

¹ Memoir, Boston Society of Natural History, 1869, Vol. I, p. 499.

² Minot, H. D.: The Land-Birds and Game-Birds of New England, 1895, p. 336.

³ Blanchan, Neltje: Bird Neighbors, 1901, p. 56.

insects which, if left to do their work unhampered, would soon increase in numbers so as to devastate every orchard.¹

In the biennial report of the Commissioners on Fisheries and Game, Indiana, 1905-06, Charles K. Reed, the well-known naturalist of Worcester, Massachusetts, is credited with the following statement: —

Last fall I watched a Downy busily at work hammering on the trunk of an apple tree. He would pound away for half a minute steadily in one spot and then hitch sideways about an inch and repeat the operation; when he had completely encircled the tree he dropped down about his length and made another ring around the trunk. The marks left on the tree were identical with those that I had supposed were made by the Sapsuckers. The Downy did not appear to find anything to eat, and I concluded that he was doing it in play, or that he wished to sharpen his bill.²

It will be noted here that the bird having made one line of holes backed down the tree and started another. Mr. Stephen P. Brownell watched a Sapsucker making similar rings of holes in an alder in summer, and he says that the mother bird in making the pits, out of which the young took sap, always worked upward.³ Frank Bolles and C. Hart Merriam also noted this: at that time of the year sap flows from the upper holes, or the last row made.

A note to Mr. C. K. Reed elicited the reply that he did not write the article referred to, but that he supplied the cuts that went with it. Also that he never had observed this habit of the Downy Woodpecker, but he says that Chester Reed wrote this, as well as other unsigned articles in the magazine, and that Chester's statement of what came under his personal observation could be depended upon as an accurate chronicle of the facts. Charles K. Reed was the publisher of the magazine entitled "American Ornithology," and Chester Reed was its editor. The latter died in 1912. He wrote all the material in this magazine not credited to others. The article in the Indiana publication was evidently made up by some one in Indiana by taking excerpts bodily from American Ornithology written by Chester Reed, and illustrating them with

¹ Reed, Chester A.: *American Ornithology*, Vol. III, 1903, p. 94.

² *Biennial Report, Commissioners Fisheries and Game, Indiana, 1905-06*, p. 733.

³ *American Ornithology*, Vol. VI, 1906, p. 78.

cuts taken from the same magazine, and crediting C. K. Reed with the authorship of the article as it appeared in the biennial report. This was a very natural mistake, as the name of Charles K. Reed the publisher appeared prominently on the cover of each number of the magazine.

The assertion regarding the habits of the Downy Woodpecker quoted above, and written by Chester A. Reed, appeared first in *American Ornithology*, Vol. VI, No. 2, February, 1906, page 39, under the heading "Yellow-bellied Sapsucker," and was written to show that the Downy Woodpecker was responsible for a part, at least, of the lines of pits ordinarily seen on fruit trees in Worcester County, Massachusetts, and generally attributed to the Yellow-bellied Sapsucker. This is the first definite statement recording actual observation of this habit in the Downy Woodpecker that I have been able to discover.

Now for the evidence of eyewitnesses that the Downy and other Woodpeckers take both sap and cambium. In the "Food of Woodpeckers of the United States," by Professor F. E. L. Beal, the stomach contents of 3,453 Woodpeckers, including sixteen species, were recorded. Professor Beal reported that nearly all members of the Woodpecker family ate some cambium.¹ The quantity found in the stomachs of Sapsuckers, however, is apparently much greater than that found in other species. There seems to be little evidence available about other Woodpeckers, regarding the habit of taking sap, but in 1873 Mr. C. A. White wrote as follows: —

Upon the Iowa University campus we have a number of grand old aboriginal oaks, a favorite resort for red-headed woodpeckers (*Melanerpes erythrocephalus*). Among the young and growing trees that have been transplanted upon the campus are some sugar maples (*Acer saccharinum*) the bodies of which are 6 to 8 inches in diameter. Seeing the woodpeckers busily tapping upon them, I examined the trunks and found them perfectly sound, but the birds had pierced many holes of the usual size through the bark and into the cambium layer, where they stopped. The sap was flowing freely from the holes, and, watching the movements of the birds afterwards upon the trees, I became convinced that they were sucking the sap and that they had pecked the holes for the purpose of obtaining it.²

¹ United States Department of Agriculture, Biological Survey, Bulletin No. 37, 1911, p. 11.

² *American Naturalist*, 1873, Vol. VII, p. 496.

Mr. F. Stevens makes (1895) the following statement in regard to the California Woodpecker: —

At one of my camps in the pine region of Smiths Mountain, a family of this species developed the sapsucking habit. I had noticed some fresh holes in the bark of two live oaks, a foot or two from the ground, from which sap was flowing, and later I saw the birds drinking; in one case three were seen drinking at the same time. This is the only instance of the habit of this species that has come under my observation.¹

Joseph Grinnell records the following observation in 1908 regarding the same species: —

At Seven Oaks, June 24, 1906, we had been watching a Sierra Sapsucker (*Sphyrapicus v. daggetti*) industriously running a line of bark pits around the branch of an alder, when a California Woodpecker . . . flew down and drove off the sapsucker . . . then went the rounds of the borings himself, "dipping" from each.²

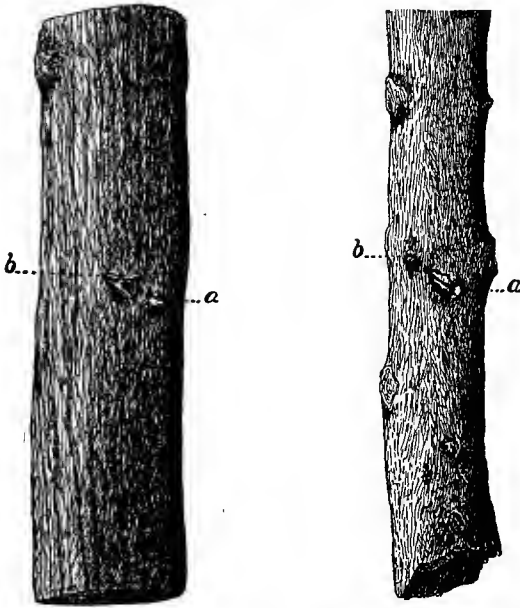
Farmers operating maple sugar orchards in New England assert that the Yellow-bellied Sapsucker, Downy Woodpecker Hairy Woodpecker and the Nuthatches all take sap from the trees when it is running. There is no reason to doubt this, as squirrels and insects, such as flies, wasps, hornets and butterflies, are known to have similar habits when the sap is flowing. In "Useful Birds" it is proved by the observations of the late C. E. Bailey, a very careful and accurate field ornithologist, that the Downy Woodpecker sometimes taps trees for the sap alone.³ Mr. Bailey followed a Downy Woodpecker from 12.30 until 2.45. He saw the bird tap two small maples 4 and 6 feet from the ground, after which it spent most of the time taking sap. The tree was tapped by pecking it a few times. The perforations made by the bird are figured from the specimens brought in by Mr. Bailey. The bird clung to the tree and took the sap out of the lower cut. It then sat for a long time in another tree, when it came back and took more sap. This was done three times while Mr. Bailey was watching it, and he was able to get within 6 feet of the bird while it was actually engaged in taking sap. The illustration

¹ Bendire, Charles: Life Histories of North American Birds, 1895, p. 115 (Smithsonian Institution, special bulletin).

² University of California Publications in Zoölogy, 1908, Vol. V, pp. 65, 66.

³ Useful Birds and their Protection, 1913, p. 256.

shows that the apertures made for taking sap were quite different from those to which reference has been made in the foregoing pages.



Section of two small red maple trees tapped for sap by Downy Woodpecker. The bird while making the cuts was watched by C. E. Bailey. It came back three times in two hours to take sap from the lower holes *a-a*. The upper incisions *b-b* were not used.

In the investigation made during 1919 and 1920 by our official observers, several people who actually saw the Yellow-bellied Sapsucker in the act of making horizontal lines of holes and feeding from them, described their observations. Mrs. Viola E. Richards of South Deerfield writes on October 18, 1920, that she watched a Yellow-bellied Sapsucker make two round holes in an apple tree. He drilled one shallow hole and then began on another, which he frequently left to return to the first, as if sap had gathered in one hole while he worked at the other. There is a recrudescence of sap in maple trees sometimes in autumn. The Indians are said to have drawn sap in October.

Mrs. William F. Eldredge of Rockport, Massachusetts, writes

that on October 8, 1920, she saw an immature Yellow-bellied Sapsucker drilling small holes low down on a girdled apple tree, and the bird allowed her to come very close. It had bits of "pulp" in its beak; the larger pieces were apparently discarded and the smaller ones swallowed. It drilled a few strokes, with its head turned to the left, and then turned it to the right, and in the midst of its labors it seemed to drink from the last completed boring. She reports that her husband saw it eat the inner bark. Others report similar observations. It seems probable that the Downy Woodpecker and possibly the Hairy Woodpecker may, at times, have the same object as this Sapsucker.

Miss Florence W. Rockwell of Montague writes, June 3, 1920, that she has watched the Downy Woodpeckers evidently drinking sap from such holes, but has not seen the pits in the making. Miss Nina G. Spaulding writes from Jaffrey, New Hampshire, on March 12, that she watched a Downy Woodpecker on an old apple tree evidently pecking some small round holes. After he left she found fresh holes. Some were increased in size, evidently by pecking at the same place until a large space was cleared of bark. She writes that she has seen but one Sapsucker in that region, but that there are quantities of round holes in apple trees. Many others report the prevalence of Downy Woodpeckers and the scarcity of Sapsuckers, but this cannot be accepted as conclusive proof that the Sapsucker did not make the holes.

Major Mark Robinson writes from Mowat post office, Ontario, that on February 2, 1920, he saw a male Downy Woodpecker in a small yellow birch making a ring of holes along one side of the trunk about 6 inches below a knot hole, or "cat face," and watched the bird for some time about 8 feet distant. On April 11 he writes that he has examined carefully the holes that he reported as made by the Downy Woodpecker, and found that some insect had bored into the trunk of the tree. It was hoped to get a photograph of this Woodpecker's work, but it was learned that Major Robinson had destroyed the specimen by tearing off the bark in making his examination. He asserts that this work was "not in the same class" with that of the Sapsucker. The Woodpecker evidently was drilling for insects.

Mr. William J. Cartwright of Williamstown, Massachusetts, writes, October 28, 1920, that he flushed a Downy Woodpecker from an apple tree having holes in circles about its trunk, and found some freshly cut holes, while others showed signs of various stages of weathering. He did not actually see the Woodpecker make the holes, but the point he makes is that the holes he has found made by Sapsuckers always have gone deeper into the sapwood than those found on this ash tree. He noticed, however, that the individual holes in both cases were about the same distance apart. The bird did not come back to the tree while he was present.

Mrs. Susan K. Squires of Fredericton, New Brunswick, writes, November 11, 1919, that in October of that year when picking apples she saw two or three Downy Woodpeckers going over and over an old crabapple tree. She examined the tree and found it had rows of new holes and some that looked like old ones newly opened, but most of the new ones were on spots where loose bark had fallen, or where the Woodpeckers had pecked it off.

Mr. Norman P. Woodward of Worcester, Massachusetts, writes, November 17, 1919, that there is an old pear tree in his yard that is full of holes made by Woodpeckers. He has often seen the Downy Woodpecker drilling these holes, but never long at one hole. It runs from hole to hole, and gives half a dozen pecks with its bill. He has never seen in either spring or autumn any signs of sap running from these holes. He has sugar maples at the door, but so far as he is aware, they are not visited by these Woodpeckers.

Mr. J. K. Jensen, a Danish field ornithologist of long experience, formerly of Westwood, Massachusetts, but now of Santa Fé, New Mexico, says that he has seen the Downy Woodpecker make the small holes so often seen in apple, maple and birch trees, and believes that it is the author of most of these holes. Trees with the bark punctured are very common near his old home in Westwood, where the Downy Woodpecker was common and the Sapsucker scarce. In fact he had never seen the Sapsucker during his eleven years' residence in that region. He spent much time studying birds and investigating their habits, and believed that had there

been Sapsuckers enough to make 10 per cent of these holes, he would have met with one or more of the birds.

He states that during the latter part of August, 1919, he was camping near the ranches of Taos, New Mexico. On the bark of several large and healthy white birches he found at least 100 punctures forming lines at even heights one line above the other. What first called his attention to the trees was seeing a bird he believed to be Nelson's Downy Woodpecker alight on a tree just above what seemed to be the freshest row of holes. The bird stayed on the spot about twenty minutes, every little while picking up one of the ants which was attracted to the flowing sap. For several hours the bird could be seen, apparently catching ants on this tree, remaining on the tree from fifteen to twenty minutes at a time. He asserts that in Denmark he has seen similar holes in the bark, mostly in apple, maple and linden trees.

Mrs. Wilhelmine Seliger of Hartford, Connecticut, writes:—

The small holes in the apple trees I have seen made by the Downy Woodpecker, who curiously turns his head from side to side and then begins to pick again for the purpose of getting the juice out from under the bark.

Mr. C. J. Maynard of West Newton, Massachusetts, in a letter dated October 24, 1920, says that he has actually seen the Downy Woodpecker making rings of holes about a tree, and that there was an old wild apple tree back of Prospect Hill, Waltham, on which he remembers seeing the Downy at work. This, he avers, is the habit to which he refers in his "Birds of Eastern North America," in which he says:—

I do not think that this is in the least injurious to the trees, nor that they are drilled by the birds with the intention of eating bark, but that they are simply following the promptings of what we may call inherited instinct.¹

He asserts that these holes are drilled one-fourth inch or little more in depth, that he never saw one that penetrated the "fresh bark within," and believes that they serve as a sort of storehouse for the birds, as insects enter them for con-

¹ Maynard, C. J.: *The Birds of Eastern North America*, 1896, p. 377.



Work of Yellow-bellied Sapsucker on apple tree at Huntington, Massachusetts, October 10, 1920, observed by Albert A. Cross. The bird was watched while it was making these bark pits.



Work of Downy Woodpecker on apple tree at Huntington, Massachusetts, November 13, 1920. Observed by Mr. Wm. J. Trudell, who watched the bird make the three rows of pits — *a*, *b* and *c*.

venient hiding places, and are thus readily found by the "sagacious Woodpeckers."

Recently, Mr. A. A. Cross of Huntington, Massachusetts, wrote that Mr. William J. Trudell of that town had seen a Downy Woodpecker in the act of making a row of holes in the bark of an apple tree. In response to an inquiry Mr. Trudell sent the following:—

On November 13, 1920, while rabbit hunting, I came into a small apple orchard on the Russell watershed, known as the Ritch Farm. I was standing under one of the apple trees waiting for a sign of game, when I heard a Woodpecker at work over my head. I took my glasses and saw it was a Downy. It was about 8 feet from me and I plainly saw it make a series of round holes horizontally on the limb, and I am positive it was making the original holes and not opening up old holes. I am not sure whether the bird was securing food, but I think it was, as there is no sap in the tree as late as that.

The Sapsucker does not always follow any definite plan in making these perforations. Sometimes they are spotted over a tree like a charge of buckshot. The Downy Woodpecker also sometimes makes these pits in a very haphazard manner. In a recent letter from Mr. R. A. Gilliam of Dallas, Texas, there appears the following:—

December 5, 1920, I saw two Downy Woodpeckers on the stem of a honey locust, just below where the first limb branch off, industriously boring into what I knew, even without a glass, was perfectly good bark. They kept at this for at least twenty minutes before I was compelled to disturb them. I found they were going entirely through the cambium, the incisions or holes being about one-eighth inch in diameter, and possibly one-fourth inch apart up and down the tree, then one would start another run about one-fourth inch to the side.

Apparently these incisions were made in a vertical line, as was the case once with a Sapsucker watched by Frank Bolles.¹ The main point in the observation, however, is that they were made in sound bark. Two correspondents assert that the Hairy Woodpecker also is responsible for the rings of punctures that appear on apple trees, but do not say that they have actually seen the bird make such pits.

¹ Auk, July, 1891, Vol. VIII, No. 31, p. 258.

In the foregoing observations we find the following motives attributed to the Downy Woodpecker:—

It is said to make rings of punctures —

- (1) to secure insects from beneath the bark.
- (2) to catch insects that come to seek the sap.
- (3) to prepare hiding places for insects, in which it later seeks them.
- (4) to take sap.
- (5) to take cambium.
- (6) to take the inner bark.
- (7) to sharpen the bill.
- (8) to exercise, as in play.

There is sufficient proof found in stomach examinations alone to show that the bird takes cambium. Small pieces of the inner bark often are found in the stomachs of Woodpeckers, taken purposely or accidentally while swallowing their chief food, which consists of destructive insects. Undoubtedly the Woodpeckers hammer much in play, and this serves to wear down the end of the bill, which otherwise because of its rapid and continuous growth would become so elongated as to be useless for its main purpose.

The reader may judge for himself whether the above evidence is sufficient to convict the Downy Woodpecker of making circlets of pits. In any case further evidence is needed regarding the depth of the holes usually made, the prevalence of the habit, and what nourishment, if any, the bird secures in the operation. There is hardly sufficient testimony to convict the species of injuring the trees. So far as the writer's observation goes, the vigor of the trees seems to be increased by these small rounded holes, whether made by the Downy Woodpecker or Sapsucker, although McAtee has shown that the Sapsucker holes injure the wood of timber trees, causing defects in the lumber. The large rectangular holes made by the Sapsucker sometimes destroy limbs or entire trees by girdling.

The series of small holes made by Woodpeckers on sound apple trees may have the effect of stimulating growth. Scraping off the outer bark of fruit trees or slitting it vertically often produces a similar effect.

On the whole, the Downy Woodpecker is one of the most

beneficial birds of New England, a persistent enemy of borers, bark beetles, codling moths and other destructive tree pests; and the Sapsucker, which may be more or less destructive in the northern forests, apparently does little harm to orchards in Massachusetts.

THE HEATH HEN.

In April an attempt was made to take a census of the Heath Hen on Marthas Vineyard, but, owing to inclement weather during the only time when a visit to the island could be made, it was impossible to get a reliable census or even a close estimate of the numbers. Nevertheless, information acquired then and since indicates that under the present management of the reservation the birds are increasing. A more definite report probably can be made next year. There are now no birds of this species anywhere on the mainland, as all that have been distributed there have died; therefore, the saving of the species depends on the success of the colony on Marthas Vineyard.

EXHIBITIONS.

In September the Division prepared an exhibit for the Eastern States Exposition at Springfield, which was visited by more than 100,000 people. A prominent part of the exhibit was a case showing the different forms of the gypsy moth and the birds that destroy the pest. On children's day the booth was largely given up to an exhibit of living birds from the Bird Hospital, the unique undertaking of Miss Mary C. Curn of Seven Acres School, Springfield. About 18,000 people saw this exhibit on that day. Below is a brief report of the hospital for the year:—

THE BIRD HOSPITAL.

During the past year more than a hundred of our common birds have been or are at present inmates of our hospital. All the patients are interesting, but especially so are the Black-crowned Night Heron (victim of a steel trap), the European Goldfinch (blinded by illicit game poachers), an Albino Red-eyed Vireo, a normal Red-eye with dust shot in back of head, a Baltimore Oriole, a Catbird, Barn Swallows, and a prize-winning Pigeon with shorn wings.

We found the English Sparrows to be suffering from a kind of lockjaw,

thirty being brought in badly emaciated with jaws shut fast. No other variety of birds seemed to be so afflicted.

This year but two birds were found suffering from the European blowfly, — a Song Sparrow and a Red-eyed Vireo; the tumors developed more slowly in captivity than when the birds were in a wild state.

During the summer many visitors saw our birds, and several schools came. Children often came to get help for sick Pigeons, Parrots and pet Canaries. Seventy dollars have been contributed toward the support of the birds. As a result of the interest the press has taken in our work, several retired physicians in the west have written us in regard to establishing bird hospitals.

Our school children have worked hard to get insect food for the birds. We have spent on the average two hours daily since April 19 to catch fish for our Heron. This service has been done most willingly. Several zoölogical societies have asked for some of the birds to exhibit, but the boys and girls love them too well to part with even one invalid. Feed boxes are ready for the use of winter birds. Money is being raised to buy a lantern for lecture purposes, the lecture to be entitled "Hospital Work for the Birds."

BIRD DAYS.

As usual the Division co-operated with the bird committee of the State Grange, Patrons of Husbandry, in bird day exercises. The director was present and spoke at the exercises at Charlemont May 22, which were attended by many people from all the near-by country. This committee of the State Grange is doing an excellent educational work, among the rural population, which deserves every encouragement.

BIRD MIGRATION OBSERVED DURING THE YEAR.

The study of the distribution and migration of Massachusetts birds in New England has been continued. Nearly four hundred observers have contributed notes on birds seen through the year. Some send in notes occasionally, some once or twice a month, and others more often. These reports have been filed, and the notes on migration and distribution have been entered on maps kept for each species. Valuable records have been noted and recorded. Notes on food and habits have been kept. A general summary, or bulletin of information giving a résumé of the movements of birds, has been sent out at the close of each month to these correspondents, and on the 15th notes have been sent to each giving warning of un-

usual birds and current movements. The records of migration as collated from these observations during the year may be summarized briefly here. The fiscal year which this report covers begins December 1, 1919.

December, 1919.

The first half of December was mild, with a few exceptionally cold days; but the last half was cold, with occasional light snows and few mild days. During the first period grass was still green in many places and a few wild flowers were in bloom. From the 14th to the 21st, exceedingly low temperatures were recorded, ranging from 42 degrees below zero in Maine to 10 degrees below on Cape Cod.

A Southward Movement of Wild Fowl. — The freezing of northern waters drove the river ducks southward; many appeared in the Carolinas, and winter species arrived in Massachusetts waters in considerable numbers. A few Arctic and sub-Arctic sea birds began to appear along the coast. Some Geese, which had remained very late on Prince Edward Island, began to fly south early in the month, and on the 24th a single Swan was seen flying very high, moving southward over Middlesex County, Massachusetts. All through December, land birds were few and far between, except in localities where food was abundant and shelter excellent. There was a marked absence of such northern Hawks and Owls as were numerous in 1917-18.

About December 1 an Arkansas Flycatcher was taken on Cape Cod and a Crested Flycatcher was seen from the 8th to the 14th in Essex County. A great flock of Cowbirds, a few small flocks of Redwinged Blackbirds, and a flock of about 40 Mourning Doves remained through the month on Cape Cod. Evening Grosbeaks appeared in small numbers from the northwest during the month; Siskins moved southward through New England, and their places were taken by Redpolls from the north.

Movements of Grebes and Jays. — Early in the month there was a flight of Horned Grebes, and a few stragglers were seen until late in the month. Blue Jays and Canada Jays were reported as very abundant on the 12th in northern Ontario —

an apparent southward movement. Brown Creepers appeared in New England in smaller numbers than usual, and Golden-crowned Kinglets were rare. Those northern species, the Pine Grosbeaks, Evening Grosbeaks and Snow Buntings, increased in numbers generally in the Provinces and northern New England during the month. By the end of December Crows had mostly left the Maritime Provinces and northern New England, but three large "roosts" were reported in southern New England.

January, 1920.

In January a single flock of Bohemian Waxwings was reported in the Province of Quebec, and two from Maine. January was a remarkable month, — driving gales, snow, ice and cold predominating. There were a few milder days, but nothing that could be designated by the name of "January thaw." The average thermometer readings were as low as those of January, 1918. Night temperatures averaged extremely low and there were very few bright, sunny days. The snow varied in depth from 6 inches along the southeastern coast to 2 or 3 feet in some of the western mountainous wooded sections. In early December some willow catkins had begun to bloom on Cape Cod, but late December and January were too much for them. Peach buds were destroyed throughout New England.

Observers of long experience asserted that they had not seen so few birds in winter for years. Nevertheless, there were some gatherings of land birds, principally on the southern coast of New England.

A Southward Movement of Land Birds. — A great storm occurred on the 17th, after which common winter land birds were even more scarce than before. Many were believed to have fled southward before the storm or with the cold, driving northwest wind that followed on the 18th. Many Starlings disappeared from Massachusetts, but there was an influx in New York. Chickadees appeared on Block Island. Robins drifted across the Sound to Long Island; Pine Grosbeaks, Evening Grosbeaks and Snow Buntings appeared in Massachusetts in greater numbers after the storm.

On the coast no scarcity was noted among the water birds, which had been driven out by the ice from most of the lakes and ponds. Open holes in the rivers, springs and swift-running, unfrozen streams were visited night and day by wild fowl. Murres, Guillemots, Razor-billed Auks and Dovekies were reported.

Geese Wintering.—Canada Geese were wintering in large numbers on the southern coast of Nova Scotia, and Geese and Brants still remained in large flocks south of Cape Cod. Snowy Owls appeared in the west, but very few were reported in New England. Hairy Woodpeckers were not nearly so common in New England as during the winter of 1918-19, but appeared in increasing numbers in some Canadian localities.

The great flock of Cowbirds on Cape Cod had disappeared late in December, but smaller flocks of 50 to 100 birds remained during January, and a few were noted on Block Island, Rhode Island, and Long Island, New York. Large flocks of Red-winged Blackbirds were seen on Cape Cod early in the month, a few Catbirds and some Rusty Blackbirds in other parts of Massachusetts. Bohemian Waxwings were noted in numbers in Ontario and Quebec. One or two Mockingbirds were seen near Boston during the month, and Red-breasted Nuthatches were scattered through the eastern Canadian Provinces and south to southern New England.

February.

Winter reached its climax during the first week of February, which began with the lowest temperature of the season, and ended with the greatest snowfall. On February 1 temperatures as low as 40 to 54 degrees below were reported in northern New England. On that day immense flocks of Snow Buntings appeared in northern Vermont, and great flocks of Evening Grosbeaks moved southward. In some of the valleys of northern Vermont snow was reported 7 feet deep. Snowstorms continued until in Massachusetts the snow varied in depth from 2 to 5 feet, according to locality and exposure. This succession of storms lasted generally until about the 12th and proved very destructive to bird life. Along the south-

eastern seaboard rain and snow with a final coating of ice made it almost impossible for birds to find food.

Birds destroyed by Storm and Cold.—Individuals of even the more hardy species, such as Redpolls and Siskins, perished. Bob-whites in some northern and western sections of Massachusetts were destroyed; even Ruffed Grouse were found dead, apparently from starvation and cold.

Great Blue Heron and Cowbirds Wintering.—Notwithstanding the severity of the season a Great Blue Heron was observed on Cape Cod during January and another in February. Several White-winged Juncos were reported. A flock of Cowbirds continued to come to a feeding place on Cape Cod, others were reported from Rhode Island; but Rusty Blackbirds and Red-wings which had been noted in January did not appear on the February reports. Bohemian Waxwings were reported from three different localities in Maine, but not from southern New England. Early in the month a spring movement of Robins apparently had started in the south, but this did not reach New England.

Winter Land Birds moving Coastward.—After the storm of the 12th winter birds from the north increased in southern New England, scattering along the coastal region from Essex County, Massachusetts, to central New Jersey. High shifting northwesterly and northeasterly winds seemed to have driven some into the interior and others toward the coast. At the end of this storm period birds were more scarce than ever over a large part of the hill country of New England, but had become more numerous on the coastal plains. These conditions continued for about two weeks.

March.

Probably no winter since the twentieth century came in took a greater toll of bird life in New England than the winter of 1919–20. Perhaps the greatest mortality occurred during and after the storm which swept into southern New England on the 5th and 6th of March, and continued in some of the northern sections until the 7th. High northerly and easterly gales were accompanied at first by rain, followed by sleet and snow, with rapidly falling temperature. When the skies

cleared these shifting gales were succeeded by cold, piercing northwesterly winds of nearly hurricane force. The storm was regarded in some localities as the "worst blizzard within the memory of man."

Bird Mortality. — After this storm birds of even the hardest northern species were found dead in the snow, some of them in sheltered places, even under cover, apparently in splendid condition, and with stomachs full of food; others with empty stomachs and emaciated frames. Hardy birds, like Grebes and Loons, were cast up dead on some of the southern New England shores. For the first time in the writer's experience dead Snow Buntings were reported. When the storm ended, the few species of small winter land birds still left in Massachusetts seemed to have decreased much in numbers. Goldfinches had practically disappeared. Most of New England was now buried under from 3 to 6 feet of snow. Railroad trains were stalled for days; a large number of trolley lines were completely blocked and moved no more cars until spring. On the 13th rain swept Cape Cod nearly clear of snow, but the same storm added more in the interior. Deep snow continued throughout New England during the first half of the month. Then came a sudden change. Soon hylas were heard peeping, snakes were seen. By the 23d bullfrogs and aquatic beetles were reported; the 23d and 24th seemed like summer days. From the 26th to the 28th butterflies and moths were seen.

The Northward Movement begins. — During the month the early bird migration had progressed very slowly up the coast to the middle Atlantic States. Snow and cold on the 14th arrested this movement and only a few stragglers reached southern New England.

The First Great Bird Wave. — From the 16th to the 19th more stragglers began to filter into Massachusetts, but the great bird wave of the month came from the 23d to the 25th, when multitudes of early land birds were moving northward from Florida to Maine. From the 27th to the 30th a great movement took place. Holboell's Grebes came in numbers. Many flocks of Ducks and Geese were flying north from March 27 to 30. The Great Blue Herons known to have

wintered in Massachusetts probably died or disappeared on or before the 6th of March, but on the 28th the first spring migrant of the species was reported. About that time Ospreys appeared. The main flight of Red-winged Blackbirds began to arrive in Massachusetts on the 22d. Grackles had reached Maine by the 30th. Evening Grosbeaks decreased at this time in Massachusetts but increased in Maine. During the blizzard of March 6 Snow Buntings had appeared in immense flocks in northern Vermont. A few days later flocks were observed in Aroostook County, Maine, flying northward at a great height. Fox Sparrows appeared in southern New England on the 23d and 24th. Tree Swallows were numerous at Nantucket on the 25th. Despite the severe winter a single Hermit Thrush had wintered successfully in Bristol County, Massachusetts, and was heard singing on the 24th, and at least one Catbird survived.

April.

April was a month of cold, snow and driving rain with sweeping gales, scant sunshine, and but few days of vernal warmth. Migrants were much delayed or driven back by northerly winds; also, the birds were drifted inland by easterly gales, but they still pushed on. No great bird wave was recorded until late in the month, when spring flowers were seen, butterflies appeared, and woodchucks and chipmunks were noted. After the 15th toads, hylas, wood-frogs, turtles, snakes and bats were reported in southern New England. On the 19th there was a strong northward movement of birds, but on the 24th a high northwest gale again checked the advance.

A Retrograde Movement. — During this gale a retrograde movement of Swifts, Barn Swallows and Tree Swallows was observed in Massachusetts and Connecticut localities. From the 25th to the 26th the forward movement was resumed. During the month Blue-gray Gnatcatchers appeared in unusual numbers in the middle States.

Northward Flights of Hawks and Other Land Birds. — On the 24th, 25th and 26th great flights of Hawks were observed in Massachusetts.

In April the large Northern Hairy Woodpecker had left

northern Ontario, and the smaller or more southern race had appeared. An immense flight of Sapsuckers was reported in the west. Late in the month the numbers of Evening Grosbeaks thinned out, and Pine Grosbeaks practically disappeared from Massachusetts. Goldfinches remained scarce, but many were reported from the south. The delayed migration of Fox Sparrows reached immense numbers in southern New England, but the great majority passed northward early in the month. The Red-breasted Nuthatch was extremely scarce, and Black-capped Chickadees were much less common than in February and early March, while Golden-crowned Kinglets, as last year, appeared to be very rare.

There was an early flight of Kingbirds on Cape Cod and Marthas Vineyard this month.

May.

The first fourteen days of May were mainly cold with snow, frosts, much cold and rainy weather, and northerly or easterly winds. During this time many of those land birds which feed chiefly on the ground moved on to their northern breeding places, but arboreal birds were slower in coming. The migration of the month was peculiar. The weather was generally cold and backward from the southern States to New England. During the colder periods, with east and northeast winds and much rain, there was little evidence of forward movement, except as the birds worked northward in the daytime, feeding as they moved along; but when the wind shifted to the southward, with fair, warm days and clear nights, the northern migrants made great leaps over wide spaces.

The Spring Movement of Warblers. — On May 6 the weather moderated and a south wind brought several species of Warblers to northwestern Massachusetts that were not recorded in the eastern sections until later, where most species were reported as late and few in number. On the 17th rains and easterly winds gave place in southern New England to fair, warm weather with southerly breezes. On that day and the next, a great flight of Warblers and other land birds appeared. It reached New Hampshire on the 18th. The temperature of northern Maine at this time had attained the maximum of

the month, as from 80 to 88 degrees were reported. A Warbler flight was noted in the Province of Quebec. Another warm wave on the 27th and 28th sent forward most of the northern migrants. A large number of species was observed, but a comparatively small number of individuals. Eight Blue-gray Gnatcatchers were noted in eastern Massachusetts.

Passenger Pigeons reported. — Reports of Passenger Pigeons came in with the opening of spring and continued throughout the summer. While it is not impossible that there are a few Passenger Pigeons left, it seems extremely improbable. The only "Pigeon" that has been produced for identification thus far has been the Mourning Dove.

Nighthawks were not reported during the month in large numbers. Goldfinches continued scarce during the most of the month, but began to come in numbers in the latter part of the period, and continued to arrive in northern New England and the Provinces until June 1. The migration of Juncos and other Sparrows extended well into May. Crossbills remained on Marthas Vineyard all the month. Many birds were late in coming, and the flight continued into the month of June. The extremely warm weather and southerly wind that prevailed during the last days of May greatly accelerated the progress of migration. Northern migrants were heard passing, night after night.

June.

June in southern New England gave us only short periods of fine, warm weather; low temperatures, clouds, fog and rain predominated; local tempests with torrential downpours occurred, when branches of trees were torn off and large trees blown down. The high winds, together with cold rains, destroyed many birds' nests and young birds. In some places these storms were destructive to young game birds. Floods locally overflowed the nests of Bitterns, Rails and Sandpipers, while high tides and raging seas along the coast swept away the eggs of gulls, terns and Piping Plovers.

The Migration continues. — The migration of straggling northern transients among the land birds continued until about June 10. Many Sandpipers and some Plovers were still migrating the first week in June, and individuals were seen later

on the coast of Massachusetts. In the early evening of June 7 many small birds were heard migrating in Massachusetts and Maine.

Waxwings, Vireos, Cuckoos, Nighthawks, Purple Martins, Goldfinches, Wood Pewees, Black-poll Warblers, Baltimore Orioles and Indigo Buntings continued to appear locally in New England and Canada after June 1. The last flight of Red-breasted Mergansers noted at Block Island, Rhode Island, was June 4, and 20 Loons were reported off Cape Cod on June 7. Goldfinches and Waxwings were first noted the second week in June in some places, while a few shore birds were reported still migrating. Among the rarer birds noted in Massachusetts were Worm-eating and Mourning Warblers, and several Blue Grosbeaks were reported from Massachusetts and Maine. Notwithstanding the severe winter, which must have reduced the vigor of winter residents, there were many reports of large sets of eggs deposited by the Ruffed Grouse. The spring migrations were hardly finished when a few shore birds appeared, apparently on their southward journey, but these may have been non-breeding birds that had remained somewhere on our shores. Great Blue Herons were reported on the Massachusetts coast and on Long Island during the last week of June.

July.

July was not far from normal generally in most of southern New England, with only one short period of abnormally high temperatures and a few very cool days the last week, but there was a heavy rainfall in some localities, particularly in the hills of western Massachusetts. In northern New England there was a favorable breeding season for the birds, with much pleasant weather.

Autumnal Migration begins. — On July 1 some of the shore birds had reached Long Island, and about July 15 some of the earlier breeders among the land birds began flocking or deserting their breeding places. Herring Gulls appeared in numbers on Marthas Vineyard by the 26th, and on the 28th five Black Terns were noted there. During this month Ruby-throated Hummingbirds were reported as feeding on small caterpillars. There seems to have been no considerable num-

ber of Egrets wandering from the south this year. The first was noted on Cape Cod July 30.

A Few Egrets move Northward. — The hot weather of late July and early August appeared to send more Egrets northward at the time when Great Blue Herons had begun moving southward. Egrets were reported in August, and several Little Blue Herons were noted on Long Island. Experience leads to the belief that Egrets and Little Blue Herons move north in small numbers through the middle Atlantic States into New York and New England after the breeding season, particularly when the weather of July or August is exceedingly hot. Snowy Herons are more rarely seen. Very few individuals of any of these species are noted in early spring or in late autumn.

An Increase of Gulls and Terns. — Reports from the coasts and islands of Massachusetts indicate that the increase of Gulls and Terns still goes on. Herring Gulls bred in at least three localities in Massachusetts and one in southern New Hampshire, near the Massachusetts line, but one of the sandspits on which they nested in Massachusetts was nearly washed away by the sea, doubtless destroying both eggs and young. The number of Laughing Gulls increases and they are seen more and more in summer along our shores at localities distant from their principal breeding place on Muskeget Island. Common Terns now breed in large or small colonies, or in pairs at nearly every suitable location on the coast. Roseate Terns and Arctic Terns are increasing in numbers, and Least Terns have settled in new breeding places, some at least on the mainland, where formerly they bred only on islands. A great migration of sandpipers and other shore birds occurred during the cold wave of the latter part of July.

August.

August was nearly normal so far as weather and temperature were concerned, with perhaps a little more rain than usual in Massachusetts and less than usual in parts of northern New England.

Southward Flights. — Early in the month night flights of land birds were noted in Maine. Soon after the 15th there

were movements of Swallows, Flycatchers and Warblers along the coast, and during the third week the frosts in the interior of northern New England started flocks of Warblers toward the south. Great numbers of birds in northern New England began moving before September 1. The early Hawk migration began during the last few days of August, and a great flight of Nighthawks appeared. Bird song continued later than usual in some places, particularly where more than the normal rainfall had been noted. Many northern Gulls appeared during the month as far south as the Connecticut coast. Shore birds were abundant in Massachusetts.

September.

September was noted for a great variety of weather and temperature. There was much fair weather in southern New England but many storms to the southward. In Massachusetts, the first part of the month was fine and was ideal for bird migration. During the first week great numbers of Sparrows, Warblers and Thrushes moved through New England southward. Light frosts occurred early in the month, and about the 20th there were severe frosts with heavy snow on the White Mountains and less in Maine. The latter part of the month was mainly clear and warm in southern New England, with only a few cloudy or rainy days. The thermometer during the month ranged from 26 to 90 degrees. Bird migration was heavy throughout a large part of the month, but, nevertheless, there were many localities where very few birds were to be seen in the daytime, although large flights went over at night. In other places flocks of migrating birds were seen in daylight. These reports cover nearly every day of the month. Practically all the fall migrants and some of the winter residents were observed.

Early Migration of Geese. — There was a small early movement of Geese, and Brants arrived in goodly numbers on Prince Edward Island, while Double-crested Cormorants came in considerable flocks. During the month there was a great migration of Gulls and an unusual flight of Wood Ducks and Blue-winged Teals in southern New England. Large flights of Black Ducks occurred in the Maritime Provinces, reaching

Massachusetts during the latter part of the month. Canada Geese also reached Massachusetts and were noted from time to time, but were not seen on Long Island or farther south.

A Large Flight of Shore Birds. — Many observers reported unusual numbers of shore birds. The flight extended well through the month. Hudsonian Curlews were more common than usual. Upland Plovers and Killdeer Plovers seemed to have increased in numbers over former years. Reports of the increase of Ruffed Grouse in Massachusetts were disappointing in many cases, but in northern New England and the Provinces the reports were more optimistic.

Hawks, Nighthawks, etc. — There was a flight of Hawks the first week of the month, but the main movement came from the 16th to the 19th. Great numbers of Chimney Swifts, in flocks, appear to have vanished from Massachusetts on the night of the 18th, as few were reported afterwards.

The main Nighthawk flight moved southward early in the month, but stragglers continued to pass over until October. Immense roosts of Starlings were reported from Essex, Middlesex and Bristol counties, Massachusetts, and considerable numbers in the Connecticut valley. During the month there appeared a definite movement of this species toward the coast. Its numbers seem to increase from season to season. Goldfinches were less in number in Massachusetts than last year, but abundant locally in northern New England; and but very few Siskins were reported. Horned Larks and Tree Sparrows arrived in New England during the latter part of the month, but in very small numbers. During September Red-breasted Nuthatches arrived in the coastal region of northern New England, and Brown Creepers were recorded south to Massachusetts. A single Mockingbird was reported on Cape Cod. As the month closed a southern hurricane was blowing up the coast.

October.

Copious summer rains in many parts of New England and the Provinces had helped to develop and mature a great crop of wild fruit and seeds. In regions where such food was plentiful certain birds remained somewhat later than usual. Birds and squirrels moved into regions where nuts or seeds on

which they feed were numerous. In many places squirrels found so much nourishment in the abundant pine seeds that they neglected the cornfields, doing little or no injury. Through the eastern coast States October was remarkable for mild and pleasant weather and high temperatures. The storm that came the last part of September continued for about two days into October, with gales on the 1st. Heavy rains fell in New England and 7 inches of moist snow in Algonquin Provincial Park, Ontario. Although these rains early in the month flooded the Connecticut River, there was very little precipitation thereafter in New England until nearly the last of the month. There was little frost in southern New England and few frosts in the northern sections. On the 10th twenty-seven varieties of wild flowers were gathered on Cape Cod. On the 18th and 25th an observer at St. Lambert, Province of Quebec, picked wild flowers of at least six species. Vegetables were still untouched by frosts in the gardens of Massachusetts and New Hampshire, and raspberries and strawberries were being harvested during the last week in the month. Trees held their foliage as long as there were few frosts, storms or high winds to strip them, and the wooded hills were clothed in wonderful colors.

A Great Flight the First Nine Days. — Land birds were moving almost daily or nightly nearly all the month, but the greatest flight occurred during the first nine days. Several Cuckoos were reported in southern New England during the first week. Most of the smaller passerine migrant birds seem to have gone south long before the close of the month. Shore birds continued to pass in some numbers, and water birds slowly increased along the New England coast. Six Swans were reported from Maine October 11. A flight of Canada Geese, unusually large for October, was noted on the Massachusetts coast from the 12th to the 26th, comparatively few being seen in the interior, and many passed far out over the sea. A flock of Snow Geese was reported. A flight of Great Blue Herons passed Block Island, Rhode Island, on October 30. There was a large flight of Wilson's Snipes the latter part of the month.

Hawks were drifting southward as usual throughout this month, but no great wave of any species was noted. There

were late stragglers of many species of land birds, which, perhaps, had been beguiled into staying longer than usual on account of the mild weather and plentiful food supply, and there was much autumnal singing by many species. On the 17th Pine Grosbeaks appeared in northern Ontario, apparently moving southward. Pipits passed through New England in goodly numbers. More Winter Wrens than are usually seen in the autumnal migration were reported. Brown Creepers appeared in larger numbers in northern New England than for the past two years, and Golden-crowned Kinglets, which had been rare for several years, appeared to have increased wonderfully in numbers. During the latter part of the month the number of land birds seemed less than usual.

November.

The weather of November was in general mild rather than severe, with occasional gales and a long storm with high winds the third week. Grass remained green, and some wild flowers were still in bloom during the first half of the month. November was notable for a great scarcity of land birds, and an abundance of water birds, Ducks, Geese, Brants, Gulls, etc. Great schools of small fishes, which remained along the shores of southern New England in October and November, brought flights of Gulls, Cormorants and Gannets. Terns remained later than usual, and a few were reported in November.

Great Flights of Geese and Ducks. — Immense flights of Geese appeared passing largely through the interior early in the month and later both in the interior and along the coast. They were reported from every New England State and from New York, New Jersey, and all the Maritime Provinces. In many localities the migration was the largest seen for very many years. The greatest flight of all came with the stormy weather which began on the 21st and continued for the remainder of the month, with only two pleasant days. Some of the heaviest flights thus came in storm, snow, sleet and rain. Geese wet, worn out and weighted down by sleet came to the ground or to roofs of sheds; others alighted in poultry yards, and some are said to have been killed by clubs. Scaup Ducks were found dead or dying upon the ground in Maine and Con-

necticut, others too exhausted to fly longer were seen walking in fields and gardens. A few Swans were reported from time to time in eastern Massachusetts, but not elsewhere.

During the storms of the latter part of the month many northern Ducks, such as Mergansers, Old-squaws, Golden-eyes and Eiders, appeared. A late flight of Great Blue Herons passed south during the stormy period. Sanderlings were still passing in small numbers up to the 26th, and there were a few Killdeers still left in Connecticut as the month ended.

A Scarcity of Land Birds. — One reason for the scarcity of land birds was that most of the summer residents and fall migrants had passed southward, and winter birds from the north had not come to take their places. Only a few winter Hawks appeared. Snow Buntings and Horned Larks had come in more or less along the coast, but Pine Grosbeaks, Redpolls, Siskins and Crossbills moved southward very slowly and in remarkably small numbers. Fox Sparrows were seen in large numbers by very few observers, many saw none, and even Juncos and Tree Sparrows did not appear generally in their usual abundance. One flock of Bohemian Waxwings was noted in New Hampshire on the 14th.

A few late stragglers among the Warblers and Flycatchers were noted this month, but the period ended with the most remarkable dearth of land birds reported at any time in the experience of the last three years.

AN ORNITHOLOGICAL SURVEY.

Late in May Mr. John A. Farley began an ornithological reconnaissance for the Division. The principal purpose of this undertaking was to clear up some points regarding the breeding ranges in Massachusetts of certain birds of the Canadian fauna. This work was continued through June and July, as long as the birds remained at their nesting grounds. In his search Mr. Farley traveled over parts of Berkshire, Franklin, Hampshire and Hampden counties. He intended also to visit northern Worcester County, but was delayed by continued heavy rains. While en route or later he visited and consulted with the following persons, most of them correspondents or observers of this Division, who freely gave time, advice and as-

sistance: Professor W. W. McLaren, Judge Sanborn G. Tenney, Miss Helen Hart and Mr. William J. Cartwright of Williamstown; Miss Dorothy Davies of Blackinton; Mrs. Frank Ransford and Mr. W. H. Sperry, chairman, Greylock Reservation Commission, of North Adams; Mrs. Thomas Carne of Adams; Miss Florence M. Pease of Conway; Miss Caroline E. Hamilton of Greenfield; Mrs. Julia F. A. Browning, Mrs. George Stanford and Mr. Emory Sibley of Rowe; Mr. Perley Carr of Colrain; Mr. J. W. Jackson of Belchertown; Mr. R. L. Coffin of Amherst; Mr. A. C. Bagg of Holyoke; Mr. A. A. Cross of Huntington; and Hon. Herbert Parker of Lancaster.

The notes secured by Mr. Farley during this trip, coupled with information previously obtained by him and other observers of this Division, all go to prove that certain species breed much more widely or generally in Massachusetts than previous records would indicate. Some results of the season's work are shown below:—

The Northern Pileated Woodpecker is distributed in the breeding season very sparsely through the forested regions of western and northern Massachusetts. It is even rarer now than the reports would indicate, as it is a conspicuous wandering bird, and a single individual may be seen often in different localities. It has nested in recent years as far east as Middlesex County, but has not been known to nest recently in Essex County. A nest was found this year by Mr. A. A. Cross in Hampshire County near the Hampden County line.

The Yellow-bellied Sapsucker was met with in the breeding season only in Franklin and Berkshire counties, at altitudes of 1,600 to 2,200 feet. Three nestings were noted,—one in Berkshire County and two in Franklin County.

The Olive-sided Flycatcher may breed anywhere between the western border of Massachusetts and the elbow of Cape Cod. It has been reported as far east as Dennis, and is well known in Berkshire County. It breeds from near sea level to an altitude of 1,600 feet and higher, but it now seems to be rarer in New England than it was forty years ago. It comes and goes. In Rowe, Franklin County, where Mr. Farley found six or seven pairs and two nests in June, 1918, he could not find a single individual in 1920. This bird may be found in

swamps or on mountain sides. It seems fond of a nesting location where there are tall dead trees to serve as lofty watch towers for its hunting.

The Slate-colored Junco is abundant on Mount Greylock, Berkshire County, and was noted more or less commonly elsewhere, where spruce trees grow. In fact it may be found more or less sparingly both in and out of the spruce growth in most parts of western Massachusetts. It is widely but sparingly distributed elsewhere in the State east to Middlesex County. There seem to be no records of its breeding in Plymouth, Barnstable, Dukes or Nantucket counties or in southern Worcester County. It is most common at altitudes of 1,200 feet or more.

The White-throated Sparrow is more common than the Junco in the spruce regions of western Massachusetts, and where the spruce has been cut off it remains to breed in the "slash," where it seems to increase in numbers. It is not confined to the spruce regions. In northern Massachusetts the White-throat is now noted locally clear down to the sea, where the Junco has not yet been observed in the breeding season. There seems to be no record of this Sparrow in summer in the southeastern region of Massachusetts.

The Blue-headed Vireo breeds in every county in the State, except perhaps in Barnstable, Dukes and Nantucket counties. It is a white pine and hemlock bird; hence, it breeds sparingly where there are few of these trees. Contrariwise, it is a common bird in Plymouth County and in similar country in other adjacent counties. In this general region there is more white pine to-day than in any other part of the State; therefore, it breeds commonly, if locally, near sea level in southeastern Massachusetts.

The Black-throated Blue Warbler breeds both in coniferous and deciduous woods over most of western Massachusetts, ranging east sparingly as far at least as north central Worcester County.

The Myrtle Warbler is much less common than the Blackburnian or Magnolia, but it has quite a wide breeding range over central and western Massachusetts; and as it has now been found nesting in one locality in southern Worcester

County near the Connecticut line and carrying food apparently to nestlings in another town a few miles away, it may yet be found nesting in eastern Massachusetts, or even in Connecticut. It has been noted in the highlands of western Connecticut in the breeding season. This species is fond of spruce, but Mr. Farley found two nests in white pines, — one high up, the other less than 6 feet from the ground. This species may be confidently looked for in the breeding season anywhere in Massachusetts where spruces or white pines grow at altitudes of 1,200 feet or more. Like the Magnolia Warbler it frequents pasture spruces, but unlike that bird it also inhabits white pine groves; therefore, it may be found casually in the breeding season almost anywhere in central or western Massachusetts, and its nests should be looked for as a possibility in the northeastern counties and also in the highlands of northwestern Connecticut.

The Magnolia Warbler is a bird of the spruce regions, and is most common in rather open country, such as pastures where young spruces, more or less scattered, are growing. It is likely to nest where such spruces are found, from Berkshire County east to northern Worcester County, but has not been noted elsewhere, or at altitudes much below 1,200 feet.

The Blackburnian Warbler is a forest bird. It is very common on Greylock, where it may be found in the tall, dense spruces and in the adjoining mixed growth as well. But it is also found among hemlocks and white pines in clear stands or mixed with hardwoods at low altitudes, and breeds from Berkshire almost to the sea. It is an equally common bird in New Hampshire, occurring anywhere in the white pines of the southern and central parts of that State. In the breeding season it seems gradually to disappear as we approach southeastern Massachusetts, but breeds sparingly elsewhere in the eastern sections, principally in white pines or hemlocks.

The Louisiana Water Thrush breeds here and there, along the banks of small streams and up their tributary brooks west of the Connecticut River and north to the Vermont line. We know very little of its occurrence in the breeding season east of the river. But the Northern Water Thrush breeds scatteringly eastward in the northern half of the State to Middlesex

County, at least, and is also colonized in good numbers in at least one locality in Plymouth County.

The Mourning Warbler is a bird of sprout-land, where timber has been cut off. It is common in such lands near the very summit of Mount Greylock, but is not confined to the top of the mountain. It has been met with in other parts of the range, and also well to the eastward in Franklin County, but apparently does not range very far east in Massachusetts. It was found in its favorite sprout-land down to 1,000 feet. A very few individuals have been reported in summer in eastern Massachusetts, apparently stragglers.

The Canada Warbler is widely distributed as a breeder over most of the State, but is more common in western Massachusetts than in the eastern counties, where it is very local. It seems to care little about altitudes or any particular kind of vegetation, but in most parts prefers cool, moist places, such as cedar swamps, for its breeding grounds.

The Winter Wren was noted in the breeding season not only in Berkshire County, where it may be seen on Greylock and at other more or less high altitudes, but in Franklin, Hampshire and Hampden counties at altitudes ranging down to 600 feet. As a rule, it was found near a brook in the woods, often in a ravine, but it is not by any means confined to spruce or even to coniferous trees, but is seen in mixed woods.

Golden-crowned Kinglets breed in the spruces on Mount Greylock, and in other stands of this tree in Berkshire County, also intermittently or sporadically elsewhere in western Massachusetts. They formerly bred in northern Worcester County in swamp spruces at an altitude of about 1,200 feet, but no one has *reported* them there recently. Mr. Farley and other observers saw them and their young this year only in Berkshire County.

Bicknell's Thrush was not recognized this season even on Greylock. It seems quite possible that the collectors have extirpated this bird here within the past few years. On the other hand, rare species like this come and go. It may appear next year.

The Olive-backed Thrush is a bird of the spruce and the fir. On Greylock it was noted down to 2,500 feet, elsewhere down

to about 1,600 feet, and not much lower. Its breeding has now been reported from Berkshire County east to northwestern Worcester County. It nests in swamps where spruce and white pine grow, and along streams shaded with spruce and hemlock.

Formerly the Hermit Thrush was regarded, rightly or wrongly, as absent or as a very rare breeder in most of the State, though always more or less common on the western highlands. Now, however, it occupies most of our territory as a summer resident, though still rare or wanting locally in southern Worcester County, seldom seen in the breeding season near Boston, and not reported from Nantucket. It is especially common in southeastern Massachusetts, as in Plymouth and Bristol counties, and on the western half of Cape Cod (Barnstable County), where it is the forest thrush of this entire section, being known as "Wood Thrush" by many of the inhabitants. It prefers woods containing some coniferous trees and seems to have been increasing in recent years.

RECOMMENDATIONS.

A Report on the Birds of the Commonwealth.

During the service of the present incumbent, a demand has been manifested at this office for a report giving full descriptions of all forms of Massachusetts birds, with colored plates of all the species. There is no such work extant. The two volumes published by the Commonwealth, "Useful Birds and their Protection" and "Game Birds, Wild-Fowl and Shore Birds," having run through their several editions, are now out of print. Reprints cannot be made unless authorized by special legislation. There is nothing to take their place, and they gave only a partial view of Massachusetts bird life, with brief descriptions and only two colored plates. The Commonwealth has not published even a list of its birds since 1863. In recent years many other States have put out reports on their birds, some of them quite well illustrated with colored plates, none, however, giving full descriptions.

The writer has had twenty-five years' experience in learning what the people of the Commonwealth desire to know about our birds. With the help of many correspondents from all

parts of the State he has been able to collect a great amount of information. It is purposed to embody this material in two volumes of about 600 pages each, giving not only descriptions but also the marks by which the species may be known in the field, and notes on the life history, habits and food of each species.

The plan proposed is to print 5,000 copies of each volume, place both volumes in every free public library in the Commonwealth, and dispose of the remaining copies at a price that will reimburse the Commonwealth for the money expended. It is recommended, therefore, that the director of the Division of Ornithology be authorized to prepare for printing two volumes, of 600 pages each, on the birds of the Commonwealth, and that a sufficient sum for the preparation of the drawings to be used in illustrating this report be appropriated at the coming session of the Great and General Court of Massachusetts.

An Assistant Ornithologist.

This office was allowed \$750 for an assistant during the year 1920. It is respectfully submitted that no capable assistant can be obtained for this sum. It cannot be expected that the present director will remain in office many years. It will be difficult to secure a man fit to fill the position, as most trained ornithologists have work that is more congenial or more remunerative. A capable man should be engaged immediately to be trained to fill the vacancy which will occur before many years. It is recommended, therefore, that \$1,500 be appropriated for an assistant ornithologist.

A Plan for Adequate Protection of the Ruffed Grouse.

In 1919, after two years of great scarcity of Ruffed Grouse, a closed season for one year resulted in a considerable increase of the birds. At present, however, the numbers of this species in Massachusetts are rather disappointing.

In some places where the birds were common in summer they mostly disappeared during the shooting season. This is true particularly of regions about the centers of population, and also in many sections readily accessible to motor cars. On some reservations where no shooting has been allowed, and on

or near posted lands provided with caretakers, the birds are now more common, also, in some parts of western Massachusetts many birds are left over.

Reports on the present numbers of the Grouse are contradictory. One man finds no birds, while another, near at hand, finds many. There are sections where very few young birds were reared in 1920, and others where many were raised, but, on the whole, the increase of the year was disappointing.

More than 95,000 hunters were licensed last year to kill Grouse in this Commonwealth. The species has been killed off or driven out of large sections in many States. With the increasing number of hunters, motor cars and automatic guns, the clearing of more and more land, and all the accessory adverse influences due to modern civilization, the Grouse cannot stand continuous shooting year after year if we are to rely alone upon the number of birds that the woods naturally produce.

Artificial propagation never has been a commercial success with any woods Grouse. To increase this species more protection will be necessary. There is a complete remedy for the decrease of this bird which can be applied whenever it becomes necessary. Whenever the sportsmen of Massachusetts are willing to practice sufficient self-denial, we may have the Ruffed Grouse almost as plentiful again as it was in the early decades of the nineteenth century.

The remedy is a closed season for two or three years. Whenever such a law has been enacted and enforced the decimated birds have increased wonderfully. Recently, after such a season of forbearance in Michigan, Ruffed Grouse became so remarkably abundant that they were common in places where they had not been noted at all for many years. After a similar closed season in Minnesota, more than 500,000 birds were killed, according to the tabulated reports of the sportsmen as returned by them individually to the game commissioners.

There is a disadvantage, however, in leaving the protection of this bird entirely to the legislative body. The Legislature meets before the breeding season and has no means of knowing what the year's increase will be or how much protection will be required. The Department of Conservation could ascertain the facts after the breeding season and before the hunting

season, and would then be in a position to know whether the species required additional protection, and could give protection when most needed if it had the power to do so. Legislation might be enacted giving the Department of Conservation the right to declare a closed season on the Ruffed Grouse whenever, after due investigation of conditions throughout the Commonwealth, such closed season might seem necessary to protect and preserve the species.

EDWARD HOWE FORBUSH,

Director.

