Weed, C. M. -

Bibliography of the economic relations of North American birds.

(1902)

A-Weed

HARVARD UNIVERSITY.

LIBRARY

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

51,348

GIFT OF

Samuel Henshaw.

February 1, 1919.

51.348

New Hampshire College Agricultural Experiment Station

TECHNICAL BULLETIN NO. 5

A PARTIAL BIBLIOGRAPHY

OF THE

ECONOMIC RELATIONS

OF

North American Birds

BY

CLARENCE M. WEED

DURHAM

NEW HAMPSHIRE COLLEGE

OF AGRICULTURE AND THE MECHANIC ARTS

1902

5

New Hampshire College Agricultural Experiment Station

TECHNICAL BULLETIN NO. 5

A PARTIAL BIBLIOGRAPHY

OF THE

ECONOMIC RELATIONS

OF

North American Birds

BY

CLARENCE M. WEED

DURHAM

NEW HAMPSHIRE COLLEGE

OF AGRICULTURE AND THE MECHANIC ARTS

1902

NEW HAMPSHIRE COLLEGE
OF
AGRICULTURE AND THE MECHANIC ARTS

AGRICULTURAL EXPERIMENT STATION
DURHAM, N. H.

BOARD OF CONTROL

HON. JOHN G. TALLANT, *Chairman*, Pembroke.
HON. GEORGE A. WASON, New Boston.
CHARLES W. STONE, A. M., *Secretary*, Andover.
PRES. CHARLES S. MURKLAND, *ex-officio*, Durham.

THE STATION COUNCIL

FRED W. MORSE, M. S., *Vice-Director and Chemist*.
CHARLES H. PETTEE, A. M., C. E., *Meteorologist*.
HERBERT H. LAMSON, M. D., *Bacteriologist*.
CLARENCE M. WEED, D. Sc., *Entomologist*.
FRANK WM. RANE, B. Agr., M. S., *Horticulturist*.
HARRY HAYWARD, M. S., *Agriculturist*.

ASSISTANTS

HARRY F. HALL, *Assistant Horticulturist*.
ALBERT F. CONRADI, M. S., *Assistant Entomologist*.
LUCIAN A. HILL, A. B., *Assistant Chemist*.
ARTHUR L. SULLIVAN, B. S., *Assistant Chemist*.
FREDERICK C. KEITH, *Clerk*.

A PARTIAL BIBLIOGRAPHY OF THE ECONOMIC RELATIONS OF NORTH AMERICAN BIRDS

BY CLARENCE M. WEED

The importance of birds as checks upon the undue increase of noxious insects has long been recognized by observing men scattered here and there throughout the United States. But a general appreciation of the value of these feathered allies is of comparatively recent development, and in some regions they are still unappreciated.

The literature which has led to a wider knowledge of the value of birds has been scattered through many publications, much of which is inaccessible to the general reader, and some of it difficult to obtain even by the specialist. In the following pages I have attempted to bring together a bibliographic list of the more important articles treating of the economic relations of our birds. In compiling it I have had the help of Messrs. A. F. Conradi, W. F. Fiske, and R. A. Cushman, while assistants in the entomological department of this station. For a number of citations of articles in *Forest and Stream* I am indebted to the pages of *The Auk*, while a few others have been gleaned from various other sources. It has been impracticable to include citations of the great mass of literature treating specifically of game birds, or their acclimation and domestication, as well as of the thousands of references to the English sparrow, and of the many general bird books of recent years.

1808-14. WILSON, ALEXANDER. American Ornithology; or, the Natural History of the Birds of the United States: Illustrated with plates engraved and colored from original drawings taken from nature. By Alexander Wilson. v. I—IX Philadelphia; Published by Bradford & Inskeep.

Much information as to feeding habits.

1825-33. BONAPARTE, CHARLES LUCIEN. American Ornithology; or, the Natural History of the Birds inhabiting the United States of America, not given by Wilson, with figures drawn, engraved, and colored, from nature. By Charles Lucien Bonaparte. v. I (IV). Philadelphia: Carey, Lea & Cary, Chestnut street. London: John Miller, 40 Pall Mall.

1831-39. AUDUBON, JOHN JAMES. Ornithological Biography, or an account of the habits of the Birds of the United States of America; accompanied by descriptions of the objects represented in the work entitled "The Birds of America," and interspersed with delineations of American scenery and manners. By John James Audubon, F. R. S. S. L. & E. Edinburg: Adam Black.

Frequent references to feeding habits.

1832-34. NUTTALL, THOMAS. A Manual of the Ornithology of the United States and of Canada. By Thomas Nuttall, A. M., F. L. S. (v. I) The Land Birds. Cambridge: Hilliard and Brown, booksellers to the University. MDCCCXXII. (v. II) The Water Birds. Boston: Hilliard, Gray & Co. MDCCCXXXIV.

Many references to insect and other food of birds.

1840-44. AUDUBON, J. J. The Birds of America, from drawings made in the United States and their Territories. By John James Audubon. Philadelphia: J. B. Chevalier. 1840-44. 7 vols.

1850. KIRTLAND, J. P. Fragments of Natural History. Family Visitor (weekly newspaper), v. I, No. 1, 1850, p. 1.

Notes on twenty-one species, chiefly regarding their relative abundance compared with former years. Washington eagle, red-tailed, red-shouldered, broad-winged, Cooper's and swallow-tailed hawks, goosander, mallard, summer duck, wild turkey, partridge, quail, pileated woodcock, turkey buzzard, raven, crow, crow blackbird, robin, bluebird, thrush, catbird.

1850. KIRTLAND, J. P. Editorial Correspondence. Family Visitor, v. I, No. 10, 1850, p. 72.

1850. (KIRTLAND, J. P.) The Wild Pigeon. Family Visitor, v. I, No. 17, 1850, p. 133.

1852. (READ, M. C., Editor.) The Cow Blackbird. Family Visitor, v. III, No. 9, 1852, p. 68.

1854. GORGAS, JOHN. Importation of Skylarks. U. S. Patent Office, Agricultural Report, 1853, pp. 70-71.

Account of an importation of skylarks into America in the spring of 1853.

1854. WOLFORD, H. L. On the Importation and Protection of Useful Birds. U. S. Patent Office, Agricultural Report, 1853.

A strong recommendation for the importation of immense numbers of European song and insectivorous birds into America.

1855. BROWN, D. J. Climatology. U. S. Patent Office, Agricultural Report, 1854, pp. 436-441.

Dates of first appearance of barn-swallow and whippoorwill in various towns of the United States in spring of 1851.

1859. KIRKPATRICK, JOHN. Rapacious Birds of Ohio. Ohio Agricultural Report for 1858, pp. 341-383.

1860. KIRKPATRICK, JOHN. Birds of Ohio. Ohio Farmer (newspaper, Cleveland), 1858-60.

A series of articles running through three years.

1861. COLLINS, W. O. Report of Senate Select Committee, upon Senate Bill No. 12, "For the Protection of Birds and Game." Fifteenth Annual Report Ohio State Board of Agriculture for 1860 (1861), pp. 381-390.

Facts in the natural history of Ohio birds, with recommendations for legislative action.

1861. (HARRIS, S. D., Editor.) Field Notes, I, 1861, p. 65.

Note on the introduction of the English skylark, at Columbus, in 1851.

1861. WELLS, D. A. On the Feeding and Growth of the American Robin. U. S. Patent Office, Report on Agriculture, 1860, pp. 88-89.

Abstract of an article by Professor Treadwell of Cambridge, Mass., directed to the Boston Society of Natural History, and containing a detailed account of the food required by two young robins, captured when about half grown.

1862. FLAGG, WILSON. Utility of Birds. Massachusetts Agricultural Report, 1861, pp 70-78.

Long essay on the economic value of birds with numerous notes on food habits of certain species, some of them from original observations.

1864. MICHENER, E. Agricultural Ornithology. Insectivorous Birds of Chester County, Pennsylvania. U. S. Department of Agriculture, Report, 1863, pp. 287-307.

The value of birds to the agricultural interests discussed, and followed by a list of the birds of Chester county, Penn., with the exception of the water species. Brief notes on the food and habits of each bird are given.

1864. SAMUELS, E. A. Mammalogy and Ornithology of New England with special reference to Agricultural Economy. U. S. Department of Agriculture, Report, 1863, pp. 265-286.

Outlines of the classification of mammals, birds, and insects with brief notes on the economic importance of each order from an agricultural standpoint. Also a more general discussion of the relations between the birds and mammals and the former, and the causes which tend to alter them.

1865. DODGE, J. R. Birds and Bird Laws. U. S. Department of Agriculture, Report, 1864, p. 431.

Treats of the uses of birds, the necessity of a balance in animal production, value of birds as insect destroyers; the refutation of false charges against them and manner of protecting them; and gives in conclusion a digest of the bird and game laws then existing in most of the eastern and central states.

1865. ELLIOT, D. G. The "Game Birds" of the United States. U. S. Department of Agriculture, Report, 1864, pp. 356-385.

An introduction defining the phrase "game bird" as here used followed by more or less lengthy discussions of the following species which he classifies under that head: Wild turkey, Mexican wild turkey, ocellated wild turkey, cock of the plains, ruffed grouse, Sabine's grouse, allied grouse, prairie hen, sharp-tailed grouse, Arctic sharp-tailed grouse, dusky grouse, Richardson's grouse, spruce grouse, Franklin's grouse, white-tailed ptarmigan, willow ptarmigan, Virginian partridge, Texan partridge, plumed partridge, California partridge, Gambel's partridge, scaled partridge, Massena partridge, woodcock, Wilson's or English snipe and wild pigeon.

1865. SAMUELS, E. A. Oology of some of the Land Birds of New England. U. S. Department of Agriculture, Report, 1864, pp. 386-430.

A short discussion of the importance of Oology as indicating the breeding habits of birds is followed by short accounts of above one hundred species which inhabit New England. The information given is almost exclusively confined to descriptions of eggs and accounts of nesting habits.

1866. GLOVER, TOWNEND. Report of the Entomologist. Report of the Department of Agriculture, 1865, pp. 36-45.

A general synopsis of the insectivorous birds of North America, with account of the examination of stomachs of many of them. Included in the report of the government entomologist for 1865.

1866. SAMUELS, E. A. The Agricultural Value of Birds. Massachusetts Agricultural Report, 1865-'66, pp. 94-117.

An address on the value of the different groups of birds, with general discussion and citation of examples at home and abroad.

1868. HICKS, ISAAC. Entomological items. American Entomologist, November, 1868, v. I, p. 54.

Food habits of the Baltimore oriole.

1868. SAMUELS, E. A. Value of Birds on the Farm. U. S. Department of Agriculture, Report, 1867, pp. 201-208.

Notes on the economic importance of birds with accounts of the examination of stomachs of the robin, various species of woodpeckers, cuckoos, crows, and jays; nearly all of the notes are apparently original.

1869. F. W. The Crow Blackbird a Robber. *American Naturalist*, v. II, p. 326.

A short article including reference to fact that crow blackbird has driven out martins.

1870. FOWLER, AUGUSTUS. The Golden-winged Woodpecker. *American Naturalist*, v. III, pp. 423-427.

Economic status.

1870. ORTON, JAMES. The Great Ank. *American Naturalist*, v. III, pp. 539-542.

Home; food; extinction, etc.

1871. GLOVER, T. Report of the Entomologist, U. S. Department of Agriculture, 1870, pp. 90-91.

Note on the economic value of birds in general and on the introduction of the English sparrow in particular, included in the report on Entomology.

1872. LOCKWOOD, REV. SAMUEL. The Baltimore Oriole and Carpenter Bee. *American Naturalist*, v. II, pp. 721-724.

Oriole removes head of bee and empties honey sack.

1872. PALMER, FRANK H. The Utility of Birds to Agriculture. *Massachusetts Agricultural Report*, 1870-'72, pp. 107-120.

An essay on economic importance of birds, special reference being made to some thirty New England species.

1873. PERKINS, G. H. Birds in their Relation to Agriculture. *Vermont Agricultural Report*, 1872, pp. 316-337.

A paper read before the Vermont State Board of Agriculture, on the economic relation of birds. Abstracted in the report of the U. S. Department of Agriculture, 1873, p. 476.

1873. WHITE, C. A. Woodpeckers tapping Sugar Trees. *American Naturalist*, v. III, p. 196.

Short article about red-headed woodpeckers rupturing the bark of sugar maples for purpose of obtaining the sap.

1874. BAILEY, L. H., JR. Birds. Third Annual Report Secretary State Pomological Society of Michigan for 1873, pp. 127-128.

Insect-feeding habits of several common singing birds of Michigan.

1874. BOYCE, CAROLINE. The Robin. *American Naturalist*, v. VIII, pp. 203-208.

Habits, food, nesting, broods, time of brooding.

1874. LANG, J. W. The Value of Insect Eating Birds. New Hampshire Agricultural Report, 1873, v. III, pp. .

Introduction, followed by a synopsis of families with chief characteristics; a discussion on the food of birds with some apparently new data on stomach contents in a few instances and concluding remarks on the necessity of a proper balance, the usefulness of birds in general, and a plea for their protection.

1874. LEBARON, WM. The Bird Question. Transactions Illinois State Horticultural Society, 1873, v. VII, pp. 311-319.

Discussion of the economic importance of birds.

1875. PALMER, FRANK H. Insect Eating Birds, the Farmer's Best Friends. Boston, Mass., Society Prevention Cruelty to Animals, 1875.

A prize essay and an admirable discussion.

1875. WHEATON, J. M. The Food of Birds as Related to Agriculture. Ohio Agricultural Report for 1874 (1875), pp. 561-578 (Sept., 1875). Also reprint, repaged but otherwise unchanged, pp. 1-18.

"This is in effect a corrected and completed list of the birds of Ohio, briefly annotated, and with the general food

regimen of each family given; being a well-conceived essay of much practical utility." Coes, *Bibliographical Appendix, Birds of Colorado Valley*, 1878, p. 716.

1876. COES, ELLIOTT. The Destruction of Birds by Telegraph Wires. *American Naturalist*, v. X, pp. 734-736.

Many hundreds of thousands of birds killed. Instances cited.

1877. ALLEN, J. A. Destruction of Birds in the United States. *Popular Science Monthly*, v. X, p. 636.

Review of article by Mr. Allen in *Penn Monthly*, condemning the wholesale slaughter of the herons in Florida.

1877. ARROW. A Voice Against the English Sparrow from Indianapolis, Indiana. *Forest and Stream*, New York, v. VIII, 1877, p. 261.

1877. CAREY, A. G. Observations on the English Sparrow at Indianapolis, Indiana. *Forest and Stream*, New York, v. VIII, 1877, p. 307.

1877. CATON, J. W. The Wild Turkey and its Domestication. *American Naturalist*, v. XI, pp. 321-330.

The young; effects of domestication; characters of sexes; food; three principles of domestication.

1877. CALVIN, SAMUEL. On Changes of Habit Among Woodpeckers. *American Naturalist*, v. XI, pp. 471-472.

Struggle for life among bark-searching insects during recent geologic ages, severe, etc.

1878. LOCKWOOD, SAMUEL. The Night Herons and Their Exodus. *American Naturalist*, v. XII, pp. 29-35.

The quantity of food consumed by this bird.

1878. LYLE, DAVID ALEXANDER. The Robins' Food. *American Naturalist*, v. XII, pp. 448-453.

Habits, quality, quantity.

1878. OSWALD, FELIX L. The Home of the Harpy Eagle. *American Naturalist*, v. XII, p. 155.

On the food of the harpy eagle.

1878. WILLISTON, S. W. The Prairie Dog, Owl, and Rattlesnake. *American Naturalist*, v. XII, p. 207.

The shore lark part of food of the owl.

1880. BREWER, T. M. The Value of Birds. *Transactions Illinois State Horticultural Society*, 1879, v. XIII, pp. 173-178.

Reprint of an address delivered before the Hingham (Mass.) Agricultural and Horticultural Society, July 19, 1869, on the economic importance of birds.

1880. CUMMINGS, A. L. Horticultural Ornithology. *Transactions Illinois State Horticultural Society*, 1879, v. XIII, pp. 295-298.

Discussion of the economic relations of certain of our native birds.

1880. FORBES, S. A. The Food of Birds. *Transactions Illinois State Horticultural Society*, 1879, v. XIII, pp. 120-172.

Discussion of the economic value of birds, followed by detailed account of the feeding habits of the robin, catbird, brown thrush, wood-thrush, Alice's thrush, and Swainson's thrush; followed by a detailed account of the stomach contents of these birds.

1880. FORBES, S. A. The Food of Birds. *Bulletin Illinois State Laboratory Natural History*, v. I, pp. 80-148.

A general introduction discussing the necessity of a knowledge of bird food and methods of study, with extended records of studies of food of the thrushes and stone-chats.

1880. FORBES, S. A. On Some Interactions of Organisms. *Bulletin Illinois State Laboratory Natural History*, v. I, pp. 3-17.

A general discussion of the food relations of animals, with especial reference to birds and insects.

1880. FORBES, S. A. Notes on Insectivorous Coleoptera. *Bulletin Illinois State Laboratory Natural History*, v. I, pp. 153-160.

Feeding habits of ground beetles, with discussion of relation to birds.

1880. WEBSTER, F. M. Notes upon the Food of Predaceous Beetles. Bulletin Illinois State Laboratory Natural History, v. I, pp. 149-152.

Observations on food habits of ground beetles and others that birds feed upon.

1881. ALDRICH, CHARLES. Value of the House Wren as an Insect Destroyer. American Naturalist, v. XV, p. 318.

Hardiness, sociability, love of locality, wonderful fecundity, render it one of the most valuable of our insectivorous birds.

1881. BUMPS, H. C. The Habits of the Yellow-Bellied Woodpecker. American Naturalist, v. XV, p. 738.

A proof that they are sap eaters, if not also bark eaters.

1881. FORBES, S. A. Supplementary Report on the Food of the Thrush Family. Transactions Illinois State Horticultural Society, 1880, v. XIV, pp. 106-126.

Comparison between earlier and more recent tables of the food of the thrushes of Illinois. (Transactions Illinois State Horticultural Society, 1879, v. XIII, pp. 120-172), with additional notes on the food of this family, followed by a detailed account on the food of the bluebird.

1881. LOCKWOOD, SAMUEL. The Eastern Snow Bird. American Naturalist, v. XV, p. 524.

Note on exportation as a trade.

1882. ALLEN, C. A. The Birds. New Hampshire Agricultural Report, 1881, pp. 269-282.

Discussions on the following topics: Useful birds; warblers, fly-catchers, swallows, creepers, woodpeckers, and thrushes. Singular habits of birds; the cow bunting. Birds injurious to farmers; a list comprising the crow and blue jay, species of hawks (coopers, duck, pigeon, sparrow, sharp-shinned, gas-, red-tailed, red-shouldered), and two species of owls (horned and earved). Plumage birds; descriptions of some of the brightest colored birds occurring in New Hampshire.

1882. FORBES, S. A. The Ornithological Balance Wheel. Transactions Illinois State Horticultural Society, 1881,

new series, v. XV, pp. 120-131. Extract Report State Horticultural Society, Michigan, 1881, p. 203. Pacific Rural Press, January 21, 1882. Shawnee News, February 13, 1882.

Relations of birds to army worms, canker-worms, and chinch bugs.

1882. SLADE, ELISHA. Food of the Nestlings of *Turdus migratorius*. American Naturalist, v. XVI, p. 1007.

Animal food—insects in all stages of development—later broods all kinds of fruits growing in the garden.

1882. STEARNS, R. E. C. Wild Geese as Pests. American Naturalist, v. XVI, p. 326.

Pull up the young wheat in the grain fields of the Upper San Joaquin Valley, California.

1882. WHEATON, J. M. Report on the Birds of Ohio. Geological survey of Ohio, v. IV, pp. 187-628.

An elaborate report, with many references to economic relations. First published separately in 1879.

1883. FORBES, S. A. The Food Relations of the Carabidae and the Coccinellidae. Bulletin Illinois State Laboratory Natural History, v. I, No. 6, pp. 33-64.

Record of studies with reference to food of ground beetles and lady-beetles, and their relations to birds.

1883. FORBES, S. A. The Regulative Action of Birds upon Insect Oscillations. Bulletin Illinois State Laboratory Natural History, v. I, No. 6, pp. 3-32.

Results of investigation of food of birds in an orchard infested with canker-worms.

1883. FORBES, S. A. Birds in Relation to Agriculture. Stoddard's Encyclopedia Americana, v. 1, pp. 131-134.

A short discussion.

1883. SLADE, ELISHA. Kingbirds Feeding their Young upon Fruits. American Naturalist, v. XVII, p. 887.

The parents feed their young on fruit of honeysuckle, and when nestlings were able to fly they were conducted to bush and persisted until the plant was stripped.

1883. STEARNS, W. A. The Utility of Birds in Agriculture. New Hampshire Agricultural Report, 1882, pp. 219-238.

An address on the economic importance of birds, treating of classification, utility of birds in general, and certain species (blue jay, Baltimore oriole, chickadee, white and red bellied nuthatch, etc.) in particular, and the utility of birds in migration.

1883. STORER, F. H. A Caterpillar-eating Henhawk. (*Buteo pennsylvanicus*) Science, No. 6, v. 1, p. 168.

1883. SOMERS, J. On the Winter Food of the Partridge and on Partridge Poisoning. Proceedings and Transactions Nova Scotian Institute Natural Science, v. VI, Part 1, pp. 78-84.

1883. VAN OKEN, A. G. The Hairy Woodpecker. American Naturalist, v. XVII, pp. 511-513.

Reference to economic value.

1884. ALDRICH, CHARLES. Notes on the Redwing Blackbird. American Naturalist, 1884, v. XVIII, pp. 309, 310.

On its nesting habits and decrease in numbers through the reclamation of wet lands.

1884. Birds and Electric Light. Forest and Stream, v. XXII, p. 424.

Extract from the Winona (Minnesota) "Republican" of May 23, 1884, giving account of the destruction of large numbers of birds killed by striking against electric lights during two nights, May 20 and 21, at Winona, Minnesota.

1884. BYRNE. Fruit-eating Birds. Forest and Stream, v. XXII, p. 24.

Arraignment of the robin and catbird.

1884. CANOON, J. C. Protecting Song Birds. Forest and Stream, v. XXII, p. 203.

In defence of collecting for scientific purposes. In the same heading is a protest by H. W. C. against indiscriminate egg collecting by boys "as a business," but in favor of collecting for scientific purposes.

1884. CHUBB, A. B. Birds and Electric Lights. Forest and Stream, v. XXII, p. 26.

List of species picked up at the foot of electric light masts in Cincinnati, Ohio.

1884. (COOPER), C. (V.) Insectivorous Grouse. Canadian Sportsman and Naturalist, v. III, p. 261.

A specimen of the ruffed grouse (*Bonasa umbellus*), found to have its crop full of caterpillars of *Notodonta concinna*, commonly known as the red-humped apple-tree caterpillar.

1884. CUMMINGS, A. L. Ornithology. Transactions Illinois State Horticultural Society, 1883, v. XVII, pp. 202-206.

Notes on habits of birds and difficulty of correct determination of species in all cases.

1884. CUMMINGS, A. L. Migratory Birds. Transactions Illinois State Horticultural Society, v. XVII, pp. 163-165.

Notes on bird migration in Illinois.

1884. C. E. B. Utility of the Crow. Forest and Stream, v. XXII, p. 424.

1884. Editorial. The Sacrifice of Song Birds (for millinery purposes). Forest and Stream, v. XXII, Aug. 7, p. 21.

1884. Editorial. Domesticating Game Birds. Forest and Stream, v. XXI, No. 14, p. 264.

Notes on the ruffed grouse, the pintail grouse, and the common quail.

1884. Editorial. The Destruction of Small Birds. Forest and Stream, v. XXII, p. 24.

Statistics relating to the appalling magnitude of the millinery trade in bird skins.

1884. G. M. S. The Migratory Quail. Forest and Stream, v. XXII, p. 385.

Birds turned loose at Springfield, Mass., two years ago, have raised young, and are still there, and are there to stay.

1884. HORSFORD, B. The Yellow-bellied Woodpecker, *Forest and Stream*, v. XX, No. 7, p. 124.

Kills trees by girdling them. \

1884. MERLIN. Protect the Small Birds. *Forest and Stream*, Feb. 28, p. 83.

Against the "mania" for possession of immense series of birds' eggs and skins.

1884. NESSMUCK. Robins and Strawberries. *Forest and Stream*, v. XXII, Sept. 25, p. 164.

Verdict heavily against the robin.

1884. NOE, FLETCHER M. Are Owls Beneficial to the Farmer? Also notes on the species in Indiana. *Indiana Farmer*, July 5, 1884.

1884. PICKET. Fruit Eating Birds. *Forest and Stream*, v. XXII, Aug. 28, p. 83.

Statistical table showing contents of stomachs of various species.

1884. PROTT, J. S. Acclimation of Foreign Birds (in the United States). *Forest and Stream*, v. XXII, p. 364.

In view of the unsuccessful attempts with the European quail, skylark, etc., it is suggested that such birds should be turned out in the South (Florida, Louisiana, Mexico) instead of the North.

1884. R. T. The Robin as a Game Bird. *Forest and Stream*, v. XXII, Sept. 4, p. 105.

1884. RAGSDALE, G. H. A Plea for the Hawks. *American Field*, v. XXI, March 22, p. 281.

Urging discrimination in the slaughter of the birds, the greater part of which are beneficial, they subsisting chiefly upon noxious mammals and insects.

1884. [Special.] Small Bird Destruction. *Forest and Stream*, v. XXII, Sept. 11, p. 123.

Forty thousand tern skins taken in Massachusetts sent during the past year to Liverpool for millinery purposes. Comment also on the destruction of woodpeckers and other small birds, which fall victims to the gunning craze.

1884. WARREN, HARRY. Diurnal Rapacious Birds. (With special reference to Chester county, Pa.) Agriculture of Pennsylvania, 1883 (1884), pp. 96-112.

A very important paper on the food of various hawks, with report of numerous examinations of the contents of stomachs.

1884. WEED, CLARENCE M. Does the Crow Blackbird eat Crayfish? American Naturalist, v. XVIII, p. 832.

Part of a crayfish was found in the stomach of a young crow blackbird.

1884. WEED, CLARENCE MOORES. The Food of Young Birds. Report Michigan State Board of Agriculture, 1884. Also Report Michigan State Horticultural Society, 1884.

Report on food of nestling catbirds, robins, bluebirds, and crow blackbirds, with discussion of economic relations.

1885. BARNES, G. L. Kingbirds and Bees. Forest and Stream, v. XXV, Oct. 8, p. 205.

1885. BENNETT, GEO. B. The Lesson of a Market. Forest and Stream, v. XXIV, June 4, pp. 366, 367.

An account of the small birds exposed for sale in the market at Norfolk, Va.

1885. BROWN, E. L. An Insectivorous Kite. The Naturalist, v. I, No. 3, p. 125.

1885. BUTLER, A. W. The Cuckoo. Indiana Farmer. April, 1885, p. 14.

1885. DURY, CHAS. Notes on the Food of Raptorial Birds. Journal of Cincinnati Society of Natural History, v. VIII, pp. 62-67. Also reprinted in Random Notes on Natural History, v. I, No. 8.

Notes on the contents of stomachs of various species of hawks and owls.

1885. HAYWARD, R. Curious Food of the Kingfisher. Auk, v. II, p. 311.

Found in stomach, fragments of various beetles belonging to the families Carabidæ, Dytiscidæ, and Scarabæidæ.

1885. NOBLE, G. Destructive Electric Light Towers. Forest and Stream, v. XXV, Nov. 12, p. 305.

During a rainy night in October 105 birds were picked up under one light tower in Savannah, Ga.

1885. NOE, FLETCHER M. The Value of Birds as Insect Destroyers. Indiana Farmer, Jan. 17, 1885. (Abstract of paper before State Board of Agriculture.)

1885. WARREN, B. H. Blackbird's Food. Facts from the diary of a field-working naturalist, showing the piscivorous habit of two species of the genus *Quiscalus*. Agriculture of Pennsylvania, Report for 1885, pp. 157-159.

Statistics of examinations of stomachs of numerous specimens of *Quiscalus purpureus* and *Quiscalus major*.

1885. WARREN, H. H. Birds' Food. Agriculture of Pennsylvania, pp. 150-156.

On the food of robin and catbird.

1885. X. Foreign Game Birds in America. Forest and Stream, v. XXV, September 3, pp. 103, 104.

An important historical paper on the subject.

1886. AMERY, CHAS. F. That Thieving Rice Bird. Forest and Stream, v. XXVII, No. 15, November 4, pp. 283, 284.

On its probable utility as well as destructiveness.

1886. BOWLES, E. D. English Sparrow as Egg Robber. Forest and Stream, v. XXVI, p. 5, Jan. 28, 1886.

1886. BUTLER, A. W. The Periodical Cicada in Southeastern Indiana. U. S. Department of Agriculture, Division of Entomology, Bulletin No. 12, pp. 24-31.

Refers to birds known to eat cicadas.

1886. CHAPMAN, FRANK M. Birds and Bonnets. Forest and Stream, v. XXVI, No. 6, February 25, p. 84.

List of birds seen on ladies' hats in an afternoon's walk in New York city.

1886. DURY, CHAS., FISHER, W. H., WARDEN, R. H., LANGDON, F. W., JAMES, J. F. Papers on the Destruction of Native Birds. Journal of the Cincinnati Society Natural History, v. IX, pp. 163-224.

1886. Editorial. A Use for Falconry. Forest and Stream, v. XXVII, No. 13, October 21, p. 241.

Trained hawks suggested as a means of protecting rice fields from the depredations of the rice birds.

1886. Editorial. Snipe Decoration. Forest and Stream, v. XXVII, No. 15, November 4, p. 281.

Use of snipe and migratory game birds for millinery purposes in lieu of song birds.

1886. GRANT, W. G. The Terns of Matinicus Rock (Coast of Maine). Forest and Stream, v. XXVII, No. 25, January 13, p. 485.

On the wholesale slaughter of terns at this point for millinery purposes by C. E. Cahoon, of Taunton, Mass., during the season of 1886.

1886. MILLER, WARNER. Ravages of Rice Birds. Congressional Record, 49th Congress, June 11, 1886, p. 5747.

A loss of \$6.87 per acre by the rice birds to the rice crop and the total annual loss to one plantation is estimated at \$8,250.

1886. NOE, FLETCHER M. Notes on the Destruction of Indiana Birds for Millinery Purposes. Indianapolis News, Feb. 22, 1886.

1886. THOMPSON, MAURICE. Some Song Birds of Indiana. Report of the State Board of Agriculture, 1885, pp. 247-252.

1887. FISHER, WM. H. The Canada Grouse. Journal Cincinnati Society of Natural History, v. X, pp. 205-206.

Some remarks as to its scarcity, fearlessness, habitat, and its feeding on the tamarack.

1887. HAY, O. P. The Red-headed Woodpecker a Hoarder. The Auk, v. IV, p. 193.

An insect-eating species, and during winter avail themselves of grain, grass seeds, and softer nuts. Some eat fruit and berries.

1887. MARSHALL, WILLIAM. Birds and their Daily Bread. Popular Science Monthly, v. XXX, p. 600.

Food of birds very diversified.

1887. MERRIAM, DR. C. H. Report of the Ornithologist and Mammalogist. U. S. Department of Agriculture, Report, 1886, pp. 227-258.

Notes on importance of subject, progress of work and copies of circular letters sent to various classes of agriculturists throughout the country. Extracts from the answers received have served as the basis for article on the English sparrow, its introduction, rate of increase, rate of spread, relations to other birds, and economic importance as an enemy to the gardener and fruit grower, effects on agriculture, failure to reduce the numbers of caterpillars, and recommendations for protective legislation. On the rice bird, its ravages and habits, and on the distribution and migration of birds.

1888. ALEXANDER, G. E. Trochilus Colubris killed by a Mantis. Proceedings of Elliott Society of Science and Art, v. II, May, 1888, pp. 195-196.

1888. AVERY, W. C. Game Destroying Hawks. The American Field, v. XXIX, p. 7.

1888. BAILEY, VERNON. Report of Some of the Results of a Trip through Part of Minnesota and Dakota. U. S. Department of Agriculture. Annual Report, 1887, p. 426.

Notes on damage done by the yellow headed blackbird by devouring grain, both in planting and harvesting seasons. Also notes on distribution and habits of red-winged blackbird, purple grackle, Brewer's blackbird, cow bird, bobolink, and Franklin's gull.

1888. FISHER, A. K. Food of Hawks and Owls. U. S. Department of Agriculture, Annual Report, 1887, pp. 402-422.

Statements of the stomach contents of more than 1,000 hawks and owls. The following species are mentioned: Swallow-tailed kite, Mississippi kite, marsh hawk, sharp-shinned hawk, Cooper's hawk, goshawk, red-tailed hawk, red-shouldered hawk, Swainson's hawk, broad-winged hawk, rough-legged hawk, golden eagle, bald eagle, prairie falcon, duck hawk, pigeon hawk, sparrow hawk, barn owl, long-eared owl, short-eared owl, barred owl, Florida barred owl, sawwhet owl, screech owl, great horned owl, snowy owl, hawk owl, and burrowing owl. Only a few of these species were found to be injurious.

1888. FISHER, A. K. Experiments in Poisoning. U. S. Department of Agriculture, Annual Report, 1887, pp. 423-426.

Details of experiments with strychnine and arsenic in various forms and corrosive sublimate as poisons for birds.

1888. WARREN, B. H. Report on the Birds of Pennsylvania, with special reference to food habits. Harrisburg, 1888, pp. I-XII, 1-260.

An elaborate report based on the examination of over three thousand stomachs. Illustrated with fifty plates. A revised and enlarged edition covering 450 pages was published in 1890. The notes on food materials are unusually complete.

1889. BAKER, C. F. Notes on the Food of Birds. Proceedings Academy of Natural Sciences of Philadelphia, pp. 266-270.

Upwards of 300 stomachs examined in Florida.

1889. BARROWS, W. B. The Rose-breasted Grosbeak. U. S. Department of Agriculture, Report, 1888, pp. 535, 536.

Extracts from correspondence tend to prove this species a valuable friend to the farmer from the fact of its feeding freely on the Colorado potato beetle.

1889. BARROWS, W. B. The Food of Crows. U. S. Department of Agriculture, Report, 1888, pp. 498-535.

Short introduction followed by a long discussion on both the common and fish crow, with many extracts from correspondence. Information has been collected on distribution of the crows, injury to various cereals, damage to other crops, other vegetable food, distribution of noxious seeds, as a destroyer of eggs and young of poultry and wild birds, insect food, as an enemy to grasshoppers, as an enemy to potato beetles, insect food as revealed by an examination of the stomachs, as an enemy to field mice, miscellaneous animal food, and as a scavenger. The paper is closed by the results in detail of the examination of a large number of stomachs of the common and a few of the fish crow.

1889. BLATCHLEY, W. S. Our Feathered Friends of Indiana. A series of five articles in Indiana Farmer, under dates of May 4, May 18, May 25, and Nov. 23, 1889, and March 29, 1890.

1889. FISHER, A. K. The Sparrow Hawk. U. S. Department of Agriculture, Report, 1888.

Range and habits, extract from correspondence and account of the contents of 163 stomachs from various localities.

1889. FISHER, A. K. The Short-eared Owl. U. S. Department of Agriculture, Report, 1888, pp. 496-498.

Short account of the habits and food of this species, with extracts from correspondence.

1889. GOSS, N. S. Feeding Habits of *Pelecanus erythrorhynchos*. Transactions Kansas Academy of Science, v. XI, pp. 11, 12. See also The Auk, v. V, pp. 25-27.

1889. MERRIAM, C. H. Introduced Pheasants. U. S. Department of Agriculture, Report, 1888, pp. 484-488.

Account of the introduction of certain game birds into the western portion of the United States, and extract from correspondence in regard to them.

1889. STRODE, W. S., M. D. Food of the Owls. American Naturalist, v. XXIII, pp. 17-24.

Treats especially of great horned owl.

1889. WRIGHT, JULIA MCN. The Shrike. Science, v. XVII, p. 217.

Feeding habits.

1890. BRIMLEY, H. H. How the Cooper's Hawk Hunts its Prey. Ornithologists' and Oologists' Semi-Annual, v. II, pp. 32-34.

1890. COOK, C. B. The English Sparrow. Michigan Agricultural Experiment Station, Bulletin 62, May, 1890.

General notes on English sparrow; description; native birds likely to be mistaken for it, and means of destruction.

1890. COUPER, WM. Food of Woodcock. Shooting and Fishing, v. VIII, No. 2, p. 28.

1890. COUPER, WM. Food of Woodcock. Shooting and Fishing, v. VIII, No. 7, pp. 131-132.

1890. COUPER, WM. The Food of Woodcock. Shooting and Fishing, v. V, No. 23, p. 458.

1890. FISHER, A. K. The Marsh Hawk, Screech Owl, and Flammulated Screech Owl. U. S. Department of Agriculture, Report, 1889, pp. 370-376.

Discussion of the distribution and habits of these species, with extracts from various publications.

1890. SAINT CROIX. The Food of Woodcock. Shooting and Fishing, v. V, No. 25, p. 488.

1890. SAINT CROIX. Food of Woodcock. Shooting and Fishing, v. VIII, No. 4, p. 70.

1891. BARROWS, W. B. Seed Planting by Birds. U. S. Department of Agriculture, Report, 1890, pp. 280-285.

Discussion of the subject in various phases and statement of some of the problems to be solved.

1891. BLATCHLEY, W. S. Birds and Their Value on the Farm. *Terre Haute Gazette*, Jan. 13, 1891. A paper read before the Vigo County Farmers' Institute.

1891. BOLLES, FRANK. Yellow-bellied Woodpeckers and Their Uninvited Guests. *The Auk*, v. VIII, pp. 256-270.

1891. BUTLER, AMOS W. Our Birds and What they do for the Farmer. Report State Board of Agriculture, Indiana, 1890, pp. 113-125. Also issued separately in pamphlet form.

1891. MACKAY, GEO. H. Habits of the Golden Plover, (*Charadrius dominicus*), in Massachusetts. *The Auk*, v. VIII, pp. 17-24.

With paragraph on feeding habits, pp. 18, 19.

1891. MACKAY, GEO. H. Habits of the Scoters. *The Auk*, v. VIII, pp. 256-270.

1891. MERRIAM, DR. C. H. Birds which Feed on Mulberries. U. S. Department of Agriculture, Report, 1890, p. 285.

List of twenty-six species of birds which had been observed by Dr. A. K. Fisher and the author feeding upon mulberries.

1891. RESS, CARL. Take Care of the Birds. *Popular Science Monthly*, v. XXXIX, p. 687.

A plea for bird protection.

1892. BENDIRE, CHARLES. Life Histories of North American Birds. Washington, U. S. National Museum, Special Bulletin, No. 1.

Elaborate accounts, with special reference to breeding habits and eggs of the gallinaceous birds and the birds of prey. Eggs illustrated in twelve plates. Many references to feeding habits.

1892. BOLLES, FRANK. Young Sapsuckers in Captivity. *The Auk*, v. IX, pp. 109-119.

1892. J. W. G. D. Food of Woodcock. Shooting and Fishing, v. XIII, No. 7, p. 129.

1892. MACKAY, GEO. H. Habits of the American Herring Gull in New England. The Auk, v. IX, pp. 221-228.

Contains a few remarks on feeding habits.

1892. MILLER, H. H. Food Habits of Hawks and Owls in Maryland. Shooting and Fishing, v. XII, No. 19, p. 366.

1892. WILCOX, E. V. The Food of the Robin. Ohio Agricultural Experiment Station, Bulletin 43, September, 1892, pp. 115-131.

Details of a somewhat extended study of the food of the robin as indicated by a study of stomach contents. A total of 187 stomachs were examined of birds killed during the spring and summer months. In the summary it is estimated that the beneficial species of fruit and insects eaten will amount to 52.4 per cent. of the total, the injurious to 18.6 per cent., while the remainder consists of species of which the economic importance is as yet unknown.

1893. BARROWS, W. B. The Food of the Horned Larks or Shore Larks (*Otocoris*). U. S. Department of Agriculture, Report, 1892, pp. 193-197.

Account of the examination of the stomachs of fifty-nine horned larks, and summary of results.

1893. BEAL, F. E. L. Food Habits of the Cedar Bird. U. S. Department of Agriculture, Report, 1892, pp. 197-200.

Account of the examination of 125 stomachs of the common cedar waxwing, with a short summary of the result.

1893. BREWSTER, WM. A Brood of Young Flickers and how they were Fed. The Auk, v. X, pp. 231-236.

1893. BUTLER, A. W. Further Notes on the Evening Grosbeak. The Auk, v. X, pp. 155-157.

General notes with references to feeding.

1893. Editorial. Feathered Women. The Times, London, England, Oct. 17, 1893.

Leading article protesting against use of birds for millinery purposes.

1893. FISHER, A. K. The Hawks and Owls of the United States in their Relation to Agriculture. U. S. Department Agriculture, Division Ornith. and Mam., Bulletin No. 3, 1893.

A remarkable volume of more than 200 pages, with full discussion of feeding habits of each species, and a colored plate illustrating its appearance.

1893. HINE, JANE L. Birds that Befriend Our Forest Trees. A series of chapters irregularly published in the Farmers' Guide, Huntington, Indiana. Chapter I in v. V, No. 1, January 1; chapter II in v. V, No. 2, January 15; chapter III in v. V, No. 3, February 1; chapter IV, in v. V, No. 4, February 15; chapter V, in v. V, No. 6, March 15; chapter VI in v. V, No. 27, Dec. 15.

1893. LUCAS, F. A. Food of Humming-birds. The Auk, v. X, pp. 311-315.

1893. McLOUTH, C. D. Protection of Birds from the Boys. Science, v. XXII, pp. 347-348.

Recommends for schools (1) Punishment of guilty by law; (2) Teaching of sentiment; (3) Close study of birds; (4) Organizing societies for bird protection.

1893. SHUFELDT, R. W. Some Recent Economic and Scientific Questions in Ornithology. Science, v. XXII, pp. 255-256, Nov. 16, 1893.

Discusses causes for recent decrease in birds around large cities and remedial measures and legislation.

1893. WEED, CLARENCE MOORES. The Relations of Birds to Carnivorous Insects. Proceedings Society Promotion Agricultural Science, Fourteenth Meeting, pp. 70-74.

A general discussion showing incorrectness of calling all parasites and predaceous insects beneficial.

1894. BARROWS, W. B. Food Habits of the Kingbird or Bee Martin. U. S. Department of Agriculture, Report 1893, pp. 233-234.

Brief discussion of range, habits, and food as indicated by a study of the stomach contents.

1894. CARD, F. W. Birds Injuring Apples. Garden and Forest, v. VII, p. 114.

Brief mention of birds attacking the fruit.

1894. HINE, JANE L. Farmers, Take Care of your Birds. The Farmers' Guide, Huntington, Indiana, v. VI, No. 10, May 15, 1894.

1894. SMYTH, E. A., JR. Are all Birds of Prey Injurious to the Farmer? Virginia Agricultural Experiment Station, Bulletin 38, pp. 23-39.

Notes on the feeding habits of the common hawks and owls of Virginia, largely compiled from "The Hawks and Owls of the United States."

1894. TROOP, JAMES. Protecting Fruit from Birds. Purdue University Agricultural Experiment Station, Bulletin 53, pp. 125-126.

Details of an experiment in the use of netting to protect cherries from the attacks of birds, in which it was shown that the saving from its use would pay for the original cost the first year, under conditions in which the fruit is obliged to remain upon the tree until ripe.

1894. WINSHIP, A. E. Bird Day. Journal of Education, May 24, 1894.

Account of observance of bird day in schools of Oil City, Pa.

1895. The American Crow. The Wilson Ornithological Chapter of the Agassiz Association, Bulletin No. 5, March, 1895, pp. 5-42.

Notably feeding, nesting, roosting, flight, relative abundance.

1895. BARROWS, W. B., and SCHWARZ, E. A. The Common Crow in the United States. U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bulletin No. 6, 1895, p. 98.

General habits of the crow, geographic distribution, migration, crow-roosts; animal food of the crow; methods of investigation, method of examining stomachs; relative percentages of animal and vegetable food; relation of the crow to mammals; relation of crow to other birds; relation of crow to reptiles, fishes, and invertebrates; insect food of the crow; testimony of correspondents on insect food by the crow; vegetable food of the crow, corn, wheat, oats, barley, buckwheat, mast, grass, and weed seeds, wild rice, fruit; protection of crops,—tarring corn, use of poison, bounties; list of localities at which crows' stomachs were collected.

1895. BEAL, F. E. L. Crow Blackbirds and Their Food. U. S. Department of Agriculture, Year Book, 1894, pp. 233-248.

Discussion of the purple grackle and its two sub species, the bronzed and Florida grackles. The following subjects are treated: Geographic range, observations regarding the diet of the crow blackbird, examinations of stomach contents, various articles of bird diet, grains and fruits as blackbird food, seeds as bird food, food of the young, and summary.

1895. BEAL, F. E. L. Preliminary Report of the Food of Woodpeckers. U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bulletin No. 7, pp. 1-33. Rev. in Amer. Nat. v. XXX, p. 946; Pop. Sci. Monthly, v. XLIX, p. 573.

General remarks and table showing food percentages, followed by short discussions of the range, habits, and food of the following species: downy, hairy, red-headed, red-bellied, and pileated woodpeckers, flicker, and yellow-bellied sapsucker.

1895. BENDIRE, CHARLES. The Cowbirds. Report U. S. National Museum. 1893. pp. 587-624. plates 1-3.

Extended account of the life history of various species of cowbirds, with especial reference to their relations to other birds.

1895. BENDIRE, CHARLES. Life Histories of North American Birds, from the Parrots to the Grackles. Washington, Smithsonian Contributions to Knowledge, 985, 1895.

A continuation of the work listed above (1892), with many references to feeding habits.

1895. BLATCHLEY, W. S. Protect the Woodpeckers. Indianapolis Sunday Journal, Oct. 27, 1895.

1895. FISHER, A. K. Hawks and Owls as Related to the Farmer. U. S. Department of Agriculture, Year Book, 1894, pp. 215-232.

Discussion of the economic importance of the birds of prey, taking up the subjects of cause of the prejudice against birds of prey, some characteristics of rapacious birds, food habits of the principal birds of prey, harmless species of hawks and owls, wholly beneficial hawks, hawks and owls mostly beneficial, and harmful hawks and owls. All the common North American species are discussed.

1895. FORBUSH, E. H. Birds as Protectors of Orchards. Massachusetts Crop Report, Bulletin No. 3, Series of 1895, pp. 20-32. Also in Report Ont. Ent. Society, 1895, pp. 53-62.

Notes on feeding habits of the chickadee, nuthatch, brown-creeper, downy woodpecker, and others. Especial attention is given to the chickadee.

1895. HALL, F. H. Birds, Fruits, and Flowers. National Stockman and Farmer, 1895, p. 559.

Discussion of value of birds to fruit-growers. Experience with Russian mulberry in attracting birds.

1895. HUDSON, W. H. (Bird Protection and the Clergy.) English Society for Protection of Birds, Letter to Clergy, November, 1895. Reprint by Wisconsin Audubon Society, 1898.

Discussion of use of birds for millinery purposes.

1895. LUCAS, F. A. The Tongues of Woodpeckers. U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bulletin No. 7, pp. 33-39, 3 plates.

Discussion of the anatomy of the tongues of the various species of woodpeckers, the variation in form and relation of the tongue to the food.

1895. WEED, CLARENCE M. The Robin. The Mirror and Farmer (Manchester, N. H.). Oct. 4 and 11, 1895.

A discussion of economic status of the robin.

1895. WINSHIP, A. E. Bird Day. The Outlook, April 6, 1895, p. 560.

Account of original bird day at Oil City, Pa., on the first Friday in May, 1894. Plea for general adoption.

1896. BABCOCK, C. A. Bird Day. Journal of Education, April 4, 1896.

1896. BEAL, F. E. L. The Meadow Lark and Baltimore Oriole. U. S. Department of Agriculture, Year Book, 1895, pp. 419-430.

Brief notes on distribution and habits of the two birds, followed by statements of their food as indicated by the examinations of a large number of stomachs. Almost three fourths of the food of the meadow lark was found to consist of insects, and of these a very large per cent. were grasshoppers and crickets. The accusation of pulling sprouting grain and feeding upon grain generally appears not without basis, but the damage done in this manner is more than counterbalanced by the numbers of insects eaten. The food of the oriole was found to consist almost exclusively of insects, and these to a large extent of noxious species. No question can be raised as to the value of this bird as an insect destroyer.

1896. BUTLER, A. W., Indiana. A Century of Changes in the Aspects of Nature. President's address. Proceedings of the Indiana Academy of Science, 1895, pp. 31-42.

Refers to changes in avifauna.

1896. CHANSLER, E. J. Our Feathered Beauties. Indiana Farmer, Feb. 15, 1896, p. 6.

1896. FORBUSH, E. H. The Crow in Massachusetts. Massachusetts Board of Agriculture, Crop Report Bulletin, 1896, No. 4, pp. 24-40.

General notes on the American crow, migration, gregarious habits, mating and nesting habits, digestive capacity, food, the protection of crops, summary.

1896. HINE, JANE L. Cedar Waxwing. Farmer's Guide, v. VIII, No. 12, June 15, 1896.

1896. HINE, JANE L. Farm Birds in Northern Indiana. The Farmer's Guide, Huntington, Ind., v. VIII. A series of articles in chapters in the following numbers of that paper: No. 3, Feb. 1, 1896; No. 4, Feb. 15; No. 5, March 1; No. 6, March 15; No. 7, April 1; No. 8, April 15; No. 9, May 1.

1896. JUDD, S. D. The Food of Birds. American Naturalist, v. XXX, pp. 1050-1051.

Catbird, brown thrasher, and house wren. Wren exclusively insectivorous and highly valuable in agriculture. Catbird and thrasher have a mixed diet, 63 per cent. animal in thrasher, 44 in catbird. Bulk of food of mocking bird appears to be animal.

1896. KIRKLAND, A. H. The Army Worm. Massachusetts Crop Report, July, 1896, p. 35.

List of ten birds feeding on army worms: Kingbird, phoebe, bobolink, cowbird, red-winged blackbird, Baltimore oriole, crow blackbird, English sparrow, chipping sparrow, robin. Probably also meadow larks, crows, flickers, quail.

1896. OBERHOLSER, H. C. A preliminary list of the birds of Wayne county, Ohio. Ohio Agricultural Experiment Station, Bulletin No. 4, Technical Series, pp. 243-354.

Notes on 183 species of birds known to inhabit this region, together with a list of the species thought to be occasional visitors. Notes on food of a few species.

1896. PALMER, T. S. Bird Day in the Schools. U. S. Department of Agriculture, Division Biological Survey, Circular No. 17.

History of the movement; discussion of object and value.

1896. RICHARDS, HARRIET. The Birds at Dinner. Popular Science Monthly, v. XLIX, p. 337.

Nearly all birds feed their young on insects, worms, or some form of animal food, and also depend mainly on that food for themselves at that busy season, although at other seasons their favorite food may be grains and berries.

1896. WARREN, B. H. Our Home Birds. Pennsylvania Agricultural Experiment Station Report, 1895, pp. 244-265.

Popular account of the birds of Pennsylvania and discussion of the value of birds as destroyers of vermin and the danger of destroying them.

1896. WARREN, B. H. Taxidermy; How to Collect, Skin, Preserve, and Mount Birds. Pennsylvania Department of Agriculture, Division of Economic Zoölogy, Bulletin 6. p. 128.

A condensed account of methods for collecting, skinning, preserving, and mounting birds; followed by the game laws of the state.

1897. ANTHONY, A. W. The Roadrunner as a Destroyer of Caterpillars. The Auk, v. XIV, p. 217.

Roadrunners in California feed on caterpillars of *Agraulis vanillæ*, which attack leaves of passion vines.

1897. BAILEY, WM. L. Disgorgement of Cherry Stones again Noted. The Auk, v. XIV, pp. 412-413.

Cherry stones disgorged by young robins, catbirds, and wood robins (thrush?).

1897. BEAL, F. E. L. Recent Investigations of the Food of European Birds. The Auk, v. XIV, pp. 8-14.

Review of papers by Hollrung and Gilmour; remarks on methods of estimating percentages of food.

1897. BEAL, F. E. L. The Blue Jay and its Food. U. S. Department of Agriculture Year Book, 1896, pp. 197-206.

General remarks on habits and distribution of blue jay, followed by an account of examination of 292 stomachs. The bulk of the food was found to be of vegetable origin, largely

mast, the amount of fruit and cereals being small. In certain seasons of the year many insects were eaten, few of them beneficial. But a very small percentage of the whole consisted of vertebrate remains, thus giving little support to the reports of damage done by eating small birds, nor were birds' eggs eaten to any extent. The relative proportions of the various foods varied remarkably from season to season.

1897. BEAL, F. E. L. Some Common Birds in their Relation to Agriculture. U. S. Department of Agriculture, Farmer's Bulletin, No. 54.

A short popular discussion of the food habits of a number of birds of more or less importance to the farmer. Treats of the black and the yellow-billed cuckoos; the downy, golden-winged, hairy, red-shafted, and red-headed woodpeckers; the yellow-bellied woodpecker or sapsucker; the kingbird; the phoebe; the blue jay; the bobolink or rice bird; the red-winged blackbird; the meadow lark or old field lark; the Baltimore oriole; the crow blackbird; the song, chipping, field, and tree sparrows; the snowbird; the rose-breasted grosbeak, the barn, cliff, and white-bellied swallows, and the martin; the cedar bird; the catbird; the brown thrasher; the house wren; the robin; and the bluebird. Most of these species are shown to be highly beneficial in their feeding habits.

1897. BRUNER, L. The Birds of Nebraska. Nebraska State Horticultural Society Report, 1896, pp. 98-178, 51 figures.

Notes on the distribution, food habits, etc., of birds of Nebraska, with list of forms found within the state. Corrected to April, 1896.

1897. DUTCHER, WM. Report of A. O. U. Committee on Protection of North American Birds. The Auk, v. XIV, pp. 21-32.

Report of progress during the year.

1897. GRINNELL, JOSEPH. Disgorgement among Song Birds. The Auk, v. XIV, p. 318.

Robins and cedar birds disgorge seeds of pepper tree.

1897. JONES, LYND. The Oberlin Grackle Roost. The Wilson Bulletin, v. IX, O. S. Bulletin No. 15, July 30, 1897, pp. 39-56.

Habits during courtship and nesting; how the young are taken to the roost; eat fruit, then ripening corn; time of roosting; in the North the breeding season is beneficial to agriculture; the roosting season the reverse.

1897. JUDD, SYLVESTER D. Methods in Economic Ornithology, with Special Reference to the Catbird. *American Naturalist*, v. XXXI, pp. 392-397.

Proportions of foods ascertained by examination of stomach contents; preferences by field observations; shy birds caged and various foods offered.

1897. KENYON, F. C. The English Sparrow not always a Nuisance. *American Naturalist*, v. XXXI, p. 73.

Dr. Judd reports fondness for dandelion seeds; saw the sparrow catch and devour a cicada. His ability to catch insects on wing discussed.

1897. KIRKLAND, A. H. The Sugar Maple Borer. *Massachusetts Crop Report*, June, 1897, p. 32.

Presumptive evidence that hairy woodpecker, downy woodpecker, and flicker feed on larvæ of *Plagionotus speciosus*.

1897. LUCAS, F. A. The Tongues of Birds. *U. S. National Museum, Report for 1895*, pp. 1001-1019.

Discusses the relation of the tongue to the hyoid, and the different forms of development of the two in the various groups of birds.

1897. OWEN, DANIEL E. Notes on a Captive Hermit Thrush. *The Auk*, v. XIV, pp. 1-8.

Account of feeding habits of hermit thrush; method of determining rate of digestion.

1897. PALMER, T. S. Extermination of Noxious Animals by Bounties. *U. S. Department of Agriculture, Year Book*, 1896, pp. 55-68.

History of bounty system in the United States and other countries. Bounties on birds almost invariably pernicious.

1897. PROCTOR, THOMAS. Disgorgement among Song Birds. *The Auk*, v. XIV, p. 412.

Wood thrushes and other true thrushes disgorge cherry pits; disgorgement also noticed in red-eyed vireo, myrtle bird, and European robin.

1897. REED, J. HARRIS. Notes on the American Barn Owl in Eastern Pennsylvania. *The Auk*, v. XIV, pp. 374-383.

Occurrence, nesting habits, feeding habits.

1897. WARREN, B. H. The Army Worm. Report Pennsylvania State College, 1896, pp. 164-220.

Record of studies of food of many birds during an army worm outbreak, showing that nearly all fed freely on the pests.

1898. ADAMS, STEPHEN J. Swallow Investigations. *The Wilson Bulletin*, v. X, O. S. No. 20, May 30, 1898, pp. 42-43.

They take enormous numbers of insects; nearly, if not quite, all taken on the wing. Barn swallows take enormous numbers of apple maggot flies.

1898. BAILEY, L. H. The Birds and I. Cornell University, Teachers' Leaflet, No. 10.

Popular discussion of relations of birds to children. Pictures of many bird houses.

1898. BEAL, F. E. L. Birds that Injure Grain. U. S. Department of Agriculture, Year Book, 1897, pp. 345-354.

After a short discussion of the damage done by birds to the wheat crop and the cause of increased numbers of black-birds, the more important noxious species are taken up in detail. The following are treated: Crow, crow blackbird, red-winged blackbird, yellow-headed blackbird, rusty grackle, cowbird, mourning dove, California valley quail, horned lark, and certain imported pheasants.

1898. BEAL, F. E. L. The Food of Cuckoos. U. S. Division of Biological Survey, Bulletin 9, pp. 1-15.

General notes on North American cuckoos, followed by an account of the examination of 155 stomachs of both species. Food was found to consist almost exclusively of animal matter. Nearly 50 per cent. of the whole was composed of cater-

pillars, of which, contrary to the usual habits of birds, hairy species were in majority. The percentage of Orthoptera ranged from 3 per cent. in May to 43 in July, mostly arboreal forms, and there were from 5 to 6 1-2 per cent. of miscellaneous insects, beetles and bugs respectively. No particular support was found to the accusation that they are in the habit of sucking eggs of other birds.

1898. BEAL, F. E. L. Birds and Farm Pests. Popular Science Monthly, v. LII, p. 136.

Short but comprehensive article on birds relative to what insects they eat. Those which by his own methods are most easily obtained, etc.

1898. BUTLER, AMOS W. The Birds of Indiana. Twenty-second Annual Report State Geologist of Indiana, pp. 515-1187.

A descriptive catalogue of the birds that have been observed within the state, with an account of their habits. Much information as to food.

1898. Birds and Trees. Audubon Society of the State of Connecticut.

A four-page pamphlet containing selections suitable for bird day.

1898. BREWSTER, WM. The Short-eared Owls of Muskeget Island. The Auk, v. XV, pp. 211-213.

"Bird protectors would do well to study more closely the balance of nature." Notes on Owls of Muskeget Island.

1898. CRAM, WM. EVERETT. Woodpeckers and Their Ways. Popular Science Monthly, v. LIII, p. 339.

Eating aphides in fall.

1898. DUTCHER, WM. (Chairman). Report of the A. O. U. Committee on Protection of North American Birds. The Auk, v. XV, pp. 81-114.

An extended discussion showing work in the different states, with general recommendations.

1898. HORNADAY, W. T. The Destruction of Our Birds and Mammals. Second Annual Report of the New York Zoölogical Society, pp. 77-126.

A circular letter of inquiry was sent to persons in various states and territories, and the results here given. The subjects for investigation were the per cent. of decrease of birds in various localities, and the causes for such decrease. The results are given in detail.

1898. *Helps to Bird Study.* Massachusetts Audubon Society, 1898.

A pamphlet of thirty-two pages giving selections in prose and verse helpful for bird day programmes.

1898. JUDD, SYLVESTER D. *The Food of Shrikes.* U. S. Division of Biological Survey, Bulletin 9, pp. 15-26.

General notes on North American shrikes, followed by an account of the examination of 155 stomachs of both species. So far as could be determined from the stomachs of 67 butcher birds the food closely resembled the sparrow hawk. About 26 per cent. of the food consisted of mice, 34 per cent. of small birds, including many English sparrows, consisting almost wholly of seed-eating species, and the remainder of insects, mostly grasshoppers. The food of the loggerhead differs in the much smaller percentage of mice and birds, about 24 per cent. The insects eaten consist largely of Orthoptera, and in the spring of beetles, many of them predaceous species. Both the butcher bird and loggerhead eat, to some extent, caterpillars.

1898. KEL LICOTT, D. S. *Feeding Habits of Winter Birds of Interior Ohio.* Journal Columbus Horticultural Society, v. XIII, pp. 45-51.

A brief discussion of feeding habits with list of winter residents.

1898. LAZENBY, WM. R. *Preserve the Birds.* Journal Columbus Horticultural Society, v. XIII, pp. 44, 45.

A brief discussion of benefits of birds and methods of protecting them.

1898. MERRIAM, FLORENCE A. *Birds of Village and Field.* A bird book for beginners. Boston: Houghton, Mifflin & Co., 1898.

A book of 406 pages with 220 illustrations, with considerable attention to the economic relations of the birds discussed.

1898. NASH, CHARLES W. *The Birds of Ontario in Relation to Agriculture.* Toronto: Department of Agriculture, 1898, p. 64.

A general discussion of the economic status of the common birds of Ontario, with figures of many species.

1898. SANDERSON, E. DWIGHT. The Economic Value of the White-bellied Nuthatch and Black-capped Chickadee. *The Auk*, v. XV, pp. 144-155.

Record of food of 23 nuthatches in winter and 11 in early spring, and of 19 chickadees in winter and 9 in spring.

1898. WEED, CLARENCE MOORES. Our Largest Standing Army, the Birds. *Granite Monthly*, v. XXV, pp. 325-331.

Discussion of regulative action of birds.

1898. WEED, CLARENCE MOORES. The Causes of the Decrease of Birds. *Granite Monthly*, v. XXV, pp. 211-215.

An illustrated discussion of the subject.

1898. WEED, CLARENCE MOORES. The Insects Eaten by Birds. *Agricultural Education*, v. I, pp. 4-7, 51-53.

Illustrated discussion of the insects most commonly fed upon by birds.

1898. WEED, CLARENCE MOORES. The Feeding Habits of the Chipping Sparrow. *New Hampshire College Agricultural Experiment Station, Bulletin 55*, July, 1898.

An illustrated account of a day's work by a pair of chipping sparrows feeding three young. Nearly 200 visits to the nest were made.

1898. WILLIAMSON, E. B. The Economic Importance of Some Common Birds. *Journal of Columbus Horticultural Society*, v. XIII, pp. 33-44.

Touches upon the economic importance of many species of North American birds, with notes on feeding habits of some of them in Ohio.

1899. BEAL, F. E. L. Economic Relations of Birds and Their Foods. *Proceedings 24th Annual Meeting New Jersey State Horticultural Society*, 1899.

A general discussion of the subject.

1899. CHAPMAN, FRANK M. Bird Life. New York: D. Appleton & Co., 1899.

This admirable book contains a brief account in Chapter I of the relation of birds to man.

1899. CHAPMAN, FRANK M. The Passing of the Tern. Bird Lore, v. I, pp. 205-206.

Use of terns for millinery purposes leading to their extermination.

1899. CHASE, VICTOR P. A Blood-thirsty Blue Jay. The Wilson Bulletin, v. XI, O. S. No. 27, July 30, 1899, pp. 55-56.

Eats cherries; killed a newly fledged English sparrow.

1899. GRANT, ANNIE M. Birds. Report Rhode Island Board of Agriculture, 1899.

Discussion of economic value of birds.

1899. HODGE, C. F., and BALL, HELEN A. Our Common Birds. Suggestions for the Study of their Life and Work. Worcester, November, 1899.

Record of work in bird study in schools of Worcester, Mass.

1899. JUDD, SYLVESTER D. Birds as Weed Destroyers. U. S. Department of Agriculture, Year Book, 1898, pp. 221-232.

A general discussion of the kinds of seeds eaten by birds and the species that eat them.

1899. LANGE, D. Our Native Birds; How to Protect Them and Attract Them to Our Homes. New York: The Macmillan Co., 1899.

A small volume of 162 pages with 10 illustrations.

1899. PALMER, T. S. The Danger of Introducing Noxious Animals and Birds. U. S. Department of Agriculture, Year Book, 1898, pp. 87-110.

Introduction, means of dispersal, domesticated species may become noxious, sources of danger from noxious species,

rats and mice, rabbits, the mongoose, ferrets, stoats, weasels, flying foxes or fruit bats, the English sparrow, the starling, the mina, the kohlmeise or great titmouse, the skylark, the green linnet, and the black thrush; need of legislation; summary.

1899. OSGOOD, FLETCHER. The So-called Sparrow War in Boston. Bird Lore, v. I, pp. 137-138.

Account of the campaign against English sparrows in Boston in the spring of 1898.

1899. O. J. L. MARTINS Kill the Caterpillars. The Wilson Bulletin, v. XI, O. S. No. 27, July 30, 1899, pp. 60, 61.

Built a martin house in orchard; this was soon filled; kept caterpillars and moths from orchard.

1899. SORLE, CAROLINE G. Birds and Caterpillars. Bird Lore, v. I, p. 166.

Notes on birds attacking forest tent caterpillars (*Clisio-campa disstria*) in Vermont.

1899. WEED, CLARENCE MOORES. Our Winter Birds in Their Food Relations. The Granite Monthly, v. XXVI, pp. 77-82.

Food of pine grosbeak, purple finch, junco, chickadee, nut-hatches, brown creeper, hairy and downy woodpeckers, and ruffed grouse.

1900. BAILEY, VERNON. Where the Grebe Skins Come From. Bird Lore, v. II, p. 34.

Destruction of grebes in California and Oregon to supply demands of fashion.

1900. BURNS, FRANK L. A Monograph of the Flicker. The Wilson Bulletin, v. XII, O. S. No. 31, April, 1900, pp. 3-82.

An eighty-two page monograph bringing together what is known of the flicker.

Hard to find birds with fewer harmful qualities than downy and hairy woodpeckers and flicker. Eats ants, coleoptera and other insects.

1900. CHAPMAN, FRANK M. Bird Studies with a Camera. New York: D. Appleton & Co., 1900.

This well known book contains much information regarding economic relations of birds.

1900. CHAPMAN, FRANK M. Bird Slaughter in Delaware. Bird Lore, v. II, p. 60.

Note on order for 20,000 bird skins placed in Milford, Delaware.

1900. CHAPMAN, FRANK M. A Note on the Economic Value of Gulls. Bird Lore, v. II, pp. 10-11.

Value of gulls in feeding on garbage in New York harbor.

1900. CHERRIE, GEORGE K. The Egret Hunters of Venezuela. Bird Lore, v. II, pp. 50-51.

Account of collection of plumes by natives of Venezuela.

1900. DIBBLE, EDWARD B. Two Notes by a Young Observer. Bird Lore, v. II, p. 117.

Observations on robbing of birds' nests by blue jays, and on feeding of young by horned larks.

1900. DUTCHER, WM. The Bird Protection Fund. Bird Lore, v. II, pp. 60, 90.

Fund of \$477 raised for protection of gulls and terns. Arrangements being made for wardens to enforce laws.

1900. (EDITOR.) Sparrows Eat Grapes. Gardening, v. IX, p. 29.

Injury to grapes by English sparrows.

1900. HUTCHINS, JOHN. The House Wren as a Depredator. Bird Lore, v. II, pp. 89-90.

Wrens pierce eggs of chipping sparrows and throw them out of nest, also persecute other birds.

1900. LEMMONS, ISABELLA McC. Notes on the Food of the Chickadee and the Screech Owl. Bird Lore, v. II, p. 59.

Chickadees observed taking "tiny black insects" (probably aphid eggs) from willow. Screech owls' stomachs full of harvest flies "in the pupa form in which they leave the earth."

1900. PALMER, T. S. Protest Against the Collection of Plume Birds through Postmasters. *Bird Lore*, v. II, p. 66.

Account of action of postmaster-general in warning postmasters against illegal killing of birds.

1900. PRAEGER, WILLIAM F. Birds in Horticulture. Transactions Illinois State Horticultural Society, 1899. Review in *Bird Lore*, v. II, p. 61.

A paper discussing the economic values of birds.

1900. ROOSEVELT, THEODORE. A Letter from Governor Roosevelt. *Bird Lore*, v. II, p. 98.

Endorsement of work of Audubon society.

1901. CRAM, W. E. Food of the Downy Woodpecker. *Bird Lore*, v. II, p. 142.

Feeding on larvæ in mullen seed cases.

1901. DEARBORN, NED, and WEED, CLARENCE M. The Vegetable Food of Birds. *Granite Monthly*, v. XXXIII, pp. 277-286.

1901. DEARBORN, NED, and WEED, CLARENCE M. Birds in their Economic Relations. *Granite Monthly*, v. XXXI, pp. 158-167, 276-285.

Discussion of various phases of the subject.

1901. ECKSTORM, FANNIE HARDY. The Bird Book. Boston: D. C. Heath & Co., 1901.

In this unique book there is much information of economic value.

1901. ECKSTORM, FANNIE HARDY. Visible Results. *Bird Lore*, v. III, p. 184.

Reappearance of terns along the Maine coast.

1901. (EDITOR.) The Sparrow Again. *American Gardening*, v. XXII, pp. 759-760.

Usefulness of English sparrows in cities.

1901. HERRICK, FRANCIS HOBART. *The Home Life of Wild Birds: a New Method of the Study and Photography of Birds.* New York: G. P. Putnam's Sons, 1901.

A beautiful book of 148 large pages giving methods of photographing birds at close range, and results of study of nesting habits. Notes on food of nestlings of several species.

1901. MILLER, OLIVE THORNE. *The First Book of Birds.* Boston: Houghton, Mifflin & Co, 1901.

In this excellent book for children there is considerable discussion of economic relations, one division of the book being devoted to the relations of birds to man.

1901. MILLER, OLIVE THORNE. *The Second Book of Birds: Bird Families.* Boston: Houghton, Mifflin & Co., 1901.

An illustrated account of the families of North American birds, with numerous references to feeding habits.

1901. NEWKIRK, GARRETT. *For Our Encouragement.* *Bird Lore*, v. III, pp. 183-184.

Increase of birds in Missouri because of bird protection.

1901. PALMER, T. S. *Some Fundamental Principles of Bird Protection.* *Bird Lore*, v. III, pp. 79-81.

An admirable discussion of principles on which laws are based.

1901. Peabody, P. B. *Saw-Whet Homes.* *Bird Lore*, v. III, pp. 55-58.

Account of nests of saw-whet owls in flicker holes. Evidences of mice and small birds as food.

1901. SMITH, ROBERT WINDSOR. *Food and Gravel.* *The Wilson Bulletin* No. 34, v. XIII, O. S. March 30, 1901, pp. 16, 17.

Song sparrow has much gravel in stomach; robin more dirt than gravel; seed-eating birds require it for grinding.

Date Due

2 27
MAR 1 1 1953