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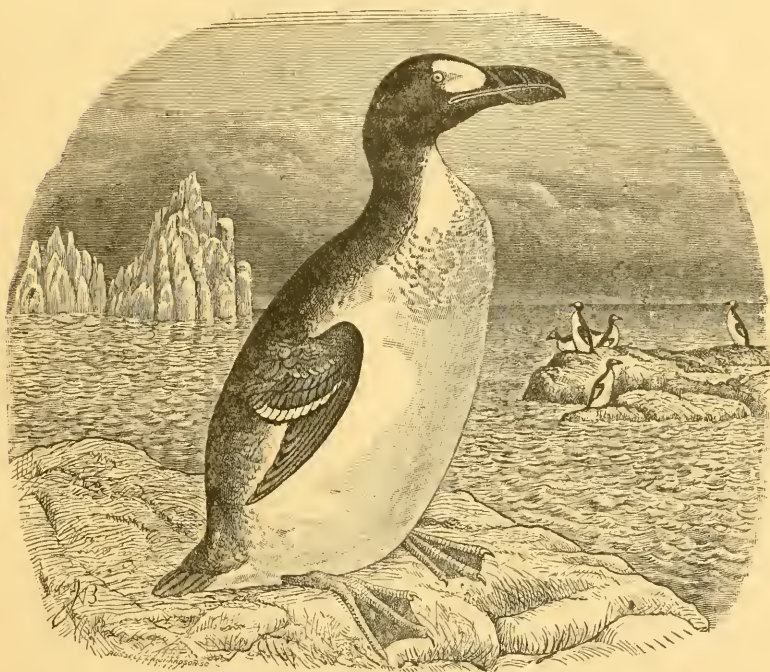
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CONTENTS OF VOLUME IX.

NUMBER I.

	PAGE
THE BREEDING HABITS OF THE FLORIDA BURROWING OWL (<i>Speotyto cunicularia floridana</i>). By Samuel N. Rhoads.	1
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By W. E. D. Scott.	9
HABITS OF THE ESKIMO CURLEW (<i>Numenius borealis</i>) IN NEW ENGLAND. By George H. Mackay.	16
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By George K. Cherrie.	21
A FURTHER REVIEW OF THE AVIAN FAUNA OF CHESTER COUNTY, SOUTH CAROLINA. By Leverett M. Loomis.	28
A PRELIMINARY LIST OF THE BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON. By R. H. Lawrence.	39
A LIST OF BIRDS TAKEN ON MARAGUANA, WATLING'S ISLAND, AND INAGUA, BAHAMAS, DURING JULY, AUGUST, SEPTEMBER AND OCTOBER, 1891. By Charles B. Cory.	48
NOTES ON THE RANGE AND HABITS OF THE CAROLINA PARRAKEET. By Amos W. Butler.	49
NINTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION.	56

RECENT LITERATURE.

The New Nuttall, 59; Shufeldt's 'Myology of the Raven,' 62; Bolles's 'Land of the Lingering Snow,' 62; Keyser's 'Bird-dom,' 63; Scott B. Wilson's 'Aves Hawaiienses,' 63; MacFarlane's Notes on Arctic Birds, 64; Fannin's 'Check List of British Columbia Birds,' 65; Chapman on the 'Birds of Corpus Christi,' 65; Chapman 'On the Color Pattern of the Upper Tail-coverts in *Colaptes auratus*,' 66; Minor Ornithological Publications, 66; Publications Received, 70.

GENERAL NOTES.

The Black Tern at Prince Edward Island, 71; *Calidris arenaria* in Massachusetts in Winter, 71; Late Breeding of *Columbigallina*

passerina, 72; A Belated Migrant, 72; *Funco hyemalis* in Eastern Massachusetts in June, 72; Distribution of the Species of *Peuceæa* in Cooke County, Texas, 73; *Thryothorus ludovicianus* in Massachusetts, 73; Notes from Springfield, Massachusetts, 74.

NOTES AND NEWS.

Obituary,—August von Pelzeln, 74; Captain Thomas Wright Blakiston, 75.

SUPPLEMENT.

THE INHERITANCE OF ACQUIRED CHARACTERS. President's Address. By <i>D. G. Elliot</i>	77
FOURTH SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS.	105

NUMBER II.

YOUNG SAPSUCKERS IN CAPTIVITY. By <i>Frank Bolles</i>	109
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i>	120
SUMMER BIRDS OF THE CREST OF THE PENNSYLVANIA ALLEGHANIES. By <i>Jonathan Dwight, Jr.</i>	129
A DESCRIPTION OF THE ADULT MALE OF <i>Botaurus neoxenus</i> (CORY), WITH ADDITIONAL NOTES ON THE SPECIES. By <i>W. E. D. Scott</i>	141
HABITS OF THE BLACK-BELLIED PLOVER (<i>Charadrius squatarola</i>) IN MASSACHUSETTS. By <i>George H. Mackay</i>	143
OUR SCOTERS. By <i>G. Trumbull</i>	153
HYBRIDISM, AND A DESCRIPTION OF A HYBRID BETWEEN <i>Anas boschas</i> AND <i>Anas americana</i> . By <i>D. G. Elliot</i>	160
DESCRIPTION OF A NEW TURKEY. By <i>George B. Sennett</i>	167
THE DWARF SCREECH OWL (<i>Megascops flammeolus idahoensis</i> MER- RIAM). By <i>Dr. C. Hart Merriam</i> . (Plate II.)	169

RECENT LITERATURE.

Packard's 'The Labrador Coast,' 171; Lucas on the Osteology of the Paridæ, *Sitta*, and *Chamaea*, 172; Lucas on the Structure of the Tongue in Hummingbirds, 172; Lucas on the Bird Skeletons Collected by the U. S. Fish Commission Steamer 'Albatross,' 172; Cherrie on Costa Rican Birds, 172; Shufeldt on the Osteology of Arctic and Sub-Arctic Water Birds, 173; Shufeldt on the Osteology and Classification of the North American Pigeons, Wood-

peckers, and Kites, 174; Ridgway on New or Little-known Central American and South American Birds, 174; Ridgway and Bendire's Directions for Collecting and Preparing Birds and their Eggs and Nests, 175; Stejneger on a Collection of Birds from Japan, 176; Stejneger on the Cubital Coverts in the Birds of Paradise and Bower Birds, 176; Stone on the Birds of Harvey's Lake, Luzerne County, Pennsylvania, 176; Allen on the North American *Colaptes*, 177; Chapman on the Origin of the Avifauna of the Bahamas, 179; Chapman on the Grackles of the Subgenus *Quiscalus*, 180; Newton on 'Fossil Birds,' 183; Sclater on the Geographical Distribution of Birds, 183; Sclater and Shelley on the Scansores and Cocyges, 184; Hartert's Catalogue of the Birds in the Museum of the Senckenberg Natural History Society, 185; Leverkühn's 'Fremde Eier im Nest,' 185; Jäckel's Birds of Bavaria, 186; Minor Ornithological Publications, 187; Publications Received, 196.

GENERAL NOTES.

An Egg of the Great Auk, 198; Wintering of the Canvasback in Arizona, 198; The Pacific Eider in Kansas, 198; *Anas carolinensis* and *Gallinago delicata* in Winter, 199; The Migration of *Charadrius dominicus* in Massachusetts in 1891, 199; The Golden Eagle in Pennsylvania, 200; The Golden Eagle in Ohio, 200; Nesting of the Golden Eagle in Arizona, 201; *Melanerpes carolinus* in Madison County, New York, in Winter, 201; The Whippoorwill Wintering near Charleston, South Carolina, 201; The Prairie Horned Lark (*Otocoris alpestris praticola*) Breeding in New Hampshire and Massachusetts, 201; The Prairie Horned Lark in Northeastern Pennsylvania, 202; A Correction, 202; Some Bird Notes from Litchfield, Connecticut, 202; Some Birds Recently Added to the Collection of the New York State Museum, 203; Winter Birds of Cape May, New Jersey, 203; Notes on a Few Louisiana Birds, 204; An Overlooked Volume, 206.

NOTES AND NEWS.

Plate of *Dendroica nigrifrons*, 207; The Audubon Monument, 207; A New Organization, 207; A New Monograph of the Birds of Paradise, 207; Ornithological Explorations, 208.

NUMBER III.

NOTES ON THE BIRDS OF THE CALOOSAHATCHIE REGION OF FLORIDA.

By <i>W. E. D. Scott</i>	209
<i>Pitta granatina</i> TEMMINCK ET AUCTORES. By <i>D. G. Elliot</i>	218
HABITS OF THE AMERICAN HERRING GULL (<i>Larus argentatus smithsonianus</i>) IN NEW ENGLAND. By <i>George H. Mackay</i>	221

REMARKS ON A COLLECTION OF BIRDS MADE BY WILMOT W. BROWN, JR., ON MONA AND PORTO RICO DURING FEBRUARY AND A PART OF MARCH, 1892. By <i>Charles B. Cory</i> .	228
LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS. By <i>H. P. Atwater</i> .	229
SOME NOTES CONCERNING THE EVENING GROSBEAK. By <i>Amos W. Butler</i> .	238
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By <i>George K. Cherrie</i> .	247
A STUDY OF THE SPARROW HAWKS (SUBGENUS <i>Tinnunculus</i>) OF AMERICA, WITH ESPECIAL REFERENCE TO THE CONTINENTAL SPECIES (<i>Falco sparverius</i> LINN.). By <i>Edgar A. Mearns</i> .	252
DESCRIPTION OF AN APPARENTLY NEW <i>Centurus</i> FROM GREAT BAHAMA ISLAND, BAHAMAS. By <i>Charles B. Cory</i> .	270
IN CUBA WITH DR. GUNDLACH. By <i>Charles B. Cory</i> .	271
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i> .	273

RECENT LITERATURE.

Salvadori's Catalogue of the Parrots, 277; Mrs. Miller's 'Little Brothers of the Air,' 279; 'Wood Notes Wild,' 280; Oustalet on the Birds of Patagonia, 281; Stone on the Crows, Birds of Paradise, and Orioles in the Museum of the Philadelphia Academy of Natural Sciences, 282; Stone on Birds collected by the West Greenland Expedition, 282; Minor Ornithological Publications, 282; Publications Received, 290.

GENERAL NOTES.

Migration of *Urinator imber*, 292; *Pelecanus erythrorhynchos* in Maine, 292; The Spring Migration of the Scoters in 1892, 292; The Red Phalarope (*Crymophilus fulvicarius*) at Nantucket, Massachusetts, 294; *Crymophilus fulvicarius* in Provincetown Harbor, 295; *Pavoncella pugnax* in North Carolina, 299; Correction, 300; *Lagopus lagopus* in Maine, 300; Occurrence of the Black Gyrfalcon in Rhode Island, 300; The Carolina Paroquet (*Conurus carolinensis*) in Missouri, 301; *Aphelocoma californica* in Washington, 301; *Carduelis elegans* in Connecticut, 301; *Zonotrichia albicollis* in California, 302; Abnormal Plumage of *Habia ludoviciana*, 302; On the Breeding of *Helminthophila pinus* with *H. leucobronchialis* at Englewood, New Jersey, 302; Warblers destroyed by a 'Norther,' 303; *Sciurus noveboracensis notabilis* in New Jersey, 303; Melanism in a Caged Wood Thrush, 303; Water Birds at Nantucket, Massachusetts, 304; Brief Notes from Long Island, 305; Spring Arrivals at Washington, D. C., 307; Notes on some Birds of Grays Harbor, Washington, 308.

NOTES AND NEWS.

Obituary, Dr. John Amory Jeffries, 311; Elliot's Monograph of the Pittidae, 312; Dr. Ernst Hartert, 312; Plate of the Rio Grande Turkey, 312.

NUMBER IV.

BREEDING HABITS OF THE FISH HAWK ON PLUM ISLAND, NEW YORK. By <i>Charles Slover Allen</i> . (Plates IV and V).	313
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By <i>George K. Cherrie</i>	322
HABITS OF THE OLDSQUAW (<i>Clangula hyemalis</i>) IN NEW ENGLAND. By <i>George H. Mackay</i>	330
LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS. By <i>H. P. Attwater</i>	337
HABITS OF THE HUDSONIAN CURLEW IN MASSACHUSETTS. By <i>George H. Mackay</i>	345
FURTHER NOTES ON BIRDS OF THE GRAY'S HARBOR REGION, WASH- INGTON. By <i>R. H. Lawrence</i>	352
BIRDS OF SOUTHWESTERN NEW MEXICO. By <i>A. W. Anthony</i>	357
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i>	369

RECENT LITERATURE.

Pendire's Life Histories of North American Birds, 375; Ridgway's 'The Hummingbirds,' 376; Merriam on the Life Areas of North America, 377; Suchetet on Hybridity in Birds, 382; Minor Ornithological Publications, 383; Publications Received, 387.

GENERAL NOTES.

Habits of the Herring Gull, 388; Another Specimen of the Labrador Duck, 389; *Ereunetes occidentalis* in Connecticut, 389; *Totanus flavipes* and *Charadrius dominicus*, 389; *Tryngites subruficollis*, 389; A specimen of *Numenius arquatus* said to have been taken on Long Island, N. Y., 390; Notes on *Syrnium occidentale*, 392; *Coccyzus americanus occidentalis* in Washington, 393; Original Description of Lewis's Woodpecker, 394; *Myiarchus nuttingi* in Arizona, 394; *Perisoreus canadensis* in Massachusetts, 395; Up to Date, 395; Abnormal Eggs of *Spizella socialis*, 395; *Vireo olivaceus* in British Columbia and Washington, 395; The Chestnut-sided Warbler Nesting in Missouri, 396; Two Cape Cod Records, 396; Notes on a Few Birds from Northern Ohio, 397.

CORRESPONDENCE.

Robert W. Shufeldt, 3d., 398.

NOTES AND NEWS.

Obituary, Dr. Hermann Burmeister, 399; R. W. Shufeldt, 3d., 400; Potomac Valley Ornithological Club, 400; British Museum Catalogue of Birds, 400; Tenth Congress of the A. O. U., 400.

INDEX	401
ERRATA	420
TITLE PAGE AND CONTENTS	i-viii
OFFICERS AND COMMITTEES OF THE A. O. U.	ix
MEMBERS OF THE A. O. U.	x

 PLATES IN VOLUME IX.

I. Black-throated Warbler (<i>Dendroica nigrifrons</i> Brewst.).	1
II. Dwarf Screech Owl (<i>Megascops flammeolus idahoensis</i> Merriam).	169
III. Rio Grande Turkey (<i>Meleagris gallopavo ellioti</i> Sennett).	167
IV and V. Nests of the Fish Hawk, Plum Island, N. Y.	313

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WHARTON, HENRY T., 39 St. George's Road, Kilburn, London, N. W. 1884
 ZELEDON, DON JOSÉ C., San José, Costa Rica.....1884

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ALLEN, DR. CHARLES S., 21 East 28th St., New York City.....	1888
ALLEN, FRANCIS H., West Roxbury, Mass.....	1888
AMERY, CHARLES F., 20 Astor Place, New York City.....	1886
ANTHONY, A. W., 2042 Albatross St., San Diego, Cal.....	1885
ARCHER, W. C., 252 7th St., Jersey City, N. J.....	1888
ATKINS, J. W., Key West, Florida.....	1887
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AYER, ED. E., cor. Dearborn and Adams Sts., Chicago, Ill.....	1889
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BACON, SAMUEL E., JR., 2d National Bank, Erie, Pa.....	1891
BAGG, EGBERT, 187 Genesee St., Utica, N. Y.....	1883
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BAILY, WM. L., 138 South 4th St., Philadelphia, Pa.....	1885
BANGS, E. A., 31 Pemberton Sq., Boston, Mass.....	1884
BANGS, OUTRAM, 31 Pemberton Sq., Boston, Mass.....	1884
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BARNES, HON. R. M., Lacon, Ill.....	1889
BARNEY, EVERETT H., Springfield, Mass.....	1891
BARRE, WILL DE LA, 1301 7th St., Minneapolis, Minn.....	1891
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BEARD, DANIEL C., 110 Fifth Ave., New York City.....	1887
BELL, JAMES P. H., Gainesville, Fla.....	1889
BELLOWS, ED. D., 215½ 4th St., Jersey City, N. J.....	1889
BENNER, FRANKLIN, 315 3d Ave., South Minneapolis, Minn.....	1883
BENNERS, GEO. B., 2048 Arch St., Philadelphia, Pa.....	1889
BENSON, Lieut. H. C., U. S. A., West Point, N. Y.....	1886
BENT, ARTHUR C., Taunton, Mass.....	1889
BERTOLD, DR. W. H., 56 Allen St., Buffalo, N. Y.....	1889
BERIER, DELAGNEL, Bay Ridge, Kings Co., N. Y.....	1885
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BISHOP, DR. LOUIS B., Box 235, New Haven, Conn.....	1885
BOARDMAN, G. A., Calais, Maine.....	1883
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BOND, HARRY L., Sioux City, Iowa.....	1890
BOWDISH, B. S., Tallapoosa, Ga.....	1890
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BRADFORD, L. M. B., Providence, R. I.....	1889
BRANDRETH, FRANKLIN, Sing Sing, N. Y.....	1889
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BROWN, EDWARD J., 820 20th St. N. W., Washington, D. C.....	1891
BROWN, HERBERT, Tucson, Arizona.....	1885
BROWN, HUBERT H., 22 Collier St., Toronto, Ontario.....	1889
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BROWNE, FRANK C., Framingham, Mass.....	1883
BULLEY, REGINALD H., Canton, Ohio.....	1889
BURNS, FRANK L. Berwyn, Chester Co., Pa.....	1891
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CAIRNS, JOHN S., Weaverville, N. C.....	1889
CAMPBELL, HARVEY C., Lansingburg, Rens. Co., N. Y.....	1890
CANTWELL, GEORGE G., Colorado Springs, Col.....	1889
CARR, CHAS. F., 126 State St., Madison, Wis.....	1890
CARRUTH, C. T., 119 Milk St., Boston, Mass.....	1891
CAULK, WM. B., Terre Haute, Ind.....	1891
CHAMBERLAIN, C. W., 51 Lincoln St., Boston, Mass.....	1885
CHURCHILL, GEO. B., 47 Wellington St., Worcester, Mass.....	1890
CLARK, HUBERT L., Amherst, Mass.....	1886
CLARK, J. N., Saybrook, Conn.....	1885
CLARKE, Prof. S. F., Williamstown, Mass.....	1890
CLUTE, WILLARD N., 11 Jarvis St., Binghamton, N. Y.....	1889
COALE, H. K., 131 Wabash Ave., Chicago, Ill.....	1883
COLBURN, A. E., 738 Broadway, New York City.....	1891
COLBURN, W. W., Springfield, Mass.....	1889
COLEMAN, GEO. A., Lincoln, Neb.....	1888
COLLINS, Capt. J. W., Smiths. Inst., Washington, D. C.....	1888
COMEAU, NAP. A., Godbout, P. Q.....	1885
CONKLIN, Dr. WM. A., Director of Menagerie, Central Park, New York City.....	1885
COOK, Prof. CHAS. B., Agricultural College P. O., Ingham Co., Mich.....	1890
COOMBS, FRANK E., Patterson, La.....	1890
COPE, ALBAN, Germantown, Pa.....	1885
COPELAND, A. M., Springfield, Mass.....	1889
CORNING, ERASTUS, Jr., Albany, N. Y.....	1891
COUES, ELLIOTT BAIRD, care of Dr. E. Coues, Smiths. Inst., Wash- ton, D. C.....	1886
COUES, WM. PEARCE, 14 Ash St., Cambridge, Mass.....	1888
COX, PHILIP, Newcastle, New Brunswick.....	1887
CRAMPTON, H. E., Jr., 256 W. 121st St., New York City.....	1891
CRANDALL, C. W., Woodside, Queen's Co., N. Y.....	1891

CULYER, Col. JOHN Y., Room 150, Potter Building, New York City.	1890
DAENZER, CARL, 13 North 3d St., St. Louis, Mo.	1888
DAGGETT, FRANK S., Duluth, Minn.	1889
DANA, ROY, Warren, Ohio.	1889
DAVIS, F. J., 4 Noyes St., Utica, N. Y.	1890
DAVIS, GEO. A., Mexico, N. Y.	1890
DAVISON, J. L., Lockport, Niagara Co., N. Y.	1885
DELAFIELD, JOSEPH L., 475 5th Ave., New York City.	1888
DENNE, DAVID, 104 St. Francois St., Montreal.	1890
DETWILLER, Dr. JNO. W., Bethlehem, Pa.	1891
DICKINSON, EDWIN, Springfield, Mass.	1885
DICKINSON, W. S., Tarpon Springs, Fla.	1891
DIXON, FREDK. J., Hackensack, N. J.	1891
DOUGHERTY, CAPT. W. E., U. S. A., Angel Island, Cala.	1890
DOUGLASS, BERT H., Burlington, Kansas	1890
DREW, FRANK M., Bloomington, Ind.	1885
DURFEE, OWEN, Box 125, Fall River, Mass.	1887
DUTCHER, BASIL HICKS, 525 Manhattan Ave., New York City.	1886
DYCHE, Prof. L. L., Lawrence, Kansas.	1886
EAMES, Dr. EDWIN H., Bridgeport, Conn.	1888
EASTMAN, HARRY D., Framingham, Mass.	1891
EATON, ALVAH A., Dunlap, Cala.	1890
EDDY, N. A., 615 North Grant St., Bay City, Michigan.	1885
EDGAR, NEWBOLD, 28 E. 39th St., New York City	1891
EDSON, JOHN M., Sehome, Washington.	1886
ELDON, CHARLES H., Williamsport, Pa.	1891
EMERSON, W. OTTO, Haywards, Cala.	1885
EVANS, EVAN M., Englewood, N. J.	1888
EVANS, SAMUEL C., Jr., Riverside, Cala.	1889
EVERMANN, Prof. B. W., Terre Haute, Ind.	1883
FAIRBANKS, Hon. FRANKLIN, St. Johnsbury, Vt.	1885
FANNIN, JOHN, Provincial Museum, Victoria, B. C.	1888
FAXON, WALTER, Mus. Comp. Zoöl., Cambridge, Mass.	1891
FERNALD, ROBERT H., Orono, Me.	1890
FIGGINS, J. D., 429 P St., N. W., Washington, D. C.	1889
FISHER, DAVENPORT, Milwaukee, Wis.	1890
FISHER, WM. HUBBELL, 12 Wiggins Block, Cincinnati, Ohio.	1883
FLINT, H. W., Yale National Bank, New Haven, Conn.	1888
FLINT, WM. R., Madera, Fresno Co., Cala.	1890
FORBUSH, EDW. H., 424 Main St., Worcester, Mass.	1887
FOX, Dr. WM. H., 1826 Jefferson Place, Washington, D. C.	1891
FUERTES, LOUIS AGASSIZ, Ithaca, N. Y.	1891
GALE, DENIS, Gold Hill, Boulder Co., Colorado.	1886
GAULT, B. T., Glen Ellyn, DuPage Co., Ill.	1885
GESNER, Rev. A. H., Sing Sing, N. Y.	1885
GIBSON, LANGDON, Flushing, N. Y.	1887
GILBERT, CARLETON, 1800 Wabash Ave., Chicago, Ill.	1889

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GORDON, THEODORE, Savannah, Ga.	1891
GOSS, B. F., Pewaukee, Waukesha Co., Wis.....	1883
GOULD, JOSEPH E., 281½ North High St., Columbus, Ohio.....	1889
GRANGER, WALTER W., Am. Mus. Nat. Hist., New York City	1891
GRANT, JNO. B., 108 Duane St., New York City	1890
GRANT, U. S., 200 West 19th St., Minneapolis, Minn.....	1885
GREEN, MORRIS M., 410 Graves St., Syracuse, N. Y.....	1886
GREENE, I. C., Fitchburg, Mass.	1891
GREGG, Dr. WM. H., 143 West 21st St., New York City	1883
HAGERUP A., (Greenland), Viborg, Denmark.....	1888
HALES, HENRY, Ridgewood, N. J.....	1890
HANMER, C. C., Burnside, Conn.....	1888
HARDY, MANLY, Brewer, Maine.....	1883
HARTE, CHAS. R., Columbia College, New York City.....	1890
HASBROUCK, EDWIN M., 1303 Corcoran St., Washington, D. C.	1887
HAUPT, LOUIS, 61 Liberty St., New York City.....	1888
HAWLEY, A. H., Vineland, N. J.....	1886
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HAZZARD, Dr. T. L. Allegheny, Pa.	1891
HEDGES, CHARLES F., New Haven, Conn.....	1891
HEIMSTREET, Dr. T. B., 14 Division St., Troy, N. Y.....	1888
HELME, ARTHUR H., Miller's Place, Suffolk Co., N. Y.....	1888
HENDRICKSON, W. F., 860 Broadway, New York City	1885
HICKS, HENRY, Westbury Station, Queens Co., N. Y.	1888
HICKS, JOHN D., Old Westbury, Queens Co., N. Y.....	1888
HINE, Mrs. JANE L., Sedan, Ind.....	1890
HITCHCOCK, FRANK H., Dept. of Agriculture, Washington, D. C....	1891
HOADLEY, Dr. FREDK. H., 9 W. 30th St., New York City	1891
HOLBROOK, Judge S. T., Norwich, Conn.....	1885
HOLMAN, RALPH H., Worcester, Mass.....	1890
HOOPES, JOSIAH, West Chester, Pa.....	1889
HORNADAY, W. T., 42 Niagara St., Buffalo, N. Y.	1888
HOUGH, ROMEYN B., Lowville, N. Y.....	1883
HOWELL, ARTHUR H., 212 Madison St., Brooklyn, N. Y.....	1889
HOYLE, CHARLES E., West Millbury, Mass.....	1889
HOYT, F. R., Grand Hotel, New York City.....	1891
HOYT, WM. H., Stamford, Conn.....	1888
HOWE, C. P., Waukesha, Wis.	1891
HUBBARD, Miss SARA A., 39 33rd St., Chicago, Ill.	1891
HUGHES, Dr. WM. E., 3726 Baring St., Philadelphia, Pa.....	1891
HULL, WALTER B., Box 47, Milwaukee, Wis.....	1889
HURD, THEO. D., Riverside, Cal.....	1890
HURTER, JULIUS, 2346 South 10th St., St. Louis, Mo.....	1888
HVOSLEF, Dr. J. C., Lanesboro, Minn.....	1885
HYATT, Miss MARY, Stanfordville, N. Y.....	1891
INGALLS, CHARLES E., East Templeton, Mass.....	1885

INGERSOLL, ALBERT M., 816 5th St., San Diego, Cala.....	1885
INGRAHAM, D. P., Elmira, N. Y.....	1889
ISHAM, C. B., Am. Mus. Nat. Hist., New York City.....	1891
JACKSON, THOS. H., West Chester, Pa.....	1888
JACOBS, J. WARREN, Waynesburg, Pa.....	1889
JAMES, HOWARD K., Rockville, Conn.....	1888
JARDINE, CHAS. S., 318 East 39th St., New York City.....	1888
JEFFRIES, WM. A., 78 Devonshire St., Boston, Mass.....	1883
JENKS, Prof. J. W. P., 31 George St., Providence, R. I.....	1888
JESURUN, Dr. MORTIMER, Douglas, Wyoming.....	1890
JOHNSON, ALBERT I., Hull, Iowa.....	1885
JOHNSON, FRANK E., Parkville, Kings Co., N. Y.....	1888
JOHNSON, FRED. O., Oakland, Cala.....	1888
JOHNSON, HY. C., American Fork, Utah.....	1890
JOHNSON, Prof. O. B., Seattle, Washington.....	1885
JOHNSTON, Dr. A. D., Allegheny City, Pa.....	1891
JONES, LYNDY, Oberlin, Ohio.....	1888
JONES, MARCUS E., Salt Lake City, Utah.....	1890
JORDAN, A. H. B., Willsborough, Essex Co., N. Y.....	1888
JORDAN, Prof. D. S., Leland Stanford, Jr., Univ., Menlo Park, Cala.....	1885
JOUY, P. L., Smiths. Inst., Washington, D. C.....	1883
KEELER, CHARLES A., Berkeley, Alameda, Co., Cala.....	1889
KELLOGG, VERNON L., Lawrence, Kansas.....	1888
KENDALL, W. C., U. S. Fish Commission, Washington, D. C.....	1889
KEYSER, LEANDER S., Columbus, Ohio.....	1891
KING, GEORGE GORDON, Newport, R. I.....	1888
KIRKPATRICK, H. C., Meadville, Pa.....	1891
KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C.....	1883
KOCH, Prof. AUGUST, Williamsport, Pa.....	1891
KOCH, FRED. W., Esccondido, Cala.....	1891
KOHN, GUSTAVE, 14 Carondelet St., New Orleans, La.....	1886
LADD, SAMUEL B., West Chester, Pa.....	1889
LAMB, CHARLES R., Cambridge, Mass.....	1885
LAMB, Prof. ELI M., Friends' High School, Baltimore, Md.....	1891
LANGDON, EDWIN, Central National Bank, New York City.....	1891
LANO, ALBERT, Madison, Minn.....	1890
LANTZ, Prof. D. E., Manhattan, Kans.'s.....	1885
LAWRENCE, ROBT. B., Mills Building, New York City.....	1883
LAWRENCE, ROBERT HOE, Seattle, Washington.....	1890
LEWIS, E. G., Hartford, Conn.....	1888
LEWIS, WM. H., Pawtucket, R. I.....	1890
LEWIS, JOHN B., Eubanks, Pulaski Co., Ky.....	1890
LILIENCRANTZ, T., Aptos, Cala.....	1890
LINSKILL, DAVID J., Plymouth, Pa.....	1891
LLOYD, WILLIAM, Brownsville, Texas.....	1885
LOCKWOOD, Dr. SAMUEL, Freehold, N. J.....	1890
LONG, H. B., Lake View, Mass.....	1889

LOOMIS, JOHN A., Paint Rock, Concho Co., Texas.....	1887
LOOMIS, LEVERETT M., Chester, S. C.....	1883
LORING, J. ALDEN, Owego, N. Y.....	1889
LUCAS, FREDERIC A., U. S. Nat. Mus., Washington, D. C.....	1888
LUCAS, WM. ⁵ H., Bridgeport, Conn.....	1889
MACDOUGALL, GEO. R., 88 Wall St., New York City.....	1890
MACGILLIVRAY, ALEX. D., Cornell Univ., Ithaca, N. Y.....	1890
MACKAY, Prof. A. H., Halifax Academy, Nova Scotia.....	1885
MACKAY, GEO. H., Nantucket, Mass.....	1890
MACOUN, Prof. J., Geol. and Nat. Hist. Surv., Ottawa, Ontario.....	1883
MCCORMACK, F. W., Leighton, Ala.....	1891
MCGREGOR, R. C., 2847 Champa St., Denver, Col.....	1889
MAITLAND, ROBERT L., 70 Broad St., New York City.....	1889
MALL, CHARLES M., 329 Broadway, New York City.....	1889
MARSHALL, ALFRED, 59 South Canal St., Chicago, Ills.....	1886
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MERRILL, HARRY, Bangor, Maine.....	1883
METCALFE, WM. C., 21 Cortlandt St., New York City.....	1886
MILLER, G. S., Jr., 6 Bond St., Cambridge, Mass.....	1886
MILLER, Mrs. OLIVE THORNE, 244 Macon St., Brooklyn, N. Y.....	1887
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MORTIMER, BENJAMIN, 348 Lafayette Ave., Brooklyn, N. Y.....	1888
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NICHOLAS, Dr. GEORGE LAWRENCE, 386 Manhattan Ave., New York City.....	1888
NICHOLS, J. M., Greene, Maine.....	1890
NORRIS, J. PARKER, 723 Walnut St., Philadelphia, Pa.....	1886
NORTON, ARTHUR H., Westbrook, Maine.....	1890
NORTON, RICHARD, Cambridge, Mass.....	1888
OBERHOLSER, HARRY C., Wooster, Ohio.....	1888
OLDFIELD, W. A., Port Sanilac, Mich.....	1891
OLDRIGHT, CHAS. D., Austin, Texas.....	1890
ONG, PLUMMER L., Milan, Sullivan Co., Mo.....	1888
OSBORN, Rev. WM., Golden, Col.....	1890
PAINÉ, AUGUSTUS G., Jr., Room 60, Times Bldg., New York City...	1886
PALMER, E. L., New Haven, Conn.....	1891
PALMER, T. S., Dept. of Agriculture, Washington, D. C.....	1888
PALMER, WM., U. S. Nat. Mus., Washington, D. C.....	1888

PANNEPACKER, D. E., 2513 North 12th St., Philadelphia, Pa.....	1888
PARK, AUSTIN F., 31 Boardman Building, Troy, N. Y.....	1885
PARK, J. T., Warner, Tenn.....	1890
PARKHOUSE, H. H., Tacoma, Washington.....	1890
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PEABODY, W. RODMAN, Cambridge, Mass.....	1890
PEACOCK, W. F., Marysville, Cala.....	1888
PEARSON, T. GILBERT, Archer, Fla.....	1891
PECK, E. B., Brockport, N. Y.....	1890
PENNOCK, C. J., Kennett Sq., Chester Co., Pa.....	1888
PERKINS, CHAS. E., Hartford, Conn.....	1888
PERNOT, E. A., Corvallis, Oregon.....	1891
PETERSON, J. P., Luck, Wis.....	1885
PETTIT, A. E., 15 Cortlandt St., New York City.....	1889
PHILLIPS, A. H., 77 Biological Laboratory, Princeton, N. J.....	1891
PIERCE, A. K., Renovo, Pa.....	1891
PIERS, HARRY, Willow Park, Halifax, N. S.....	1891
PLEASANTS, J. H., Jr., 606 Cathedral St., Baltimore, Md.....	1888
PLUMMER, GORDON, 242 Purchase St., Boston, Mass.....	1890
POPNOE, Prof. E. A., Manhattan, Kan.....	1886
POSSON, NEIL F., Medina, N. Y.....	1890
PRATT, W. E., Lake Forest, Ill.....	1890
PRENTISS, D. W., JR., Washington, D. C.....	1890
PRILL, Dr. A. G., Springville, N. Y.....	1890
PRIME, Rev. WENDELL, 38 Park Row, New York City.....	1889
RADCLIFFE, CARLETON R., 127 West 64th St., New York City.....	1888
RAGSDALE, G. H., Gainesville, Texas.....	1885
RAINE, WALTER, Hayden St., Toronto, Ontario.....	1889
RALPH, Dr. W. L., 26 Court St., Utica, N. Y.....	1888
RAUB, Dr. M. W., Lancaster, Pa.....	1890
RATHBUN, FRANK R., 40 Franklin St., Auburn, N. Y.....	1883
RAWSON, CALVIN L., Norwich, Conn.....	1885
REDDINGTON, ALFRED P., 25 Second St., San Francisco, Cala.....	1890
REED, CHAS. K., Worcester, Mass.....	1890
REED, J. HARRIS, Beverly, N ^o J.....	1890
RHOADS, SAMUEL N., Haddonfield, N. J.....	1885
RICE, FRANK L., Evanston, Cook Co., Ill.....	1886
RICHARDS, JOHN BION, 8 Barnaby St., Fall River, Mass.....	1888
RICHARDSON, JENNESS, Am. Mus. Nat. Hist., New York City.....	1888
RICHARDSON, W. M., Am. Mus. Nat. Hist., New York City.....	1891
RICHMOND, CHAS. W., Patuca, Spanish Honduras.....	1888
RIDGWAY, JNO. L., U. S. Geol. Surv., Washington. D. C.....	1890
RIECKER, ERNST, 900 South 4th St., St. Louis, Mo.....	1888
RIKER, C. B., South Orange. N. J.....	1885
RILEY, Prof. C. V., U. S. Entomologist, Washington, D. C.....	1885
RIVES, Dr. WM. C., 113 East 38th St., New York City.....	1885
ROBBINS, WM. A., 528 Golden Gate Ave., San Francisco, Cala.....	1888

ROBERTS, GEORGE W., West Chester, Pa.....	1891
ROBERTS, W. F., 503 E St., N. W., Washington, D. C.....	1888
RODDY, Prof. H. JUSTIN, Millersville, Pa.....	1891
ROGERS, GEORGE H., Madison, Wis.....	1891
ROOSEVELT, Hon. THEODORE, Oyster Bay, Queens Co., N. Y.....	1888
ROWLAND, THOS., 182 6th Ave., New York City.....	1890
ROWLEY, J., Jr., Am. Mus. Nat. Hist., New York City.....	1889
RUSSELL, GEO. C., 144 West 7th St., Erie, Pa.....	1888
RUSSELL, ROY, Kokomo, Indiana.....	1891
SAGE, HENRY M., Albany, N. Y.....	1885
SCHLEGEL, Miss MATILDE, 134 16th St., Buffalo, N. Y.....	1889
SCHURR, THEO. A., Pittsfield, Mass.....	1888
SCOTT, W. L., 74 Sparks St., Ottawa, Ontario.....	1883
SCROGGS, Dr. G. A., Beaver, Pa.....	1891
SEE, ABRAM W., Arlington, N. J.....	1888
SEELY, HENRY M., Middlebury, Vt.....	1890
SEITER, PHIL. J., Chattanooga, Tenn.....	1888
SHARP, Miss ALDA M., Gladbrook, Iowa.....	1889
SHELTON, GEO. H., Seymour, Conn.....	1888
SHERRATT, W. J., 263 North 2d St., Philadelphia, Pa.....	1891
SHORES, Dr. E. I., Soldiers' Home, Hampton, Va.....	1883
SHORT, ERNEST H., Chili, N. Y.....	1891
SLADE, JOHN A., 1134 Herkimer St., Brooklyn, N. Y.....	1888
SMALL, FRED'K L., Provincetown, Mass.....	1891
SMITH, CLARENCE A., 12 College Place, Colorado Springs, Col.....	1889
SMITH, HORACE G., Jr., 2918 Lafayette St., Denver, Col.....	1888
SMITH, Dr. HUGH M., 1248 New Jersey Ave., Washington, D. C.....	1886
SMITH, JAMES E., East Killingly, Conn.....	1889
SMITH, LUTHER H., Box 132, Pittsburgh, Pa.....	1891
SMITH, PHILO W., Jr., Mona House, St. Louis, Mo.....	1890
SMITH, S. SIDNEY, 59 Wall St., New York City.....	1888
SMYTH, CLIFFORD, 435 East 116th St., New York City.....	1890
SORNBORGER, JEWELL D., Cambridge, Mass.....	1888
SOUTHWICK, E. B., Arsenal Bldg., Central Park, New York City....	1888
SOUTHWICK, WM. C., Raritan, N. J.....	1891
SPELMAN, H. M., 62 Sparks St., Cambridge, Mass.....	1883
SPRAGUE, JOHN C., 38 Wall St., New York City.....	1891
STANTON, Prof. J. Y., Bates College, Lewiston, Me.....	1883
STEBBINS, EDWARD S., Minneapolis, Minn.....	1889
STERE, Prof. J. B., Ann Arbor, Mich.....	1890
STEPHENS, F., Santa Ysabel, San Diego Co., Cal.....	1883
STOEY, W. W., Harrisburg, Pa.....	1891
STONE, D. D., Lansing, N. Y.....	1891
STONE, WITMER, Acad. Nat. Sci., Philadelphia, Pa.....	1885
STREATOR, C. P., Garrettsville, O.....	1889
STRODE, Dr. W. S., Bernadotte, Ill.....	1889
STRONG, REUBEN M., Wauwatosa, Wis.....	1889

STUDER, JACOB H., P. O. Box 2417, New York City.....	1888
SURBER, THAD., White Sulphur Springs, West Va.....	1890
SWALLOW, C. W., Willsburgh, Multuoma Co., Oregon.....	1890
SWINBURNE, JOHN, Holbrook, Apache Co., Ariz.....	1887
TALBOT, D. H., Sioux City, Iowa.....	1885
TATLOCK, JOHN, JR., Mutual Life Ins. Co., New York City.....	1887
TAYLOR, ALEX. O'D., 124 Bellevue Ave., Newport, R. I.....	1888
TAYLOR, HARRY R., Alameda, Cal.....	1889
THOMPSON, ERNEST E., 86 Howard St., Toronto, Ontario.....	1883
THOMPSON, FRANK J., Zoological Garden, Philadelphia, Pa.....	1885
THORNE, Capt. PLATTE M., 22d Inf. U. S. A., Ft. Keogh, Montana.....	1885
THURBER, E. CARLETON, Alhambra, Cal.....	1886
TODD, LOUIS M., Calais, Me.....	1887
TODD, W. E. CLYDE, Dept. Agriculture, Washington, D. C.....	1890
TOPPAN, GEO. L., 138 Jackson St., Chicago, Ill.....	1886
TORREY, BRADFORD, Wellesley Hills, Mass.....	1883
TORTAT, W. R. M., Atchison, Kansas.....	1890
TOWNSEND, C. H., Smiths. Inst., Washington, D. C.....	1883
TREAT, WILLARD E., East Hartford, Conn.....	1885
TREICHLER, Dr. A. C., Elizabethtown, Pa.....	1891
TROMBLEY, JEROME, Petersburg, Mich.....	1885
TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa.....	1888
TURNER, Dr. M. H., Hammondsville, Essex Co., N. Y.....	1885
TURNER, Dr. T. S., Huntington, N. Y.....	1889
TUTTLE, Dr. CARL, Berlin Heights, O.....	1890
VAN CORTLANDT, Miss ANNE P., Croton-on-Hudson, N. Y.....	1885
VAN RIPER, PAUL, Niles, Mich.....	1891
VELIE, Dr. J. W., Academy of Sciences, Chicago, Ill.....	1886
VERRILL, Prof. ALPHEUS H., 86 Whaley Ave., New Haven, Conn.....	1888
VILARO, Dr. JUAN, Havana Univ., Havana, Cuba.....	1888
VOORHEES, CLARK G., 59 East 75th St., New York City.....	1888
WADSWORTH, D. S., 401 Albany St., Hartford, Conn.....	1885
WAKEFIELD, J. R., Dedham, Mass.....	1885
WALKER, Dr. L. R., Mansfield Valley, Pa.....	1888
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WEST, SAMUEL H., 76 Devoe St., Brooklyn, N. Y.....	1889
WHEELER, DAVID E., cor. Park Ave. and 71st St., New York City.....	1888
WHITE, FRANCIS BEACH, Cambridge, Mass.....	1891
WHITE, HARRY GORDON, Dep. of Agriculture, Washington, D. C.....	1889
WHITE, STEWART E., Grand Rapids, Mich.....	1890
WHITNEY, Prof. E. R., Binghamton, N. Y.....	1891
WIGLEY, W. N., Johns Hopkins Univ., Baltimore, Md.....	1891
WICKHAM, H. H., Beaver, Pa.....	1890

WICKS, M. L., JR., Los Angeles, Cala.....	1890
WILLIAMS, J. B., 171 Johns St., Toronto, Ontario.....	1889
WILLIAMS, ROBERT S., Great Falls, Montana.....	1888
WINTLE, ERNEST D., 11 Hospital St., Montreal.....	1887
WINTON, REV. GEORGE BEVERLY, San Luis Potosi, Mexico.....	1889
WOOD, A. H., Painted Post, N. Y.....	1887
WOODCOCK, REV. C. E., Ansonia, Conn.....	1891
WOODMAN, EDMUND J., Phillips Acad., Andover, Mass.....	1890
WOODRUFF, LEWIS B., 14 East 68th St., New York City.....	1886
WORTHEN, CHARLES K., Warsaw, Ill.....	1891
WORTHINGTON, WILLIS W., Shelter Island, Suffolk Co., N. Y.....	1889
WRIGHT, Capt. J. W. A., Livingston, Ala.....	1888
WYE, SAMUEL A., Ocosta, Washington.....	1891
YORKE, DR. F. HENRY, Hallock, Minn.....	1891
YOUNG, CURTIS C., 63 Greene Ave., Brooklyn, N. Y.....	1891
ZEREGA, DR. LOUIS A., Barrett House, New York City.....	1883

DECEASED MEMBERS.

ACTIVE MEMBERS.

	<i>Date of Death.</i>
BAIRD, SPENCER F.....	Aug. 19, 1887.
GOSS, N. S.....	June 8, 1891.
HOLDER, J. B.....	Feb. 28, 1888.
WHEATON, J. M.....	Jan. 28, 1887.

HONORARY MEMBERS.

GURNEY, JOHN HENRY.....	April 20, 1890.
KRAUS, FERDINAND.....	Sept. 15, 1890.
PARKER, WILLIAM KITCHEN.....	July 3, 1890.
PELZELN, AUGUST VON.....	Sept. 2, 1891.
SCILEGEL, HERMANN.....	Jan. 17, 1884.
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890.

CORRESPONDING MEMBERS.

BLAKISTON, THOMAS W.....	Oct. 15, 1891.
BOGDANOW, MODEST N.....	March 4, 1888.
HAAST, JULIUS VON.....	Aug. 15, 1887.
HOMEYER, E. F. VON.....	May 31, 1889.
MARSCHALL, A. F.....	Oct. 11, 1887.
PREJEVALSKI, N. M.....	Oct. 20, 1887.
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888.

SEVERTZOW, N.....	Feb. 8, 1885.
STEVENSON, HENRY.....	Aug. 18, 1888.

ASSOCIATE MEMBERS.

ATKINS, H. A.....	May 19, 1885.
BECKHAM, C. W.....	June 8, 1888.
BRESE, WM. L.....	Dec. 7, 1889.
COE, W. W.....	April 26, 1885.
ELLIOTT, S. LOWELL.....	Feb. 11, 1889.
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885.
KUMLIEN, THURE.....	Aug. 5, 1888.
LINDEN, CHARLES.....	Feb. 3, 1888.
MABBETT, GIDEON.....	Aug. 15, 1890.
MINOT, H. D.....	Nov. 13, 1890.
NORTHROP, JOHN I.....	June 26, 1891.
SMALL, EDGAR A.....	April 24, 1884.
VENNOR, H. G.....	June 8, 1884.
WILLARD, S. W.....	May 24, 1887.
WOOD, WILLIAM.....	Aug. 9, 1885.

N. B.—Members of the Union and Subscribers to 'The Auk' will please promptly notify the publisher of 'The Auk' of any change of address.





E. V. ITERSON, LITH.

KETTERLINUS, PHILADA.

$\frac{3}{4}$

BLACK-FRONTED WARBLER
 DENDROICA NIGRIFRONS BREWSTER.
 ADULT MALE AND FEMALE.

THE AUK:
A QUARTERLY JOURNAL OF
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No. I.

THE BREEDING HABITS OF THE FLORIDA
BURROWING OWL (*SPEOTILLO
CUNICULARIA FLORIDANA*).

BY SAMUEL N. RHOADS.

SO LITTLE relating to the habits of this race has been made known that I am induced to offer the following observations made during a recent visit to southern Florida. I arrived, April 24, 1891, at Fort Myers near the mouth of the Caloosahatchie River, and, engaging a small boat with guide, proceeded up the river, intending to penetrate the interior as far as Lake Okeechobee. After three days' exhausting work with sail, oar and pole, we reached 'Coffee Mill Hammock', a tiny grove of palmettoes on the north bank of the canal connecting Lake Hicpoochee with Lake Flirt. At this point I spent a day collecting birds, and in the course of my rambles chanced to meet a 'cracker' who was looking after some stock in the neighborhood and who said that he could take me to a place where there were "plenty of ground Owls." The next morning, having dismissed my former guide, I started across country with 'Jack.' We had a two-horse open wagon, a barrel of corn, can of provisions, and my baggage, in all making with ourselves a fair load for the little scrub ponies to drag across the twenty miles of prairie stretching between us and Nicodemus Slough, where, Jack assured me, there

were more Owls than I could carry away. We struck into and through the pines and live oaks, which here reach near the upper waters of the lake, in a northeasterly direction and emerging upon the prairie five miles beyond, took a direct easterly course across it.

The elevation of the land in Florida south of Lake Okeechobee is not more than twenty-eight feet above the Gulf of Mexico, that is, the average between high and low lands is at about the level of Lake Okeechobee* in the rainy season. Four feet above this level and higher grow the pines, within three feet of it flourish live oaks, within two feet of it grows the cabbage palmetto, and within a foot of it the saw palmetto. The true prairie region in this neighborhood comprises a vast extent of country whose elevation is less than a foot above the high water mark of Lake Okeechobee. At widely distant intervals in this plain occur circular mounds varying in extent from plots twenty feet in diameter to those of several acres, which are evidently composed of sand blown up by the winds of summer. Upon these, according as they range one, two or three feet above their surroundings we find dense clumps of saw palmetto, cabbage palmetto, or live oak hammocks. Those hammocks which are three feet high, contain all three species arranged symmetrically, the dwarf palmettoes forming the border, the cabbage palms coming next and mingling with the live oaks which crowd the centre. The prairie proper is thickly clad with short grass, indicating considerable fertility in the soil, and upon this subsist immense herds of half-wild cattle and hogs, and numerous deer. By the first of May the greater part of this area is three feet above the water level, and one may travel for miles without finding anything in the numberless dry lakes and water holes that is fit to drink, until he reaches some slough that communicates by a depressed channel with the main lake. Despite the greenness of this grassy wilderness the northern traveller who looks abroad over it, is involuntarily reminded of a desert—a sort of Sahara in miniature. The heat on his back, the dancing reflections of the semi-tropic atmosphere, the distant groups of tall palmettoes rising sheer from the plain, all conspire to impress him with the wonderful resemblance.

*Twenty feet.

Across this desert we proceeded, winding among the intervening clumps of scrub palmetto, bumping over their half-buried roots where it became necessary to make a short cut, until we entered a sloping piece of ground a mile or so wide, from which the water had but lately evaporated and which was evidently the site of a large, shallow pond. Traveling here was comparatively easy, and here Jack reported having seen Owls a few days previously. We had nearly reached the borders of this pond when my companion pointed to an indistinct spot near a low clump of palmettoes, saying with perfect confidence that it was an Owl. At that moment the animal, for so it proved, vanished, and in a few seconds reappeared on a low, sandy hillock a few feet from its former position and, bowing profoundly in opposite directions, sailed off a few rods to another mound where it continued to bow in the most ludicrous and deferential manner. Simultaneously another Owl appeared on the original hillock. Dismounting from the wagon, Jack whispered a few instructions, and each man approached his bird. I was too much entertained with the antics of mine to think of shooting it till the report of my companion's gun frightened both of us sufficiently to render my snap shot ineffectual; but after a short flight the bird alighted behind a clump of palmetto and was secured.

Jack having secured the male, we examined mound number one and found that the female had been surprised in the act of digging her burrow, over which the male had acted sentinel, and from which, after entering and giving her notice, he had reappeared in the manner described. The cavity was barely a foot deep and two feet long, dug in the wet sand near the margin of the pond and not ten feet from the palmetto bushes. Near it was the ruin of a former burrow from which Jack had procured eggs ten days previously.

Mound number two was then looked after. Its situation was at a lower level than the others, and the depth of the burrow below the surface was correspondingly less, being only three inches. It was about five feet long, and had two openings about midway between which was a cave-in caused by the trampling of cattle. Inserting the hand and giving a quick upward jerk, the thin sod was easily removed without much danger of snake or skunk bites, and when some two feet of the burrow were opened we found an egg. There were no others, indicating that the female had been trapped

during oviposition, had been forced to dig her way out in the opposite direction, and had then abandoned the site for a better one on higher ground where the danger from beast and flood could be avoided. This was evidently the pair Jack had previously robbed, so we see that *Speotyto* is nowise behind others of its family in the persistency with which it attaches itself to a given locality.

No other birds were seen in this place, but a mile farther on we found three more in a precisely similar location. These also had been robbed some days previously but had succeeded in making a new home near the old one, from which we procured four fresh eggs. In this case, as before, the male gave notice of our approach, but instead of showing fear, boldly flew toward us with a threatening chatter, while the female concealed herself among the long grass near the nest. Nicodemus Slough, our destination, was reached about six p.m. It is a low, swampy 'bonnet'-covered estuary reaching from the lower waters of Lake Hicpoochee northward across the prairie. It is about eight miles long, and at the place where we crossed it half a mile wide. The dry season had so reduced the flow of water from the surrounding lowlands that we could not detect it on crossing, though a week before the horses had here waded up to their bellies.

At this spot, in a large live oak and palmetto hummock, we spent the weary night amid a memorable chorus of alligators, frogs, Barred Owls and mosquitos. Our start next morning was an early one. Having loaded everything on the wagon and harnessed the horses, I armed myself with gun and hatchet and made my way through the swamp to the opposite side, where I was directed by Jack to walk along and keep a sharp lookout, he at the same time driving the team and hunting along the left bank. In the course of half an hour we had struck — especially on my side of the slough — a continuous colony, three miles long, of breeding Owls. The retreating waters of the adjoining slough had left a margin of flat, grass-grown sand, of varying width, between the swamp and the saw palmettoes, and extending indefinitely in the direction of the stream. This formed the breeding ground of several hundred pairs of Owls, and here in the course of three hours I made a thorough acquaintance with the outdoor and indoor life of a very interesting bird.

The actions of this species upon the near approach of an intru-

der to its nest are interesting and ludicrous in the extreme. If the pair have a full clutch of eggs, one parent is sure to be on the mound or just within the entrance, as often the female as the male. If the former, she makes far less demonstration than the male, and generally slinks away to the long grass, or behind the palmettoes, and peeps at you. If it be the male, he performs the most elaborate tricks, and either comes to meet you or circles about and alights on the level ground near the hole, frequently uttering as he does so a hurried succession of sounds between a chatter and a choke. In either case the sitting bird does not leave the nest, and if dug out will fight to the death though given the chance to escape.

If the birds are nest-building or have not laid a full clutch of eggs both of them are often found on the mound, sometimes, as it were, wing-in-wing (I have seen them bow together), but generally the female takes the traditional 'back seat' and the doughty father demands the countersign and braves the onset alone, while the weaker vessel makes good her retreat. In this case, should there be one in the burrow, the other utters a low half-audible cry which speedily brings its companion above ground.

When the burrow contains young you rarely surprise the adults below ground. Out of ten nests examined which held young of all ages I captured only one adult bird. This is owing to the extreme solicitude of the parents and the voracity of the brood which is always numerous. The anxiety of the old males whose young are being threatened is so great that I have had them strike my cap awry while digging, and in general the conduct of the females in comparison is shameful. On all occasions a wounded bird would make for the nearest hole with all possible speed and could not be dislodged without being dug out.

The utmost harmony prevailed in this widely scattered community. Where four or five pairs were living close together the males would combine their attacks upon me and the females would retire together to some secluded spot and have a talk. On one occasion an over-curious mother flew up from behind a bunch of palmettoes, and alighting thereon took a comical sidelong glance at me, but finding she was perceived returned to the ground. On only one other occasion did I see them alight otherwise than on the ground, although later in the afternoon I noticed

several sitting on a row of fence posts which ran through their domains precisely as *S. c. hypogæa* does in the West. On no occasion did I notice either young or old sit in the open air. They always stood upright, even when unconscious of my presence.

Every action of this species bespeaks a bird of eminently diurnal habits, but I have no reason to believe that they cannot range with equal freedom at night. From the nature of their food, however, I conclude they are more active in the daytime. The flight of this Owl, while rarely protracted, is well sustained and graceful. They made long trips to and from the water holes, which were often a mile distant, in search of food for their hungry brood, but on no occasion did I see them fly higher than thirty feet. The voracity of the young is phenomenal. I kept seven, of different ages, in a tin box for several days. Beside eating everything, fresh or putrid, that was offered, they attacked and devoured each other. I was forced to kill the three remaining cannibals to preserve them.

In no instance was there any evidence that the Owls utilized the homes of other animals. At the best, such places are very scarce in this region of Florida, and owing to the friable nature of the soil and the evident facility with which these birds dug for themselves, such a supposition seems unnecessary. With three exceptions all of the twenty burrows I explored were dug in the moist, sandy margin of the slough, from twenty to one hundred feet down the gentle, grassy slope between the thickly fringed palmetto bank and the water's edge. The more recently constructed burrows were invariably nearer the water, owing to the greater ease of digging in the wet sand. In these cases the burrow throughout its entire length would just graze the lower surface of the thin sod, occasionally even penetrating it, causing, in such an event, its abandonment. If not abandoned, one of the myriad roving cattle would be likely soon to set foot on it and break through, or a sudden shower might fill it with water. These unfortunate attempts were evidently those of young or late-paired birds, or those whose earlier housekeeping had been broken up by some prowling snake, raccoon, or prairie skunk, and who found it impossible to build a new dormitory in the dry, higher levels at this season.

The normal plan of architecture was as follows: a straight

descent of from 6 to 18 inches, then a level or slightly descending tunnel *in a northerly direction* from four to seven feet in length, at the end of which, in an oven-shaped pocket, often a foot in diameter and with flat roof, is placed the nest. The most frequent exception to this rule was a burrow starting as above and descending at an angle of 45° for three feet, then turning westwardly and proceeding with a slight inclination two or three feet farther or even rising abruptly to near the surface. In two instances I saved myself half an hour's digging by sounding the surface with a hatchet, and once the trouble of digging at all, by the hissing of the brood under the sod in a burrow that made a sheer pitch the length of my arm toward the antipodes. I mentioned above certain exceptions. These burrows must have been the work of very wise old birds, and from their appearance had been bequeathed from family to family through many generations. They were all found in a little grassy area twenty feet behind the outer edge of the palmettoes. One of them, which I unfortunately attempted to dig out with my hatchet, descended obliquely among the roots of a palmetto bush to a depth of four feet, made a semi-circular sweep of seven feet, and terminated in a nestful of seven half-fledged young, bedded among the thick rootlets. The size and general character of this burrow made me think it might have been the deserted earth of a fox; but an examination of the other two showed such a similarity with it that I am persuaded the Owls had done all this tremendous digging themselves.

Every completed burrow contained a nest for the reception of the eggs, always composed of broken pieces of dry cow droppings and the fragments of sod which had been removed at the commencement of the excavation. As may be imagined, there was no form nor comeliness to this kind of nest, the material being scattered about the rear end of the tunnel without attempted arrangement, and it as often covered the eggs as the reverse. Not a vestige of grass, feathers, or hair was detected in my examination.

On my side of the slough nearly all the nests contained young, the oldest having been hatched a fortnight, while others were not a day old, a great disparity of age being frequently noticed in the same family. Seven was the largest number of young, and six the greatest number of eggs found, the average being a little

above five. Jack's territory had been hunted a few days before and his success in egg collecting was proportionately better, as each disappointed pair had made another home and laid again. It was impossible to determine the length of incubation, but that the male bird undertakes a large share of this task in the daytime we received certain proof.

When the nest contained young, the mound and burrow were strewn with the rejected remains of their food, but, strange to say, there was no evidence that the young or old ejected the pellets so peculiar to rapacious birds. If they had done so we certainly should have found them. Among these remains were detected the legs and elytra of various grasshoppers and coleoptera, skulls of a very small rodent, skulls and backbones of fish, one of which was six inches long, the skins of snakes, the dried body of a lizard, frogs and crayfish, and feathers of four or five species of birds, noticeable among which were those of the Cuban Nighthawk, Bobolink and Savanna Sparrow.

Contrary to the usual experience with Burrowing Owls, I found *S. c. floridana* almost entirely free from vermin. I was forced to carry some of the dead birds in my shirt for lack of room in the satchel, yet I did so without the least annoyance from insects. Jack cautioned me to beware of snakes in the tunnels, but in examining forty the only signs I found of these reptiles consisted of skins and partially eaten fragments that had been carried thither by the birds. I was also told to look out for the small species of skunk inhabiting these regions. Three of the birds shot and two of the tunnels opened had the strong odor of this quadruped, but farther than this the skunks did not materialize.

OBSERVATIONS ON THE BIRDS OF JAMAICA
WEST INDIES.

BY W. E. D. SCOTT.

II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND,
WITH ANNOTATIONS.*(Continued from Vol. VIII, p. 365.)*

44. *Ajaja ajaja* (*Linn.*). ROSEATE SPOONBILL.—I did not meet with this species, nor has Mr. Taylor seen it on the island. It is included from records by Gosse ('Birds of Jamaica,' p. 346) and by March (Proc. Acad. Nat. Sci. Phila. 1864, p. 65).

45. *Guara alba* (*Linn.*). WHITE IBIS.—It seems somewhat uncertain whether this species is at present a resident or even a visitor in Jamaica, but it is alluded to by Gosse ('Birds of Jamaica,' p. 348) and later by Denny (P. Z. S. 1847, p. 39).

46. *Guara rubra* (*Linn.*). SCARLET IBIS.—This bird is an occasional visitor to Jamaica. See, for records, Gosse, 'Birds of Jamaica,' p. 348; Denny, P. Z. S. 1847, p. 39, and March, Proc. Acad. Nat. Sci. Phila. 1864, p. 65.

47. *Tantalus loculator* (*Linn.*). WOOD IBIS.—The only record of the occurrence of this species in Jamaica is that given by Denny, P. Z. S. 1847, p. 39.

48. *Botaurus lentiginosus* (*Mont.*). AMERICAN BITTERN.—Referred to by Gosse, 'Birds of Jamaica,' p. 346, and by March, Proc. Acad. Nat. Sci. Phila. 1864, p. 65. Mr. Taylor has no records of the species.

49. *Botaurus exilis* (*Gmel.*). LEAST BITTERN.—A rather common resident, of local distribution. From Mr. Taylor's notes I quote: "This species was found breeding at Port Henderson. Two sets of eggs were brought in. The last clutch, taken June 25, had two eggs in which embryos were formed. The nests were slight, flat structures of twigs on mangrove bushes in the swamps. I have never met with more than two, or at most three, of these birds in the course of a whole day, and they were always seen singly. So far as my experience goes they seem to prefer the vicinity of fresh or brackish water."

50. *Ardea occidentalis* *Aud.* GREAT WHITE HERON.—Referred to by Gosse, 'Birds of Jamaica,' p. 346, and by March, Proc. Acad. Nat. Sci. Phila. 1864, p. 63. Mr. Taylor says: "A large white Heron seen among the salines at Port Henderson may have been this species."

51. *Ardea herodias* *Linn.* GREAT BLUE HERON.—This would seem to be an uncommon bird in Jamaica. It is referred to by Gosse, 'Birds of Jamaica,' pp. 346, 347, at some length; also by March, Proc. Acad. Nat. Sci. Phila. 1864, p. 63.

52. *Ardea egretta* Gmel. AMERICAN EGRET.—Apparently a rare or accidental species in Jamaica. See Selater, P. Z. S. 1861, pp., 70-80; also March, Proc. Acad. Nat. Sci. Phila. 1864, p. 63.

53. *Ardea candidissima* Gmel. SNOWY HERON.—Gosse regarded this species as a rare migrant visitor in winter ('Birds of Jamaica,' pp. 336, 337), and Mr. Taylor says: "Occasionally seen in the winter months."

54. *Ardea rufescens* Gmel. REDDISH EGRET.—Included from the record by March, Proc. Acad. Nat. Sci. Phila. 1864, p. 63.

55. *Ardea tricolor ruficollis* (Gosse). LOUISIANA HERON.—This seems the commonest Heron of the island, but is much more abundant on the southern than the northern shore. The following notes are from Mr. Taylor's experience: "This was the most common Heron seen at Port Henderson. The swamps and shallows in the early part of the day fairly teemed with them, yet they were shy and very difficult to approach from the open. The nests were in the highest mangrove trees, deep in the recesses of the swamps. When disturbed or alarmed at feeding they retired in a body to the tallest trees in the most inaccessible parts of the swamps, coming back, however, immediately when the danger appeared over. The birds were very restless at feeding time, making short flights here and there, and constantly changing positions, so that the scene was usually a very animated one. Many nests had young in June, while fresh eggs were obtained in the same month."

56. *Ardea cœrulea* Linn. LITTLE BLUE HERON.—A common resident and observed at many points during my stay. From Mr. Taylor's notes I quote as follows: "Next to *A. tricolor ruficollis* the most abundant Heron at Port Henderson, breeding in numbers in all the swamps; of a large number of eggs taken in July more than half were taken in a very advanced state of incubation. Pied or parti-colored birds are not infrequent and many young on leaving the nest show a large proportion of blue in the plumage. The white phase is common."

57. *Ardea virescens* Linn. GREEN HERON.—Met with at Stony Hill once, and it was rather common about Boston. Mr. Taylor writes me: "I did not meet with one of these birds during all my stay at Port Henderson, though they are of common occurrence elsewhere, especially among the mangroves at the Pallisades. Like the little Bittern this species is only seen singly, and I have met with it along the banks of rivers many miles from the sea. It is resident and breeds, but I know nothing of its nesting habits."

58. *Nycticorax nycticorax nævius* (Bodd.). BLACK-CROWNED NIGHT HERON.—Mr. Taylor has not seen this species, nor did I meet with it. The records of Gosse ('Birds of Jamaica,' pp. 344-346) and of March (Proc. Acad. Nat. Sci. Phila. 1864, p. 65) are warrants for its admission to this list.

59. *Nycticorax violaceus* (Linn.). YELLOW-CROWNED NIGHT HERON.—This species I met with several times while on the island, where it is resident and of common occurrence locally. Subjoined are Mr. Taylor's interesting notes: "Common in all extensive mangrove swamps. Breeds.

Three eggs of this species were taken in June from the swamps near Passage Fort; the female was shot on the nest. At about dusk on calm, still evenings in the winter months these birds fly over from the Pallisades, singly or in pairs. They usually come flying very low, just clearing the tops of the houses on gaining the land. When it is too dark to distinguish them, their loud, startling note, a single *quack*, from which they take their name, tells of their presence in passing.

60. *Aramus giganteus* (Bonap.). LIMPKIN. CLUCKING HEN. — There can be no doubt that this was, in Gosse's day at least, by no means a rare bird on the island, but, if not extinct, it is at least very rare now. Mr. Taylor's notes are quoted from as follows: "No living example seen. A skin in the museum of the Jamaica Institute is labelled: 'presented by H. O. Vickers, Esq., 12-12-86. Locality Westmoreland.'"

61. *Rallus longirostris caribæus* Ridgw. MANGROVE HEN. — Having had little or no opportunity to study the Rails while on the island I quote from Mr. Taylor in regard to the species under consideration. "I first became familiar with the habits of the 'Mangrove Hen' during a visit to the extensive swamps bordering the Pallisades. They have always proved shy and difficult of approach. In the swamps near Port Henderson these birds nested in hundreds, but though I spent many hours wading through the shallows in the search for eggs, and counted at one time upwards of twenty-five or thirty nests, I did not see a single bird. At the Pallisades I have obtained many specimens, but only through lying in wait at the little open pools where they love to feed. They appeared most abundant at dawn and just before sunset, when they were very noisy. They called to one another with a harsh, stuttering *crek*, and often their cry alone determined their presence. Many clutches of eggs were brought in from the swamps at Port Henderson, varying in number from five to eleven. All the nests I examined were on the ground among the roots; one was almost sure to be found at the base of any one of the numerous detached clumps that dotted the shallows in all directions. The materials were roots and dry leaves, large quantities of which were used, sufficient, in most cases, to raise the eggs above the influence of wet."

62. *Porzana concolor* (Gosse). RED RAIL. WATER PARTRIDGE. — Mr. Taylor has not met with this species, nor was I so fortunate as to find it. The reader is referred to Gosse ('Birds of Jamaica,' pp. 369, 370) for the original description of the species and notes regarding it.

63. *Porzana flaviventris* (Bodd.). MINUTE CRAKE. — Mr. Taylor says in his notes as follows: "Shot near Passage Fort, December 27, 1886. Of frequent occurrence. Skin: length, 6 inches; bill olive; legs and feet yellowish."

64. *Porzana carolina* (Linn.). CAROLINA RAIL. STRIATED CRAKE. — The following I quote from Mr. Taylor's notes: "One shot on one of the canals near Passage Fort, December 27, 1886. Not uncommon in the winter months. Skin: length, 9 inches; bill yellowish at base, merging into olive brown."

65. *Porzana jamaicensis* (Gmel.). BLACK RAIL. LITTLE RED-EYED

CRAKE.—Resident according to Gosse who procured specimens in August and in February ('Birds of Jamaica,' pp. 375, 376).

66. *Ionornis martinica* (Linn.). PURPLE GALLINULE. SULTANA.—Mr. Taylor tells me that he has had no personal experience with this species though it is said to be resident and not uncommon in many inland swamps. Gosse speaks of it as "not uncommon" and gives details as to where he found it ('Birds of Jamaica,' pp. 377-380).

67. *Gallinula galeata* (Licht.). FLORIDA GALLINULE. SCARLET-FRONTED GALLINULE.—A common resident species in suitable localities. At Boston, Portland Parish, I met with them frequently, and took two very young birds in the black downy plumage, perhaps ten days old, on January 23, 1891.

From Mr. Taylor's notes I quote: "Abundant in all wet places where there is suitable cover, salt marshes excepted. Along the line of railway between Kingston and Spanish Town is an extensive line of mangrove swamp, in some places bordering the track on either side. Here, in every month and at almost all hours, these birds can be seen feeding among the rank growth at the edges of the swamp or running swiftly among the roots of the mangroves, scarcely alarmed by passing trains. Among the common people this bird is always called the Coot. I have had eggs brought me at the end of the year as well as in the months of May and June."

68. *Fulica americana* Gmel. AMERICAN COOT.—A common resident, but perhaps not as plentiful as *Gallinula galeata*. From Mr. Taylor's notes I quote the following, as of interest: "Abundant, though not seen as often as the common Gallinule. Of eggs taken in May and June some were fresh, and others were in an advanced state of incubation. More than one brood probably is reared."

69. *Recurvirostra americana* Gmel. AMERICAN AVOCET.—Mr. Hill informed Gosse of the occasional visits of this species to the island ('Birds of Jamaica,' p. 389). It must be considered, however, as rare or casual at the present time, for it has not been observed by Mr. Taylor.

70. *Himantopus mexicanus* (Müll.). BLACK-NECKED STILT.—A not uncommon winter resident in suitable localities, remaining till late in the spring. The following interesting notes I quote from Mr. Taylor: "Until late in the month of June small companies of these Stilts frequented the swamps and salines at Port Henderson. They were often in company with Herons, fishing in the shallows close to the bordering mangroves where the water reached above the tarsus. A few birds probably stay to breed."

71. *Philohela minor* (Gmel.). AMERICAN WOODCOCK.—The evidence as to the occurrence of this species in Jamaica seems very slight and rests largely on hearsay. See Gosse, 'Birds of Jamaica,' p. 354. Mr. Taylor has been unable to learn of any specimens.

72. *Gallinago delicata* (Ord). WILSON'S SNIFE.—A regular winter visitor to the island. These birds were not uncommon at Boston late in January. A female was taken on the 23d of that month. Gosse says that

the birds are "rather common from November to April" ('Birds of Jamaica,' p. 353). Mr. Taylor speaks of it as "occasionally seen."

73. *Macrorhamphus griseus* (Gmel.). DOWITCHER. — Mr. Taylor gives me this species in his list of birds observed, without comment. Mr. Cory refers to Jamaica records ('Birds of the West Indies,' p. 233). It would appear that Gosse had confounded this or the next species with *Gallinago delicata* ('Birds of Jamaica,' p. 353, lines 6-16).

74. *Macrorhamphus scolopaceus* (Say). LONG-BILLED DOWITCHER. — There is apparently the same ground for including this species in the present list, as there is for its near ally, the preceding species. Mr. Taylor does not mention it, however.

75. *Micropalama himantopus* (Bonap.). STILT SANDPIPER. — Recorded by March, Proc. Acad. Nat. Sci. Phila. 1864, p. 67. Mr. Taylor gives it to me in his list without comment.

76. *Tringa canutus* Linn. KNOT. — Recorded by Gosse ('Birds of Jamaica,' p. 354) and by March (Proc. Acad. Nat. Sci. Phila. 1864, p. 67). Mr. Taylor has not seen the species.

77. *Tringa maculata* Vieill. PECTORAL SANDPIPER. — This is included by A. and E. Newton in their list (Handb. Jamaica, 1881, p. 116) but is not recorded by Mr. Taylor.

78. *Tringa fuscicollis* Vieill. WHITE-RUMPED SANDPIPER. — There are records from the island: Scater, P. Z. S. 1861, pp. 70, 80; Albrecht, J. f. O. 1862, p. 205. Mr. Taylor has not observed it.

79. *Tringa minutilla* Vieill. LEAST SANDPIPER. — This seems to be a regular but not very common winter visitor and migrant.

80. *Ereunetes pusillus* (Linn.). SEMPALMATED SANDPIPER. — This Sandpiper would seem to occupy about the same position in the bird fauna of the island as the last. For remarks as to the probability of the occurrence of *Ereunetes occidentalis* Lawr., see Cory, 'Birds of the West Indies,' p. 234.

81. *Calidris arenaria* (Linn.). SANDERLING. — Mr. Taylor gives this as a common winter visitor. He says the strip of sand beach dividing Kingston Harbor from the sea, known as the Palisades, is a favorite resort of these birds.

82. *Limosa* ———. — A species of *Limosa* is referred to by March (Proc. Acad. Nat. Sci. Phila. 1864, p. 64), but not fully determined.

83. *Totanus melanoleucus* (Gmel.). GREATER YELLOWLEGS. — There are numerous Jamaican records. Mr. Taylor gives it in his list, but says he has not personally observed it.

84. *Totanus flavipes* (Gmel.). YELLOWLEGS. — A regular winter visitor, and apparently more common than the last. Mr. Taylor's notes are to this effect.

85. *Totanus solitarius* (Wils.). SOLITARY SANDPIPER. — A common winter resident in suitable localities. Common at Boston in December, January, and February. A male taken on January 21 at this point is moulting. This is particularly apparent in the primary quills, the first of which in each wing have just been replaced. The new feathers are particularly dark.

The following notes are from Mr. Taylor: "Very common at the end of the year on all sandy beaches. They are usually seen singly, though I have more than once met with small parties composed of six or eight birds. They frequent the edges of the shores, picking among the weeds and refuse and following the retreating waves for food. The earliest record of their arrival, that I can find among my notes, is dated September 4."

86. *Symphemia semipalmata* (Gmel.). WILLET.—There are records by both Gosse ('Birds of Jamaica,' p. 354) and March (Proc. Acad. Nat. Sci. Phila. 1864, p. 67). Mr. Taylor tells me that he has not met with the species, and it must be considered rare or casual.

87. *Bartramia longicauda* (Bechst.). BARTRAMIAN SANDPIPER.—This is also only a casual or very rare visitor to the island. The only record is that given by March (Proc. Acad. Nat. Sci. Phila. 1864, p. 67), and this appears to be somewhat doubtful. Mr. Taylor has no personal records of the species.

88. *Actitis macularia* (Linn.). SPOTTED SANDPIPER.—I found this species not uncommon in suitable localities whenever I was able to investigate the bird fauna of the island. This was from late in November till the last of February. Gosse says ('Birds of Jamaica,' p. 349): "It arrives from the north about the end of August, and remains certainly till after the middle of April, and I am not sure that individuals do not stay all the summer." Mr. Taylor gives me the following notes: "This species is probably a resident. It is common in favorable localities, but I have no notes regarding it."

89. *Numenius longirostris* Wils. LONG-BILLED CURLEW.—Apparently a rare or casual visitor. Referred to by both Gosse ('Birds of Jamaica,' p. 348) and March (Proc. Acad. Nat. Sci. Phila. 1864, p. 68). Mr. Taylor gives me the following notes: "A Curlew reported to me as seen near Milk River in Clarendon during the winter months may be this species."

Besides *Numenius longirostris*, there are evidently one or two other species of Curlews or Godwits that seem to have occurred on the island. From the following quotation from Gosse ('Birds of Jamaica,' p. 348) it will be seen that the identity of these is uncertain. "On the same authority [Mr. Hill] I mention two species of Curlews, the one known as the Black Curlew, which is *Numenius longirostris*, and the other called the White Curlew, which may be *N. hudsonicus*, or perhaps *Ibis alba*."

90. *Charadrius squatarola* (Linn.). BLACK-BELLIED PLOVER.—Records from Jamaica by both Gosse ('Birds of Jamaica,' p. 333) and March (Proc. Acad. Nat. Sci. Phila. 1864, p. 66). Mr. Taylor has no personal record of this nor of the following species.

91. *Charadrius dominicus* Müll. AMERICAN GOLDEN PLOVER.—There are several well-authenticated records of its occurrence on the island: Gosse, 'Birds of Jamaica,' p. 333; March, Proc. Acad. Nat. Sci. Phila., 1864, p. 66; Cassin, *ibid.*, p. 241; Albrecht, J. f. O., 1862, p. 205.

92. *Ægialitis vocifera* (Linn.). KILLDEER.—This is apparently a common resident species in suitable localities throughout the island. At Constant Springs and on the Liguanea Plain I saw them constantly

throughout the months of November and December, sometimes singly, sometimes in pairs, and oftenest in small flocks. During my stay on the north side of the island, from the last of December till the middle of March, I saw them daily in suitable localities. At Boston a flock of twenty to thirty individuals frequented the large pasture below the house during the entire three months spent at this point. This flock still remained unbroken on March 17, the day I left this point.

The following record of the breeding of the species I quote from Mr. Taylor's notes: "An abundant resident species, though I know nothing of its habits. It is described as frequenting bare open localities rather than marshes, etc., and I have never met with it near the seashore or even in the vicinity. Three eggs received in July last (much incubated) labelled 'Ring-tailed Plover,' are obviously referable to this species."

93. *Ægialitis semipalmata Bonap.* SEMIPALMATED PLOVER. — See Gosse, 'Birds of Jamaica,' p. 333, and March, Proc. Acad. Nat. Sci. Phila. 1864, p. 66, also Albrecht, J. f. O. 1862, p. 205, for records from Jamaica.

94. *Ægialitis meloda (Ord)*. PIPING PLOVER. — The following notes are kindly furnished me by Mr. Taylor: "In October, 1887, Piping Plover were abundant among the lagoons and mangrove swamps at the Palisades; they moved about in large flocks which, when once alighted on the shell-bestrewn beaches, it was impossible to detect."

95. *Ægialitis wilsonia (Ord)*. WILSON'S PLOVER. — From Mr. Taylor's notes I quote: "This was the only Plover seen at Port Henderson. Small flocks daily resorted to the large shallows frequented by the Herons and Stilts. It is apparently resident."

96. *Arenaria interpres (Linn.)*. TURNSTONE. — From Mr. Taylor's notes I quote as follows: "On a much later date in June than that on which I last saw the Black-necked Stilt, three Turnstones were shot near Passage Fort; their plumage was then undergoing change. The occurrence of these birds at this time of the year seems worthy of note, though these individuals may have been only stragglers from the main flocks, or perhaps barren birds. During the winter months the Turnstone is common in all favorable localities. It was the first bird I saw on landing at the Morant Cays in April, 1890. At that time large flocks frequented the different islets particularly the largest two. In the mornings and afternoons they fed along the shores, as well as on many of the bare open spaces where the grass had been burnt away and from which I often flushed a flock."

✓ 97. *Jacana spinosa (Linn.)*. The following notes are from Mr. Taylor, and he kindly showed me the bird in question: "Notice of the species here, hitherto recorded only from Cuba, Haiti and San Domingo, is based on a specimen of an immature bird in the collection of the Institute of Jamaica, where it remained for a long time in a neglected state, uncared for and unidentified. It is labelled '12-12-86, presented by H. O. Vickers, locality, Westmoreland.' The sex is undetermined. I have not met with the living bird."

(To be continued.)

HABITS OF THE ESKIMO CURLEW (*NUMENIUS BOREALIS*) IN NEW ENGLAND.

BY GEORGE H. MACKAY.

FROM the shores of the Arctic Ocean, where they breed, to Patagonia, where they probably winter (Ibis, 1878, page 404), is a journey of seven thousand miles; yet the Eskimo Curlews, familiarly known as Doughbirds, compass it every year on their migrations. Starting from the far north after incubation is over, the older birds, which are then generally lean and in poor condition, commence to straggle down in small parties until about the first of August they reach Labrador, where they remain, with constantly increasing numbers, for about three weeks, becoming extremely fat upon the berries of the *Empetrum nigrum* (known as curlew-berry, crow-berry or bear-berry) to which they are particularly partial.

About the twenty-third of August, at such time as the weather conditions prove favorable for migration southward, they undertake their long journey to the southern portion of the South American continent. They are then in the best physical condition, and are frequently so fat that when they strike the ground after being shot flying the skin bursts, exposing a much thicker layer of fat than is usually seen in other birds. Hence their local name 'Doughbird,' from the saying "as fat as dough." At this season they are considered by epicures the finest eating of any of our birds, and consequently they are watched for and sought after by sportsmen with great perseverance during the very short period that they are expected to pass along this coast during their migration southward. They suffer but little, however, in New England from such pursuit, as the number killed in the great majority of years is trivial and has no effect in diminishing their numbers.

When I take a retrospective view for a series of years I am more than ever impressed with the few birds killed except in some very exceptional year. In most years they are far from being abundant, in fact are rather the reverse. I am inclined to the opinion that these birds generally pass our coast much further from land than has been usually supposed, for it rarely happens

that any large numbers of them are deflected over the land by ordinary storms, very severe thunder and lightning with heavy rain, or dense fogs, apparently being required to drive them from their customary line of flight and force them to seek land until more favorable conditions for migrating take place, for they are unusually strong and high fliers with great endurance. I believe also, that it is only in exceptional years that we see a portion of the principal movement of these birds while making their southern migration.

Those which do visit us almost invariably land with their boon companions, the American Golden Plover, of whose flocks I have frequently noticed they were the leaders, and I can scarcely call to mind, as I write, an instance where any number of Eskimo Curlew have landed without there being more or less Golden Plover present at the same time.

Those birds which may come cannot, if they would, remain any longer than is absolutely necessary, for they are so harassed immediately after landing that the moment there occurs a change in the weather favorable for migration they at once depart. They appear to leave the coast at Long Island, New York, and strike further out to sea, and then are not seen on the Atlantic coast for another year.

It is on the spring migration to their breeding grounds, while passing through the United States and especially along the Mississippi Valley, that they suffer, being unmercifully shot in many places on the route, particularly in Nebraska. Like the American Golden Plover (*Charadrius dominicus*) the Eskimo Curlew never returns in the spring to the North via the Atlantic coast.*

Of those I have observed in New England during a series of years I may say that most of their habits closely resemble those of the Golden Plover. In migration they fly in much the same manner, with extended and broadside and triangular lines and clusters similar to those of Ducks and Geese at such times. They usually fly low after landing, sweeping slowly over the ground,

*The only Eskimo Curlew that I have ever heard of being obtained in the spring in New England was shot by my friend Mr. Augustus Denton on Cape Cod, Mass., about the end of May, 1873. It was a lone bird. Mr. Denton told me that he always supposed it was a bird which had been wounded the previous autumn and had managed to live through the winter; the reason for this conclusion was the condition of the bird, it being very thin, and sedgy in taste when eaten.

apparently looking it over, generally standing motionless for quite a little while after alighting, which, owing to their general color approximating so closely to the withered grass, renders it difficult at times to perceive them. I have had a flock of fifty or sixty alight within thirty yards of me, and have been unable to make out more than two or three birds. If disturbed they will frequently alight again at no great distance, if not previously harassed, and under the same conditions they can be approached at all times, for they are either very tame or very shy.* They seek out, and are found in, the same localities selected by the Golden Plover (see Auk, Vol. VIII, p. 17) with which they generally associate if any are in the vicinity, there always being a strong friendship between them. They are not so active as the Plover; on the ground they appear less inclined to move about, especially after landing and during rainy weather when I have at times noticed them standing on the ground quite close together, every bird headed to the wind, with heads and necks drawn down and resting on their backs, with the rain running off their tails. At such times they could be approached on foot to within half a gunshot, showing little fear.

They are said to make a whistle somewhat similar to the Hudsonian Curlew's (*Numenius hudsonicus*), only very much finer in tone. The only note I have ever heard them make is a kind of squeak, very much like one of the cries of Wilson's Tern (*Sterna hirundo*), only finer in tone. If one or more of these birds are wounded, after shooting at a flock, they will often keep calling and jumping up, trying to fly, which causes the remainder to hover over or in near proximity to the wounded ones, thus frequently affording an additional shot. They are very gregarious, and unless much harassed will come with the greatest confidence to either Golden Plover, or Curlew decoys.

The young birds do not as a rule make their appearance in New England before the eighth or tenth of September, continuing up to about October first. They appear very gentle and

*While on Nantucket Island they seem to prefer the ground near the headlands adjoining the beach shore, even among the beach grass, probably on account of the abundance of the large gray sand spider (*Lycosa*) which lives in holes in the sand in such localities. They feed on this spider and also eat the seeds of the poverty-grass (*Hudsonia tomentosa* Nutt.), especially when it is on ground which has been burnt over.

tame.* I have occasionally shot the older birds on the Island of Nantucket, with their vent stained purple from the berries of the *Empetrum nigrum* (probably obtained in Labrador).

In order to give some idea that may serve as an indication when the Curlew moves southward, I have copied the following from my notes. — my place of observation being the Island of Nantucket, Mass. The years 1858 to 1871 and 1873-1876, both inclusive, were given me by a friend, and are for Cape Cod, Mass.

1858, Aug. 31.—Some Eskimo Curlew, with Golden Plover.

1859, Aug. 29.—Some Eskimo Curlew, with Golden Plover.

1860, September.—Some Eskimo Curlew during the month.

1861, Sept. 5.—First birds shot,—with Golden Plover.

1862.—No birds.

1863, Sept. 5.—No birds of any account until Sept. 5 when an *immense flight*, the birds remaining through September on Cape Cod. Over 200 shot on Nantucket. The wind was light, southwest, with thick fog. It was northeast the previous day. The largest flight known on the island of late years.

1864.—No birds.

1865.—No birds.

1866, September.—A very few birds. No flight.

1867.—No flight.

1868, September.—No birds until September, when a very few. No flight.

1869, September.—No flight. A few scattering birds only.

1870.—Only a very few scattering birds this year.

1871.—No flight or birds.

1872, Aug. 29.—Raining and blowing very hard with wind southeast. Some Eskimo Curlew landed. Saw one flock of fifty.

Sept. 15.—Cape Cod. A flight, but did not stop; a few scattering birds landed; shot six.

1873, Aug. 25.—Some birds.

1874.—No flight or birds, an unusually poor year.

1875.—No Eskimo Curlew noted, nor have I seen any on Nantucket. Some shot on Cape Cod Sept. 5,—the first this year.

1876.—Some birds in September.

1877, Aug. 27.—A severe rain last night, and a good many Eskimo Curlew landed; I saw 250 (estimated) up to three o'clock P. M. today, the same birds that came last night. This morning until ten o'clock A. M. thick fog; then came out *hot*. Saw 100 Eskimo Curlew on the 29th.

*There is a way of determining the old birds from the young, where there is little difference in plumage to distinguish them; on bending the legs the former's will break, the latter's will not.

1878, Aug. 25.—Slight rain this evening and night: a few Eskimo Curlew landed; saw one flock of 60 or 70 birds (estimated); wind light, north and west; on the 27th saw a flock of 50 birds (estimated).

1879.—Shot none, and have none noted.

1880.—Up to Sept. 10 only twelve Eskimo Curlew were shot on the Island.

1881, Sept. 2.—Tonight some Eskimo Curlew landed with American Golden Plover; the wind was northeast and weather thick; saw a flock of 50 on the 3d; and 65 on the 4th.

1882.—Have only heard of about twenty-five Eskimo Curlew during the entire season.

1883, Aug. 26.—On the night of the 25th and morning of the 26th it rained, and blew very hard from the northeast (northerly and north-westerly weather having previously prevailed). This storm was local, as far as New England was concerned. New Jersey and New Brunswick also had storms, but *in between* these points nothing severe was noticed. During the night of the 25th and next day (26th) the Eskimo Curlew landed with Golden Plover, both in large numbers, and nearly evenly divided as to numbers, there being rather less of the Curlew. On the 29th all birds had left. This was the first flight of either kind this season.

1884, Aug. 31.—A *very* few Eskimo Curlew landed; wind southeast. A very large flight of Golden Plover and some Eskimo Curlew passed Cape Cod and Nantucket Island today, but none to speak of landed or were shot at either place. The wind was southeast, light, with clear weather, at the Cape, great numbers being seen passing, mostly in the afternoon. It was foggy on Nantucket during the morning.

1885.—I have not seen an Eskimo Curlew this season; but eight having been shot on the Island, these came after September 10.

1886, Aug. 24.—Very severe thunder and lightning tonight, accompanied with severe rain, wind northeast, blowing hard; a few scattering Eskimo Curlew landed with a very large number of Golden Plover.

1887, Aug. 28.—Shot one Eskimo Curlew.

Sept. 18.—Shot one Eskimo Curlew. Not on the Island much this season.

1888, Sept. 1.—Quite a number of Eskimo Curlew landed this afternoon, wind southwest, light, thick fog. About all the birds that landed on the 1st left the next morning.

Sept. 26.—Shot one.

1889, Sept. 11.—On this night there was considerable rain and fog, with wind southeast. A small number of Eskimo Curlew landed. There has been a circular storm, the northern limit of which was Long Island, N.Y.; it was considered the severest for twenty years; it came up from the West Indies following the Gulf Stream, Nantucket Island only having the remnants of the outside edge of it. No birds either Eskimo Curlew or Golden Plover landed during the early stage of this storm, those which did appear arriving when it was about over.

Sept. 22.—I saw four, and shot one, the wind being northwest and cold.

Sept. 23.—I saw three more, but think they were the ones seen yesterday.

Sept. 29.—I saw and shot two.

Oct. 2.—I saw two and shot them.

All these late birds, I think, had been living on the Island of Nantucket since the Sept. 11 landing. The summer of 1889 has been unusually wet and very cool.

1890.—Some fifteen Eskimo Curlew are reported to have been seen this season; none have been killed to my knowledge; I have not seen any. Some birds passed Tuckernuck and Nantucket on Sept. 18, a few of which remained over night; all gone next day.

1891, Aug. 20.—Thirteen were seen, they remained during the next day and then departed.

Sept. 1.—I saw one.

Sept. 7.—Three birds shot on Tuckernuck Island.

Sept. 13.—Two seen, one shot.

Sept. 15.—Two shot from a flock of Hudsonian Curlew.

Sept. 17.—Flock of thirteen seen. Up to Oct. 1 the birds above enumerated as being shot or seen comprise the entire number killed or noted on the Islands of Nantucket and Tuckernuck for this year.

A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA.

BY GEORGE K. CHERRIE.

(Continued from Vol. VIII, p. 279.)

17. *Dendroica cærulea*.—I have seen the Cerulean Warbler only four times in Costa Rica. The first was a young male taken Aug. 24, 1890, in company with a lot of *D. æstiva* and *D. blackburniæ*. The other three were also young birds and were taken as follows: male Sept. 12, female Oct. 7, and female Oct 24, 1890.

18. *Dendroica dominica*.—Oct. 4, 1891, I saw a handsome male in the central park. It is the only example I have seen in Costa Rica.

19. *Seiurus noveboracensis*.—A series of twenty examples were taken between the middle of September and the last of May.

20. *Seiurus aurocapillus*.—I have taken but one at San José, and only three in Costa Rica.

21. *Seiurus motacilla*.—Rare.

22. *Oporornis formosa*.—I took a single female Oct. 7, 1890.

23. *Geothlypis trichas*.—In three years' collecting only five have been taken, These evidently belong to the eastern North American form.

24. *Geothlypis philadelphia*.—Not uncommon from the middle of September until the first of April.

25. *Geothlypis macgillivrayi*.—There are only three specimens in the Museum collection

26. *Geothlypis caninucha icterotis*.—Abundant resident about San José. Breeding commences the latter part of May. See further Proc. U. S. Nat. Mus., Vol. XIV, p. 526.

27. *Icteria virens*.—All specimens taken are in fully adult plumage.

28. *Sylvania pusilla pileolata*.—Adult and young birds are taken in about equal proportions.

29. *Sylvania canadensis*.—Of fourteen specimens collected about the city only one proved to be a male; that one was in immature plumage. The females also are duller than spring examples from the North.

30. *Basileuterus delatirii*.—One of the most abundant resident birds in the vicinity of San José. Breeding commences the last of May. I think only one brood is reared each year. A nest brought with two fresh eggs and the dead female to the Museum, June 6, 1890, is constructed of dry grass and fine rootlets, lined with horse hairs. Outside it measures 2.50 inches deep by 4.50 in diameter, inside 2.10 deep by 1.87 diameter. It was placed on the ground at the foot of a tree in a large coffee plantation. The eggs are white, thickly speckled, especially about the larger end, with cinnamon-rufous. They are oval in shape, and measure $.75 \times .57$ and $.77 \times .55$ inch.

31. *Setophaga ruticilla*.—Males in adult plumage are seldom seen about the city. At lower altitudes adults seem quite as common as young.

32. *Progne chalybea*.—A resident species about San José, but most abundant during the breeding season from May to the last of July. A favorite nesting site is in the hoods of the arc electric street lamps. The young do not differ from the adult bird except in having softer plumage.

33. *Chelidon erythrogaster*.—Abundant from September until March. Birds in perfect plumage are rarely seen. In 1890 the first arrivals were noted Aug. 27.

34. *Atticora cyanoleuca montana*.—A common resident. Breeds in the roofs of the houses. The young birds begin appearing about the first of July. They differ from the adult in being washed with pinkish-buff below, including the under tail-coverts, while above the metallic lustre of the feathers is not so bright. In some examples the throat and belly are white and the breast is crossed by a buffy band.

The male of a pair that had their nest in the roof of the Museum was accidentally killed before the eggs hatched. The female did not desert her post, and when the eggs were hatched attended to the wants of the young alone.

35. *Stelgidopteryx serripennis*.—Common resident. Breeds abundantly.

36. *Vireo olivaceus*.—Not at all common anywhere or at any time in Costa Rica.

37. *Vireo flavoviridis*.—I cannot add anything to my notes on this species published in this journal, Vol. VII, p. 329.

38. *Vireo philadelphicus*.—The earliest arrival I have noted was on Oct. 21, 1890.

39. *Vireo flavifrons*.—The first arrival in 1890 was noted on Oct. 4. This and the preceding species are rare birds about San José.

40. *Cyclorhis flavipectus subflavescens*.—Common. A sweet and tireless singer for about five months in the year, from February to July, during the breeding season, usually concealing itself amid the dense foliage at the top and middle of the low trees bordering the fields, where, out of sight of prying eyes, it pours forth melody loud and clear.

41. *Arbelorhina cyanea*.

42. *Arbelorhina lucida*.—These two species of Blue Creepers are only transient visitors in the neighborhood of San José, appearing early in September and lingering until December. They are most abundant during October, feeding together in small flocks in the 'jocote' trees, (*Spondias odulis*). It is only during the time this plum-like fruit is ripening that the birds are found.

The males of the two species are known under the name 'Rey de Picudos', while the females are only 'Picudos'.

43. *Euphonia*.—Although I have only taken five of the ten Costa Rican species of *Euphonia* in the vicinity of San José, three of the other forms are frequently to be seen for sale in the market, and I have thought it might not be out of place to present not only a list of all the Costa Rican species but also a key by which the different species may be known. Below is the key and following it are my notes on the different species. I might here add that I have never seen examples of either *E. gnatho* or *E. laniirostris*.

Key to the Species of Euphonia found in Costa Rica.

- a. Size relatively small, wing not more than 2.25 inches, usually less.
 - b. Outer tail-feathers only faintly (if at all) marked with white on inner webs, and under tail-coverts not whitish.
 - c. Crissum chestnut. *gouldi*.
 - c'. Crissum yellowish. *luteicapilla*.
 - b'. Outer tail-feathers distinctly marked with white on inner webs, or under tail-coverts whitish.
 - c. Middle of belly and crissum white or whitish. *minuta*.
 - c'. Middle of belly and crissum yellow or yellowish. *affinis*.
- a'. Size relatively large, wing more than 2.25 inches.
 - b. Crissum and under tail-coverts grayish or white with darker base. *annæ*.
 - b'. Under tail-coverts not grayish or white.
 - c. Middle of belly white and outer tail-feathers marked with white on inner webs (occupying the terminal third in adult males, sometimes rather faintly indicated in females or young).

- d.* Bill moderate. *hirundinacea.*
d'. Bill much thickened. *gnatho.*
e'. Middle of belly not white, and outer tail-feathers not always with white marks on the inner webs (never present in *elegantissima* or females of other species?).
d. Adult birds with crown blue and forehead chestnut; *young* without obvious chestnut on forehead and only faint indications of blue on crown. *elegantissima.*
d'. Crown not blue.
e. Males with shining blue-black throat. Females, forehead chestnut and middle of belly tawny ochraceous. *gracilis.*
e'. Males, throat and entire under parts yellow. Females without tawny ochraceous on belly or chestnut forehead. *laniirostris.*

43. *Euphonia elegantissima*.—In the immediate vicinity of San José I have taken only a single example, but a short distance out they are a not uncommon resident.

An abnormally colored adult female in the Museum collection has the upper parts and sides of head dusky greenish olive-gray; the top of head, forehead, chin and throat are normal, the rest of the lower parts are bluish gray, whitish in middle of belly.

Euphonia affinis.—I have never taken examples here in the wild state, but they are frequently brought to the San José market.

Euphonia anne.—Not taken at San José, but frequently seen in cages.

44. *Euphonia luteicapilla*.—A rather rare bird about San José.

Young males are indistinguishable from the females. As the bird grows older the characters of the male begin to show themselves in black in the loreal region and a yellowish shading on the forehead and sides of the crown. Then a few scattering black feathers appear in the throat, and lastly the breast begins to assume an orange tint. Fully adult plumage is not attained, I think, until the second year.

45. *Euphonia gracilis*.—I took an adult male Dec. 30, 1890. The bird was in full song, and the plumage showed no signs of having been in a cage. However, the home of this species is on the southwest Pacific coast. For further observations on this species see Proc. U. S. Nat. Mus., Vol. XIV, p. 530.

46. *Euphonia hirundinacea*.—A rare bird about San José, but of rather wide distribution in the country, chiefly on the Pacific side from the coast to an altitude of about 7000 feet. They are frequently seen in cages at San José. Young males resemble females. The transition to adult plumage seems to be accomplished very slowly.

Sr. Don Anastasio Alfaro who has had frequent opportunities for observing the nesting of this bird gives me the following interesting note. The nest is constructed in a hole in the ground, frequently the bank of some stream or by the roadside where the grading of the road has left

banks suitable for the excavations which are always some distance from any habitation, the bird being quite shy. Senor Alfaro is not entirely sure whether the *Euphonia* makes its own excavations or uses deserted holes of the Rough-winged Swallow (*Stelgidopteryx serripennis*). The hole ordinarily is about a foot in depth. The nest proper consists of a few small twigs lined with soft dry grass. The eggs are ovate in form; white, thickly speckled in a ring about the larger end with light walnut brown and over this some larger spots of seal brown. In two of the five eggs before me, collected May 4, 1888, the walnut-brown color covers uniformly the entire larger end of the eggs and there are seal-brown spots above this. In two of the remaining three eggs there is a distinct band about the larger end. In the last egg the band is broken, the white ground color being quite apparent. The five eggs measure as follows: .69X.50; .70X.48; .71X.51; .72X.50 and .73X.51 inch.

47. *Euphonia minuta*.—Not uncommon about San José, especially during the latter part of the rainy season from September until November.

48. *Tanagra cana*.—A very abundant resident. Gregarious. Feeding chiefly on fruits. Usually a rather silent bird, and if it has any song I have never heard it. Breeds abundantly, but while I have taken many young I have not been fortunate enough to secure a set of eggs. The young differ from the adult only in softer, duller plumage.

49. *Piranga leucoptera*.—A rare resident species.

50. *Piranga rubra*.—Met with sparingly from the beginning of October—first noted in the fall of 1890 on Oct. 7—until about January 10; this is about San José. Down near the coasts they are not uncommon until as late as the second week in March.

In a series of forty-three birds there are only seven males in adult plumage: the remainder are females and young males, many of the latter in mixed plumage.

51. *Piranga bidentata*.—A resident, but not common. Young males resemble the adult female, and I am inclined to think that the adult male plumage is not assumed until the beginning of the second year. Birds in mixed plumage are taken only in the spring during the breeding season, while young males in the dress of the female are met with for fully nine months of the year.

52. *Buarremon gutturalis*.—Resident, but except at the beginning of the breeding season (the first of May) very shy and retiring in its habits. Feeding chiefly on the ground, at the first approach of danger they dart into the hedgerows at the sides of the lanes and are out of sight. If the bird has any song I do not remember having heard it.

This species breeds abundantly about San José. It is often compelled to act as foster parent to the Bronzed Cowbird (*Callothrus robustus*), its nests seeming to be especially attractive to this bird. The first nest I found of this species was on May 12, 1889. On that date it contained three eggs. On the 17th there were four eggs in the nest and one on the outer rim, the last two eggs being those of the Cowbird. The eggs of *B. gutturalis* are ovate in form; before being blown they appeared perfectly

white; after the contents were removed they had a very pale bluish shade. The eggs of the Cowbird are larger and much darker, varying between pale blue and pea-green. Incubation in the eggs of *B. gutturalis* was far advanced, one of the eggs being broken in removing the contents. The two remaining eggs measure $.67 \times .90$ and $.64 \times .88$ inch. The Cowbird eggs were perfectly fresh; they measured $.75 \times .94$ and $.75 \times .86$. The larger is ovate in form, and the smaller rounded ovate. The nest was placed in an upright fork of a small coffee tree, about seven feet from the ground, and was not well concealed. Outwardly it is constructed of coarse, dry grass stems, and it is lined with a little soft, fine, dry grass. It measures: outside diameter 4.75, depth 2.50 inches; inside diameter 2.50, depth 1.75 inches. I almost placed my hand on the female before she left the nest. She made no fuss, flying quietly into the low bushes near by and disappearing.

A second nest was taken June 2, 1889, containing five eggs, three of the Cowbird. The eggs of *B. gutturalis* were fresh; one of the Cowbird eggs was much incubated, the other two fresh. The *B. gutturalis* eggs measure $.90 \times .65$ and $.91 \times .65$; one is marked with a few small specks of chestnut. The nest measures 2.75 inches in inside diameter by 1.75 in depth; outside diameter, 7.00×5.00 , depth 4.00 inches. It is rather large and bulky and was built in the tops of some bushes where it was not well supported. The outside consists of rough dry grass stems; within this are smaller plant fibres and grass blades and a lining of very fine, dry grass and horse-hairs.

A third nest, taken June 11, 1889, contained three fresh eggs. The nest was rather peculiarly situated, being placed about four feet from the ground, against the trunk of a large tree, in the hollow formed by the branching of a parasitic plant that clung to the bark, and was most excellently concealed by leaves, and by far the neatest and most compact nest of the species I have seen. The three eggs measure $.67 \times .91$, $.65 \times .89$, and $.66 \times .90$ inch. A week before, in the bushes only a few feet from this nest, I took an abandoned nest containing one Cowbird's egg.

I took the last nest in 1889 on June 20. It contained two eggs of *B. gutturalis* and one of the Cowbird; all were fresh. The eggs of *B. gutturalis*, as usual, were white before being blown, and a very pale bluish after the contents had been removed. The eggs are ovate, measuring $.95 \times .68$ and $.96 \times .68$ inch. The Cowbird's egg measures $.93 \times .73$ inch, and in shape is a short ovate. The nest is roughly constructed, the materials used being much coarser than usual. Measurements: outside diameters 5.50×6.00 , depth 2.75 inches; inside diameter 2.38, depth 1.50 inches. The bird was not once seen nor heard. June 22 I shot a female with a half-formed egg in the oviduct. After this date all the specimens I secured indicated, by the ovaries, that the nesting season was passed. At this same time the birds became very shy, usually keeping themselves hidden in the low, tangled hedges.

Young birds have a slightly olive shading on the back. The white crown stripe is only indicated by a few grayish white feathers. The throat

is a paler yellow than in the adult. The breast and abdomen are washed with yellowish olive, and the feathers of the breast have dusky blackish shaft-lines.

53. *Saltator magnoides*.—This bird is widely distributed throughout Costa Rica; it is found on both coasts and up to an elevation of 6000 feet. It is resident at San José, where for about five months in the year it is one of the most pleasing songsters of the early morning. Young birds are not as bright olive above as the adult; the superciliary stripe is only faintly indicated and of a pale yellowish color. There is a narrow ashy whitish stripe on chin and upper throat; the sides of throat and breast are dusky blackish. The cinereous of the belly is variegated with blackish and on the crissum the feathers are faintly barred with pale yellowish olive and dusky.

54. *Saltator grandis*.—This is much more abundant about San José than the preceding species, but is not found at as low an altitude. In the series of forty specimens in the museum collection none were taken lower than 3000 feet, and none above 7000 feet. As is the case with its congener, *S. grandis* has a loud, clear, and very pleasing song that is to be heard almost every morning for half the year. Both the male and female sing.

The nesting season commences about the first of May, for I have taken fully fledged young by the middle of June. A nest taken May 10, 1889, was placed about twelve feet from the ground between some upright forks of a small tree at the side of a lane. It was rather loosely constructed of dry grass and other plant stems. The outside was quite rough in appearance with many straggling pieces. The nest measures inside: diameter 2.75, depth 1.75 inches; outside diameter 6.00, depth 4.00 inches. The nest contained two slightly incubated eggs. They are light Nile-blue in color, marked, chiefly in a ring about the larger end, with spots and irregular lines and scratches of black. The eggs measure 1.07×.75 and 1.04×.75 inch. The female, as soon as one approached the nest, would glide quietly away, and not return until all danger had passed. I did not once see the male near the nest.

Young birds are rich olive-green above. The superciliary stripe, spot on lower eyelid, bend of wing and under wing-coverts are pale yellow; chin and throat pale yellowish white; upper breast and sides olive-green; lower part of breast and belly olive, much suffused with buffy; crissum and under tail-coverts as in the adult.

55. *Habia ludoviciana*.—Rare. I have never seen a specimen taken here in the plumage of the adult male.

56. *Sporophila moreleti*.—Common resident. This species, I believe, is never found on the Atlantic side of the mountains, but on the Pacific side down to the coast. Although it breeds abundantly about San José I have not found either the nest or eggs. This species is prized very highly as a cage bird, the song being low and sweet, and not without variations.

57. *Volatinia splendens*.—Common resident. Not found on the Atlantic side of the mountainous interior.

(*To be continued.*)

A FURTHER REVIEW OF THE AVIAN FAUNA OF
CHESTER COUNTY, SOUTH CAROLINA.

BY LEVERETT M. LOOMIS.

(Continued from Vol. VIII, p. 173.)

OBSERVATIONS ON MIGRATIONS.*

December and January.—The migrations may scarcely be said ever to be at a complete standstill in this region. Every month of the year witnesses migratory movements. In December and January both northward and southward movements are alternately manifested, each in turn obtaining the supremacy. Toward the close of the latter month, if the season be favorable, the former movement gains the ascendancy, setting more steadily northward. Temperature appears to be a controlling influence at this time of the year. Cold waves increase and warm ones diminish the abundance of some birds, especially those that winter chiefly further north—the Prairie Horned Lark for example.† Snow renders some birds particularly plentiful, others scarce; the American Pipit being entirely driven away by it. With the uncovering of the ground, however, it immediately reappears. After mild weather it sometimes happens that the Pipit, in its movements southward, waxes in numbers with cold, the severe waves sending birds from further north, yet not driving the majority south of us. The exceptional mildness of December, 1889, accelerated the progress northward. Birds that ordinarily winter rather sparingly in the Upper Country, and more abundantly in the Lower, gradually appeared in larger numbers, the Mockingbird and Pine Warbler being notable instances. The Grasshopper Sparrow also made its appearance, and some of the common birds of winter became less numerous, the Red-tailed Hawk almost wholly disappearing. In January there were feeble movements from the north during cool spells, but there was no perceptible diminution in the birds that had advanced from the

*Read at the Ninth Congress of the American Ornithologists' Union, Nov. 18, 1891.

†The previous portions of this article should be consulted where examples are cited without statement of detail.

region below. After the intervals of inclemency their numbers further increased, the Pine Warbler becoming decidedly abundant. In neither month was the Palm Warbler met with, it apparently being less susceptible to the milder influences of temperature than its congener.

The presence or absence of birds in winter cannot be explained wholly on the score of migration brought about by cold or warmth. Irrespective of these conditions, one season a particular species may be plentiful in a restricted locality, while the next it may be but poorly represented there, or even entirely wanting. Bewick's Wren well exemplifies this. A similar shifting of abode has been observed in the Purple Finch, Towhee, Brown Creeper, and others. The peculiar case of the Red-headed Woodpecker also bears upon this point. This transposition of habitat may be accounted for in part on the ground that there exists among certain species a tendency to aggregate around local centres (the contiguous territory at the time being thinly inhabited or even totally depopulated), and that these centres shift with different years. Why a locality is selected or rejected is not obvious. Birds must occupy some part of the region constituting their winter habitat, must be somewhere, and, if the conditions were alike, the choice of a particular location might be largely arbitrary. It falls within the bounds of possibility that a mere desire for change of scene, as among human beings, may have some weight in determining the selection of a winter home. On the other hand there may be causes that have escaped our discernment, which if understood, would account for much that now seems in a measure mysterious. The question of food is an all important one, but when a locality has been forsaken by any of the species mentioned there has been no visible deficiency in the food supply. The disposition, without apparent reason, to shun certain localities, save during migratory movements, further accounts for the absence of birds.

For about a week during the early part of January, 1887, the whole country, hereabouts, was suddenly flooded with Robins. They were as abundant as during the height of their northward migration. The occurrence was so unusual as to excite general remark that the Robins had come a month ahead of time. Their appearance was coincident with snow and a severe turn in the weather. With the advent of a milder season they disappeared.

At the usual time the regular migration northward took place. Their presence in the first instance finds solution, I think, in the shifting of a local centre above us, the boreal weather driving the birds southward, the pleasant weather enticing them northward again. The army of regular migrants that came later were evidently those that wintered further south. The movement of Bewick's Wrens at the close of December, 1889, may be imputed to migration northward of the birds of some local centre of abundance not far removed, the long-continued clemency bringing it about. It is assumed, as a general principle, if birds appear abruptly in the depth of winter and then again in the flush of migration, that their first coming is due to local shifting, from the north if cold, from the south if warm.

During the hard winter of 1886-87 there were great inroads of Red-tailed Hawks; the mild winter of 1889-90, as previously stated, was notable for their scarcity. Their absence in the latter season is seemingly explained by the migration of local birds occasioned by warmth that was not sufficiently far-reaching to bring the breeders and later migrants from further south to fill their places.

When the centres of distribution are small, at the extremes of range or elsewhere, a retrograde or a forward movement would result in but a slight influx in the region immediately invaded. It further follows that when a locality does not lie within the path of a north-bound community, another point further north may be sooner reached, be sooner to have recorded from it, 'first appearance.'

February to the Middle of March.—Ordinarily it is not until February that the northward movement becomes conspicuously apparent. Many winter residents are then reënforced from the region below and the departure for the north truly begins. This month is also the usual time of the opening of the song period. Unless the season is backward, by the first week there are decided signs of migration. Robins become more noticeable and Red-winged Blackbirds are found with increasing regularity, and greater activity is displayed among the hordes of Sparrows. The Meadowlark, too, grows restless. The Flicker, Pine Warbler, Mockingbird, and others begin to increase in numbers and become more generally distributed. As the days pass, if the weather is not unfavorable, the movement from the south gains

steadily in strength, the middle of the month and the third week showing marked increase in many 'resident' and winter birds, as Wilson's Snipe, Vesper and Field Sparrows, Cardinal, etc. The hosts of Robins and Blackbirds also arrive, and females become more numerous in species represented in winter chiefly by males. In forward seasons straggling Grasshopper Sparrows make their appearance. By the end of the month the flood tide of the Robin migration is reached. Other birds have been continually strengthened, and a few, as the Bluebird, have waned. The dates given are the approximate average, an open or backward season manifesting corresponding earlier or later ones. The fluctuations in abundance of winter birds, which arise from the passage of successive waves northward, begin to be apparent in this month. At this time of the year the cold is rarely ever of sufficient duration to cause pronounced movements from the north. A few Prairie Horned Larks, however, respond to the severer waves, and the advancing migrants are sometimes forced back, the scale of local abundance ascending somewhat as in a forward movement. A descent of temperature usually produces but little effect upon the birds that have come up from the region below, though protracted inclemency retards further advance.

During the first half of March the migration is chiefly a continuation of the movements of February. The birds that winter mainly below receive further accessions. Other winter residents decline, or exhibit variations in abundance as the waves roll northward, a considerable hiatus often existing between the different advances of a species. Cold sometimes checks the migration as in February, holding it in abeyance, but rarely, if ever, bringing about slight regurgitating movements.

Middle of March to the Middle of June.—With the coming of the Black-and-white Warbler, about the 15th of March or during the week following, begins the regular migration of birds that are never found in this locality in the winter. But a few days behind this Warbler arrive the first Blue-gray Gnatcatchers. Both usually become very numerous during the last portion of the month. Bachman's Sparrow, the Yellow-throated Warbler, Maryland Yellowthroat, White-eyed Vireo, Henslow's Sparrow, Bartramian Sandpiper, Parula Warbler, Yellow-throated Vireo, and Black-throated Green Warbler also make their appearance at the end of the month, about as in the order named. The last

three, however, are essentially April birds as to the time of their first arrival. Some of the constant winter visitors diminish greatly during the closing fortnight, successive waves characterizing their decline. The aftermath of the Robin migration, too, continues in a similar manner through this month. Other species, again, simply display fluctuations. Some of the irregular and uncommon birds, wintering chiefly in the region below, as the Brown Thrasher, now become prominent, unless delayed. The breeding season proper normally opens in this month, particularly during the last half of it.

The ordinary spasmodic returns at this time of the year to cooler temperature have not been found to exercise great influence upon the migrations, the birds usually being but little affected by such vicissitudes. When once under headway they stubbornly hold their ground. Prolonged inclemency, which is now exceptional, is more potent, however, impeding the movement during its prevalence. While the most forward seasons have been the mildest, it has not invariably been true that an open spring was accompanied by corresponding early migratory movements from the south. Other agencies, aside from local cold, have sometimes, apparently, arrested advance. The backward spring following the phenomenally mild winter of 1889-90, considered in connection with other years, showed that the later migrations, those of the Black-and-white Warbler, etc., are directly accelerated or retarded by the immediate meteorological conditions, and not by the remote ones. Late dates of first arrival, in individual species, are not to be accounted for solely, I believe, by phases of the weather, as is evidenced by the case of the Yellow-throated Warbler which varies considerably in its coming in different years when other early migrants are on time. Other causes, as a variation within narrow limits in the line pursued by the vanguard, may bring about these apparent delays. It may further be stated, in general, if the van of migration was held back immediately below a point, the territory nearest above might be passed over for the time being, and a locality further north be the first stopping place, and hence exhibit an earlier record.

The migrations gather force through April onward until about the first of May, or the first week of May, when the falling off commences. The winter birds (migrants really) now finally disappear; some, as the Slate-colored Junco, about the first or

second week of April, others, as the Hermit Thrush, after the middle of the month. A few linger well on into May, as the Savanna and White-throated Sparrows and the American Pipit. During April the Myrtle Warbler (an abundant winter resident) attains its greatest abundance, illustrating the increase, from the bulk below, of a species wintering here in numbers. The American Crow, a 'permanent resident,' does not altogether complete its migration until the early part of April, though its breeding season is well under way. The Robin migration closes about the middle of the month, straggling parties bringing up the rear. Summer birds continue to arrive, the majority of individuals in some species passing further north. Transients vanish and others take their places. In all waves are typically exemplified. From the foregoing it will be seen that 'winter residents,' migrants, and breeders overlap. The general dispersion of early breeding birds, and later ones as well, which occurs after the young are hatched, contemporaneously with the northward movement, is not to be ascribed, of course, to reinforcement through migration, either northward or southward, nor is their comparative scarcity during the interval of confinement to the vicinity of the nest to be attributed to the opposite cause, withdrawal from the locality.

After the first week of May the decline in the migrations becomes very evident. New arrivals ('firsts') cease to appear. The scale of abundance among most transitory visitants rapidly descends; in a few, however, as the Bobolink, the failing point is often not reached until about the 15th. With the progress of the month, wider and wider gaps occur between the waves, and by the first of June the rear guard consists only of stragglers. The young in most species are now hatched and many are abroad. By the middle of June the period of song in some birds begins to wane, and generative organs to deteriorate, and incipient bird gatherings to form, — all portending southward movement.

Middle of June to November.—The departure of adult birds of certain species, as the Black-and-white Warbler, at the close of their season of reproduction inaugurates the southward migration in this region.* The precise time when old birds leave

*It is not intended to impart the idea that the young, in varying numbers, do not, in some instances, accompany the adults.

varies. Those that have been hindered from any cause in bringing up young are later in starting than other representatives of the same species. Some species finish breeding early, and depart early, while others are tardy breeders or normally raise second broods. That second broods, however, are habitually reared by but comparatively few species in this vicinity, is my firm conviction. Of recent years my attention has been so largely fixed upon other lines of field work that I have not been able to devote the careful observation necessary to determine, even with approximate exactness, the time when the first stages of movement take place in each species breeding here. About the 20th of June, however, if not a little sooner in some years, appears to be the date of the inception of the migration.*

With July come the first Warblers that are not known to breed hereabouts, — the American Redstart, Worm-eating Warbler, Louisiana Water-thrush. All, however, rear their young near by in the mountains. It is worthy of note, that all these early comers, that I have taken, and others in August, have been birds-of-the-year. They were probably stragglers of short migration, the adults having previously passed over us in their southern flight. In evidence of this, it should be mentioned that at Mt. Pinnacle and Cæsar's Head the adults of the Louisiana Water-thrush disappeared about the middle of June. Furthermore, a number of common summer residents of the Southern Alleghanies pass in their migration southward without stopping in this locality, being rarely or never detected. Circumstances similar to this case of the prior occurrence of hornotines have very likely led to the belief, entertained by many, that the young precede the old in journeying southward.†

The migratory impulse is further manifested in July by the continued desertion of summer residents. Toward the end the

*In this connection note the arrival of Warblers in July at Key West, *Scott*, Auk, Vol. VII, pp. 16-22.

†From the very nature of the case it cannot be affirmed with certitude that the first arrivals at a given location (particularly one having a great stretch of territory to the northward) are the first birds that have migrated from any common starting point — the place of breeding. On the contrary, when adult birds have grown scarce in a locality and the young remain in force, and there have been no fluctuations in abundance indicating movement from above, and adults of the same species occur soon after in the region lying to the southward of the breeding range, it does seem to be proven that the young do not migrate earlier than their parents.

Orchard Oriole and Summer Tanager take their departure. The gathering of claus of Red-winged Blackbirds and their subsequent disappearance form one of the closing features of the month. Birds similar to the breeding ones, also, begin to appear from localities above as the month progresses. The Black-and-white Warbler, Parula Warbler, and Blue-gray Gnatcatcher are examples. The first song period draws rapidly to a close with July. In the study of the beginnings of the southward migration, the waning of the song season tends to convey an erroneous idea of rarity in many birds, owing to their diminished prominence, while on the other hand the formation of gatherings and the general distribution incline to create an impression of increased abundance. The inroads of birds of like kind to those that breed are also to be taken into account — migrants not being mistaken for denizens.

August, from the outset, is a month of extensive movements in this region. The waves of migration, and they are sharply defined, bring many species that have grown scarce, or varied in abundance, since their season of breeding was over. Some reappear in limited numbers, never reaching their previous prominence, as the Orchard Oriole, Summer Tanager, Prairie Warbler, etc. Others become more plentiful than they were before, as the Chuck-will's-widow, Whippoorwill, Loggerhead Shrike, Yellow-throated Vireo, Parula Warbler, Carolina Chickadee, Blue-gray Gnatcatcher, etc. In all intervals of paucity are conspicuous. In certain birds, as the Yellow-throated Warbler, there is a period of absence, more or less marked, between the going of the breeders and the coming of the migrants. The Ovenbird, Cerulean Warbler, Blackburnian Warbler, Chestnut-sided Warbler, Golden-winged Warbler, and Bobolink arrive — the first three in the early part of the month. All occur intermittently and, with the exception of the Ovenbird, Chestnut-sided Warbler, and Bobolink, very sparingly. Wilson's Thrush has been taken in two instances during the last week of this month. Of July birds, the American Redstart and Worm-eating Warbler are at times fairly numerous, the former especially. From the study of the after movements it seems safe to say that the August migrants are from territory not far distant. Reproduction here practically ceases with August. It is only the few tardy species and second breeders that protract it even to this length.

With August, likewise, essentially terminates the season of first song, — the singing of the last of the summer residents coming to an end. Before the conclusion of the first season, the second begins in the efforts of the young and the returning migrants, summer species. The opening of this second period is typically illustrated in the Mockingbird about September 1, or a little later. A great influx of this species takes place during August. From the first or second week onward they swarm the hedgerows, plum thickets, and roadsides. The late breeders — Blue Grosbeak, etc. — commence to depart at the termination of this month. About September 1, the Blue-gray Gnatcatcher passes the point of culmination. It carries on, however, nearly or quite to the end of the month.

Through September the tide of migration continues to rise, the high-water mark being reached about the first week of October. 'Resident' and summer species alternately wax and wane with the swell and fall of the current. Most of the latter decrease before the close of the month, as the Red-eyed Vireo. Some, as the Orchard Oriole, altogether cease to appear. Of the former, many grow more numerous, as the Flicker and Bewick's Wren. Among the purely transients, August arrivals are in the ascendency, waves following waves in frequent succession. Some of these earlier birds of passage now gain their maximum abundance, as the Chestnut-sided Warbler and American Redstart. The new ones come mainly after the first week, in most cases attaining extreme numbers in October, as the Black-throated Blue, Black-throated Green, and Palm Warblers. The appearance of the Savanna Sparrow, well to the close of September announces the coming of winter birds. Belated broods and migrants of the same species sometimes overlap. An instance of this sort is recalled in the Blue Grosbeak. A family of young, unsteady of wing, under the care of the mother bird was observed September 4, 1888. The day before a party of migrants were seen, — adjudged migrants because of the time of year and their manner of behavior. They flew high in air, coming from the northward, and alighted in a body on the summit of a giant pine, blasted and weathered. Their whole mien and conduct were entirely at variance with summer demeanor.

A striking feature in the southward migration in this region is the collection of the woodland birds into gatherings led by Tufted

Titmice and Carolina Chickadees.* In a typical gathering there will be associated with a band of these birds a few White-breasted Nuthatches, one or more Downy Woodpeckers, and a multitude of Warblers, Vireos, etc. On different days, these gatherings vary in aspect, species temporarily predominant giving to each a distinctive character. Thus, July 31, 1888, the Blue-gray Gnatcatcher was the prevailing bird; August 8, the Parula Warbler; September 11, the Blackburnian Warbler. The last, also, was the characteristic bird September 24 of the previous year. Examples of this sort might be cited indefinitely. So constant are these gatherings, that when they have not been detected—a considerable tract of territory being traversed and groups of Titmice and Chickadees found—it has been regarded proof that no movement of importance of woodland birds has taken place.† In spring these assemblages are prominent at the outset, but usually after the first of April the migrants form oases, or islands, in the woods rather than compact bodies moving synchronously.

The ebbing of the southward migration begins soon after the first week of October. It is more gradual than the decline in the opposite movement, bearing closer resemblance to that movement at its commencement. The last of the strictly summer species finally withdraw. Several, as the Red-eyed Vireo, loiter on toward the end of the month. Transients as first arrivals are replaced from the start almost exclusively by species that reside during the winter, the Yellow-bellied Sapsucker, Song Sparrow, Myrtle Warbler, and American Pipit being examples. At the middle of the month, unless their departure has been hastened, the Parula, Black-throated Blue, Blackpoll, and Black-throated Green Warblers are present in force. Through the third week there are still quite a number of typical migrants remaining, some of them continuing fairly numerous. The last week is one only of stragglers, as the Blue-headed Vireo, Cape May Warbler,

*The subject of bird gatherings in the migrations will be considered at greater length in a subsequent paper.

†This statement, or any former one implying oscillatory movement, is not in any sense to be construed as conflicting with the theory of a continuous current of migration setting steadily southward; the phenomena described being simply local manifestations. A simile is perhaps found in a vast army of Crows on their way to roost, great flocks being connected by straggling columns in one unbroken array.

Black-throated Blue Warbler, Blackpoll Warbler, Black-throated Green Warbler. During the last half of the month, all the regular winter sojourners are represented (the Prairie Horned Lark and a few others perhaps excepted) — some by large numbers, as the Song Sparrow and Golden-crowned Kinglet. The Flicker, toward the middle of the month, and the Ruby-crowned Kinglet, at the close, exemplify the diminution, in its beginning, of 'resident' and winter birds most abundant as migrants.

The Parula Warbler serves well as a type of the whole southward movement. As a breeder it is only tolerably common. In July it begins to grow more numerous. Increasing through August, it finally attains its greatest numbers in September and early October. During all these months fluctuations are constant, and they may well be supposed to indicate waves of migration; each rise in the scale of abundance signifying arrival of birds from territory farther and farther north, and each fall, departure for the south. Among strictly transient species the migration is epitomized, likewise, in the Blackburnian Warbler, its sojourn having extended from August 8 to October 22. The appearance of the Red-breasted Nuthatch — a summer dweller in the higher mountains of North Carolina — at the end of September seems to throw additional light upon the source from which the later and earlier migrants are drawn. The Wood Thrush during the last days of September and first part of October furnishes a striking instance of the reappearance of birds after a well-defined period of absence, the intervening gap being accounted for by the passing over of the inhabitants of the nearer localities. The oscillations of the earlier season continue to the close of the migration.

November.—What February and the first half of March are to the northward movement, November is to the southward. The opening fortnight witnesses the full tide of Blackbirds, the Red-winged returning after a long void but imperfectly broken since the breeding season. The Meadowlark reaches its height and wanes, and most other winter birds come to their complete measure of abundance. About the 15th the topmost wave of this closing migration recedes, and the subsidence to winter numbers takes place, and the refugees from the northern blasts appear, and, at last, the contest of movements begins anew. In November, too, occur loiterers, chiefly species wintering not far below,

as the Grasshopper and Henslow's Sparrows, Blue-headed Vireo, etc. Prolonged warmth holds some birds here and further north in abundance greater than is usual. The effect of temperature is illustrated in the Mockingbird. At the beginning of October, 1889, they were abundant, but a sharp turn and heavy frost drove all but winter numbers southward before the week was over. The year before, when exceptionally mild, they had not reached this basis on the 24th, although diminished by a cool wave and slight frost that came September 30. It appears to be true that an early cool spell is more potential with certain species than subsequent protracted mildness—the bulk retiring before the chill instead of tiding it over. The genial weather later, however, may encourage other species coming from further north to remain in larger numbers than they would if it were ordinarily cold.

(*To be continued.*)

A PRELIMINARY LIST OF THE BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON.

BY R. H. LAWRENCE.

GRAY'S HARBOR lies on the Pacific Ocean in the extreme western part of Chehalis County, Washington, about forty miles north of the mouth of the Columbia River. It is the most northern of the few safe and large harbors between San Francisco and the Straits of Fuca. The harbor drains a large area, is bordered by much marshy land, and, being large and mostly shallow, shows when the tide is low a vast expanse of mud-flats cleanly cut by the two main channels—the north and the south. These channels separate inside the bar and run eastward till they join again near Aberdeen. The harbor is about sixteen miles long east and west, by twelve north and south at its western end, narrowing much toward its eastern end. It is protected from the sea by two long, narrow, sandy points, Point Brown on the north and Point Chehalis on the south. Its largest river, the Chehalis, rises in the Cascade Mountains near Mount Rainier, and is navigable by steamers for twenty miles or more. The Humptulips,

next in size, rises in the Olympic Mountains, flows southwest fifty or sixty miles, and empties into its northwest side. This stream is shallow, rapid, broad, and very clear; it is not navigable by steamers, excepting small ones for three miles. Canoes are poled up-stream for thirty miles. All the harbor streams have much marsh land about their mouths. The whole country back of this low land is hilly and is densely covered with a heavy growth of large timber — fir, hemlock, spruce, and cedar. The firs and spruces grow to be giants: it is usual to see them from four to seven feet in diameter, and over two hundred feet high. Underneath these great trees is generally a thick growth of vine-maple, hemlock, large and small, alder, etc., the ground being a network of ferns, vines, bushes, and brush, with fallen giant trees here and there in all stages of decay. On all this much moss grows; and long festoons hang from the branches of the standing trees. Except in the few dry weeks of midsummer, the bushes and ferns are generally wet. With one's face spattered with rain-drops and cobwebs, and with an unsure footing, it is no wonder progress is slow through such a tangle. There are a few scattered prairies or 'opens' north of the harbor, mostly of poor soil covered with a large growth of ferns. Stevens Prairie is the largest and most grassy. Three towns are on the harbor: Aberdeen at the junction of the Wishkah and Chehalis Rivers; Hoquiam on the Hoquiam River, four miles farther west; and Ocosta on the opposite (southwest) side between the Johns and Elk Rivers. The only industry is the manufacture of lumber.

In April, 1890, I first visited this section, for a few days, going just beyond the present site of Ocosta. Afterwards a few more hurried trips were taken; and one in May was extended to Stevens Prairie, a natural prairie lying along the north side of the Humptulips River for two miles, and reaching back for a mile to Stevens Creek, which borders it on the north. Humptulips is situated on the prairie. Flowers blossom there plentifully, and in the river-bottoms, the soil being very rich, is a great growth of underwoods with large cottonwoods, alders, and maples, and a scattering of giant spruces. Humptulips is about twenty-four miles northward of Hoquiam by the county road. From the first part of June to the first part of October, 1890, and again from about the middle of December, 1890, to July, 1891, I was in the county, and most of my time was spent on the East Humptulips

River, in a very rough and densely wooded region, some ten miles northeast of Stevens Prairie. Occasional trips were taken to the harbor, and in June, 1891, one long tramp of five days to Quiniault Lake, a lovely sheet of water lying eighteen miles north from Stevens Prairie. Until April but little chance was had to study the bird life. The winters are generally mild at Humptulips, though there are many frosty nights in summer. There is a great rainfall from late autumn to well into the spring; perhaps nearly one hundred inches of rain fall yearly. What snow falls usually melts in a few days, except on the high ridges. The summers are generally dry and fine from late June to September.

To Dr. J. A. Allen many thanks are due for much assistance in determining species and for courtesy shown.

Æchmophorus occidentalis. WESTERN GREBE. — Winter resident? Occasional? Have seen a mounted specimen, shot on the harbor about February.

Urinator imber. LOON. — Winter resident? A skin examined of one shot on the harbor in March.

Lunda cirrhata. TUFTED PUFFIN. — Accidental. Rare at this point on the coast. I have examined a mounted specimen and a skin of birds secured on the south and north sides of the harbor after a great storm, or series of storms, about December 25, 1890, when a large number of the bodies of these birds were driven on to the beach. About thirty were seen by Mr. S. A. Wye below Peterson's Point (Point Chehalis), and perhaps as many above Point Brown — one of these birds was alive.

Larus glaucescens. GLAUCOUS-WINGED GULL. — Winter resident. Very common about tide-water from fall until late spring. During the salmon runs in fall and winter, when so many hundreds of these fish are at times rotting along certain branches of the Humptulips, and far up the river, these birds fly often thirty miles or more up-stream to feed upon them, returning at evening to the harbor.

Larus occidentalis. WESTERN GULL. — Winter resident. Very common on tide-water, and I think in greater numbers than any other Gull. Habits similar to *L. glaucescens*.

Larus philadelphia. BONAPARTE'S GULL. — Winter resident. Habits similar to those of the two above. In numbers not so plentiful. Large flocks reported seen on Quiniault Lake in April.

Merganser americanus. AMERICAN MERGANSER. — Resident. Common on the Humptulips, where they breed.

Anas boschas. MALLARD. — Resident? Common during migrations. A few are said to breed on the Humptulips and Upper Quiniault Rivers, but I am not yet quite positive of this.

Anas strepera. GADWALL. — Migrant? Two seen May 17, near Hoquiam, flying at a distance.

Anas americana. BALDPATE. — Migrant? Not common. A mounted bird seen, shot on the harbor about March.

Aix sponsa. WOOD DUCK. — Resident? Not common. A few seen on the Chehalis River May 12. A few said to winter about the harbor.

Aythya vallisneria. CANVASBACK. — Migrant. Fairly common on the harbor during migrations.

Aythya marila nearctica. AMERICAN SCAUP DUCK. — Winter resident? Pretty common.

Aythya affinis. LESSER SCAUP DUCK. — Winter resident? Common. In greater number than *A. m. nearctica*. Habits similar. One shot May 11.

Glaucionetta islandica. BARROW'S GOLDENEYE. — Winter resident. Not common? A mounted specimen seen, shot on the harbor in February.

Charitonetta albeola. BUFFLEHEAD. — Winter resident. Not very common. A mounted specimen seen, shot on the harbor in February.

Oidemia perspicillata. SURF SCOTER. — Winter resident. Pretty common. Frequents the ocean—the saltier—side of the harbor.

Erismatura rubida. RUDDY DUCK. — Resident? Saw two Ducks on Quiniault Lake, June 14, at a distance, which I felt sure were this species. They were very wild.

Branta canadensis. CANADA GOOSE. — Migrant. Common on the harbor tide-flats during the migration, in large flocks, and with other species. One seen on the East Hoquiam River May 21.

Branta nigricans. BLACK BRANT. — Migrant. Fairly common on the harbor during migration. A flock seen flying south August 30, 1890, near Axford Prairie, four miles south of Humptulips.

? *Olor columbianus*. WHISTLING SWAN. Migrant. Rather rare. Two Swans were shot this year on the harbor by boatmen; one April 18, out of a flock of seven or eight. A flock of about twenty was reported by a settler as passing over Humptulips about April 10.

Botaurus lentiginosus. AMERICAN BITTERN. — Resident? Not common. Several seen near Ocosta April 3, 4, and 5, 1890.

Ardea herodias. GREAT BLUE HERON. — Resident? Rather common. Several seen near Ocosta April 3, 4, and 5, 1890, and after. Seen on the lower Humptulips; also one on Quiniault Lake June 14.

? *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON. — A Heron, which was taken for this one, flew up as our canoe approached the east shore of Quiniault Lake, June 12.

Grus mexicana. SANDHILL CRANE. — Migrant. Fairly common on the harbor during migrations. A flock of eighteen or twenty seen April 20, near the head of tide-water on the Hoquiam River, flying north.

Gallinago delicata. WILSON'S SNIFE. — Migrant? On the evening of April 2, 1890, I picked up one which was injured, on the street in Aberdeen. They often fly very low over the harbor towns, in the gloaming. I saw a large flock near Hoquiam on March 8, 1891.

Tringa alpina pacifica. RED-BACKED SANDPIPER. — Migrant. Common. Many flocks of six to twenty were seen on the north shore of the harbor May 11. Also sparingly associated with *Ereunetes occidentalis*.

Ereunetes occidentalis. WESTERN SANDPIPER. — Summer resident? Very common. Many large flocks were seen May 11 on the north shore of the harbor; in them were almost invariably a few *T. a. pacifica*. Flocks of Sandpipers, taken to be *E. occidentalis*, were seen on the harbor July 4.

Actitis macularia. SPOTTED SANDPIPER. — Summer resident. Very common during migrations. Some breed on the Humptulips River.

Numenius hudsonicus. HUDSONIAN CURLEW. — Winter resident? Large flocks seen April 19 at a distance on the 'flats' at Hoquiam.

? *Callipepla californica*. CALIFORNIA PARTRIDGE. — Resident. From stock introduced in the fall of 1889 by a settler living on the Humptulips near Stevens Prairie. Flocks of young birds seen in the summer of 1890 and in May, 1891, by settlers at Stevens and Axford prairies. Descriptions not clear; may be *Oreortyx pictus*.

Dendragapus obscurus fuliginosus. SOOTY GROUSE. — Resident. Common. Oftener heard booming from some tall spruce or fir than seen. In winter rarely seen, as it lives in the tree tops two hundred feet above ground.

Bonasa umbellus sabini. OREGON RUFFED GROUSE. — Resident. Common. More plentiful than *D. o. fuliginosus*. Most plentiful in the river-bottoms and more open places in the woods, unlike *fuliginosus* which loves to haunt the large timber.

Columba fasciata. BAND-TAILED PIGEON. — Summer resident. Common in the larger river-bottoms where cottonwoods, alders, and other soft woods grow, and berries abound.

Aquila chrysaëtos. GOLDEN EAGLE. — Resident. Rare. One was seen May 10 perched in a tall spruce on the bank of the lower Humptulips.

Haliaëtus leucocephalus. BALD EAGLE. — Resident. Rather common on the harbor, and occasionally seen on the Humptulips. A pair, evidently breeding, observed at Quiniault Lake June 12.

Falco columbarius. PIGEON HAWK. — Resident. Not common. One flew very close to me, May 22, near the Hoquiam River. A few seen elsewhere and on the Humptulips.

Falco sparverius. AMERICAN SPARROW HAWK. — Resident. Pretty common. One seen August 13, 1890, on the East Humptulips. Small Hawks now and again seen there, at Stevens Prairie, and on Gray's Harbor, some of which were noted as this bird, others probably being *Accipiter velox*.

Pandion haliaëtus carolinensis. AMERICAN OSPREY. — Resident? One seen April 12, catching fish near the mouth of the Humptulips. Near the same place saw two, May 11, evidently breeding there.

? *Strix pratincola*. AMERICAN BARN OWL. — Resident. This Owl was seen twice in February near the East Humptulips by a neighbor who de-

scribed it to me pretty clearly. The bird seemed to be attracted by the carcass of a small striped skunk.

Scotiaptex cinerea. GREAT GRAY OWL. — A skin examined of one shot near Ocosta in May.

Nyctala acadica. SAWWHET OWL. — Resident. Reported by settlers who had heard and seen it on the lower Humptulips in March and April, 1891. It frequented then an overflowed bottom.

Glaucidium gnoma californicum. CALIFORNIA PYGMY OWL. — Resident. One shot on the East Humptulips September 2, 1890; another seen at same place January 22.

Coccyzus americanus occidentalis. CALIFORNIAN CUCKOO. Summer resident. Uncommon. I heard one near the East Humptulips River September 15, 1890, and at the same place saw and heard one high up in a dead fir a few days later — September 27. The man who was then with me reported hearing one on the Wishkah River in June, 1891.

Ceryle alcyon. BELTED KINGFISHER. — Resident. Very common on the lower parts of the harbor streams; fairly common on their upper waters and on the Quiniault River.

Dryobates villosus harrisii. HARRIS'S WOODPECKER. — Resident. Common everywhere.

Colaptes cafer RED-SHAFTED FLICKER. — Resident. Pretty common on the occasional grassy prairies along the Humptulips and on the scantily wooded salt marshes about its mouth.

Trochilus rufus. RUFOUS HUMMINGBIRD. — Summer resident. Very common on Stevens Prairie, and common on the Humptulips River bottoms where salmon-berry and other flowering bushes grow. First seen in 1891, April 12, near James's Rock on the north side of the harbor.

Trochilus alleni. ALLEN'S HUMMINGBIRD. — Summer resident. Perhaps as common as *T. rufus*, and frequenting similar places. First noted in 1891 on the East Humptulips, April 30. I had a good view of one on Quiniault Lake June 13.

Trochilus calliope. CALLOPE HUMMINGBIRD. — Summer resident. As common perhaps as *T. rufus*. First seen in 1891 on Stevens Prairie, April 22. The Hummers are very plentiful in this region, and are found in abundance on Stevens Prairie where the conditions are very favorable for breeding, the prairie being bounded north and south by two streams, Stevens Creek and the Humptulips River, whose fertile bottoms have quite a growth of salmon-berry and other bushes. The prairie produces many kinds of flowers and berries. No specimens of Hummers were secured.

Contopus richardsonii. WESTERN WOOD PEWEE. — Summer resident. One shot June 3 on Stevens Prairie. Heard occasionally there and on the Humptulips; also at Quiniault Lake, June 14.

Empidonax difficilis. WESTERN FLYCATCHER. — Summer resident. One of the commonest, if not the commonest, of the Flycatchers here.

Empidonax pusillus. LITTLE FLYCATCHER. — Summer resident. Rare. One seen August 21, 1890, and another May 25, 1891.

Otocoris alpestris strigata. STREAKED HORNED LARK. — Resident? A pair, seen June 12 on the Upper Quinault River by my companion, came to our camp at a small clearing on the river bank. One reported by a settler on the Lake as seen several times in April. My companion also described a pair which lived from April to June near his house in the woods four miles north of Humptulips; the forest there was broken by open beaver marshes.

Cyanocitta stelleri. STELLER'S JAY. — Resident. Common on the water courses, and in the clearings; in the forests largely replaced by *P. obscurus*. Very suspicious and alert.

Perisoreus obscurus. OREGON JAY. — Resident. Common in the heavy timber; not often seen in the opener places. An unsuspecting and rather silent bird.

Corvus corax sinuatus. AMERICAN RAVEN. — Resident. Fairly common in the thicker timber; probably would be so in the opener places, but *C. caurinus* makes war on it. Sometimes not seen for days, then a flock may be located by the noise it makes over some elk's or deer's carcass.

Corvus caurinus. NORTHWEST CROW. — Resident. Very common on the lower Humptulips and the harbor tide-flats; common on the upper river. With the Gulls they are good scavengers when salmon are running in fall and winter.

Agelaius gubernator. BICOLORED BLACKBIRD. — Winter resident? I saw a few at Hoquiam March 8. I think they stay on the harbor all winter.

Scolecophagus cyanocephalus. BREWER'S BLACKBIRD. — Resident? Pretty common on the harbor; a few winter there, I believe. Saw one at Stevens Prairie May 3.

Loxia curvirostra minor. AMERICAN CROSSBILL. — Resident. Common. Gregarious. Oftener heard chipping in the high tree tops, than seen. Confined mostly to the thick and tall timber. Generally seen in flocks of six to ten. Near the Hoquiam River on December 13 I saw a great flock of two or three hundred perched high in two tall dead trees.

Ammodramus sandwichensis alaudinus. WESTERN SAVANNA SPARROW. — Summer resident. Common on the harbor about Hoquiam and on Stevens Prairie where they breed. This bird may be typical *sandwichensis*, but the measurements of a skin I have seem too small.

Zonotrichia leucophrys intermedia. INTERMEDIATE SPARROW. — Resident. Very common on Stevens Prairie and on the harbor, where they breed. First noted in 1891 on Stevens Prairie April 12. Some probably winter there. A sweet songster.

Junco hyemalis oregonus. OREGON JUNCO. — Resident. Not as common as *Z. l. intermedia* or *M. f. guttata*, but fairly common.

Melospiza fasciata guttata. RUSTY SONG SPARROW. — Resident. Very common everywhere on the harbor, and along its tributary streams, and on the few natural prairies. Fairly common on the Quinault. Heard two singing sweetly at Aberdeen in February in cold wintry weather. The finest songster in this region.

Chelidon erythrogaster. BARN SWALLOW. — Summer resident. Common on the harbor, especially at Hoquiam. A few seen on Stevens Prairie.

Tachycineta bicolor. TREE SWALLOW. — Summer resident. A pair seen May 10 perched on a snag on a sand bar of the lower Humptulips. Another noted near the same place, July 4.

Tachycineta thalassina. VIOLET-GREEN SWALLOW. — Summer resident. Pretty common on the harbor, especially at Hoquiam. Have noted none at Stevens Prairie.

? *Clivicola riparia.* BANK SWALLOW. — Summer resident. Not common. First noted in 1891 on Stevens Prairie May 3. Seen also on the lower Humptulips July 4 and at other times. I have no specimen of this bird; it may be *S. serrifennis*.

Lanius ludovicianus excubitorides. WHITE-RUMPED SHRIKE. — Resident? Rare. Three seen June 10, 1890, in a small clearing on the Humptulips. None seen since.

Vireo gilvus. WARBLING VIREO. — Summer resident. I secured specimens while at Quiniault Lake June 12 and 14. I have heard it often on the Humptulips before and since then.

Helminthophila celata lutescens. LUTESCENT WARBLER. — Summer resident, not very common. One shot on Stevens Prairie April 22; others shot June 15 and 23.

? *Dendroica aestiva.* YELLOW WARBLER. — Summer resident. A Warbler, taken to be this one, was seen June 12 perched in a small tree on the river-bottom of the Upper Quiniault.

Dendroica auduboni. AUDUBON'S WARBLER. — Summer resident. Not common. One shot April 22 on Stevens Prairie, the only one noted.

Dendroica nigrescens. BLACK-THROATED GRAY WARBLER. — Summer resident. A pair seen May 11 on the harbor near Hoquiam. No others noted.

? *Dendroica occidentalis.* HERMIT WARBLER. — Summer resident? At Hoquiam, July 10, I am very sure I saw a female of this species. It was but a few yards away, on and about a clump of bushes on the open marsh, and was very restless. A few days afterward I saw the same bird,—or another one like it.

Geothlypis macgillivrayi. MACGILLIVRAY'S WARBLER. — Summer resident. One shot on Stevens Prairie, June 23, was the only one noted.

Sylvania pusilla pileolata. PILEOLATED WARBLER. — Summer resident. Very common throughout this region. In 1891 first noted April 29 on the East Humptulips. The commonest Warbler here.

Anthus pensilvanicus. AMERICAN PIPIT. — Migrant. Uncommon. Two were shot on Stevens Prairie, April 22, out of a flock of seven or eight which were the only ones seen there.

Cinclus mexicanus. AMERICAN DIPPER. — Resident. Common on the upper part of the Humptulips, where the river is swift and its bed rocky. On April 12 I found these birds far down the Humptulips at the time of high water, but on July 4 there was no trace of them there. They

descend the Upper Quinault in the winter to the Lake, I am told, and can then be found on its beach.

Salpinctes obsoletus. ROCK WREN. — Summer resident? A few observed on the Wishkah River and on the East Humptulips in June, 1890; no specimen shot. Not seen in 1891 on the East Humptulips. I have not been on the Wishkah since August, 1890.

Troglodytes hiemalis pacificus. WESTERN WINTER WREN. — Resident. Common everywhere in the thick undergrowth and 'trash' of the heavy timber. Sunshine and light this bird does not need to help it trill its cheery song.

Certhia familiaris occidentalis. CALIFORNIAN CREEPER. — Resident? Uncommon. I saw a few in January on the East Humptulips.

Parus gambeli. MOUNTAIN CHICKADEE. — Resident? One seen at Hoquiam, May 16, was the only one noted.

Parus rufescens. CHESTNUT-BACKED CHICKADEE. — Resident. Nearly as common in the timber and elsewhere as *Troglodytes h. pacificus*.

Regulus satrapa olivaceus. WESTERN GOLDEN-CROWNED KINGLET. — Resident. Not nearly as common as *P. rufescens*. A small flock seen on the East Humptulips in January, and three birds near the West Humptulips May 29; the latter seemed to be breeding. Heard at times. Seen at Hoquiam in May.

Regulus calendula. RUBY-CROWNED KINGLET. — Resident? Rare. Shot two on Stevens Prairie April 22. One had not a vestige of the scarlet crown patch. No others noted.

Turdus ustulatus. RUSSET-BACKED THRUSH. — Summer resident. Very common throughout the river-bottoms, and common on the small prairies and in the timber. Musical and timid. It comes about the time the salmon-berry bushes blossom; and goes when its berries are gone.

Merula migratoria propinqua. WESTERN ROBIN. — Resident. Less common than *Turdus ustulatus*, but a common bird on the harbor, the Humptulips, and Stevens Prairie. I saw some on Axford Prairie in February in the midst of our wintriest weather.

Hesperocichla nævia. VARIED THRUSH. — Resident. Not quite as plentiful, I think, as *T. m. propinqua*. Most migrate, but a few stay through the winter on the East Humptulips. One seen there February 7 during cold weather.

Sialia mexicana. WESTERN BLUEBIRD. — Migrant? One seen May 15 at Hoquiam, perched on an electric-light wire. No others noted.

Sialia arctica. MOUNTAIN BLUEBIRD. — Migrant? Two were seen on Stevens Prairie April 22; one was secured. No others noted.

A LIST OF BIRDS TAKEN ON MARAGUANA,
WATLING'S ISLAND, AND INAGUA. BAHAMA-
MAS, DURING JULY, AUGUST, SEPTEMBER,
AND OCTOBER, 1891.

BY CHARLES B. CORY.

MARAGUANA (August 5 to September 14).

<i>Larus atricilla</i> Linn.	<i>Ceryle alcyon</i> (Linn.).
<i>Gelochelidon nilotica</i> (Hasselq.).	<i>Tyrannus dominicensis</i> (Gmel.).
<i>Ardea tricolor ruficollis</i> Gosse.	<i>Loxigilla violacea</i> (Linn.).
<i>Ardea virescens</i> (Linn.).	<i>Spindalis zena</i> (Linn.).
<i>Nycticorax violaceus</i> (Linn.).	<i>Euethia bicolor</i> (Linn.).
<i>Himantopus mexicanus</i> (Müll.).	<i>Chelidon erythrogaster</i> (Bodd.).
<i>Tringa maculata</i> Vieill.	<i>Vireo crassirostris</i> (Bryant).
<i>Tringa minutilla</i> Vieill.	<i>Cœreba bahamensis</i> (Reich.).
<i>Totanus flavipes</i> (Gmel.).	<i>Dendroica petechia gundlachi</i>
<i>Symphemia semipalmata</i> (Gmel.).	<i>Baird.</i>
<i>Bartramia longicauda</i> (Bechst.).	<i>Dendroica dominica</i> (Linn.).
<i>Ægialitis vocifera</i> (Linn.).	<i>Dendroica discolor</i> (Vieill.).
<i>Ægialitis wilsonia</i> (Ord).	<i>Mimus polyglottus orpheus</i>
<i>Arenaria interpres</i> (Linn.).	(Linn.).
<i>Hæmatopus palliatus</i> Temm.	<i>Mimus gundlachi</i> Caban.
<i>Columba leucocephala</i> (Linn.).	<i>Polioptila cærulea</i> (Linn.).
<i>Columbigallina passerina</i> (Linn.).	<i>Margarops fuscatus</i> (Vieill.).

WATLING'S ISLAND (September 28 to November 9).

<i>Larus atricilla</i> (Linn.).
<i>Phalacrocorax dilophus floridanus</i> (Aud.). — Eight specimens.
<i>Ardea tricolor ruficollis</i> (Gosse).
<i>Ægialitis vocifera</i> (Linn.).
<i>Coccyzus minor maynardi</i> Ridgw.
<i>Coccyzus americanus</i> (Linn.).
<i>Tyrannus dominicensis</i> (Gmel.).
<i>Dolichonyx oryzivorus</i> (Linn.). — Oct. 12, female.
<i>Habia ludoviciana</i> (Linn.). — Oct. 20, female.
<i>Euethia bicolor</i> (Linn.).
<i>Vireo olivaceus</i> (Linn.). — Oct. 5, male.
<i>Cœreba bahamensis</i> (Reich.).
<i>Mniotilta varia</i> (Linn.).
<i>Compsothlypis americana</i> (Linn.). — Five specimens.

- Dendroica tigrina* (Gmel.). — Seven specimens.
Dendroica petechia gundlachi Baird. — Common, breeds.
Dendroica maculosa (Gmel.). — Six specimens, Oct. 6-21.
Dendroica striata (Forst.). — Thirty-six specimens.
Dendroica blackburniæ (Gmel.). — Two specimens, Oct. 12.
Dendroica dominica (Linn.). — Six specimens.
Dendroica virens (Gmel.). — Oct. 12, male.
Dendroica palmarum (Gmel.). — Oct. 20, female.
Dendroica discolor (Vieill.). — Twenty-five specimens.
Seiurus aurocapillus (Linn.). — Thirteen specimens.
Mimus gundlachi Caban.
Margarops fuscatus (Vieill.).

INAGUA.

- Gallinula galeata* (Licht.). — July 17.
Tringa minutilla Vieill. — July 28.
Totanus flavipes (Gmel.). — July 28.
Myiarchus sagræ Gundl.
Loxigilla violacea (Linn.).
Vireo olivaceus (Linn.). — Sept. 17, female.
Vireo crassirostris (Bryant).
Cœreba bahamensis (Reich.).
Helmitherus vermivorus (Gmel.). — Sept. 22, female.
Dendroica petechia gundlachi Baird.
Mimus gundlachi Caban.

 NOTES ON THE RANGE AND HABITS OF THE
 CAROLINA PARRAKEET.

BY AMOS W. BUTLER.

THE CAROLINA PARRAKEET (*Conurus carolinensis*), whose range is now confined to quite restricted areas in some of our southern States, was formerly known as a characteristic bird of Indiana. At the time of its greatest range in that State, within historic times, it was known from New York, Pennsylvania and Maryland to Kansas, Nebraska, and possibly Colorado. It is my desire to present some evidence tending to show its distribution in Indiana and neighboring States together with some notes upon its habits.

In 1831 Audubon notes them from the vicinity of Cincinnati, and states: "Our Parakeets are very rapidly diminishing in number, and in some districts, where twenty-five years ago they were plentiful, scarcely any are now to be seen. At that period [1806] they could be procured as far up the tributary waters of the Ohio as the Great Kanawha, the Scioto, the heads of the Miami, the mouth of the Manimée (Maumee) at its junction with Lake Erie, on the Illinois River and sometimes as far northeast as Lake Ontario. At the present day very few are to be found higher than Cincinnati, and it is not until you reach the mouth of the Ohio that Parakeets are met with in considerable numbers." Wilson after mentioning their occurrence near Lake Michigan, in latitude 42°, and also twenty-five miles northwest of Albany, N. Y., speaking of his trip down the Ohio, says of this bird: "In descending the Ohio, by myself, in the month of February, I met with the first flock of Parroquets at the mouth of the Little Scioto. I had been informed by an old and respectable inhabitant of Marietta, that they were sometimes, though rarely, seen there. I observed flocks of them afterwards at the mouth of the Great and Little Miami [the former near Lawrenceburg, Ind.], and in the neighborhood of the numerous creeks that discharge themselves into the Ohio." He also reported them in great numbers at Big Bone Lick in Kentucky.

Dr. Kirtland in 1838 says: "The Parakeets do not usually extend their visits north of the Scioto, though I am informed, perhaps on doubtful authority, that thirty years since [1808] flocks of them were seen on the Ohio at the mouth of Big Beaver, thirty miles below Pittsburg." Atwater notes them as far north as Columbus, Ohio, and Mr. M. C. Read at Talmadge, Summit Co., Ohio. Dr. F. W. Langdon reports them from Madisonville, near Cincinnati, during the summers of 1837, 1838, and 1839. Few were seen in 1840, and none after that year. Nelson in his 'Birds of Northeastern Illinois' says: "Formerly occurred. Specimens were taken in this vicinity by R. Kennicott many years ago, and Dr. H. M. Bannister informs me he has seen it in this vicinity." Mr. Robert Ridgway in his 'Ornithology of Illinois', 1889, says: "Fifty years ago [1839] it was more or less common throughout the State. The National Museum possesses a fine adult example from Illinois, . . . another from Michigan."

The earliest published notice I find of its occurrence in Indiana is in Dr. Haymond's account of the 'Birds of Southeastern Indiana' in 1856 in the Proceedings of the Philadelphia Academy. He says: "This bird was formerly very numerous along the White Water River. Several years have elapsed since any of them have been seen." The same author in his report on the Birds of Franklin County, Indiana, 1869, also alludes to their former abundance.

Some little investigation has brought to my attention a number of interesting facts. Dr. George Berry of Brookville informs me they were last seen by him in that vicinity in 1835. Mr. Peter Pelsor of Metamora formerly lived at North's Landing, Switzerland County, where in the winter of 1838-39, Parakeets were common. Prof. John Collett has informed me of its occurrence along the Wabash River as far up as Fort Wayne. He further notes that as a boy, from 1834 to 1844, he was accustomed to seeing flocks of from thirty to fifty on his father's farm in Vermilion County. Judge A. L. Roache, of Indianapolis, informs me that his father's family moved to Monroe County in 1828 when Parakeets were common there. The family came from western Tennessee where the bird was well known and abundant. He says they were to be found in Monroe County also in 1836, and the same year, and perhaps the year after, he noted them near Rockville, Parke County. Prof. B. W. Evermann has also learned from the late Louis Bollman of the occurrence of the species in Monroe County in 1831. My father informs me that the last Parakeets he saw in Indiana were at Merom, on the Wabash River in 1834. At that time he saw a small flock of about a dozen. He also told me of seeing a small number—perhaps six individuals—along Pogue's Run near Indianapolis. He thinks the last-mentioned observation was made in 1832. When he was a boy (1806-8) they were common about Brookville, but at that time they were noticeably less in numbers than a few years before. Prof. E. T. Cox informs me they were as numerous as Blackbirds (*Quiscalus quiscula aeneus*) when he went to New Harmony in 1826.

Mr. Fielding Beeler of Indianapolis says he was born in 1823 and grew to manhood within seven miles of the city in which he now lives, and has a very distinct recollection of the Parakeets. They were rather rare, and he thinks they disappeared from that

vicinity about 1835. Near the site of the present village of Centerton, Morgan County, Mr. Beeler says they were more numerous. There they frequented the bottoms of White River. They were last seen in that vicinity about 1838-40.

Professor John Collett thinks the Parakeet left Indiana in 1844. This is evidently not the case. Hon. John W. Ray informs me they were observed by him in Clark County up to about 1844, and in Greene County in 1849. Mr. W. B. Seward of Bloomington informs me that these birds were well known to him from 1840 to 1850, and in many places were plentiful. The late Dr. Richard Owen a short time before his death very kindly furnished me with quite a number of valuable notes on the occurrence of this species near New Harmony, based upon observations of his own, of Mr. Sampson, and of several of the older residents of that place. Mr. Sampson remembers them as common when he went there in 1827. Further evidence is presented of their known occurrence in that vicinity in 1840, 1842, 1850, 1857, and last in 1858.

From the evidence here presented it seems that they had disappeared almost wholly from Ohio and from Indiana, save the southwestern portion, by some time between 1835 and 1840, and that they left Indiana about 1858. So far as I know, there is but one record of the recurrence of the species in the region thus vacated. The late Dr. J. M. Wheaton gives, upon what he considers good authority, an account of a flock of twenty-five or thirty individuals at Columbus, Ohio, in July, 1862. Within about thirty years from the time first referred to by Audubon the species had entirely disappeared from the territory south of a line drawn, from Chicago, Ill., to Albany, N. Y., to, approximately, a line drawn from some point in Virginia, or perhaps North Carolina, to the lower Wabash Valley. In the next forty-five years they disappeared from southwestern Indiana, Illinois, Iowa, Nebraska, Kansas, Colorado, Kentucky, most of Missouri, and from the immediate vicinity of the Mississippi River, also from the States of the Atlantic coast as far south as Florida. The steady contraction of occupied area still continues. They are now perhaps found in but a few restricted localities. In the southern part of Florida they are still to be found in some numbers. Perhaps a small area in the interior of some of the Gulf States may still be occupied by them. Besides there is an area,

whose limits are undefined, in Indian Territory, extending probably into Texas and possibly into Arkansas and Missouri, where Parakeets are said to be found still. It is but natural to think that the extinction of these birds is but a question of a few years.

Not a great deal is known of the habits of these birds throughout their earlier range, but some characteristic facts are remembered, and for such as I have I am indebted to the gentlemen whose names I have mentioned. The species seems to have been present throughout the year over most, if not all, of its range, and consequently must have bred. They were currently reported to hibernate, but sometimes appear to have been active during winter. Concerning the habit of hibernation I am furnished the following note by Prof. Collett: "In 1842 Return Richmond of Lodi, Indiana, cut down, in the cold weather of winter, a sycamore tree some four feet in diameter. In its hollow trunk he found hundreds of Parakeets in a quiescent or semi-torpid condition. The weather was too cold for the birds to fly or even to make any exertion to escape. Mr. Richmond cut off with his saw a section of the hollow trunk some five feet long, cut out a doorway one foot by two in size, nailed over it a wire screen of his fanning mill, rolled this cumbersome cage into the house, and placed in it a dozen of the birds. They soon began to enjoy the feed of fruit, huckleberries and nuts he gave them, and he had the pleasure of settling absolutely the disputed question as to how they slept. At night they never rested on a perch, but suspended themselves by their beaks and with their feet on the side of the cage. This was repeated night after night during their captivity."

To Mr. W. B. Seward I am indebted for the following notes: "My first intimate acquaintance with the Parakeet was about the year 1845 when I secured a nest of young ones on the border of White River, in Owen County. The nest was in a decayed tree that had been blown down by the wind. The young birds had been secured by a farmer boy of whom I bought them soon after they had been captured. I think there were five of them. My impression now is that the nest was inside of the tree, but of this I am not now positive owing to the lapse of time and the fact that I was more interested in the pets I had secured than in the exact situation of the nest where they were hatched. But I remember that it was a much decayed tree with but few limbs, so it was hardly possible that there was a place on the outside of the tree

where a nest could have been secured. I think it may be set down as a fact that Parakeets make their nests inside of hollow trees, always selecting a tree with a side opening into the hollow near the top. I had often, before and since I secured these birds, passed through the region where they were captured, and seldom if ever passed without seeing Parakeets. It was near White River, where the road was for many miles almost always in sight of the river, with cornfields on the bottom lands and here and there a dead tree in the fields and on the river bank. Parakeets, more or less in numbers (never in flocks), could be seen flying from tree to tree. My admiration for these beautiful birds was unbounded, and I often wished I could capture one, but they were so wild that I had no hope of ever accomplishing it. The young birds I secured all lived to maturity and were kept by me for several years in a large cage made for the purpose. The special food of the Parakeet was the 'cuckle burr.' It was my custom to gather large quantities of these burrs in the fall to last until they ripened again. In eating, the bird picked up a burr with its beak, this was then delivered to one foot raised to receive it. Then one end of the burr was cut off with the sharp-ended under beak, the burr being held with the foot and the under side of the upper beak while two small kernels were extracted with the assistance of the tongue and the husk was thrown away. Parakeets will leave any other kind of food for cuckle-burrs, but will eat all kinds of nuts, if broken, and various kinds of seeds. I never knew them to eat meat of any kind. They invariably roost on the side of the cage with their beak hooked over one of the wires. It has been claimed that they roost hanging by their beak but this is a mistake. I did everything I could to induce them to breed, by providing them with nests, materials for shells, etc., but without success. I do not think they will breed in confinement. Most of the time I kept their wings cropped so that they could not fly, and allowed them much freedom in this way. They would climb into trees in the yard, but return to the cage to feed and to roost. They knew me and were pleased to have me visit them and allow them to climb on me, but would bite me the same as any one else if I put my hands on them. They were extremely fond of one another and exhibited great distress if one was absent for any length of time. I often took one or two of them away on my shoulder and was absent an hour or two, and

at such times a noisy racket was kept up till my return." Another authority speaking of these same birds says: "If at any time an accident happened to one of them, or one escaped from confinement, the household, and neighborhood as well, was aroused by their outcries. They would not be satisfied until the escaped bird was found and returned, when quiet was restored."

The Parakeets are said by Prof. Collett to be very affectionate in their wild state. It is said that when one of a flock was wounded, the others gathered about, regardless of danger, and made every effort to render assistance to their unfortunate comrade. They were very easily tamed. A crippled bird seemed at once to be contented with the cabin to which it was taken, and in a day's time would clamber over the clothing of its captor and take food from his hand.

As has been mentioned, the principal food of the Parakeet was 'cuckle-burrs' or 'cockle-burrs' (*Xanthium canadense* Mill.) which grew abundantly on the river bottoms. So great was their fondness for these burrs that everyone noticed it, and for this destruction of weed seeds they were held in high regard by farmers. They also ate pecans, acorns, beechnuts, haws, berries of the black gum, persimmons, and hackberries. Next to cuckle-burrs they preferred the last-mentioned food. In spring they were very destructive in orchards, biting out the tender shoots and eating the blossoms and young fruit. In summer and autumn they lived largely on fruit and grain. Apples, grapes, and cherries are especially mentioned. They were gregarious, moving in flocks of from six to one hundred, and are said to have been as common, in some localities, as Blackbirds (Bronzed Grackles). They are said by one authority to have alighted on an apple tree in such numbers as almost to cover it over. When the fruit was ripe, sometimes the entire crop would be destroyed. Often they seemed to destroy in a spirit of mischief. They would tear off apples and other fruits, and after taking a bite throw them to the ground, and so continue. They tore off the heads from wheat stalks, and seemed to delight in throwing them away.

The favorite haunts of these birds were along water courses and about lakes and sloughs. Especially were they abundant in the extensive bottom lands along the rivers. There it was that cuckle-burrs grew most abundantly and there were always many hollow trees suitable for their habitations. Seldom were they found away from such surroundings.

They were quite expert acrobats, and became proficient in many ways. They seemed to delight in exhibiting their ability and practical jokes to an audience whether of birds or human beings. One thing in which they were said to have delighted, in captivity, was climbing a suspended string. They were very cleanly in their habits, and are said to have bathed regularly every day at a particular spot.

All facts concerning their former distribution and their habits as noted when they ranged north of the Ohio River, are very much desired.

NINTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE NINTH CONGRESS of the American Ornithologists' Union was held in the Library of the American Museum of Natural History, New York, Nov. 17-19, 1891, the President, Mr. D. G. Elliot, in the chair. In the absence of the Secretary, Mr. Sage, on account of illness, Mr. C. F. Batchelder was appointed Secretary *pro tem*. There were present during the session fourteen Active Members, and thirty-two Associate Members. The present membership of the Union, as given in the report of the Secretary, is as follows: Active Members, 47; Honorary Members, 22; Corresponding Members, 72; Associate Members, 352;— Total, 493, showing an increase of 28 for the year. During the year the Union has lost by death, one Honorary Member, Dr. August von Pelzeln of Vienna, Austria; one Active Member, Col. N. S. Goss, a member of the Council, of Topeka, Kansas; and one Associate Member, Dr. J. I. Northrop of New York City. The Treasurer's report exhibited the finances of the Union in good condition, there being no liabilities, and a balance in the Treasury.

Dr. Anton Reichenow, of Berlin, Germany, was elected an Honorary Member; Dr. Max Fürbringer of Amsterdam, Holland, Ernst Hartert of London, England, and Wm. V. Legge of Hobart Town, Tasmania, were elected Corresponding Members,

and ninety-six new members were added to the list of Associates. After considerable discussion it was voted not to elect any Active Members this year. On the motion for the election of officers a letter was read from Mr. Robert Ridgway, in which he declined to be a candidate for Vice-president. The officers elected were D. G. Elliot, President; Wm. Brewster and H. W. Henshaw, Vice-presidents; John H. Sage, Secretary; Wm. Dutcher, Treasurer. The vacancies in the Council, occasioned by the above election and the death of Col. Goss, were filled by the selection of R. Ridgway and C. F. Batchelder.

On call for reports of Standing Committees, Dr. Merriam on behalf of the Committee on Bird Measurements reported progress and asked for the continuance of the Committee, which was granted. Mr. G. B. Sennett, chairman of the Committee on Bird Protection, reported progress, and Mr. Brewster stated what had been done to protect the Terns on Muskeget Island during the past four years. Mr. Dutcher on behalf of the Committee for the Audubon Monument Fund, reported progress, and the committee was continued. No formal report was received from the Committee on Avian Anatomy and the Committee was continued. The Amendments to the By-laws proposed at the Eighth Congress were then all adopted, and new amendments were referred to the next Congress. The Council subsequently provided for the publication of a new edition of the By-Laws and Rules, as revised to date.

Rule X of the By-Laws and Rules, relating to the Committee on Publications, was amended so as to make this Committee consist of the President, Secretary, Treasurer, and the Editors of 'The Auk,' *ex officio*. By a subsequent vote of the Union this Committee was relieved of the duty, formerly assigned it, of also acting as a Committee on the Nomenclature and Classification of North American Birds, in reference to the annual supplements to the Check-List, and a new Committee for this especial purpose was appointed, consisting of the following nine persons: Messrs. Allen, Brewster, Chapman, Cory, Coues, Elliot, Henshaw, Merriam, and Ridgway.

The rest of the session was devoted to the reading of scientific papers, of which the following is a list.

1. The Inheritance of Acquired Characters. President's Address. D. G. Elliot.

- *2. The American Scoter. Gurdon Trumbull.
- 3. The Migrations in Chester County, South Carolina. L. M. Loomis.
- *4. Summer Birds of the Crest of the Pennsylvania Alleghanies. J. Dwight, Jr.
- 5. Birds Attracted by the Rays of Liberty's Torch. J. Dwight, Jr.
- *6. The Genus *Peucaea* as represented in Cooke County, Texas. George H. Ragsdale.
- 7. A Preliminary Study of the Grackles of the Subgenus *Quiscalus*. Frank M. Chapman.
- 8. Geographical Variation in the North American Forms of the Genus *Colaptes*. J. A. Allen.
- 9. The Intergradation of *Colaptes auratus* with *C. cafer*. J. A. Allen.
- 10. Suggestions regarding the Genesis of the North American Forms of *Colaptes*. J. A. Allen.
- *11. List of Birds observed at Salamanca, Costa Rica, from March 15 to April 12, 1890. G. K. Cherric,
- 12. Why the Mockingbird Left New Jersey.—A Geological Reason. Samuel Lockwood.
- *13. Habits of the Black-bellied Plover in Massachusetts. George H. Mackay.
- *14. Habits of the Eskimo Curlew in New England. George H. Mackay.
- 15. The Birds of the Pribylof Islands, Alaska. Illustrated by Lantern Slides. William Palmer.
- 16. Exhibition of Lantern slides representing Birds in Life. Contributed by Members.
- *17. Cause of the Late Breeding of the American Goldfinch. Henry Hales.
- *18. Notes on the Range and Habits of the Carolina Parakeet. Amos W. Butler.
- *19. A List of Warblers found at Raleigh, North Carolina. C. S. Brimley.
- 20. A Probable Occurrence of the European Curlew (*Numenius arquatus*) on Long Island, N. Y. William Dutcher.
- 21. Some of the Results of the Death Valley Expedition. Dr. C. Hart Merriam.
- 22. On Protection of Birds. T. A. Schurr.
- *23. Some Birds recently Added to the Collection of the New York State Museum. Wm. B. Marshall.

The exhibition of photographs of living birds, and nests *in situ* thrown on screens, was given in the lecture hall of the Museum. About eighty were shown, a marked advance from last year.

*Owing to lack of time, read by title only.

They proved of great interest, and it is hoped that such exhibitions will become a permanent feature of the annual meetings.

Resolutions were adopted tendering the thanks of the Union to the President and Trustees of the American Museum of Natural History for the courtesies extended to the Union; and to the Linnaean Society of New York for their hospitality shown to the Members during the Ninth Congress.

Through the kindness of Mr. D. G. Elliot, a selected series of drawings, by Wolf of London, were exhibited in the Library of the Museum during the session, these drawings being the originals of Mr. Elliot's 'Birds of North America,' and of his Monographs of the Grouse, Pheasants, etc.

It was voted that the Tenth Congress of the Union should be held in Washington, D. C., Nov. 15, 1892.

RECENT LITERATURE.

The New Nuttall.* Thomas Nuttall's 'Manual of the Ornithology of the United States and Canada,' originally published in two volumes in 1832 and 1834, with a second edition of the first volume (Land Birds) in 1840, was a work so charmingly written and so true to nature that it has never ceased to win admiration and serve as an inspiration to bird lovers. While Nuttall was not deeply versed in the technicalities of ornithology, his bird biographies display a profound sympathy with his subject, and an intimate acquaintance with the ways of his beloved feathered associates of field and wood, acquired through a long period of varied and widely extended field experience, during his expeditions as a botanist and explorer to distant and then little known parts of the United States. In addition to his love of bird life and his keen powers of observation, he had the literary gift to portray in a simple yet fascinating way what he saw and heard, without being unduly sentimental or lapsing into exaggeration. In this rests the charm of Nuttall's 'Manual,' the republication of which has been till now delayed, though often seriously contemplated during the many years since it has practically been out of

* A | Popular Handbook | of the | Ornithology | of the United States and Canada, | Based on Nuttall's Manual. | By Montague Chamberlain. | [Vignette] Vol. I | The Land Birds. | [Vol. II. Game and Water Birds.] Boston: | Little, Brown and Company. | 1891. 2 vols. 8vo. pp. i-xlvi, 1-473, 1-viii, 1-431, with 2 colored plates and numerous illustrations in the text.

print. During the fifty years which have elapsed since the original publication of the 'Manual' our knowledge of the subject has greatly advanced, and much that Nuttall wrote, including especially his classification and the more technical parts of his work, have become obsolete, while his statements respecting the distribution of some of the species require revision. But his biographies have for the most part lost none of their truthfulness and charm. It is, therefore, a subject of congratulation that the successors of the original publishers of the 'Manual' have decided to reissue the work in a modernized form, eliminating from it the obsolete and erroneous parts and supplementing it by a brief résumé of the advances made since Nuttall's time.

Mr. Chamberlain, to whom was intrusted the preparation of the new edition, has done his work fairly well, considering the limitations by which he was doubtless necessarily restricted by his publishers, the new edition, while more generously illustrated than the original work, containing much less matter. The many pages devoted by Nuttall to general remarks on the higher groups, as orders and families, are wholly discarded, as are his rather elaborate descriptions of the genera and species. Also a number of his species are omitted, for reasons to be given later. Although Nuttall's classification and nomenclature are both very properly eliminated, his arrangement of the species is, with slight exceptions, retained, thus preserving to a great degree the original character and appearance of the 'Manual.'

Of Nuttall we thus have his charming 'Introduction' reproduced nearly in full, and the principal part of his biographies. The new matter consists of new vernacular and technical names, a short diagnosis of generally about three to five lines in small type,—often too brief to be of much importance beyond giving a general idea of the appearance of the bird,—while about five lines more of similar type tell the story of the nest and eggs, aside from the information Nuttall's biographies may chance to give. Nuttall's biographical matter follows next, with at the end, as occasion may require, a few lines, again in smaller type, by Mr. Chamberlain, qualifying or supplementing Nuttall's account, generally relating to the geographical range of the species, as now known.

In general style the new edition, in typographic arrangement, recalls the old, though the size of the paper is larger and the general effect more modern; the illustrations are more numerous and better, some of those made expressly for the work being excellent; others, however, are far from satisfactory. In two instances figures of European species are given in place of figures of the birds they purport to represent (see Vol. II, pp. 86 and 340), and the figure of Wilson's Warbler (Vol. I, p. 167) is misplaced.

Nuttall's 'Manual of the Ornithology of the United States and Canada' was a handbook of the subject as then known. It is hence natural to expect that a 'Popular Handbook of the Ornithology of the United States and Canada, based on Nuttall's Manual,' would be for the present day what Nuttall's 'Manual' was in its day. But alas, while the title-page

implies this, we have a work of far more limited scope, the proper title of which would be a 'Popular Handbook of the Ornithology of Eastern North America, based on Nuttall's Manual.' For, after reading, through three and a half pages of the four and a half pages of 'Preface,' devoted chiefly to an eulogium on Nuttall's original work, we meet the statement that the limits of a handbook compel the omission of "those species which occur only to the westward of the Mississippi valley, though I have endeavored to make mention of every bird that has occurred within this Eastern Faunal Province, from the Gulf of Mexico to the Arctic Ocean, and to give their distribution and breeding area so far as these are known." This, then, is the real scope of the work and a correct statement of the nature and extent of the supplementary matter; it also accounts for the small size of the revised Nuttall. It is quite true that "only a few short chapters" of Nuttall "have been lost through restricting the scope of the present work to Eastern forms," but it would seem a little more in the line of strict commercial and scientific integrity to indicate the fact at some point earlier than in the last third of the preface. Indeed, the prospectus issued by the publishers goes so far as to promise "to give the reader the latest acquired facts regarding the species mentioned in the original work, also an account of the species and subspecies that have been discovered since Nuttall wrote," etc., with no intimation anywhere that the work is not a handbook of North American ornithology as implied in the title. The prospectus further implies the presence of many excellent features, "so far elaborated as the limits of a 'hand-book' will permit"—this saving clause covering apparently a large mental reservation.

The book, so far as it goes, is excellent, though not above criticism at many points, not a few of the annotations having an apparently perfunctory character, and being occasionally defective in point of accuracy and completeness, in respect to the ground they purport to cover. Occasionally the spirit of some of the comments is not eminently creditable from the pen of an intelligent ornithologist. The following from the 'Preface' is a case in point where, in contrasting Nuttall's work with that of later workers, we read: "For if a great advance has been made in the study of scientific ornithology,—which term represents only the science of bird-skins, the names by which they are labelled, and the sequence of these names, in other words, the classification of birds,—if this science has advanced far beyond Nuttall's work, the study of bird-life, the real history of our birds, remains just about where Nuttall and his contemporaries left it. The present generation of working ornithologists have been too busy in hunting up new species and in variety-making to study the habits of birds with equal care and diligence, and it is to Wilson and Audubon and Nuttall that we are chiefly indebted even at this day for what we know of bird-life"! Is this, then, the estimate Mr. Chamberlain places on the thousands of pages of field notes published during the last fifteen years by his confrères of the Nuttall Club and the A. O. U.—in the 'Nuttall Bulletin,' 'The Auk,' and the 'O. & O.,' to say nothing of other channels of publication!—J. A. A.

Shufeldt's 'Myology of the Raven.'*—This work, as stated in the title, is intended as 'A Guide to the Study of the Muscular System in Birds, and as such should be a welcome addition to the literature of avian anatomy. The Raven is chosen as the basis of the work on account of its being "a large representative of a very numerous and cosmopolitan family of birds, the Corvidæ," some near ally of which hence becomes readily accessible to students everywhere. It forms also a monograph of the muscular system of one of the leading Oscinine types, copiously illustrated by original drawings by the author from actual dissections. Much of the work appears to have been done under the unfavorable circumstances attendant upon isolation from libraries and museums. Since the work appeared, rather more than a year since, it has been extensively reviewed, by both favorable and unfavorable critics. While not an ideal production, its utility for the purpose for which it was written is beyond question, as it subserves a purpose no other work in English so well meets. The muscular system being to some extent variable in different types of birds, the more prominent departures from the structures met with in the Raven are generally more or less fully noted. The author acknowledges his indebtedness to many of the leading writers on the subject, and closes his volume with a bibliography of "important works and papers treating of the muscles of birds, compiled, abridged, and rearranged from the bibliographical lists of Hans Gadow" and other sources. He gives also in copious footnotes the synonymy of the principal muscles, as given by Gadow in his work on the muscles of birds in Bronn's 'Klassen des Thier-Reichs,' as well as much descriptive matter from the same source, transcribed from the original German without translation, also numerous extracts from the writings of Garrod and Forbes.—J. A. A.

Bolles's 'Land of the Lingering Snow.'†—This little book is a series of delightful sketches of rambles in the vicinity of Cambridge, with excursions to Cape Cod, Wachusett and Chocorua, at various dates from January to June. Several of the essays are distinctively ornithological, as 'The Bittern's Love Song,' 'The Vesper Song of the Woodcock,' 'The Coming of the Birds,' 'A Forest Anthem,' etc., while all have a distinctly ornithological flavor, and record many observations of special interest, woven in with charming allusions to the ever changing face of nature under the varying aspects of winter, spring, and early summer. Everywhere the author gives evidence of the poetic sense, keen sympathy with nature, acute powers of observation, and an ability to portray with unusual skill and realistic effect the scenes noted amid storm and sunshine as winter passed on through spring into summer.—J. A. A.

* The | Myology of the Raven | (*Corvus corax sinuatus*). | A Guide to the Study of the Muscular System | in Birds. | By | R. W. Shufeldt. | London: | Macmillan and Co. | and New York | 1890. 8vo., pp. xix+ 343, with about 90 figures in the text.

†Land of the Lingering | Snow | Chronicles of a Stroller in | New England | from January to June | By | Frank Bolles. | [Vignette] Boston and New York | Houghton, Mifflin and Company | The Riverside Press, Cambridge | 1891. 12mo., pp. 234.

Keyser's 'Bird-dom.'*—Despite its rather unprepossessing title, 'Bird-dom' proves to be a collection of twenty-six ornithological essays possessing much attractiveness as a series of popular sketches of bird life, most of which have previously appeared in various magazines. The writer gives his experiences in the field, in the hope of awakening in others an appreciation of nature. "If the hearts of the young," says our author, "could be stirred to a love of nature, and their minds aroused to study her, much would be done toward solving some of the perplexing social problems of the day." The titles of the essays, as 'The Alert Eye,' 'A Lesson in Bird Study,' 'Difficulties of Bird Study,' 'First Meetings,' 'Birds on the Wing,' 'My Woodland,' 'Lyrist of a Suburb,' etc., suggest to some degree the character of the book, in which the writer tells how he learned to recognize birds, relating his methods, his successes and his failures, and their causes. A healthful spirit, unlimited enthusiasm, and an intense love of birds pervades Mr. Keyser's little book, which is interspersed with many useful hints to those who would have a 'speaking acquaintance' with the feathered tenants of field and wood. While appreciating the need of specimens on the part of specialists, he disapproves of the killing of birds by amateurs, and offers this good advice: "So I advise that the money spent for guns and cartridges be spent in visiting some good college, or a large city, where an extensive collection of mounted birds may be studied at leisure. In that way you will be able to clear up ornithological points without resort to bloodshed." He has evidently become a proficient field ornithologist without destroying many birds, and writes delightfully and in an original vein of many of his favorite bird friends. The book is based apparently on observations made mainly in northeastern Ohio, and a Kirtland's Warbler is one of the author's much prized discoveries.—
J. A. A.

Scott B. Wilson's *Aves Hawaiienses*.† — The progress of ornithology of late years is well exemplified by the work before us. Twenty years ago a small octavo pamphlet held all we knew about the birds of one of the most interesting and peculiar zoögeographical provinces; while today it requires a handsome quarto volume with numerous colored plates to fully represent our knowledge of the subject. Twenty years ago the number of species known to inhabit the Hawaiian Islands was considered to be about forty by the best authority (Sclater, *Ibis*, 1871, p. 361); today the number is scarcely less than seventy; and the most astonishing fact is that this increase of our knowledge of one of the most accessible and most civilized archipelagoes in the Pacific Ocean has taken place during

* *Bird-dom* | By | Leander Keyser | [Motto=6 lines, from Lowell] Boston | D. Lothrop Company | Washington Street opposite Bromfield. No date. 1891, 12mo, pp. 226.

† *Aves Hawaiienses*.—The Birds of the Sandwich Islands. By Scott B. Wilson, F.Z.S. Assisted by A. H. Evans, M.A., F.Z.S. London, R. H. Porter. Part i. Dec. 1890; part ii, Sept. 1891.

the last five years. To Mr. Scott B. Wilson, who spent eighteen months on the islands in order to study their ornithology, much credit is due for this increase, and it is with great pleasure that we extend our welcome to the work which he is now publishing, and we wish specially to call the attention of our American ornithologists to it, as from the situation of the Hawaiian Archipelago in relation to our own continent we ought to take more interest in its avifauna than has been done hitherto.

The work is uniform in appearance with most of the more ambitious ornithological monographs which have been published in England of late years, and is issued in five parts, two of which have already been published. These two parts treat of 18 species, and are accompanied by 20 plates, some of them representing species now extinct or nearly so. The second part contains a very valuable and interesting treatise by Dr. Hans Gadow 'On the Structure of Certain Hawaiian Birds with Reference to their Systematic Position,' to the illustration of which three of the plates are devoted. Many unexpected conclusions are the result of his investigation, and the ornithological public is under great obligations to Mr. Scott Wilson for not having spared any expense in order to have this side of the ornithology of the group as well taken care of as that devoted to the outside of the birds alone. For details and information we refer the reader to the book itself, and we advise all who can afford it to subscribe for it. The author has had heavy expenses in order to bring it out, and the work is well worth encouragement.

For the present we abstain from any remarks about various points on which we might disagree with the author. We prefer to wait until the work is finished, and then shall be glad to offer such remarks as might have a bearing on any special point. — L. S.

MacFarlane's Notes on Arctic Birds.*—From 1861 to 1866 Mr. MacFarlane had exceptional opportunities to study the birds breeding in the region lying between the lower Mackenzie River and Franklin Bay and southward to the sixty-seventh parallel, and especially in the neighborhood of Fort Anderson (lat. 68° 30', long. 128°). The good use he made of his time has been long attested by the generous collections he sent to the Smithsonian Institution.

In the present paper,—a revised edition of one published two years ago in the Transactions of the Historical and Scientific Society of Manitoba, based on the author's memoranda made during these years,—he gives the results of his experience of the breeding habits of about a hundred and thirty species, especially of their nests and eggs. It would be difficult to overestimate the interest and importance of these notes, relating, as they do, to a region so remote and so little known. The only regret they inspire is that matter of such value was not given to the public many years ago.—C. F. B.

* Notes on and List of Birds and Eggs collected in Arctic America, 1861-1866. By R. MacFarlane. [etc.]. Proc. U. S. Nat. Mus., Vol. XIV, 1891, pp. 413-446.

Fannin's 'Check List of British Columbia Birds.'*—In this list 308 species and subspecies are enumerated as occurring in British Columbia. Most of the records are based on the author's own observations, although some are entered upon the authority of several of his friends, and others are taken from Chapman's report on the Streater Collection, from Ridgway's Manual, and from other published sources. Under each species brief notes are given upon its abundance, seasons of occurrence, and distribution in the Province, with occasionally some remark upon its habits. The List closes with a short appendix describing the character of the country in different parts of the Province, and giving some valuable tables of rain and snow fall. The work is illustrated with an uncolored lithograph of *Falco columbarius suckleyi*.

Mr. Fannin's records enable him to extend the range of a number of species, especially among the water birds, considerably beyond what has been generally supposed to be their limits. On the other hand we note that he occasionally admits to the List some name that does not at present meet with general acceptance,—*Deudroica æstiva morcomi* and *Æchmophorus clarkii* are examples,—and it seems not unlikely that his further researches may lead him to change his views as to the identity of one or two of the subspecies he has recorded. He regrets that as yet a list of the birds of British Columbia must necessarily be incomplete, and he expresses the hope that the present List may "stimulate further and more careful research." In spite of the large amount of information he has now given us, there is, of course, a great deal yet to be learned, and the Province offers attractive fields which are still virgin soil to the ornithologist.—C. F. B.

Chapman on the Birds of Corpus Christi.†—In five or six weeks of March and April spent in a field where others had been before him Mr. Chapman succeeded in finding much that was new and interesting to repay his efforts.

After a brief sketch of the character of the vegetation and of the birds frequenting the different growths, followed by some observations on the spring migration and the faunal position of "southwestern" Texas, comes the main portion of the paper, 'Remarks on certain species observed.' Under this head are given various interesting notes upon thirty-four species. These relate in great part to the habits of the birds. One new subspecies is described, *Cardinalis cardinalis canicaudus*, its habitat being stated as "southwestern Texas, south into northeastern

*Check List [of] British Columbia Birds [by] John Fannin, Curator Provincial Museum, Victoria, B.C. | Associate Member American Ornithologists' Union. | September, 1891. | [Seal] | Victoria, B.C.: | Printed by Richard Wolfenden, Printer to the Queen's | Most Excellent Majesty. Pp. xiv, 49. Pl.

†On the Birds observed near Corpus Christi, Texas, during parts of March and April, 1891. By Frank M. Chapman. Bulletin American Museum of Natural History, Vol. III, No. 2, Art. XXII, pp. 315-328.

Mexico." Its most striking character is the coloration of the tail in the female, the rectrices being "broadly margined with gray, instead of . . . narrowly edged with olivaceous brown" as in *C. cardinalis*.

The paper closes with a list of the birds observed which were not recorded* from Corpus Christi by Mr. Beckham, and another of those recorded by Mr. Beckham but which Mr. Chapman did not find.—C. F. B.

Chapman 'On the Color Pattern of the Upper Tail-coverts in *Colaptes auratus*.'† —Mr Chapman has availed himself of a large series of skins of *Colaptes* to study the differences in color pattern of the upper tail-coverts. He finds two distinct styles of marking with many variations and intermediate forms; one of these consists of transverse barring; the other shows longitudinal or concentric markings parallel to the border of the feather. Mr. Chapman's material leads him to conclude that the former pattern prevails among young birds and that a change to the other style is accomplished through successive moults.

He further believes that sufficient material—as yet lacking—of the more southern species of the genus will show them to possess the transversely barred pattern, which, if it should prove the case, might indicate that *C. auratus* is a more recent and extreme offshoot from the main *Colaptes* stock. Sex and locality seem to have nothing to do with these differences, but apparently there is enough individual variation in the markings to make satisfactorily definite conclusions difficult.—C. F. B.

Minor Ornithological Publications.—Forest and Stream.

This journal was last noticed in these pages in Vol. VII, pp. 388-398 (October, 1890). In Vols. XXXV and XXXVI we note the following (Nos. 2113-2203).

2113. *Hermit Thrush (T. pallasi) in Maryland in Summer.* By Arthur Resler. 'Forest and Stream,' Vol. XXXV, No. 1, July 24, 1890, p. 11.

2114. *Chinese Pheasants in America.* Editorial, *Ibid.*, July 31, p. 28.

2115. *Pointer Dog and Mother Duck.* By A. B. II. *Ibid.*, Aug. 7, p. 48. — *Aix sponsa*.

2116. *Woodcock in Town.* By Hy. J. Grootage. *Ibid.*

2117. *Migration of Prairie Chickens.* By Levi S. Kegale. *Ibid.*, Aug. 21, p. 88.

2118. *Six Weeks with a Sparrow Family.* By Julia M. Hooper. *Ibid.*, Sept. 11, pp. 146, 147.

2119. *California Quail.* By A. *Ibid.*, Sept. 25, p. 187.

* Proc. U. S. Nat. Mus., X, 633-696.

† On the Color-Pattern of the Upper Tail-Coverts in *Colaptes auratus*. By Frank M. Chapman. Bulletin American Museum of Natural History, Vol. III, No. 2, Art. XXI, pp. 311-314.

[Forest and Stream.—Continued.]

2120. *The Heath Hen. Notes on the Heath Hen (Tympanuchus cupido) of Massachusetts.* By William Brewster. *Ibid.*, p. 188.
2121. *Wild Pigeons in Virginia.* By D. *Ibid.*, p. 190.
2122. *Heath Hen of Martha's Vineyard.* By J. E. Howland. *Ibid.*, Oct. 2, p. 207.
2123. *Nesting Birds and Scent.* By Hermit. *Ibid.*
2124. *Ways of the Ruffed Grouse.* By Dorp. *Ibid.*, p. 210; Oct. 16, p. 249.
2125. *Notes on the Woodcock.* By D. S. S. *Ibid.*, Oct. 23, p. 267.
2126. *A Grouse Combat.* By Dorp. *Ibid.*, Oct. 30, pp. 286, 287.
2127. *Quail Invade Washington.* By T. H. B. *Ibid.*, p. 289. — *Colinus virginianus* in the city.
2128. *Woodcock, Whistle and Worm.* By H. B. N. *Ibid.*, Nov. 6, p. 307.
2129. *Chinese Pheasants in Illinois.* By W. O. Blaisdell. *Ibid.*, p. 312.
2130. *In a Heap of Leaves.* By Dorp. *Ibid.*, Nov. 13, p. 331. — *Bonasa umbellus*.
2131. *The Yellow Rail in Michigan.* By Morris Gibbs. *Ibid.*, Nov. 20, p. 347.
2132. *Another Woodcock in Brooklyn.* By W. Arthur Hale. *Ibid.* p. 352.
2133. *The Ways of the Woodcock.* By Chas. H. Eldon. *Ibid.*, Nov. 27, p. 372.
2134. *Land Birds at Sea.* By George Shepard Page. *Ibid.*
2135. *The Chickadee for Public Parks.* By Hermit. *Ibid.* — *Parus atricapillus* said to have modified its habits under partial domestication.
2136. *Second Occurrence of the Red Phalarope at Monroe, Michigan.* By Robt. B. Lawrence. *Ibid.*
2137. *Food of the American Goshawk.* By W. L. Bishop. *Ibid.*, Dec. 4, p. 391. — *Bonasa umbellus*.
2138. *A Snowbird in a Crockery Store.* By J. L. Davison. *Ibid.* — *Funco hyemalis*.
2139. *The American Woodcock.* Editorial. *Ibid.*, Dec. 11, p. 411.
2140. *The American Woodcock.* By Gurdon Trumbull. *Ibid.*, p. 412. — Observations on feeding habits and notes in captivity.
2141. *A Skeleton of the Ivory-bill.* By R. W. Shufeldt. *Ibid.*, Dec. 18, p. 431. — *Campophilus principalis*.
2142. *Chinese Pheasants.* By J. F. L. *Ibid.* — Habits in Oregon.
2143. *Yellow Rail in Chicago.* By Korax. *Ibid.*
2144. *Evening Grosbeak in New York.* By Morris M. Green. *Ibid.* — At Ithaca, N. Y., Dec. 11, 1890.
2145. *The Woodcock's Whistle.* By William Brewster and U. S. G. White. *Ibid.*, Dec. 25, pp. 453, 454. — Controverting and confirming some of Mr. Trumbull's statements in No. 2042.
2146. *Snowy Owls.* By E. W. L. and 'Del. A. Ware.' *Ibid.*, p. 454.

[Forest and Stream.—Continued.]

2147. [*The notes of the Woodcock.*] Editorial. *Ibid.*, Jan. 1, 1891, p. 470.
2148. *The Woodcock's Whistle.* By Geo. A. Boardman and T. M. Aldrich. *Ibid.*, p. 472.
2149. *Surrounded by Snow Buntings.* By J. D[=L]. Davison. *Ibid.*
2150. *Snowy Owls.* By H. *Ibid.*—In Nebraska.
2151. *A Belated Woodcock.* By J. H. B. *Ibid.*, p. 475.
2152. *The Woodcock's Twitter.* By Gurdon Trumbull and W. *Ibid.*, Jan. 8, p. 491.
2153. *Japanese Pheasants in Oregon.* By W. A. Wilcox. *Ibid.*
2154. *The Curlew's Bill.* By Geo. A. Boardman. *Ibid.*
2155. *Chicago and the West.* By E. Hough. *Ibid.*, pp. 493, 494.—Contains some discussion of the vernacular names of Geese.
2156. *The Woodcock's Whistle.* By R. W. Shufeldt, Henry B. Nicol, and John Burroughs. *Ibid.*, Jan. 15, p. 511.
2157. *Mockingbirds Breeding in Massachusetts.* By E. H. Lathrop. *Ibid.*
2158. *Ivory-bills.* By W. E. Hudson. *Ibid.*—*Campephilus principalis.*
2159. *Perth Amboy, N. J.* By J. L. K. *Ibid.*—*Nyctea nyctea* and *Uria lomvia.*
2160. *The Woodcock's Whistle.* By H. Austin, A. H. P., J. Gantz, and J. S. M. *Ibid.*, Vol. XXXVI, Jan. 22, 1891, pp. 2, 3.
2161. *An Unseasonable Rail.* By Sinkboat. *Ibid.*, Feb. 5, p. 44.—*Rallus virginianus* in Maryland in January.
2162. *Florida Bird Notes.* By O. K. Chobee. *Ibid.*—At Biscayne Bay.
2163. *Maine Winter Birds.* By D. *Ibid.*, Feb. 12, p. 63.
2164. *Winter Rail.* By W. A. H. *Ibid.*, p. 64.—*Rallus elegans* and *Nyctea nyctea* in New York. See also *ibid.*, Feb. 19, p. 84.
2165. *Winter Robins in New England.* By C. H. G. *Ibid.*, Feb. 19, p. 84.—Contains notes also on *Nyctea nyctea.*
2166. *Pelican and Catfish.* By O. K. Chobee. *Ibid.*, Feb. 26, p. 104.
2167. *Song Sparrows Rearing Kingbirds.* By Reuben M. Strong. *Ibid.*, pp. 104, 105.
2168. *Winter Rail on Long Island.* By Alfred A. Fraser. *Ibid.*, p. 105.—*Rallus virginianus.*
2169. *Eider Duck on the Niagara.* By Eben P. Dorr. *Ibid.*—*Somateria spectabilis.*
2170. *Wilson's Snipe in Rhode Island.* By F. L. G. *Ibid.*
2171. *The Woodcock's Noise.* By H. Austen and Wm. E. Præger. *Ibid.*, March 5, p. 123.
2172. *Ways of the Ruffed Grouse.* By Dorp. *Ibid.*
2173. *Winter Robins in New England.* By J. W. G. *Ibid.*
2174. *Quail in a Skunk Trap.* By A. V. R. *Ibid.*, p. 124.
2175. *Evening Grosbeak in Pennsylvania.* By F. F. C. *Ibid.*

[Forest and Stream.—Continued.]

2176. *Early Woodcock*. By J. P. B. *Ibid.*, p. 126.
2177. *Drumming of the Grouse*. *Ibid.*, March 12, p. 148.
2178. *Snowy Owl in New York*. *Ibid.*
2179. *Snowy Owl*. By Woronoco. *Ibid.*
2180. *Doves Nesting in Trees*. By S. A. Ball. *Ibid.*, March 19, p. 167. — With notes on nesting of several other birds.
2181. *Dakota Game Birds*. By Elmer T. Judd. *Ibid.*, p. 169. — Chiefly Water Birds.
2182. *Whistling Up a Woodcock*. By John J. Harris. *Ibid.*, March 26, p. 187.
2183. *Harlequin Duck at Cohasset*. By E. H. Clark. *Ibid.*
2184. *Wild Geese*. By Richard Gear Hobbs. *Ibid.*, p. 188. — Causes of scarcity.
2185. *Wild Geese and Electric Lights*. By F. B. *Ibid.*, April 9, p. 227.
2186. *Sierra Nevada Notes*. By Arefar. *Ibid.*, p. 229. — Contains notes on *Merula m. propinqua* and other species.
2187. *Why the Grouse Drums*. By Dorp. *Ibid.*, April 16, p. 248.
2188. *Eagle and Jack Rabbit*. By W. L. J. *Ibid.*
2189. *Bird Notes from Missouri*. By Jasper Blines. *Ibid.*, April 23, p. 268.
2190. *Sounds of Woodcock and Snipe*. By H. Austen. *Ibid.*
2191. *The Ways of the Ruffed Grouse*. By Dorp. *Ibid.*, April 30, p. 290.
2192. *Puzzled Geese*. By F. L. B. *Ibid.*, May 7, p. 310.
2193. *The Ways of Snipe*. By Henry B. Nicol, M.D., *Ibid.*
2194. *The Drumming of the Grouse*. By Hermit. *Ibid.*, May 14, p. 327.
2195. *Downy Woodpecker or Sapsucker*. By Henry Stewart. *Ibid.*, May 21, p. 347.
2196. *A Sparrow-killing Crow*. By W. H. *Ibid.*, p. 348.
2197. *Indians and Wildfowl*. By J. W. Schultz. *Ibid.*, June 4, p. 391. — Destruction of Ducks and Geese in the far North.
2198. *Ruffed Grouse in Confinement*. By O. O. S. *Ibid.*, June 11, p. 411. — See also *ibid.*, July 9, p. 496.
2199. *Fulvous Tree Duck in Missouri*. Editorial. *Ibid.*, June 18, p. 435. — See also *ibid.*, July 2, p. 476.
2200. *Florida Hummingbirds*. By Didymus. *Ibid.*, June 25, p. 455.
2201. *Bird Notes from Takoma*. By R. W. Shufeldt. *Ibid.*, pp. 455-456. — In the District of Columbia.
2202. *Pennsylvania Notes*. By H. *Ibid.*, July 9, p. 496.
2203. *Breeding of the Teal Duck*. By J. G. S. *Ibid.* — *Anas discors* near Geneva, N. Y. — C. F. B.

Publications Received. — Allen, J. A. On a Collection of Birds from Chapada, Matto Grosso, Brazil, made by Mr. Herbert H. Smith. Part I. Oscines. (Bull. Am. Mus. Nat. Hist., III, No. 2, pp. 337-380.)

Baur, G. On the Origin of the Galapagos Islands. (Ann. Nat., March, 1891, pp. 217-226.)

Büttikofer, J. On a Collection of Birds from Flores, Samao and Timor. (Notes from Leyden Mus., XIII, pp. 210-216.)

Cherrie, George K. Notes on Costa Rican Birds. (Proc. U. S. Nat. Mus., XIV, pp. 517-537.)

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Fannin, John. Check List of British Columbia Birds. Svo. pp. 49. Victoria, B. C., Sept., 1891.

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MacFarlane, R. Notes on and List of Birds and Eggs Collected in Arctic America. (Proc. U. S. Nat. Mus., XIV, pp. 413-446.)

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GENERAL NOTES.

The Black Tern at Prince Edward Island.—As far as I can learn, the Black Tern (*Hydrochelidon nigra surinamensis*) has never been reported from the Atlantic coast north of Grand Manan Island, where three specimens were taken "in the latter part of August, 1879," as recorded by Mr. Ruthven Deane (Bull. Nutt. Orn. Club, Vol. V, p. 63). I have in my collection a young male of this species which I shot September 13, 1887, at Tignish, Prince Edward Island.—FRANK H. HITCHCOCK, *Washington, D. C.*

Calidris arenaria in Massachusetts in Winter.—While on a shooting trip at Nantucket Island, Mass., I saw on Dec. 13, 1891, a Sanderling which alighted for a moment within a few feet of where I was and then flew away. As I have before stated (Auk, VII, 294), some of these birds regularly winter in this locality.—GEORGE H. MACKAY, *Nantucket, Mass.*

Late Breeding of *Columbigallina passerina*.—On November 3, 1891, I saw a pair of Ground Doves just able to fly. They were accompanied by their parents. This species must breed regularly up to November, for on October 19, 1886, I took a set of two slightly incubated eggs on Sullivan's Island, South Carolina.—ARTHUR T. WAYNE, *Mount Pleasant, South Carolina.*

A Belated Migrant.—On November 26, 1891, I saw and positively identified a Bobolink (*Dolichonyx oryzivorus*). I had just shot a Wild Turkey, and had scarcely walked ten steps with the Turkey when, quite to my surprise, a Bobolink flew up from a patch of weeds. I could have easily shot the bird, but did not care to. Previous to November 26 the weather was very inclement, there having been ice four times.—ARTHUR T. WAYNE, *Mount Pleasant, South Carolina.*

Junco hyemalis in Eastern Massachusetts in June.—On May 23, 1891, I was much surprised to find a male Snowbird (*Junco hyemalis*) feeding in a pasture at some distance from my home, in company with two Chipping Sparrows (*Spizella socialis*). On May 27 he was in the same pasture, again in company with two Chippers. Owing to the distance, my next visit to the place was on June 7, when I found things going on as before. Evidently the Snowbird intended to spend the summer there.

June 13 Mr. Bradford Torrey accompanied me, and we then found the Junco engaged in feeding young birds in a nest looking exactly like a typical Chipping Sparrow's nest, placed in the crotch of a small limb of a red cedar some twelve feet from the ground. After waiting a few minutes we saw a female Chipper feed the same young, and then the case waxed exceedingly interesting, for it seemed to be one of interbreeding between birds of different genera. To our disappointment, however, a male Chipper finally appeared, who showed much interest in subsequent proceedings. But he never once brought food, while the Snowbird and female Chipper did so constantly. Any casual observer would undoubtedly have declared them the parents of the brood. When, at last, I climbed the tree to get a look at the young birds, Junco made far more protest than did either of the Sparrows; in short, during all our visit, he behaved precisely as the father of the young birds would naturally do.

Of course we decided to obtain the young when they should become of proper size and plumage. But this proved impracticable. The birds got out of the nest, and although I with others saw the Snowbird feed them repeatedly after this, we were unable to get one of them for examination. It must be said, however, that, so far as we could observe with the aid of

a good glass, they looked exactly like ordinary young Chipping Sparrows.

Junco remained in the same vicinity during all of June, being seen on several dates, as also being heard to sing freely; he was also seen July 14. Whenever seen he was invariably accompanied by several Chippers, probably the two adults and the family of young. In August I sought him vainly. Repeated search failed to reveal him, and at last I gave up the quest.

The gist of the story is this: *Junco hyemalis* haunted one field in this town from late in May until the middle of July; during part of this time he assisted in feeding a brood of young Chipping Sparrows. Whether he was the real father or only the godfather of these young Sparrows is an interesting question which, I deeply regret to say, I cannot answer.—E. F. HOLDEN, *Melrose, Mass.*

Distribution of the Species of *Peucæa* in Cooke County, Texas.—The eastern third of the county is covered with timber, principally post oak and black jack on the upland, with hickory, ash, and elm on the streams. The soil is sandy. In this timber belt is found *Peucæa æstivalis bachmanii*. I have never seen this bird in this county in winter.

The central part of the county embraces the Grand Prairie, which is undulating and slopes gently to the southeast, the underlying chalky limestone producing a rich, stiff, almost black soil, and forming an escarpment to the north and west. In this prairie only have I found *Peucæa cassini*. It is only seen during the breeding season, and it is then of irregular occurrence.

Under the scarp of the above-described limestone is a sandy soil grown with post oak and black jack, but in a dwarfed condition, while there is a growth of bramble (chaparral) not seen in the eastern portion of the county. In this part of Cooke County alone have I seen *Peucæa ruficeps eremæca*. I have seen the young on the wing on May 31, and have also seen one pair on December 27.

All three have distinctive songs, but only *cassini* sings on the wing, and it does not always do so. I once shot one singing in the crack of a worm fence.—GEO. H. RAGSDALE, *Gainesville, Texas.*

***Thryothorus ludovicianus* in Massachusetts.**—On September 27, 1891, I shot in my garden in Cambridge, Mass., a Carolina Wren. The bird was an adult male and was in fine condition. He had been in the neighborhood for nearly a week and possibly longer, and was frequently to be heard calling or singing. The spot seemed to be to his taste, for my own and the adjoining gardens afford an abundance of shade trees and shrubbery, while, separated only by a high board fence, is an extensive pile of firewood and odds and ends of lumber the attractions of which he seems to have been the first to discover.

As far as I am aware this species has been captured in New England, beyond the limits of the Carolinian fauna, but three times before: at

Brookline (Nov. 4, 1883) and Lynn, Mass. (July 6, 1878), and at Rye Beach, N. H. (Aug. 7, 1880). In the present instance the habits of the species, as well as the absence of violent storms for some time previous, preclude all idea of the bird's having been swept away from his home and dropped here by some cyclonic gale. In all probability it was simply a case of that restless spirit of wandering that takes possession of most 'non-migratory' species in the autumn, and which is very likely the surviving remnant of a former habit of migration in such species.—C. F. BATCHELDER, *Cambridge, Mass.*

Notes from Springfield, Massachusetts.—November 14, 1891, I captured on the Connecticut River near Springfield an adult male *Aythya collaris*. Occasionally in autumn a small flock of this species will locate their feeding grounds in this vicinity and remain a month or so, but as far as my experience goes they have heretofore been young birds.

During the first half of November, the most common Duck about here was *Dafila acuta*; this was something quite unusual. One day I was one of a party that captured nine specimens, and we could easily have taken more if we had cared to do so. There were a few *Anas obscura* in company with the *Dafila acuta*, instead of the reverse as is usually the case if any of the latter kind are in this locality.

From the 28th day of last August until about the 20th day of September a water bird, which I suppose to have been a Clapper Rail, located itself and remained among the wild oats that grow on the muddy banks of the Connecticut River upon the shore directly opposite the city of Springfield. During calm days the call of the bird, which very much resembles that of the common Guineahen, could be distinctly heard from this side of the river, a distance of more than a quarter of a mile. All my attempts at capture failed, although I approached within a few feet of the bird. I know of but one Clapper Rail having been taken in this vicinity.

While shooting from a blind this fall, a Wood Duck stopped and fluttered over the decoys, and while in that position, like a flash, a Sharp-shinned Hawk flew and fastened itself upon the back of the Duck, when both were shot. I relate this incident to show the ferocity and boldness of this little Hawk.

A pair of Mockingbirds, whose presence in West Springfield I have heretofore recorded, passed this their fourth successive season in the same locality in that town.—ROBERT O. MORRIS, *Springfield, Mass.*

NOTES AND NEWS.

AUGUST VON PELZELN, an Honorary Member of the American Ornithologists' Union, died at Oberdöbling, near Vienna, on the 2d of September, 1891, in the sixty-seventh year of his age. Owing to failing health

he had recently resigned the position of Custos of the Imperial Museum at Vienna, where for forty years he was in charge of the collections of mammals and birds. He had for a long period been recognized as one of the leading ornithologists of the world, and an especial authority on the birds of Brazil. Although the author of a long list of minor papers and essays, his best known work is doubtless the invaluable 'Zur Ornithologie Brasiliens,' published in parts, 1868-71, based on the collections made by Johann Natterer during the years 1817 to 1835, representing 1200 species and numbering over 12,000 specimens. He also published extensively upon mammals, particularly those of Brazil, collected by Natterer.

CAPTAIN THOMAS WRIGHT BLAKISTON, R. A., one of the original Corresponding Members of our Union, died in San Diego, Cal., on October 15, 1891, from pneumonia.

To ornithologists Capt. Blakiston was best known for his invaluable contributions to the knowledge of the avifauna of Japan, and it is safe to say that no one man has done so much towards the thorough understanding of the ornithology of that interesting country. During a sojourn of twenty years in the northernmost island of Japan proper, Yezo, he was enabled to give a nearly exhaustive list of the regular visitors and residents of that hitherto almost entirely unknown island, introducing an entirely new feature in the Japanese avifauna, viz., the Siberian, and demonstrating the fact that the dividing line between the Manchurian and the Siberian subregions of the Palearctic region is formed by the Strait of Tsugaru which separates Yezo from the main island. This zoögeographical line has justly been termed 'Blakiston's line' in recognition of his valuable work.

After having collected material for a full understanding of the zoögeographical position of Yezo, he in conjunction with Mr. Pryer in 1879 issued the first catalogue of the Birds of Japan that lays claim to an approach to completeness, as the list of the 'Fauna Japonica' only comprises the birds of the extreme southern part of Japan proper. In 1880 a new list was published, a revised edition of which was again printed in 1882. The latter is practically the foundation of all future work in Japanese ornithology. It is *the* 'Check List' of Japan.

It was not only the geographical distribution pure and simple that attracted his attention. With true scientific tact and accuracy he investigated the changes of plumages, the migrations, and the habits of the birds he came in contact with, and many an intricate question has been solved which without his untiring energy and loving understanding would have remained unsolved to this day.

Blakiston was not a 'professional' ornithologist; he was an amateur in the best sense of the word, for he was scientific in his methods and aims as only few of even the professionals. But he was an amateur in this that his motive was a most unselfish love of truth and his science. He did not pursue his studies for the 'glory' they might bring him, but in order to satisfy his thirst for knowledge. Nor did he, while working out the details, lose sight of their connection with the whole. Unlike most

amateurs he appreciated that the knowledge of distribution, migration, habits, etc., is not the ultimate aim of his science, but that these details are only valuable in so far as they assist in ascertaining the laws and history of the whole living world, of life itself.

In strict conformity with the scientific spirit that characterized all his doings were the modesty and generosity of the man. Always willing to help and to give, never jealous of anybody 'stealing his thunder,' but on the contrary, openhearted and openhanded, giving out of his stores both of knowledge and material without expecting or claiming 'returns' or 'credit.' And because men of Captain Blakiston's stamp are so scarce his loss is felt more deeply by those who had the good fortune to know him and to profit by his nobleness of heart and mind.

We have not space to enumerate all the various papers published by him on the birds of Japan. The principal ones have been alluded to above, and to these we would add the title of a very interesting paper read by him on February 14, 1883, before the Asiatic Society of Japan, viz: 'Zoölogical Indications of Ancient Connection of the Japan Islands with the Continent.'

The following species were named in his honor:—*Alauda blakistoni*; *Anthus blakistoni*; *Areoturnis blakistoni*; *Arundinax blakistoni*; *Bubo blakistoni*; *Chelidon blakistoni*; *Motacilla blakistoni*.

Captain Blakiston was born at Lymington, Hants, England, December 27, 1832. He received his education at the Royal Military Academy, joined the Royal Artillery, and served during the Crimean War. At the end of the latter he was sent to Canada where he was detailed to join the Palliser Expedition for exploring the country between Canada and the Rocky Mountains. The winter of 1857-58 was spent in Hudson's Bay Territory and in Western Canada, and during the following summer he crossed the Rocky Mountains twice. The ornithological results of his wanderings in the Fur Countries are embodied in two valuable papers, published in 'The Ibis' for 1861, 1862, and 1863, entitled 'On the Birds of the Interior of British North America,' which are still the main source of our ornithological knowledge of these parts of our continent. In 1861 he surveyed the middle and upper Yangtse-Kiang, for which work he received the Royal Medal of the Royal Geographical Society. Shortly after he left China for Japan, where, after a brief visit to England, he settled in Hakodate, engaging in mercantile pursuits. In his spare time he engaged in his favorite studies, exploring and surveying a then almost unknown country and people. In 1884 he retired from business and came to this country where he settled and married Miss Dun of London, Ohio.

Captain Blakiston collected extensively. His Canadian collections went to Woolwich, England; quite a number of Japanese birds he sent to R. Swinhoe, while a great many more were given to the local museum in Hakodate, but the remainder of his valuable collection he donated to the United States National Museum, where it forms the nucleus and most valued portion of one of the most extensive collections of Japanese birds in existence.—L. STEJNEGER,

SUPPLEMENT.

THE INHERITANCE OF ACQUIRED CHARACTERS.

*President's Address, Delivered at the Annual Meeting of the
American Ornithologists' Union, New York,
Nov. 18, 1891.*

BY D. G. ELLIOT.

COLLEAGUES:—I desire at this time to bring to your notice a subject that does not seem to have greatly occupied the attention of ornithologists, although it has been the cause of much discussion among others prominent in different branches of science, and is so important that it strikes at the very root of the principles of evolution, and the causes that effect the variations exhibited by living creatures. This subject is comprised in the question, "Can acquired characters be transmitted by a parent to its offspring?" A school has arisen, under the leadership of Prof. August Weismann, of Freiburg University, which denies that acquired characters can be transmitted by their possessor, but attributes all variations that occur to the principle of natural selection, and Weismann asserts* that the inheritance of acquired characters has never been proved, either by means of direct observation or by experiments. This theory is of course in direct opposition to Lamarck's fourth law which those who do not agree with Prof. Weismann, accept as explaining their belief. This law, freely translated is as follows: "All that has been acquired, impressed, or altered in the organization of individuals during the course of their life, is preserved by generation, and transmitted to the new individuals which spring from those who have experienced these changes." Of course we receive this statement with a reservation, for it is not to be presumed that *all* characters, but only such would be transmitted, as would be necessary for the preservation or well-being of, or would be advantageous to, the offspring. Before discussing this subject it is very necessary to

*Essays upon Heredity, 2d ed. p. 81, English Translation.

ascertain what is meant by the expression "acquired characters." Weismann* defines these, as "no more than local or sometimes general variations which arise under the stimulus provided by certain external influences." Prof. Ray Lankester,† one of the most ardent as well as aggressive of Weismann's followers, explains the term as "new characters acquired by the parent as the direct consequence of the action of the environment upon the parental structure, and exhibited by that parent as definite measurable features."

Mr. Dyer‡ gives his view of this expression, in perhaps not quite so lucid a manner, as follows: "Acquired characters are those changes of hypertrophy, extension, thickening, and the like, which are obviously due to the direct physical action of the environment on the body of the individual organism." I would define this term, as seems most reasonable to me, as follows: Acquired characters are differentiations due to any cause, known or unknown, assumed by an individual or individuals during life, which render it or them recognizable as varying from the ancestral form. I do not profess to be able to produce proofs that are absolute, and show causes for these variations which may not be explained away by some unexplainable theory, any more than have Weismann and his followers been able to bring forward any that absolutely prove the position they have assumed to be correct, but I think evidence can be given, that may be called strongly circumstantial, if not direct, to show that characters have been acquired and then transmitted by a parent to its offspring. We will first consider the causes that, as has been asserted, produce these variations, and then cite some of the cases that would seem to show direct evidence of the power some of these causes, at least, have exerted in influencing these variations, and of their transmission from the parent to the offspring.

Weismann and his followers, as has been stated, assert that natural selection is all-sufficient to explain these phenomena. What is natural selection? For a reply I turn to Darwin, the originator of this theory, and read as follows: "The preservation of favorable variations, and the rejection of injurious varia-

* *Essays*, p. 171.

† *Nature*, 1890, p. 315.

‡ *Ibid.* 1889, p. 128.

tions, I call natural selection.*...Some," he states, "have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as occur, and are beneficial to the being under its conditions of life"; and he farther says,† "unless profitable variations do occur, natural selection can do nothing"; also,‡ "unless favorable variations be inherited by some at least of the offspring nothing can be effected by natural selection," and this is reiterated farther on,§ "nothing can be effected unless favourable variations occur," and he goes on to say|| "what applies to one animal will apply through all time to all animals — that is if they vary — for otherwise natural selection can do nothing." It will thus be seen that the author of this doctrine expresses himself in the most positive terms that the principle does not originate variation, but on the contrary is only effective when variation arising from some other cause has been produced. Let us consider some of the causes which, from the results, lead us to believe that they have originated variation. and first among these is environment. Darwin paid little or no attention to the influences of this cause, and in his letter to Moritz Wagner he says: "In my opinion the greatest error I have committed has been not allowing sufficient weight to the direct action of the environment, that is food, climate, etc., independently of natural selection. Modifications thus caused, which are neither of advantage or disadvantage to the modified organism, would be especially favored, as I can now see, chiefly through your observations, by isolation in a small area, where only a few individuals live under nearly uniform conditions. When I wrote the 'Origin of Species,' and for some years afterwards, I could find little evidence of the direct action of the environment. Now there is a large body of evidence."¶ It is, I think, the general belief, of ornithologists at all events, that a form to be successful in attaining a new development, must be isolated from other forms. This would seem to be self-evident; otherwise an individual that

*Origin of Species, 3d ed. p. 84.

†Ibid. p. 86.

‡Ibid. p. 107.

§Ibid. p. 114.

||Ibid. p. 119.

¶Darwin's Life and Letters, Vol. III, p. 159.

should begin to vary from its type, no matter what its cause might be, would almost certainly have those variations extinguished by interbreeding with typical individuals. A reasonable supposition, why such individuals as above mentioned should be able to perpetuate their variations or acquired characters without isolation, would be that the influences producing the characters were so powerful as to extend over and include the majority of the members composing the group affected, and then it would naturally follow that the original type would gradually disappear (the same influences continuing with undiminished force), to be succeeded by the new form, which in its altered condition would be more fitted, as we may believe, to battle with its changing surroundings.

It is perhaps well that, before proceeding farther, I should here explain what I mean by 'type' and 'typical' forms, as those terms will be used by me frequently. Type simply denotes the *starting point*. Thus an individual first described is the starting point in our literature of what we call a species, with which all subsequently discovered forms are to be compared. The form represented by this individual may not be, and probably is not, the original source from which all its varieties have sprung, but merely, mainly from accidental circumstances, was first brought to our notice. Thus *Cyanocitta stelleri* is the type of its particular group, and it is customary to compare the allied forms with it. It does not follow that because the bird we recognize under this name was described first, that it was the source from which its races derived their existence, as one of the forms we call subspecies may just as likely have been the origin of all the races, *C. stelleri* included, but the latter, having been first known, is the starting point or 'type.' 'Typical' is that form which identically represents the type.

Weismann,* referring to environment, says, "I only know of one class of changes in the organism which is with difficulty explained by the supposition of changes in the germ; these are the modifications which appear as the direct consequence of some alteration in the surroundings," and he declines to consider the subject in detail because facts of sufficient precision are not known for a final verdict to be pronounced. But it may be seriously doubted if Prof. Weismann has been able to produce more facts

*Essays, 2d ed. p. 99.

of "sufficient precision" to prove the theory he advocates than those who as yet decline to accept his views can bring forward as practically substantiating their position. Neither side has proofs that can demand the pronouncing of a final verdict, and we can consider only which evidence produced is most likely to show the true solution of the problem.

Some of the evidence of variation produced, as we believe, by environment and isolation may be derived from various genera of birds containing numerous species with a wide dispersion, and of these I would cite *Ptilopus*, a genus of Fruit Pigeons. These birds are chiefly inhabitants of islands, and intercourse between them is impossible on account of the intervening sea. As an example of variations that are produced, I will select as a type *Ptilopus melanocephalus*, a thoroughly characteristic and well-marked form, known to and accepted by ornithologists as a species, and which is an inhabitant of Java, Lombok, Sumbawa, and Sulabessie. In the neighboring island of Flores is a form *Pt. melanauchen*, varying but slightly from the type as if just commencing to differentiate. To the north in the great island of Celebes is another variation called *Pt. melanospilus* differing in a narrower throat mark, and in having the crissum lemon-yellow washed with orange, instead of clear yellow. Sula and Ceram possess another form which has the occipital black band (present in all the forms cited) smaller, and the crissum orange yellow; and lastly in the island of Sanghir, farthest away, *Pt. xanthorrhous* is found, which has both abdomen and crissum orange, this color running upwards nearly to the breast, thus exhibiting the widest divergence from the type. It will be seen from this distribution that, as might have been expected, the variations in the forms living nearest to the type, and consequently with less change of environment, are the slightest, while as the separation becomes greater these differences are more pronounced, until in Sanghir appears a form which has departed so greatly from the type as to merit specific rank.

The probable cause of these differentiations in the members of *Ptilopus* may be explained as follows. The islands of the Eastern Archipelago doubtless are but the remains of what was once a continent, and this was not broken up simultaneously or always suddenly in its length and breadth, but sometimes gradually and at various periods. Therefore we should not be surprised that

one species should inhabit various islands, between which are others containing distinct forms of the same genus. This may be accounted for in two ways. First, a species may have been widely dispersed over the continent; and when portions of this had disappeared beneath the waves, the fragments that remained above water at the outset were all inhabited by the same species; but the physical and other conditions of the environment at intermediate points were of a different character from those at the extremes, and in course of time the individuals, influenced by their environment, isolated on intervening islands, departed from their types, while others, though widely separated, retained their characters. Or, second, it may have been, on the breaking up of the continent, a portion of this inhabited by a strictly local form, but one surrounded by a more widely disseminated and typical species had not been submerged. This might explain the fact of why a distinct form should intrude itself on an island lying between others inhabited by a different one, the species with the greater range having been preserved at the extremes of its habitat which also had become islands. Thus isolation and environment had fulfilled their work, but the form remained true to its type, except where the environment had been changed.*

Other groups in the same genus present similar gradations of change and typical departures, but the above is sufficient for the present illustration. Now what has caused this variation? If, as we may suppose would be asserted by Weismann and his followers, it has occurred through natural selection and not by the parent transmitting its acquired characters to its offspring, how did the principle named act, if the environment was not sufficient to influence the change? Weismann acknowledges that the *germ-plasm*, that is, what he designates as the undying part of the organism contained in the germ-cells, may itself be modified through the action of the environment on the *soma*, that is, the body, increasing its nutrition, yet he denies that definite changes induced in certain parts of the *soma* by the action of the environment can be transmitted to a succeeding generation. If, as granted by Weismann, the so-called 'immortal' part of the organism can be changed or modified by the influences of the environment, is it not reasonable to suppose that such modifications

*In this connection see Baur, 'Origin of the Galapagos Islands,' *Am. Nat.* 1891, p. 107.

would be exhibited by the germ-plasm upon the body of the individual's offspring, or must we believe that a modified or changed germ-plasm would produce the same results on succeeding generations that it did before it was altered from its original condition, no matter what the causes may have been to effect such modifications? But if such a modified germ-plasm did produce a modification in the offspring as presented by its parent, would not that be a transmission of acquired characters caused by the environment and not by natural selection?

If the influences of environment affect only the cells of the body, and these are unable to affect or modify the reproductive cells, would it not naturally follow that the offspring of an animal that was first changed by its environment, would not resemble its changed parent, but on the contrary would be what that parent was before it had acquired any new characters, and then the young would have to undergo in its life similar changes to those the environment had produced in its parent, and this would always be the case throughout all the generations of that species? In the young would always be produced the original appearance of the parent, never its alterations. But this, of course, is not so. The young bears a very close resemblance to its parent in the majority of instances, else the continuity of specific forms would be an impossibility. It is difficult to believe that the germ-plasm could be predisposed to all the infinite variations exhibited by the body in the many and totally different influences of its environment, and that the somatic cells exerted upon it no influence whatever. "If the body of the multicellular organism is thus, even according to Weismann's ideas, of secondary importance in comparison with the germ-plasm, if the latter corresponds to the unicellular organism, it follows that the multicellular is just as immortal or mortal as the unicellular. And thus it is impossible to see why, between the germ-plasm of the multicellular on the one hand, and that of the unicellular on the other, there should exist this profound difference, that the latter acquires characters during life and transmits them by heredity, the former not, — how the former any more than the latter can nourish itself and grow without being influenced in its nature by its nurture."*

*Eimer, *Organic Evolution*, p. 71.

The germ-plasm, according to Weismann's theory, can produce body-plasm, but the latter can never originate germ-plasm. Germ-plasm is continuous, undying, the body-plasm is mortal. On this point Prof. Lloyd Morgan* remarks, "I cannot but regard his doctrine of the continuity of germ-plasm as a distinctly retrograde step. His germ-plasm is an unknowable, invisible, hypothetical entity. Material though it be, it is of no more practical value than a mysterious germinal principle. By a little skilful manipulation, it may be made to account for anything and everything. . . . The fiction of two protoplasts, distinct and yet commingled, is, in my opinion, little calculated to advance our knowledge and comprehension of organic processes. For myself I prefer to stand on protoplasmic unity and cellular continuity."

Mr. Lucas† has shown how the change of habit in certain birds of the island of Guadalupe, due to their insulation, illustrates certain facts affecting skeletal variation. The descendants of migratory species having their habitat restricted, show the symptom of weakening flight in the decrease in the length of the sternum; later on a diminution in depth of keel takes place. Then follows a reduction in length of wing, beginning with the manus and fore-arm, the humerus apparently not being affected, until the rest of the wing is perceptibly lessened. Then the outer wing bones disappear, leaving only the humerus,—as in *Hesperornis*,—and finally the humerus itself may be wanting, as in *Dinornis giganteus*. But there are exceptions to this, and one is exhibited in *Salpinctes guadalupensis* which has gained in power of flight, both the wing and sternum exceeding in length those of the continental form, and this would seem to indicate that insulation does not necessarily cause degeneration. Mr. Bryant had shown that this Wren had become the most abundant species on the island, and in ten years had exhibited a slight increase in length of bill; and Mr. Lucas argues that in this species superior wing power would give superior ability to obtain food, to escape its enemies, and to prevent its being blown out to sea, and a superiority in these points would naturally lead to its increase. Why this bird should be an exception to the others on

*Anim. Life and Intell. p. 141.

†Auk, 1891, p. 218.

the island may be due to the fact that *Salpinctes*, being a genus whose members are feeble in flight, required a greater development of wing and sternum to place it on a par with other species whose wing power was naturally sufficient to successfully combat the influences of insular life, and which *Salpinctes* alone lacked.

But to draw my illustrations solely from island forms, may be objected to on the ground that the influences there exerted are more powerful and exceptional than in other geographical areas which have environments not so abruptly separated. I will therefore cite the effects we assume continental environments have upon a form of wide distribution, and take for my illustration the familiar species *Melospiza fasciata* Gmel. and its allies. This species and its subspecies are distributed throughout North America from the Atlantic to the Pacific, and from Mexico to Alaska, and its islands. The type is found in the form inhabiting the eastern States, and extends its range to Nebraska and Indian Territory, and is generally constant in its characters, the variations being scarcely noticeable, as would be expected from the similarity of the environment throughout this dispersion. New Mexico and Arizona present a form, *M. f. fallax*, that varies from the type in its extreme pale coloration and increase of size. This region possesses climatic influences of an arid character, very different from that with which the type has to contend, and in certain portions of the habitat, as in the region of the Gila River, these influences cause individuals to exhibit markedly different characters from those observed in the type. In Colorado, Utah, Nevada and northward occurs another form, *M. f. montana*, which in winter visits the neighborhood of Tucson in Arizona. This is darker in color than *fallax*, as might be supposed it would be from the greater humidity of its habitat, but the two forms seem to run into one another on the northern and southern limits, respectively, of their dispersion, and individuals thus intermediate present characters that are inconstant, and which are probably the result of interbreeding. The foothills of the Sierras, through the mountains, and in their western foothills, produce another departure from the type, *M. f. heermanni*, and here we have a form of a much darker shade of brown, and bill intermediate in size between those of the two forms first mentioned. In the neighborhood of Comodu, in Lower California, the physical conditions have differentiated

another group, *M. f. rivularis*, distinguished from its New Mexico and Arizona relatives by darker color and greater size. Northward along the Pacific coast to the Columbian region another style is produced (*M. f. samuelis*), almost black in its coloration, and the smallest in size of all the subspecies. In the Columbian region a race, *M. f. guttata*, occurs, rufescent in hue, and with the bill more slender in porportion than any of the forms already mentioned. The typical home or central region of the dispersion of this form is the Columbia River region coastwise, but before reaching this point changes of an intermediate character in the color of plumage among individuals occur, foreshadowing the subspecies that ranges through the coast region of British Columbia, northward to Sitka. Thus migrants obtained in the fall and winter at Nicasio,* near San Francisco, are intermediate in coloration between the Pacific coast subspecies and that of the Columbian region, and individuals from the base of the eastern slope of the Cascades in Oregon exhibit gradations from that form which connect it by insensible stages with the subspecies of the Columbian region, *M. f. guttata*.

What is to be gathered from this mass of indisputable evidence, save that the variations of this widely dispersed form are caused primarily by the effects of environment, carried on, if you please, by natural selection, but not originated by it. The allied forms change with the localities they frequent. The different kinds of food, aridity, humidity, the elevation and depression of the earth's surface, producing mountain ranges and valleys, of various heights and depths, in short the many and potential physical and climatic influences that constitute what we call environment, have separately or together produced the various forms now existing, and that the characters acquired through these influences have been transmitted from parent to offspring. The various forms are isolated in the centre of their dispersion, as if on islands, from their allies, and when two of these are connected in the outlying portions of their dispersion, where the environment exerts influences derived from both neighboring regions, a new form is prevented from arising by the interbreeding of the two subspecies, even though the environment in the intermediate region could exert, if isolated, sufficient influences to produce and maintain

*Henshaw, Bull. Nuttall Ornith. Club, 1879, p. 159.

another subspecies. It seems to me this deduction from the evidence is reasonable and more probable than to suppose that the germ of these various forms had a predisposition in some ancestor to produce them. We cannot actually prove that environment has caused these changes, with any more certainty, perhaps, than the theory of germ predisposition can be proved, but this we do know, that desert tracts contain light-colored species, and forests and districts with great rainfall have dark-colored species, and it is a fair assumption that these great differences are caused by environment; and granting this, have we not an explanation of causes of variation, in some degree at least?

Additional evidence of the presumed effects of environment in another genus of birds could be produced from Mr. Dwight's exhaustive paper on *Otocoris* or Shore Larks, with which you are all familiar, but my time is too brief to consider this portion of my subject any further. If natural selection were all sufficient to produce variations in any particular species, it is reasonable to suppose that it would effect such changes in others under the same environment. But our evidence seems to point the other way, and that environment causes variations, and natural selection only assists in their transmission.

The effect of climatic influence is shown in the changes exhibited by the blue butterfly, *Lycæna agrestis*.* This occurs in three forms. A and B alternate in Germany as winter and summer forms; B and C are the winter and summer forms in Italy. The form B occurs in both climates, but appears in Germany as the summer, in Italy as the winter, form. The German winter form A, however, is completely wanting in Italy, while the Italian summer form (var. *allous*) does not occur in Germany.

Duration of life, among individuals, we also regard as a prominent factor in the development of species, and cause of variation; and the longest-lived creatures evolve new forms or variations the slowest. This would seem to be almost paradoxical, for it would appear that the longer an animal was exposed to the influences of its environment the more its immediate offspring would be impressed by and illustrate those influences. This might be so if reproduction and development were equally rapid in all creatures. But of course this is not so. The longest-lived creatures produce the fewest young, and naturally maturity is

*Eimer, *Organic Evolution*, p. 126.

slow in arriving. It is difficult to ascertain the age to which wild creatures are capable of attaining, but as the results of our only means of observation, viz., animals in captivity, it is found that Eagles live nearly one hundred years.* Ravens live nearly as long. Parrots have reached nearly one hundred years. Magpies live twenty years, and small birds, as the Nightingale, Blackbird, etc., from ten to twenty years. As a rule birds of long lives lay but few eggs at a time, and allowing for the destruction of the eggs from numerous causes, and the mortality among the young, it is estimated by Weismann,† arguing on the lines of Darwin and Wallace, that given the fertility and average of life of a species, a calculation can be made of the number of those reaching maturity. A species living ten years and laying twenty eggs each year, only two of its young in that time will reach maturity, if the number of individuals in the species is to remain constant. Or if the duration of life of an eagle is sixty years, and it reaches maturity at ten years, and then lays two eggs a year, out of the one hundred eggs laid only two will develop into adult birds. Weismann considers that this calculation rather under- than over-estimates the proportion of mortality among the young. However this may be, or whether we may altogether accept his calculations as correct, or warranted by recorded data, it appears to be a recognizable fact that the greater the age of an animal the slower it reproduces, and is the less able to originate divergences from those characters it received at its birth. The influences of the environment would be slower in their effects on a long-lived individual, and changes from its type, or starting point, correspondingly delayed. We must therefore look for variations and departures from the types more among those species with shorter lives, and greater number of offspring, where the influences of environment and natural selection are able to produce their legitimate effects in the briefest periods of time.

What is the result of the effect of environment on individuals? It provides them with the means of succeeding in the struggle for life. Dwellers of deserts, or desert-like districts, are pale in coloration and assimilate the ground, and so escape detection. Humidity and rainfull cause a melanistic phase of plumage,

* Brehm, *Leben der Vögel*, p. 72. Weism. *Essays*, p. 37.

† *Duration of Life*, *Essays*, 2d ed. p. 13.

witness the birds of Florida or those of the Northwest Coast, as compared with similar forms in drier sections of our country, and evidence is given upon this point in 'The Entomologist' as stated by Cockerell* that moisture is the cause of a certain phase of melanism, especially among lepidoptera. We may believe that the climatic changes of boreal regions influence the appearance of animals that are found within their limits, witness the white covering, affording, during the lengthened winter, an additional means of protection through concealment amid snow and ice. All such evidence strengthens us in the belief that the environment originates variation. Additional evidence of this I obtained in the clever paper† of my friend, Mr. F. M. Chapman, on a collection of birds from British Columbia, obtained on the coast and in the interior. The former is visited by a rainfall heavier than that observed in any other portion of North America, resulting in a dense forest-growth; the interior has a minimum of rainfall and vegetation comparatively desert-like in character. "The effect of this rainfall is the production of forms that are darker, more richly colored, or more heavily barred or streaked than any other representative of their respective genera." As a proof of this, thirty-one birds are enumerated from the coast, all of which present these distinguishing characters, when contrasted with their representatives from the interior, which are paler in every instance.

An acquired character resulting from the influence of environment will be inherited as long as the causes that produced it remain the same, but will be extinguished or changed with a changing environment, provided sufficient time has not elapsed for the character to become fixed. In the latter case heredity would probably cause the appearance of the character for several generations at least, even under a changed environment. Baur‡ has shown that Hoffman by isolating the wild carrot and bringing it under different conditions changed it considerably, and this change was inherited. Alpine plants removed to a botanical garden acquire new characters. The green Parrot (*C. festiva*),

* Nature, Feb. 27, 1890.

† Bulletin Am. Mus. Nat. Hist. III, No. 1, 1890, p. 127.

‡ Amer. Nat. 1891, p. 312.

as mentioned by Darwin,* when fed with the fat of siluroid fishes became variegated with red and yellow feathers, and the natives of Gilolo, in an analagous manner, alter the colors of the *Lorius garrulus* into the *L. rajah*. These characters will reappear if the causes that produced them continue, but not otherwise. The effect of food is illustrated in bees. The larvæ of worker bees, royally fed, develop into queens; and the workers raise queens when from any cause these are not present in the hive. The faculty enabling the workers to attain the wisdom to accomplish this cannot be inherited from their parents, queen and drone, but must exist in germ in worker larvæ, and be developed into mental characters either of queen or workers, according to the nourishment provided. This can only be explained by the inheritance of acquired characters, and by correlation, and not by the continuity of the germ-plasm, or by panmixia.†

In his essay on heredity Weismann asserts‡ that “from an Eagle’s egg an Eagle of the same species is developed, and not only are the characteristics of the species transmitted to the following generation, but even the peculiarities. The offspring resemble the parents among animals as among men”; and again in the same essay, when speaking of the reproductive power of the germ-cells, he says: “Each of these can, under certain conditions, develop into a complete organism of the same species as the parent, with every individual peculiarity of the latter produced more or less completely.” This is the position he would naturally take for his line of argument, and although those who differ from his views, might and do agree with him to a certain degree, they are not willing to go with him to the full extent such assertions would naturally carry them. Like does beget like, but not always. There are restrictions. It does in the sense that an Eagle can only produce an Eagle, and not a Swan, and a Grouse can only produce a Grouse, and not a Crow, but both forms can and do often produce young that vary from their parent in essential characters, such as color of plumage, size, and other attributes that form their complete organization. If this were not so, if like only could beget like, in its restricted sense,

*Animals and Plants. Domest. II, p. 269.

†See Eimer, Organic Evolution, p. 267.

‡Essay, pp. 72, 73.

there could be no advancement towards a more perfect development, and the creature of today would be the same creature it was at its creation, and it would remain the same throughout its existence. John T. Gulick* has defined this principle in a manner that seems most satisfactory, and nothing that I have yet seen advanced by the advocates of natural selection as the all-sufficient cause, is able to controvert his conclusions. Mr. Gulick explains: "1st. Unlike to unlike, or the removal of segregating influences, is a principle that results either in extinction through failure to propagate; or in the breaking down of divergences through free crossings. 2d. Like to like, when the individuals of each inter-generating group represent the average character of the group, is a principle through which the stability of existing types is promoted. 3d. Like to like, when the individuals of each group represent other than the average character of the group, is a principle through which the transformation of types is effected."

In exemplification of these principles this author illustrates them somewhat in this way. Sexual and social instincts often bring in groups like to like together that do not cross, and when the different groups occupy the same area, and are guided by the same habits in the use of the environment, divergences occur even without a diversity of natural selection. He farther explains the way in which this divergence arises. A partial change of plumage or development of plumes results from a local segregation; and through social segregation, the principle that causes animals to associate with those whose appearance has become familiar to them, these variations are prevented from being submerged by intercrossing. Then when the invisible instinct and visible character lead individuals thus characterized to associate together, the new characters are intensified, because any individual of the community not imbued with the desire to remain with animals thus changed, will stray from them and fail to breed. He calls this process social selection. Then sexual selection steps in and preserves and accumulates peculiarities of color or plumage, for any individual deficient in these characteristics would be less likely to breed and produce offspring. He concludes as follows: "Varieties thus segregated may often develop divergent habits in

**Nature*, XLII, 1890, p. 536.

their use of the environment, resulting in divergent forms of natural selection, and producing additional changes, but so long as their habits of using the environment remain unchanged, their divergencies cannot be due to natural selection." From these deductions, it is very obvious that we can only accept the dogma that 'like begets like,' with reservations. The offspring may be like its parent, but not always, nor in all respects. There are too many and too complex influences at work to hinder and prevent this. Natural selection cannot prevent a character from diverging from its accustomed path, and subsequently reappearing with modifications. Nothing, I believe, has yet been adduced to prove that natural selection can cause variation; it is merely the vehicle by means of which variation is continued. It takes what it finds already prepared and assists its transmission to succeeding generations. Selection, to employ the phraseology of a well-known naturalist, Prof. E. D. Cope,* "cannot be the cause of those conditions which are prior to selection"; in other words, selection cannot explain the origin of anything, and to this fact, even so strong an anti-Lamarckian as Prof. Lankester subscribes, for in his rather heated reply to Prof. Cope's article, he asks† "Who has ignored this? When and where?" If then it is conceded, even by this ardent follower of Weismann, that selection does not originate, or cannot cause variation, what becomes of their theory? We must look for some more potent factor to explain the origin and transmission of acquired characters, and this we believe we find in the influences exerted by isolation and environment.

Another fact requiring investigation, and its influence in the transmission of acquired characters, is the use or disuse of any particular organ. Prof. Romanes‡ explains the effect of this as follows: "If any structure which was originally built up by natural selection on account of its use, ceases any longer to be of so much use, in that degree will the prominence before set upon it by natural selection be withdrawn. And the consequences of this withdrawal of selection as regards that particular part, will be to allow the part in a corresponding measure to degenerate through successive generations." Weismann calls this principle

*Nature, XLI, 1889, p. 79.

†Ibid. p. 129.

‡Ibid. p. 437.

Panmixia, but Prof. Romanes terms it Cessation of Selection. The first-named author contends that this cessation of selection is capable of inducing degeneration down to the almost complete disappearance of a rudimentary organ, but Prof. Romanes argues that unless assisted by some other principle it can at most only reduce the degenerating organ to considerably above half or even one quarter its original size; because although no longer sustained by natural selection, it is by heredity, and as long as this force is unimpaired, the withdrawal of selection cannot reduce the organ much below the efficient level above which selection maintained it. But he farther argues that the force of heredity must fail, because a useless organ absorbs nutriment, occupies space, etc., and then natural selection not only ceases, but becomes reversed, and hastens the degeneration of the organ until a point of balance is reached, and the organ being no longer a source of detriment remains as a rudiment, and so it would remain forever if heredity were everlasting, which is not reasonable to suppose, and that the eventual disappearance of the organ would be caused by this failure of heredity. Prof. Weismann at first argued that the degeneration of an organ from disuse could be effected by panmixia alone, until it was reduced to five per cent of its original size, or in his words* "the complete disappearance of a rudimentary organ can only take place by the operation of natural selection; this principle will lead to its elimination, inasmuch as the disappearing structure takes the place and the nutriment of other useful and important organs;" not that the organ is transmitted from parent to offspring in a continued diminished state until it disappears, not from a failure of heredity itself, but by the influence of selection exerting a deteriorating effect. This he modifies, however, in his reply to Prof. Vine's criticism† when he says, "organs in disuse become rudimentary, not through the direct action of disuse, but because natural selection no longer sustains them." Therefore these disused organs which have become 'acquired characters,' transmitted from parent to offspring through undiminished conditions, disappear not through the failure of heredity but by selection withholding its sustaining power, or as Prof. Romanes has argued, acting in an opposite degree.

*Essays, 2d ed. p. 89.

†Nature, Oct. 24, 1889.

Now what is heredity, how did it originate, and how can it cause individual variability? An explanation cannot be found in the higher organisms, but must be sought for, according to Weismann, in unicellular organisms, or those in which no distinction exists between body and germ-cells; and which reproduced by fission, or division, when the two descendents of an individual are nothing more than the two halves of that individual. It is undisputed and acknowledged* by Weismann, that unicellular organisms are acted upon by external influences, and that these cause variations of size, color, form and number or arrangement of cilia, and these resulting characters are transmitted to the offspring, and he remarks "We are thus driven to the conclusion that the ultimate origin of hereditary individual differences lies in the direct action of external influences upon the organism," and that when individual difference had been attained by unicellular organism, "it necessarily passed over into the higher organisms when they first appeared." Does it not seem reasonable then to suppose that when these latter organisms received these inherited characters, they also obtained the power of transmitting direct adaptations derived from their environment? Regarding the evolution from cells of one kind (Protozoa) to cells of two or more kinds (Metazoa) coöperating in the same organism, Prof. Lloyd Morgan† argues that "Whenever and however this occurred the new phase of developmental reproduction must have had its origin. And if in cell-division there is any continuity of protoplasmic power, the faculty of producing diverse coöperating cells would be transmitted. On any view of the origin of the metazoa, this diverse or developmental reproduction is a new protoplasmic faculty; on any view it must have been transmitted, for otherwise the metazoa would have ceased to exist." But Weismann claims that in multicellular or higher organisms these variations could not originate and be transmitted, and illustrates this by citing* the improbability of a pianist, who by practice had developed the "muscles of his fingers so as to ensure the highest dexterity and power," being able to transmit this power to his offspring, because, according to his view, the effect would be entirely transient, as it would be unable to produce any

*Essays, 2d ed. pp. 285, 286.

†Anim. Life and Intell. p. 143.

change in the molecular structure of the germ-cells, and could not therefore produce any effect upon the offspring. This, however, does not seem to be a proper illustration of the subject, for the son of a pianist, even if capable, might not choose to become a pianist, and although the muscles his parent developed, might, if exercised, easily acquire an equal power to them, more easily probably than the offspring of a parent who had not so developed them, yet if disused they would remain in an only partially developed condition. Such may also be the answer to the similar illustration of Mr. Dyer,* of the blacksmith and his muscular arms. It does not follow that the son of a blacksmith must, or will, himself be a blacksmith; and until this acquired development has been observed in a line of blacksmiths descending from father to son for generations, it would be impossible to ascertain whether the abnormal muscular development could be transmitted or not. In this connection it may be stated that Mr. Arbuthnot Lane (as quoted by Lloyd Morgan)† has shown that certain occupations, such as shoe-making, coal-heaving, etc., produce recognizable effects upon the skeleton, the muscular system, and other parts of the organization. And he believes that such effects are inherited, being very much more marked in the third generation than they were in the first. And it might also be pointed out that the extreme development of the thigh muscles in the Ostrich is continued from parent to offspring, and although this is now an inherited character through long periods of time, it must have been at one stage of the bird's existence a character acquired from use, and its unusual development began when the wings became modified and its changed habits caused the individual to rely for defence and safety more upon its legs.

We may therefore say with Prof. Eimer that "every character which must have been formed through the activity of the organism, is an acquired character. All characters, therefore, which have been developed by exertion are acquired, and these characters are inherited from generation to generation. The same holds for all organs atrophied through disuse — the degree of atrophy is acquired and inherited. In the first class we see especially the

*Nature, XLI, 1890, p. 247.

†Anim. Life and Intell. p. 169.

‡Organic Evolution, p. 86.

action of direct adaptation, in the second the results of the cessation of this action. A third class of acquired characters is to be traced simply to the immediate action of the environment on the organism, and originally, at the commencement of their appearance, all characters must have belonged to this class."

Let us now consider other characters that are transmitted. Myopia is a deterioration of the powers of the eye, and this has become so prevalent in certain portions of Europe as to be almost a national characteristic. That its effects are and have been transmitted from parent to offspring is undeniable. Natural selection can have had nothing to do with it, otherwise this would be to assert that this principle, in this instance at least, had transmitted a character having an injurious effect, and thus enabling its possessor to be less fitted for the struggle for life, or exactly the opposite of the theory of the survival of the fittest. Weismann attempts* to meet the difficulty of this evident transmission of this acquired character by attributing it to an "accidental disposition on the part of the germ, instead of to the transmission of acquired short-sightedness," or to the "greater variability of the eye, which necessarily results from the cessation of the controlling influence of natural selection," or pamaixia. Or, in other words, that some progenitor of these myopic-inflicted generations may have had a congenital disposition to myopia, and have developed weak sight from an original predisposition which he naturally transmitted, not as an acquired character. And again, eyesight in a European, unlike that of a savage, is no longer under the preserving influence of natural selection, and the European, therefore, to make up for this deficiency and render himself the equal of any, uses spectacles. On this explanation Prof. Osborn well remarks† that "the latter example shows how Weismann's followers are put on the defensive when they try to explain the introduction of a new character without the Lamarckian principle, and solely by ingenious application of the Darwinian principle." Another instance of transmission of acquired characters, though perhaps old and often referred to, is that of a puppy, the offspring of parents trained to hunt birds, which, though untrained itself and never having seen other individuals of its species at work in the fields, suddenly stops and, without

*Essays, 2d ed., pp. 90,91.

†Atlantic Monthly, 1891, p. 360.

knowing the effect of a shot, springs forward, barking, to seek for game when the gun is discharged. Weismann endeavors* to explain this by saying that the dog has not inherited from his forefathers a certain association of ideas,—shot and game,—but rather he has inherited a reflex mechanism which impels him to start forward on hearing a report, and that it is not the effects of training, but some predisposition on the part of the germ, which has been increased by artificial selection. But this reasoning, even if capable of proof, which of course it is not, would not explain the fact of a puppy suddenly coming to a stand and remaining motionless in an uncomfortable attitude in the same manner as was the habit of its parent, unless this character of the breed so displayed had been transmitted by its parent. The first pointer undoubtedly possessed the instinct, or inherited the habit of hunting. It is not to be imagined it also possessed the trait of stopping and remaining stationary when it had found the object it sought, for that would have enabled the game to escape, but this additional trait was added by man to utilize and make more efficient its other powers, and assist him in obtaining game, and this habit so acquired by the dog was transmitted to its offspring, and continued by succeeding generations. If this had not been so, each offspring of every parent would have been obliged to acquire the same habit in the same way independently. Prof. Eimer† cites instances of pointer puppies belonging to him, which had never been trained, and never had seen a Partridge, “pointing a covey perfectly correctly, standing motionless with head outstretched, fore paw lifted, and tail stiffly erected.” These, he says, “are thorough-bred pointers which require no training at all, but have completely inherited the habits to which their ancestors were educated.” He also cites an instance of a *Wildbodenhund*, a dog “used to drive game towards the sportsman by barking.” It was about two weeks old when he obtained it, and as soon as it grew up, although it was never taken out shooting, began to drive game on its own account, and in spite of punishment, extended its operations every day. Another instance of acquired characters being transmitted is that of a pure-blooded female pointer or setter which had produced offspring by mating

*Essays, p. 94.

†Organic Evolution, pp. 168, 169.

with a dog of another breed. These puppies would be mongrels showing traits of both parents. Now if this female is again mated with a pure-blooded dog of its own species, the offspring will be pure, but occasionally in some of the litters, it may be years afterwards, there will appear in some of the offspring characters belonging to the breed to which the first dog belonged. These having been received by the female, were retained and transmitted to her offspring, though apparently they may have been dormant for considerable periods of time.

Birds acquire habits not possessed by their parents. I cite an instance. Currituck Sound, in North Carolina, where wild fowl are accustomed to pass the greater portion of the winter, is a great resort of sportsmen, who pursue the birds in every way to accomplish their destruction. This at length was carried to such a degree that the fowl had no place left for them to rest during the day. Some years ago the gunners were surprised to find that whenever the weather permitted, as soon as a gun was fired in the early morning, the birds would rise and betake themselves to the ocean, and remain congregated on the water, just beyond the line of the breakers, and would not return until night closed in. This custom was acquired by birds of succeeding years, until the habit has become apparently established. Now it may be said that this is not an *acquired* habit, but the result of example, the old birds leading the young to the sea. But this would be to assume that the majority of the birds which commenced this habit had survived and returned to this locality every winter. And even if the young, without at first comprehending the reason for so strange a proceeding, merely followed the old birds, is it reasonable to suppose they would remain in such an unusual locality throughout the day, deprived of their food, which could be obtained in profusion on the other side of the narrow beach? It must have been something more powerful than the mere example of the flight of the old birds to the ocean, witnessed by the young for the first time, which compelled them to remain. Can we not more reasonably presume that it was the knowledge acquired by the parents that this was a secure method to escape from a threatened danger, and transmitted to the young who assumed the habit as part of their nature?

Instances of transmission of acquired habits are found in the change of nesting among birds. Geese proverbially make their

nests upon the ground, but in certain localities arboreal nidification is adopted. This is witnessed in various parts of the Yellowstone, and upper Missouri regions, as related by Coues,* where the birds build in the heavy timber along the larger streams, and transport their young to the water in their bills, corresponding with the habits of the Wood Duck, some of the Mergansers and other Ducks. This character of change of habits is also exemplified in the Herring Gull (*L. a. smithsonianus*), caused mainly by persecution, and to escape from its enemy, man. Audubon† gives a striking instance of this. On arriving at White Head Island in the Bay of Fundy, he was surprised to see individuals of this species nesting in trees, and the owner of the island, a Mr. Frankland, informed him that this habit had been acquired *within his recollection*. When he first came to the island all the nests were placed on the moss in open ground, but as the eggs were collected for winter use, the old birds began to nest in trees in the thickest part of the woods, and their young followed this habit when their time of breeding arrived. Audubon also states that on neighboring islands to which fishermen and eggers have free access, this Gull breeds altogether on trees, and their original habits have been entirely given up. A remarkable effect of this transmission of an acquired character is that the young hatched in the trees do not leave the nest until they are able to fly, while those hatched in nests on the ground run about in less than a week and conceal themselves at the sight of man among the moss and plants. Some of the nests he saw in the trees were placed at a height of more than forty feet, those in the thickest part of the woods were about ten feet from the ground, and placed close to the stem, and were to be seen with difficulty. The species of the genus *Colaptes* build in holes in trees, either natural cavities, or enlarged to suit their needs. But *C. cafer* is known to breed in the banks of streams, where the absence of trees renders such a proceeding necessary, and like a Kingfisher, readily excavates a burrow. This fact has been observed by Mr. Henshaw‡ in New Mexico and Arizona, and is also mentioned by Dr. J. A. Allen§ as occurring along the Ogden and

*Birds of the North-west, 1874, p. 554.

†B. of Am. Vol. VII, p. 163.

‡Ornith. Wheeler Survey, p. 401.

§Bull. Mus. Comp. Zoöl. III, p. 169.

Weber Rivers in Utah. In the latter instance, it being September, the time for breeding had passed, but the birds were dwelling in the holes, were frequently seen sitting in them, and the author's observations led him to believe they had nested in the holes, there being no trees in the vicinity.

The evidence of variations produced by use and disuse of special organs also tends to confirm our views that acquired characters are transmitted. The modifications of the wing in various families of birds, when through disuse the power of flight has been lost, and this member has become either rudimentary, or else changed both in form and size so as to serve more like a fin, giving its possessor additional powers for the pursuit of its prey under water, are numerous; and to attribute these modifications to the principle of selection, or predisposition of the germ and to deny that use or disuse has produced hereditary effects, as Prof. Weismann asserts,* is to argue from a mere assumption that lacks evidence to establish even its probability.

Migration preserves a species true to its type, in that migratory birds keep together in flocks, and select localities in which to remain, having similar environments to those where they were reared. But if a species ceases to migrate for any cause and remains isolated in its habitat, then differentiation occurs, and the variations that appear are reproduced in their offspring. Thus it may not be supposed that the Great Auk was always incapable of flight, but that it migrated, even if only to a limited extent, while its wings were fully developed. This is a reasonable supposition, because all its relatives, the Divers and Auks, are birds of great wing-power and migrate at the present time. From some cause, unknown to us, but possibly from its ability to procure food throughout the year in the region it inhabited, it gradually ceased to migrate, and its wanderings becoming less and less, its wings were employed chiefly under water in pursuit of its natural food. The wings therefore being used in a different manner from that when the bird was flying, would be modified and reduced in size until they reached the form and dimensions most suited to assist the species in swimming beneath the surface, but which in their reduced condition rendered flight no longer possible. These modifications were transmitted to its offspring, rather, we would

*Essays, p. 92.

suppose, from the production of hereditary effects than to a predisposition of the germ, or selection, for there is no reason to suppose that this especial species of Auk, the largest and most powerful of the family, should have been in any way more predisposed to a degeneration of any of its organs than were any of its relatives, which have not degenerated, and which from their structure were no better fitted for the struggle for existence.

The Ostrich probably has descended from ancestors capable of flight, but they, we may suppose, did not possess so great a stature because a bird of that size would require such an expansion of wing that it hardly would be available to any creature other than a pelagic species. This ancestor was also a ground-feeding bird, and it is to be supposed that from physical changes occurring in its habitat it was obliged to rely more upon its legs than on its wings in order to procure a sufficiency of food, or escape from its enemies. Then the wings became reduced in size and the thighs correspondingly increased, and the legs not only were a means to enable the bird to travel with great swiftness, but also became a powerful weapon of offence or defence. Although the Ostrich is unable to fly at the present day, yet the manner in which it uses its wings when running, elevating them, and keeping them stationary as a bird does when sailing in the air, may be regarded as a trait derived from its flying ancestor, the only one appertaining to flight which its rudimentary wing permits it to retain.

I have by no means exhausted the evidence derived from birds, which strengthen us in the belief that acquired characters may be inherited; and I think the majority of ornithologists will agree with Prof. Lloyd Morgan* when he says: "I confess when I look round upon the varied habits of birds and mammals, when I see the Frigate Bird robbing the Fish Hawk of the prey that it has captured from the sea, the bald-headed chimpanzee adopting a diet of small birds, a *Semnopithecus* in the Mergui Archipelago eating crustacea and mollusca, and the Koypu, a rodent, living on shell fish; when I consider the divergence of habits in almost every group of organisms, the Ground Pigeons, Rock Pigeons and Wood Pigeons, seed-eating Pigeons and fruit-eating Pigeons; the carrion-eating, insect-eating, and fruit-eating Crows, the aquatic and terrestrial Kingfishers, some living on fish, some on

*Anim. Life and Intell. p. 446.

insects, some on reptiles; the divergent habits of the Ring Ouzel and the Water Ouzel; and the peculiar habits of blood sucking bats; — when I see these and a thousand other modifications and divergences of habit, I question whether the theory that they have all arisen through the elimination of those forms which failed to possess them may not be pushed too far; I am inclined to believe that the inheritance of acquired modifications has been a coöperating factor. It is not enough to say that these habits are all useful to their possessors. *It has to be shown that they are of elimination value* — that their possession or non-possession has made all the difference between survival and elimination.”

Other branches of zoölogy also afford striking evidences of this transmission difficult to explain away. Moritz Wagner has shown that a species of *Saturnia*, transferred from Texas to Switzerland acquired new characters and transmitted them to its offspring of the first generation. A number of pupæ were brought over, and the moths developed out of the cocoons exactly resembled the Texan species. Their young were fed on leaves of *Juglans regia*, and the moths were different, both in form and color, and were considered by entomologists as a distinct species. The polymorphic snail *Helix nemoralis*, was introduced from Europe into Lexington, Virginia, a few years ago. Under its new conditions it varied to a greater extent than it had been known to do elsewhere, and one hundred and twenty-five varieties have been observed, of which no less than sixty-seven are new or unknown in Europe, its native country.*

The shrimp *Artemia salina* lives in brackish water, and the *A. milhausenii* in water much saltier. By altering gradually the saltiness of the water, either of them can be transformed into the other in the course of a few generations, and the change of form is maintained, the altered conditions remaining the same.†

Vertebrate paleontology furnishes evidences that acquired characters are transmitted, and that the majority of these occur alone from use and disuse, and Weismann argues that these variations are quantitative, and are acted upon by natural selection. But in tooth evolution, as pointed out by Prof. Osborne,‡ there are ex-

*Cockerell, Nature, Feb. 27, 1890.

†Lloyd Morgan, after Schmarkewitsch, Anim. Life and Intell. p. 164.

‡Am. Nat. 1891, p. 16.; ibid. Nature, XLI, 1890, p. 227.

amples that are qualitative, or "rise of structures that are essentially new, and not simple modifications of pre-existing forms."

One of them is the addition of new cusps, which do not rise at random points and disappear, but successive cusps are added to the simple conical crown at the point of the maximum wear. There are rare exceptions to this fact, however, which will require subsequent research to explain whether or not they are in conformity with the laws of individual adaptation. A very striking instance of the effects of use and disuse is cited also by Prof. Osborne* derived from the ancient pedigree of the American horse, where we are (to use the Professor's words) in before the birth, so to speak, and the modifications in the leg from the four-toed *Hyracotherium* to the eocene *Mesohippus* were caused, as proved by various investigators including himself, by the strain arising each time the foot was placed upon the ground producing infinitesimal alterations in all the bones of the leg, and "during the early geological periods these strains were constantly changing *pari passu*, with the gradual decrease of the lateral, and increase of the central digits." And in view of this evidence we may all say with the writer of the article from which I have quoted that "it is hard to believe with the new school, these invariable sequences of race adaptation on individual adaptation are not instances of cause and effect. If they are, they afford absolute proof of the transmission of acquired characters. If not, all our pains-taking researches and vast literature lead to no result."

I have thus as briefly as possible, though fully conscious of having occupied more time than I ought, brought this extremely important subject before you for your earnest consideration. It will be readily perceived that I have merely touched upon a few of the points that would naturally arise for discussion, in connection with the transmission of acquired characters but my object, in drawing your attention more particularly to this question, is to excite your interest, in the hope that by your own individual investigations and experiments you may be able to throw some light on so much that now is obscure and impossible of explanation. We none of us have the temerity, I trust, to say with a distinguished botanist† that "the questions at issue with regard to evolution are now thoroughly understood by biologists," but

*Atlantic Monthly, 1891, p. 362.

†Dyer, Nature, XLI, 1890, p. 315.

rather approach our task with a full appreciation of its enormous difficulties, and in the words of the Duke of Argyll* "conscious above all thing of the ignorance of man." The subject I have discussed offers a new field for ornithologists to explore, one of a higher plane, and permitting a wider vision than many of those they are accustomed to tread. I submit it to my younger colleagues, who have time and opportunities before them, as of infinitely more importance than the discovery and naming of new forms, which is by no means the beginning and end of ornithology, but rather, if I may so term it, the A B C of the science; and then by their contributions towards the elucidation of my theme, they will benefit not only those who are devoted to our own branch but also all scientific men throughout the world.

*Nature, XLI, 1890, p. 367.

FOURTH SUPPLEMENT TO THE AMERICAN
ORNITHOLOGISTS' UNION CHECK-LIST OF
NORTH AMERICAN BIRDS.

By ORDER of the Council of the American Ornithologists. Union the Committee on Classification and Nomenclature of North American Birds has prepared the following report on the species, subspecies, and changes of nomenclature proposed during the year ending November, 1891, forming the Fourth Supplement to the American Ornithologists' Union Check-List.

The numbers at the left of the scientific names facilitate collation with the Check-List. The interpolated species and subspecies are numbered in accordance with the provisions made therefor in the code of Nomenclature (see page 14, last paragraph).

Committee	{	D. G. ELLIOT, <i>Chairman.</i>
		J. A. ALLEN.
		WILLIAM BREWSTER.
		FRANK M. CHAPMAN.
		CHARLES B. CORY.
		ELLIOTT COUES.
		H. W. HENSLAW.
		C. HART MERRIAM.
ROBERT RIDGWAY.		

I. ADDITIONS.

310 *b.* *Meleagris gallopavo osceola* SCOTT.

Florida Wild Turkey.

Meleagris gallopavo osceola SCOTT, Auk, VII, Oct. 1890, 376.

[B 457 *part*, C 379a *part*, R 470a *part*, C 554 *part*.]

HAB. Southern Florida.

374 *a.* *Megascops flammeolus idahoensis* MERRIAM.

Dwarf Screech Owl.

Megascops flammeolus idahoensis MERRIAM, North American Fauna, No. 5, July, 1891, 96, pl. i.

[B—, C—, R—, C—.]

HAB. Central Idaho.

- 462 a. **Contopus richardsonii peninsulæ** BREWST.
 Large-billed Wood Pewee.
Contopus richardsonii peninsulæ BREWST. Auk, VIII,
 April, 1891, 144.
 [B—, C—, R—, C—.]
 HAB. Sierra da la Laguna, Lower California.
- 529 a. **Spinus tristis pallidus** MEARN'S.
 Western Goldfinch.
Spinus tristis pallidus MEARN'S, Auk, VII, July, 1890, 244.
 [B 313 part, C 149 part, R 181 part, C 213 part.]
 HAB. Arizona.
- 547 a. **Ammodramus henslowii occidentalis** BREWST.
 Western Henslow's Sparrow.
Ammodramus henslowii occidentalis BREWST. Auk, VIII,
 April, 1891, 145.
 [B 339 part, C 163 part, R 199 part, C 326 part.]
 HAB. Dakota.
- 567 c. **Junco hyemalis thurberi** ANTHONY.
 Thurber's Junco.
Junco hyemalis thurberi ANTHONY, Zoe, I, Oct. 1890, 238.
 [B 352 part, C 175 part, R 218 part, C 263 part.]
 HAB. California.
- 593 c. **Cardinalis cardinalis canicaudus** CHAPMAN.
 Gray-tailed Cardinal.
Cardinalis cardinalis canicaudus CHAPMAN, Bull. Am.
 Mus. Nat. Hist., III, Aug. 1891, 324.
 [B 390 part, C 203 part, R 242 part, C 299 part.]
 HAB. Southwestern Texas, south into northeastern Mexico.
- 629 d. **Vireo solitarius lucasanus** BREWST.
 St. Lucas Solitary Vireo.
Vireo solitarius lucasanus BREWST., Auk, VIII, April,
 1891, 147.
 [B—, C—, R—, C—.]
 HAB. Lower California.

682.1. **Geothlypis poliocephala palpebralis** (RIDGW.).

Mirador Yellowthroat.

Geothlypis palpebralis RIDGW. Man N. Am. Bds. 1887, 526.*Geothlypis poliocephala palpebralis* ALLEN, Auk, VIII, July, 1891, 316.

[B—, C—, R—, C—.]

HAB. Eastern Mexico, north to Brownsville, Texas. (Cf. ALLEN, Auk, VIII, 1891, 316.)

II. CHANGES OF NOMENCLATURE.

567.1. **Junco carolinensis** BREWST. This becomes567 *e.* **Junco hyemalis carolinensis** BREWST. (Cf.

DWIGHT, Auk, VIII, July, 1891, 290, and BREWSTER, Auk, III, Jan. 1886, 108.)

III. FORMS CONSIDERED AS NOT ENTITLED TO RECOGNITION.

Ictinia plumbea (VIEILL.).—The record of the occurrence of this species in Florida proves to have been founded on a misidentification of an immature example of *Ictinia mississippiensis*. (Cf. CAHOON, Orn. and Oöf. XV, March, 1890, 35, and CHAPMAN, *ibid.* XVI, March, 1891, 44.)

Ammodramus caudacutus becki RIDGW. Proc. U. S. Nat. Mus. XIV, 1891, 483.

The type and single known specimen proves to be not distinguishable from *A. c. nelsoni*.

Pipilo maculatus magnirostris BREWST., Auk, VIII, April, 1891, 146.

Rejected on the ground of the slight and inconstant nature of the differences supposed to distinguish it from *P. m. megalonyx*.

Sitta carolinensis lagunæ BREWST. Auk, VIII, April, 1891, 149.

Not satisfactorily distinguishable from *S. c. aculeata*, the alleged characters proving slight and inconstant.

Turdus sequoiensis BELDING, Proc. Cal. Acad. Sci. 2d ser. II. Oct. 1889, 79.

Considered as not distinguishable from *T. aonalaschkæ auduboni*.

IV. PROPOSED CHANGES IN NOMENCLATURE REJECTED.

Hirundo LINN. vs. *Chelidon* FORST. (Cf. REICHENOW, J. f. O. 1889, 187.)

An examination of SHÄFFER'S work (*Elementa Ornithologica*) as regards its scope, character, and purpose, including his treatment of *Hirundo*, fails to substantiate the claim that *H. rustica* must be considered the type of *Hirundo*, and that consequently *Chelidon* becomes a synonym of *Hirundo*. Therefore the former action of this Committee on this case is now reaffirmed.

V. ACTION DEFERRED FROM LACK OF MATERIAL.

Final action on the following was deferred, owing to the absence of sufficient material to enable the Committee to arrive at satisfactory decisions.

Megascops asio aikenii BREWST. Auk, VIII, April, 1891, 139.

Megascops asio macfarlanei BREWST. Auk, VIII, April, 1891, 140.

Megascops asio saturatus BREWST. Auk, VIII, April, 1891, 141.

Vireo vicinior californicus STEPHENS, Auk, VII, April, 1890, 159.

The following proposed changes of nomenclature were laid on the table, to be considered at some subsequent meeting of the Committee, in connection with other cases requiring revision.

216 a. *Porzana jamaicensis coturniculus* BAIRD vs. *Porzana coturniculus* RIDGW. (Cf. RIDGWAY, Pr. U. S. Nat Mus. XIII, 1890, 309.)

431.1 *Trochilus floresii* GOULD vs. *T. rubromitratus* RIDGW. Auk, VIII, Jan. 1891, 114.

The question of the generic or subgeneric rank of the genus *Ardetta* GRAY.

ERRATA.—In the Third Supplement to the Check-List (Auk, VIII, Jan. 1891) numbers 582*h* and 582*i* (p. 86) should stand respectively as 581*h* and 581*i*.



DWARF SCREECH OWL
MEGASCOPS FLAMMEOLUS IDAHOENSIS MERRIAM.

117

THE AUK:

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No. 2.

YOUNG SAPSUCKERS IN CAPTIVITY.

BY FRANK BOLLES.

AS READERS of 'The Auk' may remember, I spent much time during the summer of 1890 in watching Yellow-bellied Woodpeckers at work in their 'orchards' near Mt. Chocorua, N. H. From my observations I drew the following conclusions ('The Auk,' July, 1891, p. 270), that "The Yellow-bellied Woodpecker is in the habit . . . of drilling . . . trees for the purpose of taking from them the elaborated sap, and in some cases part of the cambium layer; that the birds consume the sap in large quantities for its own sake and not for insect matter which such sap may chance occasionally to contain; that the sap attracts many insects of various species, a few of which form a considerable part of the food of this bird."

These conclusions differed so radically from opinions held by many ornithologists that some persons, who either doubted the sufficiency and unimaginativeness of my observations, or who read my conclusions without scrutinizing my statements of fact, were unwilling to admit that I had proved the Yellow-bellied Woodpecker to be a sap-drinker. In order to present additional and different evidence in the case, I determined to secure several living Sapsuckers, to cut them off as completely as might be practicable from insect food, to feed them if possible upon concentrated maple sap, and to see whether a diet of that kind would

sustain life. It was possible that they might refuse to eat anything, that they might eat the offered food but die in a few days, that they might live for a time but show distress and inability to digest the food. On the other hand it was possible that they might take kindly to the diet, thrive upon maple syrup, and live for weeks, perhaps months, in a manifestly healthy condition. I had confidence enough in my previous observations to believe that the birds would relish syrup, and would live upon it for a sufficiently long time to induce those who still considered the birds insect eaters only, to admit that a contrary presumption had been raised.

It was first necessary to secure the birds. Having failed in 1890 to catch old birds by making them tipsy, I decided to secure a nestful of young birds before they took to the wing. Searching the forest near 'Orchard No. 1' I found, on July 1, a nest filled with noisy fledglings whose squealing sounded afar in the otherwise silent woods. The hole was on the south side of a living poplar, about twenty feet from the ground. Two old holes scarred the trunk. The parent birds came frequently to the tree, and their arrival was always greeted by more vigorous crying from the young. On the 6th I visited the nest again and found both old birds feeding the young which were now much nearer the mouth of the hole. The old birds scolded me on my approach, and the young remained silent for a long time after hearing the warning notes of their parents.

On Tuesday, July 7, at noon, I raided the nest. The poplar was felled so that its top caught in a tree near by, preventing any shock to the young birds. In spite of the resounding blows of the axe the old birds continued to come to the nest, and in the intervals of chopping they fed the young. Moisture glistened on their bills, and I was not sure that they brought insects in any instance. One young bird flew before the tree fell, a second took wing as the crash came, but the third remained in the nest until taken out by hand. I named them Number One, Number Two and Number Three, corresponding to the order of their entry into active life. Their coloring varied sufficiently for me to recognize each with certainty after his transfer to a cage, and as weeks passed by they became more and more dissimilar both in coloring and conduct.

Their cage was an oblong pine box containing about three

cubic feet. Its floor was covered with sawdust, its face was closed by fine wire mosquito netting, and apple and alder branches were arranged for perpendicular and horizontal perches. A sliding door allowed me to handle the birds when necessary. During the afternoon of the day of their capture I fed each bird four times with sugar and water. Holding each little creature in my left hand I slid the tip of a small quill toothpick between its mandibles, when it quickly drank the few drops of liquid held in the half-filled quill. The second time I did this the bird opened its beak willingly. By the fourth lesson the rapid use of the long and nervous tongue in draining the quill of every particle of moisture showed that the quill was a satisfactory substitute for the parent's bill.

At 5 A.M. on July 8 the young Sapsuckers began a lively 'tat-tat, tat-ta-ta, tat-tat' on the resounding sides of their box. They were unmistakably hungry when, an hour or two later, I presented the point of the quill at a hole in the wire netting. One bird after another drank the diluted maple syrup with which I filled the tube. I repeated this process at intervals of about half an hour until evening, the birds becoming more and more expert in draining the quill and more and more prompt in responding to my offers of nourishment. Number One was the most restless and aggressive; Number Three the slowest in feeding, and the least hungry. It was also the dullest in coloring. On the 9th the birds did not begin to stir until about 7 o'clock, their cage having been darkened so as to prolong their slumber. On my presenting the quill all three tried to drink at once, and Number One was very rough with the others, striking them sharply with his beak. His violence led me to add a second room to the cage, into which the others could withdraw to escape him. I placed it directly above the other, with a round hole in the floor opposite a similar opening in the top of the first cage. None of the birds noticed the hole, either from below or from above, when put in the upper room. I placed cups of birch bark and wooden troughs filled with syrup in various parts of both cages, but the birds did not go to them. They took more syrup than on the 8th, drinking a greater number of times and more at each time. Towards evening I exchanged the quill for a slender spout of birch bark through which I let the syrup ooze. They drank from the spout, from the netting down which drops coursed, and

from the wood upon which the drops fell. Number One made his first attempt to catch a fly on the netting, but failed.

During more than half the day the birds were in motion, flying from one side of the cage to the other, hitching up and down the netting or the perpendicular perches, and pounding on the netting, boards and perches. Twice they gave the squealing note of alarm so characteristic of the wild Sapsucker. At night I looked to see how they slept. They were side by side, hanging erect upon the back wall of the cage, with their heads tucked under their wings. One by one they waked and turned with sleepy surprise to look at the lamplight glaring at the mouth of their cage.

On July 10 I made serious efforts to teach the birds to feed themselves. Catching them at intervals, I dipped their bills into the syrup in their cups, forcing them to drink. By 9.30 A.M. Number One had learned his lesson. Two hours later Number Two drank voluntarily, and a little after one o'clock the feeble and timid Number Three followed suit. Early in the afternoon Three seemed so exhausted by the blows showered upon her by One and Two that I thought she was going to die. I took her out and allowed her to perch upon the top of the cage. Suddenly she revived, slipped through my hand, flew the length of the open barn, out into the trees beyond, and was gone. After searching for her for over an hour, I gave her up as lost.

At 8 A.M. the next day I heard a Sapsucker squeal near the house, and running out found Three sitting on top of a clothes-line post. She looked bright and knowing, but did not offer to fly, even when I extended my hand to catch her. Claspng her quickly, I carried her back to the cage. She was very hungry, and went at once to a cup and drank long and often. Her brief outing had given her courage to stand up against the attacks of the others, and I had no further anxiety for her health. I filled their cups at 8 A.M., 1 P.M., 4 P.M., and at dark,—the last as a precaution against unseasonable tapping in the morning.

During the next few days I filled the cups several times a day, and the birds drank freely, and seemed happy and perfectly healthy. On July 17, being satisfied that the birds never would learn to go up and down between the upper and lower cages, I removed the upper cage and placed it on the floor beside the lower one, opening a door between the two so that the birds

could hop through from one to the other on the same level. They did this at once. I then added a third room which could be entered by a door in its side, and found that the birds quickly availed themselves of the chance to be alone for a part of each day.

One warm day I sprinkled the birds with water. They were greatly astonished, but at once surprised me as much as I had them, for they flung themselves upon the floor and went through all the head, wing, and feather motions of a bath, scattering about chips and sawdust in a most energetic way. It was their first acquaintance with water. I at once supplied them with a large dish of water, in which they bathed occasionally during the summer,—usually, it seemed to me, towards evening, and when no one was near.

The smell of maple syrup which pervaded their cage of course attracted insects, which crawled up and down the outside of the wire netting, occasionally finding a crack in the cage and entering. The young birds were always on the alert to catch one of these intruders, and made a great fuss eating it,—squealing, and crowding into a corner to hold it securely between their breasts and the boards until they could swallow it in just the right way. The number of insects caught by them in this way was small, and I do not think amounted at any time to ten per cent of their food.

Within a week after the birds' capture I felt sure that Number Two was a male, because red feathers appeared on his throat. I surmised that Number Three was a female, partly on account of her more subdued coloring and partly from her gentleness. Number One bullied both Two and Three and was more noisy than they. By July 20 I had reduced the number of their syrup cups to one—a large earthen saucer which I filled once a day, sometimes twice. If I allowed the saucer to become dry, the Woodpeckers drummed more and more vigorously until I supplied their needs. Sometimes all three birds would drink at once. They were astir by 5.30 A.M., and still noisy at 8 P.M. On July 20 my notes say, "They are perfectly healthy and happy."

About noon on July 23 the door of the Woodpeckers' cage was opened by mistake, and not long after I discovered that

Three had escaped for a second time. I searched for her in vain. The next day rain fell in torrents all the forenoon. About one o'clock the cry of a Sapsucker was heard through the closed windows of the house, and Three was discovered clinging to the piazza railing just in front of my study window. She was wet and dismal. I tried to catch her with my hand but she flew to the nearest tree trunk, where I secured her by throwing a piece of soft mosquito netting over her. The moment I placed her in the cage she fastened herself beside the cup and drank many times. After satisfying her hunger she retired to the darkest corner of the cage to dry and doze. The other birds paid no attention to her.

On July 25 two Downy Woodpeckers were working in my orchard. Taking a trout rod and line, I made a small slip-noose at the end of the tip joint and poked it into the tree where one of the Woodpeckers was inspecting the bark. He watched the rod and seemed puzzled by it, but did not fly. Slowly lowering the noose I let it settle around his neck, and then by a slight jerk drew it tight. He flew in small circles round and round the tip of the rod, held by the noose, and slightly choked by it. A minute later, freed from the line, he was in the Sapsuckers' cage.

He was a young bird, like the Sapsuckers, and I supposed that the latter would not notice that he was not one of their own family. I thought it possible that he might follow their example and drink syrup from the cups, for I had once seen a Downy Woodpecker dipping at one of the Sapsucker's 'orchards.' Unhappily, however, the stranger was not welcomed kindly, and as I was called away for the day, he had no defender. The Sapsuckers pursued him from one corner of their cage to another, striking him fierce blows on his head and over his eyes until he fell to the floor exhausted. Reviving, he again attracted their notice and attack, but his second fall was his last.

About August 1 it seemed to me that the Sapsuckers were unusually restless; they whined and scolded a great deal and went from room to room incessantly. I think that at this season the wild birds begin to frequent their 'orchards' less regularly than in May, June, and July. The captives tapped a great deal, and I gave them a variety of things to play upon, as, for example, a sweet-toned glass tumbler, thin sheets of zinc, and resonant pieces of wood arranged to give out various tones. They tested

these things, but seemed to prefer the sides of their cage, especially portions walled with clapboards, which yielded a great volume of sound to their blows. I spent many hours in noting down the number and order of their taps, in order to see whether they constituted distinct signals. At first it seemed to me that Number One liked to tap in twos and fours, that Number Three was more apt to make threes, or threes and fives, than other combinations, and that Number Two mingled fives and twos. The longer I listened the more combinations I found them making, and at last I decided that with these birds it was mere chance whether they said - - - - -, or - - - - -, or - - - - -. They seemed to pay no attention to each other's performances, and to mean nothing by their own tappings. If they tapped at all, it was necessary to make some number of taps and to space those taps in some particular way. If in a large number of such series, ones, twos, threes, fours and fives came equally freely and frequently — as they seemed to — there appeared to be no ground for imagining that the different combinations indicated different feelings or impulses. Nevertheless I think the old birds at Orchard No. 1 during July, 1890, called each other by tapping, and I do not feel at all sure that closer study than mine might not work out a Sapsucker code.

On August 9 I noted that the birds were "as noisy as a boiler factory," and that One and Three were showing reddish coloring on their heads. Three I speak of as "gentle and refined," but One is constantly alluded to as rough, noisy, and restless. I tested their color sense by placing some flaming nasturtiums in the front of their cage. They did not even look at them, but trampled back and forth over them until the flowers fell.

On August 13, a very warm day, I saw one of the Sapsuckers bathing at 7.30 P. M. when it was nearly dark in the cage. On the 14th — a rainy day — one of them bathed about 6 P. M. When the sun fell upon their cage in an afternoon the birds often sought the sunlight, and standing in it drooped their wings and opened their mouths as though suffering. They could readily have avoided its heat.

On August 17 I was away all day, and the Sapsucker's syrup dish became dry. Early on the 18th the birds began pounding so furiously that, as my notes say, "they could be heard a quarter of a mile away." When I filled their dish they crowded

around it, and all three drank at once. They consumed more than a tablespoonful of the diluted syrup between 7 and 11 A. M. Ordinarily they disposed of eight teaspoonfuls each during the twenty-four hours. Part of this evaporated, and part was probably secured by black ants which visited the cage by night. On August 25 I did not give the young Woodpeckers any syrup until late in the day. Then I offered syrup and insects at the same time. They ignored the insects and drank long and often of the liquid. Later they ate the insects. I kept a dish of water in their cage all the time, but they were seldom seen to drink from it.

On September 4 I placed the Woodpecker's cage in a finished room in the barn and opened their door to see what they would do with limited liberty. Number Three showed the effects of former freedom by coming first to the doorway and perching in it. After a moment One flew out past her and bumped against the window pane. Ten minutes elapsed before Two came out. Then they flew back and forth from window to looking-glass, curtains to woodwork. I handled them freely, and they seemed to have no feeling of fear. They clung to my fingers, and perched upon my shoulders. All the interior finish interested them, and they hammered wood and glass, paint and plaster with vehemence. One of them hopped back and forth over the board floor, striking it now and then as if it had been a great log, prostrate. Three caught a few of the many flies in the room, but showed no eagerness over them. The others scarcely tried to catch them. That night they slept in separate corners. In the night I lit a candle and looked at them. They awoke, squealed, and Three came to the syrup and dipped twelve times. The red on her head seemed brighter day by day. I also noted that Two was growing more yellow below. On September 6 I noticed that One and Three were together while Two remained much alone. He seemed to be moulting. During the next fortnight I let the birds out once or twice each day and watched them closely. Three was the only one which seemed to care much about catching house flies, and she secured very few. Black ants visited the cage at night, and occasionally I heard the birds moving about a great deal although their cage was as dark as it could well be made. By September 11 Three had transferred her affections from One to Two. The latter's plumage had by that time be-

come quite brilliant; the yellow and black below, and the red on head and throat making him a decidedly distinguished looking bird. He made up for all Number One's earlier bullying and brow-beating by scolding him and driving him from perch to perch. When free in the room, Two and Three spent most of their time upon a great horizontal timber, a portion of the framework of the barn, which ran through the upper part of the room. It had been rough-hewn by the sturdy hands which had framed the barn many a long year before, and patches of bark still clung to its surface. The devoted couple ran up and down the upper surface of this beam, tapping from time to time upon its flat face, never upon its edges. One stayed in the cage much of the time when Two and Three were together. He seemed jealous and far from cheerful. None of them ever went back to the cage voluntarily, and as time passed they did their best to avoid me when I was ready to lock them up.

On the evening of September 12 the birds were very restless. Between eight and nine they were drumming furiously. The night was dark, and not a ray of light found its way into their cage. On September 16 they continued their hammering until 10 P.M. They took less syrup than usual at this time and caught practically no insects. On September 21 my notes speak again of the small quantity of syrup consumed by the birds. On September 26 the birds were brought to Cambridge in a small box. They were fed in the usual way, and drank frequently from their dish while the train was at rest. The next day they were given a room to themselves. It was eight feet by five and was lighted by a window looking into an upper entry. Opposite and above the window was a large skylight through which sunlight streamed into their room for several hours each day. They promptly chose the curtain roller at the top of the window as their favorite perch, and to this I attached their syrup dish, which they recognized and used at once.

For several days they seemed perfectly well and contented. They hammered the woodwork, cut holes in the plastering until they reached the laths, and drilled small holes in the floor. Absolutely no insects gained access to their room. On October 4 I state in my notes that they never seemed more happy or more energetic. They bathed freely at this time while I was in their room, and seemed to enjoy the water greatly.

On October 11 I recorded the fact that Three seemed dull and allowed me to catch her without opposition. On the 12th she was evidently feeling far from well and stayed on the floor, but Two and One were unusually cheerful. On the 13th Three showed alarming symptoms. As early as 7 A. M. she had a convulsion, throwing herself upon her back and struggling violently. Reviving, she drank some syrup and seemed better, but the spasms recurred at frequent intervals during the day. She kept her head moving up and down a great deal of the time. When a spasm was imminent she turned her head far around to the left and, with her neck thus twisted, spun around towards the left seven or eight times, then fell upon the floor and beat her head upon it. After most of these spasms she drank from her cup, and during the day she ate four flies which I gave her. The last attack was at 5.30 P. M., and not long after she was found dead. I placed her body in the hands of several graduate students in biology at the Museum of Comparative Zoölogy, and received from one of them, Dr. Thomas G. Lee, the following statement: "We found the intestines quite empty. In the stomach, which was deeply bile-stained, was a ball composed of cotton fibres and containing fragments of insects. The liver was very large, deeply bile-stained, and very soft. The other organs were apparently normal." The body was plump, and large deposits of fat covered the abdomen.

On Sunday, October 18, Number One, who had been dull for a day or two, showed symptoms similar to those of Number Three. He had several convulsions and was weak after them. I gave him lemon juice. For several days I had been trying to change the diet of the surviving birds, but they refused everything except their syrup and a fly or two which they seemed to care for but little. Among the things offered them were a sweet apple, a pear, a peach, grapes, and earthworms. I diluted their syrup more than usual, and put lemon juice with it. Number One's condition was such on the evening of the 18th that I had no hope of finding him alive on the next morning. He survived, however, although in a most pitiful condition; his eyes winked frequently, he seemed to see little, and that little in such a way as to confuse distances; his breathing was unnatural and he trembled constantly. Monday passed, and while One grew no better, Two became seriously ill. On Tuesday morning both birds

were alive, that was all. At eight o'clock Two had a violent convulsion and never recovered from it. A few moments later One, who had clung to life with such tenacity, died in the same way — maintaining to the last the advantage which he had first claimed in the nest. Number One was examined by an expert physician in Cambridge, who pronounced his liver enormous and in a diseased condition. It nearly filled the abdominal cavity, crowding other organs. It was soft and greenish. Number Two was forwarded to the Department of Agriculture which reported that the bird “had enlargement and fatty degeneration” of the liver. The most probable cause of this enlargement of the liver, which seems to have been the reason for the death of the three Sapsuckers, was an undue proportion of sugar in their diet. In a wild state they would have eaten insects every day and kept their stomachs well filled with the chitinous parts of acid insects. Under restraint they secured fewer and fewer insects, until, during the last few weeks of their lives, they had practically no solid food of any kind. Two of them lived in captivity exactly fifteen weeks, and the third fourteen weeks. During that time they subsisted mainly upon maple syrup diluted to half its strength with water. This diet was not refused nor disliked by them at the outset; quite the contrary, it was adopted readily. It did not cause speedy death, nor even indigestion. The birds did not mope and pine; they enjoyed life, changed their plumage as much as caged birds could be expected to do, and until nearly the time of their deaths manifested no abnormal condition. In fact they thrived upon maple syrup and were in an apparently healthy condition for more than three months.

Summary. From these experiments I draw the following conclusions: (1), that the Yellow-bellied Woodpecker may be successfully kept in captivity for a period corresponding to that during which as a resident bird he taps trees for their sap, sustained during this time upon a diet of which from 90 to 100 per cent is diluted maple syrup; (2), that this fact affords evidence of an extremely strong character, in confirmation and support of the theory that when the Yellow-bellied Woodpecker taps trees for their sap he uses the sap as his principal article of food, and not primarily as a bait to attract insects.

OBSERVATIONS ON THE BIRDS OF JAMAICA,
WEST INDIES.

BY W. E. D. SCOTT.

II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND,
WITH ANNOTATIONS.*(Continued from p. 15.)*

98. *Colinus virginianus* (Linn.). BOB-WHITE. QUAIL.—The Quail was introduced from North America, according to Gosse (*Birds of Jamaica*, p. 328), about the year 1747, or nearly a hundred and fifty years ago. He says further, "It was very soon naturalized, and became abundant. It is found in almost all situations, where there is cover; and from its peculiar manners, its loud call, and the sapidity of its flesh, is familiar to all."

This was written in 1847, and many persons whom I met with while in Jamaica assured me of the great abundance of Quail until within the last two years.

During my visit to the island I did not see or hear any of these once common birds, and though in some localities, where especial attention has been paid to their protection, a few birds doubtless still exist, this bird once so plentiful must be regarded as about exterminated. I was particularly anxious to obtain a small series of the bird in question to see if any appreciable and general variation or departure from the parent stock had occurred under the new conditions of environment. However, I became aware in a very short time that it would be very difficult to get any of the birds, and so looked up what specimens existed in the museum of the Jamaica Institute. Here I found a single specimen, a female, without adequate data as to when and where it was captured, and I have been obliged up to the present time to forego the comparison which I had hoped material collected on the island would make possible. Mr. Taylor thought he would be able to procure some specimens for me, but in a recent letter dated July 3, 1891, from Kingston, he writes: "No news as yet of *Colinus virginianus*, though I have been constantly on the watch for and have made many inquiries respecting them." Oscar Marescaux, Esq., of Kingston told me that a single small covey still existed in the garden of his estate, Cherrygarden, near Kingston, but that these were the only ones he knew of. He said that the birds were formerly very abundant, and were hunted over the dog as they are in the United States, and that there was no difficulty in making large bags. Mr. William Bancroft Espent says in a letter dated Spring Garden, June 1, 1891, "Undoubtedly the mongoose has played havoc with the

Quail and other ground-nesting birds, but they (the Quail) are not exterminated, for I saw five Quail at Halfway Tree three weeks ago." These are the only personal records I was able to obtain, and one is of a negative nature and the other two support the story of their destruction by the mongoose. In the letter referred to Mr. Espent, in answer to my question as to where and how the mongoose was introduced, says, "I got nine, four females and five males on the 9th of March, 1873; others arrived subsequently, but I don't know how many. Mr. Morris in a pamphlet he wrote said he thought the entire mongoose population of Jamaica was due to my nine." From this it is apparent that coincident with the introduction of a few individuals of the mongoose began the disappearance of the Quail and that now, in a period of less than twenty years from the date of the introduction of a few individuals of the mongoose, the Quail, formerly very abundant, are practically exterminated from the island and no longer can be considered as a part of the bird fauna of the region.

The following notes are quoted from Mr. Taylor's manuscript records:

"The once abundant Quail has become so rare that by many it is regarded as extinct. It still exists in a very few exceptionally favorable localities, and it is not unreasonable to believe that from these, also, it will ere long be extirpated. That the evil is directly traceable to the mongoose there can be but little doubt, as prior to the introduction of this animal Quail were common even in the immediate vicinity of Kingston. The habit of depositing single eggs here and there appears to be common to this genus. Several eggs have been thus found, and I have taken one from the bare ground at the roots of a tree in a wood near which the birds were calling. It must have been lying some time, as it was quite discolored where it had rested on the decaying leaves, etc."

99. *Numida meleagris* Linn. Guinea-fowl. — This is also an introduced species which I have no personal knowledge of, save that I was told that they had once been common and now were almost unknown on the island. According to Gosse's account, written in 1847 (*Birds of Jamaica*, p. 325), "it was abundant in Jamaica as a wild bird, 150 years ago, for Falconer mentions it among the wild game in his amusing 'Adventures.' I shall confine myself to a few notes of its present habits. . . . The Guinea-fowl makes itself too familiar to the settlers by its depredations in the provision grounds. In the cooler months of the year, they come in numerous coveys from the woods, and scattering themselves in the grounds at early dawn, scratch up the yams and cocoes." The account goes on to tell of the depredations caused by the great numbers of these birds, and various methods of getting rid of them are described and others suggested.

In contrast to all this I now quote from Mr. Taylor's manuscript notes recently sent to me from Jamaica: "Like the Quail this bird has decreased in numbers sadly, and from the same cause apparently. The

Guinea-fowl is now generally regarded as much less abundant than formerly, when large coveys were to be found in the lowlands and afforded good sport. Very recently, however, and on more than one occasion, I have met with a covey of wild birds near Kingston. At an unfrequented part of the Long Mountain Road, where perhaps not more than three or four persons pass in the course of a whole day, I twice saw a large party of these birds dusting."

100. *Columba leucocephala* Linn. WHITE-CROWNED PIGEON. — A common resident species in most parts of the island. At Boston it was abundant and to be seen or heard at all times of the day. Here they were associated together in pairs or in small flocks of from six to ten individuals. About the 20th of January at Boston the birds were generally mated and their constant cooing was to be heard at almost all points in the woods. Males taken about this date have the iris almost white with the faintest tinge of straw color. A female taken on February 9 had an egg in the oviduct about ready to be laid, and other females taken indicate that the birds generally are breeding or about to breed at this point.

The following are Mr. Taylor's notes: "Abundant and generally dispersed. Always to be found in the vicinity of water; the mangrove forests and woods bordering the river banks near Passage Fort were localities in which they were fairly abundant. Many nests of eggs were taken from the mangrove trees near the shore.

"Pigeon Island, a thickly wooded cay off the port of Old Harbor, takes its name from the large number of Doves that frequent it and breed there; from all accounts the Baldpate is the most numerous species. Like the other Doves they are very early breeders. More than one brood appears to be reared. Eggs may be taken as early as February."

101. *Columba caribea* Linn. RING-TAILED PIGEON. — In the wild and little settled portions of the parish of Portland, in the vicinity of Boston, these birds were common, but not so plentiful as *C. leucocephala*. Three females and a male secured at this point on January 16 were all apparently adult, but showed no signs of breeding as yet. The iris in these individuals varied from reddish orange to a deep, intense vermilion. Four birds taken at the same point on January 17 had just completed the moult, and three individuals taken later on the same day were still moulting, though the change was nearly completed. These birds do not appear to breed quite as early as the other Doves and Pigeons of the region. A pair taken February 21 at Boston were apparently mated and the female looked as if she would lay the first eggs in about two weeks. A pair taken on February 23 were about ready to breed. These birds frequent the hills back some little way and were most common at an altitude of about one to two thousand feet above the sea level. Here they feed on wild fruits and berries and become early in the year very fat, and are esteemed a great delicacy for the table. They were so common in the region spoken of that I frequently used them as food while at Boston. Mr. Taylor says that he has never had the opportunity of studying these birds in life.

102. *Columba inornata* Vig. BLUE PIGEON. — I did not meet with this

species while in Jamaica nor has Mr. Taylor ever seen the birds alive. Under the name of *Columba rufina* Gosse refers to this species at some length (Birds of Jamaica, p. 296). It is apparently not so abundant as it was in former years. None of the local hunters about Boston seemed to know anything about such a Pigeon, though they are familiar with the different representatives of the family that exist in the vicinity; and describe the kinds of Pigeons and Doves so that they are recognizable.

103. *Zenaida zenaida* (Bonap.). ZENAIDA DOVE. PEA DOVE.— A common resident species near Boston, and met with almost daily during my stay at that point. They feed generally on the ground, and are often associated with *M. leucoptera*. The iris is reddish orange. These birds are about the first of the Pigeons and Doves to breed. A male taken on January 6 had the testes almost fully developed, and females taken about the same time indicate the near approach of the breeding season. Subjoined are Mr. Taylor's notes. "Common in some parts. Breeds at Port Henderson among the low woods and mangroves. Eggs average smaller than those of *M. leucoptera*."

104. *Engyptila jamaicensis* (Linn.). WHITE-BELLIED PIGEON.— This was a common species in the localities frequented by *C. caribea*, but was by no means as abundant as that species. It is undoubtedly one of the native birds that have suffered seriously from the persecutions of the mongoose. The birds are rarely seen away from the mountains. Females taken on January 13 indicated the near approach of the breeding season. Mr. Taylor's notes are as follows: "A mountain species about whose habits I know little. The nest is said to be built chiefly in low bushes. I have not seen the eggs. The White-belly appears to be more terrestrial in its habits than any of the other Doves of Jamaica, the Ground Dove perhaps excepted."

105. *Melopelia leucoptera* (Linn.). WHITE-WINGED DOVE.— This was a common and conspicuous species at Boston, and more gregarious than the other Doves and Pigeons. Flocks of a dozen individuals were not at all uncommon, and on several occasions I saw flocks of as many as forty or fifty individuals. The species was represented, but was not common, at Stony Hill, and I saw the birds near Port Antonio in numbers.

Mr. Taylor's notes, which I quote, are very full in regard to these birds: "The White-wing is strictly gregarious, moving and feeding in flocks. It is especially partial to the seeds of the moringa or horseradish-tree, and numbers are often taken in traps baited with these seeds. At the Palisades is an extensive moringa plantation where these birds are numerous at all times of the year. Next to the Ground Dove it is the most common Pigeon in the lowlands. There is one locality in Kingston where they always may be seen, and that is the woods near the sea at Belle Vue, a property nearly adjoining the Lunatic Asylum. The White-wing is partial to clumps of cactus and thorny trees such as the cashaw for nesting purposes; it also breeds in numbers among the woods and mangroves at Port Henderson and Passage Fort, and I found nests

on Lime Cay near Port Royal. Eggs vary from dull white to reddish white, and may be found between the months of February and July."

106. *Columbigallina passerina* (Linn.). GROUND DOVE. — Common resident species, but not reaching up in the hills above five hundred feet. The subjoined notes of Mr. Taylor's show the near affinity of the Jamaican to the North American representatives in habits. The series that was collected during my stay on the island presents a race of birds that show little individual variation, but which differ markedly from Florida individuals. Both sexes are much paler, but especially the females, and the scaled appearance of the breast is much more striking and somewhat more extended. In size the birds are smaller than Florida individuals. So far these birds seem to agree very well with the *C. p. bahamensis* (Mayn.), but of all the individuals before me from the Island of Jamaica, some forty-one in number, only six (all females) have dusky bills, and in thirty-five examples (about equally divided as to sex) the yellow or orange base of the bill is very conspicuous. It seems, however, with the present material, better to leave fine discriminations in this group till more individuals from different points are available. From Mr. Taylor's notes I quote as follows: "Very abundant everywhere, but especially in the beds of the gullies or dry water-courses where little companies of from two to six or eight may be found feeding at almost any time of day. Their food in such places seems to consist entirely of the minute seeds of a shrub very common in all dry places, and known to the negro boys as 'vica.' The nest is invariably built on trees, usually at a good height; materials are merely a few slight twigs arranged to form a platform, and the eggs can be nearly always seen from beneath. Often the deserted nest of some other bird is used, and I once found a Ground Dove sitting on two eggs in the nest of a Mockingbird. Another favorite site is on the top, or in the fork, of a clump of cactus, but what appears to me the most remarkable situation for a nest is where the bird took advantage of a slight depression on top of a pendent tuft of tillandsia, 'old-man's beard,' and, after adding a few bits of grass, deposited two eggs. The presence of the sitting bird alone discovered the nest. When discovered sitting, or when young are in the nest, the old birds endeavor by falling to the ground and feigning lameness to draw the intruder away from the vicinity, and the same manners are practised by the White-wing. The Ground Dove is among the earliest breeders. I have seen nearly fledged young in March and April and have taken fresh eggs as late as June and July, so that more than one brood is probably reared in a season."

107. *Geotrygon montana* (Linn.). RUDDY QUAIL-DOVE. PARTRIDGE DOVE. MOUNTAIN PARTRIDGE. — Several times while at Stony Hill, and afterward quite commonly near Priestman's River, I met with this species. Adults taken on January 24 had just completed the moult. At the same time the testes in the males were large, but not fully developed to the size assumed during the breeding season. Males taken February 7 had the testes fully developed. By February 20 the birds were breeding,

From Mr. Taylor's notes I quote, and I fully agree with him, that this is one of the species that has become appreciably rarer through the influence of the mongoose. "I can give little or no information concerning the habits of the 'Partridge,' as I have never met with it near Kingston. The nest is often so slight and flimsy a structure as scarcely to suffice for the reception of the eggs, two in number, which are regularly oval and vary from pale to deep buff. This bird seems to prefer to nest in low bushes, and is reported to have suffered from the depredations of the mongoose."

108. *Geotrygon crista**a (*Temm.*). BLUE DOVE. MOUNTAIN-WITCH. — During my stay at Priestman's River I received two specimens of this bird, and knew of one other that was killed during that time. The birds are apparently very rare, though formerly common, and, it seems probable, are becoming rapidly exterminated by the mongoose. The first specimen, procured on January 7, had not quite finished the moult. It was a male, and showed no signs of the approach of the breeding season. A second male was taken on February 14 and had fully moulted, though the breeding season seems at least a month later than with the other Doves and Pigeons. The birds are shy, and frequent the dense woods, most of the time being spent on the ground.

I quote from Mr. Taylor: "The Blue Dove is so exclusively a mountain bird that I have had no opportunity of observing it alive. It is reputed rare, and even extinct in some parts, but this scarcity must be more apparent than real, since the habits of the bird are so solitary and retiring."

109. *Sturnænas cyanocephala* (*Linn.*). BLUE-HEADED QUAIL-DOVE. — There are no recent records of this species from the island. From the 'Birds of Jamaica,' Gosse, p. 324, I quote: "The Spanish Partridge (*Sturnænas cyanocephala*) is not considered as indigenous in Jamaica, though it is frequently imported thither from Cuba. It may, however, yet be found in the precipitous woods of the north side; Albin, Brisson, Buffon, and Temminck, attribute it positively to our island."

During my stay at Priestman's River I was frequently told of a kind of Pigeon, locally known as the 'Red-neck.' The bird is described as a large Pigeon, larger than the 'Ring-tailed Pigeon,' and as being a *tree* Pigeon. At the same time its present great rarity is attributed to the mongoose's depredations. The bird was described to me by all the local gunners and hunters, and there can be little doubt of the existence of a Pigeon not obtained so far by naturalists who have worked on the island. Gosse (*Birds of Jamaica*, p. 324) refers to what appears to be this same bird under the name of "Red-necked Dove."

Mr. Taylor sends me the following note: "*Turtur risoria* is a common cage-bird in Jamaica, but I know of no instance in which it has been seen or taken in a wild state on the island."

110. *Cathartes aura* (*Linn.*). TURKEY BUZZARD. JOHN CROW. — Fairly common resident. Breeds. Said to have decreased greatly in numbers in the past few years, being preyed upon, like all other ground, and many low tree, builders, by the mongoose,

I quote from Mr. Taylor's notes as follows: "It has been asserted that the John Crow Vulture has suffered severely from the ravages of the mongoose, but in Kingston, at least, I have noticed no apparent diminution in their numbers. In and around Kingston hundreds roost all the year round, and certain favored trees have been resorted to for many years. As their numbers do not appear sensibly diminished, even during those months in which they apparently breed, I have considered that a very large proportion of the birds frequenting the roost at this time must be of the male sex. With respect to the oft-disputed point, sight *vs.* smell, in the Turkey Vulture, I wish to record one or two cases, coming under my own notice, which seem to me to prove incontestably the use of both senses, as circumstance may require. The dead bodies of poultry, cats, dogs, rats, etc., so frequent in the streets and lanes of the city, are as often as not passed over by the 'Crows' until decomposition has begun. If, however, the object is white or light-colored, it is quickly found. I once saw a good instance of this when shooting among the lagoons at the Palisades. In sailing down a narrow channel the boat grounded on a mud bank midway between the shores. A White Heron that had been fishing near the lee shore was shot while we were still aground. The bird had been wading deeply, and fell struggling on the water some little distance from the land, towards which it was drifted slowly by the wind and waves. A Crow almost immediately afterwards came in sight, and after flying round once or twice, alighted on the beach. Soon becoming impatient, the Vulture waded out into the shallow water, and seizing the Heron, dragged it ashore and into the bushes to devour it. Other cases have occurred where the carcasses of animals have remained untouched until thoroughly decomposed, and this nearly always happens where the bodies are not wholly exposed. The Crow is certainly not a carrion eater from choice, fresh meat being eagerly taken whenever an opportunity offers, and when sore pressed young and weakly chickens, etc., are taken up."

111. *Catharista atrata* (*Bartr.*). BLACK VULTURE.—Recorded from Jamaica by March (*Pr. Acad. Nat. Sci. Phila.* 1863, p. 151).

112. *Elanoides forficatus* (*Linn.*). SWALLOW-TAILED KITE.—Recorded from Jamaica by Gosse (*Birds of Jamaica*, p. 19).

Mr. Taylor sends me this note: "There is a specimen (in a very mangled state) of the Mississippi Kite among the collection of skins in the Museum of the Jamaica Institute, but without any label to show when or where it was obtained."

113. *Buteo borealis* (*Gmel.*). RED-TAILED HAWK.—Common throughout the island. Breeds. Seen almost daily at Priestman's River, and frequently in the immediate vicinity of Kingston.

Mr. Taylor's notes are as follows: "The Red-tailed Buzzard appears to be common all over the island, a pair or more may always be seen hovering near pastures and commons and along the slopes of the lesser hills. I know nothing of the nest, but a friend to whom I am indebted for several notes, writes: 'They build chiefly on the huge silk cotton trees, and only rarely on bushes or trees of small elevation.'"

114. *Urubitinga anthracina* (Licht.). MEXICAN BLACK HAWK. — Recorded by Mr. Hill from Jamaica (see Gosse, Birds of Jamaica, p. 19).

115. *Falco peregrinus anatum* (Bonap.). DUCK HAWK. — Not met with. Mr. Taylor says: "I have not met with this Hawk on the mainland, but at the Morant Cays a pair or two were resident. One bird regularly roosted on the tallest cocoanut palm on Southeast Cay. I have an egg in my possession that I can ascribe to no other bird; it was taken from among a number of eggs of the Noddy and Sooty Terns offered for sale in Kingston; whether it was brought from the Morant or Pedro Cays I cannot determine with certainty."

116. *Falco columbarius* Linn. PIGEON HAWK. — Taken at Priestman's River on January 13 and 19. Both birds were females and these were the only ones obtained. From Mr. Taylor's notes I quote: "A not infrequent bird in the lowlands where it preys upon the Doves and smaller birds as well as lizards and such 'small deer.' Its flight is very swift and darting, but I have never seen it soar and circle like the Red-tailed Hawk. It is resident and breeds, but I have not seen the nest."

117. *Pandion haliaëtus carolinensis* (Gmel.). AMERICAN OSPREY. — Noted at various points along the seashore in driving from Priestman's River to Kingston. Mr. Taylor regards it as a rather rare species and says further: "One bird seen near Port Henderson, and at the Morant Cays a pair were seen daily."

118. *Strix flammea furcata* (Temm.). SCREECH OWL. WHITE PATOO. — The Barn Owl was quite abundant in the vicinity of Priestman's River and in fact anywhere along the coast where there are meadows or fallow fields of much area. On moonlight nights I have seen the birds many times sitting along the road on telegraph poles or on some dead limb. They seem at such times quite fearless, and allow one to walk or ride close by without any attempt at flight. I am unable to be sure of their time of breeding, but think it is probably in October and November.

Subjoined are Mr. Taylor's notes. "The 'Screech Owl' is common wherever it can find suitable shelter. The small caverns and sink holes that are of such frequent occurrence in the limestone formation, as well as the forests of the mountain slopes, are favored haunts. For some time a pair of Owls resorted to the steeple of St. Michael's Church at Rae Town, and are probably there still.

"They often select strange localities for breeding. A pair tenanted for years the partially submerged hull of an old barque that lay at no great distance from the shore of the Palisades, and in the forepart of which they successfully reared their young. Lately I have been told of another pair that nested regularly in the recesses of the iron work under the large bridge crossing the dry river at May Pen in Clarendon and over which trains pass daily."

119. *Pseudoscops grammicus* (Gosse). DUSKY EARED OWL. BROWN PATOO. PATOO. — Not quite so common as the last, but still not at all rare in the vicinity of Priestman's River. It frequents the forests more than the Barn Owl does, and I did not meet with it hunting over the

large fields far away from any trees as was the case with the Barn Owl. Specimens were taken on January 14 and 16. Females taken on the latter date were about to lay. A pair taken on February 17 would have bred in about a month. A female parent and young bird just able to fly were taken February 23. The young bird is perhaps two months old. I think that the breeding season varies with different individuals from December to the last part of April. Both this species and the Barn Owl are of the greatest benefit to the agriculturists and they should be most carefully protected. Rats and mice form a large part of the food that they consume, and they must be of especial benefit on the 'pens' and sugar estates. The iris of this species is hazel or dark brown, looking much like that of *Syrnium nebulosum*.

120. *Amazona agilis* (Linn.). BLACK-BILLED PARROT. — Common resident in the parish of Portland. Especially conspicuous on the wild orange trees during my stay. They are quite nomadic in their habits, going about in parties of from six to thirty and even more individuals. In a fine series of this species obtained during my stay there are individuals without the scarlet coverts to the primaries. Others have some of these feathers green and some scarlet on the same wing; others lack the scarlet feathers altogether on one wing, but have them all scarlet on the other, and in many individuals the coverts are all scarlet on both sides. The black edging to the feathers of the throat, neck, and head varies greatly in different individuals, in intensity and extent, and in absolute width.

Mr. Taylor has had no opportunity, he tells me, to study this bird in life, and so can add nothing to the foregoing.

Gosse says that both the Yellow-billed and the Black-billed Parrots breed in holes in trees, but he does not state the time of year, and though this is probably in June, I have been unable to ascertain with exactness.

121. *Amazona collaria* (Linn.). YELLOW-BILLED PARROT. — What I have already said of the occurrence of the Black-billed Parrot in the parish of Portland applies equally well to this species. Just in the vicinity of Boston the Yellow-bills were much the more common, however. The individual variation in these birds is almost entirely confined to a greater or less intensity of color in different specimens, which seems to be correlated with age, but not with sex or season. During my stay at Boston a few hours' walk would always enable one to see flocks of these birds and often a few moments would be sufficient to walk to where a flock fed on the wild orange and other wild fruits and seeds.

Mr. Taylor's notes are subjoined: "Gosse regards this species as less abundant than the 'Black-bill.' My own limited experience and the information I have gathered from others does not support that view. At a property near the summit of Mount Diablo, where I stayed for a few days, large flocks of 'Yellow-bills' were seen feeding at the pimento trees. They were always very wary and difficult of approach."

122. *Conurus nanus* (Vig.). YELLOW-BELLIED PAROQUET. — I did not meet with this species while in Jamaica, where its distribution appears to be quite local, though where it does occur the bird is said to be com-

mon. Mr. Taylor tells me that he has never seen them alive, and that there are but few specimens in the collection of the Jamaica Institute. For a more detailed account of the economy of the species the reader is referred to Gosse, 'Birds of Jamaica,' p. 263, where the species is referred to as *C. flaviventer*.

123. *Ara tricolor* (Bechst.)?—There seems to be little doubt that a species of *Ara* has occurred on the island. It is the general opinion of some of the most intelligent native hunters that I talked with that a large red Parrot has been shot on the island, and that it still occurs at times. This last seems to me very doubtful. Mr. Taylor writes: "Jamaican examples not seen. All the domesticated birds I have seen appear to have been brought over from Cuba." The reader is further referred to the Gosse, 'Birds of Jamaica,' pp. 260-263, where a most detailed account of the occurrence of a species of *Ara* on the island is given.

(To be continued.)

SUMMER BIRDS OF THE CREST OF THE PENNSYLVANIA ALLEGHANIES.

BY JONATHAN DWIGHT, JR.

VARIOUS observers in the Virginias and the Carolinas have already called attention to the distinctly Canadian tinge of the fauna on the higher mountains of the Appalachian system, but until recently there has been little to show that like conditions prevail at much lower altitudes in the State of Pennsylvania. The present paper not only proves this most conclusively, as regards the bird life, but also brings together for the first time in a list those birds that make their summer home in the mountain region of the State. It is the outcome of two brief visits made at the height of the breeding season to some of the more elevated portions of the mountains.

The first occupied a period from June 18 to June 25, 1890, the localities visited being the vicinity of Altoona in Blair County and that of Cresson in Cambria County, at which latter place most of my time was passed. The second occupied from June 10 to 17, 1891, and this time portions of Luzerne, Sullivan, and

Bradford Counties were traversed, my longest stay being on North Mountain where several days were spent.

Previous observers, with few exceptions, do not refer directly to the region under discussion, nor have they always distinguished between summer visitants and migrants, so that they cannot be quoted for comparisons. There are two exceptions,—one an old record of careful observations made early in the forties by the Messrs. Baird* and the other Dr. Warren's recent volumes.†

The Baird lists are briefly annotated, but they illustrate how well such work could be done even fifty years ago. Breeding birds are marked with an asterisk, this often showing that an occasional species of the Canadian avifauna bred near Carlisle, which, it will be observed, lies on the easternmost slopes of the outlying ridges of the mountains. The majority of the birds of these lists are Alleghanian with a goodly sprinkling of the Carolinian types, while it is worthy of notice that, though the birds of my list are chiefly Alleghanian, the Canadian element is strongly marked, and nowhere, not even in the valleys, did I meet with Carolinian forms.

Dr. Warren's book (the 1890 edition) contains the only extensive and accurate information we have had concerning the bird life of the mountain regions. This, however, is scattered through the pages of a large book of a popular character, and the importance of many of the statements is not sufficiently emphasized.

Reference to almost any map will show that the Appalachian Mountain system enters southern and southwestern Pennsylvania in a series of parallel ridges which curve to the northeast and pass out of the State at its northeastern corner. The crest of the

* List of birds found in the vicinity of Carlisle, Cumberland County, Penn., about Lat. 40° 12' N., Lon. 77° 11' W., by Wm. M. and S. F. Baird, *Silliman's Am. Journal*, XLVI, 1844, pp. 261-273; and Catalogue of birds found in the neighborhood of Carlisle, Cumberland Co., Pa., by S. F. Baird, *Lit. Rec. and Journ. Linn. Ass. of Penna. College*, I, 1845, pp. 249-257.

† Report on the Birds of Pennsylvania by B. H. Warren, M. D., 1838, and a later revised edition, 1890.

Since the above was written a paper has been published that bears directly upon the mountain fauna, entitled 'The Summer Birds of Harvey's Lake, Luzerne Co., Penna., with Remarks on the Faunal Position of the Region,' by Witmer Stone, *Proc. Acad. Nat. Sci. Phila.*, 1891, pp. 431-438).

Alleghanies is the principal range, near the centre of the State; its sky line is seldom below 2000 feet elevation, and many points reach 2500 feet. Roughly speaking it may be said that west of this backbone of the mountains is a plateau region sloping away so gradually that much of northern and western Pennsylvania is at an altitude which, when combined with forest, cannot fail to attract birds of the Canadian avifauna. Eastward, on the contrary, this main axis dips sharply into the valley a thousand feet below, from which rises rather abruptly an even-topped range, and this in turn descends into another valley, so that a succession of narrow valleys and parallel ridges characterizes much of the eastern part of the State before the level country is reached. Some of these secondary mountains attain considerable altitudes, 2000 feet and more, but they lack the unbroken continuity of the main divide, and the southern extension of the Canadian fauna and flora is doubtless less marked upon them than upon the Alleghanies proper.

There was a time when the mountains of Pennsylvania were clothed with unbroken forest, the cool recesses of which afforded refuge for many species now found in reduced numbers in the few tracts of timber still untouched by the axe. At the present time the plateau region is in many places covered with farms, which often extend to the very crest line, and there is little suggestive of the top of a mountain range. Bits of the original forest, however, still remain in many places, and on North Mountain (which includes a large section of plateau in or adjacent to the southern part of Sullivan County) is found what is said to be the largest body of timber remaining uncut in the whole State. It certainly is a grand forest, large hemlocks, yellow birches, and maples predominating. There are also groups of white pines, and even a tract of spruces, which I was unable to visit, for roads are by no means the rule in this wilderness, and besides my time was limited.

About Cresson, which is over a hundred miles southwest of North Mountain, there still remain small bodies of timber, chiefly of oak, maple, chestnut, and beech, with here and there a hemlock. On Wopsononock Mountain, a few miles northeast of Cresson, lumbering is still carried on, but at the rate it is being pushed, here as well as on North Mountain, it will not be many years before the mountains will have been entirely denuded, and

with the forests will disappear many of the birds that now dwell in their shade. Cresson and North Mountain are characteristic spots to study the fauna and flora of the plateau region. The elevation of both places is very nearly the same, a little over 2000 feet; but while the latter represents the mountains in their original wildness, the former shows them in a semi-civilized state, after they have been stripped of forest and converted into a country of woodland and pasture. Of the intervening region I can only say that it probably partakes of the nature of both, the forest predominating.

On North Mountain the forest is truly primeval; the hemlock, the yellow birch, and the maple are the characteristic trees, and attain great size. The hemlocks are scattered in considerable numbers through the forest, and tower above it, their huge trunks, often four or five feet in diameter, marking them out as giants among their lesser brethren. The underbrush is often dense and everywhere great logs, covered with green moss, lie mouldering. Here and there you hear clear cold brooks that seem to imitate the song of the Winter Wren that is almost constantly heard along them. The drawling song of the Black-throated Blue Warbler and the sprightly one of the Canadian Warbler is heard on every hand. High up in the hemlocks the drowsy sounds of the Black-throated Green Warbler are heard, and the lively chatter of the Blackburnian Warbler catches the ear. Is not this a bit of northern Maine? You can easily imagine yourself there, although several familiar birds of that region are here missing. There are no White-throated Sparrows, nor Myrtle Warblers, so truly Canadian. The only civilized spot on North Mountain is the clearing of a few acres about a summer hotel on its extensive, almost level top, at an altitude of 2318 feet. Here it was that for the first time in my life I heard the Wood Thrush, the Hermit, and the Olive-backed all singing at the same time. The three species were abundant, and the music at sundown was a concert which for sweetness would be hard to excel.

There is a wild and rocky gorge down the eastern side of North Mountain, a most picturesque spot and one typical of the wilderness. Kitchen's Creek tumbles down something like a thousand feet in its course from the plateau above to the valley below, giving rise to a succession of foaming pools and noisy waterfalls of

great beauty. The trees growing from the precipitous rocks on either hand arch overhead, admitting occasional bursts of sunshine that dance in the clear and sparkling water. Here the tiny Winter Wrens were at home and were found along the brawling brook, as long as it was covered in by the forest shade. When, however, it emerged into the open farming country in the valley below (here many miles broad and of an elevation not exceeding 1000 feet), they and the Juncos and the Magnolia Warblers and all the other Canadian species were left behind in the coolness brought down from the mountain by the rapid stream.

Cresson and the adjacent country lack the wildness and inaccessibility of North Mountain. At Cresson may be found some of the densest of rhododendron swamps, but they are not extensive. Laurel also grows, but it is far more abundant on North Mountain where the rhododendron was not seen. There was an absence of forest-loving birds, although Blackburnian, Black-throated Green, and Black-throated Blue Warblers were to be found in the isolated patches of woods, particularly when they contained cold springs, and then Water Thrushes and Canadian Warblers were often present. There were some wet meadows at Cresson where a few Red-winged Blackbirds and a colony or two of Savanna Sparrows were nesting, and in general it may be stated that the species in greatest abundance were those of the open fields. At Gallitzin, a few miles north of Cresson, the charred stubs in clearings about coke ovens had their effect in soiling the plumage of many of the birds. Still further north along the crest of the mountains is a region of second growth oak, often 'scrubby,' where few birds were found, though the Chestnut-sided Warbler was rather abundant, and beyond this is Wopsonnock Mountain, which has been nearly cleared of forest. Where fire has swept its broad top is a considerable tract of open 'barrens' grown up with blueberry bushes, sweet-fern, and brakes. Here I met with the only Mourning Warbler observed, and on its very top, among a few scattered yellow pines, I found a pair of Hermit Thrushes and a few Solitary Vireos.

At all the localities visited the Junco was constantly met with, even down to 1000 feet elevation, but was nowhere abundant. It may be regarded as a species typical of the southward extension of the Canadian avifauna which seems to be largely influenced

in distribution by the forest. The coolness of forest shade seems to be the equivalent of higher altitudes.

As June was well advanced at the times of my visits, it is safe to say that all the birds seen were summer residents. A good many young birds were on the wing, and the woods were full of song, so that it was possible to recognize and secure many species that otherwise would have escaped detection.

Unless otherwise indicated in the following list, it will be understood that the birds were noted both in the vicinity of Cresson and on North Mountain, and without doubt the intervening region will be found to contain practically the same species. This is already proved in part by the reports of observers in the intervening counties of Centre, Clinton, and Lycoming, as published in Dr. Warren's book.

Such species as did not come under my personal observation have been placed in brackets in the following list which I think shows that the mountain regions of Pennsylvania partake far more of the Canadian element than has been generally supposed. Here are some of the most distinctly northern species and many of them were abundant in suitable localities.

<i>Sphyrapicus varius.</i>	<i>Geothlypis philadelphia.</i>
<i>Empidonax flaviventris.</i>	<i>Sylvania canadensis.</i>
<i>Loxia curvirostra minor.</i>	<i>Troglodytes hiemalis.</i>
<i>Junco hyemalis.</i>	<i>Certhia familiaris americana.</i>
<i>Dendroica caerulescens.</i>	<i>Regulus satrapa.</i>
<i>Dendroica maculosa.</i>	<i>Turdus ustulatus swainsonii.</i>
<i>Dendroica blackburniæ.</i>	<i>Turdus aonalaschkæ pallasii.</i>
<i>Seiurus noveboracensis.</i>	

None of the species in the list which now follows have been marked as breeding because, with a few obvious exceptions, *all* the birds mentioned undoubtedly nested within a short distance of the spot where they were encountered.

Ardea virescens. GREEN HERON.—One was seen on two occasions along a swampy brook at Cresson. There is little to tempt this species, or in fact any of the water birds, to the plateau region.

Ægialitis vocifera. KILLDEER.—A single pair was found in an open pasture at Cresson.

Bonasa umbellus. RUFFED GROUSE.—As might be expected this species was far more abundant in the forest on North Mountain than about Cresson. The ruddy tint of the tails was apparent, though but one speci-

men was secured. A brood barely able to fly was met with June 16 on North Mountain.

Zenaidura macroura. MOURNING DOVE.—A few were seen at Cresson, and some at the foot of North Mountain, in the valley eastward.

Buteo lineatus. RED-SHOULDERED HAWK.—A pair had a nest in a rhododendron swamp at Cresson. Its cry was heard several times on North Mountain.

Haliaeetus leucocephalus. BALD EAGLE.—A pair was seen June 18 circling about the rocky ledges of the Blue Ridge Mountains, one of the outlying ridges near Mifflin.

Falco sparverius. SPARROW HAWK.—It was not actually seen on the mountains, but was met with in the valley and doubtless occurs elsewhere. Hawks of all kinds seemed to be rare.

Syrnium nebulosum. BARRED OWL.—Every evening on North Mountain a pair would be heard calling to each other. No others were observed.

[*Nyctea nyctea*. SNOWY OWL.—It may be of interest to record the fact that a specimen of this species was captured one winter a few years ago near the hotel on North Mountain.]

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO?—While not abundant, this species was occasionally met with, though unfortunately none were secured. The notes heard were all referable to this species. Baird did not record it as breeding at Carlisle, where *Coccyzus americanus* was regularly found. Dr. Warren records both species as summer residents, presumably everywhere throughout the State.

Ceryle alcyon. BELTED KINGFISHER.—A single one was seen flying over at Cresson.

Dryobates villosus. HAIRY WOODPECKER.—Seen but twice and on North Mountain only. Dead trees were not abundant, except in some clearings near Gallitzin, and as Woodpeckers are generally in direct proportion to them, comparatively few were observed.

Dryobates pubescens. DOWNY WOODPECKER.—Detected in both localities; evidently not common.

Sphyrapicus varius. YELLOW-BELLIED WOODPECKER.—Occasionally met with on North Mountain only. Dr. Warren records this species as breeding rarely in Bradford, Lycoming, McKean, and Warren Counties, and perhaps Lackawanna, and it is marked without comment as breeding in Cumberland, Crawford and Sullivan Counties. Baird also marks it as breeding at Carlisle.

[*Ceophlæus pileatus*. PILEATED WOODPECKER.—While this species did not actually come under my observation, I learned of its occasional occurrence on North Mountain. Dr. Warren records it as resident in many counties.]

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—A few birds seen almost daily about Cresson only pointed to the probability of its nesting.

Colaptes auratus. FLICKER.—Fairly abundant, a few being seen daily.

Chordeiles virginianus. NIGHTHAWK.—Not met with on North Mountain, probably because there are no clearings except about the hotel. Several seen at Cresson and vicinity.

Chætura pelagica. CHIMNEY SWIFT.—Rather common everywhere.

Trochilus colubris. HUMMINGBIRD.—Now and then one would be seen, but they were rare.

Tyrannus tyrannus. KINGBIRD.—Not seen on North Mountain, doubtless on account of the continuous forest, and not common at Cresson. It was more abundant in the valley region.

Myiarchus crinitus CRESTED FLYCATCHER.—One was seen on Wopsonock Mountain at perhaps 1800 feet elevation, and a few others were noted near North Mountain, in the valley.

Sayornis phœbe. PIGEON-BIRD.—A few met with wherever there were houses, even near a deserted mill on North Mountain.

Contopus virens. WOOD PEWEE.—It was rare at Cresson, and very few were detected on North Mountain.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—This species was found on North Mountain only, a few along the cold brooks. Dr. Warren states that many breed in Lycoming County and other mountainous parts of Pennsylvania. Baird did not meet with it in summer.

Empidonax minimus. LEAST FLYCATCHER.—Only detected in the valley, though there seems to be no good reason why it should not be found on the mountains.

Dr. Warren says: "I have been informed that Traill's Flycatcher has been seen in the mountainous parts of the State during the summer." The possibility of error in identifying the small Flycatchers is so great that the actual capture of the bird should be the only authority for stating its occurrence.

Cyanocitta cristata. BLUE JAY.—Rather common; noisy parties of young birds met with frequently.

[*Corvus corax sinuatus*? RAVEN.—It was well known to the people on North Mountain, but it is now very rare. Dr. Warren records it as resident in many counties.]

Corvus americanus. CROW.—There were no Crows on North Mountain and very few about Cresson.

Molothrus ater. COWBIRD.—At Cresson a single bird was noted.

Agelaius phœniceus. RED-WINGED BLACKBIRD.—A few were seen in a wet meadow at Cresson. More common in the valley.

Sturnella magna. MEADOW LARK.—Several seen each day, near Cresson only.

Quiscalus quiscula. PURPLE GRACKLE?—Seen at Cresson only, where a few bred. In the valley near Altoona (1197 feet) they were abundant. A specimen obtained proved to be a young bird, probably *quiscula*, and one male that I saw at a distance of thirty feet was evidently of this species. Still the crest of the Alleghanies must be somewhere near the dividing line between *quiscula* and *æncus*, and more material is desirable to determine which is the prevailing form.

Carpodacus purpureus. PURPLE FINCH. A few individuals were seen about the hotel on North Mountain. Dr. Warren states that this species breeds sparingly, particularly in the northern part of the State. Baird did not find it breeding.

Loxia curvirostra minor. AMERICAN CROSSBILL.—A flock of a dozen was seen on North Mountain June 16, and previously a couple had been heard flying over. Dr. Warren says of the species that it breeds regularly in several counties. Baird does not record it as a summer bird.

Spinus tristis. AMERICAN GOLDFINCH.—Several seen nearly every day, of course not in the deep woods.

Passer domesticus. ENGLISH SPARROW.—Found everywhere, of course, except on North Mountain, and I suppose it must be included in the list.

Pooecetes gramineus. GRASS FINCH.—There was not enough open ground on North Mountain to attract this species which was one of the most abundant birds in the vicinity of Cresson and in the valley region.

Ammodramus sandwichensis savanna. SAVANNA SPARROW.—This species, which Dr. Warren mentions as rare and occurring in a few counties, was found at Cresson. A large colony was established in a wet pasture, and a few other individuals were encountered. Baird does not record the species as breeding.

Ammodramus savannarum passerinus. GRASSHOPPER SPARROW.—Several pairs were found in the same meadow as the preceding species, but occupying drier portions of it. In the valley region they abounded, but the wooded character of North Mountain naturally precluded their occurrence there.

Spizella socialis. CHIPPING SPARROW.—Common everywhere, even about the hotel on North Mountain, but not in the deep wood.

Spizella pusilla. FIELD SPARROW.—Fully as abundant as the preceding species, particularly where bushy fields attracted them. A few were in the clearing on North Mountain.

Junco hyemalis. SLATE-COLORED JUNCO.—The birds of the region approach a little more closely true *hyemalis* than they do the form *carolinensis* of the high mountains of North Carolina and Tennessee. The question is fully discussed by me in a recent article (see 'Auk,' VIII, 1891, pp. 290-292). The examination of additional material brings out no new facts. Some specimens are quite indistinguishable from *carolinensis*, but the majority differ little from northern specimens of true *hyemalis*. The birds are distributed all over the more elevated country, nowhere abundant, but a few were met with almost every day, whether in the forest or in the open. I found them sometimes as low as 1000 feet elevation. The males were in full song, thus constantly betraying their presence. Young birds were on the wing during both of my visits. Baird did not record it as breeding near Carlisle. R. M. S. Jackson in 1860, in a book called 'The Mountain,' containing a long list of the birds of this very region, said of

this species that "large numbers nest and permanently occupy the mountain." Dr. Warren states that it is a common resident on all the higher ranges. It has been also recently reported as breeding in the western part of the State, which, as I have shown, is nearly as elevated as the section under discussion.

Melospiza fasciata. SONG SPARROW.—Everywhere abundant except in the deep woods.

Pipilo erythrophthalmus. TOWHEE.—One was seen on North Mountain. At and near Cresson it was fairly abundant.

Habia ludoviciana. ROSE-BREASTED GROSBEEK.—It was only detected on the mountain side near Altoona and again west of Cresson.

Passerina cyanea. INDIGO BUNTING.—A common species at many points, even in the clearing on North Mountain. Baird does not record this bird as breeding at Carlisle.

Piranga erythromelas. SCARLET Tanager.—Often heard than seen, but a common species.

Progne subis. PURPLE MARTIN.—Some nested at Altoona. There is every likelihood of its being found on the mountains.

Petrochelidon lunifrons. CLIFF SWALLOW.—A colony with perhaps fifty nests was noted under the eaves of a barn at Cresson, also another smaller one a few miles away.

Chelidon erythrogaster. BARN SWALLOW.—Common even on North Mountain where several pairs were nesting in the hotel barn.

Tachycineta bicolor. TREE SWALLOW.—Seen only on North Mountain where one or two pairs were nesting in the barn.

Ampelis cedrorum. CEDARBIRD. Rather abundant everywhere.

Vireo olivaceus. RED-EYED VIREO.—Very abundant, less so at Cresson.

Vireo solitarius. SOLITARY VIREO.—Abundant on North Mountain, as many as a dozen males being heard in the course of a day. Also found on Wopsonnock Mountain, but not elsewhere. The specimens obtained show an approach toward *alticola*, but the plumbeous tinge of the back is only slightly more extensive than in true *solitarius*. Baird found it breeding at Carlisle.

[The impressions of Dr. Warren's observers that *V. philadelphicus* breeds in the State need confirmation.]

Mniotilta varia. BLACK-AND-WHITE WARBLER.—Seen only occasionally, but everywhere.

Compothlypis americana. PARULA WARBLER.—Rather common in certain localities on North Mountain, and I thought I caught its song on the mountains near Altoona. Baird and Dr. Warren both record it as breeding.

Dendroica æstiva. YELLOW WARBLER.—A few were seen near Cresson only.

Dendroica cærulescens. BLACK-THROATED BLUE WARBLER.—About Cresson this species was found in the bits of woods grown up with an underbrush of rhododendrons, and was far less abundant than on North

Mountain where fifteen or twenty males would be heard in the course of a day. The young were apparently not yet out of the nest. It is reported as breeding by both Baird and Dr. Warren.

Dendroica maculosa. MAGNOLIA WARBLER.—Another common species, less so, however, than the preceding. Young were on the wing. Dr. Warren says that it breeds in many sections of the mountains. It was not found by Baird in summer.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—Rather common about Cresson and on Wopsonnock Mountain, but only detected once on North Mountain where the continuous forest has no attractions for a species so partial to tracts of 'scrub.'

Dendroica blackburniæ. BLACKBURNIAN WARBLER.—It would be hard to say whether this species or *D. cærulescens* was the most abundant. There were times and places where both might almost be said to swarm. I obtained young. Baird and Dr. Warren both record it as breeding; the latter says "sparingly in the mountains."

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Still another most abundant species, frequenting, like *D. blackburniæ*, the hemlocks. Found as low as 1000 feet in several different localities. Young were met with. Baird records it as breeding; also Dr. Warren who says it breeds in the northern tier of counties and in many to the south.

Dendroica vigorsii. PINE WARBLER.—In Bradford County, near Towanda, where the altitude is less than 1000 feet, scattered groups of yellow pines were full of Pine Warblers, but neither this species nor the pines (except a few on Wopsonnock Mountain) were met with on the Alleghanies proper.

Seiurus aurocapillus. OVENBIRD.—A common species everywhere.

Seiurus noveboracensis. WATER-THRUSH.—Further evidence of the Canadian tinge of the avifauna is afforded by the common occurrence of this species along streams. The young were barely able to fly, and several vacated nests were found in the upturned roots of fallen trees. Dr. Warren states that it breeds in Lycoming, Centre, Clinton, and Clearfield Counties. In Baird's time this species was not distinguished from *Seiurus motacilla*.

Geothlypis philadelphia. MOURNING WARBLER.—A single male was found singing on Wopsonnock Mountain where was an extensive well-nigh treeless slope of ferns. No doubt it can be obtained elsewhere in suitable localities, for Dr. Warren states that it breeds in a few secluded mountain districts. Baird does not mark it as breeding.

Geothlypis trichas. MARYLAND YELLOW-THROAT.—Common about Cresson, and one detected in a swampy portion of the clearing on North Mountain.

Sylvania canadensis. CANADIAN WARBLER.—There is little in a name, but this bird does happen to belong to the Canadian fauna, and seems in summer to be out of place in that of Pennsylvania. Still it is certainly abundant in all the localities I visited. Young birds were obtained. Baird records its breeding; and Dr. Warren says that it breeds sparingly in some of the mountains.

Setophaga ruticilla. AMERICAN REDSTART.—This species was not found at all on the mountains, and but few were observed in the valley region, still it seems strange that it should not occur higher up.

Galeoscoptes carolinensis. CATBIRD.—A few seen daily about Cresson; once detected in the clearing on North Mountain.

Harporynchus rufus. BROWN THRASHER.—Frequently met with about Cresson and one on North Mountain; also in the valley region.

Troglodytes ædon. HOUSE WREN.—A few observed about Cresson, though more numerous at Gallitzin, three miles away, where they frequented a clearing full of tall dead stubs. None on North Mountain.

Troglodytes hiemalis. WINTER WREN.—Observed on and about North Mountain only, where it was generally distributed throughout the forest, most abundantly in the damper portions. It was especially numerous along Kitchen's Creek. It is a species ever suggestive of cool, secluded forest and moss-covered logs, and its presence always betokens a northern tinge of bird life in the region where it is found. Dr. Warren records it as breeding sparingly in the mountains and northern part of the State. Baird did not find it breeding at Carlisle.

Certhia familiaris americana. BROWN CREEPER.—Occasionally observed on North Mountain, where a family of young birds was encountered, not elsewhere. Dr. Warren reports it breeding in the higher portions of the State.

Sitta carolinensis. WHITE-BREASTED NUTHATCH.—Occasionally observed, but not common.

[Dr. Warren says that *S. canadensis* breeds sparingly in the higher parts of the State, and this is not altogether improbable.]

Parus atricapillus. BLACK-CAPPED CHICKADEE.—Observed not infrequently.

Regulus satrapa. GOLDEN-CROWNED KINGLET.—Met with but once, a pair on North Mountain along Kitchen's Brook. Dr. Warren says of it: "My friend Prof. August Koch of Williamsport informs me he has occasionally met with this species and their young in August and September in Lycoming County. Perhaps future investigators will show that this species breeds sparingly in some of the extensive coniferous forests of our higher mountain ridges." Baird does not record this truly Canadian species as breeding.

Turdus mustelinus. WOOD THRUSH.—An abundant species, found in the woods to the highest points.

Turdus fuscescens. WILSON'S THRUSH.—Tolerably common about Cresson and in the valley at Altoona. Not met with on North Mountain itself, but seen in the valley eastward. Dr. Warren says that it breeds sparingly in the northern and mountainous parts of the Commonwealth, also in Northampton, Lackawanna, Crawford, and Erie Counties. Baird did not find it breeding at Carlisle.

Turdus ustulatus swainsonii. OLIVE-BACKED THRUSH.—Found only on North Mountain, but quite abundant there. I believe there is no record of this species being found in summer south of the Catskill Moun-

tains in New York, although Dr. Warren says it "breeds occasionally, it is said, in our higher mountainous regions."

Turdus aonalaschkæ pallasii. HERMIT THRUSH.—Among some scattered pines at the top of Wopsononock Mountain I found a pair feeding their young. As the abundance of this species can best be determined about sunset, when every male is pouring forth its evening song (and the same remark applies to *T. u. swainsonii*), I cannot say how abundant it is at this point. It was not encountered at Cresson, but in the deep woods of North Mountain it found a congenial home and was very numerous. Often it was possible to distinguish a dozen singing at the same time in the early morning or late evening hours. There was an overhanging cliff commanding a deep, narrow valley, whence at sunset even a greater number might be heard, their notes blending with those of the Olive-backed and Wood Thrushes. I have listened to the songs of all these birds many times, but never before have I heard all these species singing at the same time and had such opportunities for comparing their notes. I am satisfied that the song of the Hermit Thrush is more beautiful than that of the much-renowned Wood Thrush. There is a liquid, ringing sweetness about it, that is only matched in part by the song of the latter. The notes of the Olive-backed Thrush are inferior to both, although delivered with more swing and emphasis than either. The Hermit Thrush is one of the characteristic Canadian birds found in this region. Baird did not meet with it in summer. Dr. Warren says: "This species, it is stated, breeds sparingly in some of our higher mountainous districts."

Merula migratoria. AMERICAN ROBIN.—Abundant everywhere except in the deep woods.

Sialia sialis. BLUEBIRD.—Tolerably common and met with in the clearings on the top of North Mountain.

A DESCRIPTION OF THE ADULT MALE OF *BOTAURUS NEOXENUS* (CORY), WITH ADDITIONAL NOTES ON THE SPECIES.

BY W. E. D. SCOTT.

CAPTAIN J. F. MENGE of Fort Myers, Florida, procured for me during the summer of 1891 three specimens of Cory's Bittern (*Botaurus neoxenus*), and as one of these has the sex deter-

mined, much additional light is thrown on this little known form. Captain Menge saw, besides the specimens he procured for me, some eight individuals, one pair of which were breeding and had young and have already been referred to in this journal, Vol. VIII, p. 309. The male about to be described is not the dark bird of this pair, neither of which was taken by Captain Menge, but he tells me that in coloration one of the birds of the pair was identical with it, and that he has seen others of similar color. The other bird of this pair was in color like the type of *B. neoxenus*. In view of the new material and of the foregoing information, I believe that the four individuals heretofore collected are probably all females. Appended is the description of the three additional individuals, making a total of seven birds so far known of this species.

Adult male, No. 11,449, collection of W. E. D. Scott, taken three miles south of Lake Okeechobee and thirty miles east of Ft. Thompson, Florida, June 28, 1891, by Capt. J. F. Menge. General appearance throughout, both above and beneath, dark greenish black. The feathers of the lower neck alone having traces (edgings) of dark chestnut, their centres being of the greenish black tone prevailing throughout the bird. The belly is greenish black with no traces of chestnut, and the axillary feathers are greenish black. The central feathers of the belly near the vent, two or three in number, are pure white. The feathering of the legs is blackish chestnut, and on the right leg there are a number of cream-colored or whitish feathers.

No. 11,450, collection of W. E. D. Scott, taken at Lake Flirt, Florida, Aug. 15, 1891, by Capt. J. F. Menge, is a young bird of the year, and is like Mr. Cory's original specimen save that the entire belly is still covered with white feathers of a downy character and that the first primary of the right wing is pure white throughout; one of the axillaries of the left wing also is pure white. The legs where they are feathered are smoky brown in color behind, and pure white in front.

No. 11,451, collection of W. E. D. Scott, taken at Lake Flirt, Florida, July 15, 1891, by Capt. J. F. Menge (believed by Capt. Menge to be a female) is very like Mr. Cory's original bird save that there are traces on the sides of the back of lines, much obscured, but of a general brownish tint, thus approaching *Botaurus exilis*.

In view of the small amount of material so far extant it may be premature to hazard an opinion regarding this bird, but I feel impelled to record the strong impression that I entertain, that it will ultimately be found to be a color phase of *Botaurus exilis*.

HABITS OF THE BLACK-BELLIED PLOVER
(*CHARADRIUS SQUATAROLA*) IN MASSA-
CHUSETTS.*

BY GEORGE H. MACKAY.

THIS distinguished-looking bird, the largest of the Plovers, is nearly cosmopolitan. It ranges in the Western Hemisphere as far south as Brazil, New Grenada and Peru, with a corresponding limit in the Eastern Hemisphere in Australia and New Guinea. It is said to breed on the marshes above forest growth at the delta of the Lena River in northern Siberia, in the valley of Pechora on Taimyr Peninsula, northern Russia, on the banks of the Anderson River, and on Melville Peninsula in Alaska (Seebohm's Plovers, p. 103; Baird, Brewer, and Ridgway, N. A. Birds, Vol. I, p. 132).

In summer plumage the adult male is black from around the base of the bill to the eyes, fore neck, and under parts of body; abdomen to end of tail white; axillars black; forehead and fore half of crown creamy white to white; a broad white line or band running from the sides of the head over the eyes, down the sides of the neck, and enlarging and encroaching into the black on the breast where the neck joins the body, sharply defined in front by the black, but blending into the plumage of the neck and back (this white line or band is the most prominent feature of their plumage as seen from a distance); sides of the neck and rump ashy gray; back and hind half of crown whitish, covered with small irregular spots of brownish black; upper tail-coverts barred with brownish black. The legs and bill are black; small hind toe. The adult female is rather smaller than the male; the plumage of the top of the head, back of the neck, and back, is duller with more brownish, not being so defined as in the male; the fore neck, breast and lower parts, interspersed with brownish to black, and white, feathers; abdomen white. They never have the clear crow-black fore neck and breast of the males, nor is the white band or line of the forehead and sides of the neck so prominent. As a whole their plumage lacks that clearly defined

* Read before the Nuttall Ornithological Club, Dec. 7, 1891.

pattern so distinctive of the adult male. The young birds, commonly called Beetle-heads, Chuckle-heads, or Bull-heads, have the entire upper parts brownish gray-black covered with irregular spots of white and pale yellow, which last color varies in different specimens; under parts white; the fore neck and breast dull white with longitudinal, short, gray lines; axillars dusky brown to black. I have at times shot large specimens of young American Golden Plover (*C. dominicus*)—Pale-bellies as they are called—which quite closely resembled small specimens of young Black-bellied Plover (*C. squatarola*), or Beetle-head, but the dusky or blackish axillars and the presence of a hind toe in the latter will always distinguish them from the former.

It is stated, or at least implied, in most ornithological works that the plumage of the adult female is the same as the male's; it will be noticed that I have described it differently. I now desire to call attention to the universal statement current in the literature of the subject that the adults assume what is designated as the winter plumage, that is, gray above and white underneath, similar to the plumage of the young birds. I cannot but believe that such statement is an error of long standing, it being my conviction that such gray and white plumage is confined exclusively to the younger birds, and is retained by them in varying stages up to three or four years of age, or in other words until such time when they change it (never to reappear in it) for that which is known as full spring plumage. Birds with light-colored breasts without any, or with very few, black feathers, are seen to a greater or less extent every spring. I have yet to see an old bird from any locality in any season, in the gray and white plumage. Lest I may be misinterpreted, permit me to add that as these birds do not, in my opinion, reach the height of their plumage until they are three or four years old, my remarks apply only to birds of that age or over. Mr. George A. Tapley of Revere, Mass., who is a close observer and has probably shot as many of these birds as any one in Massachusetts, and whose shooting experience extends over a period of about fifty years, informs me that he has shot the old birds in full plumage on Cape Cod, Mass., on July 28, 29 and 30. He says he never saw an old bird in the gray and white plumage, but has shot old and young birds together. Mr. Charles G. Kendall, also a sportsman and a close observer, has passed the last twenty-five winters in South Caro-

lina. In reply to my inquiry asking for his experience in that State he writes me; "A few Blackbreasts always winter on the coast of South Carolina, and I see a few almost daily every winter on the marshes near my residence. There are as many full, *deep black*-breasted birds in winter as in spring or summer. I see no reason for believing that the fully adult birds ever again assume a gray plumage. . . . In the spring I have occasionally shot specimens with blotchy or mottled breasts, evidently changing to full plumage from gray."

In addition to the above I have thought it might prove interesting to have descriptions of a few individual birds to serve as illustrations. Through the kindness of Mr. William Brewster of Cambridge, Mass., I am able to refer to some examples in his collection. Specimen No. 29,626 was taken Aug. 29, 1890, at East Marshfield, Mass.; it is a male. The entire lower parts of this bird from the bill to the abdomen are coal-black with the exception of a few small white feathers interspersed. No. 19,170 was taken Sept. 3, 1888, at Monomoy Island, Cape Cod, Mass.; it is a male. This bird is black and white on the breast and would be said to have nearly arrived at full plumage. Specimen 19,171 was taken Sept. 6, 1888, at Monomoy Island; it is a male, and is black on the breast with the exception of a few white feathers. Specimen 731 (Spelman Collection) was taken on Sept. 1, 1881, at Rye Beach, N. H.; it is a female in full plumage. Specimen 730 (Spelman collection) was taken Aug. 22, 1881; it is a male. The entire lower parts from the bill to the abdomen are black and white, evenly divided. These data will, I think, be sufficient to make plain the point in question.

I have examined, also, about thirty of the younger birds (those in the gray and white plumage) in Mr. Brewster's collection; they are from Maine, Massachusetts, South Carolina, Georgia, Florida, Lower California, and San Francisco, California. Each and all have every appearance (to me) of being young and undeveloped birds. I think the reason we see and capture so many more of the gray and white plumaged birds is because they are younger and less wary than the old birds, which latter, being shy and having been over the route a number of times previously, do not stop or remain at places where they are likely to be harassed. In studying the plumage of the Black-bellied Plover,

as also of the Knot (*Tringa canutus*), a large series of specimens is imperative in order to arrive at satisfactory results, owing to the diversity of their plumage as they advance from youth to age. The Knot, too, is said to assume this gray and white form of plumage similar to that of the young birds, during the winter. I think this statement also is incorrect, but as I intend to present an article on this bird later in the year, I will defer until that time what I wish to say regarding its habits and plumage.

The Black-bellied Plover is in a great degree a *tide* bird, seeking a large portion of its food on those extensive sand flats left by the receding waters, which may be adjacent to marshes where the grass is short, and which are interspersed with barren places where there is no grass, also to uplands and fields where the grass is scanty or closely fed down by sheep or cattle. It is to such places that they like to resort when driven from their feeding grounds on the sand flats by the incoming tide. They also frequent at such times the crest and dry sand of the beaches and shoals; here they remain until the tide has sufficiently ebbed to permit them again to return to feed. Their food consists largely of minute shell-fish and marine insects. They feed also on the larva of one of the cut-worms (Noctuidæ) which they obtain on the marshes; sometimes after being shot on the Dennis marshes, Cape Cod, Massachusetts, they will have some of them still in their throats. They also eat the large whitish maritime grasshopper (*Ædipoda maritima*). When on the flats they usually seek their food near the edge of the water. They also frequent such flats during the night as well as in the daytime. As there is more ground on Cape Cod suitable for this bird's requirements than in the rest of New England there would consequently more of them collect in this locality than elsewhere. In the neighborhood of the islands of Tuckernuck and Muskeget there are also extensive sand flats at low tide, and here also they used to be abundant many years ago. In the neighborhood of these islands, as also on Nantucket, they have been known to remain until the end of November. On Cape Cod their favorite resorts were, on the south side, the Dennis marshes, the sand flats outside Chatham, and the marshes below Great Island, near Hyannis, also Wellfleet on the north side. Here in former years large numbers, as many as a thousand at one time, frequented the Dennis marshes and the flats outside, often mingling and stand-

ing and feeding on the marshes for hours together, with the Knots or Redbreasts (*Tringa canutus*), Turnstones (*Arenaria interpres*), and Red-backed Sandpipers (*Tringa alpina pacifica*). Some of the flocks were composed of these four kinds of birds, it being no very uncommon thing, after discharging the gun at a flock, to gather up some of each, and many an old Black-breast has been inveigled up to the decoys within gunshot by being in company with its less suspicious companions.

While the Knot (*T. canutus*) mingles freely with the Black-bellied Plover here, as elsewhere, those of each kind composing one flock seem to keep a little apart. Often when alighting the Knots will be all on one side just a little distance away by themselves, and the Black-bellied Plovers by themselves.

In the autumn I have occasionally seen a flock composed of American Golden Plover (*C. dominicus*) and Black-bellied Plover. One flock I have in mind was composed of fifteen of each of these birds. They remained together on Nantucket Island for a week or more, feeding on the flats together and then coming to the same field when driven off by the incoming tide. On Nantucket Island some thirty-five or forty years ago the Black-bellied Plover frequented the uplands, there being but little marsh land adapted to them; to such uplands they became much attached. Mingled with them would be Turnstones (*Arenaria interpres*), Ringneck Plover (*Ægialitis semipalmata*), and Peeps, all congregating together on the high ground or plains adjacent to the north shore of this island, such flocks often aggregating several hundred.

On these islands (with one exception hereafter described), as also on Cape Cod, they have been noted year by year in lessened numbers until few are seen now as compared with former years. In looking for the cause of this falling off in numbers I am not wholly in accord with the statement which I have frequently heard expressed, that it is owing to the numbers killed during their migration north and south along this coast. The aggregate number of these birds killed in New England for many years past is not in my judgment sufficient to have been alone the cause of such a perceptible difference. I lean to the view that for a considerable number of years past they have been sufficiently harassed on their arrival and during their sojourn to have caused them to forsake such places, and they pass by, without stopping at those localities

where they formerly have been so incessantly pursued. I am also strongly of the opinion that many of them, having a number of times previously made this same journey, recognize such localities as places to be avoided and consequently pass on. In passing over such former resting places, of late years no responsive note of invitation is heard in answer to passing flocks, for all is silent. I am informed on what I consider reliable authority that about twelve years ago large numbers of the Black-bellied Plover and also of the Knot, or Redbreast (*Tringa canutus*), were noted from the 20th of May to the 1st of June on the Magdalen Islands. When tired at sea they will alight on masses of floating seaweed, and also on the ocean where they sit buoyantly, swimming with ease, experiencing no difficulty in taking wing. I judge they have never been very abundant in America, being probably outnumbered many times by the American Golden Plover (*C. dominicus*) and the Knot (*Tringa canutus*).

It has occurred to me that possibly they may have in part changed their habitat and lines of migration to the Eastern Hemisphere although I am not in possession of any facts to substantiate such a theory. It is, however, a fact that fewer of them visit us now than formerly, although during the spring of 1890 quite a remarkable change in the abundance of these birds was noticed in the neighborhood of the island of Tuckernuck, Massachusetts; from a flock of about twenty-five birds which served as the nucleus they continued to increase until six to eight hundred had collected, the average number in the spring for the fifteen years previous being two to three hundred birds. The spring of 1891 showed no such corresponding result, for the number again decreased without any apparent reason to the average of former years. During their stay in the above locality they frequented the upland on the south side of the island, also Smith's Island (a sand spit) and the extensive sand flats bare during low water, following the inside line of the beach when flying, and generally being in pairs or a few together.

On their return from the north the first of the old birds begin to appear about the 25th of July, from which date to the 20th of August is the height of their abundance. The young birds come, a few scattering ones, about the first of September, rarely before, and they often remain until the latter part of November, or until snow flies. The earliest dates on which I have

heard of the Black-bellied Plover appearing in the spring were May 6, 8, and 12. They are most abundant about the 20th of May and for a few days after, according to weather conditions; by the end of the first week in June they have all departed north. In the spring, when migrating north, they seem to appear on warm pleasant days when the wind is fair. Head winds are likely to arrest their flight until favorable conditions again prevail.

From notes taken by a friend near Port Royal, South Carolina, I gather that some birds pass north from the last week in April to the middle of May, when the movement ceases; on their return from the north they are seen at the above place from the middle of August until the end of October going south, but they never have been what might be called numerous at either season, according to his experience.

I have heard of but one instance when these birds have been taken during the winter in New England. Mr. S. Hall Barrett of Malden, Mass., shot three in December, 1872, at Gravel Island, Monomoy, Cape Cod. They were all black-breasted birds with whitish heads. It was thought at the time that they were spending the winter in this locality, as they had been seen a number of times previous to their being killed. This gentleman has also shot the Red-backed Sandpiper (*Tringa alpina pacifica*) in March in New England.

In migrating south in the autumn the Black-bellied Plovers pass inland through New England to a greater or less extent. I have in mind an instance when I shot nine about the end of October, 1865, at Missisquoi Bay, Lake Champlain, in northern Vermont, near the boundary line of Canada. The weather was cold and there was a fall of snow during the first week in November. I also saw others. The water in the lake at this time was quite low and there were considerable sandy margins and points exposed suitable for the birds' requirements. I learned, on inquiry, that, when this low stage of water prevailed in the lake, many of the water birds were not uncommon visitants at this season. At the same time that I shot the nine Black-bellied Plover above mentioned I also obtained Willets (*Symphemia semipalmata*), Greater Yellowlegs (*Totanus melanoleucus*), and Peeps.

The Black-bellied Plover fly lower on migration, I think, than do the American Golden Plover, and the flocks string out more, a customary mode of flight being in lines; they also fly like Ducks and Geese at such times. They are apt to fly in lines also when coming from the sand flats to and over the marshes.

I have noticed in the autumn that the young birds generally appear in pairs or singly. I never have observed more than a few together, and they are seemingly rather solitary at this season. They also show a preference for the sandy shores and margins of ponds near the ocean, often frequenting the crest of the beach. As a rule they like to be where the sand is wet. They roost on the dry crest of the beaches and on shoals.

When on the ground they usually run very fast for four or five yards, then stop, elevate the head, and look around. They strike at the object they are going to pick up and eat with a very quick motion. In the spring when passing from their feeding grounds on the sand flats and over the marshes they fly low and swiftly, apparently always on the alert, often turning on their sides so as to show the whole of the breast. It is customary for them to approach the marshes from the leeward side. It is not an uncommon occurrence for them to remain on the marshes during low water, instead of going to the flats, which indicates that they obtain considerable of their food in such places.

They make two notes, one a call which is very clear and far-reaching, of several notes with the accent on the second one, and plaintive and mellow; the other is low, and is uttered when they feel easy and contented. It is customary for them to remain silent when a number are standing together. They will not always respond to the call-whistle of the sportsman, or come to the decoys, even if he be well concealed; and even when leading up to the decoys, they do not come in closely flying flocks, but are much scattered and strung out in line, so that while some may be near enough to shoot, there will be others out of range. The reason is the older birds are more wary and suspicious, the adults, as far as my experience shows, being invariably shy. One must lie close and have all the immediate surroundings perfectly natural about the place of concealment in order to get them up to the decoys; and after many unsuccessful attempts to capture them one becomes imbued with the fact that the old birds

are well calculated, under ordinary circumstances, to avoid danger; they succumb only to those sportsmen who have served a long apprenticeship, and who have acquired a knowledge of their habits.

There is something very aristocratic in the bearing of the adult birds as you watch them standing on the marsh with their heads erect, their black and white plumage strikingly defined, and their large, dark, liquid eyes ever on the alert for danger. With the yellowish green marsh grass for a background, they make a most interesting study in black and white, which, coupled with that clear, penetrating note of alarm when danger is discovered, cannot fail to impress one. I have known the old birds in the spring fairly to scream with terror on suddenly perceiving my close proximity as I arose from my sunken hogshead to shoot at them.

To my old friend Mr. Augustus Denton I am indebted for a considerable share of the following notes, given me in 1877, which are for Cape Cod, Massachusetts, unless otherwise stated. I consider them especially serviceable in giving a very good idea of the spring migration of the Black-bellied Plover northward, as well as indicating their great regularity of movement.

1842, May 24, 25. — A great many birds having collected on Tuckernuck Island, Mass., three men shot one hundred and twenty on the former, and one hundred and fifty on the latter, date. These were noted records even in those days.

1843. — A great many birds on Tuckernuck Island in the spring; a great many were killed.

1858, May 28. — First birds shot.

1858, June 8. — Last birds shot. Aug. 6, shot a few birds.

1859 and 1860. — Practically the same as 1858 without August date.

1861, May 27. — First birds shot. None killed in June. Shot five between Oct. 1 and 27 at Marblehead Neck, Mass.

1862. — Very few birds.

1863, May 25. — First birds shot; good shooting until June 6.

1864, May 28. — First birds shot; good shooting until June 8. A few birds killed in August.

1865, May 26. — First birds shot; abundant until June 5. A fair amount of birds in August; shot 30 at Wellfleet, Cape Cod.

1866. — Only a few scattering birds this spring. Shot one Sept. 29 at Rockport, Mass.

1867, May 27. — First birds shot; most numerous between the 29th and 31st; good shooting until June 7.

1868, May 23. — First birds shot; numerous from the 27th to 30th, lasting until June 6.

1869, May 27. — First birds shot; birds very scarce. A few birds in August.

1870. — Law prohibiting spring shooting.

1871, May 17. — First birds shot, the earliest date I have ever shot these birds; abundant until June 5. Law prohibiting spring shooting repealed. Quite a number of birds in August.

1872, May 25. — First birds shot; continuous good shooting until June 8.

1873, May 19. — First birds shot; most numerous on 31st; last birds shot June 7.

1874, May 17. — First birds shot; best shooting May 29; no birds in June.

1875, May 14. — First birds shot; best shooting on 29th; last birds shot June 5. Sept. 24 shot six on Muskeget Island. Oct. 1, shot 24 young birds. Last bird killed on Cape Cod Oct. 20. Nov. 5, shot one on Nantucket Island.

1876, May 20. — First birds shot; best shooting on the 26th. Very few birds in June. From Oct. 5 to 21 shot a good many young birds.

1877, May 20. — First birds shot; best shooting May 28; birds about all gone June 1. Aug. 25 shot one bird on Nantucket Island; Sept. 26, shot three, Nantucket Island.

1878, Oct. 14. — Shot one, Nantucket.

1879, Aug. 28. — Shot six on Nantucket Island.

1880, Sept. 11. — Shot one, Nantucket.

1881, Aug. 11. — Saw seven, Nantucket.

1882, September 21. — Shot one, Nantucket; Sept. 27, shot one.

1884, Aug. 25. — Shot six, Nantucket.

1886, Sept. 1 and 5. — Shot one on each date, Nantucket.

1888, Aug. 19. — Shot one, Nantucket.

1889, Sept. 22. — Shot one, Nantucket.

1890, May. — More birds than for many years, in neighborhood of Tuckernuck Island. June 3, saw a flock of eighteen on Nantucket Island.

1891, May 27. — Shot four old birds on Nantucket; heard of several flocks seen. July 18, one bird seen, Essex, Mass., flying from the east. Aug. 16, saw four; shot one whose breast was nearly all black. Sept. 12, saw two birds; Sept. 13, saw one, Nantucket. Sept. 26, saw two young birds, Nantucket. Sept. 29, saw one young bird, Nantucket.

OUR SCOTERS.

BY G. TRUMBULL.

HAVING devoted a good deal of time to the study of these birds, I venture to call attention to numerous errors which have appeared, and to certain facts which have not appeared, concerning them. It is my intention, however, to devote the present article more particularly to the American Scoter, and to follow it at a later date with additional notes concerning the White-winged and Surf Scoters. The colors (in a marked degree transitory after death) of the bills, eyes, and feet, I have noted in each case within a very few minutes after the bird was shot.

It seems strange we should so long have neglected to familiarize ourselves more fully with the colors and certain other characteristics of these widely distributed and easily secured species. They present such exceptionally favorable opportunities for study, particularly along our sea coast, where in spring and fall men and boys slaughter them by hundreds and cripple them by thousands. They are also reached without much difficulty during the winter months, and a few, as is well known, tarry with us throughout the summer.*

AMERICAN SCOTER (*Oidemia americana*).

Though the inaccuracies of former descriptions, to which I would here point, are but indirectly connected with the plumage, perhaps I had better describe, with the exception of the well-known dress of the adult male, *all* the variations in this bird's appearance which I have myself noted. Indeed I do not see how I can well emphasize facts which should be emphasized, without being thus tiresome.

I have failed to witness most of the phases through which the male's bill passes while developing from the form of the female's into the swollen dimensions and brilliant coloring of the old

* Some of those which remain are probably of the superannuated and sterile class, but very many of them are convalescent or recovered survivors of the last shooting season, pensioners, as the gunners call them, which at the time of the vernal migration were in too crippled a condition to fly with their fellows.

drake's, and I am unfamiliar with other intermediate aspects between chickenhood and maturity. It is therefore among the possibilities that during some of these intermediate variations certain tints very different from those I have observed may be developed and retained for a time. Yet, after examining a large number of specimens in both spring and fall, I cannot believe that any of the statements which I quote from others as erroneous concerning this species (and *deglandi* and *perspicillata*) will ever be proved to be other than practically erroneous by any amount of additional material.

*Adult male.** — Bill, in front of nostrils and narrowly along the sides, pure black; the remainder, which includes the bulging part or hump, light lemon or canary yellow, richly dyed at the sides with scarlet vermilion, deeply at and near the nostrils, and lightly (the reddish glow becoming lighter and more yellowish) toward the base; this bright coloration meeting the black of both bill and plumage abruptly. Though the red color at the sides of the bill is never continued farther forward than the nostrils, the yellow — between the nostrils — is sometimes extended beyond them for an eighth of an inch, and in such specimens the black along the sides or edge of the bill is narrower. All the drakes that I have examined whose bills are thus more broadly brilliant are to some extent larger than the others, and represent, I imagine, the very highest degree of maturity. Again, in some of those specimens which I regard as less thoroughly developed, the yellow does not quite fill the space between the nostrils, but leaves at each side — at the edge of each nostril — a narrow line of black. Eyes deep brown. Feet dark brown shaded with black; webs black. It may be stated here once for all that the eyes of the males, old and young, as well as those of the females, are deep brown — the species differing in this respect from *deglandi* and *perspicillata*.

Adult female in spring.† — Plumage practically brown all over, but this color blackening here and there, particularly upon the upper parts, and paling to buff and sometimes, very narrowly, to a still lighter tint at the edges or ends of the feathers; the lower surface of the body a trifle lighter than the upper, and a trifle more grayish; the sides of the head below the eye, and the throat, continuously gray, or dull white faintly and minutely flecked with dusky brown; this gray part (referred to hereafter simply as the light part of the head) meeting rather abruptly the dark brown which extends over the upper part of the head and along the nape. Bill black or blackish, irregularly *marked with yellow*, this color often beginning on the culmen between, or a trifle in front of, the nostrils, and continuing patchily toward the base in two diverging streaks; in other specimens the yellow is almost or wholly confined to the sides of the bill, and runs back-

*Described from specimens killed April 18 and 19.

†Described from specimens killed April 12.

ward in a scratchy fashion from the nostrils. I have found this yellow marking — though varying greatly in extent and continuity — on the bills of all the females of this plumage which I have examined. I was inclined to believe these birds young males — the bill of the female having been always described as uniformly black or blackish — until they were opened and their sex was determined. Feet warm olive brown with blackish shading, or, to be more exact, olive brown shaded with black on the inner side (or side of tarsus and toes next the other foot), and almost solidly black on the outer side; webs also black.

*Young female in autumn.** — Light part of head considerably lighter, contrasting very strongly with the deep brown above, the throat almost evenly pale buff or dull whitish; the lower plumage considerably lighter than the upper parts and more gray, the lower surface of the body very pale, approaching whitish, and faintly spotted with the brown or grayish brown of the fore breast and posterior region. Feet as before; bill grayish black.

*Young male in autumn.** — Like young female just described, but somewhat more whitish and more spotty below; the bill showing no indication of its future hump.

Young female in spring. — Younger at least than the more uniformly brownish females to which the term 'adult' is attached, and more mature than those described under the heading 'Young female in autumn.' Lower surface of body with a great deal of white, and more boldly spotted, with deeper and less grayish brown than the younger (male and female) birds of autumn. Light part of head as in adult female. Bill uniformly blackish, or generally so, sometimes showing a very little of the older bird's yellow. I have noted the presence of this yellow on but two of these young females, and in each case it was as a hardly noticeable spot or speck above the nostrils. With these exceptions there was but little variation among a large number shot April 12.

The basal portion of the adult male's bill has been described as "orange," "entirely orange," "orange yellow," "bright orange (yellowish in the dried skin)," "yellow or orange," etc. It is not surprising that the term 'orange' should have been employed, as some of the color on the side of the hump is somewhat like the color of some oranges; but the most conspicuous part of the reddish color is too pure, too decided a red, to be so termed, and the chief, most noticeable color of the bill (the light yellow part) has not the least suggestion in it of an orange tint. So if we permit the term 'orange' (for this reddish color) to pass unchallenged, the bill is still yellow rather than orange, and most surely it is not "entirely orange," neither is it "orange yellow" nor "yellow

*Described from early October specimens.

or orange," but yellow *and* orange. It may be added that the reddish color becomes more orangey (and the light yellow above somewhat less pure) within a little time after the bird has been killed. I have myself used the term 'orange' for the red of this bill in a description which was written when none but stale specimens, or those which had been killed two or three days, were at hand.

One author describes "the swollen basal portion" as "red to beyond the nostrils," but as he makes no mention of the yellow, and as the red never does extend beyond the nostrils, his description cannot be regarded as happy.

Another says: "The male is noted for the gibbosity of pinkish-white near base of bill; the lower edge of the swelling is deep red, gradually blending with the black of the bill." There is no pinkish white on the bill, nor any "blending"—gradual or otherwise—of the red and black.

Another describes the feet as "greenish" simply, but there is not the least greenish or olive cast about the feet of the adult drake, and the feet of the female and young male are as brownish and blackish as they are greenish.

Audubon's account of the drake's beak, though better than others, is nevertheless unsatisfactory, for it gives the color of the "bulging part" as "bright orange, paler above," leaving the reader to suppose that the upper part though "paler" is also of an orange tint; and though in his original folio edition there is a show of pure yellow, the orange color is carried too far forward, appearing in front of the nostrils, where the bill is always black, and between the nostrils, where it is always pure yellow. In some of the octavo issues of Audubon (those of 1840-44 and 1871 at least) the plumage is much too highly glossed with blue or blue and purple. The upper parts of the adult drake are, to be sure, somewhat glossy, and the head, with a little of the neck, shows in certain lights a plum-colored iridescence, but in no case is this iridescence very noticeable.

Among the colored illustrations of two of our later ornithological works, the eye of the drake in one case is yellow, instead of deep brown as nature paints it, and in the other white, as in the adult drakes of *deglandi* and *perspicillata*.

Wilson's picture and description published in 1814 (before our American Scoter was separated from the European) were the

beginning of much of our confusion. In 'Fauna Boreali-Americana,' 1831, our bird is fully recognized as a distinct species, but Wilson's plate (which was certainly not colored from any specimens found in our country) is referred to as follows: "It is clear from an inspection of Wilson's plate, that the true *O. nigra* is also found in America, since the coloring he has given to the bill perfectly accords with the English specimens in the British Museum." This was a most natural conclusion, and when in 1834 Nuttall's 'Water Birds' appeared, it included both species as occurring along our coast, i. e. "Scoter Duck" (*nigra*) and "American Scoter Duck" (*americana*).

WHITE-WINGED SCOTER (*O. deglandi*) AND SURF SCOTER (*O. perspicillata*).

I place what I have to say about these two species — or about their descriptions — under a common headline for convenience in presenting some of my more fragmentary notes.

In Wilson's work, Vol. VIII, 1814, the male of *deglandi* (believed by all at that time to be identical with the European variety *O. fusca*) is represented as having the upper mandible black at base, "the rest red." Its bill has been referred to in our own half of the century also, as "black at base and lateral edges; red elsewhere." The writer of this last description probably got the idea of so uniform a red from Wilson, but where on earth did Wilson get it? Surely not from nature. Another writer has lately described *deglandi* in a fashion as original. He says: "Knob on bill black, rest of bill and legs orange." It will be observed that though this later author has chosen a less sanguinary hue than his predecessors, he has carried it considerably farther, continuing it over the legs as well as beak.*

*The colors of the bill and feet (of adult male *deglandi*) are in reality as follows:—

Upper mandible: immediately at base black, this black spreading forward over the elevated portion or knob and continued along the edges of the mandible, sometimes as far as the nail, and sometimes disappearing brokenly before reaching it; sides purplish red, or wine-purple, changing to orange next to the basal black; nail orange, but of a somewhat deeper tint; from nail to knob white; the middle of the bill, in other words, being broadly white from the nail to the black between the nostrils.

Lower mandible: with patch of orange (including nail) at end; back of the orange, white, this white meeting irregularly with basal black which is extended in a somewhat varying degree toward the gonys.

Feet: side of tarsus and toes, excepting inner toe, dull purplish pink or light wine-purple; the inner side (or side next to the other foot), with both sides of the inner toe, orange-vermilion; joints and other portions splashed with black; webs solidly black,

Another bit of Wilson's fallibility may be referred to in this connection. In his article on our White-wing (*deglandi*) which immediately follows his account of our Black Scoter (*americana*) he says: "This and the preceding are frequently confounded together as one and the same by our gunners on the seacoast. The former, however, differs in being of greater size; in having a broad band of white across the wing," etc. A clerical error, to be sure, but how indicative of the inexplicable tendency to misrepresent and confound our 'Coots.' I am wondering if in this very article I have myself made some such clerical or more blamable blunder. If I have, I shall most certainly be in good company, and shall have added new interest to an already amusing list.

Audubon describes the eyes of our White-wing as follows: male "bright yellow" (they are white); female "as in the male but of duller tint" (they are deep brown); and of the eyes of *perspicillata* (which are as in *deglandi*) he says: male "bright yellow-white"; female "as in the male." To be sure Audubon also wrote before *deglandi* was pronounced different from *fusca*, and he may have taken his colors from pictures or descriptions of European birds. I will not attempt, however, to say whether his colors are or are not like those of *fusca*. I have examined no European White-wings (fresh specimens I mean) and dare not trust the testimony of others concerning them; too many errors are being perpetuated by such copying. Scientists on the other side of the water may have failed to note the colors of life, and may have misrepresented their Scoters unwittingly, as we have misrepresented ours.

We all remember how Herbert (Frank Forester) mistook *deglandi* for a nondescript, and that some of the scientists were slow to recognize his mistake. I wonder if any one has ever observed that he (Herbert) was also unfortunate in using in his 'Field Sports' the specific character of *perspicillata* for *americana*. He quotes from Giraud's 'Birds of Long Island,' but unhappily copied from the wrong side of the leaf, — page 329 instead of 330.

While thus retrospective (and captiously inclined?) I very naturally recall that specimen of *deglandi* taken in Alaska, which for a time was referred to *fusca*, and that other distinction without a difference, the supposed variety of *perspicillata* — i.e., *trowbridgii*.

I have already referred to a work in which *americana* is represented with white eyes. The same work contains other evidence of carelessness. The writer informs us that *deglandi* is sometimes "found in company with the Velvet Scoter," a fact hardly worth publishing, as the Velvet Scoter (he is describing our own avifauna) and *deglandi* are one. He also tells us in his account of *perspicillata* that "it was common in summer to see males in the *bimaculata* plumage," but as this term *bimaculata* (the specific name given by Herbert to his supposed nondescript) can only be applied with any technical significance to the plumage of *deglandi*, we are left somewhat in doubt as to his meaning.

In another volume of late date we find the colors of the *perspicillata* male described as follows: "Bill mostly orange red, with a patch of black near the base of the upper mandible, bordered by orange and pale blue; lower mandible pinkish; legs and toes orange, webs dull green."* Perhaps I had better leave the reader to make his comparisons with my foot-note uninterruptedly, but I will add this much: I have examined most carefully numerous specimens in spring, autumn, and winter. I have never seen the least touch of blue on any of the bills (the nearest approach to it being the inconspicuous lavender tint at the root of the nail), neither have I found the least greenish cast on the webs, but the

*The colors referred to (of adult male *perspicillata*) are as follows:

Upper mandible: above at base, including nostrils, dull crimson (or pinkish-purplish crimson), this changed to flame-scarlet over the front of the mandible; nail cadmium-yellow, narrowly edged anteriorly with lighter yellow, and sometimes posteriorly with light lavender; side of mandible with large squarish patch of black at base, this separated from the black feathering above it by orange and from the feathering behind by a narrower edging of crimson; beneath this black patch, and in front of it as far as anterior edge of nostril, or thereabouts, continuously white, the remainder of the side (anterior to white portion), pure orange.

Lower mandible: nail like its fellow above; back of this for a short distance reddish flesh-color terminating irregularly in white, the white continued to the base, with more or less black on the naked skin between the rami.

Feet: outer side of tarsus and toes, excepting inner toe, crimson; the inner side (or side next the other foot) with both sides of the inner toe, orange-chrome deepened in part to orange-vermilion—a little of this color sometimes showing on the outer side of the middle toe; joints and other portions blotchily marked with black; webs solidly black.

Decidedly the most truthfully colored representation of this drake's bill which I have seen is that of Nelson in his 'Report upon Natural History Collections made in Alaska,' plate V. Whatever the faults in the picture, we can readily believe that it was colored, as he says, "from nature."

very conspicuous white of the upper mandible, which he does not even hint at, is discernible a gun-shot away.

I might also point to a modern work in which the bill of the *deglandi* female is painted blue; that of female *perspicillata*, sea-green; the eyes of both, yellow; and where in the text the eyes of the *deglandi* female are still "yellow," and those of female *perspicillata* "yellowish-white." How much prettier and more appropriate for the sex, this blue, green, and yellowish, than the dusky hues used by nature.

It is a pity, perhaps, ever to call attention in print to these mistakes, for if in some far off future the theory of evolution is as fascinating as it is today, what interesting changes might be shown among the Scoters.

HYBRIDISM, AND A DESCRIPTION OF A HYBRID BETWEEN *ANAS BOSCHAS* AND *ANAS AMERICANA*.

BY D. G. ELLIOT.

THE OCCURRENCE of hybridism among birds in a state of nature in certain groups is not infrequent, but it is generally believed that the individual hybrids are infertile, if not in the first certainly in the second generation. If this were not so, the evidences of the existence of these crosses would be exhibited in specimens killed, more often than has been the case up to the present time. Of course it will be readily understood that the probability of the continuance of the peculiarities shown by these hybrids under the most favorable circumstances, and allowing that they were fertile beyond the second generation, is not great, for they would be extinguished by interbreeding with pure-blooded birds in a comparatively brief period of time; otherwise in those families whose members migrate on the same lines of travel, and associate more or less together, there would exist the possibility of a mongrel race supplanting a pure species, and our scientific classification would be thrown into considerable

confusion thereby. By many persons, who have not appreciated the fact of this existence of hybridism, crosses arising from the interbreeding of distinct species have been described from time to time as new species, although to those more familiar with the subject the evidence of their descent, shown in their style of coloration, and often in the outline and structure of the bill, is manifested almost at a glance.

Among ornithologists, as a rule, there seems to have existed a strange reluctance to acknowledge this condition of hybridism, the reason for which would be very difficult to explain, save where in some instances it might conflict with preconceived opinions or theories entertained by various authors. One of the most, if not *the* most, remarkable conditions of hybridism known to us, is that produced by the crossing of *Colaptes cafer* and *C. auratus*, the offspring of which has been known in our literature as *C. hybridus*, and the evidence of which has been witnessed over a vast extent of North America; but even in this case it has not been ascertained that the hybrids have been fertile to any very great degree, although the information gathered would seem to foretell the gradual curtailment of the range of *C. cafer* as the dominant form, *C. auratus*, intrudes itself farther and farther upon its domain.

Perhaps the most numerous examples of intercrossing have been obtained from the families of the Phasianidæ and Anatidæ, and species of both of these are known to interbreed more or less readily under the conditions pertaining to domestication. But even under such circumstances, when the physical conditions of the birds have attained a most perfect development, and their passions have been excited by stimulating food to the highest degree, fertility rarely extends beyond the second generation among the hybrids breeding *inter se*. Prof. Newton (P. Z. S. 1860, p. 338) instances a case that came under his own observation, where a pair of hybrids, the result of a cross between *Anas boschas* and *Dafila acuta*, interbred, as he believed, near a pond in his park, and produced four young, two males and two females. During the next breeding season these birds were closely watched. His observations led him to regard them as infertile, and his belief was shown to be well founded, when he dissected them after death, proving that in this case ability to reproduce their kind did not extend to the second generation.

Among the species, so-called, described from hybrids I may mention *Fuligula ferinoides* Bartlett (P. Z. S. 1847, p. 48) and *F. homeyeri* Bäckeler (Naumannia, 1851, pp. 12-15). These were afterwards shown to be hybrids between *Fuligula ferina* and *F. nyroca*. An analogous example is now before me of a cross between *Aythya valisneria* and *Aythya collaris*. I exhibited this specimen with others at a meeting of the Zoölogical Society of London, and a poor figure is given of it in the P. Z. S. 1860, pl. clxvii. It is there erroneously called a cross between *A. americana* and *A. collaris*. Its great length of bill and extent and depth of coloring of the neck show the Canvas-back derivation and not the Redhead. *Anas breweri* (Audubon, B. of Am. Vol. VI, p. 252) is, again, an instance of crossing between *A. boschas* and *A. strepera*, and interbreeding has occurred so frequently in this family that M. de Sélys-Longchamps in 1856 (Bull. Acad. Roy. de Bruxelles, Tom. XXIII, No. 7) was able to record no less than forty-four different crosses among its members.

In the Phasianidæ, as in other families of gallinaceous birds, hybridism is often met with, and especially among certain of its species. Thus *Euplocamus lineatus*, found in Tenasserim, Pegu, and Siam, interbreeds with *E. horsfieldi*, a resident of Assam and neighboring provinces, and the two species pass completely one into the other in the province of Arakan. In like manner *E. albocristatus*, ranging in the northwest Himalayas as far as Nepal, interbreeds in the last province with *E. melanotus*, which is found in Sikkim and Butan. In the domestic and semi-domestic state, as observed in England, the offspring of two or three introduced species are fertile, but these are mongrel races, not strictly hybrids, and are perpetuated by the infusion of fresh blood.

When speaking of hybrids, this term is meant to define those individuals which are the direct offspring of two distinct species, each possessing in equal degree the blood of both parents. It is such creatures, which may be termed *complete hybrids*, that it is believed are not fertile beyond the second generation. But it is not yet, I believe, conclusively proved that such a complete hybrid may not be fertile when mated with a pure-blooded bird of one or the other of the species from which it descended, and their progeny, being three quarters pure

blood, may also be fertile; and these incomplete hybrids may thus transmit the characters of the separate stocks to which they owe their existence, through numerous generations, and spread over a wide extent of country, but it is the constant infusion of fresh blood that makes this fact possible, and not the ability of complete hybrids to produce offspring indefinitely, breeding *inter se*. Without the accession of pure blood constantly introduced into the hybrid stock, there appears to be no recorded evidence of the continued fertility of complete hybrids. Under this hypothesis an explanation is obtained of the occurrence of *Colaptes hybridus*, already mentioned, over an extent of country about one thousand miles in length with a varying width of from three to five hundred miles. (See Allen, Bull. Amer. Mus. Nat. Hist. IV, pp. 29-33.) The two species dwelling on either side of this tract encroach probably upon it to a certain degree, breeding with the incomplete hybrids within the borders, thus introducing a constant stream of fresh blood, and these incomplete hybrids breeding again, if even only through their first generation, would easily produce the almost limitless diversity of characters pertaining originally to the pure-blooded *C. auratus* and *C. cafer* which are met with throughout the district in which these crosses are mainly dispersed.

It has been urged as a proof of the unlimited fertility of hybrids, at all events among mammals, that the wild bison (*Bison americanus*) can be crossed with domestic cattle, and that their progeny is fertile. This, however, cannot be considered a proper criterion for the reason that domestic cattle are artificial breeds that either have never been wild, or, if the present generations of any of them can be traced back to a wild ancestor, it is only through such a lapse of time that their descendants are practically, if not completely, domesticated animals, and therefore through artificial selection have acquired the power of fertility. Their offspring are mongrels, *i. e.* offspring of varieties, not hybrids, which are offspring of species. The influences of domestication have dominated and superseded those pertaining to the animals in a state of nature, and it is hazardous to argue that, because wild animals crossed with those in captivity can produce offspring that are fertile and which transmit their power of fertility to their descendants indefinitely, two wild animals in a state of nature would be able

to accomplish similar results in their offspring. It is, of course, next to impossible to prove this fact among wild animals, but the fact that a strain of hybrids occupying a district to the exclusion of their parent stock, save in one or two very exceptional instances, has not been observed in a state of nature, would seem to be the best possible proof that a cause does exist which prevents complete hybrids from continuing to exist, and that they either die out from inability to reproduce, or else are swallowed up and extinguished through the interbreeding of incomplete hybrids and pure-blooded races, the influences exerted by the latter proving too powerful for the mixed races to overcome. In this fact lies the possibility, and the only one where two pure-blooded races are liable to cross, of the continuity of distinct species.

In this connection it may be suggested by some believer in complete hybrid fertility, that these individuals are the progenitors of new species, evolving new characters out of the mixed ones derived from their original sources. I do not think that there is any recorded evidence permitting the belief that such a view is anywise tenable.

Sterility in hybrids is caused by the disturbance in the reproductive organs arising from the union of two distinct forms, thus rendering them inoperative; or the continuance of the race is prevented by the early death of the embryo. (See Darwin, *Origin of Species*, 3d ed. p. 286.)

The principle of reversion also acts as a check to the continuation of hybrid and mongrel strains. Thus domesticated pigeons constantly show a tendency to revert to their parent stock, *Columba livia*, and fowls in the same way, to their original source, *Gallus ferrugineus*. Darwin relates an instance ('Animals and Plants under Domestication', 1868, Vol. I, p. 242) where he crossed a black Spanish cock with a white silk hen, and one of the progeny, a cock, closely resembled the wild *G. ferrugineus*. This was the more extraordinary as the black Spanish has been long known to breed true, and the silk hen, being of most ancient extraction, having been known previous to the year 1600, also breeds true. If left entirely to themselves, without the possibility of receiving any fresh blood, it is presumable that in course of time these hybrid and mongrel strains would breed back to their original stock, by means of this inherited tendency to reversion.

Comparatively few hybrids among the wild ducks of North America have been observed, and of those met with the majority have had either *Anas boschas* or *Anas obscura* for one of their parents, which would seem to show that the infidelity of these birds is the chief cause for the appearance of crosses. Beside the examples already cited, hybrids have been obtained from the interbreeding of the Muscovy (*Cairina moschata*) and the Black Duck, producing offspring of enormous size, which have been called *Anas maxima*, and the Mallard and Black Duck also cross in the wild state. It may not be surprising that salacious creatures like Ducks should cross when the species are in the habit of associating commonly together and have similar habits; but it is surprising to find hybrids of species whose habits are different, and which, as a rule, keep apart. Therefore I was not prepared to meet with a cross between a Mallard and an American Widgeon, which was killed out of a small bunch of Mallards on the grounds of the Narrow's Island Club in Currituck Sound, North Carolina, in January, 1892. The only other instances that I know of the interbreeding of Mallard and Widgeon is that recorded by Prof. Newton (P. Z. S. 1861, p. 392), but this was between the European birds in captivity, a male *Anas penelope* having mated with a female which was a cross between *Anas boschas* and an ordinary farmyard duck, or a mongrel. I do not recall, however, any other instances when a cross between Mallard and Widgeon has been obtained in the wild state. This bird in question is about the size of an ordinary drake Mallard, and is a male. The first point about it that arrests attention is the bill, which is similar in shape to that of the Widgeon, but about one fourth larger, and light blue in color, with a black nail on the point of the maxilla. The head and neck are brilliant emerald-green like the Mallard, with white dots on the lores and fore part of the cheeks, and a conspicuous buffy white line, the feathers tipped with black, broadest in its upper portion, and running from the ears down the neck. Front, and a line on top of head, blackish, with rusty tips to the feathers on top of the head. Mantle and wings crossed with fine irregular lines of black and buff, this last hue becoming pale buff on the apical half of the tertiaries. Greater, median, and lesser coverts, pale brownish gray, with a narrow white bar, succeeded by a narrow black one on the tips of the last row of the greater coverts. Secondaries

pale gray, with half of the outer web black edged with white. A brilliant, metallic, emerald-green speculum. Two innermost secondaries silvery gray without any black. Primaries blackish brown with rufous shafts save at their tips which are blackish brown like the webs. The inner webs along the shafts are silvery gray. Back and rump brownish-black, finely vermiculated with buff; on the rump a few black blotches, and feathers of lower part, extending over the tail, irregularly crossed with black and white.

Breast dark chestnut with numerous black spots in the centre forming a narrow line from base of the neck, and widening out in a fan shape towards the lower part of breast, where the chestnut color changes to a purplish shade and graduates into the buffy white of the lower parts. Feathers of flanks crossed irregularly with narrow black and white lines. Abdomen and vent whitish, indistinctly barred with fine blackish brown lines, and faintly blotched with buff. On each side of rump a conspicuous, large, white patch, some of the feathers faintly barred with black. Tail: median feathers velvety black, sharply graduated and extending beyond the other feathers about an inch. Lateral feathers grayish brown edged with white on outer webs and tips. Upper tail-coverts velvety black, edged on inner webs with buff. Under tail-coverts velvety black. Legs and feet dark yellow.

On comparing this hybrid with the parent species, the following resemblances are observed. It approaches the Widgeon in the shape and color of its bill, in the buff markings on the side of the head, in the vermiculation of the upper parts, and color of back and rump; also in the coloring of the secondaries, in the purplish hue of the lower breast, in the upper tail-coverts with their peculiar buff edging on the inner webs, and in the shape of the pointed, lengthened tail. It resembles the Mallard in the green head and neck, in the chestnut of the breast, in the slight tendency to curl of the tips of the median feathers, and in its large size. It resembles neither species in the coloration of the wing-coverts, the speculum, the flank feathers, the under part of the body, and the legs and feet.

The specimen is in the collection of the American Museum of Natural History, New York City.

DESCRIPTION OF A NEW TURKEY.

BY GEORGE B. SENNETT.

IN 1879, in the 'Bulletin of the United States Geological Survey', Vol. V, No. 3, p. 428, I called attention to the probable distinctness of the Turkey found on the lower Rio Grande in Texas, but hesitated to characterize it for lack of specimens. Since that time I have obtained a fair series of both sexes which convinces me that the bird of this region represents a well-marked subspecies. I propose to call it

Meleagris gallopavo ellioti.

RIO GRANDE TURKEY.

Similar in coloration to *M. gallopavo* in its neck, mantle, upper wing-coverts and breast, but differing in having the back and rump jet black; in certain lights all the feathers show a subapical silvery gray bar of about half an inch in width, with slight rosy reflections, and a narrow line of the same hue on the extreme tip. Feathers of lower back extending over the tail also black with a metallic coppery bronze subapical bar, and broadly tipped with dark ochraceous buff. Upper tail-coverts, save the lower series, chestnut with irregular narrow black cross lines, succeeded by a broad black bar, widest in its central portion, with metallic coppery bronze reflections, and broadly tipped with dark ochraceous buff. The lowest series of upper tail-coverts is also deep chestnut, irregularly crossed with black and tipped with ochraceous buff and without a vestige of the subapical black bar so conspicuous in the other feathers. Tail mottled with pale chestnut and black, taking the form of irregular bars on the lateral feathers, with a subapical black band, and tipped with ochraceous buff. Under tail-coverts black, with metallic green, bronze, and red reflections, and broadly tipped with dark ochraceous buff.

The young male resembles the adult, except in having breast and under parts, flanks, back, and rump, conspicuously tipped with ochraceous buff.

The adult female is black with the iridescent hues seen in the male on back, wings, and under surface. All the feathers of the upper surface have black subapical bars, and the tips grayish, becoming broader on the lower back and rump, while the feathers of the under surface have pale buff tips. The tips of the upper tail-coverts are ochraceous, but paler than in the male, while the under tail-coverts closely resemble those of the male. The tail also resembles that of the male, but with paler tips.

Types: adult ♂, No. 569, my collection, Lomita Ranch, Hidalgo Co., Texas, April 13, 1878; adult ♀, No. 5533, my collection, Cameron Co., Texas, March. 6, 1888.

The range or habitat of this race, so far as known at the present time, is restricted to the lowlands of eastern Mexico and southern Texas. It will probably not be found south of Vera Cruz, nor is it likely to be met with to the north beyond the Brazos River of Texas, its range being thus restricted within about ten degrees of latitude. Wherever timber and food are in abundance we find this new form common to the coast and lowlands, and we could not expect to find it at an altitude exceeding 2000 feet above sea-level; while the variety *mexicana* is found only at the higher altitudes from 3000 to 10,000 feet above the sea.

So far as the wild state of the country embraced in the habitat of *M. g. ellioti* allows us to judge, there is no sign of its intergrading with any other form. All the specimens that have come under my observation are remarkably alike, and when compared with the other races show a decidedly marked contrast.

The material on which I base my description is as follows:— Three fine adult males: first, the type taken at Lomita Ranch on the Rio Grande, by myself, on April 13, 1878; second, one taken by my collector, John M. Priour, at Victoria in the State of Tamaulipas, Mexico, April 22, 1888; and third, one taken by F. M. Chapman on the Nueces River, not far from Corpus Christi, Texas, in the latter part of April, 1891. Also two young males taken by my collector, M. A. Frazar, at Lomita Ranch, Hidalgo Co., Texas, Jan. 16, 1881; two adult females, and parts of a dozen other birds which, taken together, show the characters of the race.

In comparing with the other forms, I have access to the figure of the type of *Meleagris mexicana* Gould, in Elliot's 'Birds of North America', Vol. II, pl. 38, exhibiting the bird half its natural size; also to two fine adult females of *M. g. mexicana* in the American Museum of Natural History, New York, which were collected by Dr. Mearns in the high altitudes of Arizona; and of the eastern form several truly typical specimens which are in the mounted collection of the American Museum.

M. g. ellioti can be distinguished from the other forms by its dark buff edgings on tail and upper and lower tail-coverts, in

contrast with the white color on the same parts of *mexicana*, and the deep, dark, reddish chestnut of the same parts in *M. gallopavo*, the eastern United States bird. The lower back is a deep blue black and is wanting in those brilliant metallic tints so prevalent in the eastern bird and in the type of *mexicana*. The primaries of the wing are black with white bars in contrast with *M. gallopavo* the primaries of which are white with black bars; in this respect the new race more nearly resembles *M. g. mexicana*, and approaches *M. g. osceola* of Florida described by Scott, which has narrow, white bars on the primaries. The adult female is darker than that of the other races, and the decided dark ochraceous buff edgings will separate it from the white of *mexicana* and from the dark reddish chestnut of *M. gallopavo*. In the young of both sexes the edgings of all the feathers are paler or lighter than those of the adults, but in all cases the buff is present, while in the other races the edgings are either red or white.

It gives me pleasure to name this new Turkey after my friend, Mr. D. G. Elliot, who, both in his published works and in field study has, in a greater degree than any other ornithologist, made a specialty of the game birds of America.

THE DWARF SCREECH OWL (*MEGASCOPS
FLAMMEOLUS IDAHOENSIS* MERRIAM).

BY DR. C. HART MERRIAM.

(Plate II.)

IN STUDYING the bird life of a limited area in the summer season it is usually possible to secure specimens of most of the diurnal species. Not so, however, with the Owls, and the difficulty increases inversely with the size, and is greatly augmented in the case of species that spend the day in holes in trees. As a rule these species are obtained by chance. Who has not heard small Owls about his camp fire at night for weeks, or even

months, without securing a single individual? Perhaps the most difficult kinds to get are the Pigmy, Saw-whet, and Flammulated.

In the summer of 1889 the writer and Mr. Vernon Bailey spent two months in the San Francisco Mountain region in Arizona. Our base camp was at Little Spring among the pines at the north foot of the mountain, and though small Owls were frequently heard at night, we were unable to obtain them. Dr. Mearns, who chanced to pass this same spring during a hurried military trip, had the good fortune to see a Saw-whet at the mouth of a Flicker's hole in a tall pine stump. He killed the bird, which "proved to be the parent of three young and an egg" (Auk, VII, 1890, p. 54). An equally accidental capture was that of the rare Flammulated Screech Owl shot by me at three o'clock in the morning while climbing out of the Grand Cañon of the Colorado by moonlight, Sept. 13, 1889. (N. Am. Fauna, No. 3, Sept., 1890, p. 91.) A third instance of the same kind was the chance capture, in the mountains of central Idaho, of the new Dwarf Screech Owl which is the subject of the present article. It was killed in a low pine tree on a mountain on the west side of Big Wood River, a few miles north of the town of Ketchum, Idaho, September 22, 1890.

The type of *Megascops flammeolus* came from Mexico, and for many years the species was known only from central Mexico and Central America; and it is probable that the type locality of the Idaho form is separated from that of *flammeolus* by about two thousand miles. The southern bird is larger and very much darker than the northern. The latter may be distinguished by the following description:—

"Similar to *M. flammeolus*, but smaller and paler. Wing, 125 mm.; tail, 62 mm. (measured from insertion of middle feathers). The back is only slightly paler than in *flammeolus*; the under parts are very much paler, the ground color being white and the vermiculations distant; the black markings are everywhere restricted. The facial ring is bright tawny ochraceous, and spreads out above so as completely to encircle the eyes; the cheeks are ash-gray, and the chin white. The dusky spots in the facial ring are inconspicuous; in true *flammeolus* they are strongly developed, sometimes forming a black ring which is merely tinged with tawny. The black spots on the

side are very much reduced in size, and seem to be arranged in a single row."

"Type, No. 119,654, ♂, ad., U. S. National Museum (Department of Agriculture collection). From Ketchum, Idaho, September 22, 1890. Collected by C. Hart Merriam and Vernon Bailey." (*N. Am. Fauna*, No. 5, Aug., 1891, p. 96).

The type specimen still remains unique. The accompanying colored plate is the work of Mr. John L. Ridgway.

RECENT LITERATURE.

Packard's 'The Labrador Coast.*'—The first twenty pages are devoted to a sketch of the physical geography of Labrador, followed by about forty pages of historical matter, devoted largely to a discussion of the early discovery of the country by the Norsemen. Chapter V, 'One of Fifty Days in Southern Labrador,' gives a general view of the country as seen from the standpoint of the naturalist. The next hundred pages are somewhat in the nature of an itinerary of two summer cruises along the coast, with descriptions of the scenery, and notes on the geology, and the various forms of animal and vegetable life met with. Then follow chapters on recent explorations, on the civil history of Labrador and its fisheries, and on the Labrador Eskimo. The four concluding chapters are devoted respectively to a systematic account of the zoölogy and botany of the Labrador Coast, and an extended bibliography of works and papers relating to Labrador (pp. 475-501). The list of plants is by Prof. John Macoun, Naturalist of the Department of the Interior, Canada. The list of birds is by Mr. Lucien M. Turner, reprinted from the Proceedings of the U. S. National Museum (1885, pp. 233-254), "revised and brought down to 1891, by J. A. Allen."

The work is, in the main, a collection of previously published papers and memoirs, here brought together and revised, forming a valuable manual of our present knowledge of the Labrador coast. The narrative portions are entertainingly written, and contain passing references to the various species of birds met with.—J. A. A.

*The Labrador Coast. | A | Journal of two Summer Cruises | to that Region. | With Notes on its Early Discovery, on the Eskimo, | on its Physical Geography, Geology | and Natural History, | By | Alpheus Spring Packard, M. D., Ph. D., | . . . [etc.= 2 lines of titles]. | — | With Maps and Illustrations. | — | New York: N. D. C. Hodges, Publisher, | 47 Lafayette Place. | London: Kegan Paul, Trench, Trübner & Co. | 1891.—8vo, pp. 7 + 513.

Lucas on the Osteology of the Paridæ, Sitta, and Chamæa.* — In this paper Mr. Lucas passes in review the principal osteological characters of these groups. The genera *Parus*, *Auriparus*, *Ægithalus*, and *Psaltriparus*, differ much from each other in cranial characters, and form a group much less homogeneous than the Swallows, Wrens, or Thrushes. *Sitta* differs so much from any of the Titmice that it seems proper to place it in a separate family from the *Paridæ*. *Chamæa*, as previously pointed out by Dr. Shufeldt (see *Auk*, VII, p. 278), appears to find its nearest relative in *Psaltriparus*, and not with the Wrens, as Mr. Lucas was formerly inclined to believe (see *Auk*, VII, p. 277). "It appears, then," says Mr. Lucas, "that in its cranial characters *Chamæa* is much like *Psaltriparus*, while the shoulder girdle is slightly, and the pelvic girdle decidedly, Wren-like. . . . On the other hand, none of the characters shown in the skeleton of *Chamæa* seems sufficient to warrant placing the genus either with the Wrens or Tits, but rather bear out the intermediate position indicated in the name Wren-tit." — J. A. A.

Lucas on the Structure of the Tongue in Hummingbirds.† — The tongue of the Hummingbird has generally been supposed to be tubular, but Mr. Lucas shows that this is not so, in a strict sense. Towards the tip "the tongue becomes forked, each division being a rod bordered by a wide flange of thin membrane," which curls upward and inward, so that toward the apex two very delicate parallel tubes are formed. The tubular part, however, "exists only for a short distance towards the anterior end, so that the common statement that the tongue of the Hummingbird consists of two parallel muscular tubes is quite erroneous." The width of the bordering membranes is found to vary in different genera. "Certainly there can be no sucking in the proper meaning of the word, since no vacuum can be formed at the back of the tongue, and liquids probably pass through the tubular portion by capillary attraction." A plate and figures in the text aid in giving a very clear idea of this peculiar mechanism. — J. A. A.

Lucas on the Bird Skeletons Collected by the U. S. Fish Commission Steamer 'Albatross.'‡ — These skeletons represent 33 species, mostly water birds, including *Creagrus furcatus*. A few notes are given on the osteology of the four species of Cormorants collected. — J. A. A.

*Notes on the Osteology of the Paridæ, Sitta, and Chamæa. By Frederic A. Lucas. Proc. U. S. Nat. Mus., XIII, 1890, pp. 337-345, pl. xxvii.

†On the Structure of the Tongue in Hummingbirds. By Frederic A. Lucas. Proc. U. S. Nat. Mus., XIV, 1891, pp. 167-172, pl. iv.

‡Scientific Results of Explorations by the U. S. Fish Commission Steamer Albatross. XIII. Catalogue of Skeletons of Birds Collected at the Abrolhos Islands, Brazil, the Straits of Magellan, and the Galapagos Islands, in 1887-88. By Frederic A. Lucas. Proc. U. S. Nat. Mus., XIII, 1890, pp. 127-130.

Cherrie on Costa Rican Birds. — In two recent papers Mr. Cherrie has made known some of the more important results of his recent work on Costa Rican birds. The first* contains descriptions of two new genera, eight new species, and one new subspecies, as follows: (1) *Lophotriccus squammicristatus minor*, (2) *L. zeledoni*. (3) *Pachyrhamphus ornatus*, (4) *Deconychura* (gen. nov.) *typica*, (5) *Premnoplex* (gen. nov., type *Margornis brunnesceus* Lawr.), (6) *Vireo superciliaris* (Ridgw. MS.), (7) *Basileuterus salvini*, (8) *Grallaria lizanoi*, (9) *Myrmiceza intermedia*. There are notes also on *Basileuterus delatreei*, restricting the name to the Costa Rican form, and renaming the Guatemalan form *B. salvini*, as above. The Atlantic and Pacific forms of *Arremon aurantirostris* are found to present slight differences, and in view of their probably proving separable the name *Arremon aurantirostris saturatus* is suggested for the dark-colored bird of the Atlantic slope.

In the second paper,† which is really a continuation of the first, being based on the same collection, contains an annotated list of 55 species, and is a paper of much interest and importance. The annotations are often based on large series of specimens, and relate to individual, seasonal, or other variations, with often extended tables of measurements, and critical remarks on the affinities and nomenclature of the species treated. *Dendroornis lawrencei* Ridgw. is considered a synonym of *D. nana* Lawr., as first shown by Mr. Elliot (Auk, VII, p. 174) and now conceded by Mr. Ridgway. The *D. lawrencei costaricensis* Ridgw. hence now becomes *D. nana costaricensis*. *Picolaptes gracilis* is also referred to *P. compressus*, of which measurements are given of 33 specimens. — J. A. A.

Shufeldt on the Osteology of Arctic and Sub-Arctic Water Birds.‡ — Since noticing this series of papers (Auk, VI, p. 333) Parts V to IX, have appeared, treating of the Puffins (Pt. V), Loons and Grebes (Pt. VI), Gulls and Jaegers (Pts. VII and VIII), and *Chionis* (Pt. IX). These Parts are illustrated by 43 cuts in the text and 7 beautifully executed plates, illustrating in detail the osteology of the various species treated. In respect to the Alcidæ, Dr. Shufeldt's conclusions bear out the arrangement of the minor subdivisions adopted in the A. O. U. Check-list, though written we are informed, before the publication of that work, except that in his opinion the positions of the genera *Uria* and *Plautus* should be transposed, *Uria* being more nearly related to the Gulls than either *Alca* or *Plautus*.

The Loons and Grebes are believed to be more closely related to each

*Description of New Genera, Species, and Subspecies of Birds from Costa Rica. By George K. Cherrie, Taxidermist and Ornithologist of the Costa Rica National Museum. Proc. U. S. Nat. Mus., XIV, 1891, pp. 337-346.

†Notes on Costa Rican Birds. Ibid., pp. 517-537.

‡Contributions to the Comparative Osteology of Arctic and Sub-Arctic Water-birds. Parts V-IX. By R. W. Shufeldt, M. D., C. M. Z. S., etc. Journ. Anat. and Phys., XXIV, 1890, pp. 89-116, pl. vi-viii, pp. 169-187, pl. xi, xii, pp. 543-566, pl. xxv, 1891, pp. 60-77, 509-525, pl. xi, xii.

other than are the former to the Auks; in fact, so far as the skeleton goes, the Loons are ten times more nearly related to the Grebes than they are to any other group. Dr. Shufeldt would arrange the Grebes, Loons, and Auks in two 'suborders,' as follows: (1) Pygopodes, with two superfamilies — (a) Podicipedes, containing the Grebes, and (b) Cepphi, for the Loons; (2) Alcæ, with the following four families — Fraterculidæ, Phalaridæ, Alcidæ, and Allidæ. *Uria* is the Alcadine form most nearly allied to the Gulls.

The Sheathbills (*Chionis*) are considered as forming one of the links between the Gulls and Plovers, having, however, their nearest living allies in *Hæmatopus* and *Glareola*, though also retaining characters remotely allying them with the Columbo-gallinaceous group. — J. A. A.

Shufeldt on the Osteology and Classification of the North American Pigeons, Woodpeckers, and Kites. — In recent papers Dr. Shufeldt has discussed the classification of Pigeons, Kites, and Woodpeckers, from the standpoint of their osteological structure. The North American Pigeons* he considers as constituting two subfamilies, Columbinæ, containing all of the genera except *Starnænas*, and Starnænadinæ, consisting of the single genus *Starnænas*.

The North American Kites † he refers to a family Milvidæ, with four subfamilies — Ictiniinæ, Elanoidinæ, Elaninæ, and Rostrhaminæ, the latter adopted provisionally, the osteology of this form not having been examined. Our Kites are found to differ "most markedly among themselves" in their osteological characters. *Elanoides* is found to share important skeletal characters with so distantly related a form as *Pandion*.

The Woodpeckers ‡ are considered primarily in reference to their alleged saurognathism, of which he finds little evidence, to which is added a 'Summary of the Chief Osteological Characters of the North American Pici.' The Woodpeckers are held, in accordance with the views of most recent writers, to be a group coördinate in value with the Pigeons or the Parrots, and that they are more nearly allied to the Passeres "than to any other existing suborder of birds." — J. A. A.

Ridgway on New or Little-known Central American and South American Birds. — Mr. Ridgway has recently described a new Whippoorwill from Costa Rica§ under the name *Antrostomus rufomaculatus*, resembling *A. vociferus* in size and proportions, but more similar in coloration to

*On the Comparative Osteology of the United States Columbidae. Proc. Zool. Soc. 1891, pp. 194-196. (2) Notes on the Classification of the Pigeons. Am. Nat., Feb. 1891, pp. 157, 158.

†Some Comparative Osteological Notes on the North American Kites. The Ibis April, 1891, pp. 228-232.

‡On the Question of Saurognathism of the Pici, and other Osteological Notes upon that Group. Proc. Zool. Soc., 1891, pp. 122-129.

§Description of a New Species of Whippoorwill from Costa Rica. By R. Ridgway. Proc. U. S. Nat. Mus., XIV, 1891, pp. 465, 466.

A. sericeocaudatus. It is based on a specimen from Volcan de Irazir, collected by Señor Anastacio Alfaro, director of the Costa Rica National Museum.

In a short notice of a collection of birds from the interior of Honduras,* Mr. Ridgway has described two new subspecies (*Platyptaris aglaie hypophæus* and *Pithys bicolor olivaceus*), and the female and young male of *Gymnocichla chiroleuca* Scl. and Salv., and a young male of *Grallaria guatemalensis* Prév., previously undescribed. He also records 13 other species as of interest on account of the locality. He has also described as new *Thamnophilus albicrissa* and *T. trinitatis* from Trinidad,† and published remarks on *Xiphocolaptes procurvus* Cab., and *X. albicollis* Licht.,‡ and on *Pachyrhamphus albinucha* Burm.,§ which he makes the type of a new genus *Xenopsaris*. In a paper on Costa Rican birds,|| he has given notes on 10 species, including two described as new (*Platyptaris aglaie obscurus* and *Scytalopus argentifrons*). *Picolaptes gracilis* Ridgw. is thought to have been based on a young example of *P. compressus*.

He has also reviewed the genus *Sittasomus*,¶ of which he recognizes seven species, two of which (*S. chapadensis* and *S. æquatorialis*) are described as new. This is an addition of four to the three recently admitted by Dr. Sclater (Cat. Bds. Brit. Mus., Vol. XV, 1890). Mr. Ridgway's review is based on a series of 44 specimens, including the types of *S. olivaceus* Wied and *S. amazonus* Lafr.

Two other recent papers by the same author relate to North American birds, one of them treating of *Porzana jamaicensis coturniculus* Baird,** which he finds is closely related to *P. spilonota* of the Galapagos Islands. He proposes to recognize it provisionally as a distinct species, under the name *Porzana coturniculus*. The original type of the species remains unique. (Cf. Auk, IX, p. 108.) The other paper describes a new Sharp-tailed Sparrow from California,†† under the name *Ammodramus caudatus becki*, based on a single specimen from Santa Clara County. (Cf. Auk, IX, p. 108.)—J. A. A.

Ridgway and Bendire's Directions for Collecting and Preparing Birds and their Eggs and Nests.—In twenty-seven pages of Bulletin No. 39 of

*Notes on Some Birds from the Interior of Honduras. Proc. U. S. Nat. Mus., XIV, pp. 467-471.

† Description of Two Supposed New Forms of *Thamnophilus*. *Ibid.*, p. 481.

‡ Further Notes on the Genus *Xiphocolaptes* of Lesson. *Ibid.*, XIII, pp. 47, 48.

§ Note on *Pachyrhamphus albinucha*, Burmeister. *Ibid.*, XIV, pp. 479, 480.

|| Notes on Some Costa Rican Birds. *Ibid.*, XIV, pp. 473-478.

¶ Notes on the Genus *Sittasomus* of Swainson. *Ibid.*, pp. 507-510.

** Observations on the Farallon Rail (*Porzana jamaicensis coturniculus* Baird). *Ibid.*, XIII, pp. 309-311.

†† Description of a New Sharp-tailed Sparrow from California. *Ibid.*, XIV, pp. 483, 484.

the United States National Museum Mr. Ridgway* gives very full and explicit directions for collecting birds for scientific purposes, under the following subheadings: (1) 'General Remarks,' (2) 'Outfit for Collecting,' (3) 'Procuring Specimens,' (4) 'Preparing and Preserving Specimens,' (5) 'Packing Specimens for Shipment,' and (6) 'Records.'

Captain Bendire, in a paper of ten pages† gives similar directions for collecting, preparing, and preserving birds' eggs, and nests. Both papers are illustrated with cuts of implements to be employed, etc., and having been prepared by experts of long experience may be relied upon as being in the highest degree trustworthy.—J. A. A.

Stejneger on a Collection of Birds from Japan.‡—In a paper of about ten pages Dr. Stejneger gives notes on a first instalment of birds from the Science College Museum of Tokyo, Japan, sent him for examination. Of some thirty-five species here annotated several prove to be additions to the Japanese avifauna. Among these is *Bulweria bulweri*, *Falco pealei*, *Emberiza leucocephala*, and *E. pusilla*. Important critical notes occur in relation to the species of *Phaëton* and *Cuculus*.—J. A. A.

Stejneger on the Cubital Coverts in the Birds of Paradise and Bower Birds.§—This paper is apropos of Mr. Goodchild's paper on 'The Cubital Coverts of the Euornithæ in Relation to Taxonomy' (Proc. Roy. Phys. Soc. Edinb., X, pp. 317-333, pl. xv). Dr. Stejneger finds that the arrangement of the cubital coverts in these birds conforms to that in the other Passeres, instead of to that of the Cypseliformes, as claimed by Mr. Goodchild. Dr. Stejneger's examinations thus tend rather to strengthen Mr. Goodchild's estimate of the considerable value of the arrangement of the cubital coverts in birds as a taxonomic character.—J. A. A.

Stone on the Birds of Harvey's Lake, Luzerne County, Pennsylvania.|| Mr. Stone gives an annotated list of 54 species observed June 15-20, 1891, prefaced by an account of the position and general character of the region in question, and remarks on its faunal relations. It is 'situated

*Directions for Collecting Birds. By Robert Ridgway. Part A of the Bulletin of the United States National Museum, No. 39. 1891. 8vo. pp. 27.

†Directions for Collecting, Preparing, and Preserving Birds' Eggs and Nests. By Charles E. Bendire, Part D of Bulletin of the United States National Museum, No. 39. 1891. 8vo. pp. 10.

‡Notes on Japanese Birds contained in the Science College Museum, Imperial University, Tokyo, Japan. By Leonhard Stejneger. Proc. U. S. Nat. Mus. XIV, 1891, pp. 489-498.

§ Notes on the Cubital Coverts in the Birds of Paradise and Bower Birds. *Ibid.*, pp. 499, 500.

|| The Summer Birds of Harvey's Lake, Luzerne Co., Pennsylvania, with Remarks on the Faunal Position of the Region. By Witmer Stone. Proc. Acad. Nat. Sci. Phila. 1891, pp. 431-438.

in what is known as the Alleghanian faunal belt, with a strong tinge of the Canadian fauna in the deep forests, and a slight Carolinian element in the lower clearings." The elevation of the lake is 1250 feet above sea-level, while the mountains around it rise 100 to 150 feet higher. With Mr. Dwight's paper on 'The Summer Birds of the Crest of the Pennsylvania Alleghanies,' published in the present number of 'The Auk,' and the various other recent contributions to the same subject, the bird fauna of the Alleghanian region, from Pennsylvania southward, bids fair to become soon well known. — J. A. A.

Allen on the North American Colaptes.* — As there are doubtless many readers of 'The Auk' who will not be so fortunate as to see this paper, it seems desirable on account of its great interest and importance to present a brief summary of its contents.

After mentioning the sources of the material (785 specimens) on which his study of this group is based, and referring to the several theories that have been suggested as to the relationships between *C. auratus* and *C. cafer*, the author proceeds to state the distinctive characters and geographical distribution of each member of the genus that is found north of Panama. The distribution is well illustrated by a map.

C. mexicanoides of Guatemala is essentially *C. cafer* with the coloration intensified, the black dorsal bars broadened, rump spotted with black, entire top of head and nape rufous, quills and malar stripe a deeper, darker red. Its habitat very probably reaches to that of *C. cafer* which species is found from the southern border of Mexico northward throughout Mexico, excepting western Sonora and Lower California, and from the eastern base of the Rocky Mountains to the Pacific north to British Columbia. "*C. rufipileus*, from Guadalupe Island, off Lower California, is an insular form of *cafer*, differing . . . mainly in smaller size, much longer bill, and rather deeper colors, in this latter respect rather more resembling *C. cafer saturatior* of the Northwest Coast," which differs from *cafer* "in slightly larger size and much deeper colors."

C. chrysoides ranges through most of Lower California and parts of Sonora, southern Arizona, and southeastern California. "To the northward and eastward its habitat thus reaches, and at some points (at least in winter) overlaps, that of *C. cafer*, with which, however, it appears never to blend." It is "a small, pale form presenting the general appearance of *mexicanoides*," but having the quills golden as in *auratus*, though possessing no other of the distinctive characters of the Eastern form.

"*C. auratus* while ranging over the northern and eastern three fourths of the continent of North America, has also two outlying insular forms,

*The North American Species of the Genus *Colaptes*, considered with Special Reference to the Relationships of *C. auratus* and *C. cafer*. By J. A. Allen. Bulletin American Museum of Natural History, New York, Vol. IV, No. 1, Article 11, pp. 21-44, map. Author's edition published March 8, 1892.

C. chrysocaulosus of Cuba, and *C. gundlachi* of Grand Cayman, both evidently offshoots from the *auratus* stock, modified by environment, and differing from *auratus* somewhat as *mexicanoides* differs from *cafer*."

Of the three groups into which these forms may be classed, (1) *cafer-mexicanoides*, (2) *chrysoides*, and (3) *auratus*, "the first and the last, so far as features of coloration are concerned are the most unlike, having no special characters in common, and yet it is these two, *cafer* and *auratus*, which, as shown by the material now in hand, thoroughly intergrade wherever their habitats meet, that is, over a belt of country from 300 to 400 miles wide, and some 1200 to 1500 miles long. They are also more or less mixed from the eastern border of the Great Plains westward to the Pacific Coast, from about the latitude of 38° northward to about latitude 55°." The intermediates between the two vary "from individuals of *C. auratus* presenting only the slightest traces of *C. cafer*," or vice versa, "to birds in which the characters of the two are about equally blended. Thus we may have *C. auratus* with merely a few red feathers in the black malar stripe, or with the quills merely slightly flushed with orange, or *C. cafer* with either a few black feathers in the red malar stripe or a few red feathers at the side of the nape, or an incipient barely traceable scarlet nuchal crescent." Where the mixture of characters is more complete, an unsymmetrical combination is the rule. The quills of wings or tail may be some red and others yellow; "a bird may have the general coloration of true *cafer* combined with a well developed nuchal crescent, or nearly pure *auratus* with the red malar stripes of *cafer*"; sometimes the body plumage is of one form, the head of the other. In short there are "almost endless variations, it being rare to find, even in birds from the same nest, two individuals alike in all their features of coloration."

East of the Mississippi, with rare exceptions, the *cafer* characters outcropping in *auratus* are confined to traces of red in the malar stripe which are to be seen in "perhaps one male in a thousand (or more probably a still smaller proportion)." This occurs about equally throughout this area, "quite as frequently along the Atlantic seaboard as at any point east of the Mississippi River." Nearly pure *auratus* probably "prevails westward to the eastern border of Texas, Indian Territory, Kansas and Nebraska, and over the greater part of both Dakotas and Manitoba." Throughout the Plains mixed birds are the rule, though in winter in the more southern portions there is some influx of both *auratus* and *cafer*. From central Colorado and western Texas to Nevada and southern California nearly pure *cafer* prevails in the breeding season, though mixed birds are not uncommon in winter. From Wyoming and Montana west to the Cascades the mixed birds occur with but few exceptions, while from Puget Sound southward to central California are found mixed birds together with nearly pure representatives of both *cafer* and *auratus*.

All this array of evidence, to which scant justice can be done here, but which Mr. Allen has marshalled so admirably, leads him to re-affirm the hypothesis, originally suggested by Baird, "of hybridization on a grand

scale between *Colaptes auratus* and *C. cafer*." This conclusion seems inevitable, for, while the transition between geographic races is apt to be gradual and symmetrical, what we have here is quite the reverse, an utterly irregular intergradation with, at the same time, all sorts of asymmetrical combinations of the characters of the two birds.

Mr. Allen has investigated also the geographical, individual and seasonal variation among the Flickers, with interesting results. Geographical variation in size amounts in *C. auratus* to about 10 per cent in the length of wing between Arctic America and southern Florida, while the West Indian forms are even smaller. The difference between *C. c. saturator* and *C. rufipileus* is nearly parallel to this, but in *C. cafer* itself the variation is less uniform with latitude, being perhaps complicated, Mr. Allen suggests, by opposing effects of altitude. *C. chrysoides* shows hardly any difference in size geographically. In the Florida *auratus*, though it is smaller and darker than the northern bird, the average difference "proves too slight and too inconstant, in either size or color, to make a separation practicable."

Individual variation is considerable, both in size and in color. The bill varies in length from 15 to 25 per cent, the wing from 8 to 12, the tail from 12 to 18. In color the variation "affects (1) the size and shape of the circular black spots on the lower plumage, (2) the width and number of the dusky crossbars of the upper plumage, (3) the size and form of the malar stripe, (4) the presence or absence of black spots on the white rump, (5) the tone of color suffusing the general plumage." These variations are discussed in detail, as is the tendency in the females to develop a malar stripe.

The only seasonal changes in color are those due to fading and abrasion.

Throughout the group the nestling plumage differs from the adult chiefly in showing more or less red in the crown and in having the markings in general coarser and heavier. An interesting variation is shown in the malar stripe which in the adults is so prominent, and yet so unstable, a character. Young *C. auratus* shows in both sexes the black malar stripe that in the adult is confined to the male. In *C. chrysoides*, *C. cafer*, and *C. c. saturator* this marking is red in the male, and rufous in the female, as in the adults.—C. F. B.

Chapman on the Origin of the Avifauna of the Bahamas.*—Mr. Chapman gives a general review of the bird life of the Bahamas, grouping the species, in accordance with their distribution, primarily into two classes: (1) those of more or less general distribution, numbering 32 species, and (2) species peculiar to the Bahamas, 24 in number. The species of the first class are further divided, as regards their distribution, into cos-

*The Origin of the Avifauna of the Bahamas. By Frank M. Chapman. American Naturalist, June, 1891, pp. 528-539.

mopolitan, continental, North American, West Indian, etc., while those of the second class are compared in detail with their nearest allies. His conclusions are (1) that the Avifauna of the Bahamas is strongly West Indian, and that this group of islands is entitled to rank as a fauna of the Antillean region, the endemic species having been derived from West Indian stock, with a slight intrusion from Florida; (2) that Cuba has been the source of the greater number of forms; (3) that while North American species occur numerously as migrants, they have not assisted in forming the resident avifauna; (4) that the avifauna is of comparatively recent origin; (5) that forms having a common ancestry, and which now occupy widely separated areas, may have become so differentiated as to resemble more each other than they do the original stock (e.g., *Geothlypis beldingi* of Lower California as compared with the Bahama and Florida forms, with nearly parallel cases in the genera *Spindalis*, *Vireo*, and *Certhiola*); (6) that certain Bahaman forms, occupying contiguous islands, have become differentiated under practically the same climatic or physiographic conditions—in other words, simply through isolation; (7) that we may probably assume that some of these endemic forms owe their origin primarily to features of individual variation, which through isolation, and hence close interbreeding, have become permanent. Several of these important generalizations we do not remember to have seen previously stated. The paper is thus of unusual interest.—J. A. A.

Chapman on the Grackles of the Subgenus *Quiscalus*.*—This interesting discussion of a highly perplexing subject—the relationships of our Grackles—is the result of the study of a series of over eight hundred skins, largely of breeding males, from many widely separated localities. This series shows the breeding range of *æneus* to extend from Texas and Louisiana to Great Slave Lake, “and from the eastern slopes of the Rockies to the western slopes of the Alleghanies, while from Massachusetts to Nova Scotia it reaches the Atlantic seaboard; *Quiscalus quiscula aglæus* is typically represented from New Orleans to Charleston, and southward to the extreme point of the Florida peninsula; and *Quiscalus quiscula* breeds from the northern limit of the range of *aglæus* northward to the southern limit of the range of *æneus* in the lower Connecticut and Hudson River Valleys.”

As a preliminary to the discussion of their relationships, a detailed description is given of the coloration of each form, especially of *quiscula*, of which lack of space unfortunately permits us to quote but little.

In *æneus*, throughout its range, aside from a trifling seasonal, and considerable sexual, difference in brilliancy, there is practically no variation in the colors of the plumage, except of the head and neck which in both

*A Preliminary Study of the Grackles of the Subgenus *Quiscalus*. By Frank M. Chapman. Bulletin American Museum of Natural History, Vol. IV, No. 1, Article I, Feb. 25, 1892, pp. 1-20; map,

æneus and *quiscula* seem to vary with the individual independently of the coloring of other parts. Of the plumage of the head and neck "there are three types of coloration with their various degrees of intergradation. Briefly, these are (1) the purple type with more or less bronzy reflections, this closely resembling the color of the same parts in *aglaeus*; (2) the steel-green or bluish-green; and (3) the steel-blue or purplish blue, previously described, which occurs in about twenty-five per cent of the specimens examined."

"Omitting all reference to the color of the head, as too variable a character to be used in diagnosis, we may know *æneus* as a bird in which the back and under parts are metallic brassy, or olivaceous bronze without iridescent bars in any part of the plumage. *Quiscula* assumes three phases of coloration which merge into one another in the order named: first, the bottle-green; second, the bronze-purple; and third, the brassy bluish green. In each of these phases the feathers of the back and under parts are banded with iridescent bars of varying extent. *Quiscalus quiscula aglaeus* represents the highest development of phase No. 1 of *quiscula*." The reader must not infer that all or nearly all specimens of *quiscula* agree at all typically with one or the other of these three 'phases.' For instance in a series of 51 from West Chester, Penn., only about half that number could be referred to either of them, the remainder being variously intermediate between them.

Mr. Chapman proceeds to consider the series (of breeding males) of *quiscula* in geographical sequence from the south northward, grouping them by States, and noting the numbers, actual and relative, in each group that can be referred to each 'phase' or are intermediate between them. The results are tabulated and show, for so limited a series (between three and four hundred), a fairly steady gradation from *aglaeus* ('phase No. 1') toward *æneus*. His conclusions, as to the facts, are as follows: "(1) *Quiscalus æneus*, throughout a breeding range which extends from the Rio Grande Valley to British America and New Brunswick, varies in coloration only in that comparatively limited part of its habitat adjoining the area occupied by *Quiscalus quiscula*, with which, at least from Pennsylvania to Massachusetts, it completely intergrades. (2) *Quiscalus quiscula*, an extremely variable form, assumes three phases of coloration; the first reaches its extreme development at the southern limit of the bird's range where the third phase is unknown, while the third phase is most highly developed at the bird's northern limit, where the first phase is unknown. The second phase connects the first and third, and is rarely found at either extreme, but is most abundant near the centre of the bird's habitat where, it is to be noted, all three phases with their connectants, occur together. (3) The exact relationships of *quiscula* and *æneus* in the lower Mississippi Valley and northward along the Alleghanies to Pennsylvania are not at present known. (4) In the Alleghanies of Pennsylvania, in the Hudson Valley from Sing Sing to Troy, in eastern Long Island, in Connecticut, and in Massachusetts as far north as

Cambridge, *quiscula* and *æneus* completely intergrade. (5) This intergradation is in every instance accomplished through phase No. 3 of *quiscula*."

From his measurements Mr. Chapman concludes that "the differences in size, which exist between these three forms, are too slight to be of diagnostic value in individual cases, the range of variation in either form completely overlapping the average differences."

"*Quiscalus æneus* presents slight but regular increase in size northward . . . On the whole it appears to be a somewhat smaller bird than *quiscula*, with perhaps a slightly longer tarsus."

"In *aglæus* and *quiscula*, in passing from the South northward we find about the same increase in size shown by *æneus*: the wing and tail become longer, the bill thicker, but the length of this member decreases; Florida specimens having an actually, as well as relatively, longer bill than northern specimens."

The author seeks an explanation of the intergradation from *æneus* into *quiscula*, and finds it, to his own satisfaction, by assuming that it is due to hybridity between two distinct species. That it is a case of geographical variation he considers impossible, for, he says, we know of no differences of environment between the regions inhabited by the two forms, sufficient to cause the differences between them, and he thinks further that it is contrary to known laws of geographical variation for a form to continue as constant as *æneus* throughout a wide area and then abruptly change into one as different as *quiscula*.

It appears almost as if he had overlooked what certainly seems to be the simplest explanation of the facts, — that it is a case of geographical intergradation between two subspecies, one, *aglæus*, inhabiting the peninsula of Florida and the adjacent coasts, the other, *æneus*, spread over a large area in the West and North; between them a gradual intergradation from one into the other, every step of which Mr. Chapman has shown us in his 'phases' 'No. 2' and 'No. 3' and the many specimens intermediate between them. From this point of view the greater part of the series he calls *quiscula* — all, indeed, that are usually called by that name — are to be considered as intermediates of varying degree between the two subspecies *aglæus* and *æneus*, each of which, within its own territory is as constant as a subspecies can be fairly expected to be.

If we resort to the theory of hybridity between *æneus* and *quiscula* which he is inclined to accept, our way is not without stumbling blocks. According to this view the *æneus* blood has mingled in the veins of *quiscula* to a greater or less degree the nearer or farther from the habitat of *æneus* the impure *quiscula* is bred. But why should this corruption of the *quiscula* stock have penetrated nearly the whole of the area the bird occupies, while the territory of *æneus* has not been invaded at all by the other? If hybridization had gone on to such an extent we should expect to see at least some traces of *quiscula* blood cropping out now and then through the wide range of country that *æneus* inhabits. But such mongrels do not appear. — C. F. B.

Newton on 'Fossil Birds.'* — This is a brief survey of our present knowledge of fossil birds, the subject being treated in outline. It is, however, an important and instructive summary of the subject, presented by an eminent authority. As indicated by the title, it formed one of the long series of important papers read at the Second International Congress held last year at Budapest. — J. A. A.

Slater on the Geographical Distribution of Birds.† — In this paper of some thirty-five pages, Dr. Slater has summarized the recent progress in our knowledge of the geographical distribution of birds, the period covered being mainly the interval since the publication of his well-known address on Geographical Zoölogy delivered before the Biological Section of the British Association at its meeting at Belfast in 1875. He briefly restates, with some qualifications, his views then and previously set forth, respecting the principal faunal regions and subregions of the earth's surface, based on a study of the geographical distribution of birds, and notes, *passim*, the leading recent authorities upon their ornithology. This is followed by an appendix of eight pages, in which are given the titles of the principal publications referred to, 125 in number. This list, with that contained in his British Association Address, forms a most convenient and useful guide to the more important works and papers bearing on the special subject here treated.

As is well known, Dr. Slater's division of the earth's surface into six primary ontological divisions of coördinate value has been the subject of criticism from many sources; yet, while practically admitting that some other method of division might prove more in accordance with facts, he expresses himself as in the main, "after more than thirty-five years close attention to the subject," well satisfied with his own system, and believes (with Wallace, whose adoption of his principal regions he "points out with pride") that, in the words of Mr. Wallace, "in geographical equality, compactness of area, and facility of definition, they are beyond all comparison better than any others that have yet been proposed for the purpose of facilitating the study of geographical distribution" — as though "practical convenience," instead of the facts of distribution, were to be the deciding test in favor of this or that author's scheme! Thus, as Dr. Slater says, many writers on zoö-geography have treated his "Nearctic Region as merely a piece of the Palæarctic," and he admits that "there are, no

* Fossil Birds. From the forthcoming "Dictionary of Birds." Delivered before the Second International Ornithological Congress, on the 18 May, 1891, by Alfred Newton, M. A., Prof. Zoöl. and Comp. Anat., etc., Cambridge, Magdalene College. Budapest, published at the Office of the Congress, 1891, 4to, pp. 16.

† The Geographical Distribution of Birds; an Address delivered before the Second International Ornithological Congress at Budapest, May, 1891, by Philip Lutley Slater M. A., Ph. D., F. R. S., Secretary to the Zoölogical Society of London. Budapest, 1891. Published at the Office of the Congress. 8vo., pp. 45.

On Recent Advances in our Knowledge of the Geographical Distribution of Birds. By P. L. Slater, M. A., Ph. D., F. R. S. *Ibis*, Oct., 1891, pp. 514-557.

doubt, grounds upon which this view may be supported"; but then the *inconvenience* of considering it a subregion of a primary circumpolar region must be duly regarded!

Dr. Sclater's paper was prepared for presentation at last year's International Ornithological Congress, and forms one of the memoirs published by the Congress; it also appears, as noted above, under a somewhat different and more explicit title, and "slightly modified," in 'The Ibis' for October last.—J. A. A.

Sclater and Shelley on the Scansores and Coccoyges.*—Volume XIX of the British Museum Catalogue of Birds treats of seven families of birds, as follows: Rhamphastidæ, Galbulidæ, and Bucconidæ, by Mr. Sclater, and Indicatoridæ, Capitonidæ, Cuculidæ, and Musophagidæ, by Mr. Shelley. The number of species recognized is 448, of which only 32 are not represented in the British Museum. The total number of specimens belonging to these families in the British Museum collection is 9231, among which are 123 types of species, of which 73 are admitted as valid.

The work is similar in character to that of the preceding volumes, and therefore calls for no special comment. One genus and five species and subspecies appear to be here for the first time named, as follows: (1) *Urococcyx* Shelley, gen. nov., p. 398 (type *Phanicocephus erythrogathus* Hartl.); (2) *Xantholoma intermedia* Shelley, p. 97; (3) *Capito salvini* Shelley, p. 119, pl. v, fig. 4; (4) *Brachygalba fulviventris* Sclater, p. 172; (5) *Coccyzus dominicæ* Shelley (subsp. of *C. minor*), p. 306, pl. xii, fig. 1; and (6) *Centropus purpureus* Shelley, p. 348, pl. xiii.

In view of Mr. Shelley's treatment of *Coccyzus minor*, of which he recognizes two subspecies—*maynardi* Ridgw. and *dominicæ* subsp. nov.—we are surprised that he should lump all of the large *Piaya* under *Piaya cayana*, considering the wide distribution of the group, and the great range of variation in both size and color shown by specimens from distant points in the common habitat. Doubtless the extremes grade into each other through birds from intermediate localities, yet the birds from Mexico, Guatemala, Cayenne, and southern Brazil present average differences too well marked to be wholly ignored.

The volume is a most welcome continuation of this long series of invaluable handbooks.—J. A. A.

* Catalogue | of the | Picariæ | in the | Collection | of the | British Museum. | — | Scansores and Coccoyges, | containing the Families | Rhamphastidæ, Galbulidæ, and Bucconidæ, | by | P. L. Sclater, | and the Families | Indicatoridæ, Capitonidæ, Cuculidæ, | and Musophagidæ, | by | G. E. Shelley. | London: | Printed by order of the Trustees. | Sold by | Longmans & Co., 39 Paternoster Row; | B. Quaritch, 15 Piccadilly; Asher & Co., 13 Bedford Street, Covent Garden; | Kegan Paul, Trench, Trübner & Co., 57 Ludgate Hill; | and at the | British Museum (Natural History), Cromwell Road, S. W. | 1891. 8vo. pp. xii+484, pl. xiii.= Vol. XIX of the Catalogue of the Birds in the British Museum.

Hartert's *Catalogue of the Birds in the Museum of the Senckenberg Natural History Society*.* — The bird collection of the Senckenberg Museum contains much historic material, as shown in the author's account of the origin and growth of this important collection, which appears to number nearly 4000 species. The collection was begun in 1820, through the purchase of the collections of the well-known ornithologists Wolf and Meyer, consisting chiefly of birds of Central Europe. Subsequently was added the greater part of Rüppell's collection from northeastern Africa, and many from various noted South American expeditions, as well as from other historic sources. Mr. Hartert considers it necessary to recognize subspecies, and freely adopts trinomial for their designation. He accepts the tenth edition of Linné's 'Systema Naturæ' as the starting point of nomenclature, and considers that strict adherence to the principle of priority is the only way to secure stability of names. He is thus in hearty accord with the recent innovations in respect to principles of nomenclature reflected in the A. O. U. Code and so emphatically endorsed by the International Ornithological Congress held last year at Budapest.

The 'Catalogue' is a systematic list of the species (without synonymy) in the Museum, with a record of the specimens by which each species is represented, with sex and locality, and apparently the exact date of collection when this is known. Questions of nomenclature and other technical matters are discussed in foot-notes, frequently at considerable length. These give to the 'Catalogue' an interest and importance to the general ornithologist far beyond that of a mere catalogue of the species and specimens contained in the museum to which it relates. Were we disposed to be hypercritical we might ask why, in a number of cases, certain names were adopted and others rejected, since the rulings are clearly at variance with the principle of priority. We fancy, however, these few cases are due to oversight, or from lack of time to personally verify all the points at issue in a work of this magnitude, when we read that the revision of the collection and the preparation of the Catalogue was performed in the short space of nine and a half months! (see p. vii). — J. A. A.

Leverkühn's 'Fremde Eier im Nest.' † — Dr. Leverkühn's 'Eggs of another bird in the nest' is an exhaustive treatment of what at first sight seems an unimportant and not especially interesting subject, but with true German patience and minuteness he has brought together a surprising amount of information, much of which has an interesting bearing on the habits and behavior of birds under unusual circumstances in respect to the imposition of other birds' eggs in their nests.

*Katalog des Vogelsammlung im Museum der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt am Main. Von Ernst Hartert. Januar 1891. Frankfurt a. M. 8vo. pp. xxii, 259.

†Fremde Eier im Nest. Ein Beitrag zur Biologie der Vögel, von Paul Leverkühn. Nebst einer Bibliographischen Notiz über Lottinger. 1891. Berlin, Wien, Leiden, London, Paris, and New York. 8vo. pp. xi, 212.

The memoir is divided into two parts, entitled respectively 'special' and 'general.' The first part, treating of the behavior of birds in relation to strange eggs in their nests, is divided into (*A*), in respect to eggs of the same species, (1) when laid by birds, (2) when placed there by man; (*B*) in respect to eggs of other species, (1) when placed there by man, (2) when laid by birds. Numerous cases are cited where two or more females of the same species lay in the same nest, and various experiments are recounted where eggs have been introduced into birds' nests for the purpose of noting the behavior of the owners of the nest under the novel intrusion. Considerable space is given to the consideration of the behavior of domesticated birds (pigeons, common fowls, ducks, etc., and cage birds), when other than their own eggs are given them for incubation; while many experiments are recounted of placing small hen's eggs in owl's nests, and various wild birds' eggs in the nests of other species. Mr. Leverkühn's essay contains much curious and interesting information, of which a convenient digest is given in tabular form in the second part. — J. A. A.

Jäckel's Birds of Bavaria.* — This posthumous work, edited by Dr. Rudolf Blasius, embodies the results of the careful and long-continued field studies of Pastor Jäckel upon the birds of Bavaria. The work, as implied in the title, treats of their habits, distribution, migrations, etc., the accounts of the different species varying in length from a few lines to many pages (nearly twenty are given to the Steinadler (*Aquila fulva*). The number of species treated is 312. The nomenclature is not the most recent, being that employed by Keyserling and Blasius in their 'Die Wirbelthiere Europas,' published in 1840.

The editor's introduction gives a sketch of the author's life, a list of his principal ornithological papers (1848-1875), and the circumstances attending the publication of the present book. Jäckel died on the 12th of July, 1885, after a long period of ill health; during the last ten years of his life he published very little, although he continued to make observations till 1884, which he transmitted to the German Committee on Bird Migration, of which Dr. Blasius was president. Dr. Blasius speaks of him as being little known to the younger ornithologists, though entitled to a place in the front rank of the students of Bavarian birds, mammals and fishes; and believes that his 'Vögel Bayerns' will give him always a place in the list of German naturalists. Dr. Blasius has himself contributed much to the value of the work, which he has brought down to date, through the coöperation of numerous correspondents to whom he sent circulars of inquiry respecting many of the rarer species. These additions appear as indited notes, signed with his initials. — J. A. A.

*Systematische Uebersicht der Vögel Bayerns mit Rücksicht auf das örtliche und quantitative Vorkommen der Vögel, ihre Lebensweise, ihren Zug und ihre Abänderungen. Von Andreas Johannes Jäckel. Herausgegeben von Prof. Dr. Rudolf Blasius. München und Leipzig, 1891. 8vo. pp. xxiv, 392. Frontispiece (portrait of the author).

Minor Ornithological Publications.—There are various scientific societies and institutions whose serial publications, though not chiefly ornithological, yet occasionally contain matter relating to North American birds. The following is a record of such papers, not already noticed in this department, from 1879 to 1890 inclusive, in all of these serials accessible to the compiler. Readers who know of other similar publications that have contained in these years any contributions to ornithology, are earnestly requested to send their titles to the Associate Editor.

Proceedings of the Boston Society of Natural History.

Since last noticed here (*Auk*, Vol. II, p. 373) these Proceedings have contained only these (Nos. 2204, 2205).

2204. *Note on the Epidermal System of Birds.* By J. Amory Jeffries, M. D. 'Proceedings of the Boston Society of Natural History,' Vol. XXIII, March, 1888, pp. 358-360.

2205. *Notes on Some Type Specimens of American Troglodytidae in the Lafresnaye Collection.* By Robert Ridgway. *Ibid.*, pp. 383-388. — See *Auk*, VI, 172.

Bulletin of the Buffalo Society of Natural Sciences.

In Vols. IV and V, Nos. 1-3, are these (Nos. 2206-2209).

2206. *Imitative and Ventriloquial Power of Birds.* By E. E. Fish. 'Bulletin of the Buffalo Society of Natural Sciences,' Vol. IV, No. 1, July, 1881, pp. 23-25. — A few notes on birds' songs.

2207. *On the Domestication of Some of our Wild Ducks.* By Charles Linden. *Ibid.*, No. 2, Jan., 1882, pp. 33-39.

2208. *Nidification of Birds on the St. Clair Flats.* By Rev. J. H. Langille. *Ibid.*, Vol. V, No. 1, [Feb. ?], 1886, pp. 33-39. — Chiefly water birds.

2209. *Ventriloquial and Imitative Power of Birds.* By E. E. Fish. *Ibid.*, No. 2, [Aug. ?], 1886, pp. 72-80.

Bulletin of the California Academy of Sciences.

In the volumes of this 'Bulletin' so far issued, Vols. I and II (= Nos. 1-8), 1884-1887, there have been the following (Nos. 2210-2214).

2210. *Additions to the Ornithology of Guadalupe Island.* By Walter E. Bryant. 'Bulletin of the California Academy of Sciences,' Vol. II, No. 6, Jan. 5, 1887, pp. 269-318. — See *Auk*, IV, 154.

2211. *Ornithological Observations in San Diego County.* By W. Otto Emerson. *Ibid.*, No. 7, June 3, 1887, pp. 419-431.

2212. *Discovery of the Nest and Eggs of the Evening Grosbeak (Coccothraustes vespertina).* By Walter E. Bryant. *Ibid.*, No. 8, July 23, 1887, p. 449.

2213. *Description of a New Subspecies of Petrel from Guadalupe Island.* By Walter E. Bryant. *Ibid.*, pp. 450, 451. — *Oceanodroma leucorhoa macrodactyla*.

2214. *Unusual Nesting Sites. I.* By Walter E. Bryant. *Ibid.*, pp. 451-454.

Proceedings of the California Academy of Sciences.

The first series of the 'Proceedings' ended in 1876. Vols. I and II (1887-1889) of the second series contain the following (Nos. 2215-2223).

2215. *Unusual Nesting Sites. II.* By Walter E. Bryant. 'Proceedings of the California Academy of Sciences,' 2d Series, Vol. I, 1888, pp. 7-10.

2216. *Birds and Eggs from the Farallon Islands.* By Walter E. Bryant. *Ibid.*, pp. 25-50.

2217. *Description of a New Subspecies of Song Sparrow from Lower California, Mexico.* By Walter E. Bryant. *Ibid.*, pp. 197-200. — *M. f. riularis.*

2218. *Description of a New Thrush from Calaveras County, California.* By L. Belding. *Ibid.*, Vol. II, 1889, pp. 18, 19. — *Turdus sequoiensis.*

2219. *Descriptions of the Nests and Eggs of Some Lower Californian Birds, with a Description of the Young Plumage of Geothlypis beldingi.* By Walter E. Bryant. *Ibid.*, pp. 20-24.

2220. *The Small Thrushes of California.* By L. Belding. *Ibid.*, pp. 57-72.

2221. *New Birds from Lower California, Mexico.* By Alfred W. Anthony. *Ibid.*, pp. 73-82. — *Oreortyx picta confinis*, *Aphelocoma californica obscura*, *Funco townsendi*, *Sitta pygmaea leuconucha*, *Sialia mexicana anabete*. See also Auk, VII, 281.

2222. *General Ornithological Notes. I.* Edited by Walter E. Bryant. *Ibid.*, pp. 83-90.

2223. *A Catalogue of the Birds of Lower California, Mexico.* By Walter E. Bryant. *Ibid.*, pp. 237-320. See Auk, VII, 281.

Proceedings and Transactions of the Royal Society of Canada.

In Vols. I-VIII (1883-1891) there is one contribution to be noted here, No. 2224.

2224. *Notes on the Birds of Hudson's Bay.* By Robert Bell. 'Proceedings and Transactions of the Royal Society of Canada,' Vol. I, Section IV, 1883, pp. 49-54.

Reports of the Canadian Geological Survey.

Although these Reports are devoted chiefly to geographical and geological explorations yet they contain a few papers on the plants and animals of the regions explored. In the 'Reports of Progress' dated 1879-1885 and the 'Annual Reports (New Series)', Vols. I-IV, 1886-1890, are the following (Nos. 2225-2227).

2225. *List of Birds from the Region between Norway House and Forts Churchill and York.* By Robert Bell. 'Geological and Natural History Survey of Canada. Report of Progress for 1878-79.' IV. Report on Explorations on the Churchill and Nelson Rivers and around God's and Island Lakes, 1879. Appendix VI, pp. 67-70.

[Reports of the Canadian Geological Survey.—Continued.]

2226. *List and Notes of Birds of the Vicinity of Hudson's Bay and Labrador*. By Dr. R. Bell. *Ibid.*, *Report of Progress for 1882-83-84*. VII. Observations on the Geology, Mineralogy, Zoölogy, and Botany of the Labrador Coast, Hudson's Strait and Bay. 1884. Appendix III, pp. 54-56.
2227. *List of Birds Collected at Lake Mistassini, by Jas. M. Macoun, 1885*. By A. P. Low. *Ibid.*, *Annual Report (New Series)*, Vol. I. Report of the Mistassini Expedition, 1884-5. 1885. Appendix I, pp. 34-35.

Proceedings of the Canadian Institute.

These Proceedings, a "continuation of 'The Canadian Journal of Science, Literature, and History'," of which they form the 'third series', have contained, in Vols. I-VII (1879-1890), these papers (Nos. 2228-2231).

2228. *The Prairie Chicken or Sharp-tailed Grouse (Pedicularis phasianellus (Baird))*. By Ernest E. T. Seton [= Ernest E. Thompson]. 'Proceedings of the Canadian Institute, Toronto,' Third Series, Vol. I, 1883, pp. 405-412. — Biographical.

2229. *Some of Our Migratory Birds*. By G. W. Allan. *Ibid.*, Vol. III, 1886, pp. 87-100.

2230. *The Mammals and Birds of Prince of Wales Sound, Hudson's Strait*. By F. F. Paine. *Ibid.*, Vol. V, 1888, pp. 111-123. — 26 species of birds noted, "during a stay of thirteen months."

2231. *Proceedings of the Ornithological Subsection of the Biological Section of the Canadian Institute*. Edited by Ernest E. Thompson. *Ibid.*, Vol. VII, pp. 181-203. — Brief notes on a large number of species, chiefly near Toronto.

Journal of the Cincinnati Society of Natural History.

The Journal of the Cincinnati Society of Natural History, since it was last noticed in these pages (*Auk*, II, 211) has contained, in Vols. VIII-XIII (April, 1885-Jan., 1891), the following (Nos. 2232-2243).

2232. *The Little Screech Owl*. By John W. Shorten. 'The Journal of the Cincinnati Society of Natural History,' Vol. VIII, No. 1, April, 1885, p. 52. — Numerous in Cincinnati in winter of 1884-85; two thirds of those taken were in the red phase.

2233. *Notes on Food of Raptorial Birds*. By Charles Dury. *Ibid.*, pp. 62-67.

2234. *Papers on the Destruction of Native Birds*. By Charles Dury, William Hubbell Fisher, R. H. Warder, F. W. Langdon, Joseph F. James. *Ibid.*, Vol. IX, No. 3, Oct., 1886, pp. 163-224.

2235. *Zoölogical Miscellany*. Edited by William Hubbell Fisher. *Ibid.*, Vol. X, No. 1, April, 1887, pp. 49-51. — Short notes, chiefly on Cincinnati birds.

2236. *Ornithological Notes*. By Charles Dury. *Ibid.*, No. 2, July, 1887, pp. 96, 67. — Near Cincinnati.

[Journal of the Cincinnati Society of Natural History.—Continued.]

2237. *Migration of Night Hawks.* By Charles Dury. *Ibid.*, No. 3, Oct., 1887, pp. 148, 149.

2238. *The American Crossbill, as to Some of its Habits and its Fondness for Salt.* By William Hubbell Fisher. *Ibid.*, No. 4, Jan., 1888, pp. 203, 204.

2239. *The Canada Grouse. Some Remarks as to its Scarcity, Fearlessness, its Habitat, and its Feeding on the Tamarack.* By William Hubbell Fisher. *Ibid.*, pp. 205, 206.

2240. *Notes Concerning Albinism among Birds.* By Amos W. Butler. *Ibid.*, pp. 214-216.

2241. *Albinos in Cuvier Club Collection.* By Charles Dury. *Ibid.*, pp. 216, 217.

2242. *On the Occurrence in Large Numbers of Seventeen Species of Birds.* By F. W. Langdon. *Ibid.*, Vol. XII, Nos. 2 and 3, Oct., 1889, pp. 57-63. — In Ohio.

2243. *Notes on Ohio Birds.* By Charles Dury. *Ibid.*, Vol. XIII, No. 2, July, 1890, pp. 93-98.

Proceedings of the Davenport Academy of Natural Sciences.

In Vols. III-V (1879-1892) the one contribution to ornithology is No. 2244.

2244. *Preliminary Annotated Catalogue of the Birds of Iowa.* By Charles R. Keyes and H. S. Williams. 'Proceedings of the Davenport Academy of Natural Sciences,' Vol. V, 1888, pp. 113-161. — See Auk, VI, 332.

Bulletin of the Scientific Laboratories of Denison University.

Vols. I-VI of this publication contain the following (Nos. 2245, 2246).

2245. *The Evening Grosbeak—Hesperiphona vespertina Bonap.* By C. L. Herrick. 'Bulletin of the Scientific Laboratories of Denison University,' Vol. I, Dec., 1885, pp. 5-15. — Chiefly anatomical.

2246. *A Specimen of Hesperiphona vespertina Bonap.* By W. G. Tight. *Ibid.*, Vol. V, June, 1890, pp. 22-23.

Journal of the Elisha Mitchell Scientific Society.

In Vols. I-VII (1883-1890) the ornithological papers are these (Nos. 2247, 2248):—

2247. *Preliminary Catalogue of the Birds of North Carolina, with Notes on Some of the Species.* By George F. Atkinson. 'Journal of the Elisha Mitchell Scientific Society,' Vol. IV, Part II, July-Dec., 1887, pp. 44-87. — See Auk, V, 311.

2248. *Soaring of the Turkey Vulture (Cathartes aura).* By Geo. F. Atkinson. *Ibid.*, Vol. V, Part II, July-Dec., 1888, pp. 59-66.

Proceedings of the Elliott Society of Science and Art.

Since the Elliott Society resumed the publication of its Proceedings in 1885 (Vol. II, p. 17) up to the latest issue seen (Vol. II, p. 200, May, 1888) they have contained the following ornithological matter (Nos. 2249-2257).

2249. *Swainson's Warbler, Helinaia swainsoni, Audubon.* By Arthur T. Wayne. 'Proceedings of the Elliott Society of Science and Art, of Charleston, South Carolina,' Vol. II, Sept., 1886, pp. 96, 97.

2250. *The Prothonotary Warbler, Protonotaria citrea (Bodd.) Baird.* By Arthur T. Wayne. *Ibid.*, Dec., 1886, pp. 112, 113.

2251. *Sterna fluviatilis and Sterna forsteri.* By Ellison A. Smyth, Jr. *Ibid.*, April, 1887, pp. 122, 123.

2252. *Note on Sitta canadensis.* By Ellison A. Smyth, Jr. *Ibid.*, pp. 123, 124. — In South Carolina.

2253. [*Notes on several birds at Charleston, S. C.*] By Ellison A. Smyth, Jr. *Ibid.*, March, 1888, p. 184.

2254. [*Clangula hyemalis at Charleston, S. C.*] By Ellison A. Smyth. *Ibid.*, April, 1888, p. 189.

2255. [*Chaulelasmus streperus at Charleston, S. C.*] By G. Manigault. *Ibid.*

2256. *Notes on Coloration in Sterna maxima.* By Ellison A. Smyth. *Ibid.*, pp. 189-192.

2257. [*Trochilus colubris killed by a Mantis.*] By G. E. Alexander. *Ibid.*, March, 1888, pp. 195, 196.

Journal and Proceedings of the Hamilton Association.

From 1884 to 1890 (Vol. I, Part I, to Part VI, — the division into Volumes seems to have been given up after Vol. II) there are the following papers (Nos. 2258-2260).

2258. *On Birds and Bird Matters.* By Thos. McIlwraith. 'Journal and Proceedings of the Hamilton Association,' Vol. I, pt. II, 1885, pp. 29-47.

2259. *The Birds of Ontario.* By Thomas McIlwraith. *Ibid.*, Vol. II, 1886, pp. 43-324, i-vii. — See Auk, IV, 245-249.

2260. *Birds Wintering near Hamilton.* By Thomas McIlwraith. *Ibid.*, pt. VI, 1890, pp. 76-81.

Bulletin of the Illinois State Laboratory of Natural History.

In the Bulletins so far issued (Vol. I-III, 1880-1891) there have appeared the following (Nos. 2261-2265).

2261. *The Food of Birds.* By S. A. Forbes. 'Bulletin of the Illinois State Laboratory of Natural History,' Vol. I, No. 3, Nov., 1880, pp. 80-148. — See Bulletin Nuttall Ornith. Club, VI, 110.

2262. *A Revised Catalogue of the Birds Ascertained to Occur in Illinois.* By Robert Ridgway. *Ibid.*, No. 4, May, 1881, pp. 161-208. — See Bull. Nuttall Ornith. Club, VI, 171.

[Bulletin of the Illinois State Laboratory of Natural History.—Continued.]

2263. *The Regulative Action of Birds Upon Insect Oscillations.* By S. A. Forbes. *Ibid.*, No. 6, May, 1883, pp. 3-32.—See Bull. Nuttall Ornith. Club, VIII, 105.

2264. *The Food Relations of the Carabidæ and Coccinellidæ.* By S. A. Forbes. *Ibid.*, pp. 33-64.—On pages 56-58 are notes of different species of these families eaten by various species of birds.

2265. *A Preliminary Report on the Animals of the Mississippi Bottoms near Quincy, Illinois, in August, 1888.* By H. Garman. *Ibid.*, Vol. III, Art. IX, Pt. 1, pp. 123-184.—Contains, on pp. 131, 132, mention of a few birds. (Also issued separately, pagged 1-53, dated 1889.)

Transactions of the Kansas Academy of Science.

Since last noted (Bull. Nuttall Ornith. Club, VIII, 238) Vols. IX-XII (1885-1890) have contained these papers and notes (Nos. 2266-2281).

2266. *Birds New to the Fauna of Kansas, and Birds Rare in the State.* By N. S. Goss. 'Transactions of the Kansas Academy of Science,' Vol. IX, 1885, pp. 26, 27.

2267. *Observations of the Breeding Habits of the American Eared Grebes.* By N. S. Goss. *Ibid.*, pp. 31-32.—*Colymbus nigricollis californicus*.

2268. *Notes on the Nesting Habits of the Yellow-throated Vireo.* By N. S. Goss. *Ibid.*, pp. 33, 34.

2269. *On the Discovery of a Fossil Bird Track in the Dakota Sandstone.* By Prof. F. H. Snow. *Ibid.*, Vol. X, 1887, pp. 3-6.—See Auk, V, 105.

2270. *Additions to the Catalogue of Kansas Birds.* By N. S. Goss. *Ibid.*, pp. 28-31.—See also Auk, III, 114.

2271. *Additions to the Catalogue of the Birds of Kansas.* By N. S. Goss. *Ibid.*, pp. 77-80.—See also Auk, IV, 7-11.

2272. *Ictinia mississippiensis and Ægialitis nivosa Nesting in South-central Kansas.* By N. S. Goss. *Ibid.*, Vol. XI, 1889, p. 11.—See also Auk, IV, 345.

2273. *Feeding Habits of Pelecanus erythrorhynchos.* By N. S. Goss. *Ibid.*, pp. 11, 12.—See also Auk, V, 25-27.

2274. *The Anhinga.* By N. S. Goss. *Ibid.*, pp. 58, 59.

2275. *The Double-crested Cormorant.* By N. S. Goss. *Ibid.*, pp. 59, 60.

2276. *Additions to the Catalogue of the Birds of Kansas.* By N. S. Goss. *Ibid.*, pp. 60-62.

2277. *Three New Kansas Birds.* By Prof. F. H. Snow. *Ibid.*, pp. 62-63.

2278. *Additions to Kansas Birds.* By Col. N. S. Goss. *Ibid.*, Vol. XII, 1891, p. 24.

2279. *Correction.* By N. S. Goss. *Ibid.*, pp. 60, 61.

2280. *Second Occurrence of the White-faced Glossy Ibis—Plegadis guarauna—in Kansas.* By N. S. Goss. *Ibid.*, p. 61.—This and the

[Transactions of the Kansas Academy of Science.—Continued.]

last are reprinted, without reference to the fact, from 'The Auk' for January, 1891.

2281. *Notes on Some Summer Birds of Estes Park, Colorado.* By Vernon L. Kellogg. *Ibid.*, pp. 86-90.

Transactions of the Meriden Scientific Association.

In Vols. I-IV (1885-1891) there are the following (Nos. 2282 and 2283).

2282. *A List of the Birds of Meriden, Conn.* By Franklin Platt. 'Transactions of the Meriden Scientific Association' Vol. II, 1887, pp. 39-53. — See Auk, IV, 154.

2283. *A Supplementary List of the Birds of Meriden, Conn.* [etc.]. By Franklin Platt. *Ibid.*, Vol. III, 1889, p. 41.

Bulletin of the Minnesota Academy of Natural Sciences.

In Vols. I-III, No. 2 (1878-1891) there is a little ornithological matter (Nos. 2284, 2285).

2284. *The Fauna of Northern Minnesota. Its Traverses and Routes of Migration.* By Charles Hallock. 'Bulletin of the Minnesota Academy of Natural Sciences,' Vol. II, No. 3, April, 1881, pp. 101-110. — Mention of several species of Geese and other water birds on pp. 108-110.

2285. *Notes on the Arrival and Nesting of Birds in the Vicinity of Minneapolis for the Spring of 1887.* By Franklin Benner. *Ibid.*, Vol. III, No. 2, pp. 187-191.

Bulletin of the Natural History Society of New Brunswick.

In Bulletins I-IX (1882-1890) there are two ornithological papers (Nos. 2286, 2287).

2286. *Catalogue of the Birds of New Brunswick, with Brief Notes relating to their Migrations, Breeding, Relative Abundance, etc.* By Montague Chamberlain. 'Bulletin of the Natural History Society of New Brunswick,' No. I, 1882, pp. 23-68. — See Bulletin Nuttall Ornith. Club, VII, 176.

2287. *Ornithological Notes.* By Montague Chamberlain. *Ibid.*, No. II, 1883, pp. 39-42.

Proceedings of the Newport Natural History Society.

Since last noticed here (Vol. II, p. 372) these 'Proceedings' have contained, in 'Documents' 6 and 7, the following (Nos. 2288-2290).

2288. *Our Birds of Rhode Island.* By James M. Southwick. *Ibid.*, Document 6, 1881, pp. 3-15. — Includes some interesting records.

2289. *The Water Birds of Newport, R. I.* By Charles H. Lawton. *Ibid.*, pp. 16, 17.

2290. *A Catalogue of the Birds of the Virginias.* By Wm. C. Rives. *Ibid.*, Document 7, Oct., 1890. — See Auk, VIII, 105.

Transactions of the New York Academy of Sciences.

Vols. I-IX (1881-1890) have contained these communications concerning birds (Nos. 2291-2296).

2291. *A Discovery by C. C. Trowbridge regarding the Purpose of the Emargination in the Primary Wing Feathers of Certain Birds.* By W. C. [= P] Trowbridge. 'Transactions of the New York Academy of Sciences,' Vol. VII, 1887-1888, pp. 19-21.

2292. *The Mechanism of Flight in Soaring Birds.* By W. P. Trowbridge, J. S. Newberry, et. al. *Ibid.*, pp. 75-78. — Abstract.

2293. *Discussion of the Mechanics of Bird Flight.* *Ibid.*, pp. 80-83. — Abstract of discussion by various persons present at a meeting of the Academy Dec. 19, 1887.

2294. *Soaring of Birds.* By J. B. Holder. *Ibid.*, pp. 83-87.

2295. *On the Structure of Birds in relation to Flight, with Special Reference to Recent Alleged Discoveries in the Mechanism of the Wing.* By J. A. Allen. *Ibid.*, pp. 89-100. — Abstract. — See Auk, V, 418.

2296. *Geographical Variations in the Horned Larks of North America.* By Jonathan Dwight, Jr. *Ibid.*, Vol. IX, 1889-1890, pp. 128-131. — Abstract.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science.

Vols. V-VIII (1879-1890) contain the following (Nos. 2297-2301).

2297. *On the Semi-annual Migration of Sea Fowl in Nova Scotia.* By J. Bernard Gilpin. 'Proceedings and Transactions of the Nova Scotian Institute of Natural Science,' Vol. V, pt. II, 1880, pp. 138-151.

2298. *On the Birds of Prey of Nova Scotia.* By J. Bernard Gilpin. *Ibid.*, pt. III, 1881, pp. 255-268.

2299. *On the Winter Food of the Partridge and on Partridge Poisoning.* By J. Somers. *Ibid.*, Vol. VI, pt. I, 1883, pp. 78-84.

2300. *Pied or Labrador Duck.* By Andrew Downs. *Ibid.*, pt. IV, 1886, pp. 326, 327.

2301. *Birds of Nova Scotia.* By Andrew Downs. Edited by Harry Piers. *Ibid.*, Vol. VII, pt. II, pp. 142-178. — See Auk, VI, 64.

Proceedings of the Academy of Natural Sciences of Philadelphia.

In the Proceedings of the Philadelphia Academy for 1879-1890 there are a few papers upon birds (Nos. 2302-2306).

2302. *Remarks on Lanius robustus (Baird), Based Upon an Examination of the Type Specimen.* By Leonhard Stejneger. 'Proceedings of the Academy of Natural Sciences of Philadelphia,' 1885, pp. 91-96.

2303. *Notes on the Food of Birds.* By C. F. Baker. *Ibid.*, 1889, pp. 266-270. — Upwards of three hundred birds' stomach contents examined, in Florida.

2304. *Hypoderas in the Little Blue Heron.* By Joseph Leidy. *Ibid.*, 1890, p. 63. — A similar parasite also in *Sialia sialis*.

[Proceedings of the Academy of Natural Sciences of Philadelphia.—Continued.]

2305. *Catalogue of the Owls in the Collection of the Academy of Natural Sciences of Philadelphia.* By Witmer Stone. *Ibid.*, 1890, pp. 124-131.

2306. *On Birds Collected in Yucatan and Southern Mexico.* By Witmer Stone. *Ibid.*, 1890, pp. 201-218.

Journal of the Trenton Natural History Society.

In Vols. I and II (1886-1891) the following (Nos. 2307 and 2308) are the only ornithological articles. With the beginning of Vol. II (Jan., 1889) the name of the publication was changed to the 'Journal of the New Jersey Natural History Society.'

2307. *Nesting Habits of the Hummingbird, Trochilus colubris.* By Prof. Wm. Macfarland. 'Journal of the Trenton Natural History Society,' Vol. I, No. 2, pp. 55-58.

2308. *Notes on an Intelligent Parrot.* By Dr. T. S. Stevens. *Ibid.*, No. 3, pp. 347-356.

Transactions of Vassar Brothers Institute.

In Vols. III-V (1884-1889? — dates of publication not stated) are these (Nos. 2309-2310). For previous reference to these 'Transactions' see Auk, II, 212.

2309. *Some Changes in the Habits of Birds.* By James M. DeGarms. 'Transactions of Vassar Brothers Institute,' Vol. III, Dec., 1884, pp. 81-84.

2310. *Note on the Downy Woodpecker.* By Geo. Tremper. *Ibid.*, p. 84. — Excavating a hole and occupying it "every night during the past winter."

Transactions of the Wagner Free Institute of Science.

In Vols. I-III (1887-1890) the only reference to ornithology is in this paper (No. 2311.)

2311. *Explorations on the West Coast of Florida and in the Okeechobee Wilderness, etc.* By Angelo Heilprin. 'Transactions of the Wagner Free Institute of Science of Philadelphia,' Vol. I, pp. viii, 134, May, 1887. — Occasional mention of birds.

Proceedings of the Biological Society of Washington.

In Vols. I-IV (1882-1890) of these 'Proceedings' there are a number of papers on ornithological subjects. Such as relate to North American birds are as follows (Nos. 2312-2317).

2312. *Descriptions of Some New North American Birds.* By Robert Ridgway. 'Proceedings of the Biological Society of Washington,' Vol. II, 1885, pp. 89-95. — *Parus atricapillus turneri*, *Psaltriparus minimus*

[Proceedings of the Biological Society of Washington.—Continued.]

californicus, *Colaptes mexicanus saturator*, *Myiarchus mexicanus magister*, *Myiarchus lawrencei olivaceus*, *Pediocetes phasianellus campestris*, *Lophortyx californicus brunnescens*, *Phalacrocorax dilophus albociliatus*. See also Auk, II, 207.

2313. *Notes on Psaltriparus grindei* Belding. By Robert Ridgway. *Ibid.*, p. 96.

2314. *A Review of the American Crossbills (Loxia) of the L. curvirostra Type*. By Robert Ridgway. *Ibid.*, pp. 101-107. — Names *L. c. hendirci*. See also Auk, II, 206.

2315. *Notes on the Anas hyperboreus, Pall., and Anser albatus, Cass.* By Robert Ridgway. *Ibid.*, pp. 107, 108. — See Auk, II, 207.

2316. *Remarks on the Type Specimens of Muscicapa fulvifrons, Giraud, and Mitrephorus pallescens, Coues.* By Robert Ridgway. *Ibid.*, pp. 108-110. — See Auk, II, 207.

2317. *Note regarding the Earliest Name for Carpodacus hamorrhous (Wagler)*. By Robert Ridgway. *Ibid.*, pp. 110-111. — See Auk, II, 207.

Transactions of the Wisconsin Academy of Sciences, Arts, and Letters.

The only papers treating of birds in these 'Transactions' (Vols. IV-VII, 1879-1889) are the following (Nos. 2318 and 2319).

2318. *The Larger Wild Animals that Have Become Extinct in Wisconsin*. By Dr. P. R. Hoy. 'Transactions of the Wisconsin Academy of Sciences, Arts, and Letters,' Vol. V, 1882, pp. 255-257. — Some facts about *Melcagris gallopavo*.

2319. *Migration and Distribution of North American Birds in Brown and Outagamie Counties*. By S. W. Willard. *Ibid.*, Vol. VI, 1885, pp. 177-196.

Proceedings of the Wisconsin Natural History Society.

Since last noted here (Bulletin Nuttall Ornith. Club, VII, 117) the only ornithological paper in these Proceedings, up to April, 1889, the latest issue, is No. 2320.

2320. *Man's Influence on the Avifauna of Southeastern Wisconsin*. By Dr. P. R. Hoy. *Ibid.*, March, 1885, pp. 4-9. — C. F. B.

Publications Received. — Allen, J. A. The North American Species of *Colaptes*, considered with special reference to the Relationships of *C. auratus* and *C. cafer*. (Bull. Am. Mus. Nat. Hist. IV, No. 1, pp. 21-44.)

Averill, C. K., Jr. List of Birds found in the Vicinity of Bridgeport, Conn. 8vo, pp. 19. Bridgeport, 1892.

Chapman, Frank M. A Preliminary Study of the Grackles of the Subgenus *Quiscalus*. (Bull. Am. Mus. Nat. Hist. IV, No. 1, pp. 1-20.)

Dagleish, J. J. Notes on the Petrels of Madeira and adjoining Seas. (Proc. Roy. Phys. Soc. Edinb. XI, pp. 27-30.)

Fürbringer, Max. Anatomie der Vögel. Large 4to. pp. 48. II Inter. Orn. Congress. Budapest.

Leverkühn, Paul. (1) August von Pelzeln. (Orn. Monats. des Deutschen Vereins z. Schutze der Vogelwelt, XVI, pp. 394-401.) (2) Ornithologisches aus Lichtenberg's Werken. (Zoolog. Garten, XXXII, pp. 108-139.) (3) Ornithologisches aus Schiltberger's Reise. (Die Schwalbe, XV, No. 13 and 20.)

Lucas, Frederic A. Explorations in Newfoundland and Labrador in 1887, made in connection with the Cruise of the U. S. Fish Commission Schooner Grampus. (Rep. U. S. Nat. Mus. 1888-89, pp. 709-728.)

Oustalet, E. (1) Mission Scientifique du Cap Horn, 1882-83. Tome VI, Zoologie. Oiseaux. par E. Oustalet. 4to, pp. 341, pll. 6. Paris, 1891. (2) Description de nouvelles Espèces d'Oiseaux du Tonkin, du Laos et de la Cochinchine. (Bull. Soc. Zool. de France, 1890, pp. 153-160.) (3) Notice sur la Collection d'Oiseaux recueillie par M. Dybowski dans la Sahara. (*Ibid.*, 1891, pp. 59-64.) (4) Description de deux nouvelles Espèces d'Oiseaux de l'Afrique orientale. (Le Naturaliste, Dec. 1890.)

Reichenow, Anton. (1) Ueber eine Vogelsammlung aus Togoland. (Journ. für Orn. 1891, pp. 369-394.) (2) [Neue africanische Vögel.] (Bericht Allgem. Deutsche Orn. Gesellsch. zu Berlin, Jan. und Febr. Sitz.)

Shufeldt, R. W. Concerning the Taxonomy of the North American Pygopodes, based upon their Osteology. (Journ. Anat. and Phys. XXVI, pp. 199-203.)

Stone, Witmer. Catalogue of the Corvidæ, Paradiseidæ and Oriolidæ in the Collection of the Academy of Natural Sciences of Philadelphia. (Proc. Acad. Nat. Sci. Phila. 1891, pp. 441-450.)

American Field, XXXVII, Nos. 1-10.

American Journ. Sci., Jan.-Mch. 1892.

American Naturalist, Dec. 1891.

Annals of Scottish Natural History, I, No. 1, Jan. 1892.

Australian Museum, Records of, I, No. 10, Dec. 1891.

Bulletin Buffalo Soc. Nat. Sci. V, No. 3.

Bulletin Minnesota Acad. Nat. Sci. III, No. 2.

Canadian Record of Science, IV, Nos. 7, 8, July and Oct. 1891.

Collectors' Monthly, III, Nos. 1, 2, Jan. Feb. 1892.

Forest and Stream, XXXVII, Nos. 22-26. XXXVIII, Nos. 1-9.

Humming Bird, The. II, No. 2, Feb. 1892.

International Ornithological Congress. Comptes-Rendus. Budapest, 1891. 4to, pp. 229.

Observer, The. II, No. 12, Dec. 1891. III, Nos. 1, 2, Jan. Feb., 1892.

Ornithologisches Jahrbuch, III, No. 1, Jan. 1892.

Ornithologist and Botanist, I, No. 12, Dec. 1891.

Ornithologist and Oölogist, XVII, Nos. 1-3, 1892

Ottawa Naturalist, V, Nos. 9-11, Jan.-Mch. 1892.

Proceedings Acad. Nat. Sci. Phila. 1891, pt. 3, Sept.-Dec.

Proceedings Delaware Valley Orn. Club, Abstract of, for 1890, 1891.

Zoologist, Jan.-Mch. 1892.

GENERAL NOTES.

An Egg of the Great Auk.—Mr. Symington Grieve of Edinburgh, in a recent letter to Capt. J. W. Collins, announces the discovery of one more egg of the Great Auk, "this time in a museum kept in the tower of an English parish church. The egg was labeled 'Penguin,' and the owner of the museum was under the impression that it was the egg of one of the Penguins of the southern hemisphere, until in reading an article in one of the magazines he observed that the Great Auk also was known as the Penguin in the American localities that were frequented by the bird. He had the egg examined by experts who pronounced it undoubtedly an egg of *Alca impennis*. From all that can be discovered of its history it appears in all probability to have come from Newfoundland."—FREDERIC A. LUCAS, *Washington, D. C.*

Wintering of the Canvasback in Arizona.—The winter resorts of this Duck along the Atlantic coast appear to be much more accurately determined than those of either the interior or the west coast of our country. It may be worth recording that the Duck is extremely abundant on various water-courses in Arizona during the winter. A party of my friends who went duck-shooting in January on one of the tributaries of the Rio Verde, not far from Fort Whipple, saw "thousands" of Canvasbacks, and killed about a hundred. Few ducks of any other species were noticed. The market in Prescott has been supplied with Canvasbacks all through the winter, together with various other Ducks, among which I have noticed Green-winged Teal, Sprigtail, Widgeon, Shovelers, Mallards, Gadwalls, and Scaup. A few Swans and Geese also have been brought in, together with many thousands of Gambel's Quail. The latter, the most characteristic game bird of Arizona, still abounds in the immediate vicinity of Prescott, and is taken with comparative ease when the snow is on the ground, though under ordinary circumstances they are among the most difficult of all birds to shoot on the wing with any hope of making a large bag. Their habits in this respect have not improved since I described them in 'The Ibis' about twenty-five years ago.—ELLIOTT COUES, *Fort Whipple, Arizona.*

The Pacific Eider in Kansas.—I desire to announce the capture of a young male of the Pacific Eider (*Somateria v-nigra*). This specimen was killed by A. L. Weidman, a hunter, about six miles from Lawrence along the Kansas River. I think this is the first instance of the capture of this species in the United States east of the Rocky Mountains. The measurements of the specimen are as follows: length, 25.50 inches; extent of wings, 41.00; wing, 11.75; tail, 4.75; culmen, 1.80; tarsus, 2.35; middle toe and claw, 3.25.—F. H. SNOW, *Lawrence, Kansas.*

Anas carolinensis and *Gallinago delicata* in Winter.—Mr. John B. Rodgers brought into the Quincy Market, Boston, Mass., on February 2, 1892, one Green-winged Teal, and four Wilson's Snipe, which he had shot at West Barnstable, Cape Cod, Mass., probably a day or so before. Both the Teal and the Snipe were very fat.—GEORGE H. MACKAY, *Nantucket, Mass.*

The Migration of *Charadrius dominicus* in Massachusetts in 1891.—Nantucket Island, August 20, 1891.—First arrival of American Golden Plover late this afternoon, about twenty in the flock. The next flock to appear was a dozen or fifteen on the 28th. Some were heard passing over the town on the night of the 27th. The weather since the 20th had been warm and humid with light southwest wind, with considerable fog which was very thick during the night and late afternoon, clearing up during the daytime. I drove constantly over the Plover ground, but no birds had landed. I saw two and shot one on the 29th.

August 30.—The wind was northeast at daylight and it was raining; later it backed all around the compass to northeast again, raining continuously all day, with considerable wind at times, and at others calm. Some Plover were heard whistling as they passed over the town last night and a very few landed, two or three flocks being seen the next day. August 31, I was on the Plover ground at daylight; the sky was lowering and atmosphere misty, almost rain; wind steady northeast all day. I had anticipated a landing of Plover, but was disappointed, only a few birds were seen. I saw one flock of thirty flying south on migration, high up. Quite a number passed the east side of the island tonight, but none landed. September 1, the weather was about the same as yesterday, and good for landing birds, but none to speak of came down. I saw this morning a flock of at least one hundred, high up, flying south on migration, also saw flocks eight and thirteen, respectively, which had landed. I was out from early morning until afternoon.

From the last date there was nothing to note until Sept. 6, on which day I was on the Plover ground at daylight; the wind was southwest and there was a dense fog which had prevailed all night, good weather to land the birds; there was a rain squall at 12.30, noon, the wind backed up as far as southeast, and the fog lifted over portions of the island. I saw only four Golden Plover, two of which I shot; no birds were reported as having been seen today.

Sept. 7.—There was quite a hard local northeast rain today, and tonight at about 8.30, a number of flocks of Plover were heard whistling as they passed over the town; none landed.

Sept. 12.—I drove over the western portion of the island; I saw only seven Golden Plover, four of which I shot from my wagon. It was a calm, pleasant day with a little air from the south. One of the above birds was a Palebelly (young), the first shot this season. The stomachs of these birds I sent to New York where they were examined by Mr. Buetenmüller, the entomologist of the American Museum of Natural History, to

whom I am indebted for the following information regarding their contents. In one they are composed almost wholly of the elytra and other hard parts of a small weevil (*Otiorynchus ovatus*); another had only coarse gravel, the ovipositors of a large ichneumon, and a few fine fragments of other insects; remains of a coleopterous larva were abundant in one or two of the stomachs with unidentifiable parts of a number of other insects.

Sept. 14. Siasconset.—Four good-sized flocks of Golden Plover passed here this morning during a severe rain squall; they were flying on migration; none came down to land; there were about two hundred and fifty birds in the aggregate.

There was nothing to note between the last date and Sept. 25; about sunset on this day two flocks of young birds passed from the east towards the west, very low down, the aggregate numbers of which were estimated at about sixty. They alighted for a few moments on the crest of the outside beach at the south side of the island, and then flew again towards the west, keeping close to the ground.

The result of the season of 1891 shows much favorable weather for landing the birds. It also shows that few birds happened to be passing during such periods, and consequently few were deflected over the island or came down to rest or feed. It bears out my view, before expressed, that these birds *will not stop*, unless compelled by adverse weather.

I have the following note from an acquaintance.—Malpeque, Prince Edward Island, August 24, 1891, the first movement of American Golden Plover today; one hundred and eighteen were seen; none were shot. The weather was like April, wind southeast, first rain, then clear, then rain again in the afternoon. There was no defined large movement after this date, the birds coming along in scattering flocks almost daily. No birds were noted at Tignish (northeast end of the island) until August 31, when a good many were seen.—GEORGE H. MACKAY, *Nantucket, Mass.*

The Golden Eagle in Pennsylvania.—On Nov. 6, 1891, a Golden Eagle was shot near Manheim, a dozen miles from here, and was brought to me the next day. It was an immature male in good condition. This is the first instance which I have known of the bird's occurrence in this vicinity for thirty-five years. Until about 1856, for many years, a pair is said to have nested every year in the southern part of the county on a lofty, jutting cliff overlooking the Susquehanna River.—M. W. RAUB, *Lancaster, Pennsylvania.*

The Golden Eagle in Ohio.—On Nov. 10, 1891, Mr. O. B. Franks, a farmer living about five miles south of Wooster, shot a Golden Eagle (*Aquila chrysaetos*) from a tree in the vicinity of his house. It was in immature plumage, and upon examination proved to be a male. In its stomach were found the remains of a bird. The species seems sufficiently rare in this region for its occurrence to merit notice.—HARRY C. OBERHOLSER, *Wooster, Ohio.*

Nesting of the Golden Eagle in Arizona. — In 1866 I included this Eagle among the birds of Arizona, but was without details of its occurrence in the Territory. Its permanent residence about Fort Whipple is attested by my friend, Mr. H. H. Keays, who possesses two eggs taken by himself from an eyrie on Thumb Butte, overlooking the city of Prescott, March 2, 1891. This butte is the most notable landmark in the immediate vicinity, forming an almost columnar mass of rock on top of a small mountain, reached by a devious and somewhat difficult Indian trail on the southern side. On reaching the top, and looking down a nearly sheer wall for a hundred feet or more, Mr. Keays observed the female Eagle on the nest. At no little risk of his life, he managed to descend to the nest through a sort of crevice in the face of the rock, and with the help of a pine tree that grew there, into whose top he first landed. The eggs were fresh at the date mentioned. The eyrie was a very old one, doubtless resorted to by many successive pairs of Eagles from time out of mind, as attested by its great size, and the quantity of rabbit skulls and other bones of rodents. — ELLIOTT COUES, *Fort Whipple, Arizona*.

Melanerpes carolinus in Madison County, New York, in Winter. — In December, 1885, I saw a Woodpecker which was unfamiliar to me, near Peterboro, Madison Co., N. Y. The bird was on high ground, in the midst of an extensive wood lot of large deciduous trees intermingled with hemlocks and a few white pines. He was very shy, and soon flew to the top of a tall pine from which my shot failed to dislodge him. My next visit to the place was on February 16, 1886. This time I again saw the bird, or one that I immediately recognized as belonging to the same species. On the next day I secured the specimen. It proved to be an adult male *Melanerpes carolinus*. The bird was in good condition, with stomach well filled with fragments of beech nuts.

Peterboro is fourteen miles south of Oneida Lake, and about 900 feet above that body of water. — GERRIT S. MILLER, JR., *Cambridge, Mass.*

The Whippoorwill Wintering near Charleston, South Carolina. — A fine adult male of this bird was brought to me on February 7 of this year. Upon skinning the bird, I was struck by finding it in fine condition. It was very fat and nearly equalled shore birds in this respect. This is certainly the first record of this species wintering in the State, and, as far as I know, the first for the United States. — ARTHUR T. WAYNE, *Mt. Pleasant, South Carolina*.

The Prairie Horned Lark (*Otocoris alpestris praticola*) Breeding in New Hampshire and Massachusetts. — That the Prairie Horned Lark is gradually extending its breeding range eastward, recent records clearly prove. The first account of its breeding in New England appeared in the 'Ornithologist and Oölogist,' Vol. XIV, p. 87, June, 1889, where Mr. C. H.

Parkhill records it as nesting in Cornwall, Vermont. On the 4th of June, 1891, my brother observed two of these birds haunting an old field in the town of Franconia, New Hampshire. The number was afterwards augmented by what were doubtless the second-brood young. He saw them near the same spot as late as the 21st of July. Mr. J. B. Grimes, an intelligent observer of birds in North Adams, Massachusetts, informs me that the Prairie Horned Lark breeds in North Adams and Williamstown at the base of the Saddleback Mountain range and he has shown me two specimens killed there the last of March, 1890, and the 13th of April, 1891—the breeding season of the bird in this latitude.—WALTER FAXON, *Museum of Comparative Zoölogy, Cambridge, Mass.*

The Prairie Horned Lark in Northeastern Pennsylvania.—I shot a typical specimen of *Otocoris alpestris praticola*, June 12, 1891, at Athens, Bradford Co., Pennsylvania. Another of the same species accompanied it. Mr. W. K. Park had informed me that a few were to be found every summer in the vicinity, and that he thought he could show me some. He was as good as his word, and the breeding range of this species in Pennsylvania must now be extended much further eastward than the character of the country would indicate.—JONATHAN DWIGHT, JR., *New York City.*

A Correction.—In my paper on *Molothrus* (Auk, 1891, p. 344) an unfortunate printer's error in the key to the species is liable to perplex anyone using it in the determination of specimens. *M. cabanisii* is there placed under the division 'B,' while it should be placed under division 'A' as a third subdivision, and should bear the heading, 'c' instead of 'b' as printed.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

Some Bird Notes from Litchfield, Connecticut.—*Strix pratincola*.—On the 28th of August, 1891, a Barn Owl was shot while flying over a small pond near the village, at dusk. This is a rare bird in Connecticut, and it is apparently the first record for this part of the State. It is now in my collection.

Turdus aonalaschkæ pallasii.—I have recorded, on July 2, two birds flying along the Bantam,—a good-sized brook near the village,—one of which on being shot proved to be a young Hermit Thrush in the speckled plumage. The date and markings suggest the probability that it was one of a brood reared in the neighborhood.

Cistothorus stellaris.—The occurrence in this locality of this species, breeding seems also worthy of note.

Geothlypis agilis was present in unusually large numbers between September 18 and October 5. I have no record of it for this part of the State prior to this fall, but between the above dates I met with from one to four almost daily, which numbers, considering the extreme shyness manifested by them, would indicate comparative abundance.—LEWIS B. WOODRUFF, *New York City.*

Some Birds Recently Added to the Collection of the New York State Museum. — During the year closing Sept. 30, 1891, the following interesting birds have been added to the New York State Museum's collection.

A pair of Evening Grosbeaks (*Coccothraustes vespertina*). These birds are interesting because they were shot at Wayland, Steuben Co., N. Y., in February, 1890. The locality is an unusual one for the species. The irruption of the species into the State of New York from the westward in 1890 has already been noticed in 'Forest and Stream.'

A pair of Heath Hens (*Tympanuchus cupido*). The female was taken on the Island of Martha's Vineyard, on December 24 or 25, 1890. Her measurements, taken after mounting, are: length, 15 inches; length of wing, 8.50 inches. The male was taken at the same locality on December 22, 1890. His measurements, taken while in the flesh, were reported to me as follows: "Length, 16 inches; expanse, 28 $\frac{3}{4}$ inches; wing, 12 $\frac{1}{2}$ inches." The length of the wing, as given above, means the length of the expanded wing. The length of the wing from the carpal joint to the end of the longest primary is 8.75 inches (measured on the mounted bird). His crop was reported to contain leaves and grasshoppers.

A Turkey Buzzard (*Carthartes aura*), an adult, probably a male, shot in the town of Clarendon, Orleans Co., N. Y., on July 18, 1891, by Mr. A. E. Snyder. Attention is called to this specimen because of the locality in which it was taken. The Turkey Buzzard is said to be of rare occurrence so far north.

Last spring Mr. Frank A. Ward of Rochester told me that he had in his possession a bird, taken near Lake Ontario, which he supposed to be a Harlan's Hawk. He afterwards changed his mind about the name of the bird, as he sent it to me without a name. It proved to be a rather immature specimen of the Black Gyrfalcon (*Falco rusticolus obsoletus*). Mr. Austin F. Park of Troy has since seen the specimen and confirms my opinion that the bird is a Black Gyrfalcon. It is a female, and was shot near Lake Ontario, in Monroe Co., N. Y., in October, 1890. The label sent with the specimen contains the following field-notes. — "Length, 22 $\frac{1}{2}$ inches; tail, 9 $\frac{1}{2}$ inches; wing, 15 $\frac{1}{2}$ inches; spread 51 inches. Cere and feet gray (not so bright a gray as in the Osprey)." This is the only specimen of Black Gyrfalcon that I have ever had an opportunity to examine. Its color is very dark. Dr. F. J. H. Merrill of the New York State Museum, who has seen the specimen exhibited in the U. S. National Museum, assures me that our specimen is several shades darker. — WM. B. MARSHALL, *New York State Museum, Albany, N. Y.*

Winter Birds of Cape May, New Jersey. — In the early part of the present year Mr. S. N. Rhoads and myself spent a few days (January 26-29) at Cape May City, N. J., with the object of investigating the avifauna of the vicinity. The weather at the time of our visit was extremely cold, and of course no migration had begun at this early date, so that we could without question consider all the species found by us as regular

winter residents in that vicinity. Of the list of thirty-four species observed by us the following seem worthy of note.

Otocoris alpestris.—Immense flocks.

Molothrus ater.—A small flock.

Poocætes gramineus.—Flock of a dozen or more.

Ammodramus princeps.—Two shot on the sand-hills, and there were no doubt others, as we failed to make a very careful search for them.

Ammodramus sandwichensis savanna.—Common in flocks.

Spizella pusilla.—Several flocks.

Melospiza georgiana.—Common on the marshes.

Passerella iliaca.—Several seen.

Dendroica coronata.—Tolerably common among the pines.

Cistothorus stellaris.—Several secured on the marshes.

Cistothorus palustris.—Tolerably common in cat-tail swamps.

Parus carolinensis.—This was the only Chickadee to be found; indeed I have never seen any *P. atricapillus* from southern New Jersey.

Among other species may be mentioned *Cathartes aura*, *Colaptes auratus*, *Agelaius phœniceus*, *Sturnella magna*, *Spinus pinus*, *Cardinalis cardinalis*, *Thryothorus ludovicianus*, *Merula migratoria*, *Sialia sialis*, most of which are regular winter residents in the vicinity of Philadelphia. —WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Notes on a Few Louisiana Birds.—The following observations were made at Calumet Plantation, Parish of St. Mary's, Louisiana, during October, November and December, 1889; July, 1890, to March, 1891; and June to November, 1891; and relate to a narrow strip of territory extending along both banks of Bayou Teche, near the town of Patterson. Other interests have prevented as yet very close attention to the birds. The following notes are offered for what they may be worth, in the hope that they will be followed later by a more complete list of the birds of this very interesting region.

Ægialitis vocifera.—Resident throughout the year, but locally rare in the breeding season. Very abundant in fall and winter, first appearing in any numbers about the last of September. Frequents open fields and margins of waterways, and the characteristic cry is often heard late into the night.

Colinus virginianus.—Very common at all seasons, breeding locally in cane and corn fields.

Zenaidura macroura.—Exceedingly common in fall and winter when pursued as game. Lingers late, and a few breed.

Cathartes aura.—Common.

Catharista atrata.—Common. It is interesting to note that this and the foregoing species seem to alternate, each occupying the field for a time very nearly to the exclusion of the other. The Turkey Buzzard, in spring and early summer, is not very common, and the Carrion Crow is quite rarely seen. As the season advances, the former species soon becomes abundant, while comparatively few of the latter are among them,

In September there seems to be an increase of the Carrion Crows, and a diminution of the Turkey Buzzards, and gradually these are less and less often observed, until by November they are comparatively scarce, remaining so through the rest of the winter.

Parabuteo unicinctus harrisi.—Fairly common in winter, hovering low over open land. One specimen taken in October.

Falco columbarius.—Not very many noted. One example taken Oct. 5, 1891.

Falco sparverius.—Very numerous from September to March. Have never seen one here in summer.

Syrnium nebulosum alleni.—Quite common. This is locally the commonest hooting Owl about houses. Between August and November, 1891, five of these Owls were shot in the grounds about the plantation residence.

Coccyzus americanus.—Common in summer, and breeds locally in some numbers.

Sphyrapicus varius.—One specimen shot in November, 1890, in the swamp.

Colaptes auratus.—Common in winter and very abundant in early spring. Confined strictly to the swamp lands. Not very many noted in summer.

Chordeiles virginianus.—Abundant in summer, breeding in grassy fields.

Chætura pelagica.—Not at all common, even as a migrant. A few noted in April and in August, 1891.

Trochilus colubris.—A small number breed, but from the first week in August onward thousands are present, staying until late in October, and always to be found as long as the flowers of the cypress vine and trumpet creeper bloom.

Tyrannus tyrannus.—Very scarce locally, the only two specimens noted being seen on July 11 and 20, 1891. Probably more common in higher districts within a few miles.

Sayornis phœbe.—Rather common and breeds.

Agelaius phœniceus.—One of the most abundant of local breeders. About the middle of August this species, as also the Great-tailed Grackle, becomes temporarily scarce, presumably leaving for the better feeding grounds of the rice districts further northward. Returning later, much swelled in numbers, they continue abundant until about April first, when the departure of migrants thins the ranks appreciably.

Scolecophagus carolinus.—An abundant spring and fall migrant. A female secured from a flock seen Jan. 19, 1891. This species, when here, does not associate with other Blackbirds.

Passerina ciris.—Very abundant. One of the few birds breeding in the cane fields.

Progne subis.—Common from April to August, breeding wherever boxes or gourds are prepared for them. They generally disappear quite early in the autumn; the last brood is usually fledged by the middle of August.

Chelidon erythrogaster.—Fairly common as a spring and fall migrant.

Tachycineta bicolor.—Like the preceding species, but more abundant and remaining for a longer period in the fall. Flights noted as late as November 25.

Merula migratoria.—Abundant in flocks during winter. Sometimes lingers as late as March 17. Is hunted as game while here, and soon becomes very shy of approach.

Passer domesticus.—This introduced species has appeared in this locality within the past five years, and has increased in numbers so rapidly that at the present time it is as common as in any northern town. Particularly abundant in summer, nesting in colonies among the live-oaks and using the common long moss with a few feathers as building material.—FRANK E. COOMBS, *Patterson, La.*

An Overlooked Volume.—In the Bibliographical Appendix to Dr. Coues's 'Birds of the Colorado Valley,' I can find no reference to a small volume in my library, a short account of which will doubtless be of interest to the students of Kentucky ornithology. It consists of a series of letters by G. Imlay, written and published during the latter part of the last century, entitled, "History of Kentucky,"* and containing among other things a catalogue of the mammals and birds of the State. Some forty-two species of the former are given, and their distribution is defined by the degrees of latitude between which they are common. The list of birds is considerably larger, a hundred and twenty-eight species in all being enumerated, for the most part under the Linnæan as well as the vernacular names. Unfortunately all reference to the distribution and abundance of the various species is omitted, thus detracting much from the value of the list. The Carolina Parakeet (*Conurus carolinensis*) and the "Large pouch pelican," (*Pelecanus fuscus?*) are among the birds mentioned.—J. H. PLEASANTS, JR., *Baltimore, Md.*

*A | Topographical Description | of the | Western Territory | of | North America; | containing | a succinct account | of its | Climate, Natural History, Population, | Agriculture, Manners and Customs, | with | an ample description of the several divisions into which that country is divided. | And an accurate Statement of the various Tribes of | Indians that inhabit the Frontier Country, | to which is annexed | a delineation of the laws and government | of the | State of Kentucky, | tending to shew the probable rise and | grandeur of the American Empire, | in a series of letters to a friend in | England. | By G. Imlay, | A Captain in the American Army during the late War, and a Commissioner | for laying out Land in the Back Settlements. | New-York: | printed | by Samuel Campbell, | no. 37, Hanover Square: | MDCCXC-III. 2(?) vols. 8vo. Vol. I, pp. (i)—(xxiii), [25]—[260], map. Mammals and birds, vol. I, pp. [202]—[209].

NOTES AND NEWS.

THE BLACK-FRONTED WARBLER (*Dendroica nigrifrons* Brewst.) figured in the January number of the present volume of 'The Auk', was described by Mr. Brewster (Auk, VI, Jan. 1889, p. 94) from specimens taken at Pinos Altos, Chihuahua, Mexico, in June and July, 1888, by Mr. M. Abbott Frazar, and is one of Mr. Frazar's most interesting discoveries in the Sierra Madre region of Mexico. This forms one of the series of species which Mr. Brewster will notice more at length in some future number of this journal. By inadvertance no reference to the plate was given in the January issue.

THE AUDUBON MONUMENT COMMITTEE of the New York Academy of Sciences is able to report subscriptions to the amount of \$9000, nearly one half of which, however, is contingent upon the raising of the total sum of \$10,000, as originally proposed. Under these conditions it should be easy to secure promptly the remaining one thousand dollars, which the committee is sanguine will soon be forthcoming. The erection of the monument now seems assured, and it is expected that the work will be completed by October of the present year.

The unveiling of the monument will be attended with appropriate public exercises, including an oration by some prominent representative of the American Ornithologists' Union. It is hoped that those who may have withheld their contributions through fear of the ultimate failure of the project will now lend a hand in completing the amount necessary to give the Committee the required sum for successfully consummating their labor of love. Remittances may be sent to Mr. William Dutcher, treasurer of the A. O. U. Audubon Monument Committee, 525 Manhattan Ave., New York City, or to Dr. N. L. Britton, Treasurer of the Academy of Sciences Committee, Columbia College, New York City.

THE WESTERN PENNSYLVANIA ORNITHOLOGICAL ASSOCIATION was organized in Alleghany City, Pa., Dec. 30, 1891, with the following officers: President, Dr. A. D. Johnston, of Alleghany; Vice-President, Thomas Harper, of Alleghany; Secretary and Treasurer, H. H. Wickham, of Beaver. The Society has already a membership of twenty-six persons, who propose to study carefully the avifauna of their respective districts, with a view to elucidating the ornithology of the western half of the State of Pennsylvania. Such organized effort is always a subject of congratulation, and much benefit must result not only to those personally engaged in such work but also to the science of ornithology.

A MONOGRAPH of the Birds of Paradise, by Dr. R. Bowdler Sharp, of the British Museum, is announced as in course of preparation. It will be published by Henry Sothorn & Co., 17 Piccadilly, London, in six parts,

forming one volume imperial folio, at a cost to subscribers of three guineas per part. Most of the species have already been figured in Gould's 'Birds of New Guinea,' and where practicable, Gould's plates will be utilized, but in many cases the species will be re-drawn, and wholly new plates added of the many striking species only recently described. Each will contain ten magnificent hand-colored illustrations, and the edition will be limited to 350 copies.

DR. EDGAR A. MEARNS, U. S. A., has been detailed as surgeon and naturalist to the United States and Mexican Boundary Commission, which is to re-locate and permanently mark the international boundary line. The Commission left El Paso early in March, and the march to the Pacific coast and return is expected to occupy rather more than two years. As the survey will thus move slowly, Dr. Mearns will doubtless have excellent opportunity for field work and collecting, and in view of his boundless energy and untiring industry we may safely look forward to important scientific results from his labors.

MR. S. N. RHOADS, of Philadelphia, has started on a six months' collecting trip to British Columbia. He intends first to spend a month cruising in Puget Sound and along the northeast coast of Vancouver Island, and then to visit the Cariboo Lake region of central British Columbia, and thence work southward to the Columbia River, along the western slope of the Selkirks, as far as the United States boundary. He will devote himself especially to birds and mammals.

MR. ROBERT C. L. PERKINS of London, England, recently sailed for the Hawaiian Islands, via New York, to spend several years in a thorough exploration of the bird and insect life of this group of islands, where in these departments of zoölogy much still remains to be done. Notwithstanding the attention of late given to the birds of the Hawaiian group, it is believed a rich harvest still remains ungathered.

CUBA seems just now to be attracting to an unusual degree the attention of American ornithologists. In February Mr. Frank M. Chapman, of the American Museum of Natural History, began a two months' exploration of portions of the southern coast of the island, and Mr. C. B. Cory, with a trained assistant, has resumed his field investigations of the Cuban avifauna.

MR. W. E. D. SCOTT selected the vicinity of Fort Myers, Florida as his field for ornithological work during the past winter, he reaching Fort Myers the last of November. His explorations of this slightly known field have been attended with interesting results, which later will be made known to the readers of 'The Auk.'





A. Heen & Co. Lithographic, Baltimore.

RIO GRANDE TURKEY.
MELEAGRIS GALLOPAVO ELLIOTI SENNETT.

337

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No. 3.

NOTES ON THE BIRDS OF THE CALOOSAHATCHIE
REGION OF FLORIDA.

BY W. E. D. SCOTT.

ON the 21st of November, 1891, the writer began to make a series of observations on the bird fauna of the region which is in the vicinity of the Caloosahatchie River, Florida, and this work was continued until April 26, the whole period extending over some five months. The collections made were obtained on both sides of the river and from ten to twenty miles in either direction. In an east and west course work was done from Punta Rassa to and past Lake Flirt, or nearly half way across the peninsula. The material obtained aggregated about twelve hundred birds, so that a fair representation of the forms was acquired, in good series.

The central point, selected as a base to work from, was the town of Fort Myers in Lee County, which is distant from the Gulf some twenty miles, and from Lake Flirt about forty-five miles. The river, which formed the line worked over from Punta Rassa to Lake Flirt, is for its first twenty or twenty-five miles really an arm of the Gulf, being salt for a great part of the year and always subject to tide influence, though the rise and fall is inconsiderable. For this twenty-five miles it is a broad stream, rarely less than one and often more than two miles in width, and in the channel it ranges from five to fifteen feet in depth. At Punta Rassa and for the distance just indicated, from that place going up the river, there is more or less mangrove along the immediate edge of the water.

These mangrove swamps, though conspicuous from the river, do not extend back for more than a very short distance, and are not of sufficient area anywhere to afford breeding grounds for aquatic birds. But at most points along this part of the stream the pine forests come down close to the water; there is some salt marsh, especially in the vicinity of Punta Rassa, and at points a fringe of cabbage palmettos or mangroves separates the pine woods from the absolute edge of the water. All through these pine forests are 'bay heads' of greater or less extent, the largest covering but a few acres, and cypress swamps, sometimes small, and again extending for many miles in length, though only a few hundred yards wide, defining generally ponds, or chains of ponds running into one another, as the case may be. These two variations are the only breaks to the monotony of the low, flat, pine forests of this region, and may be looked upon, from an ornithological standpoint, as islands, whose inhabitants make excursions into the sea—the pine forests—which surrounds them, but who are really in the main dwellers in the two kinds of localities referred to briefly above.

The land for the whole river region visited, is highest immediately at the river, or just back from it, and becomes low and very flat a mile or more away from the stream. This applies to the stream nearly as far up as Fort Thompson, where different conditions exist which will be described later.

Twenty-five miles above Punta Rassa, the stream begins to grow narrower, and in two or three miles more it is rarely over a hundred yards wide, is influenced but little by the tide, and its water is always fresh, and there is a very appreciable and constant current toward the Gulf, gradually growing swifter as Lake Flirt is approached.

The pine woods no longer come out to the bank of the river, but a kind of hammock growth is constant along its shores, and the most conspicuous growth in these hammocks, which increase in area as the river is ascended, is the cabbage palmetto, though the other trees generally found in the hammocks of Florida are present in varying proportions, the one exception being the magnolia, *M. grandiflora*, which is noticeably absent from the entire 'Caloosa Region.'

Leaving the details of this upper river country to be described from time to time in the following pages, as becomes essential

in dealing with special forms of bird life, I propose to give, first, a list of all the species that have been recorded from this area, and second, some account of such forms as are of particular interest.

In the following list the resident breeding species are indicated by a star; migrant species that breed by a star and the letter M; regular migrants by the letter M; these latter do not remain to winter or summer, being only of passage in spring and fall. The letter W indicates species that are migrants, but of which enough representatives remain during the winter to allow the species to be regarded as resident and not casual at that season. The letter R added to the foregoing indicates rare species, and the letter A those that are accidental.

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| 1. <i>Colymbus auritus</i> , W. | 28. <i>Lophodytes cucullatus</i> . * |
| 2. <i>Podilymbus podiceps</i> , W * R. | 29. <i>Anas boschas</i> , W. |
| 3. <i>Urinator imber</i> , W. | 30. <i>Anas fulvigula</i> . * |
| 4. <i>Urinator lumme</i> , W. | 31. <i>Anas americana</i> , W. |
| 5. <i>Stercorarius parasiticus</i> , W R. | 32. <i>Anas carolinensis</i> , W. |
| 6. <i>Larus argentatus smithsonianus</i> , W. | 33. <i>Anas discors</i> , W. |
| 7. <i>Larus delawarensis</i> , W. | 34. <i>Spatula clypeata</i> , W. |
| 8. <i>Larus atricilla</i> . * | 35. <i>Dafla acuta</i> , W. |
| 9. <i>Larus philadelphia</i> , W. | 36. <i>Aix sponsa</i> . * |
| 10. <i>Gelochelidon nilotica</i> , M. | 37. <i>Aythya affinis</i> , W. |
| 11. <i>Sterna teschegrava</i> , M R. | 38. <i>Aythya collaris</i> , W. |
| 12. <i>Sterna maxima</i> . * | 39. <i>Charitonetta albeola</i> , W R. |
| 13. <i>Sterna sandvicensis aculflavida</i> , * M. | 40. <i>Eristamata rubida</i> , W R. |
| 14. <i>Sterna forsteri</i> , W. | 41. <i>Chen hyperborea nivalis</i> , W R. |
| 15. <i>Sterna hirundo</i> , M. | 42. <i>Phœnicopterus ruber</i> , M R. |
| 16. <i>Sterna dougalli</i> , M. | 43. <i>Ajaja ajaja</i> . * |
| 17. <i>Sterna antillarum</i> , * M. | 44. <i>Guara alba</i> . * |
| 18. <i>Sterna fuliginosa</i> , M R. | 45. <i>Plegadis autumnalis</i> , W. |
| 19. <i>Hydrochelidon nigra surinamensis</i> , M. | 46. <i>Tantalus loculator</i> . * |
| 20. <i>Anous stolidus</i> , A. | 47. <i>Botaurus lentiginosus</i> , W. |
| 21. <i>Rynchops nigra</i> . * | 48. <i>Botaurus exilis</i> . * |
| 22. <i>Anhinga anhinga</i> . * | 49. <i>Botaurus neoxenus</i> , * R. |
| 23. <i>Phalacrocorax dilophus floridanus</i> . * | 50. <i>Ardea occidentalis</i> , M R. |
| 24. <i>Pelecanus erythrorhynchus</i> , W. | 51. <i>Ardea wuerdemanni</i> , M R. |
| 25. <i>Pelecanus fuscus</i> . * | 52. <i>Ardea wardi</i> . * |
| 26. <i>Fregata aquila</i> . * | 53. <i>Ardea egretta</i> . * |
| 27. <i>Merganser serrator</i> , W. | 54. <i>Ardea candidissima</i> . * |
| | 55. <i>Ardea rufescens</i> , * R. |
| | 56. <i>Ardea tricolor ruficollis</i> . * |
| | 57. <i>Ardea cœrulea</i> . * |
| | 58. <i>Ardea virescens</i> , * |

59. *Nycticorax nycticorax* næv-
ius. *
60. *Nycticorax violaceus*. *
61. *Grus mexicana*. *
62. *Aramus giganteus*. *
63. *Rallus elegans*. *
64. *Rallus crepitans*, W R.
65. *Rallus scottii*, * R.
66. *Rallus virginianus*, W R.
67. *Porzana carolina*, W.
68. *Porzana jamaicensis*, M R.
69. *Ionornis martinica*. *
70. *Gallinula galeata*. *
71. *Fulica americana*, W.
72. *Himantopus mexicanus*, * R.
73. *Philohela minor*, W R.
74. *Gallinago delicata*, W.
75. *Macrorhamphus griseus*, W.
76. *Macrorhamphus scolopaceus*,
W R.
77. *Micropalama himantopus*, M
R.
78. *Tringa canutus*, M.
79. *Tringa maritima*, A.
80. *Tringa maculata*, M.
81. *Tringa fuscicollis*, M.
82. *Tringa minutilla*, W.
83. *Tringa alpina pacifica*, W.
84. *Ereunetes pusillus*, W.
85. *Ereunetes occidentalis*, W.
86. *Calidris arenaria*, W.
87. *Limosa fedoa*, W.
88. *Totanus melanoleucus*, W.
89. *Totanus flavipes*, W R.
90. *Totanus solitarius*, M.
91. *Symphemia semipalmata*. *
92. *Symphemia semipalmata in-*
ornata, W R.
93. *Bartramia longicauda*, M.
94. *Actitis macularia*, M.
95. *Numenius longirostris*, * R.
96. *Numenius hudsonicus*, M.
97. *Numenius borealis*, M.
98. *Charadrius squatarola*, W.
99. *Charadrius dominicus*, W.
100. *Ægialitis vocifera*, W.
101. *Ægialitis semipalmata*, W.
102. *Ægialitis meloda*, W.
103. *Ægialitis wilsonia*, * M.
104. *Arenaria interpres*, W.
105. *Hæmatopus palliatus*, * R.
106. *Colinus virginianus florid-*
anus. *
107. *Meleagris gallopavo osceola*. *
108. *Columba leucocephala*, A.
109. *Zenaidura macroura*. *
110. *Columbigallina passerina*. *
111. *Cathartes aura*. *
112. *Catharista atrata*. *
113. *Elanoides forficatus*, * M.
114. *Elanus leucurus*, * R.
115. *Ictinia mississippiensis*, W.
116. *Rostrhamus sociabilis*. *
117. *Circus hudsonius*, W.
118. *Accipiter velox*, W.
119. *Accipiter cooperi*, W.
120. *Buteo borealis*, * R.
121. *Buteo lineatus alleni*. *
122. *Buteo latissimus*, M.
123. *Buteo brachyurus*, * R.
124. *Haliaëtus leucocephalus*. *
125. *Falco peregrinus anatum*, W.
126. *Falco columbarius*, W.
127. *Falco sparverius*. *
128. *Polyborus cheriway*. *
129. *Pandion haliaëtus carolinen-*
sis. *
130. *Strix pratincola*, * R.
131. *Syrnium nebulosum alleni*. *
132. *Megascops asio floridanus*. *
133. *Bubo virginianus*. *
134. *Speotyto cunicularia florid-*
ana. *
135. *Conurus carolinensis*, M R.
136. *Coccyzus minor*, * M R.
137. *Coccyzus americanus*, * M.
138. *Coccyzus erythrophthalmus*,
M R.
139. *Ceryle alcyon*. *
140. *Campephilus principalis*. *
141. *Dryobates villosus audu-*
bonii, *
142. *Dryobates pubescens*. *
143. *Dryobates borealis*. *

144. *Sphyrapicus varius*, W.
 145. *Ceophæus pileatus*. *
 146. *Melanerpes erythrocephalus*, * R.
 147. *Melanerpes carolinus*. *
 148. *Colaptes auratus*. *
 149. *Antrostomus carolinensis*, * M.
 150. *Antrostomus vociferus*, W R.
 151. *Chordeiles virginianus chapmani*, * M.
 152. *Chætura pelagica*, * M.
 153. *Trochilus colubris*, M.
 154. *Tyrannus tyrannus*, * M.
 155. *Tyrannus dominicensis*, * M.
 156. *Myiarchus crinitus*. *
 157. *Sayornis phæbe*, W.
 158. *Contopus virens*, M.
 159. *Empidonax acadicus*, M R.
 160. *Cyanocitta cristata florincola*. *
 161. *Aphelocoma floridana*. *
 162. *Corvus americanus floridanus*. *
 163. *Corvus ossifragus*. *
 164. *Dolichonyx oryzivorus*, M.
 165. *Molothrus ater*, W R.
 166. *Agelaius phœniceus bryanti*. *
 167. *Sturnella magna mexicana*. *
 168. *Icterus spurius*, M.
 169. *Icterus galbula*, M R.
 170. *Quiscalus quiscula aglæus*. *
 171. *Quiscalus major*, *
 172. *Spinus tristis*, W.
 173. *Pooecetes gramineus*, W.
 174. *Ammodramus sandwichensis savanna*, W.
 175. *Ammodramus savannarum passerinus*, * M.
 176. *Ammodramus henslowii*, W.
 177. *Chondestes grammacus*, W R.
 178. *Spizella socialis*, W.
 179. *Spizella pusilla*, W.
 180. *Peucæa æstivalis*. *
 181. *Peucæa æstivalis bachmani*, W.
 182. *Melospiza georgiana*, W.
 183. *Passerella iliaca*, W R.
 184. *Pip. erythrophthalmus alleni*. *
 185. *Cardinalis cardinalis*. *
 186. *Habia ludoviciana*, M.
 187. *Guiraca cærulea*, * M.
 188. *Passerina cyanea*, M.
 189. *Passerina ciris*, M.
 190. *Piranga erythromelas*, M.
 191. *Piranga rubra*, * M.
 192. *Progne subis*, M.
 193. *Progne cryptoleuca*, * M.
 194. *Chelidon erythrogaster*, W.
 195. *Tachycineta bicolor*, W.
 196. *Clivicola riparia*, M.
 197. *Stelgidopteryx serripennis*. M
 198. *Ampelis cedrorum*, * M.
 199. *Lanius ludovicianus*. *
 200. *Vireo altiloquus barbatulus*, * M.
 201. *Vireo olivaceus*, * M.
 202. *Vireo gilvus*, M.
 203. *Vireo flavifrons*, M.
 204. *Vireo solitarius*, W.
 205. *Vireo solitarius alticola*, W.
 206. *Vireo noveboracensis*, M.
 207. *Vireo noveboracensis maynardi*. *
 208. *Mniotilta varia*, W.
 209. *Protonotaria citrea*, * M.
 210. *Helinaia swainsonii*, M R.
 211. *Helmintherus vermivorus*, M.
 212. *Helminthophila bachmani*, M
 213. *Helminthophila pinus*, M.
 214. *Helminthophila chrysoptera*, M R.
 215. *Helminthophila celata*, W.
 216. *Helminthophila peregrina*, M.
 217. *Compsothlypis americana*. *
 218. *Dendroica tigrina*, M.
 219. *Dendroica æstiva*, * M.
 220. *Dendroica cærulescens*, M.
 221. *Dendroica coronata*, W.
 222. *Dendroica maculosa*, M.
 223. *Dendroica cærulea*, M R.
 224. *Dendroica striata*, M.
 225. *Dendroica blackburniæ*, M.
 226. *Dendroica dominica*. *
 227. *Dendroica virens*, M R.
 228. *Dendroica vigorsii*. *

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| 229. <i>Dendroica palmarum</i> , W. | 245. <i>Cistothorus stellaris</i> , W. |
| 230. <i>Dendroica palmarum hypochrysea</i> , W R. | 246. <i>Cistothorus palustris</i> , W R. |
| 231. <i>Dendroica discolor</i> . * | 247. <i>Cistothorus marianæ</i> , W. |
| 232. <i>Seiurus auropellatus</i> , M. | 248. <i>Sitta pusilla</i> .* |
| 233. <i>Seiurus noveboracensis</i> , M. | 249. <i>Parus bicolor</i> .* |
| 234. <i>Seiurus motacilla</i> , M. | 250. <i>Parus carolinensis</i> .* |
| 235. <i>Geothlypis trichas</i> , M. | 251. <i>Regulus calendula</i> , W. |
| 236. <i>Geothlypis trichas ignota</i> . * | 252. <i>Polioptila cærulea</i> .* |
| 237. <i>Sylvania mitrata</i> , M. | 253. <i>Turdus mustelinus</i> , M. |
| 238. <i>Setophaga ruticilla</i> , W. | 254. <i>Turdus fuscescens</i> , M. |
| 239. <i>Anthus pensilvanicus</i> , M. | 255. <i>Turdus aliciaæ</i> , M. |
| 240. <i>Mimus polyglottos</i> . * | 256. <i>Turdus ustulatus swainsonii</i> , M. |
| 241. <i>Galeoscoptes carolinensis</i> , W. | 257. <i>Turdus aonalaschkæ pallasii</i> , W. |
| 242. <i>Harporhynchus rufus</i> , W. | 258. <i>Merula migratoria</i> , W. |
| 243. <i>Thryothorus ludovicianus missouriensis</i> .* | 259. <i>Sialia sialis</i> .* |
| 244. <i>Troglodytes ædon</i> , W. | |

From the list presented in the foregoing pages a brief discussion of certain species will conclude the present synopsis of the bird fauna of the region under consideration.

Podilymbus podiceps.—A few representatives of this species remain to breed in this portion of Florida.

Stercorarius parasiticus.—It seems probable that this will be found to be of regular occurrence on the Gulf coast of this region. A specimen in my collection (No. 3213) was taken at Marco in the winter of 1884, by Mr. Hart.

Anas fulvigula.—A common resident at Lake Flirt where great numbers may be seen throughout the year. They begin to breed late in April.

Botaurus neoxenus.—Of the seven specimens of this species so far existing in collections, the original type and five of the others were all secured in this part of Florida. It is now known to occur regularly, though probably in small numbers, in Lake Flirt and in the great tracts of sawgrass that surround Lake Okeechobee.

I was taken by Capt. Menge to the points in Lake Flirt where that gentleman had secured specimens, and was shown the exact spots where two at least were shot. There is nothing apparently in the environment that does not exist in many parts of southern Florida, and it seems probable that careful search through the great swamps of sawgrass and maiden-cane, will result in extending very considerably the range of this little-known species. The points where individuals have been secured by Capt. Menge, and others observed, indicate that the birds occur over an area that extends at least fifty miles in one direction by forty in an-

other, and as this area includes almost impassable swamps of the character above indicated, and, as the birds are not at all conspicuous, having much the habits of the smaller Rails, many have doubtless escaped the observation of the few collectors who have worked in this field.

Himantopus mexicanus.—Breeds in this region. Eggs have been taken on Sanibel Island and on the Kissimmee River near where it enters Lake Okeechobee.

Meleagris gallopavo osceola.—This is still a very abundant bird in this part of Florida, though said to be diminishing in numbers every year and to be not nearly so plentiful as it was ten or fifteen years ago. During my stay at Fort Myers from November till March, the open season, the birds were constantly offered for sale in the markets, the price being on the average ten cents a pound for dressed birds. A hen Turkey could generally be bought for from seventy-five cents to a dollar, and a gobbler for from a dollar to a dollar and a half. Only a few years back the regular price paid to the hunters was twenty-five cents each. This I was told by many reliable people who had lived there a dozen years or more. I obtained without difficulty a series of more than thirty, and could readily have secured five times as many. This series bears out fully the characteristics on which the subspecies was based. All of the birds that passed through my hands whether for the collection or the table, were carefully weighed; full-grown gobblers exceeded twelve pounds in weight for the smallest individual, while the largest weighed a little over twenty-two pounds. The hens weighed from four and three-quarters to a little over nine pounds. These results were obtained from weighing rather more than seventy individuals.

These birds breed at this point from the first week in April to May first, but mating begins shortly after March first, and gobblers begin to gobble late in February.

Capt. Menge, who has had great experience with these birds, told me that he had killed gobblers on more than one occasion, which had two beards or tassels on their breasts instead of one as is usually the case. Hen birds sometimes possess small appendages of this sort.

It would seem that these birds, living as they do at this point in cypress swamps and 'bay heads,' have a natural protection that will not allow of their absolute extermination, but unless the exceedingly good laws passed by the last legislature of the State are carefully enforced, the Wild Turkey, still very abundant in this region, is doomed to become in a few years as rare as it has already become in the northern part of Florida.

Polyborus cheriway.—A common species, especially on the upper part of the river. Occasionally observed about Fort Myers where it resorted with *Cathartes aura* and *Catharista atrata* to the slaughter houses and pens. On the large prairie to the north of the river, and not far from Fort Thompson, these birds were quite common, and in early April I found three nests in one day's collecting, though not devoting particular attention to such search. Two of the nests were in cabbage palmettos, twenty-five to forty feet from the ground, and were very like in structure to

the nest of the Common Crow (*Corvus americanus*), but perhaps a little larger. The third nest was in a pine tree on the edge of one of the wooded 'islands' of the prairie. It was similar in structure to the two already spoken of and was about forty feet from the ground. All of these nests contained young birds, and two was the number in each nest. Two taken from the last nest mentioned were probably about three weeks old, and still in the down which was of a dirty cream color, except on the head where the pattern of the dark cap, characteristic of adult birds, was clearly marked by a dark brown down. The wings and back were also darker than the other parts of the bird.

The eggs are laid late in February or early in March, and Capt. Menge tells me that two is the full complement.

Strix pratincola.—A rather rare resident, but of regular occurrence. Capt. Menge found a pair breeding on the hull of an abandoned dredge that had belonged to the company engaged in draining and reclaiming land in the vicinity of Lake Okeechobee, and he tells me the birds are not uncommon in large cypress swamps on the northeast side of the lake.

Megascops asio floridanus.—The number of eggs laid by this subspecies so far as I am aware does not exceed three, being in marked contrast to its northern representative. On April 11 I obtained a female and three young perhaps three days old. The nest was in a deserted Woodpecker's hole in a dead palmetto. On April 13 I took a female, with three eggs almost ready to hatch. The nest was in a location similar to that found on the 11th. In this part of Florida my experience goes to show that the majority of individuals are in the red phase of plumage.

Speotyto cunicularia floridana.—Found commonly on the prairies back of the hammock on the north side of the river, opposite to Fort Thompson. This prairie is known as the 'big prairie,' and reaches from the north bank of the Caloosahatchie to Fort Ogden, and varies in width from twenty to thirty miles, being upwards of fifty miles in extent north and south. It is almost a level plain, there being but little difference, possibly four or five feet, in its elevation at different points. Here and there are ponds and sloughs, from one to fifteen acres in extent. These were all dry at the time of my visit, the week between April 8 and 16. The sloughs sometimes run for many miles and are generally from a hundred feet to a hundred yards wide. There was *no water* in any of these sloughs at the time I visited this region. The water in these ponds and sloughs during the rainy season varies in depth from a few inches to four or five feet. Back from ponds and sloughs the ground rises gradually till an elevation of perhaps three feet is attained, and there is a sparse growth of scrubby saw palmetto, a kind of huckleberry, and some coarse grasses. This is the general character of the growth on the prairie. At varying distances this arid flat expanse is broken by what correspond to the 'bay heads' and cypress swamps of the pine forests already spoken of. The smaller 'islands,' one to five acres in extent, here generally consist of a growth of

cabbage palmetto, and some small oaks. The larger islands, some of which are a couple of miles in length, but rarely more than a few hundred yards wide, have in addition the regular yellow pine forest with a dense undergrowth of thick saw palmetto. Occasionally these include a 'bay head' or a small cypress swamp.

The prairie, however, aside from these breaks in its monotony, reminds one strongly in general character of the arid regions of the southwestern portion of the United States, except, of course for the difference in vegetation.

The Burrowing Owls can hardly be termed gregarious at the points where I found them. The nearest burrows were at least two hundred yards apart, and often five hundred. In a square mile there might be three or four pairs scattered about in this way, and then several miles would generally be traversed before another region inhabited by the birds occurred. The highest parts of the open prairie, away from the wooded 'islands,' the sloughs and ponds, seemed to be the places chosen by the birds for their burrows. I found none nearer than a quarter of a mile to any pond or slough.

The birds were breeding, and I found young about a week old on the 13th of April, and the dozen or more sets of eggs obtained varied from being fresh to being about ready to hatch. This is probably the normal breeding season, as these birds had not been disturbed by any one before. Only one set of young was found out of the twenty-five burrows examined. There were five fledglings in this family.

The burrows were generally about eight feet in length, always bent and twisted in their course, but rarely more than eighteen inches, or at the most two feet, below the surface. The situation of a burrow was always high, dry ground, and where there was some considerable growth of a kind of huckleberry. I can make no generalization as to the course or trend of these burrows from the data gathered in excavating them. No point of the compass seemed to be preferred, and while all of them turned from the course originally started, some bent much more than others. One burrow started in a course that formed an almost complete circle, so that the nest in which it terminated was close to and just to one side of the entrance. At the mouth of the burrow was a mound of sand very like that at the mouth of the hole of the prairie dog of the Plains. Seven was the highest number of eggs found in a set, six were found in several instances, but five seems to be the average number. Judging from abandoned burrows, they are used but a single season, and the birds undoubtedly excavate them themselves. Though the sloughs cut in places considerable gullies, with banks of sand more or less abrupt, I found no burrows in such situations, nor on the edges of or near to the 'cabbage islands.' There was little attempt at nest-making in the chamber in which the burrow terminated, but generally much trash, dry grass, and cow dung, was found just in the mouth of the burrow, and some of this material was frequently found in the nesting chamber.

The male bird sat at the mouth of the burrow on most occasions, the mate usually joining him on his becoming alarmed. In four cases the

female was found upon excavating the burrow, and taken alive. Some pairs of the birds were very unsuspecting, and others again exceedingly wild and systematically shy. In many cases the birds had two burrows, always close together, but one would be quite short, and apparently used but little, probably by the male bird as a roosting place, for I believe these birds to be strictly diurnal, doing most of their hunting, however, in the early morning and evening.

The series of birds of this species obtained at this point, during the week spent there, numbers fifty-three, forty-eight adults and five young birds in the down.

Conurus carolinensis.—This can only be considered a nomadic visitor in this part of Florida. They appear, generally in the fall on the upper waters of the river, in small parties, feeding on the cypress mast. But, from the reliable information furnished by Capt. Menge and others, it appears that they are still common residents, and that they breed in the cypress swamps on the northeast side of Lake Okechobee.

Campephilus principalis.—This species, though not common, is not very rare in this region. I obtained six individuals and saw and heard about as many more. They breed here early in February.

Ceophlœus pileatus.—During early April I found two nests of this species, each containing four fresh eggs. The first, on April 9, was in a dead cabbage palmetto, forty-five feet from the ground, and these eggs were unfortunately broken in being taken from the nest. The second set was taken on April 12, from a nest in a dead pine tree, and the entrance to this nest was but fifteen feet from the ground.

Antrostomus vociferus.—Winters regularly in the vicinity of Fort Myers. During December and January I took two and saw and heard others.

Myiarchus crinitus.—Winters regularly in the vicinity of Fort Myers and Punta Rassa. Several specimens were secured during December, January, and February.

PITTA GRANATINA TEMMINCK ET AUCTORES.

BY D. G. ELLIOT.

MY ATTENTION has lately been called again to the question of the specific difference of the Pittas with black foreheads and crimson napes from Borneo, on the one hand, and from Sumatra and the Malay Peninsula, etc., on the other. I have always con-

tended that the two forms were not specifically distinct, while, per contra, a considerable number of very competent ornithologists have retained them in their writings as two species. The main difference, and the one upon which the separation of the two forms must chiefly depend, is the width of the black frontal band, this in the Bornean bird extending across the top of the head from a line drawn behind the eyes, in the Sumatran and Malayan form only to a line drawn before the eyes, the black not reaching the orbit. Other slight differences in the color of the plumage also exist, but these it is not necessary to discuss at present. The first point that requires to be considered is the nomenclature. Temminck states (Plan. Col., text to pl. 506) that two specimens were brought to Leyden from Borneo by M. Diard, and Schlegel in the *Musèum des Pays-Bas*, *Pitta*, 1863, p. 5, enumerates these as adult females from Pontianak, Borneo. There would seem therefore to be no doubt that Temminck had two Bornean specimens before him. But in his 'Planches Coloriées' he neither figures nor describes the bird that all authors have considered as from Borneo, and have called *Pitta granatina*, but on the contrary his plate represents, and his text describes, the Sumatran and Malaccan bird with the narrow black frontal band not extending back of a line drawn in front of the eyes, in fact, as represented in his figure, not reaching as far as the eye. His description of this part is as follows: "*du noir profond couvre le front, entoure le bec et l'orbite des yeux, et forme au-dessus de cet organe, un large sourcil.*" This is not a character of the Bornean bird, for it has no superciliary stripe, the whole top of the head between the eyes being black, while the Sumatran and Malayan form does possess a black line above the eye.

Now it might naturally at first be supposed from this that both styles of frontal bands occur in Bornean examples of this *Pitta*, and that Temminck had received some with the narrow black line. But we must decline to accept this view of the case, because Schlegel, who was very quick to detect such differences in examples of nearly related specific forms, figures in his work, 'De Vogels van Nederlandsch Indië' (*Pitta*, pl. 5, fig. 3), the Bornean bird with the front half of the head black, and neither in that work nor in the 'Musèum des Pays-Bas,' 1863 and 1874, *Pitta*, does he make any reference to the Sumatran and Malayan

birds, all his specimens having come from Borneo. We must therefore conclude that the bird Temminck received was of the usual style of this *Pitta* from that island. Now where did the bird figured and described in the 'Planches Coloriées' come from?

Huet, the artist who drew plate 506, was a Frenchman, and, I believe, was employed in the Jardin des Plantes, as his son is today, and lived in Paris. It may be that he took as the original of his painting a specimen in the Paris Museum (as was done in some instances by Prêtre, another of Temminck's draughtsmen), no one at the time supposing there were two styles, and that this one happened to be the bird with the narrow frontal band; and that Temminck, also not perceiving any difference, wrote his description in accordance with his plate. That he did not discover any difference need not surprise any one; as for over sixty years, during which time this plate has been published, no ornithologist seems to have noticed the discrepancy that has existed between this figure and the Bornean bird, although the species has been the subject at various times of considerable discussion.

Nine years after this plate was published, Eyton, in the Proceedings of the Zoölogical Society, 1839, p. 104, described the bird from 'Malaya' (!) as *Pitta coccinea*. His description is as follows: "PITTA COCCINEA. P. occipite, nuchâ, corporeque subtus coccineis; alis, dorso, caudâ, strigâque utrinque nuchæ, cyaneis; gutture ferrugineis; lateribus capitis, pedibus, rostroque atris. Long. corp. 8 unc.; rostrum, $\frac{3}{4}$ unc.; tarsi, $1\frac{1}{2}$ unc." It will be noticed that there is no reference whatever to the black frontal band, and his description will answer as well for the Bornean as for the Malaccan bird. Beyond Malaya, he gives no locality, but we may presume he had the bird with the narrow black front. I do not know what became of his type. The consequence of all this is, that the Sumatra and Malayan bird having been described and figured by Temminck as *Pitta granatina*, erroneously given as from Borneo, must bear that name, of which *Pitta coccinea* Eyton, is a synonym, and the Bornean bird is without a name, as no other appellation has ever been given to it. It makes no difference what name Temminck may have attached to the specimens from Borneo in the Leyden Museum, for, as he never described nor figured those birds, his appellation would be simply a manuscript one, and therefore a *nomen nudum*. Gould, in his 'Birds of Asia,' Vol. V, pls. 67 and 68,

figures both forms, under the names they usually go by, and says there is no variation in the width of the frontal bands between the narrow and the wide. I cannot think he could have made a careful examination of a series of specimens belonging to the former, as I have found a very considerable variation among specimens, although I have not yet seen any Malaccan or Sumatran specimens in which the black front passed behind the fore part of the eye, nor any Bornean with a band as narrow as in those specimens from other localities. The post-ocular stripe, and the apical portions of the wing-coverts are of a more silvery and lighter blue, and the general plumage of the adults is darker in the Bornean birds than in the Sumatran or Malaccan, and if they are to be separated the former could only be assigned to a subspecific rank, and in view of its being without a name, as I have shown, may be called *Pitta granatina borneënsis*.

Occiput and nape crimson.

Frontal black band not extending to the eye.....*P. granatina*.

Frontal black band extending behind the eye.....*P. g. borneënsis*.

HABITS OF THE AMERICAN HERRING GULL (*LARUS ARGENTATUS SMITHSONIANUS*) IN NEW ENGLAND.

BY GEORGE H. MACKAY.

THIS Gull is the most abundant of those larger Gulls which pass the late autumn, winter and spring months on the New England coast as well as farther south. Naturally exceedingly wary, they will nevertheless frequent the very heart of civilization if unmolested, and may be seen any day during the winter in the waters surrounding New York City, as also in those around Boston, flying and sailing high up over both cities as they pass from the water on one side to that on the other. Long continued undisturbed occupation of these haunts has rendered them exceedingly gentle and tame. In order to become better acquainted with them under more natural surroundings it will be necessary to remain at the seashore at some place where they can be ob-

served, and watch those birds which live 'along shore,' as such have had their wits sharpened, and evidently have learned that "eternal vigilance is the price of liberty." As a result one becomes acquainted with a most wary, ingenious, and observing bird, ever on the alert to avail itself of all opportunities thrown in its way for obtaining food as well as to preserve its own safety.

This Gull appears on the New England coast early in September, and at times a few the very last part of August, becoming more abundant as the season advances and colder weather approaches. They mostly depart for the north during the first half of April although a few remain until about the time the herring depart, say June 1. After coming south from the north in the autumn they distribute themselves along the seaboard, apparently in communities, attaching themselves to such localities as they may select for their home while here, and as a rule they do not afterwards, I think, leave their accustomed range. I have noticed repeatedly what I have taken to be the same birds daily flying along the line of beach during high water, afterwards going to the flats when they became uncovered by the tide, and finally to the same shoal to roost.

I cite as an instance of their ingenuity that in winter I have seen them carry up in their bills, to a height of twenty-five to thirty-five feet, into the air, a large sea clam (*Maetra solidissima* Gould) measuring six and a half inches by four and a half, for the purpose of breaking the shell (that they might avail themselves of the contents for food) by dropping it on the hard beach. I have seen them carry up the same clam four times when it failed to break on account of insufficient height; but they will carry them up higher after several ineffectual attempts and thus obtain the desired result; they also carry up scallops (*Pecten concentricus*) and mussels (*Modiola modiolus*). The American Crow (*Corvus americanus*) also has the same habit. That they usually succeed seems certain, for I have seen them eating them, and have noticed the broken shells, minus the contents, lying on the beach, surrounded by their tracks. They vary this mode of proceeding in some places by carrying and dropping the clams on a cake of ice, or on a rock.

They are anything but particular in the selection of their food, for to them 'all is fish that cometh to net.' I have known both

the adults and young birds to swallow a dead pollock head first, the estimated measure of which was ten inches long by two inches in diameter at the thickest part. They will eat dead ducks with avidity, never missing an opportunity to avail themselves of so satisfactory a meal if thrown in their way; in fact they seem very fond of animal food when they can procure it. Beginning at the neck of a duck where it joins the body (if the duck is lying on the beach) they will tear open the tough skin with their strong and sharp bills and clean off the flesh (rejecting the skin and feathers) as if it had been done with a sharp knife. Should the dead bird be floating they will alight beside it and pick it, but they very much prefer to have them on the beach, where it only requires a few minutes to strip it. I have known them to carry a dead Red-breasted Merganser (*Merganser serrator*) for nearly a quarter of a mile by stages of about twenty-five yards, holding it by the neck, in order to eat it in security. When a flock of the above birds (*Merganser serrator*) are diving and feeding, it is not unusual to see one or more of these Gulls hovering over where the flock is, about ten feet from the water. When a Merganser appears with a fish in its mouth, the Gull will make a rush for it, for the evident purpose of taking it away or making it drop it, at which time the Merganser will frequently dive to avoid the encounter. While I have never actually seen the Gull take the fish away, it being most difficult at the time to see, yet I am of the belief that he not only makes the Merganser drop it and thus secures the desired end, but that he also takes it out of the bird's mouth. They are also very fond of small live eels and fish. I have seen them caught by baiting a hook with the former, which was fastened to six or eight feet of line to which a half brick was attached. This is anchored on some sand flat or shoal which becomes uncovered at low water. As the tide falls, some one of the Gulls flying about perceives the eel, and as soon as it can be reached by putting its head down (for they never dive), the Gull seizes and swallows it. Should the hook catch when it attempts to fly, it will carry the brick up into the air for fifty or sixty yards (a heavier weight would tear out), but after two or three such attempts it becomes exhausted by the effort and can then be easily captured.

They frequently act as sentinels for the Black Ducks (*Anas obscura*), as do also the Great Black-backed Gulls (*Larus mar-*

inus). Under such conditions the Ducks appear to give up all care to the Gull and go to sleep in perfect confidence, nor is it misplaced. If therefore a flock of these Ducks is noticed with heads under their wings, asleep, with either one of these Gulls near by, in such a place as would appear they might be approached within shooting distance, the observer will save himself some trouble if he will pass on without making the attempt, for, depend upon it, the Gull will see him in ample time to warn the Ducks, which it will always do by flying up a short distance in the air over them and uttering its sharp, harsh cry of alarm, on hearing which the Ducks lose no time in heeding the warning, and depart for another locality. One of my old shooting companions utilized this trait to his own advantage by having a wooden Gull decoy which he placed on the rocks in full sight, while in the water near at hand would be his Black Duck decoys. "It took away the *fear* from the Ducks," he used to say, "and made them decoy better." The best way to obtain Herring Gulls from the land is to lie concealed under the headland which forms the shore line, and as they lead along the beach, as is their habit, they often pass within gun shot, especially if the wind is blowing on shore. The young birds in the gray plumage can almost invariably be waved up within gun shot by lying concealed and shaking a pair of Gull wings in such a manner that they have the appearance of a Gull hovering over something. Rarely can the adults be so decoyed, they being too suspicious and wary. These birds are very densely feathered on the breast, on the fore part of which they rest when on the water; floating with extreme buoyancy, with wings and tail elevated, they have the appearance of an inverted arc. I know of no bird frequenting New England waters which appears so much at ease during the coldest and stormiest winter weather, showing quite conclusively that they must possess great power of endurance. I have often asked myself the question how they managed always to obtain sufficient food during such times to sustain them, for of those I have noticed all seemed to be in excellent physical condition.

These Gulls pass the larger part of the time during the day on the wing, visiting the flats, however, when they become uncovered. Their modes of flight are a slow, heavy movement of the wings with long strokes, sailing with set wings, and circling. They have a habit at times of circling and soaring *very high* in

the air. At other times they will follow the line of surf along the beaches for miles hunting for anything that might prove available for food. They will also collect in numbers and follow the fishing vessels, especially when they are cleaning fish and throwing the entrails overboard, for which they fight and struggle, giving vent to their feelings in screams. When flying about, they ordinarily keep at an altitude of about thirty to forty yards; the head is carried low with eyes scanning the surface of the ocean and adjacent shores. When danger is discovered while flying near the shore they make a backward movement of the wings and fall off before the wind if practicable. When it is blowing hard they will frequently alight in numbers just outside of where the rollers are breaking and under the shelter of the beach. Here they will sit, with necks and feathers drawn down, with every appearance of contentment, regardless of wind or weather. They will frequently alight on the beaches in numbers when it blows hard, selecting such places where the headland has been blown off level with the beach, such places, I suppose, being considered safer, as affording a wider scope of vision. When wounded they are apt to show fight, biting quite hard.

I think it more than likely that some of our American birds, as also the European form (*Larus argentatus*), cross the Atlantic, reaching the several shores by following the many steamships, the very close resemblance of these two forms (the European bird only being slightly smaller) renders it most difficult to distinguish one from the other, except for expert ornithologists, into whose hands few seem thus far to have fallen.

When flying about Herring Gulls do not associate together in large numbers, being oftener seen in twos and threes. It is with considerable hesitation that I regard them as gregarious within a strict interpretation of the term, for they apparently only come together when there is some particular reason for doing so, as for instance something to eat, or to roost on some sand shoal or rest, and not apparently because they *like* to be together. I regard them as very curious and much afraid that some of their companions may fare better than themselves. Although they accumulate in considerable numbers at times on the sand bars, beaches, flats, and back of the breakers when resting on the ocean; they do not seem to me to evince much friendship for each other during the period in which they remain on this coast.

In regard to their plumage I am inclined to the belief that it requires three seasons before these birds acquire their full plumage, and my reason for so thinking is the apparently intermediate feathering which I have noticed.

They make a note similar to *cack, cack, cack*, quickly repeated, which is the alarm cry ; also a kind of cackle sometimes repeated in a much higher key than at others. And when they are collected in numbers together on the flats on a fine pleasant day, it is extremely interesting to listen to their various notes, I might almost say music. When squabbling for some floating food they will also make considerable fuss and noise.

A few adult American Herring Gulls remain during the summer frequenting the south side of Cape Cod, also at Wepecket Islands, Buzzard's Bay, where on June 26, 1891, some thirty or forty of these birds were noted. The only instance that has come to my notice of this bird's breeding in Massachusetts occurred during the summer of 1888 when Mr. Vinal Edwards (in the employ of the U. S. Fish Commission) of Wood's Holl, Massachusetts was attracted by the continued presence of a pair of Herring Gulls in the white plumage at the middle Wepecket Island, Buzzard's Bay (near Woods Holl). On landing to investigate, he found the usual well-constructed nest containing downy young which could not have been more than two or three days from the shell.

That it is customary for some of our water birds to return to their old haunts in New England waters has long been my belief, as I have expressed in former articles. It is therefore with pleasure that I narrate an instance of such return by an American Herring Gull, for the facts concerning which my readers are indebted to the politeness of Captain Edward Fogarty, master of the Brenton Reef Lightship, Narragansett Bay, Rhode Island, who has at my request most kindly furnished me with a description of the Gull and details of its sojourn in the vicinity of the Lightship for so long a period. As identification and reliable data are not always obtainable in such cases, I feel certain that the following narrative will prove of considerable interest. Hearing that a certain Gull had been in the habit of frequenting, and returning year after year to the waters adjacent to Brenton's Reef, Narragansett Bay, and was known in consequence to the crew of the lightship anchored in that locality, I entered into communication with

Capt. Fogarty, master of the lightship asking him to substantiate the report if true, and give me all the details he was able. His polite and full replies to all my inquiries have enabled me to present the story of 'Gull Dick,' as this particular bird is called by the crew of the lightship. The result of my investigation proves beyond any reasonable doubt that the Gull in question is an American Herring Gull. This particular bird is described as appearing old, and not showing the same activity as other Gulls of the same kind which also frequent the neighborhood of the lightship. After it has been absent from the first of April to the middle of October, at which times it usually departs and returns, there are many eyes on the lightship constantly on the lookout to welcome Dick back again. In 1891 the bird arrived October 12 which makes the twentieth winter it is known to have passed in this locality. In 1890 it returned on October 5. Of late the crew has considered the return of this bird problematical, owing to the increasing signs of age and feebleness. On the bird's arrival in 1890 and 1891 several of its wing feathers were missing, but they were regained in a short time. Although the Gull never comes on board the lightship it ventures very close to it, much nearer than any of the other Gulls that are flying about. It is known to the crew not only by this fact, but also by certain marks on its wings, also by its cry. It is fond of and eats boiled pork or fish with voracity, preferring the former, swallowing six or eight pieces the size of a hen's egg when hungry. If not hungry and other Gulls are about at the time of its being fed, it will not let them have any if it can prevent it, although not wishing to partake itself, making the greatest possible fuss all the while if one of the other Gulls attempts to secure an occasional piece. On April 1, 1892, when being given its supper, there were twelve or fifteen other Gulls in the immediate neighborhood, some of which endeavored to secure a share. One of them becoming too bold to please Dick, the latter started for and seized the aggressor by the neck, which resulted in the loss of many feathers by the former, who was only too glad to escape further punishment by an immediate retreat. Every morning at sunrise, when the lights on the ship are lowered for the day, this Gull is perceived coming towards the ship, from the rocks (where it roosts) about two miles away, for its breakfast which it always receives from the hands of the crew. Should the bird

not be noticed flying around near by, one of the crew will call the bird by name, whistle, or wave his hand, and soon the bird appears. The last seen of Dick in the late afternoon is just before the lights are hoisted for the night. When this movement commences, it at once starts for and flies to the rocks near the Beavertail Lighthouse to roost, again reappearing on the following morning to go through the same procedure. In a letter received from Capt. Fogarty, Jan. 30, 1892, he writes, "I have just given him his dinner since I wrote this letter." In another letter, dated April 12, 1892, he informs me that the last seen of Dick this spring was on April 6, 1892. He was fed on that afternoon as usual; since that date nothing has been seen of him, and it is supposed the bird has taken its departure, whether to return again next October remains to be seen. Pause my reader and reflect what this story conveys. Is it not a most interesting portrayal of successful bird life well rounded out? Storms, disease, fatalities, perils of migration, have all been braved and surmounted for twenty years at least, and perhaps for a longer period. Yet still constant, Gull Dick, now a veteran, may nevertheless be seen as of old in his accustomed haunt, — while on board the lightship there is not today a man who was there when this bird first appeared. It is with more than ordinary interest that I record in 'The Auk', for future reference, this most interesting example of the American Herring Gull.

REMARKS ON A COLLECTION OF BIRDS MADE
BY WILMOT W. BROWN, JR., ON MONA AND
PORTO RICO DURING FEBRUARY AND A
PART OF MARCH, 1892.

BY CHARLES B. CORY.

MR. BROWN after considerable difficulty succeeded in getting to the Island of Mona. He describes the island as having very few trees and no fresh water.

During his stay at Mona nothing of interest was procured with the exception of a specimen of *Conurus chloropterus*, which is

of value as showing that the so-called *Conurus gundlachi* from Mona is inseparable from the San Domingo species.

He found the Tropic Bird (*Phaëton flavirostris*) and the Gannet (*Sula sula*) abundant and breeding there in February. Two specimens of *Agelaius xanthomus*, evidently stragglers from Porto Rico, also were obtained on Mona.

From Porto Rico Mr. Brown sent me a number of interesting species although no novelties were among the number. Besides many of the common North American migrants the collection contained specimens of *Contopus blancoi*, *Habropygma melpoda*, *Sporadinus maugæi* Aud., *Agelaius xanthomus*, as well as the common Porto Rico species of *Icterus*, *Cæreba*, *Centurus*, *Spindalis*, etc.

LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS.

BY H. P. ATTWATER.

ALTHOUGH a number of eastern and western forms, with numerous intermediate examples, pass here together in the spring migration, San Antonio may be said to be on a dividing line, between not only many eastern and western, but also northern and southern, birds, the extreme limits of whose breeding ranges seem to meet here. So clear is this line in some instances, that birds found common and nesting a few miles west and north of the city, among the hills, would be 'rare finds' on the east side or south of it, in the more level country, and *vice versa*.

The city of San Antonio (lat. 29° 27') lies at the foot of an abrupt elevation — the first range of hills met with coming north from the Gulf of Mexico, or west from the Mississippi River. This range extends westward to the Rio Grande, and northward through the State. The city is six hundred feet above sea level, with a gradual slope for one hundred and fifty miles thence south to the Gulf, the elevation rising suddenly to sixteen hundred feet only thirty miles north and west of the city.

The San Antonio River rises in the hills about two miles north of the city, flowing south through the county. Fifteen miles from the city it is joined by the Medina River, running in from the northwest.

The timber growing along these river bottoms consists principally of pecan, cottonwood, hackberry and willows, with some scattered elms, boxwood, mulberries and cypress trees. Quite a variety of trees of smaller growth are also found, and the whole is often matted together with a tangled growth of vines and creepers. On the higher lands away from the rivers, the prevailing growth is mesquite and live oak, interspersed with patches of huisache, 'thorny brush', and 'prickly pear' or cactus, forming the growth so well known as 'chaparral.' San Antonio is just north of the thick chaparral region, for though these stunted growths occur north of this point, it is only in scattered groups and isolated areas. In the southern part of the county there is a large sandy region covered with black oak and hickory trees. The growth on the hills and rocky country consists largely of dwarf live oaks and another smaller kind of oak. It is worthy of mention, that the greater portion of the vast region to the south of San Antonio, now covered by mesquite and chaparral, was open prairie fifteen or twenty years ago.

The present list is the result of observations taken during the spring migrations and the summers of 1884, 1885, 1889, 1890 and 1891. I have not had opportunity for paying close attention to birds during the fall migrations, nor until January of each year. There are some marshes and lagoons in some parts of the county, but as I have only been able to pay occasional visits to these places, I have probably missed some waders and other water birds which undoubtedly occur at these localities. At one of the artificial lakes, on the west side of the city, some Grebes are common in winter and made their nests in 1889 and 1890, but not being allowed to shoot them, I was unable to identify them. Last spring I obtained permission to procure specimens, but found none nesting there; I think they left on account of their nests being destroyed by boys during the previous two years. I have also seen Gulls, Terns, Sandpipers, etc., around these lakes, but for the reason stated was unable to procure specimens.

There is a collection of stuffed birds at Boerne in Kendall County, thirty miles northwest of San Antonio, belonging to

Wm. Kuhlman, Esq., which contains the following birds which I have not observed myself in this region:— *Sialia arctica*, *Melanerpes erythrocephalus*, *Corvus americanus*, and *Cyanocitta cristata*. In that county Prairie Chickens are occasionally seen, but they are not known to occur in Bexar County, nor have I heard of them in the country between San Antonio and the Gulf.

A specimen of Lazuli Bunting (*Passerina amana*) was shown me by Mr. George W. Marnock at Helotes, eighteen miles west of San Antonio, which he obtained there, but I have not come across this bird myself.

I hear of some Quail being shot from time to time in the hilly country twenty miles west of San Antonio, which, from the description given, I have no doubt are the Massena Partridge (*Cyrtonyx montezumæ*).

Passer domesticus is unknown as a resident in San Antonio or any of the surrounding country.

All specimens about which there was any doubt were sent to Dr. C. Hart Merriam of the Department of Agriculture, Washington, who informed me that they were identified by Mr. Robert Ridgway of the Smithsonian Institution. To these gentlemen I am greatly indebted for much time and trouble taken in examining and naming my birds. Mr. George B. Sennett and Mr. Frank M. Chapman of the American Museum of Natural History, New York City, have also given me valuable assistance in the pursuit of my investigations. To my good friends, Mr. Gustave Toudouze and Mr. John Watson of the Medina River, I am especially indebted for a thousand services cheerfully rendered; also to Mr. John A. Morden of Hyde Park, Ontario, who was my companion in 1884, and who kindly sent me specimens from his collection, without which I could not have completed this list.

1. *Anhinga anhinga*. ANHINGA. — Rare summer resident.
2. *Lophodytes cucullatus*. HOODED MERGANSER. — Rare migrant.
3. *Anas boschas*. MALLARD. — Abundant migrant; common in winter.
4. *Anas obscura*. BLACK DUCK. — Migrant, not common.
5. *Anas strepera*. GADWALL. — Common migrant.
6. *Anas americana*. BALDPATE. — Tolerably common migrant.
7. *Anas carolinensis*. GREEN-WINGED TEAL. — Abundant migrant.
8. *Anas discors*. BLUE-WINGED TEAL. — Abundant migrant and rare summer resident; breeds at the West End Lake, one mile west of the city.

9. *Anas cyanoptera*. CINNAMON TEAL. — Rare migrant.
10. *Spatula clypeata*. SHOVELLER. — Common migrant.
11. *Dafila acuta*. PINTAIL. — Common migrant.
12. *Aix sponsa*. WOOD DUCK. — Rare summer resident.
13. *Aythya americana*. REDHEAD. — Common migrant.
14. *Aythya vallisneria*. CANVASBACK. — Tolerably common migrant.
15. *Aythya affinis*. LESSER SCAUP DUCK. — Rare migrant.
16. *Aythya collaris*. RING-NECKED DUCK. — Tolerably common migrant.
17. *Charitonetta albeola*. BUFFLEHEAD. — Rare migrant.
18. *Chen hyperborea*. LESSER SNOW GOOSE. — Common migrant. Called 'Brant' by the hunters and sportsmen.
19. *Branta canadensis*. CANADA GOOSE. — Common migrant.
20. *Botaurus lentiginosus*. AMERICAN BITTERN. — Tolerably common migrant.
21. *Ardea herodias*. GREAT BLUE HERON. — Common migrant.
22. *Ardea cœrulea*. LITTLE BLUE HERON. — Common fall visitor (young birds).
23. *Ardea virescens*. GREEN HERON. — Tolerably common summer resident.
24. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON. — Rare migrant.
25. *Nycticorax violaceus*. YELLOW-CROWNED NIGHT HERON. — Rare migrant.
26. *Grus mexicana*. SANDHILL CRANE. — Abundant migrant.
27. *Porzana carolina*. SORA. — Common migrant.
28. *Ionornis martinica*. PURPLE GALLINULE. — Rare migrant.
29. *Gallinula galeata*. FLORIDA GALLINULE. — Tolerably common migrant; probably winters here.
30. *Fulica americana*. AMERICAN COOT. — Common migrant and rare summer resident, nesting in the ornamental lakes west of the city.
31. *Recurvirostra americana*. AMERICAN AVOCET. — Rare migrant.
32. *Gallinago delicata*. WILSON'S SNIFE. — Common migrant.
33. *Micropalama himantopus*. STILT SANDPIPER. — Rare migrant.
34. *Tringa maculata*. PECTORAL SANDPIPER. — Common migrant.
35. *Tringa minutilla*. LEAST SANDPIPER. — Common migrant.
36. *Totanus melanoleucus*. GREATER YELLOWLEGS. — Common migrant.
37. *Totanus flavipes*. YELLOWLEGS. — Common migrant.
38. *Totanus solitarius*. SOLITARY SANDPIPER. — Common migrant.
39. *Bartramia longicauda*. BARTRAMIAN SANDPIPER. — Abundant migrant.
40. *Actitis macularia*. SPOTTED SANDPIPER. — Common migrant.
41. *Numenius longirostris*. LONG-BILLED CURLEW. — Common migrant.
42. *Charadrius dominicus*. AMERICAN GOLDEN PLOVER. — Rare migrant.

43. *Ægialitis vocifera*. KILLDEER. — Common resident.
44. *Colinus virginianus texanus*. TEXAN BOBWHITE — Abundant resident.
45. *Callipepla squamata castaneogastris*. CHESTNUT-BELLIED SCALED PARTRIDGE. — Common in several localities in the southern part of the county, commencing fifteen miles southwest of San Antonio, which is about their northern limit in this region.
46. *Meleagris gallopavo mexicana*. MEXICAN TURKEY. — Common resident in suitable localities, but much less numerous than formerly. I refer these birds to this species on the authority of Mr. Morden, who was well acquainted with the northern form.*
47. *Zenaidura macroura*. MOURNING DOVE. — Common summer resident; not so numerous in the middle of winter, but particularly abundant during migrations.
48. *Melopelia leucoptera*. WHITE-WINGED DOVE. — Rare summer visitor, and probably breeds.
49. *Columbigallina passerina*. GROUND DOVE. — Occasionally noticed in winter round the camp yards and ranches.
50. *Scardafella inca*. INCA DOVE. — In the month of April, 1891, my attention was called to a strange Dove, which was frequently seen on one of the streets in the city. I got quite close to it on several occasions, but could not shoot at it. When Mr. Frank M. Chapman called to see me, I mentioned the circumstance to him, and asked him to send me a specimen of *S. inca* to compare with it, which he kindly did on his return. By this the live bird was easily identified. It stayed around for some weeks, but disappeared some time late in May.
51. *Cathartes aura*. TURKEY VULTURE. — Common resident.
52. *Catharista atrata*. BLACK VULTURE. — Common resident.
53. *Elanoides forficatus*. SWALLOW-TAILED KITE. — Tolerably common summer resident. They breed on the Medina River in the tallest cottonwood and pecan trees.
54. *Elanus leucurus*. WHITE-TAILED KITE. — Rare, in the fall and early part of the winter.
55. *Ictinia mississippiensis*. MISSISSIPPI KITE. — Occasionally seen during migrations.
56. *Circus hudsonius*. MARSH HAWK. — Abundant in winter. It is probable that some stay all summer and may breed not far from this point, as I have noticed them occasionally in the summer months.
57. *Accipiter velox*. SHARP-SHINNED HAWK. — Common during fall and winter months.
58. *Accipiter cooperi*. COOPER'S HAWK. — Rare in winter.
59. *Parabuteo unicinctus harrisi*. HARRIS'S HAWK. — Common resident.

* [This is probably Mr. Sennett's *M. g. ellioti*, described in the last number of 'The Auk' (Vol. IX, p. 167), as evidence of its occurrence in Cooke County, Texas, has recently been received through specimens sent for examination by Mr. George H. Ragsdale. — J. A. ALLEN.]

60. *Buteo borealis*. RED-TAILED HAWK. — Common resident.
61. *Buteo lineatus alleni*. FLORIDA RED-SHOULDERED HAWK. — Common resident. The birds I sent to Washington were said to be intermediate between *alleni* and *B. l. elegans*.
62. *Buteo swainsoni*. SWAINSON'S HAWK. — Rare winter resident.
63. *Falco peregrinus anatum*. DUCK HAWK. — Rare in winter.
64. *Falco sparverius*. AMERICAN SPARROW HAWK. — Common winter resident.
65. *Polyborus cheriway*. AUDUBON'S CARACARA. — Common resident. An unusually early breeding record was January 30, 1890, when a nest was found with three eggs ready to hatch.
66. *Strix pratincola*. AMERICAN BARN OWL. — Common resident.
67. *Asio wilsonianus*. AMERICAN LONG-EARED OWL. — Rare migrant.
68. *Asio accipitrinus*. SHORT-EARED OWL. — Rare migrant. On two occasions I have observed these birds in small flocks on their way north in the spring. On March 1, 1890, I came across about half a dozen among some brush heaps where land had been cleared on a hill near the city. The position was very much exposed, and there had been hard frosts during the two previous nights. On March 18, 1891, while passing over the same ground, my attention was attracted by the cries of two Red-shouldered Hawks, and, making my way to the place, I started three or four Short-eared Owls. One in particular mounted in the air to a great height, followed by the Hawks, and in the fierce attack which followed it held its own bravely for some time till they finally appeared tired of the fight and flew away.
69. *Syrnium nebulosum alleni*. FLORIDA BARRED OWL. — Common resident.
70. *Megascops asio mcallii*. TEXAN SCREECH OWL. — Common resident. Red phase of plumage not noticed.
71. *Bubo virginianus subarcticus*. WESTERN HORNED OWL. — Common resident. In 1890 a number of nests and eggs were taken in the latter part of December.
72. *Speotyto cunicularia hypogæa*. BURROWING OWL. — Tolerably common resident.
73. *Geococcyx californianus*. ROADRUNNER. — Common resident.
74. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. — Common summer resident. In 1884 I found a Dickcissel's nest which contained five eggs and one Yellow-billed Cuckoo's egg. The next year some boys brought me three Black-throated Sparrow's eggs and one Yellow-billed Cuckoo's, from the same field, which they said they found all together in one nest.
75. *Ceryle alcyon*. BELTED KINGFISHER. — Common migrant, no doubt breeds along the streams in the hills, as I noticed it there on June 6, 1890.
76. *Ceryle cabanisi*. TEXAN KINGFISHER. — Tolerably common resident.
77. *Dryobates scalaris bairdi*. BAIRD'S WOODPECKER. — Common resident.

78. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.—Common migrant.

79. *Melanerpes aurifrons*. GOLDEN-FRONTED WOODPECKER.—Common resident

80. *Colaptes auratus*. FLICKER.—Common migrant and winter resident, but more numerous during migrations.

81. *Colaptes cafer*. RED-SHAFTED FLICKER.—Common migrant. Typical specimens are rare, but a number of intermediate shades, between *cafer* and *auratus* occur, and have been observed migrating together with typical birds. The bulk of *auratus* departs before the others. These birds are fond of ants; the crop of one specimen I examined contained hundreds of them.

82. *Antrostomus carolinensis*. CHUCK-WILL'S-WIDOW.—Common summer resident.

83. *Antrostomus vociferus*. WHIPPOORWILL.—Rare migrant.

84. *Phalænoptilus nuttalli*. POORWILL.—Common summer resident.

85. *Phalænoptilus nuttalli nitidus*. FROSTED POORWILL.—Rare migrant. The earliest record of its appearance in 1891 was March 18.

86. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—Abundant migrant, and common summer resident. My series of specimens shows three color forms of this species, viz., the red, the intermediate, and the lighter or frosted form. *C. texensis* probably occurs, but I have not yet been able to add it to my collection

87. *Chætura pelagica*. CHIMNEY SWIFT.—Rare migrant.

88. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Common migrant.

89. *Trochilus alexandri*. BLACK-CHINNED HUMMINGBIRD.—Common summer resident.

90. *Milvulus forficatus*. SCISSOR-TAILED FLYCATCHER.—Abundant summer resident.

The regularity with which the summer residents of this locality appear each season is worthy of mention. The state of the weather does not seem to affect these birds in their movements nearly as much as it does those which simply pass through as migrants. During a very dry spring the scarcity of the latter is very noticeable, and not only is their number greatly diminished, but they hurry through on their journey many of them being noticed only for a day or two, while during a wet spring they are much more abundant and stay longer. Particularly is this the case in regard to the Warbler family. The seasons of 1890 and 1891 are good examples of the two extremes. Heavy rains during the early spring of 1890 brought the bulk of Warblers, etc., from two to three weeks earlier than in 1891, and from the 16th to the 24th of April was the height of the migration. The corresponding period in 1891 (which was an unusually dry season) was from May 12, to May 15. The case of the Hooded Warbler will serve for an illustration. In 1890 they first appeared on March 31, were common the next day, and were gone by April 25, while in 1891 they were not noticed at all till May

12, more than two weeks after the last had left in 1890, and very few were observed.

The case, however, is different with the summer residents. Wet or dry, cold or hot, they appear each year, with surprising regularity, almost to a day. Among the best timekeepers should be mentioned the Orchard Oriole, Bell's Vireo and the Painted Bunting, but not one of them can compare with the daring, rollicking, noisy, fighting Scissor-tail Flycatcher. You may count on seeing him first on the 20th of March, and within a day or two he is everywhere, quarreling with the Mockingbirds, who seem to take delight in annoying him, by imitating not only his notes but his actions. The following record of the first appearance of the Scissor-tail is copied from my note book: 1885, March 19; 1889, March 20; 1890, March 20; 1891, March 21.

91. *Tyrannus tyrannus*. KINGBIRD.—Rare migrant.

92. *Tyrannus verticalis*. ARKANSAS KINGBIRD.—Rare migrant. April 30, 1890, is the only record for this bird, but I have observed birds at a distance, which I took to be this species, but which I was unable to procure.

93. *Myiarchus crinitus*. CRESTED FLYCATCHER. — Common migrant; a few remain to breed.

94. *Myiarchus cinerascens*. ASH-THROATED FLYCATCHER.—Common summer resident.

In the notes I sent to Prof. W. W. Cooke, when he was preparing his report on 'Bird Migration in the Mississippi Valley,' 1884 and 1885, I gave the Mexican Crested Flycatcher (*Myiarchus mexicanus*) as a summer resident at San Antonio. This was a mistake. The Mexican Crested Flycatcher does not occur anywhere in the vicinity of this place. The error occurred through my not sending my birds to Professor Cooke for examination, and was the fault of those who undertook to identify them.

95. *Sayornis phœbe*. PHŒBE. Common winter resident, and abundant during migration. I also found them nesting in the caves along the mountain streams in the hilly country west of San Antonio.

96. *Sayornis saya*. SAY'S PHŒBE. Rare migrant.

97. *Contopus borealis*. OLIVE-SIDED FLYCATCHER. Rare migrant.

98. *Contopus virens*. WOOD PEWEE.—Common migrant and rare summer resident.

99. *Contopus richardsonii*. WESTERN WOOD PEWEE.—Common migrant.

100. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.—Rare migrant.

101. *Empidonax acadicus*. ACADIAN FLYCATCHER.—Common migrant, and summer resident.

102. *Empidonax minimus*. LEAST FLYCATCHER.—Common migrant, much more numerous among the hills than south of San Antonio. I have never found *E. p. traillii* in this region, though I have looked carefully for it, and if it occurs it must be a rare bird.

103. *Pyrocephalus rubineus mexicanus*. VERMILION FLYCATCHER.—Common summer resident in a locality south and southwest of San

Antonio, but noticed nowhere else in the surrounding country. Their headquarters appear to be about ten miles southwest of the city, where I found them common and nesting. They must arrive very early, as they were observed the first week in February and I took a nest with three eggs ready to hatch on April 15, 1889. It was placed on the horizontal limb of a mesquite tree, seven feet from the ground, and was similar in appearance to the nest of the Wood Pewee. The particular locality in which they are found is apparently similar to hundreds of square miles of the adjacent region, but I have never met with them in any other place.

104. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.—Common winter resident.

105. *Molothrus ater*. COWBIRD.—Abundant migrant and common winter resident. Wishing to settle the point, as far as this locality was concerned, as to whether any examples of true *ater* remained to breed, I selected three specimens which I have reason to think were breeding birds and sent them to Dr. Merriam, with the following result: No. 1, ♂, May 2, marked intermediate; No. 2, ♂, May 8, intermediate but nearer *M. ater*; No. 3, ♂, May 9, typical *M. ater*.

I have frequently found Cowbirds' eggs as large as those taken in the North.

106. *Molothrus ater obscurus*. DWARF COWBIRD.—Abundant resident. The nest of Bell's Vireo is usually selected to deposit their eggs in, it being a rare occurrence to find a Bell's Vireo's nest that does not contain one or more Dwarf Cowbird's eggs. In one case a nest of this Vireo in a thorn bush contained four Cowbird's eggs, with three others lying on the ground three feet below.

107. *Calliothrus robustus*. BRONZED COWBIRD. Rare summer resident. Several of these birds were noticed around some of the stock yards in the city, but I could not shoot at them; consequently I was much pleased to obtain a nest of Bullock's Oriole near one of the yards, which, in addition to five eggs belonging to the Oriole, also contained one of this species. The egg was sent to Washington and fully identified.

108. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.—Common migrant.

109. *Agelaius phœniceus*. RED-WINGED BLACKBIRD.—Abundant migrant, and common winter and summer resident. Although it is not as numerous in summer as in winter, a few remain to breed.

110. *Sturnella magna*. MEADOWLARK.—Rare summer resident. I have no records of this bird in the migrations, nor have I ever observed it in winter. After all the Western Larks have gone north in the spring, I find a few Eastern Larks breeding in some hay meadows a few miles west of the city.

111. *Sturnella magna neglecta*. WESTERN MEADOWLARK.—Abundant migrant, and common winter resident. In the spring they commit great depredations in the corn fields, pulling up the young corn. A great many are destroyed at this time by scattering poisoned grain over the fields.

112. *Icterus audubonii*. AUDUBON'S ORIOLE.—This species may perhaps most properly be described as a *rare winter wanderer*. I first observed it on March 27, 1890, when I secured a fine male among the tall pecan timber on the San Antonio River just south of the city. I was attracted by the bird's note. I did not observe it again till 1891, when I obtained three specimens out of a flock of about eight or ten at the same place on February 13. The next day they were all gone, and I have never come across any since. Mr. Toudouze described some birds, which were new to him, and which he noticed on the Medina River about the same time, which from his description were no doubt this species.

113. *Icterus spurius*. ORCHARD ORIOLE.—Abundant summer resident.

114. *Icterus bullocki*. BULLOCK'S ORIOLE.—Common summer resident.

115. *Scolecophagus cyanocephalus*. BREWER'S BLACKBIRD. — Common migrant and winter resident. It is possible that some do not go far north to breed, as I have observed them in the latter part of April at a ranch on the hills twenty miles west of San Antonio, but I have never found any nest.

116. *Quiscalus quiscula æneus*. BRONZED GRACKLE. — Abundant migrant and common summer resident, breeding in colonies among the huisache trees in the city. They do not remain all winter, but appear first about the end of January or early in February.

117. *Quiscalus macrourus*. GREAT-TAILED GRACKLE. — Common summer resident. A few remain all winter around the irrigating ditches in the market gardens of the city.

(To be concluded.)

SOME NOTES CONCERNING THE EVENING GROSB BEAK.

BY AMOS W. BUTLER.

THE EVENING GROSB is pre-eminently and typically a bird of the coniferous forests of the Northwest. The first specimen known was taken by Schoolcraft in 1823 near Sault Ste. Marie, Michigan, from which William Cooper described the species in the Ann. N. Y. Lyc. N. H., Jan. 10, 1825. Bonaparte figured it in 1828, and noted two other specimens that had been taken near Lake Athabasca. Sir John Richardson refers to specimens from Carlton House, British America.

Dr. Coues, in 'Birds of the Northwest,' 1874, gives its range as "Rocky Mountains to the Pacific, United States. North to the Saskatchewan (Richardson). Eastward along the northern tier of States to Lake Superior regularly, to Ohio, Canada, and New York City, casually. South to the table-lands of Mexico." Dr. Coues said in 1879, "Notes concerning its distribution will long continue to be acceptable contributions."

The A. O. U. Check-List, 1886, says: "Western North America east to Lake Superior, and casually to Ohio and Ontario; from the Fur Countries south into Mexico "

The British Museum Catalogue of Birds, Vol. XII, gives records from places as far apart as Oregon, New Mexico, and Vera Cruz, Mexico. Sumichrast noted it in the Valley of Mexico in 1857, and Prof. A. L. Herrera in 'La Naturaleza,' second series, Vol. 1, No. 4, 1888, also notes it there, with the remark: "They come into the Valley of Mexico in small flocks in October, and leave in February."

While from these statements one gets some idea of its range, yet the knowledge is but approximate, as we are just beginning to understand anything at all of its distribution. The Valley of Mexico appears to be as far south as it has been found. There it spends its summers among the mountains and descends to the Valley to winter. It has been taken at intervals from there north, throughout the coniferous region, from the deserts of Arizona to the Barren Grounds of Arctic America. It spends the summer in the northwestern United States and western British America, from just east of the Rocky Mountains to the Pacific. From there it migrates very irregularly in autumn to the eastward, casually reaching over a greater or less part of the eastern United States, north of a line drawn from the mouth of the Ohio east to the Atlantic. Dr. Kirtland, in the 'Ohio Farmer,' March 24, 1860, mentioned that the previous week on a certain day a female of this species was secured by a gentleman, and the following day he saw several others (near Cleveland). He said it had never before been taken east of Lake Michigan, but notes that Dr. Hoy has occasionally found it near Racine, Wisconsin. Dr. J. M. Wheaton, in his 'Catalogue of Ohio Birds,' 1860 [1861], mentioned the capture of a specimen at Columbus in 1847, which he became satisfied was an error and afterwards corrected.

Mr. Thomas Mellwraith informs us of the first four records of the occurrence of these birds within the Province of Ontario, —

the first at Woodstock in May, 1856, where a flock was seen and one or two shot by Dr. T. J. Cottle; the second in 1871 near London, when several specimens were taken; the third March 17, 1883, near Hamilton, when two were seen and killed; the fourth he gives on account of a female having been obtained in Toronto, Dec. 25, 1854. Mr. E. W. Nelson (Bull. Essex Inst. Vol. VIII, 1877, p. 104), speaking of it in northern Illinois says: "A winter visitor occurring at irregular intervals. The winter of 1871 they were quite common throughout the northern portion of the State. The following winter they were much rarer, and since then but very few have been seen. I am told that formerly it was of much more regular occurrence."

Dr. Morris Gibbs has very kindly furnished me extracts from his records concerning the occurrence of the species in Michigan. He notes them at Kalamazoo, March 22, 1869; March 30, 1873; Nov. 25, 1878, common. He gives several dates from March 18 to May 3, 1879, during which time they appear to have been common. April 28 and 29 he notes that "the males appear to have gone; all here are females." May 3 he records seeing the Evening and Rose-breasted Grosbeaks together in a grove, to him a remarkable sight. Dr. Gibbs reports it from Grand Rapids in 1869, in the spring of 1874, and common there March 23, 1879. He also reports them upon the authority of J. D. Allen from Paw Paw, Michigan, in 1872. Dr. Gibbs notes that they feed principally on the buds of the sugar maple (*Acer saccharinum*). He says they are "very unsuspecting until April, and then very shy."

Prof. O. P. Hay in a paper published in the Bulletin of the Nuttall Ornithological Club, July, 1881, says these birds were found at Freeport, Illinois, in the winter of 1870-71, and at Waukegan during January, 1873, and then mentions his finding a flock, from which he killed six, at Eureka, Woodford Co., Illinois, in the autumn, about the year 1872.

There is a specimen in the collection of Purdue University, Lafayette, Indiana, of which Prof. C. R. Barnes, now of the University of Wisconsin, but at the time he wrote a member of the faculty in the first-named University, said: "It is a male; was shot at Lafayette in November, 1878." This is the first Indiana record.

Mr. H. K. Coale notes in his records two females Dec. 20, 1883, and says, upon the authority of Mr. Geo. L. Toppan,

“Five specimens shot at Whiting Station, Indiana.” Mr. S. W. Willard in ‘The Auk’, Oct., 1886, notes this species from De Pere, Wisconsin, Nov. 28, 1885, and gives it as the first record for that locality. Mr. Geo. A. Coleman records eight from London, Nebraska, March 12, 1886. There is a specimen in the collection of Mrs. A. W. Brayton, Indianapolis, Indiana, which she informs me was brought to her in the summer of 1886, having been taken near Allisonville, twelve miles north of Indianapolis.

Mr. C. R. Keyes has reported them present at Iowa City, Iowa, at different times from December, 1886, to April 30, 1887, but he had previously noted them from the same locality, in February, 1881, and from Charles City, Iowa, in March, 1879, and they have been reported by the same authority from Grinnell and Burlington. Mr. W. E. Saunders has reported them from London, Ontario, December, 1886, and has also noted their occurrence at Chatham and St. Thomas, Ontario. The winter of 1886-87 they were quite common in the vicinity of Chicago; several of my friends sent very full notes of their observations. In the collection of Mr. G. Frean Morcom at Chicago are two males and two females taken at Lake George, Indiana, December 5, 1886. Messrs. Coale and Toppin report seeing two Jan. 1, 1887, in Lake County, Indiana. Jan. 14, Mr. Toppin reported two males near Chicago. Jan. 20, 1887, a single male was taken by the late Mr. C. H. Bollman at Bloomington, Indiana, of which he wrote: “This is the first specimen that was ever taken in this vicinity and, as far as I know, in the State.” On the same day Cal. Meredith and another high school student at Frankfort, Indiana, shot five from a flock of twelve. These were identified by Mr. C. E. Newlin, then the principal of the high school.

Mr. E. L. Mosely informs me that he noted twelve at Grand Rapids, Michigan, Feb. 22, 1887. In February, 1887, they were noted for the first time at Barron, Wisconsin. May 25, 1887, Oscar Vaught shot two out of a flock of eight or ten near Mace, six miles from Crawfordsville, Indiana. He notes “they were in the centre of a dense wood, feeding upon elm buds. They were very gentle, but after I had fired twice they flew and I was unable to find them again.” These specimens are in the collection of Prof. O. P. Jenkins, now of Leland Stanford, Jr., University, Palo Alto, Cal. In the collection of Mr. Morcom I saw six males and two females, marked Berry Lake, Indiana,

April 3, 1887, also four males from the same locality, dated April 18, 1887. Mr. G. G. Williamson was successful in adding three other records from the vicinity of Bloomington, Indiana, the same spring. April 27, 1887, he noted one; April 29, two; and again April 30. Mr. C. A. Stockbridge, Fort Wayne, Indiana, has a specimen in his collection which was taken near that city and brought to him by a friend about May 6, 1887. It was taken near that place, and was said to have been one of eight or nine. Mr. R. Turtle, a taxidermist of Chicago, showed me a number of specimens of these birds of which he said he killed ten May 8, 1887, at Berry Lake, Indiana, and thirteen May 10, at Whiting, Indiana. In Mr. Morcom's collection are also two specimens, a male and a female labelled Berry Lake, Ind., May 10, 1887. In March, 1887, they seem to have appeared in some numbers in Fulton County, Kentucky. Mr. L. O. Pindar, in 'The Auk' for July, 1887, notes them March 18, 22, and 25. This is the only record from south of the Ohio River.

April 2, 1887, Mr. E. E. Thompson noted about thirty near Toronto, Ontario. April 5, 1887, Dr. Bergtold records the capture of two near Brant, Erie Co., New York.

Their distribution appeared to be not so extensive in 1888 and the early part of 1889. Mr. Edward P. Carlton, Madison, Wisconsin, says: "During the winter of 1888-89, at Wauwatosa, Wis., I saw only one flock of about eighteen, and they were very wary and kept well to the tops of the trees. This was on the 11th or 12th of November, 1888." Mr. Stewart E. White of Grand Rapids, Mich., notes that in the former year a few were seen in that city in January and February, and in the latter year he says they were first seen April 10, and occasionally from that time to May 13. Mr. Jerome Trombley, Petersburg, Mich., notes that two or three flocks were seen at that place for the first time in the winter of 1888-89. My friend, Mr. Otto Widmann, has very kindly informed me that he saw in the collection of Mr. Louis Fuchs, Belleville, Illinois, two male Evening Grosbeaks that were taken in St. Clair County, Illinois, one of them Feb. 2, 1889. This is the most southern Illinois record and, save Mr. Pindar's, the most southern extension of their range east of the Rocky Mountains.

Concerning the extensive dispersal of this bird in the winter of 889-90, I offer the following notes some of which have not been

presented heretofore. Prof. C. R. Barnes of Madison, Wisconsin, has kindly furnished me the following from that locality. "The birds were first seen here Nov. 20, 1889,—two or three only. Later, but just when I am unable to say, they appeared in numbers, a flock of about fifty staying through the winter. They ate the buds of the elm and maple trees and the seed of the box elder (*Negundo accroides*). They also ate the buds of the latter tree to some extent, but chiefly the seeds which they neatly extracted from the samaras. The flock was last noted on March 29, but a pair was seen late in May." Mr. Edward P. Carlton gives the following notes from Wauwatosa, Wisconsin. "Nov. 9, 1889, I saw a flock of fifteen Evening Grosbeaks, in a row of box elders, feeding upon the seeds. Nov. 13, a large flock near the Public Square. Jan. 10, 1890, I saw three, and throughout the month they were frequently seen, last on the 29th. They were next seen Feb. 23; on that date it was snowing very hard. Feb. 25 I saw a flock of fifteen flying about apparently blinded by the storm. Feb. 26 I saw a single Evening Grosbeak apparently much excited; it uttered continually a loud call note. March 1, thermometer zero this morning; I saw a single female. They were seen occasionally throughout the month, and were last noted April 2. During their stay with us they were exceedingly tame as a rule, and boys could easily get them with slings. The only thing they fed on, as far as I could see, was the seeds of the box elder, and in stripping them from the trees they reminded me of a lot of clumsy Crossbills. Cold did not seem to have the slightest effect on them, while during a snow storm they would move around a good deal. Males in full plumage, that is fine ones, were not common, even in a flock of twenty or thirty." Mr. O. G. Libby informs me a few were seen at Barron, Wisconsin, Nov. 20, 1889. In a week twenty or thirty appeared and remained all winter eating the buds of the elms and maples. They remained until March 29, 1890, though in smaller numbers. The same gentleman says: "A flock of fifteen or twenty was noted by me the past winter and spring (1889-90) at Patch Grove, Grant Co., Wisconsin, also at Boscobil, Grant Co., and at Bloomington. Prof. F. Cramer, Lawrence University, Appleton, Wisconsin, says: "Last winter (1889-90) I became very much interested in a flock of Evening Grosbeaks that made a crab apple tree in my yard their headquarters for some time. The tree

bore a large number of little yellow crab apples that were worth nothing to us. Most of them remained hanging on the tree until the visit of these birds. They came in a flock of about twenty-five, and remained in the neighborhood at least ten days. They spent much of their time on our tree, and stripped it of its apples before they disappeared. Sometimes a few of them fed on apples which had fallen on the snow. They were lively and made a little music sometimes, but their principal business seemed to be eating. They were here not far from Christmas. They appeared again for a day or two in the spring, but there were only a few of them."

Prof. Charles A. Davis, Alma, Michigan, informs me one of his students brought him some specimens about Jan. 15, 1890. "They had then been in the city only a few days. Their favorite haunt was a small grove of maples and beeches directly opposite our college buildings. They remained until well along into May except for a time in April. The flock returned to the grove where they made their home, again and again, notwithstanding the fact that boys shot a considerable number at each return." They were also noted at Saginaw the same winter. Prof. F. M. McFarland, Olivet, Michigan, says: "The only Evening Grosbeaks seen here for many years were taken April 14, 1890. A day or two previous they were seen in the neighborhood of Battle Creek, nineteen miles west of here. During the next ten or twelve days I saw many of them in flocks of not more than twenty or twenty-five. They frequented the orchards about the village, and were not at all shy." Mr. Charles B. Cook, Agricultural College, Michigan, informs me that these birds were quite common for the first time all of the winter of 1888-89, in flocks. They all left by the first of May.

Mr. Stewart E. White has generously placed his notes upon the species, for the year 1890, at my disposal, and from them I take the following. They appeared at Grand Rapids, Michigan, that year March 5, and were last seen May 14.

"March 5, hearing a sharp, metallic cry, often repeated, I started to investigate and was pleased to find a flock of about thirty Evening Grosbeaks. They were feeding on the ground and hearing me approach flew into the trees. The birds were very shy, their behavior being in marked contrast with that of other flocks I have seen. The males have a single metallic cry like

the note of a trumpet, the females a loud chattering like the large Cherry Birds (*Ampelis garrulus*). Their flight through the woods is very swift, reminding one, by the dexterity with which they avoid the branches, of a Pigeon; when in the open, however, it is more after the manner of a Blackbird. March 6 I tried to find this flock, but did not succeed. I, however, found four males feeding along a fence row.

“March 18.—When on the ground feeding they are quite silent. A flock lit in a tree very close to me, and I noticed that they have a chirping note like the sound of a distant flock of English Sparrows. When on the ground they progress by hopping, holding themselves like Robins. They turn over the leaves with great dexterity picking up the seeds found under them. When wounded, they are very handy with their large beaks; I carried one some distance by inducing him to seize a stick. They were loth to leave the woods. They did not leave until I had fired several shots, and even then they circled around several times. This reluctance was caused by the abundance of maple ‘mast.’

“May 3.—The Grosbeaks have left the maples and have gone to the pines.

“May 14.—The Evening Grosbeaks have appeared in large numbers. They are in the tops of the tallest pines, and are very shy. Their song is a wandering, jerky warble, beginning low, suddenly increasing in power, and as suddenly ceasing, as though the singer were out of breath.”

Mr. James Savage, Ann Arbor, Michigan, notes that Mr. E. W. Owen saw Evening Grosbeaks at Ypsilanti, Michigan, in January, 1890, and they remained common until the last week of April. April 12, Mr. Savage saw two flocks at Geddes, Michigan. Mr. Wm. Lambie also reports them from Ypsilanti, Jan. 31. Mr. Jerome Trombley, at Petersburg, Mich., Jan. 18, 1890, saw a flock of fifteen. They were the first for the year. These birds remained until Feb. 10.

Mr. F. C. Test of Purdue University, Lafayette, Indiana, writes me that Mr. H. W. McCoy shot a male from a flock of between twenty and thirty in an extensive tract of woods about two miles west of that city, Feb. 1, 1890. They became very timid after this shot. Mr. L. T. Meyer reports them from Whiting, Lake Co., Indiana, in January and February. Dr.

A. W. Brayton of Indianapolis told me of the capture of a specimen near that city in the winter of 1889-90. Mr. Chas. A. Stockbridge, Fort Wayne, Indiana, reports having seen two males Feb. 15. They were seen again the next day, when they became common. This is the only season they have ever been common there. The other specimen, of which Mr. Widmann wrote, in the collection of Mr. Fuchs at Belleville, Illinois, was taken in St. Clair County, April 19, 1890.

As we note these, our minds recall some of the many places to which these birds of the Northwest chanced to stray in their wanderings that winter. Mr. E. E. Thompson reports them from Kingston, Toronto, Peel County, and Hamilton, Ontario; Mr. William B. Marshall from Wayland, Steuben Co., New York, in February; Mr. J. A. Loring from Owego, New York, Mr. J. L. Davison from Lockport, New York, Mr. E. D. Wintle from Montreal, Quebec, in January and February; Dr. Bergtold from Buffalo, New York, Jan. 10 and 18; Prof. W. W. Cooke from Burlington, Vermont, in February; Mr. H. L. Clark from Amherst, Massachusetts, Jan. 8; Mr. E. H. Forbush from Hampden Co, Massachusetts, Feb. 1; Mr. A. C. Bent, March 8, from Taunton, Massachusetts; Mr. R. O. Morris, March 21, about twenty from Springfield, Massachusetts. Mr. Wm. Brewster from eastern New Hampshire and Massachusetts; Mr. John H. Sage from Portland, Conn., in February and March; Mr. C. K. Averill, Gaylordville, Connecticut, March 10. Dr. B. H. Warren ('Birds of Pennsylvania,' Revised Edition, 1890, p. 225) says of their occurrence in that State: "It appears these birds were quite common in many of the western, northern and central parts of the State, but rare, or not seen at least, in some of the eastern counties, from the date of their first appearance (December, 1889) to the present time (May 15, 1890)." It is not every winter that these birds cross the Mississippi, and it is unusual when we note their wide distribution east of that river. Michigan appears to be more often visited than any other State noted here. As has been observed, its first recorded extension of range east of Lake Superior was at Toronto, Ontario, in 1854; next it was noted from Ohio in 1860; from Ontario again in 1866; and from Michigan in 1869. Doubtless, had there been the number of observers at those times there are now, we should have learned more of the extent of those dispersals.

The first extensive wanderings of the Evening Grosbeaks, as far as we know, appear to have occurred in 1871, when they extended south into Illinois and east into Ontario. In 1879 they were found in localities as far apart as Charles City, Iowa, and Grand Rapids, Michigan. In the winter of 1886-87 they were reported from Nebraska, Iowa, Illinois, Kentucky, Indiana, Michigan, Wisconsin, New York, and Ontario. That year they appear to have been most common in the States of Iowa, Indiana and Illinois, and the area of eastern North America covered was the greatest known up to that time, but this was very much exceeded by the wide distribution of the species in the winter of 1889-90, when, although they do not appear to have been as numerous in some localities as in the last preceding dispersal, they reached nearly to the Atlantic coast at several localities. It will be noted, however, that we lack information concerning their movements that winter west of the Mississippi. Now that the number of observers is sufficient to note the movements of these birds with reasonable accuracy, it seems probable that much more may be learned of their winter range. In conclusion I beg to express my appreciation of the kindness of Dr. C. Hart Merriam, in affording me valuable assistance in preparing this paper.



A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA.

BY GEORGE K. CHERRIE.

(Continued from p. 27.)

58. *Euetheia pusilla*.—Common resident. Found on both Atlantic and Pacific sides of the Cordillera, but not lower down than 2000 feet altitude. The preceding and the present species are frequently kept in cages; the song is short, without variation, yet rather pleasant.

59. *Passerina cyanea*.—Rarely met with about San José, and then only immature birds during the months of October and November. Adult birds are tolerably common in the low country on both coasts until as late as the twentieth of March.

60. *Zonotrichia capensis costaricensis*. *—Abundant resident. Four or five broods are reared each year. The breeding season commences early in April and continues until the last of August. Ordinarily the nest is placed on or near the ground, in some low bush or shrub. Much individual taste is displayed in the locality selected and in the materials used in construction. Often one may find a nest at the very doorway of his house in the middle of the city, or again in the fields far from any habitation, while its owner is equally happy in either place and always full of song. Of the half dozen nests before me, the three that were built in bushes, from one to three feet above the ground, are quite bulky, constructed outwardly of dry grass stems and rootlets, inwardly of fine soft grass. Two of the nests have a scanty lining of horse-hairs, while the third is well lined with soft, white, chicken feathers. The nests that were built on the ground are much more compactly built, there is less of the rough, bulky exterior, while the layer of soft, fine grass is much thicker. Two of the nests are without the lining of horse-hairs or feathers. One is lined with green feathers of the Yellow-headed Parrot (*Amazona aurofalliata*). The average inside measurements are 1.50 inches in depth by 2.00 in diameter. A nest taken in San José, June 30, 1890, presents some peculiarities, the owner having appropriated to itself the old nest of a *Merula grayi*, only adding a lining of soft, dry grass, and this chiefly at the upper edge so as to contract the rim, and then an inner lining of a few horse-hairs. It measures 2.25 inches in diameter by 2.00 deep. The nest of the Thrush had measured 4 inches in diameter inside. The outside measurements of the entire nest are 6.50 inches in diameter by 3.00 deep. When first taken the structure was very pretty, being completely covered with bright green moss.

The eggs are a rather pale glaucous green, speckled with walnut brown, the spots thickest about the larger end. Some eggs are blotched with walnut brown in a band about the larger end; such have very few specks about the smaller end. The average measurements of a dozen eggs are .79 X .54 inch.

This Sparrow is found abundantly up to an elevation of about 7000 feet and down to within a thousand feet of the coast level. It is distinctly a bird of the open country.

61. *Spiza americana*.—Rare about San José. Arrives about Sept. 27, and is not seen after April 20. Birds in young plumage greatly predominate.

62. *Pyrgisoma cabanisi*.—Common resident, frequenting the hedgerows in the outskirts of the city. It is seldom seen far from the ground, usually scratching about among the dry leaves. Several broods are reared each year. Young birds just able to fly are taken as early as June 6, and as late as November 10. A nest of this species taken June 5, 1889, was found on the ground in a slight hollow at the foot of a few stalks of sugar cane. It was composed chiefly of dead and rotting grass stems,

* Allen, Bull. A. M. N. H., Vol. III, p. 374.

lined with fine rootlets and a few horse-hairs. It measures inside 2.75 inches in diameter by 1.50 in depth. The nest contained two fresh eggs, white with a faint bluish tinge, thinly speckled with cinnamon except at the larger end where the spots are more of a chestnut, larger, and crowded together, forming a distinct band. The eggs are elliptical ovate and measure .91 X .64 and .90 X .66 inch.

Young birds differ decidedly from the adult, and may be described as follows: (♂ juv., no. 4977, M. N. de C. R., San José, June 6, 1890, Geo. K. Cherrie). Above, bistre brown with olive shading; less olive and deeper brown on crown and occiput; most of the feathers with a blackish bar across the tip, giving the back a somewhat mottled appearance. Wing-coverts olive brown, the greater series tipped with tawny olive, forming a distinct band. Remiges dusky. Forehead and auriculars black. Checks and loreal region whitish, mottled with dusky. Throat whitish, faintly speckled with dusky tips to the feathers. Breast and sides dusky wood-brown, becoming paler and more buffy on belly and crissum. Breast and belly with distinct dusky stripes. The adult plumage is attained by the first moult, which goes on comparatively slowly, requiring about three months for its completion. The plumage of the young has almost entirely disappeared below, before the moult commences on the back.

I have not noted the species below an altitude of 2800 feet, nor above 5000 feet.

63. *Pyrgisoma leucotis*.—Rare about San José, but common enough at a slightly lower altitude. Its habits are similar to those of *P. cabanisi*. The nest and eggs I have not met with, but several broods of young are reared each year, birds just from the nest being found from June until November. I think birds do not attain the completely adult plumage until the second year, differing, however, only in having a dusky olive brown head, instead of black, and the upper back more ashy. Young birds are very much browner above and are faintly mottled with blackish tips to many of the feathers. The throat is blackish, breast dusky olive mottled with dusky, belly olive yellowish, crissum and flanks rufous.

64. *Spinus mexicanus*.—Tolerably common resident.

65. *Eucorystes wagleri*.—Seldom met with about San José. I think that only one brood of young is reared each year. Young birds are uniform black above with a slight gloss, rump brownish. The crown and occiput and sides of head are like the back, but there is a broad pale yellowish supraloral stripe extending to just back of the eye; in some examples the yellowish color meets in a band across the forehead. Throat, breast, belly and thighs dusky blackish with faint brownish shade; crissum tawny.

66. *Amblycercus holosericeus*.—Not common in the vicinity of the city. Common on both the Atlantic and Pacific slopes down as far as the coast, and I have taken examples at an altitude of over 6000 feet. The young do not differ from the adult.

67. *Icterus spurius*.—Migrants arrive as early as July 31, and linger until as late as March 12. Birds in young plumage predominate.

68. *Icterus galbula*.—Not nearly as common as the preceding species, appearing much later in the season, not having been noted earlier than October 5. In the spring I have seen birds as late as March 16.

69. *Callothrus robustus*.—Common resident, but much more abundant during the dry season. Are gregarious, associating in large flocks. For description of the eggs see page 26 of the present volume.

70. *Sturnella magna mexicana*.—Common resident.

71. *Psilorhinus mexicanus*.—Common resident. Somewhat gregarious. The plumage of the young does not differ from that of the adult. Only one brood is reared each year. As far as my observations have gone they are not found below an altitude of 2500 feet nor above 4500.

72. *Xiphorhynchus pusillus*.—Accidental visitor in the vicinity of San José. A single specimen was taken August 26, 1891.

73. *Thamnophilus doliatus*.—I shot a single straggler from the coast region November 23, 1890. Found only on the Pacific side of the country.

74. *Sayornis aquatica*.—Tolerably common resident. I have not seen either nest or eggs, but breeding evidently commences early in February. A female taken February 16, 1890, had the oviduct enlarged.

75. *Todirostrum cinereum*.—Tolerably common resident. For notes on the nidification see this journal, Vol. VIII, p. 233.

76. *Tyranniscus parvus*.—Oct. 13, 1889, a single female was taken near the city, — the only example I have seen at this altitude.

77. *Elainea pagana subpagana*.—Abundant resident. I have already described the nesting habits of this species (see this journal, Vol. VIII, p. 235).

78. *Legatus albicollis*.—Rare. Two specimens have been taken in the vicinity of San José, both males, the first, July 29, 1889, and the second June 7, 1891. Dr. Don Francisco Castro secured a female and two young at San Sebastian a few miles south of San José. They were taken July 14, 1891. The young birds are darker above than the adult. The crown is almost black and without indication of the concealed spot of sulphur yellow. The superciliary stripe and band across the nape are much broader and tinged with buffy. The greater and median coverts are rather broadly tipped with vinaceous cinnamon, the lesser coverts, feathers of the rump, upper tail-coverts, and rectrices (except the outer pair) are edged and tipped with brown, more of a chestnut hue. Below, much paler, straw yellow, and with the dusky striations confined to the breast; sides and flanks almost immaculate.

79. *Myiozetetes texensis*.—Tolerably common. For notes on nesting habits see this Journal, Vol. VIII, p. 235. Young birds do not differ from the adults.

80. *Pitangus derbianus*.—Rare about San José.

81. *Myiodynastes luteiventris*.—Rare visitor in the neighborhood of San José.

82. *Myiodynastes audax*.—Rare resident.

83. *Megarhynchus pitangua*.—Tolerably common. Somewhat gregarious, or perhaps it is only the members of single families that appear to remain together for some months after the end of the breeding season. Señor Alfaro secured a nest at Alajuela, May 18, 1888. Incubation was far advanced. The eggs are white, blotched and speckled with seal brown: only two were found with the nest; they measure $.94 \times .72$ and $.1.05 \times .76$ inch. The nest is very roughly constructed of strips from banana leaves, a few rootlets, and plant fibres, without any lining.

84. *Empidonax flaviventris*.—Somewhat rare at San José and only noted during the months of September and October. The earliest arrival Sept. 3, and the latest record Oct. 27. Tolerably common lower down on both coasts where it is found until as late as May 13.

85. *Empidonax acadicus*.—Tolerably common from about September 17 until May 11. They are found on both coasts and up to an altitude of about 6000 feet.

86. *Contopus virens*.—Tolerably common from about August 20 until April 29.

87. *Contopus richardsoni*.—Typical examples arrive later and disappear earlier than birds of the preceding species.

88. *Contopus borealis*.—Never common, but seen occasionally from October 2 until May 7.

89. *Contopus brachytarsus*.—A rare bird in Costa Rica. There are only three examples in the collection of the Museo Nacional; two were taken at San José, one October 2 and the other August 27.

90. *Myiarchus crinitus*.—Very rare transient visitor at San José, but fairly common on both coasts during the winter season in the north.

91. *Myiarchus lawrencei nigricapillus*.—Common resident.

92. *Tyrannus melancholicus satrapa*.—Abundant resident. Breeding commences the latter part of June and continues throughout August. Young birds resemble the adults, lacking only the concealed crown patch.

93. *Milvulus tyrannus*.—Resident, but much more abundant at some seasons than at others;—that is, immediately after the breeding season (from the latter part of April until the first of July) they become quite common about the suburbs of the city, and remain so until the middle of December.

(*To be continued.*)

A STUDY OF THE SPARROW HAWKS (SUBGENUS
TINNUNCULUS) OF AMERICA, WITH ESPEC-
IAL REFERENCE TO THE CONTINENTAL
SPECIES (*FALCO SPARVERIUS* LINN.)*

BY EDGAR A. MEARNS.

THIS subgenus has its centre of development in the tropical portion of America, two of the three† known American species being peculiar to the West Indian region, the third, *Falco* (*Tinnunculus*) *sparverius*, extending from the equator southward to the extremity of the Southern American continent, and northward to Hudson's Bay and Alaska, extreme points in its longitudinal dispersion being Unalaska and Pernambuco. These species may be recognized by the following:

Synopsis of the American Species.

A. Species having a single color phase — not dichromatic. Front and auriculars distinctly whitish; back always entirely rufous, with or without black bars or spots; with no conspicuous superciliary stripe of white; under surface of wing with the quills (usually) barred entirely across with black and white.

a. Vertex with or without a patch of rufous; tail of male with a single subterminal zone of black; rump and anterior portion of back immaculate; spots of under surface small and rather sparse.

1. *Falco sparverius*. *Male*: Top of head varying from light bluish ash to blackish slate, usually without conspicuously darker shaft streaks, particularly on the rusty crown patch, when present; wings bluish ash, with a few small black spots. *Female*: Black bars of tail narrower than the fulvous rufous interspaces; spots of under surface reddish brown, tending to form longitudinal streaks.

Habitat.—Whole of North and South America, straggling to the West Indies.

* The Sparrow Hawks of America are wholly different from the bird which bears the same name in Europe. The latter belongs to the genus *Accipiter* (the same that includes our Cooper's and Sharp-shinned Hawks), while the American Sparrow Hawks belong to the subgenus *Tinnunculus* of *Falco* in which are included the Kestrel, Red-footed Falcon, Lesser Kestrel, and other Old World species.

† I have here adopted Mr. Ridgway's recent views (see 'The Auk,' Vol. VIII, January, 1891, p. 113) in uniting *Falco dominicensis* Gmel. and *F. sparveroides* Vig., of the West Indies, as dichromatic phases of a single species, the material at my command being insufficient to enable me to decide the question independently.

b. Vertex always (?) rufous; tail of male crossed by numerous black bars; rump and anterior portion of back transversely barred or spotted with black; breast and sides thickly spotted with large black spots.

2. *Falco caribbeorum*. *Male*: Top of head dark bluish plumbeous, the feathers (including those of the rusty vertex) streaked with black centrally; wings dark bluish plumbeous, very heavily spotted with black; entire rufous surface heavily barred with black. *Female*: Black bars of tail broader than the castaneous rufous interspaces; spots of under surface black, many of them cordate.

Habitat.—Lesser Antilles.

B. Two distinct color phases. Front and auriculars dusky; back entirely plumbeous in the male (dark phase); with broad white frontal and superciliary stripes; under surface of quills white, merely serrated with dusky along the terminal portion of the shaft (light phase).

✓3. *Falco dominicensis*. *Male* (dark phase): Above, dark plumbeous, except the tail, which is as in *sparverius*. Below, deep rufous, with a wash of plumbeous across the jugulum, and the throat grayish white. Inner webs of quills slaty, crossed by indistinct dusky bars. There is sometimes a trace of rufous in the plumbeous of crown. *Female* (dark phase): Top of head slate-gray; upper parts rufous brown, banded with dull black; underparts, including lining of wings, castaneous rufous; inner webs of primaries dull grayish rufous, with transverse cloudings of dusky. *Male* (light phase): Above rufous, as in *sparverius*, but with little transverse spotting of black on scapulars; crown and wings bluish gray, the former usually without a rusty centre; a conspicuous white superciliary stripe, and front broadly white; 'moustache' across cheeks indistinct or obsolete. Below, immaculate white, the breast stained with a delicate shade of salmon-rufous. *Female* (light phase): Above similar to the dark phase, but with crown bluer, showing a patch of rufous. Below buffy white or very pale rufous, finely spotted or streaked with pale rusty brown; throat white.

Habitat.—West Indies, (Cuba, Hayti, San Domingo, and Porto Rico), casually to southern Florida (?).

Before discussing the geographical races and incipient forms of the single continental species, depending on locality, it will be well to consider the variations, in all these species, which depend upon sex, age, and season.

Dimorphism is confined, so far as known in this group, to the West Indian Sparrow Hawk (*Falco dominicensis*). In this species there is a light phase which quite closely resembles typical *sparverius* of the eastern United States, but is whiter, with some of the dark markings reduced or obsolete, and the colors finer and brighter, and a dark phase in which the markings are intensified, the rufous of the upper surface, except the

tail, replaced by dark plumbeous in the male, and both sexes deep rufous, on the underparts.

Sexual Differences.—In all plumages succeeding that of downy nestlings, the sexes are readily distinguishable. In addition to its larger size, the female may be instantly recognized by the absence of plumbeous on the wings. The regular transverse barring or spotting from the nape to the extremity of the tail is diagnostic of the female in all but *Falco caribbeorum*, in which the male is similarly banded, and *F. sparverius aequatorialis*, in which the rump of the female is immaculate. In all, the plumage of the female is duller; and, as a rule, the markings of the underparts (except in *Falco caribbeorum*) are brownish instead of black, and tending to longitudinal stripes rather than round spots. The female of *Falco sparverius*, except in the subspecies *aequatorialis*, usually lacks the tawny ochraceous buff of the underparts which distinguishes adult males. The reddish crown patch is common to both sexes and all ages, though often much reduced in size or entirely absent, except in specimens from the interior region of North America, in which it is largely developed. The feathers of the rusty crown patch are often more streaked centrally with dusky or plumbeous in females than in males.

Differences depending on Age.—The age differences in the American species of this group are limited to slight modifications of the adult, a marked peculiarity being the early age at which the perfect adult plumage is acquired. All winter specimens from north of the equator are practically in adult plumage, though young birds at that season are distinguishable by the paler yellow of the cere and feet, as well as by anatomical conditions. I am inclined to the opinion that the oldest males, in *F. sparverius* are those having the least number of spots on the under surface, though Florida specimens show less spotting than those from other regions on the continent of America (unless those from near the coast in equatorial South America), thus approaching, as they sometimes do in other respects, the (usually) unspotted West Indian *Falco dominicensis*. Specimens from the western United States, Mexico, Central and Southern America, are all spotted below, though a few from Texas and Arizona are slightly so.

The series of young males of the year from east of the Mississippi River comprises specimens taken in June, July, August, September and October, those captured during the last month being mostly in the patchy condition incident to the transition from the young to the adult plumage. These young males differ from adults at the same season in having the feathers edged with white or pale rusty, and the markings suffused. The buffy ochraceous color of the underparts is much paler, usually cream-buff, though the intensity varies much with the individual, even in young of the same brood. The spotting, which is chiefly confined to the sides or flanks in old males, extends to the front of the chest, where the spots have a linear instead of rounded form. In most very young birds the ashy feathers of the crown and wing-coverts have rusty edges, the former with narrow, dark shaft-streaks, also extending to the rusty crown patch

which is somewhat restricted; but in a very young example, collected by Spencer F. Baird, at Carlisle, Pennsylvania, June 6, 1844 (Smiths. Inst., No. 1598), there is very little pale edging to the feathers of the upper surface, which appear almost as sharply patterned as in adults, and the underparts are strongly ochraceous fulvous. *

In the young there is also a stronger tendency to irregularity in the pattern of the tail-feathers, in which the rufous is sometimes restricted to the middle pair and irregular areas upon those next them, the outer four or five feathers being variously banded, striped, or spotted with black, cinereous, and ochraceous, especially on their terminal portion; but variations in the amount of variegation of the tail are not confined to young birds, adults, especially from the eastern United States, showing very considerable departures from the common style, in which the tail is plain rufous, subterminally banded with black, and tipped with (usually) white, with the outer feather, and often the outer portion of the one next it varied with black and white, but which quite frequently have strong indications of additional black bands, and variable areas of ochraceous white, ochraceous ash, and rusty, scattered promiscuously over the interspaces.

The transverse barring of black on back and scapulars is sometimes nearly as in adults, but the bars are usually more numerous, extending nearer to the nape. The tips of the wing quills are broadly edged with white; and the terminal band on the rectrices is more apt to appear rusty instead of white, with the central pair often cinereous.

I am unable to appreciate any intermediate phase of plumage between that of the first plumage and the adult male of winter. The latter garb is assumed gradually during September and October.

Young females are still more similar to adults, the difference consisting almost wholly in the deeper, more suffused markings, and sharper streaking of the crown.

Seasonal Variation.—An examination of 161 males develops the fact that there is a well-marked difference between the plumages of winter and summer, the difference being in the intensity of coloring. The largest series from one region comes from Arizona. The date of capture has been accurately noted on the labels of 31 males from that Territory, of which number 23 have acquired the adult plumage. Four are moulting birds, changing from the plumage of summer to that of winter, taken from September 15 to October 17; nine specimens, captured between the dates of December 6 and February 19, represent the typical plumage of winter; and ten, taken in April and May, are in the summer plumage of the resident Arizona bird, migrants having departed before that season. April and May specimens are much paler throughout, this being especially noticeable upon the under surface, where the tawny ochraceous buff of the winter plumage is replaced by cream-buff. The three black nape patches appear more distinct, from the paling of the surrounding plumage of the neck, which, in summer, shows as a collar of ochraceous buff. The seasonal difference is so considerable that specimens could readily be as-

signed to the winter or summer plumage without reference to the labels, though one unusually pale winter specimen (No. 29,569, Am. Mus. coll., January 27), and another exceptionally dark one, taken May 28 (No. 51,642, Am. Mus. coll.), approach each other closely. The newly acquired feathers, in the four specimens taken during September and October, are somewhat more deeply colored than in winter birds, in which the plumage has been worn for some time. Three of the four have but little black spotting on the wing-coverts.

There are 55 males from east of the Mississippi River, of which all but 8 have the date of capture fixed. Thirteen of those remaining are young, leaving 34 for comparison as to the seasonal variation. From an examination of this material it appears that, though the individual variation in the depth of coloring is far greater than in Western specimens, often overlapping the seasonal difference, the average seasonal variation is the same as in the Arizona series, just compared. The greatest intensity of coloring is reached in the month of November, when the winter dress is new, at which season the underparts, excepting the throat and crissum, become deep cinnamon rufous, as exemplified by specimens from Pennsylvania (No. 1752, Smithsonian collection, Carlisle, November 25, 1844, S. F. Baird) and Louisiana (Covington, November 15, 1889, G. Kohn). During the first two months of winter this color gradually fades, becoming pale pinkish buff in some examples before the end of February, while others retain a deeper tint through the spring months, through delay in moulting, or being naturally deeper hued than most individuals. As in the Arizona series, the wing-coverts are less spotted with black in winter than in summer, several of them having this portion of the wing entirely plain, while in others the sagittate spots are few in number; and corresponding differences in the seasonal coloration of the upper surface of the body are found, though the pale, buffy collar is indistinct in the Eastern bird. The seasonal variation in other parts of North America corresponds closely to that noted in the above series from Arizona and the eastern United States; but the data at command are insufficient to show the amount and character of seasonal changes in the plumage of the forms from Central and South America, the date of capture having been written on but few labels. The change from the pale summer dress to the darker plumage of winter occurs with the fall moult, from August to October, being complete in most cases by the end of the latter month.

Females are considerably darker in winter than in summer. The dates of capture of 17 females, taken by the writer in central Arizona, cover every month of the year but June and August. Beyond the conditions incident to a change of plumage, the seasonal variation is confined to a paling of the colors in summer, at which season the upper surface is chiefly ochraceous cinnamon instead of the darker, more vinaceous, tint of winter. A similar difference is noted in the females from other regions though the number of specimens from single localities is insufficient for a thorough comparison.

Falco sparverius Linn.

AMERICAN SPARROW HAWK.

Habitat.—Entire continents of both North and South America and adjacent islands, straggling to the West Indies, etc.

The range of the Sparrow Hawk extends through 115 degrees of latitude and 133 degrees of longitude! Few species of birds are capable of following it throughout its breeding range, which is nearly co-extensive with the enormous area of its habitat. That a species of such wide distribution should not vary is scarcely supposable; and, accordingly, we find it exhibiting the results of environmental influences to such a degree that it becomes necessary to recognize no less than six geographical races or subspecies as follows:—

1. *Falco sparverius*. Habitat, northern and eastern United States, south through Mexico and Central America to northern South America.
2. *F. s. deserticolus*. Habitat, southwestern United States, north to northern California and western Montana, south to Mazatlan in north-western Mexico.
3. *F. s. peninsularis*. Habitat, peninsula of Lower California.
4. *F. s. australis*. Habitat, whole of South America, except the North Atlantic and Caribbean coasts; west of the Andes Mountains replaced by or mixed with the two following.
5. *F. s. aequatorialis*. Habitat, Ecuador.
6. *F. s. cinnamominus*. Habitat, Chile and western Brazil.

The above arrangement of the subspecies of *Falco sparverius* is based on an examination of 297 specimens,* of which 241 are from North America north of Mexico (102 from east and 139 from west of the Mississippi River), 9 from Mexico, 11 from Lower California, 13 from Central America, and 23 from South America, the several political divisions being represented as fol-

* For the use of this material I wish to acknowledge my obligation to Mr. Robert Ridgway (for the contribution of 157 specimens in the collection of the Smithsonian Institution), Dr. J. A. Allen (70 specimens from the American Museum of Natural History), Mr. George B. Sennett (18 specimens from Texas and Pennsylvania), Mr. Charles W. Richmond (16 specimens from Montana and Maryland), Mr. Gustave Kohn (11 specimens from Louisiana), Mr. G. S. Miller, Jr. (10 specimens from Florida, Colorado, Massachusetts, and Nova Scotia), Mr. Jno. H. Sage (8 specimens from Connecticut), Mr. F. C. Browne (2 specimens from Florida), Mr. G. H. Ragsdale (2 specimens from Texas), Mr. Frank X. Holzner (3 specimens from Minnesota), and to Mr. T. R. Taylor, of Rochester, New York, for the generous offer of his collection of mounted Sparrow Hawks.

lows: Northern British America, 2; Nova Scotia, 3; British Columbia, 8; Massachusetts, 2; Connecticut, 11; New York, 1; New Jersey, 1; Pennsylvania, 14; Maryland, 6; District of Columbia, 1; Virginia, 1; Ohio, 1; Tennessee, 1; Illinois, 9; Florida, 36; Louisiana, 12; Minnesota, 3; North and South Dakota, 10; Montana, 12; Washington, 1; Oregon, 2; Wyoming, 3; Colorado, 7; Nevada, 4; Texas, 19; Arizona, 51; California, 20; Lower California, 11; Mexico, 9; Costa Rica, 5; Nicaragua, 1; Guatemala, 7; Brazil, 8; British Guiana, 1; Bogota, 2; Ecuador, 3; Peru, 1; Chile, 3; Argentine Republic, 1; Paraguay, 3; Strait of Magellan, 1.

A critical survey of this material shows that there are as many regional phases in the American Sparrow Hawk as there are subspecies of Horned Larks (*Otocoris alpestris*); but, unlike that species, these differences are of so slight a character as to be insusceptible of intelligent expression in written descriptions, in the majority of cases; and it is deemed inadvisable to separate as subspecies slight forms that could not be distinguished with reasonable certainty without reference to the locality. The six subspecies here recognized are capable of ready recognition when average examples are compared with the form to which they are most closely related.

Subsp. *sparverius* Linn.

As observed by Mr. Ridgway, the most distinct and characteristic examples of the *sparverius* type come from the highlands of Mexico and central America; but, as Linné described it from specimens obtained in the eastern United States, breeding birds from that general region will be described as typical *sparverius*.

Adult male (based on No. 26,922, Smiths. Inst., Nova Scotia, taken, with female and one egg, in June, by W. G. Winter). — Back, upper tail coverts, crown patch, and tail, vinaceous cinnamon rufous, the back and scapulars rather sparingly barred with black, the tail tipped with white, with a broad, subterminal band of black, the outer feather white with four black bars on the inner web and a rufous stripe along the inner edge of the basal half of shaft; outer web of the next feather with an ashy white area in which there is a black spot. Wings bluish gray, with quills black, serrated with white on inner webs; coverts with small, oval, black spots. Breast ochraceous buff, fading to pale buff posteriorly; flanks with several rows of roundish, black spots; under surface of wing white, barred with

dull black on quills, sparingly spotted with black on under wing-coverts; top of head, bluish gray; forehead, ear-coverts, an inconspicuous superciliary line, and chin, white; moustache, a large postauricular patch and three cervical patches, black. Iris, hazel. Bill, cere, tarsi and toes, deep chrome; claws black.

Adult Female (based on No. 77,907, Smiths. Inst., Laurel, Maryland, May 4, 1879, collected by G. Marshall).—Upper surface of body cinnamon rufous, inclining to castaneous, transversely barred with blackish; quills dusky, barred with rusty and white. Below dirty white, with markings of sepia on chest and sides, the spots being chiefly linear on the chest, and subcordate on the flanks; posteriorly immaculate. Head as in the male. Tail rufous like the back, with about twelve bars of black.

Young Male (No. 1598, Smiths. Inst., Carlisle, Pennsylvania, June 6, 1844; collected by S. F. Baird).—Similar to adult male, but with spotting of under surface more as in the adult female, the markings extending across the chest as numerous, lanceolate, black spots. The tips of the quills are broadly edged with whitish; tip of tail pale rusty, plumbeous on central feathers; three outer feathers with incomplete bars of black and bluish ash.

Young Female (No. 1599, Smiths. Inst., Carlisle, Pennsylvania, June 6, 1844; collected by S. F. Baird).—Similar to adult female, but darker, with the upper surface more castaneous, the markings more diffused, the under markings nearly all tending to form broadly linear streaks, instead of being cordate on the flanks; under surface tinged with ochraceous; tips of quills edged with rusty white, top of head, including reddish crown patch, with dark shaft-streaks to the feathers.

Comparison of the specimens from east of the Mississippi River, excluding those from Florida and the Gulf Coast, shows the following variations. The rusty crown patch varies greatly in size, often being restricted to a mere trace, and is wholly absent in six specimens, five males and one female, two of which are from Connecticut, three from Pennsylvania, and one (female) from Mt. Carmel, Illinois, representing both winter and summer plumages. The absence or restriction of the crown patch seems to be indicative of a high degree of development, occurring in very old males, and associated with less spotting of the under surface, and extension of a bluish color—so characteristic of extreme adolescence in the genus *Falco*—to the crown, back, scapulars, rump and tail; but it should be remarked, in passing, that the amount of variegation of the tail with black and white on the outer feathers, or of gray and black barring, appears to be partly dependent on age, and subject to extreme variation in specimens from the same locality, some having only a portion of the outer

tail-feather variegated with black and white, others having two or three outer feathers varied with bluish, white and black, while in extreme cases the rufous is limited to the basal portion of the middle feathers, the rest of the tail being crossed by three or four more or less complete bars of black, the intermediate spaces being bluish centrally, changing to whitish on the outer feathers. The single female in which the crown patch is wanting (No. 84, -478, Smiths. Inst., Mt. Carmel, Illinois, October 5, 1874; J. L. Ridgway), has the top of the head brownish slate, almost as in *Falco dominicensis*.

All of the males from the eastern United States have a rather liberal amount of transverse black markings on the rufous feathers of the back and scapulars, though the bluish gray of the wings often encroaches considerably on this area; and the feathers of the rump and upper tail-coverts are quite often of the same color, the latter with a black central spot.

The white edging to the tips of the tail-feathers often varies to cinereous (most often on the central pair), rusty, or yellowish or grayish white. Sometimes the central feathers have gray tips enclosing a central or two lateral rufous spots, as seen in some examples of the light phase of *F. dominicensis*.

With a good series from Florida and the Gulf Coast, I am unable to characterize this littoral form in such a manner that specimens could be distinguished with any certainty from typical *sparverius* of the Eastern States, though there are appreciable average differences which strike the eye of those accustomed to making critical comparisons. The alleged subspecies *isabellinus* is described as having the bluish ash of the head changed to plumbeous, without the central patch of rufous, the breast and underparts strongly ochraceous, and the spotting much reduced in amount, especially below. Except as regards the last particular, and a slight disparity of size, the characters assigned prove to be wholly inconstant; and, accordingly, the name has been dropped from our check-lists. The crown patch is more frequently absent in specimens from the northward of the latitude of Tennessee and Virginia than south of that; and the top of the head averages more darkly plumbeous in northern birds than in those of Florida. Respecting the intensity of the ochraceous tinge on the underparts of the male, the difference between the two series is slight, averaging about the same. It is most intense

in two fall specimens coming, respectively, from Louisiana (Covington, November 15, 1889, G. Kohn) and Pennsylvania (No. 1752, Carlisle, November 25, 1844, Spencer F. Baird). The two palest males are from Florida (No. 110, Miakka, April 10, 1887, J. C. Cahoon, No. 5306, collection of G. S. Miller, Jr.) and Connecticut (No. 939, Portland, April 12, 1887, Jno. H. Sage), taken in spring. The Florida specimen is entirely immaculate below, with only a trace of the usual transverse spotting on the back and longest scapulars, and with a moderate amount of black spotting on the wing-coverts; while the Connecticut bird has less spotting than usual in northern specimens. The former shows some resemblance to the light phase of the West Indian *F. dominicensis* in the blueness of the top of the head, and whiteness of the under surface of the wing, in which the blackish transverse bars are obsolete on the outermost feather except on its terminal half, where they do not cross the entire web; but it has a large rusty crown patch, and a well-developed black moustache, besides lacking the white front and superciliary line and having the tail entirely different. In these two specimens the breast is very slightly tinged with ochraceous buff. In a specimen (No. 1301) collected by Mr. Frank M. Chapman at Pine Island, Florida, January 30, 1888, there is also considerable resemblance to the pale phase of *F. dominicensis*. The crown is of precisely the same shade of bluish ash, and lacks the rusty centre; the breast is tinged with more nearly the same shade of ochraceous; but otherwise it is as in *sparverius*. A resemblance to the West Indian species is also seen in No. 6, Miami, Florida, March, 1851, collected by Mr. F. C. Browne. This bird has the black moustache reduced and mixed with white, and has quite strong indications of the white forehead and superciliary stripe; and the outer web of the outer tail-feather is white with one black spot on the inner web in addition to the one pertaining to the subterminal zone; otherwise as in typical *sparverius*. Other specimens (as No. 100, 150, Smiths. Inst.) from Florida exhibit considerable whitening of the under surface of the wing.

Considering the absence of summer specimens in the series before me, I should say that the resident Sparrow Hawk of Florida is probably paler than that of the New England and Middle States, though many of the winter birds are rather highly colored; that it is much less spotted, especially on the under sur-

face, and is, as might be presupposed, of smaller size, with a rather large beak; beyond this, there is nothing worthy of recognition in the variety *isabellinus* so far as the coast region of the United States is concerned. The series from Louisiana shows the crown to be more darkly plumbeous than in Florida birds.

In the timbered country of the middle district, from Illinois eastward through Ohio, Tennessee, Pennsylvania, etc., there is a tendency to somewhat heavier coloration than farther east.

Sparrow Hawks from the coast region of Texas are similar to those from Louisiana, but in western Texas and the Plains region lying between the Mississippi River and the Rocky Mountains there is a form almost intermediate between typical *sparverius* and *deserticolus* of the Great Basin and contiguous areas of the Southwest, its relationship to the latter being about the same as that existing between *Octocoris alpestris arenicola* and *O. a. adusta* or *chrysolæma*, of corresponding regions.

British North America (Nova Scotia, Moose Factory, Hudson's Bay, Fort Rae, and British Columbia) and the northwestern United States furnish specimens of unusual depth of coloration, though lacking bright rufous tints. In males the spotting of the under surface, usually confined to the sides, extends over a larger area; and in females the under surface is more buffy or rufescent and the under striping broader and browner. Males taken by Captain Charles E. Bendire at Walla Walla, Washington, have the breast of a deep cinnamon color.

Taking in hand the material from south of the United States, all specimens from Mexico, except a pair from Mazatlan collected by Col. A. J. Grayson, and all from Central America, are distinctly *sparverius*. The males have considerable ochraceous on the underparts, and quite distinct moustaches (as much so as in those from Arizona, but less than in Eastern specimens). Nos. 103,357 and 103,358, Smiths. Coll., from Guatemala, have but a trace of rusty on the crown; and No. 33,213, Smiths. Coll., from San José, Costa Rica, has very little. The remaining seven have large rufous crown patches. The tail, as a rule, is less variegated than in specimens from the northern part of the continent, three having but two black spots, and a fourth only one on the lateral feathers, the outer web being plain white, with a narrow black line along the shaft; but a similar condition is noted in specimens from other regions, among which is one from Hudson's Bay.

In the much too small series of these Hawks before me from South America are several, mostly from the northeast coast, that are probably referable to *sparverius*; but most of them are mixed with the subspecies *australis*, found over most of South America.

Comparative measurements.—Average of 10 adult males from north of the latitude of Virginia and Tennessee, including five which have the rufous crown patch well developed, and five which lack the crown patch or exhibit (in two cases) but a trace of it: wing, 188.0; tail, 127.0; chord of culmen, 11.8; width of bill at base, 10.0; tarsus, 36.7; middle toe 23.7 mm. Average of 10 adult males from Florida and Louisiana, including five having the rufous crown, and five in which it is wanting (in one) or much reduced*: wing 179.0; tail, 118.0; chord of culmen, 12.1; width of bill at base, 9.9; tarsus, 34.1; middle toe, 22.7 mm. Average of 10 adult females from the eastern United States north of the latitude of Virginia and Tennessee: wing, 196.0; tail, 130.0; chord of culmen, 12.6; width of bill at base, 11.0; tarsus, 35.8; middle toe, 24.3. Average of 10 adult females from Florida: wing, 190.0; tail, 126.0; chord of culmen, 12.3; width of bill at base, 10.7; tarsus, 34.3; middle toe, 22.2. Average of six adult females from Texas: wing, 200.0; tail, 136.0; chord of culmen, 12.5; width of bill at base, 10.8; tarsus, 35.8; middle toe, 24.3 mm.

From the above measurements it will be seen that Sparrow Hawks from Florida and Louisiana are considerably smaller than those from the Northern States, while those from Texas are larger than in either of the other series.

Falco sparverius deserticolus, SUBSP. NOV.

DESERT SPARROW HAWK.

Habitat.—Southwestern United States, north to northern California and western Montana, south to Mazatlan in north-western Mexico.

General characters.—Larger than Eastern *sparverius*, with relatively longer tail. This is a desert form from the treeless regions of the Southwest. It is paler, much more rufous, and with a larger crown patch than in the typical form. The black bars on inner webs of quills do not cross

* Comparison of the average measurements of five northern and of five southern male Sparrow Hawks having large rufous crown patches with five others from each region in which it is wanting or reduced to a slight trace, shows the measurements to be almost identical, in the two sets of specimens.

the entire web, as in *sparverius*, but occur as sparse serrations of dusky along outer extremity of shaft, sometimes approaching the condition of whiteness seen in the light phase of *F. dominicensis*, and in some specimens from Florida. Female with more numerous and yellow spotting below, and a redder tone to the under side of the tail. The dark bars of the upper surface are narrower, those of the tail being more often incomplete. As the characters on which this subspecies is based are most apparent in the female, a specimen of that sex has been selected as the type.

Type, No. 51,636, Am. Mus. Coll., ♀ ad., Fort Verde, Arizona, April 29, 1884, Edgar A. Mearns.

Adult male in summer (based on No. 51,641, Am. Mus. Coll., Fort Verde, Arizona, May 23, 1884).—Back and crown patch, ochraceous buff; sides of neck, buff; upper tail-coverts and tail, pale cinnamon rufous; back and scapulars slightly spotted and barred with black; tail subterminally banded with black, and rather broadly tipped with ochraceous buff, with three outer feathers mixed with whitish or pale cinereous, crossed by irregular black bars, the outer feather white to the base. Wings pale plumbeous; quills black, with more white than black on their inner webs; coverts with numerous oval or rhomboid black spots; edges of crown light cinereous. Underparts cream-buff, with several irregular rows of small black spots on the sides, the outermost being cordate and the innermost linear.

Adult male in winter (Am. Mus. No. 51,654, Fort Verde, Arizona, December 6, 1884).—Above pale vinaceous cinnamon rufous, the crown patch plain rufous, covering nearly all of the top of the head; back and scapulars sparingly barred with black. Tail tipped with white externally, cinereous on tips of middle feathers; outer feather white only on outer web and towards tip, with two black spots on inner web; residue of tail rufous, subterminally banded with black. Wings and edges of crown, plumbeous; coverts sparsely spotted with larger, ovate or cordate, black spots. Underparts pale buff, ochraceous buff on chest, sparingly spotted with black on sides.

Adult female in summer (based on the type).—Above tawny ochraceous buff, barred with dull black with plumbeous reflections; crown patch plain, nearly covering the pale cinereous of the top of the head; quills dusky, chiefly ferruginous white on their inner webs. Below cream-buff, with chest and sides thickly streaked with yellowish clay-color; under surface of tail vinaceous cinnamon.

Adult female in winter (Am. Mus. No. 51,666, Fort Verde, Arizona, January 11, 1888).—Above somewhat darker, inclining to cinnamon rufous, with narrow black shaft-streaks to feathers of crown patch. Below more heavily streaked, those of chest being broader, those of sides and front of abdomen inclining to guttate.

Young male.—Six young of the year, captured at Fort Verde, in the American Museum collection, exhibit the following phases: No. 51,643, July 18, 1884, is more like the adult male than either of the others, having

a large rufous crown patch, with indications of plumbeous central streaks to some of the feathers, the transverse barring of the back and scapulars as usual in adults, and scarcely any rusty or whitish edges to the feathers of crown, rump and coverts, but with white tips to the wing quills, and the terminal band of tail pale rusty, mixed with gray on the middle pair of feathers. The pectoral region is moderately tinged with ochraceous, the dusky linear spots extending forward to the neck. Crissum pale cream-buff. Nos. 51,649, and 51,664, September 14 and 19, differ from the last in being nearly white below, with much more than the average amount of barring on the anterior portion of the back; otherwise they are nearly the same. Nos. 51,648 and 51,650 *bis* belong to the same brood, and were taken, together with their parents, on September 15. One is white below, and the other strongly tinged with ochraceous buff. The feathers of the upper surface, including wing-coverts, are edged with rusty white, and the back and scapulars have fewer black bars than in the male parent. All have liberal patches of rufous on the vertex, except No. 51,645, taken September 11, 1884, which is moulting, and losing the linear streaks on the front of the chest where the feathers are being replaced by the plain ochraceous buff of the winter plumage. This moult is usually accomplished during October, November males appearing in the adult plumage of winter. A young male (No. 92,469, Smiths. coll.) from Yreka (Shasta Valley), northern California, August 18, 1883, Chas. H. Townsend, has the upper surface heavily banded with black from the nape to the tips of the scapulars, with a line of black spots on the outer webs of (both webs of central) tail-feathers, and black shaft-streaks to the rusty crown.

Young female (Am. Mus. No. 51,644, Fort Verde, Arizona, July 18, 1884).—Above darker, more vinaceous, with heavier transverse bars on back and tail, and dusky shaft-streaks to the feathers of the rusty crown patch. Below, with the streaks broader and less yellowish than in adults.

Measurements.—Average of 13 adult males from Fort Verde, Arizona: length 269.0; alar expanse, 570.0; wing, 189.0; tail, 135.0; chord of culmen, 12.0; width of bill at base, 10.0; tarsus, 36.5; middle toe, 23.6. Average of 11 adult females from Fort Verde, Arizona: length, 276.0; alar expanse, 601.0; wing, 196.0; tail, 136.0; chord of culmen, 12.5; width of bill at base, 10.3; tarsus, 36.4; middle toe, 24.0 mm.

The largest examples of this race come from California. An old male, taken at Murphy's by L. Belding, measures as follows: wing, 201.0; tail, 140.0; chord of culmen 12.2; width of bill at base, 11.0; tarsus, 35.0; middle toe, 25.0 mm. An adult female from the same place measures: wing, 214.0; tail, 155.0; chord of culmen, 11.8; width of bill at base, 10.3; tarsus, 36.0; middle toe, 23.5 mm.

Remarks.—Three downy young about a week old were taken by Mr. E. W. Nelson, at Fort Lowell, Arizona, May 24, 1884. They are scantily clothed with loose, white down.

All of the Sparrow Hawks taken by the writer in Arizona, numbering 41 specimens, had the iris hazel; but, if the collector's notes on labels are to be relied upon, adults from Cape St. Lucas, Lower California, have the iris yellow, young birds having it colored hazel, as in the other subspecies of *sparverius*. The cere, maxilla and tibia are greenish yellow in young birds, changing to yellow in adults, and becoming orange-yellow in some highly developed individuals. In like manner the feet are colored pale yellow in the young, the shade deepening to orange in adolescence, or even vermilion in some old birds. The bill is bluish at base, shading to blue-black at the extremity.

The outer tail feathers are varied with black, white, and cinereous within about the same limits as in eastern *sparverius*. In a few, mostly young birds, the outer feathers are quite regularly barred with black, white, and gray, while in one specimen (No. 51,668, Am. Mus. coll.) the tail is all rufous except the terminal whitish, the subterminal zone of black, and the outer web of the lateral feather, which is white with a black line along the shaft.

Comparing a large series of specimens of this race from various parts of the Southwest, they are found to agree in the main with those above described, though manifesting the effects of regional peculiarities to a considerable degree. Thus, in a small series from the mountains of Nevada, collected by Mr. Robert Ridgway, the size is smaller, there is a peculiar reddish coloration, and the rusty crown patch is reduced in size; while the surrounding region affords quite typical specimens of this race. Other examples from the Pacific Coast, have, also, a darker coloration than those from the interior and southern portions of California, which latter region furnishes extreme examples of *deserticolus*, which differ from those of Arizona in being still paler, and of larger size. A pair from Mazatlan, Mexico, though referable to the Great Basin form, differs appreciably therefrom in being more rufous. Coues's specimens from the Souris River, those collected by Mr. Richmond in Montana, and a number of specimens from Colorado, are too near *sparverius* for reference to this form. Similar intermediates are found in western Texas; but specimens from the eastern (seacoast) district of Texas are similar to those of Louisiana and farther eastward. Farther west, in Montana (mouth of Milk River, Coues) Wyoming, and Utah, all are *deserticolus*.

Falco sparverius peninsularis SUBSP. NOV.

ST. LUCAS SPARROW HAWK.

Habitat.—Lower California.

General characters.—A depauperate insular form, in which a diminution of the general size is accompanied by an increase in the size of the bill; also characterized by pallor of coloration, and decrease in the extent of the black markings.

Type. No. 16,930, Smiths. Inst., ♂ ad., San José, Lower California, John Xantus (original No. 269).

Adult male.—Similar to *F. s. deserticolus*, but smaller, with larger, stouter bill, with less black barring on back and scapulars, and scarcely any black spots on the wing-coverts; under side of wing mostly white, the quills being merely serrated with black next to shaft on inner webs; underparts suffused with yellow; very slightly spotted on the sides.

Adult female.—Similar to *F. s. deserticolus*, but with a more rufous shade on tail; underparts more yellowish; "iris yellow," instead of hazel. A young female in autumn is said to have had the iris hazel.

Remarks.—There is considerable variation in the specimens before me. Summer males are much bleached, the under surface being pale creamy buff, those taken in winter being rather deeply tinged with ochraceous cinnamon. Several of them have an unusual amount of white on the lateral rectrices.

It is interesting, in connection with the dwarfed size of this subspecies, to note the large size of those specimens of *deserticolus* from the adjacent portion of California, which exceed the dimensions of all others from North America.

Measurements.—Average of 6 males: wing, 172.0; tail, 116.0; chord of culmen, 12.6, width of bill at base, 10.4; tarsus, 35.3; middle toe 24.0 mm. Average of 3 females: wing, 178.0; tail, 120.0; chord of culmen, 12.4; width of bill at base, 10.8; tarsus, 34.5; middle toe, 24.0 mm. Xantus has marked an adult female as measuring 10 inches in length, and 21.75 inches in alar expanse.

Falco sparverius australis RIDGWAY.

SOUTH AMERICAN SPARROW HAWK.

Habitat.—South America, chiefly east of the Andes Mountains; replaced by *sparverius* on the North Atlantic and Caribbean coasts.

General characters.—Larger than *sparverius*, with relatively longer tail; rufous crown patch absent, or reduced to a mere trace. Male with underparts whiter, lacking the ochraceous on the chest, with the black spots on the sides elliptical, and the black subterminal zone of tail only about half as broad as in *sparverius*. Female with upper surface more vinaceous rufous, and the tail less rufescent, with the subterminal bar scarcely broader than the rest.

Adult male.—Closely resembling *sparverius*; rufous of upper surface much the same; crown pale plumbeous, or, occasionally, with a trace of rufous on the vertex, the feathers with fine black shaft streaks; transverse bars of back and scapulars sometimes blurred and shaded with plumbeous; black spots of wing-coverts large, and often cordate; tail, with subterminal bar much reduced, the tip usually white, or cinereous on the middle pair of feathers, one to several outer feathers more or less variegated. Under surface as in *sparverius*, but lacking the darker cinnamon ochraceous on the pectoral region; spots on sides, elliptical.

Adult female.—Above, similar to *sparverius*, but with little or no rufous on crown, and less heavily barred, especially on the tail, where the bars are narrower and frequently interrupted near the shaft. The tail is decidedly less rufescent, often exhibiting the grayish shade seen in the rufous of the tail in immature specimens of *Buteo borealis*. Underparts similar, but with the markings, in some, much deeper brown.

Measurements.—Average of 5 adult males from Brazil, Paraguay, and Argentine Republic: wing, 193.0; tail, 144.0; culmen (chord) 12.0; width of bill at base, 10.5; tarsus, 36.0; middle toe, 23.5. Average of 5 adult females from same general region: wing, 205.0; tail, 148.0; culmen (chord), 12.5; width of bill at base, 11.0; tarsus, 38.0; middle toe, 24.0 mm.

Falco sparverius cinnamominus (SWAINSON).

CHILEAN SPARROW HAWK.

Habitat.—Chile and western Brazil, where intergrading with *australis* (and with *aquatorialis* in Peru?).

General characters.—Size about the same as *australis*, but with the crown darker, slaty plumbeous, with broader blackish shaft streaks and little or no rufous in the centre. Tail rufous throughout, the outer feathers unvariegated, and with the subterminal black bar, in males, no broader than the rufous tip.

Adult female.—(No. 48,819, Smithsonian collection, vicinity of Santiago, Chile, January, 1863). Differs from *australis* in having the crown of a duller slaty color, and the transverse bars of tail reduced to incomplete rows of spots, leaving the outer tail-feathers plain. The coloring of the back and underparts is almost identical; but the tail is lighter vinaceous cinnamon rufous, paling to light buff on the outer feathers. The

outermost tail-feather is unspotted, the one next to it has only faint indications of spots near the inner edge of the inner web, and the third has small spots on both inner and outer webs, while the black on the middle feathers amounts only to serrations along the edges. There are indications of rufous on the feathers of the centre of the crown, as often seen in females of *australis*.

Remarks.—A male (No. 48,820, Smithsonian collection) from Santiago, Chile, taken in November, 1863, has the dark, sharply streaked crown of *cinnamomus*, with the coarser spotting of sides, and the tail with a white tip, variegated outer feathers, and broader black zone, of *australis*, and a very imperfect specimen from Peru (No. 39,952, Smiths. Inst.), seem to indicate its intergradation with the following subspecies.

Measurements.—Average of two adult males from Chile: wing, 194.0; tail, 141.0; culmen, 12.5; width of bill, 11.0; tarsus, 37.5; middle toe, 25.0 mm. Measurements of No. 48,819, ♀ ad.: wing, 200.0; tail, 147.0; chord of culmen, 13.0; width of bill at base, 11.3; tarsus, 38.5; middle toe, 26.0 mm.

Falco sparverius æquatorialis SUBSP. NOV.

ECUADOR SPARROW HAWK.

Habitat.—Ecuador.

General characters.—Size, largest. Crown slate-color, streaked with black, with or without indications of a rufous crown patch; outer tail-feathers variegated; underparts deeply suffused with tawny ochraceous buff in both sexes. Female deep rufous above, sparsely barred, with the upper tail coverts and hinder part of rump immaculate.

Types, No. 101,309, ♂ ad., Guayaquil, Ecuador, Dr. Wm. H. Jones, U. S. N., and No. 67,349, ♀ ad., Ecuador, both in the Smithsonian Institution.

Description of male type.—Crown dark slate-color, with black centres to the feathers, only one of which shows a trace of rufous; dusky of crown continuous behind with the large black patch of nape. Back and scapulars vinaceous cinnamon rufous, becoming more castaneous on rump and tail. Scapulars, and hinder and middle portion of back, heavily barred with black. Wings darker plumbeous than in the other subspecies, with large black spots on the coverts. Tail with a broad subterminal zone of black as in *sparverius*, with the tip white, tinged with rufous, and plumbeous on the tips of the central feathers; two outer tail feathers variegated, the outer being cinereous and white, with six heavy black spots on the inner web. Underparts, including crissum, ochraceous buff, deepest on the chest; lining of wings stained with ochraceous; sides with several rows of black spots, varying from elliptical to oval.

Measurements.—Wing, 196.0; tail, 149.0; culmen (chord), 12.8; width of bill at base, 9.0; tarsus, 42.0; middle toe, 25.0 mm.

Another male (No. 63,621, Smiths. Inst.), moulting, but in nearly fresh plumage, differs from the above in being much less heavily barred with black on the back and scapulars, and of a still deeper shade of tawny ochraceous below.

Description of female type.—Crown bluish slate, streaked with chestnut rufous on the vertex. Above chestnut rufous, sparingly barred with plumbeous black, the bars becoming obsolete on the rump, leaving the upper tail coverts and hinder part of rump plain; tail incompletely barred with black, the outer feathers only spotted on their inner webs. Underparts pale ochraceous buff, deepening to vinaceous cinnamon on the breast; longitudinal markings below light cinnamon, nearly obsolete.

Measurements.—Wing, 200.0; tail, 152.0; chord of culmen, 13.0; width of bill at base, 10.5; tarsus, 39.0; middle toe, 24.5 mm.

DESCRIPTION OF AN APPARENTLY NEW *CENTURUS* FROM GREAT BAHAMA ISLAND, BAHAMAS.

BY CHARLES B. CORY.

A COLLECTION of some eight hundred birds lately received from Great Bahama Island contained eight specimens of an apparently undescribed *Centurus* which I propose to call

Centurus bahamensis, SP. NOV.

Type No. 19,578, Coll. C. B. Cory, Boston, Great Bahama Island, December 26, 1891. — Adult male similar to *C. blakei*, in having the entire underparts strongly tinged with olive green; the back is banded with black and yellowish green, not black and white as in *blakei*. The feathers on the flanks show a slightly reddish tinge; the forehead is dusky white; and the red at the base of the bill is somewhat darker than in *C. blakei*. Length, 9.50 inches; wing, 5.25; tail, 4.00; bill, 1.20; tarsus, .85.

The female has the forehead darker than the female of *C. blakei*, and has the under parts tinged with olive green as in the male.

IN CUBA WITH DR. GUNDLACH.

BY CHARLES B. CORY.

DURING the past winter the writer spent several weeks on the Island of Cuba in company with the well-known naturalist, Dr. John Gundlach, who, although he is nearly eighty-two years old, still continues his investigations with the enthusiasm and energy of a young man. A tramp of several miles is thought little of by the old Doctor, and I have seen him hunting for shells during a hard rain shower with the utmost unconcern as to the consequences of a good wetting.

We passed a number of days collecting birds in the vicinity of Havana, sometimes crossing the bay and taking the train as far as Cohimara. Although birds were abundant, we found only the more common species.

Every morning we visited the markets where at times many birds are brought in and offered for sale by the native hunters. There are two good markets in Havana, and any one wishing to procure birds for specimens should visit them at daybreak, as the markets open at about two or three o'clock in the morning and many of the best things are sold as soon as they are brought in by the hunters. Some mornings we found quite a variety of birds, while on others there were only a few Pigeons and one or two Quails to be had. Woodpeckers, Hawks and White Ibises, the latter with the beak and legs cut off, were often seen hanging with bunches of Doves and Meadowlarks.

The Pigeons, Doves and Quails are generally sold alive, being sent to the market in cages. The Blue-headed Dove (*Sturnanus cyanocephala*) is considered the best, and they sell readily for \$2.00 in paper money (equal to about 90 cents of our silver) per pair. At the bird stalls we often observed two species of Cuban mammals, *Capromys fournieri* and *Capromys prehensilis*; the flesh of both of these is much esteemed by the people, the larger species being considered the better. During our visits to the markets we saw the following species of birds offered for sale at different times.

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|---|--|
| ✓ <i>Aix sponsa</i> (Linn.). | ✓ <i>Columba leucocephala</i> (Linn.). |
| ✓ <i>Nomonyx dominicus</i> (Linn.). | ✓ <i>Zenaidura macroura</i> (Linn.). |
| ✓ <i>Dendrocygna arborea</i> (Linn.). | ✓ <i>Columbigallina passerina</i> (Linn.). |
| ✓ <i>Guara alba</i> (Linn.). | ✓ <i>Starnænas cyanocephala</i> (Linn.). |
| ✓ <i>Ardea occidentalis</i> Aud. (alive). | ✓ <i>Accipiter gundlachi</i> Lawr. |
| ✓ <i>Rallus elegans</i> Aud. | ✓ <i>Strix pratincola furcata</i> (Temm.). |
| ✓ <i>Gallinula galeata</i> (Licht.). | ✓ <i>Crotophaga ani</i> (Linn.). |
| ✓ <i>Jacana spinosa</i> (Linn.). | ✓ <i>Centurus superciliaris</i> (Temm.). |
| ✓ <i>Numida meleagris</i> (Linn.). | ✓ <i>Sturnella hippocrepis</i> Wagl. |
| ✓ <i>Colinus cubanensis</i> (Gould). | ✓ <i>Mimocichla rubripes</i> (Temm.). |

When not collecting, we passed most of our time with Dr. Gundlach at the Museum, studying his fine collection which he has deposited in the Havana Institute. The collections of Cuban birds, mammals, insects and land shells are nearly complete, and are the result of fifty-three years' collecting on the Island by Dr. Gundlach, almost everything in the collections having been procured and prepared by himself.

From Havana we went to San Diego de los Baños, a little town situated at the foot of the mountains in western Cuba. To reach there one has to go some five hours by rail to Passo Real, and from there is driven about twelve miles to the foot of the mountains to the quaint little town of San Diego de los Baños. At this place we found birds abundant, especially the Cuban Trogon, but only comparatively common species were procured. The birds actually taken were as follows, although we saw many other species which we did not kill, and which are therefore not included in this list.

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|--|--|
| ✓ <i>Ardea carulea</i> Linn. | ✓ <i>Colaptes chrysocaulosus</i> Gundl. |
| ✓ <i>Ardea virescens</i> Linn. | ✓ <i>Cypselus phœnicobius</i> Gosse. |
| ✓ <i>Jacana spinosa</i> Linn. | ✓ <i>Sporadinus riccordii</i> (Gerv.). |
| ✓ <i>Ægialitis vocifera</i> Linn. | ✓ <i>Tyrannus magnirostris</i> D'Orb. |
| ✓ <i>Zenaidura macroura</i> (Linn.). | ✓ <i>Pitangus candifasciatus</i> (D'Orb.). |
| ✓ <i>Columbigallina passerina</i> (Linn.). | ✓ <i>Myiarchus sagræ</i> Gundl. |
| ✓ <i>Cathartes aura</i> (Linn.). | ✓ <i>Blacicus caribæus</i> (D'Orb.). |
| ✓ <i>Falco sparverioides</i> Vig. | ✓ <i>Agelaius humeralis</i> (Vig.). |
| ✓ <i>Glaucidium siju</i> (D'Orb.). | ✓ <i>Sturnella hippocrepis</i> Wagl. |
| ✓ <i>Crotophaga ani</i> Linn. | ✓ <i>Icterus hypomelas</i> Bonap. |
| ✓ <i>Saurothera merlini</i> D'Orb. | ✓ <i>Quiscalus gundlachi</i> Cass. |
| ✓ <i>Priotelus temnurus</i> (Temm.). | ✓ <i>Melophyrhha nigra</i> (Linn.). |
| ✓ <i>Todus multicolor</i> Gould. | ✓ <i>Euethcia lepida</i> (Jacq.). |
| ✓ <i>Xiphidiopicus percussus</i> (Temm.). | ✓ <i>Euethcia canora</i> (Gmel.). |
| ✓ <i>Centurus superciliaris</i> (Temm.). | ✓ <i>Spindalis pretrii</i> (Less.). |

✓ <i>Vireo gundlachi</i> <i>Lemb.</i>	✓ <i>Dendroica discolor</i> (<i>Vieill.</i>).
✓ <i>Mniotilta varia</i> (<i>Linn.</i>).	✓ <i>Sciurus aurocapillus</i> (<i>Linn.</i>).
✓ <i>Compothlypis americana</i> (<i>Linn.</i>).	✓ <i>Geothlypis trichas</i> (<i>Linn.</i>).
✓ <i>Dendroica dominica</i> (<i>Linn.</i>).	✓ <i>Teretistris fernandinae</i> (<i>Lemb.</i>).
✓ <i>Dendroica cærulescens</i> (<i>Gmel.</i>).	✓ <i>Setophaga ruticilla</i> (<i>Linn.</i>).
✓ <i>Dendroica palmarum</i> (<i>Gmel.</i>).	✓ <i>Polioptila cærulea</i> (<i>Linn.</i>).
✓ <i>Dendroica palmarum hypochrysea</i> <i>Ridgw.</i>	✓ <i>Galeoscoptes carolinensis</i> (<i>Linn.</i>).
	✓ <i>Mimocichla rubripes</i> (<i>Temm.</i>).

While in Havana a bird was brought to me alive in a cage, which was claimed to have been caught by some boys about sixteen miles out in the country. It proved to be a rather peculiarly marked specimen of *Zonotrichia leucophrys*, three or four of the outer rectrices being white on one side and not on the other.

OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES.

BY W. E. D. SCOTT.

II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS.*

(Continued from p. 129.)

124. *Crotophaga ani* *Linn.* ANI; SAVANNA BLACKBIRD; TICK-BIRD.—Common and very generally distributed in the region below one thousand feet above sea level. Above that altitude some occur, though the birds are not nearly so abundant. At Constant Springs, in the vicinity of Kingston, I saw many daily during two weeks stay at that point. I obtained a few individuals at Stony Hill, where the species was only seen a few times during the month I spent at that locality. At Boston and on the entire north side of the island at and near sea level the species was one of the most abundant and conspicuous. At Boston on December 25, 1890, I took a young bird (No. 9824, coll. W. E. D. S.), just able to fly, that was still in company with its parents and was being fed by them.

125. *Saurothera vetula*. (*Linn.*). RAIN-BIRD.—This bird seems, as far as I am aware, of rather rare occurrence. I met with only three individuals

* Mr. Taylor's valuable notes, though promised, have not come to hand for this instalment of this paper, but the author hopes to include them in the October or the January part, concluding this series of observations.

during my stay on the island, all in the vicinity of Boston. They are retiring in their habits, but quite tame, keeping to the deep woods and being much oftener heard than seen. Gosse, in his 'Birds of Jamaica,' pages 273-276, has given so full and detailed an account of this species that there seems little to add. He found it so common, while it is now apparently rather rare, that I conclude that this is one of the species that have suffered from the depredations of the mongoose.

126. *Coccyzus minor* (Gmel.). MANGROVE CUCKOO; BLACK-EARED CUCKOO; YOUNG OLD-MAN-BIRD.—Observed at Stony Hill on two occasions in December. A common and very generally distributed species in the vicinity of Priestman's River and Port Antonio, and probably at the lower altitudes throughout the island. Its habits, as I observed the birds in the neighborhood of Boston, where they were numerous, were similar to those of *Coccyzus americanus*.

127. *Coccyzus americanus* (Linn.). YELLOW-BILLED CUCKOO; MAY BIRD.—Not observed during my stay on the island. But it was well known to the late Philip Henry Gosse, as a summer visitor, and in all probability it will be found to breed not uncommonly.

128. *Hyetornis pluvialis* (Gmel.). OLD-MAN-BIRD; RAIN-BIRD.—Common resident, but met with only in unfrequented places. A series of ten individuals, collected in the vicinity of Priestman's River, does not show any considerable variation in color, though the females average a little more intense in color than the males, but there seems quite a marked difference in size between the sexes, the female being much the larger. The breeding season must vary considerably with different pairs of birds. A female taken on January 17, would have laid in four or five weeks, judging from the ovary. Another female, taken on the 22d of January, showed no indications of the approach of the breeding season. A pair taken on January 30 (Nos. 10,782 and 10,873, coll. W. E. D. S.), indicated on dissection that breeding would have begun in four weeks. A female taken February 3 showed no signs of breeding. On February 14 two males were procured, one of which appeared about to breed and the other showed no signs of the approach of the breeding season. A female taken on February 27 (No. 11,295, coll. W. E. D. S.) had laid a full set of eggs, and incubation was well advanced.

So far as I am aware, these birds are of solitary and retiring habits, frequenting the depths of the forests and rarely if ever appearing near habitations, or open or cultivated lands.

129. *Ceryle alcyon* (Linn.). BELTED KINGFISHER.—A common winter resident, seen daily in suitable localities from December to March.

130. *Todus viridis* Linn. GREEN TODY; 'ROBIN REDBREAST.'—These pretty and singular birds I found not uncommon at Stony Hill, at an altitude of 1200 to 1500 feet above the sea level. But at Boston and Priestman's River they were rare, becoming more common, however, as we reached an elevation exceeding 800 feet, in the mountains and foothills back of these localities. Their habits are not unlike those of our smaller Flycatchers of the genus *Empidonax*, but now and then they hunt insects

in the trees and bushes much as do our Warblers (Mniotiltidæ). The birds, so far as I am aware, are insect eaters, and I found no vegetable remains in those dissected. Their breeding habits are too well known to be more than commented on. The shallow burrows, rarely exceeding a foot in depth, in which the eggs are laid, are easily robbed by the mongoose, and the birds are said to be by no means as common as in former years. They are said to nest from late March until June. Birds taken early in February, though paired, did not show signs of breeding. The iris in these birds is of a peculiar grayish white shade, and almost identical in color with the eyes of *Virco modestus*.

131. *Todus pulcherrimus* Sharpe. SHARPE'S TODY.—The type of this recently described species is in the British Museum, and the habitat is given as "Jamaica." It is very different from all other species of the genus, "by its brilliant coloration below, and by its being bluish green above."

132. *Sphyrapicus varius* (Linn.). YELLOW-BELLIED WOODPECKER.—A rather common winter resident on the island, at all points which I visited.

133. *Centurus radiolatus* (Wagl.). RADIOLATED WOODPECKER.—A common species on the island, but apparently much more common in the less settled portions. They were apparently rare at Stony Hill, where I obtained but a single bird and saw no others. But in the hills back of Priestman's River and Boston they were common, and were met with almost daily. In habits they closely resemble the North American representatives of the genus. The birds were mated during the latter part of my stay at Boston, but up to the time of my departure showed no signs of breeding.

134. *Nyctibius jamaicensis* (Gmel.). POTOO.—Not observed at Kingston, or in the vicinity, nor at Stony Hill. But at Boston five individuals were secured during my stay. A male taken on January 14, 1891, and a female secured later on the same day (Nos. 10,331 and 10,359, coll. W. E. D. S.), indicated on dissection the near approach of the breeding season. On the 25th of January a female was secured. This bird was taken in the bright moonlight. It was sitting on a branch of a dead tree, not longitudinally, but crosswise. My attention was attracted to it by its note, a guttural *ch-r-r*, that was answered by its mate near by. The note was not at all loud or prolonged, and could be heard only a very short distance. Two other individuals were procured during February. In the daytime they sit crosswise, so far as I observed, on the large limb of some good-sized tree, and where the shade is constant and the light dim. A large, low, spreading mango seems frequently selected as a day roost, and the same place is used for many days, the excrement on the ground often drawing attention to the otherwise almost indistinguishable bird. For they are very tame at all times, and do not seem at all alarmed at the approach of man.

The large eyes, with the deep orange irides, remind one strongly, both by their color and shape, of Owls' eyes, and are not at all like those of any North American Whippoorwill or Nighthawk.

135. *Nyctibius pallidus* Gosse. WHITE-HEADED POTOO.—This species was described by Gosse "from Robinson's MSS, who has given an elaborately colored figure of the species in his drawings." Gosse did not meet with a representative but concluded from facts furnished by Mr. Hill and others that there was a 'White Potoo.' I refer the reader to Gosse's 'Birds of Jamaica,' pp. 49-51. The natives at Boston were familiar with a bird called the White Potoo, which was the Barn Owl of the region (*Strix flammeola furcata*), and whenever I asked on the island about the 'White Potoo,' the Barn Owl was described to me. I concluded that probably Mr. Robinson's specimen referred to and described by Gosse was some abnormal phase of plumage of *N. jamaicensis*, an albinistic or pied individual, very likely.

136. *Antrostomus carolinensis* (Gmel.). CHUCK-WILL'S-WIDOW.—Probably a migrant and winter resident. I took three individuals at Boston in February. I did not hear the song of the species while in Jamaica, and it is apparently unknown to the residents of the island.

137. *Siphonorhis americanus* (Linn.).—I did not meet with this species, but saw a single specimen in the collection of the Jamaica Institute. It is apparently a very rare bird in the parts of the island where my collections were made.

138. *Chordeiles minor* Cab. CUBAN NIGHTHAWK.—Common migrant and summer resident. Arrives in April and leaves late in September and in October. I did not meet with the bird.

139. *Chordeiles virginianus* (Gmel.).—It seems probable that another species of Nighthawk is a migrant, passing through Jamaica in spring and fall, and I remark it here to draw to it the particular attention of future observers. While I have alluded to this under the head of *C. virginianus*, it seems more probable that *C. virginianus chapmani* may be found to be the race represented as a migrant in the fauna of Jamaica.

140. *Cypselus phœnicobius* (Gosse.). PALM SWIFT.—A common resident in Kingston and the vicinity. Also noted daily at Stony Hill. But during the two months and more of work at Boston, Priestman's River, and Port Antonio I did not see this species on a single occasion. Nor did the people about seem to know of a "Swallow that bred in the cocoanut or other palms." For a detailed account of the habits of this Swift the reader is referred to Gosse's 'Birds of Jamaica,' pp. 58-63.

141. *Cypseloides niger* (Gmel.). BLACK SWIFT.—I did not observe this species at any point where I worked while in Jamaica, but saw three specimens in the collection of the Jamaica Institute. It does not seem probable that the birds are resident or that they breed on the island, but rather that they occur as migrants.

142. *Hemiprocne zonaris* (Shaw). WHITE-COLLARED SWIFT; RINGED GOWDIE.—A common resident species. Seen at all points visited on the island, and frequently in great numbers. Generally they fly very high and are much out of gunshot, but I saw them several times just before sundown or early in the morning flying very low over the pastures and

cultivated fields in enormous flocks. Their flight is much like that of other representatives of the family and not, so far as I could judge, appreciably faster. The difficulty in procuring specimens arises from their habitually very *high* flight. I was unable to learn anything with regard to the time or place of their breeding.

143. *Mellisuga minima* (*Linn.*). VERVAIN HUMMINGBIRD.—COMMON resident at all points visited on the island, particularly in the vicinity of Kingston. It was noticed daily at Stony Hill, and often seen at Boston, though not so commonly as at other points. This seems to be more a species of the open country than either of the others found on the island, and also more fond of low-growing flowering plants. In habits it is much like our *Trochilus colubris*. Gosse has given a very detailed account of its breeding habits (*Birds of Jamaica*, pp. 130-134).

145. *Aithurus polytmus* (*Linn.*). LONG-TAILED HUMMINGBIRD; DOCTOR-BIRD.—The commonest Hummingbird of the island; very abundant and generally distributed, though perhaps preferring the region 1000 feet in altitude above the sea.

This is one of the species so carefully and fully studied and written of by the late Philip Henry Gosse, that the reader is referred directly to that author (*Birds of Jamaica*, pp. 97-127).

In the series collected I have specimens of male birds whose two long outside tail feathers are 7.90 inches in length.

146. *Lampornis mango* (*Linn.*). MANGO HUMMINGBIRD; DOCTOR-BIRD.—Not so common as either of the other two. At Stony Hill where these birds were commoner than at any other points visited, they seemed particularly to like the flowers of the banana. At Boston, Priestman's River, and Port Antonio I saw this bird on only a few occasions. At Boston during two months but two birds were obtained. I was unable to learn anything of its breeding habits.

(*To be continued.*)

RECENT LITERATURE.

Salvadori's Catalogue of the Parrots.*—While doubtless Professor Salvadori has had before him for examination the largest collection of Parrots existing in any museum, he considers this material inadequate "for affording a solid base to a general classification of Parrots, or fully illustrating the different stages of many of the species," the deficiencies relating more

* Catalogue | of the | Psittaci, or Parrots, | in the | Collection | of the | British Museum. | By | T. Salvadori. | London: | Printed by order of the Trustees. | . . . [= 6 lines, names of booksellers] | 1891.—8vo, pp. xvii, 658, and pl. 18.—Forming Vol. XX of the Catalogue of the Birds of the British Museum.

especially to the African, the Austro-Malayan and the Australian series. The number of specimens contained in the British Museum is given as "5113, belonging to 450 species, whilst 49 are not represented in the Museum, so that the total number of species admitted in the present Catalogue is 499, of which 13 are now described for the first time." He also records in footnotes 14 species and subspecies which he was unable to identify, quoting in each case the original description. In an appendix are also treated 56 "doubtful species" of Parrots.

Respecting the classification of the Psittaci, he says: "It is well known to ornithologists that the classification of the Parrots has been a very difficult problem; and I am sorry to say that I cannot offer results that will settle the question." He divides the group into six families, as follows: Nestoridae, Loriidae, Cyclopsittacidae, Cacatuidae, Psittacidae, and Strigopidae. The number of genera recognized is 79, of which 55 belong to the single family Psittacidae. As usual in these volumes generic diagnoses are omitted, beyond the few differential points noted in the 'Keys to the Genera' under the several families and subfamilies. While the general style of the volume, as regards method of treatment, is similar to that of the preceding volumes of the series, the author is much less conservative than most of his predecessors in his treatment of both genera and species,—by no means a fault, if we take certain of the earlier volumes as a standard for comparison. Dr. Finsch, in his well-known monograph, 'Die Papageien,' published in 1868, recognized 351 species, to which he added a list of 41 he was unable to identify. These he classified in one family, divided into five subfamilies and 26 genera. Dr. Reichenow, in 1882, in his 'Conspectus Psittacorum,' recognized 444 species, which he placed in nine families and 44 genera, with, in addition, 27 subgenera. These are instructive figures, showing the drift of modern ornithological research, since the work under review is not exceptional as regards increase in the number of forms now currently recognized as compared with the number admitted one or two decades ago. The change is due largely to the great increase of material, gathered in part from previously little-known regions.

Among the new genera may be noted *Conuropsis*, with the Carolina Parroquet as the type and only species.

By what reason *Amazona* Lesson, 1831, is rejected for *Chrysotis* Swain., 1837, is not clear, since on the evidence, as shown by Salvadori himself, there is apparently no reason, unless it be the fact that *Amazona* was called by Lesson a "sous-genre," although he used it in the sense of a genus, the species being called by him "*Amazona pulverulenta*," "*Amazona icterocephala*," etc. To reject it on this ground is not in accordance with either modern usage or current nomenclatural rules. Neither is it in accordance with our author's own practice in other cases, since he accepts (p. 421) Lesson's 'sous-genre' *Mascarinus* without protest, although occurring on the same page as *Amazona* and used in the same way.

While our author is willing to take Kuhl's "Sectio II. *Conurus*," as a

genus he rejects Kuhl's "Sectio VI. *Probosciger*," which has just the same status, "because *Probosciger* is not a generic name, but a term used by Kuhl for his sect. vi, of the genus *Psittacus*"! (p. 102). In seeking a substitute for *Probosciger* he passes over *Solenoglossus* Ranz, 1821, for *Microglossus* Vieill., 1821-23, after admitting the former has priority, because *Solenoglossus* "conveys quite a false idea of the structure of the tongue"!

Micropsitta Lesson, 1831, and *Nasiterna* Wagler, 1832, is a case parallel with *Amazona* and *Chrysolis*, where for no good reason a later name is taken for an earlier. *Ognorhynchus* Bon., 1857, clearly has priority over *Gnathosittaca* Cab., 1864, even if the former be taken from Gray, as used for a subgenus in 1859.

As our author adheres to the principle that erroneously constructed names should be corrected, it is not surprising that he should reject names that, in his opinion, are too barbarous to be tolerated, as for example, *Psittrichas* Lesson, *Graydidascalus* Bon., etc.

In palliation it should be said that the practices here criticized are not innovations; his nomenclatural usages in the present work are in the main consistent not only with those of his former works, but with those of many other veterans of the science; and it is perhaps too soon to expect any great swerving from long established methods, out of deference to a set of new-fangled rules recently adopted by a large number of ornithologists in behalf of stability of nomenclature. Aside from a few faults of nomenclature (as we view the case), the work is entitled to the highest approbation, and must win for its renowned author the deep gratitude of systematic ornithologists everywhere.—J. A. A.

Mrs. Miller's 'Little Brothers of the Air.'*—The frequent appearance nowadays of books and magazine articles on natural history is undeniable evidence of a growing class of readers who in these smaller volumes approach that larger book to which the eyes of the world are gradually opening. We wish we might accord to all these aids the hearty welcome Mrs. Miller's latest book deserves. But alas! natural history 'copy readers' are as yet an unknown adjunct of publishing houses. If they were we should be spared some of the unwitting mistakes or deliberate falsehoods which unchallenged pass their presses. After reading recently in a leading monthly that there are ten thousand species of water-birds, or learning from a book issued by one of our large educational publishing firms, that the Grebe paddles its nest to safety by stretching one leg over the edge, it is a relief to take up a popular work based on original, accurate, painstaking observation. Mrs. Miller is an enthusiast. Her patience is untiring, and her reward is not a 'skin,' or a 'full-clutch,' but a new fact in the life, if not of the species, at least of the individual bird she

* Little Brothers of the Air | By | Olive Thorne Miller | [seal and motto] | Boston and New York | Houghton, Mifflin and Company | The Riverside Press, Cambridge | 1892. 12°, pp. vii, 271.

is studying. Who among our 'collectors' can boast of a vigil over a bird's nest which lasted for "nearly two months . . . day after day, early and late, in storm and sunshine"? With a just pride the patient watcher writes, "now I know at least one family of Kingbirds," and whether the results of her observations are of more value than the 'skin' or 'full-clutch' no one who reads her attractively written chapters will for a moment doubt. Withal her enthusiasm is tempered by discretion. She does not jump at conclusions nor sacrifice truth to rhetorical effect, and a careful reading of the twenty-six chapters her book contains, leaves us wondering whether we know any ornithologists who as observers have one half her perseverance. Only one fault do we discover, a fault we are sure so careful a writer will not fail to correct in the future volumes we hope to see from her hand. And this fault is lack of more detailed statements as regards both date and locality. Under the heading 'Great South Bay' we find two chapters from Massachusetts, while a record of the exact date on which her observations were made would in nowise detract from the popular character of the book and would add largely to the scientific value it unquestionably possesses.—F. M. C.

'Wood Notes Wild.*—Some of Mr. Cheney's studies of bird music are already familiar to us through the pages of the magazines in which, from time to time, they have appeared.

They have now been collected by his son and, with the addition of before unpublished essays, copious extracts from the writings of other authors, and an extended bibliography, issued under the above title. The whole, we believe, forms the most extensive treatise on the subject extant.

Every writer of bird biographies has experienced the difficulty of describing bird's songs in an identifiable manner. There are some cries or call-notes, and more rarely songs, which so closely approach certain words of our language that by common consent their owners are dubbed forthwith and thus made to utter their own name, to the great assistance of beginners in ornithology. To this class belong the Pewee, Chickadee, Towhee, Bob-white, Squak, etc. But unfortunately the limits of human articulation are soon passed, and where description fails, as it too frequently does, we have ventured to hope musical notation might succeed. Certainly no one could be better fitted to prove its success than Mr. Cheney. A musician of undoubted ability, an ardent lover of nature, his book "is a record of the pastime of an old lover of birds, of a musician who counted it among his chief joys that he had lived thirty summers in a bird-haunted grove,—of one to whom the voice of the wood and field were as familiar as those of his own family" (editor's preface). We may then consider his labors as a fair, if not a final test of the assistance which musical notation can give us in recording and describing the songs of birds.

* Wood Notes Wild | Notations of Bird Music | By | Simeon Pease Cheney | Author of the American "Singing-book" | Collected and Arranged with Appendix, Notes, Bibliography, and General Index | By John Vance Cheney | . . . | Boston | Lee and Shepard Publishers | . . . | 1892. 12 mo. pp. i-xiv, 1-261, frontispiece.

Before reading 'Wood Notes Wild' we requested a pianist to play all the bird songs given in the first part of the book, while without looking at the page we attempted to identify each song as it was played. There are here (pp. 1-102) the songs of forty-one species. With thirty-nine of these we are perfectly familiar. The result was as follows:—

Thirty-three conveyed absolutely no impression, we could not even guess at their identity; while, of the remaining eight, five were named correctly. The species whose songs were recognized were Chickadee, Chipping Sparrow, White-throated Sparrow, Wood Pewee, and Quail. Making due allowance for the difference in tone between a piano and a bird's voice, this result, from the ornithologist's standpoint of identification, is disappointing and forces the conclusion that each bird must be the interpreter of its own song. But if in attempting the impossible Mr. Cheney has shared the common fate, as a lover of nature's voices he has written some charming sketches of bird life, and we cannot but regret that so sympathetic a writer should have left us so brief a record of his observations in the woods and fields.—F. M. C.

Oustalet on the Birds of Patagonia.*—The present volume gives a very full account of what is known of the birds of Antarctic America, including southern Patagonia, Tierra del Fuego, the Falkland Islands, and the various smaller islands of the neighboring Antarctic Seas. The work is based primarily on the rich collections formed by Dr. Hyades, Dr. Hahn, and M. Sanvinet, of the French Scientific Mission to Cape Horn, but includes also the collections made by M. Lebrun and the officers of the 'Vôlage,' in southern Patagonia. Instead of limiting the work to these collections, however, Dr. Oustalet has utilized the specimens collected by the various earlier French expeditions to this general region. The species of which specimens were actually in hand from the region in question number about 100, but 104 others are introduced as of actual or probable occurrence, on the basis of the literature of the subject. The species of the first catalogue (pp. 4-248) are treated at considerable length, the literature of the subject being fully cited, and much space given to the subject of their geographical distribution, and occasionally to questions of relationship and nomenclature. The annotations also include notes made by the collectors on the color of the eyes, beak, feet, etc., and the contents of the stomach. The volume closes with a synoptic table of the geographical distribution of "un total de 204 espèces pour les oiseaux qui ont été rapportés par la Mission du cap Horn ou qui ont été recueillis par d'autres expéditions dans la Patagonie proprement dite, au sud du Rio Negro, sur la Terre de Feu, la Terre des Etats, les îles avoisinantes, ou dans l'archipel des Malouines." The work is accompanied by six beautiful colored plates of (mostly) previously unfigured species.—J. A. A.

*Mission scientifique du Cap Horn, 1882-1883. Tome VI. Zoologie. Oiseaux, par E. Oustalet. 4to. pp. 341, pll. 6. Paris, 1891.

Stone on the Crows, Birds of Paradise, and Orioles in the Museum of the Philadelphia Academy of Natural Sciences.*—The Corvidæ number 434 specimens, representing 109 species, or about two thirds of the commonly recognized species. *Cyanocorax heilprini* Gentry, known only from the type in the Academy's collection, is considered as probably a hybrid between *C. cyanomelas* and *C. cyanopogon* or *C. cayanus*. The collection also includes the two original specimens of *Corvus hawaiiensis* Peale.

The Birds of Paradise number 79 specimens, representing 25 of the 45 known species. Among these is the type of *Ptilorhis wilsoni* Ogden [—*P. magnifica* (Vieill.)], and also the type of *Schlegelia wilsoni* Cass.

The Orioles in the collection (including *Sphecothebes*), number 22 out of the 35 known species, and are represented by 97 specimens, including the probable type of *Sphecothebes flaviventris* Gould. The localities of the specimens are indicated, and there are a few technical remarks on questions of affinity and nomenclature.—J. A. A.

Stone on Birds collected by the West Greenland Expedition.†—These number 147 specimens, representing 21 species, collected mainly at Disco Island, Duck Island, Melville Bay, Cape York, and McCormick Bay, by Dr. William E. Hughes and Dr. Benjamin Sharp, between June 26 and August 11, 1891. Measurements are given of nearly all the specimens, with many interesting notes on the various phases of plumage presented by some of the species. The only land birds obtained are the Greenland Ptarmigan, Gyrfalcon, Snow Bunting, Lapland Longspur, and Wheatear. In addition to the above, about a dozen species are recorded as taken at Sydney, Nova Scotia, and in the Gulf of St. Lawrence, while on the way to Greenland.—J. A. A.

Minor Ornithological Publications.—There is a number of scientific periodicals which though not exclusively ornithological yet contain considerable matter relating to North American birds. In the cases of those that have not been noticed here before, the present record begins with the year 1879.

The American Naturalist.

Since it was last noted in these pages (Vol. VI, p. 181) there have appeared in the 'American Naturalist,' (Vols. XXIII-XXV, 1889-1891) the following articles relating to birds (Nos. 2321-2329).

2321. *The Food of the Owls.* By W. S. Strode, M. D., 'The American Naturalist,' Vol. XXIII, Jan., 1889, pp. 17-24.

*Catalogue of the Corvidæ, Paradiseidæ and Oriolidæ in the Collection of the Academy of Natural Sciences of Philadelphia, by Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1891, pp. 441-450.

† Birds collected by the West Greenland Expedition. By Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1892, pp. 145-152.

[American Naturalist.—Continued.]

2322. *The Mimetic Origin and Development of Bird Language.* By Samuel N. Rhoads. *Ibid.*, March, 1889, pp. 91-102 [=191-202.]

2323. *Birds Killed by Electric Lights at Girard College, Philadelphia.* By F. H. Danenhour. *Ibid.*, September, 1889, pp. 823-824.

2324. *The Notes of Some of Our Birds.* By John Vance Cheney. *Ibid.*, Vol. XXIV, Aug., 1890, pp. 745-747.—*Vireo olivaceus*, *Passerina cyanea* and *Colinus virginianus*.

2325. *The Brain Weight of Birds.* By Dr. Joseph L. Hancock. *Ibid.*, Oct., 1890, p. 969.

2326. *Probable Causes of Polygamy Among Birds.* By Samuel N. Rhoads. *Ibid.*, Nov., 1890, pp. 1024-1036.

2327. *Notes on the Classification of Pigeons.* By R. W. Shufeldt. *Ibid.*, Vol. XXV, Feb., 1891, pp. 157, 158.

2328. *The Origin of the Avifauna of the Bahamas.* By Frank M. Chapman. *Ibid.*, June, 1891, pp. 528-539. (See Auk, IX, p. 179.)

2329. *The Problem of the Soaring Birds.* By I. Lancaster. *Ibid.*, Sept., 1891, pp. 787-800.

American Journal of Psychology.

In Vols. I-III (November, 1887-February, 1891), the only article relating to birds is No. 2330.

2330. *Winter Roosting Colonies of Crows.* By C. L. Edwards. 'The American Journal of Psychology,' Vol. I, No. 3, May, 1888, pp. 436-459.

Canadian Record of Science.

In Vols. I-IV, January, 1884-October, 1891, there have appeared the following (Nos. 2331-2335).

2331. *Dance of the Prairie Chicken.* By Chas. N. Bell. 'The Canadian Record of Science,' Vol. I, No. 4, Oct., 1885, pp. 209-211. Mating habits of *Pediocates phasianellus campestris*.

2332. *Notes on Some of the Birds and Mammals of the Hudson's Bay Co's. Territories and the Arctic Coast.* By John Rae. *Ibid.*, Vol. III, No. 3, July, 1888, pp. 125-136. Field notes on several species of Geese, Waders, and Ptarmigan.

2333. *Notes on Some Birds Observed at Montreal.* By F. B. Caulfield. *Ibid.*, No. 7, July, 1889, pp. 414-422.—On habits and food of several species.

2334. *Notes on a Bird New to the Province of Quebec.* By F. B. Caulfield. *Ibid.*, Vol. IV, No. 2, April, 1890, pp. 109-111.—*Coccothraustes vespertinus*.

2335. *Our Winter Birds.* By F. B. Caulfield. *Ibid.*, No. 3, July, 1890, pp. 143-151.

Transactions Ottawa Field-Naturalists' Club: Ottawa Naturalist.

The 'Transactions of the Ottawa Field-Naturalists' Club,' last noticed in 'The Auk,' for October, 1886, Vol. III, pp. 476, ceased publication at the

[Ottawa Naturalist.—Continued.]

end of Vol. II, and was succeeded by the 'Ottawa Naturalist,' issued as a monthly. Since the notice above referred to the following (Nos. 2336-2351) have appeared in the 'Transactions' and in Vols. I-V (April, 1887-March, 1892) of the 'Naturalist.'

2336. *Report of the Ornithological Branch for the Year 1885-86.* By W. L. Scott, John Macoun, and Geo. R. White. 'Ottawa Field-Naturalists' Club, Transactions, No. 7: Vol. II, No. III, 1887, pp. 355-361.—Records of "more important captures" and dates of arrival and departure of a number of species in 1885.

2337. *Report of the Ornithological Branch for the Year 1886-87.* By Geo. R. White and J. M. Macoun. 'The Ottawa Naturalist,' Vol. I [=Vol. III, Transactions of the Ottawa Field-Naturalists' Club], No. 7, Oct., 1887, pp. 98-104.—Notes of capture of several species at Ottawa and dates of arrival and departure of migrants in 1886.

2338. *Report of the Ornithological and Oölogical Branch for 1887.* By John Macoun and Geo. White. *Ibid.*, Vol. II, No. 4, July, 1888, pp. 49-54. Chiefly dates of migration.

2339. *Report of the Ornithological Branch for Spring of 1888.* By John Macoun and Geo. White. *Ibid.*, pp. 54-56.—Principally dates of arrival of a number of species.

2340. *Report of the Ornithological and Oölogical Branch for the Year 1888.* By John Macoun and Geo. R. White. *Ibid.*, No. 12, March, 1889, pp. 149-152.—On the occurrence of various species.

2341. *The Birds of Renfrew County, Ont.* By Rev. C. J. Young. *Ibid.*, Vol. III, No. 1, April-June, 1889, pp. 24-30.—Mention of various species.

2342. *What You See When You Go Out Without Your Gun.* By W. A. D. Lees. *Ibid.*, pp. 31-36.—Near Ottawa.

2343. *Spring Report of the Ornithological Branch.* By Wm. A. D. Lees, John Macoun and Geo. R. White. *Ibid.*, July-Sept., 1889, pp. 68-73.—"Noteworthy finds" and spring arrivals.

2344. *Report of the Ornithological Branch for the Year 1886.* By Wm. A. D. Lees and John Macoun. *Ibid.*, Vol. IV, No. 4, July, 1890, pp. 65-69.—Chiefly dates of autumn migration.

2345. [*The Short-billed Marsh Wren.*] By W. E. Saunders. *Ibid.*, No. 5, Aug., 1890, pp. 93-94.—Doubt thrown on a previous record of its occurrence near Ottawa.

2346. *A Bird in the Bush.* By W. A. D. Lees. *Ibid.*, No. 8, Nov., 1890, pp. 133-139.—A popular sketch of various birds.

2347. *A Naturalist in the Gold Range, B. C.* By James M. Macoun. *Ibid.*, pp. 139-147.—Mention of several species of birds.

2348. *The Birds of Ottawa.* Compiled from records of the Ottawa Field-Naturalists' Club, by A. G. Kingston, W. A. D. Lees and Prof. J. Macoun. *Ibid.*, Vol. V, No. 2, May, 1891, pp. 31-47.—An annotated list of 224 species and subspecies, containing some very interesting records.

2349. *Report of the Ornithological Branch for the Year 1890.* By Wm.

[Ottawa Naturalist.—Continued.]

A. D. Lees, A. G. Kingston and John Macoun. *Ibid.*, No. 4, July, 1891, pp. 77-80.—Brief notes of the more interesting observations of the year.

2350. *The Birds of Ottawa.* *Ibid.*, p. 80.—Errata of No. 2348.

2351. *The Ottawa Colony of Chimney Swifts (Chattura pelagica).* By A. G. Kingston. *Ibid.*, No. 5, Aug., 1891, pp. 89-104.—Contains interesting observations, especially on breeding habits.

Science.

Since 'Science' was last noticed (Auk, VI, 182) it has contained in Vols. XIII-XVIII, 1889-1891, the following (Nos. 2352-2366).

2352. *The Soaring of Birds.* By J. E. Oliver. 'Science,' Vol. XIII, Jan. 4, 1889, pp. 15-16.

2353. *Cucullaris Propatagialis in Oscinine Birds.* By Leonhard Stejneger. *Ibid.*, p. 16.

2354. *The Soaring of Birds.* By Wm. H. Pickering. *Ibid.*, Jan. 11, 1889, pp. 31-32.

2355. *The Soaring of Birds.* By Wm. Kent. *Ibid.*, Jan. 25, 1889, p. 71.

2356. *The Soaring of Birds.* By W. H. Pickering and J. G. MacGregor. *Ibid.*, Feb. 22, 1889, pp. 151-152.

2357. *The Soaring of Birds.* By G. K. Gilbert and Arthur L. Kimball. *Ibid.*, March 1, 1889, pp. 169-170.

2358. *The Soaring of Birds.* By J. G. MacGregor. *Ibid.*, March 8, 1889, p. 187.

2359. *The Soaring of Birds.* By L. M. Hoskins. *Ibid.*, March 15, 1889, p. 205.

2360. *The Soaring of Birds.* By J. G. MacGregor. *Ibid.*, March 22, 1889, pp. 225-226.

2361. *The Soaring of Birds.* By Wm. H. Pickering. *Ibid.*, March 29, 1889, pp. 245-246.

2362. *Gould's Ornithological Works.* *Ibid.*, May 17, 1889, pp. 387-388.—Partly biographical.

2363. *Note on the Anserine Affinities of the Flamingoes.* By R. W. Shufeldt. *Ibid.*, Vol. XIV, Sept. 27, 1889, pp. 224-225.

2364. *The Flight of Birds.* By Henry L. Ward. *Ibid.*, Vol. XVII, Jan. 23, 1891, pp. 45-46.

2365. *The Shrike.* By Julia McNair Wright. *Ibid.*, April 17, p. 217.—Feeding habits.

2366. *Mockingbirds and their Young.* By Julia McNair Wright. *Ibid.*, June 26, p. 361.

Scientific American.

Vols. 40-65 (1879-1891, inclusive) of the 'Scientific American' have contained numerous articles and items relating to birds. Most of these are eminently unscientific, or are copied from well-known works. The following, however, are worthy of record (Nos. 2367-2395).

[Scientific American.—Continued.]

2367. *A Three Legged Woodcock.* 'Scientific American,' New Series, Vol. 40, January 11, 1879, p. 23.

2368. *An Owl at Sea.* *Ibid.*, Vol. 42, March 6, 1880, p. 149.—*Nyctea nyctea.*

2369. *Wild Pigeons in Michigan.* *Ibid.*, May 29, 1880, pp. 343-344.—Interesting notes on breeding and migration, from the Detroit 'Post.'

2370. *A Kentucky Robin Roost.* *Ibid.*, Vol. 44, March 12, 1881, p. 168.—From the Glasgow, Kentucky, 'Times.' "Millions" roosting in "a cedar thicket of about sixty acres."

2371. *Home of the American Osprey.* By Daniel C. Beard. *Ibid.*, Vol. 45, July 30, 1881, p. 71.—Popular sketch of various birds on an island "within half a day's journey of New York City."

2372. *A Fish Hawk's Nest in a Channel Buoy.* *Ibid.*, Sept. 10, 1881, p. 164.

2373. *Reed Bird Shooting in Delaware.* *Ibid.*, Oct. 22, 1881, p. 265.—Estimate of slaughter of *Dolichonyx oryzivorus*, from Philadelphia 'Times.'

2374. *Two-story Birds' Nests.* By Daniel C. Beard. *Ibid.*, Vol. 46, March 18, 1882, p. 169.

2375. *A Phebee Bird's Victory.* By E. H. Davis. *Ibid.*, April 22, 1882, p. 245.—A two-story nest enclosing the body of a Robin.

2376. *Many-storied Birds' Nests.* By W. L. Scott. *Ibid.*, Vol. 47, Aug. 19, 1882, p. 117.—A five-story nest of *Dendroica aestiva*.

2377. *Compound Nest of the C. palustris and the A. phæniceus.* By Daniel C. Beard. *Ibid.*, p. 119.

2378. *A Swallow's Nest.* *Ibid.*, Sept. 30, 1882, p. 207.—A roost at Westerly, R. I., chiefly of *Tachycineta bicolor*.

2379. *Flying.* By Samuel R. Goodsell. *Ibid.*, Vol. 48, Feb. 24, 1883, p. 117.—Contains a note on *Meleagris gallopavo*.

2380. *The Loon.* By F. H. Herrick. *Ibid.*, April 21, 1883, p. 245.

2381. *Ardea cœrulea.* By E. M. Hasbrouck. *Ibid.*, Vol. 51, Dec. 13, 1884, p. 399.—Popular sketch of habits.

2382. *The Pileated Woodpecker.* By E. M. H[asbrouck]. *Ibid.* Vol. 52, Feb. 7, 1885, p. 88.

2383. *Bird Life in Florida.* By E. M. Hasbrouck. *Ibid.*, Feb. 28, 1885, p. 133.—Near Palatka.

2384. *Migration in Florida.* By E. M. Hasbrouck. *Ibid.*, April 18, 1885, p. 241.—In February and March at Palatka.

2385. *Peppering Sparrows.* *Ibid.*, June 13, 1885, p. 374.—Red pepper used to drive away *Passer domesticus*.

2386. *Phosphorescent Birds.* By Isaac N. Worrall. *Ibid.*, Vol. 56, Feb. 26, 1887, p. 133.—*Ardea herodias*.

2387. *Our Winter Birds.* By E. M. Hasbrouck. *Ibid.*

2388. *Phosphorescent Cranes.* By C. F. Holder. *Ibid.*, March 26, 1887, p. 197.

2389. *Forms of Bird Life in Central Texas.* By E. M. Hasbrouck. *Ibid.*, Vol. 57, Oct. 22, 1887, pp. 264-265.

[Scientific American.—Continued.]

2390. *Notes on Bird Life in Texas.* By C. S. Wells. *Ibid.*, Nov. 19, 1887, p. 325.

2391. *Our Lost Species.* By E. M. Hasbrouck. *Ibid.*, Vol. 58, Feb. 4, 1888, p. 72. Brief account of some extinct, rare, or hypothetical, North American birds.

2392. *Crow Roosts and Crow Roosting.* By E. M. Hasbrouck. *Ibid.*, March 24, 1888, p. 184.

2393. *The Cañon Wren.* By E. M. Hasbrouck. *Ibid.*, April 28, 1888, p. 263.—Sketch of habits of *Catherpes m. conspersus*.

2394. *The Geographical Distribution of our Birds.* By E. M. Hasbrouck. *Ibid.*, June 16, 1888, p. 369.

2395. *Economy of Flight.* By Albert F. Zahm. *Ibid.*, Vol. 65, Nov. 21, 1891, p. 320.—Some discussion of the mechanics of flight.

Zoe.

One of the youngest, and one of the most interesting, of our natural history periodicals is 'Zoe: a Biological Journal,' published in San Francisco. Vol. I, was issued monthly, (March, 1890—Feb., 1891); Vol. II has appeared as a quarterly, dated April, 1891—Jan., 1892, the real date of publication being sometimes two months or so later. Much of its space is devoted to botany, but ornithology too comes in for a large share of its pages. We note the following (Nos. 2396-2425).

2396. *Nests and eggs of Townsend's Junco (*Junco townsendi*) and San Pedro Partridge (*Oreortyx pictus confinis*).* By A. W. Anthony. 'Zoe,' Vol I, No. 1, March, 1890, pp. 5-6.

2397. *Ornithological Observations during the Total Solar Eclipse of January, 1889.* By Walter Bryant. *Ibid.*, pp. 21-24.

2398. *Nesting Habits of the Golden Eagle.* By H. R. Taylor. *Ibid.*, No. 2, April 1890, pp. 42-44.

2399. *Birds New or Rare in California.* By W. Otto Emerson. *Ibid.*, pp. 44-46.

2400. *Songs of some California Zonotrichia.* By Charles A. Keeler. *Ibid.*, No. 3, May, 1890, pp. 72-74.

2401. *Migratory Instinct in Caged Wild Birds.* By W. Otto Emerson. *Ibid.*, pp. 80-82.

2402. *Song Birds about San Francisco Bay.* By Charles A. Keeler. *Ibid.*, No. 4, June, 1890, pp. 116-120.

2403. *Notices of Supposed New Birds.* By Walter E. Bryant. *Ibid.*, No. 5, July, 1890, pp. 148-150.—The name *Auriparus flaviceps ornatus* applied to the form of the Verdin occurring in southern California.

2404. *A Nest of the California Bush Tit (*Psaltriparus minimus californicus*).* By Charles A. Keeler. *Ibid.*, p. 151.

2405. *Observations on the Life History of the House Finch (*Carpodacus mexicanus frontalis*).* By Charles A. Keeler. *Ibid.*, No. 6, Aug., 1890, pp. 172-176.

[Zoc.—Continued.]

2406. *The Geographical Distribution of Land Birds in California.* By Charles A. Keeler. *Ibid.*, No. 8, Oct., 1890, pp. 225-230; No. 9, Nov., 1890, pp. 257-260; No. 10, Dec., 1890, pp. 295-299; No. 11, Jan., 1891, pp. 337-343; No. 12, Feb., 1891, pp. 369-373.

2407. *A New Junco from California (Junco hyemalis thurberi).* By A. W. Anthony. *Ibid.*, No. 8, Oct., 1890, pp. 238-239.

2408. *A Doomed Bird.* By J. G. Cooper. *Ibid.*, pp. 248-249.—*Pseudogryphus californianus.*

2409. *An Abnormal Nest of Vigors's Wren.* By Harry R. Taylor. *Ibid.*, No. 9, Nov., 1890, pp. 276-277.

2410. *Found Dead on the Beach.* By Walter E. Bryant. *Ibid.*, pp. 282-283.—Nineteen species of sea birds "found upon the ocean beach of San Francisco County," Cala., after storms.

2411. *An Ornithological Retrospect.* By Walter E. Bryant. *Ibid.*, No. 10, Dec., 1890, pp. 289-293.—Changes in abundance of California birds.

2412. *Notice of a Supposed New Vireo from Oregon.* By A. W. Anthony. *Ibid.*, pp. 307-308.—*Vireo huttoni obscurus.*

2413. *Secondary Migration of Birds.* By A. W. Anthony. *Ibid.*, No. 12, Feb., 1891, pp. 379-381.

2414. *Oregon's Imported Songsters.* By A. W. Anthony. *Ibid.*, Vol. II, No. 1, April, 1891, pp. 6-11.

2415. *Strange Nesting Place of the Barn Owl.* By W. Otto Emerson. *Ibid.*, p. 22.

2416. *The Relationship of Bell's Sparrow and Sage Sparrow.* By F. O. Johnson. *Ibid.*, pp. 22-26.

2417. *Andrew Jackson Grayson.* By Walter E. Bryant. *Ibid.*, pp. 34-68.—A biographical sketch, followed by extracts from unpublished manuscripts of Mr. Grayson's, treating of the habits of the following species: *Anhinga anhinga*, *Scardafella inca*, *Pseudogryphus californianus*, *Sarcoramphus papa*, *Accipiter cooperi*, *Chrysotis leuallanti*, *Geococcyx mexicanus*, *Granatellus francescæ*, *Vireo flavoviridis*, *Melanotis caerulescens*, *Rhodinocichla rosea*, *Troglodytes insularis*, *Dendronis mentalis*.

2418. *Notices of some California Birds.* By L. Belding. *Ibid.*, No. 2, July, 1891, pp. 97-100.

2419. *Unusual Nesting of Empidonax hammondi.* By Dr. J. G. Cooper. *Ibid.*, pp. 104-107.

2420. *Nesting Habits of Thick-billed Sparrows.* By Harry R. Taylor. *Ibid.*, p. 123.—*Passerella iliaca unalascensis.*

2421. *Notices of certain Californian Birds.* By Walter E. Bryant. *Ibid.*, p. 128.

2422. *Notes on the Cactus Wren.* By A. W. Anthony. *Ibid.*, pp. 133-134.

2423. *The 'Reed Birds' of the San Francisco Markets.* By Walter E. Bryant. *Ibid.*, pp. 142-145.

[Zoe.—Continued.]

2424. *The Nesting Time of Birds About San Francisco Bay.* By Chas. A. Keeler. *Ibid.*, pp. 167-172.
2425. *The Cape Region of Baja California.* By Walter E. Bryant. *Ibid.*, No. 3, Oct., 1891. pp. 185-201.—Narrative of a collecting trip, containing notes on various birds.

The Zoölogist.

In Vol. II, pp. 373-375, the record of the 'Zoölogist' was carried into Vol. IX of the third series, through September, 1885. Since then (Vol. IX, Oct., 1885, to end of Vol. XIV, Dec., 1891), it has contained a number of articles and notes interesting to students of North American birds, as follows (Nos. 2426-2451).

2426. *Discovery of the Eggs of the Knot.* By H. W. Feilden. 'The Zoölogist,' Third Series, Vol. IX, Oct., 1885, No. 106, pp. 387-388.—Contains an extract from a letter from Lieut. A. W. Greely.
2427. *American Golden Plover and Richard's Pipit in Scotland.* By J. Guille Millais. *Ibid.*, Vol. X, Jan., 1886, pp. 26-27.
2428. *On the Genus *Hamatopus* or *Oystercatchers*.* By Henry Seebohm. *Ibid.*, Feb., 1886, pp. 41-49.
2429. *Voyage of the 'Eclipse,' to the Greenland Seas, Capt. David Gray, Commander.* By Robert Gray (edited by Thomas Southwell). *Ibid.*, pp. 50-54.
2430. *A Review of the Species of the Genus *Numenius*.* By Henry Seebohm. *Ibid.*, April, 1886, pp. 137-148.
2431. *Notes on a Voyage to the Greenland Seas in 1886.* By Robert Gray. *Ibid.*, Vol. XI, Feb., 1887, pp. 48-57; March, pp. 94-100; April, pp. 121-136.
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2442. *The So-called 'Martinico Gallinule' in Ireland.* By A. G. More. *Ibid.*, pp. 24-25 — '*Porphyrio smaragnotus*, not *Ionornis martinica* as had been supposed.
2443. *American Bittern* in Co. Kildare. By R. F. Scharff. *Ibid.*, p. 26.
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GENERAL NOTES.

Migration of *Urinator imber*.—Seconnet Point, Rhode Island, April 16, 1892. Clear weather, sea calm, wind light, northwest. I saw twenty to twenty-five Loons today flying toward the east, on migration, at an elevation of about sixty yards; there were five in one flock, and six in another, the others scattering. April 17, I saw six flying east on migration, with a light west wind. April 18, wind east to southeast, I saw only two or three today flying east. April 19, I saw four flying east; they were well up; wind light, northwest. April 20, no air moving, vane pointed northwest, I saw six, four of which were in company, all flying east; they were up about seventy-five yards. April 21, I saw two flying east, about sixty yards up. I shot one, an adult in full plumage, weighing eleven pounds; I have shot them larger and heavier.

Loons fly in large numbers all through May up to June first, when the migration seems over for those going north, the height of abundance being from the fifteenth of May to June first. A southwest wind is particularly favorable for such northern migration. One of their principal lines of flight is up Buzzard's Bay, crossing the land (the narrowest part) to Cape Cod Bay. While making this flight a great many are killed between Tobey and Mashnee Islands. I have seen here years ago three tiers of ten or a dozen boats each (and I am informed such is often the case at the present time) stretched across the strait between the above islands. Fifty to sixty Loons are killed sometimes, on a good southwest morning (they fly again at about dark), and as many more wounded ones are shot down which are not recovered. When the wind is from any other quarter than southwest, they pass overhead very high up.—GEORGE H. MACKAY, *Nantucket, Mass.*

***Pelecanus erythrorhynchos* in Maine.**—I have examined a magnificent adult male American White Pelican which was shot on May 28, 1892, at Saponic Pond by Peter Sibley, and was purchased by O. W. White of Burlington, Maine, for whom it has been mounted by S. L. Crosby of Bangor. This is a most interesting capture for this State and particularly so for a locality so far inland. Saponic Pond is situated on the line between Burlington and Grand Falls Plantation, about forty miles N. N. E. of Bangor, and some three miles east of Enfield and the Penobscot River.—HARRY MERRILL, *Bangor, Maine.*

The Spring Migration of the Scoters in 1892.—Seconnet Point, Rhode Island. The first week in April was hot, the thermometer rising to 71° on the 2d, and to 78° in the shade on the 3d.

On the 4th, there was rain in the early morning, with the wind east; it changed to southwest about eight o'clock A.M. From daylight until

eleven o'clock A. M., there was a very large and continuous migration of Scoters towards the east from the west. This movement is the earliest I have ever known or heard of. Among them were some Whitewings; the others were mostly Surf Scoters.

On April 7 the weather was clear, with light southwest wind, increasing to a strong breeze in the afternoon. There were no Scoters flying on migration.

On April 9, 10, 11, and 12, strong northwest winds; ice half an inch thick on the 10th, also cold on the 11th and 12th. No Scoters flying on migration.

April 14.—Light northwest wind until ten o'clock A. M.; then it changed to southwest, strong breeze. After three o'clock P. M. I saw a few flocks of Scoters flying east on migration.

April 15.—Wind northeast in early morning; very cold with snow which ceased about nine o'clock A. M., it being still cold. I saw three flocks, estimated to contain fifty birds in the aggregate, flying high up towards the east. They were either Surf or American Scoters, I think the former. In the afternoon the wind died away and came light south with some west, and warmer; no Scoters moving.

April 16.—Weather clear, sea calm, light air, northwest. A few Scoters flying towards the east, mostly Surf. At ten o'clock A. M. wind changed to southwest, but there was no movement as a result.

April 17.—A light breeze from the west in the morning; later there was some south in it and I noted quite a movement of Scoters towards the east. They were flying too far out from the shore to distinguish the species. I also saw several flocks of American Scoters.

April 18.—A very little air from the northwest early in the morning, sea calm. At about half past seven o'clock A. M. the wind changed to east, and later to southeast. I saw only an occasional flock flying towards the east until half past one o'clock P. M. when a considerable movement commenced towards the east from the west, and continued until dark. The birds flew high until towards the latter part of the afternoon. I saw some flocks estimated to contain nearly one hundred birds. It was impossible to distinguish the species as they were far out from the shore. I think they were mostly Surf Scoters, and I should estimate that about one thousand flew towards the east on migration after half past one o'clock P. M.

April 19.—A very little air from the northwest in the morning, later it changed to southwest, light breeze, weather moderate and warm. No Scoters moving, absolutely no migration.

April 20.—A fine calm morning; the vane pointed northwest. I saw only a dozen flocks, of few birds each, mostly White-wings, flying towards the east, and they were far out from shore. The wind changed to southwest, light breeze, about eight o'clock A. M. There was only an occasional flock of Scoters flying towards the east; those seen were flying near the water.

April 21.—A quiet and warm, southwest morning, nearly calm. I saw only three or four flocks of White-wings, and the same number of Surf

Scoters, flying towards the east on migration. There has been no large, defined movement since the one on April 4.

April 22.—Rain in the night, cloudy in the morning, wind south-south-east, light fog all day, with rain from three o'clock P. M. until sunset, sea quite heavy. A large flight of Scoters flying towards the east on migration.

April 23.—Pleasant, wind southwest all day. A large flight of Scoters towards the eastward on migration.

April 24.—Very pleasant and warm, wind southwest, light air, until late in the afternoon; it then changed to north. Not much worth noting.

April 25.—Wind north in the morning, and cold, ice half an inch thick; calm during the middle of the day; in the afternoon wind southwest; a pleasant day. A large flight of Scoters took place, the birds going towards the east.

April 26.—Wind north in the morning, same weather as the day before; strong southwest wind in the afternoon. Nothing especial to note.

April 27.—Wind northeast in the morning; worked around to east and south, strong breeze in the afternoon. Nothing flying.

April 28.—Wind remained south all day, quite strong breeze, sea rough, cloudy. Nothing especial to note.

April 29.—Wind southwest in the morning; changed to northwest about noon; light rain all day. Nothing especial to note.

April 30.—Wind northwest all day, very pleasant. Only a few birds moving, nothing to note.

May 4.—While passing from Nantucket Island to Wood's Holl, Mass., I saw a good many White-wing, and a few Surf, Scoters.—GEORGE H. MACKAY, *Nantucket, Mass.*

The Red Phalarope (*Crymophilus fulicarius*) at Nantucket Island, Massachusetts.—While driving in the western portion of this island on May 1, 1892, my attention was attracted while crossing the beach at the south head of Hammuck Pond to quite a number of small birds (about forty estimated) which, when flying on the waves, resembled the Sanderling (*Calidris arenaria*), and which were hovering just above the water and alighting on it amid the breakers which were rolling in on the beach. I at once recognized that that most graceful of the smaller water birds, the Red Phalarope, or Whale Bird as it is sometimes called, was before me. Never having taken them before, I filled my pocket with cartridges and, hastily jumping from my wagon (leaving my horse, who is accustomed to such proceedings, to take care of himself on the crest of the beach), I ran to the edge of the water and commenced firing; nor was my ardor dampened, although my legs and feet were, after the waves had twice washed over my rubber boots. There was a strong south by west wind blowing at the time, as it had been for a day or so previous, which drifted my dead birds on the shore. The weather for the past week, as it was that day, had been quite cool. The

surf was tumbling in on the beach, within fifteen or twenty yards of which the birds were distributed for quite a distance. They passed to and fro on wing, alighting on any temporarily smooth spot amid the rollers, and immediately commenced feeding. When a curling wave towered above and threatened to engulf them, they rose on wing and, just clearing the crest of the wave, again alighted behind it, to repeat the operation when the occasion required. While on the water all their movements were exceedingly agile and graceful, as they swam with astonishing rapidity, picking up at short intervals something edible from apparently just below the surface, the bill being immersed only about half its length; what it was, I failed to discover. Frequently they would spin around in quest of it, as on a pivot. The head and neck are carried erect to the fullest extent. I did not notice one with the neck arched or curved while swimming; neither did I see one of them attempt to dive during my observations which lasted over an hour. They appeared remarkably active, and all the time were busily engaged in feeding. I saw none resting quietly on the water, neither did I hear them utter any sound. They are said, however, to make a peeping note. Their flight and general appearance when flying reminded me strongly of the Sanderling. Occasionally four or five would collect together; but I failed to secure more than one at a single shot, owing to the rapidity of their movements as also to the waves. Although the birds remained the whole time within a few yards of the beach, during which time I was constantly firing at them, they seemed quite tame and gentle. They nevertheless were difficult to shoot as they bobbed about like a cork, now up, now down, and sometimes for an instant only in front of a wave, and then lost to view behind it, rising and falling with the waves several feet at a time. Of the fifteen I shot down I saved twelve, one of which was a Northern Phalarope (*Phalaropus lobatus*), a female in the adult spring plumage, a most beautiful bird, and the first I have taken in this plumage. I could easily have captured more of the Red Phalaropes, but considered I had a sufficiently good series, the birds being in various stages of plumage, except the fully adult. One of the crew of the life-saving station at this end of the island (west), and within a mile and a half of the spot where I shot them, informed me the next day that, on the day previous to the one on which I shot them, he should think he had seen nearly two hundred of them. On May 10 they had mostly departed. There were several hundreds in the flocks which were resting on the water and flying about. One of my friends, who has made the passage several springs from New York to South Carolina and return, and who knows the bird, informs me that in the years 1886, 1887, and 1889, he saw them in numbers beyond estimate, about April 20, fifty to one hundred miles north of Cape Hatteras, N. C., and perhaps fifty miles from land.

I am of the opinion that this bird is more abundant along the coast than would be inferred from the few which are taken, but I account for so few, comparatively, being noted by the fact that as a usual thing they do not linger near the shore, unless driven in by severe weather.

As far as I am aware, this spring, the first of these birds observed were

those taken by me on May 1. They were numerous in the vicinity of Tuckernuck and Muskeget Islands from May 19 to 22 inclusive, about all having departed at the latter date. I, however, saw eight or ten scattering birds on May 26, on which date I shot two *P. lobatus*, and one *C. fulicarius*. It would appear that the northeast rain storm of May 19, 20 and 21 must have driven in a fresh lot of these birds on this coast, for at that time and a few days later thousands were noted, and some two hundred and fifty captured, from Monomoy to Provincetown, Cape Cod, a large proportion of which were in an advanced stage of plumage and many in the fully adult dress, while on May 1 I did not see one in full spring plumage, most of them being in the gray and white stage. I am therefore of the opinion that those birds taken and noted off Cape Cod were a different lot. Among them were a few scattering *P. lobatus*. It is very unusual for the Red Phalarope to appear in such abundance on this coast. About six years ago, one day during the latter part of October, Phalaropes (species unknown) were noted passing continuously by the south side of Nantucket and Tuckernuck Islands, headed south. They flew from morning until late in the afternoon in flocks of varying size, keeping near the water.

The adult female has a white patch on each side of the head, surrounding the eye, and extending backward until they meet in a narrow line at the nape, the crown being black from the base of the bill to the nape. Adult males usually have a much smaller loreal space of white, and the crown from the base of the bill to the nape is sooty black streaked with yellowish brown, the same as on the back. The entire under parts of the adults (both sexes) from the bill to the end of the tail are deep red. Mr. M. Abbott Frazar, of Boston, first called my attention to the difference between the top of the head of males and females, which seems sufficiently constant in the large number of specimens I have viewed (about one hundred and fifty) to identify the sexes. It would also appear that the female has the higher plumage of the two, as well as being a little larger than the male. When in the gray and white immature plumage I see no way of recognizing the sexes by their general appearance.

As I am not aware that many of these birds have been heretofore taken in this vicinity at this season I thought it might be desirable if I gave an individual description of those I secured. For convenience I designate them by number.

No 1.—A young male. The upper parts mostly gray, with a few reddish feathers on the back and scapulars showing the maturer plumage. Under parts white. A band of white about three eighths of an inch wide on greater wing coverts. Top of head white with a few blackish brown feathers interspersed. Nape gray. Bill nearly black, with a tinge of deep orange yellow extending from the nostrils to the base of the upper mandible; also a tinge of the same on the lower mandible at its base.

No. 2.—This bird, a male, was of nearly the same plumage as the one above described.

No. 3.—Male. Generally the same as those above, but rather more mature.

The feathers on the back were brownish black, and there was not as much white on top of the head. The bill had a little more of the deep orange yellow at its base, and of a little deeper shade; it was also extended a little beyond the nostrils on its sides. There were also some red feathers intermingled on the neck and throat, as also a few on the sides of the breast, as well as on the lower tail-coverts. There was an oblong black spot around the eyes.

No. 4.—Female. Very similar to No. 3, with scattering reddish feathers, interspersed with white ones, extending from the throat throughout the entire lower parts, the orange yellow showing a little beyond the nostrils, beginning at the base of the upper mandible and extending somewhat farther on towards the end of the lower mandible. There were a good many brownish and black feathers on the back and scapulars, edged with white on the scapulars. Under tail-coverts reddish. A blackish brown oblong mark or spot below and in front of the eyes.

No. 5.—Male. A bird in similar plumage to No. 1.

No. 6.—Female. This bird had more red than white on its entire lower parts from the throat down. The deep orange yellow extended half the length of the upper mandible from the base forward, and to three quarters of the length on the lower. Neck very red. Throat grayish, with a few reddish feathers interspersed. Top of head almost black, with an occasional white feather. Nape blackish, with considerable red intermixed. The feathers of the back and scapulars, reddish and black. Under tail-coverts from vent red with an occasional white feather. Sides of the head black and white, the former predominating. Legs light grayish slate.

No. 7.—Male. Like No. 1, except the longest feathers of scapulars which were black, edged with dull red.

No. 8.—Female. The top of the head of this bird was all black with one white feather. Throat black and white intermixed. Neck deep dark red. Lower parts red and white intermixed. The deep orange yellow extending half the length of the upper mandible, and almost to the end of the lower, the end of the bill being black. The back and scapulars reddish and black. A number of reddish feathers on the upper tail-coverts. Nape reddish. A white band over the eyes an eighth to a quarter of an inch wide, extending to back of head.

No. 9.—Female. Top of head black and white. Entire back, including scapulars, composed of grayish and reddish and black feathers. On the lower parts, including neck, red and white feathers intermixed. Throat black and white intermixed. The deep orange yellow on the upper mandible extended seven eighths of its length on the sides, with the black at the end extending towards the nostrils so as to make a dividing line about half its length, the under mandible having the orange yellow nearly to the end which was black. There were some red feathers on the upper tail-coverts.

No. 10.—Female. This bird was in about the same plumage as No. 9, but with more red on the breast, and more of the white feathers on the lower parts.

No. 11.—Female. This bird had the top of its head black, with a few white feathers interspersed. The feathers of back and scapulars reddish and black, with an occasional gray one. On the throat and entire lower parts red and white feathers intermixed. Under tail-coverts pure red. The lower mandible orange yellow to within an eighth of an inch of the end which was black. The upper mandible orange yellow to within an eighth of an inch of the end which was black, with a dividing line of black changing to light brown as it neared the nostrils. On the breast red and white feathers intermixed, the former predominating. Nails black. In all the specimens taken the white bar on the greater wing-coverts and the color of the legs and feet were constant.

No. 12.—This bird, a female, was the Northern Phalarope (*Phalaropus lobatus*) in apparently full adult plumage. The top of the head was black. Bill black. Throat white. A small spot of white on under eyelids. A deep chestnut red color separated by a blackish band from the white of the breast which extended over the entire lower parts to end of tail. A bar of white on the great wing-coverts one quarter of an inch wide. Entire back black, striped with deep chestnut red feathers some of which had a white edging at their ends, as did also the black feathers of the scapulars. The upper tail-coverts had black and white spots alternating, there being several on each feather. Feet of a dark slate-color outside and light lead-color on the inside, the nails black.—GEORGE H. MACKAY, Nantucket, Mass.

Crymophilus fulvicarius in Provincetown Harbor.—May 21 to 23, 1892, I spent at Provincetown, Massachusetts, with Mr. Outram Bangs of Boston. The number of Phalaropes that we observed was so unusual as to seem worthy of record.

May 21.—A single *Crymophilus* found on the edge of a large pond near the town. The bird appeared to be unhurt, but moved about slowly and awkwardly on shore. The weather was rainy and foggy with a steady, strong wind from the east. Fishermen who went out to the weirs north of the town reported 'bank birds' (Phalaropes) very abundant, large numbers of them even alighting on the beach. They said that the birds had been unusually abundant a few miles out at sea for some weeks, but these were the first seen near shore.

May 22.—This morning the wind moderated, but a fog set in, bringing with it numbers of Phalaropes. At about 8 A. M. word was brought that the harbor was full of 'sea geese' (a name applied indiscriminately to both species of Phalarope). The fog was not very dense and the birds could be seen from shore, flying in large flocks close to the water. They moved mostly toward the northwest, very few being seen to fly in any other direction. It was noticeable that the flocks did not like to cross the long nets or 'leaders' stretching from the weirs toward shore directly across the usual line of flight. Although these nets rose only three or four feet above the water, the birds almost invariably turned their flight and followed them for some distance before rising to pass over. At a little after nine the fog

cleared, the birds disappearing with it. We probably saw between five hundred and one thousand Phalaropes during the hour that they were in the harbor.

May 23.—Thick fog and driving rain with moderate wind until about 8 A. M., after which the rain and wind ceased; but the fog continued nearly two hours longer until driven away by a fresh west wind which rose rather suddenly. Fishermen who landed at 7.30 reported immense numbers of 'bank birds' resting on the water less than half a mile from shore. This was something entirely unheard of, and created much interest among the men gathered about the wharf waiting for the weather to moderate. The 'white bank birds' (*Phalaropus lobatus*) sometimes come within less than a mile of shore, but the "brown ones" (*C. fulicarius*) they said had never before been seen in this region except at sea. Taking a dory we soon found a flock resting on the water only a few hundred yards from the end of the wharf. There were certainly one hundred and fifty individuals in this flock—perhaps twice as many. The number could only be guessed at, as the birds were very restless and much scattered, while new arrivals constantly came in to increase the confusion. The flocks moved slowly to windward, bunches of a dozen or more birds continually rising from behind and flying to the front. For the next two hours Phalaropes were constantly in sight, either resting on the water or flying about in every direction, mostly in large flocks, but frequently singly. They were very unsuspecting, allowing the dory to approach within fifteen or twenty yards before taking alarm. Their only note was a single *chip* like that of *P. lobatus*, and somewhat resembling a note of *Calidris arenaria*. While the fog was most dense some of the flocks settled on the water within fifty yards of the ends of the wharves, but as the air cleared they drew away from shore, and later could be seen rising through the rapidly disappearing fog. After circling about until well oriented, they flew off over the town in the most direct line for the open ocean, and when the fog finally cleared none were left in the harbor. A few, however, could still be seen out in the bay where the fog still lingered. It was impossible to get any adequate idea of the number of birds seen during those two hours. Two thousand would be a very low estimate, and I doubt whether double that number would be much too high.

Scattered about among the *Crymophilus* were a few *Phalaropus lobatus*, in about the proportion of one to twenty. The smaller species was very conspicuous on account of its snowy white breast.

This unusual occurrence so near shore of a species almost pelagic in its habits in this latitude, is of course to be accounted for by the sudden arrest of the northward migration by the easterly storm and fog. The latter was probably the more important cause as fog accompanied by a very light wind even, appears invariably to have more influence than wind alone on the movements of migrating Limicolæ.—GERRIT S. MILLER, JR., Cambridge, Mass.

Pavoncella pugnax in North Carolina.—I wish to record the capture of a

female Ruff near here on May 6, 1892. I was wading a fresh water marsh, not more than a mile from town, after marsh birds in general, and while I was struggling through the mud, water and cat-tails, a Sandpiper passed behind me. It had apparently flushed from a patch of bare mud about twenty yards from where I then was, and I at once set it down as a Lesser Yellowlegs, both from its size and its flight. It uttered no cry. After circling around the further edges of the marsh, it turned and headed, straight as an arrow, to where I crouched, so that when shot it fell in the water within reach of where I stood. I identified it as a Ruff, and, to make sure, it was sent to Mr. Robert Ridgway who promptly confirmed the identity. The bird was in fair condition, somewhat below the average of our spring shore-birds in this respect, but not by any means poor. The ova were somewhat enlarged, the largest being about the size of No. 6 shot.—H. H. BRIMLEY, *Raleigh, North Carolina*.

Correction.—In my article on the Black-bellied Plover, on page 148 of 'The Auk' for April, 1892, speaking of the abundance of these birds in the neighborhood of Tuckernuck Island, Mass., it reads, "from a flock of about twenty-five birds, which served as the nucleus, they continued to increase until six to eight hundred had collected, the average number in the spring for fifteen years previous being two to three hundred." It should read, "They continued to increase until about two or three hundred had collected. The average number in the spring for fifteen years previous being about one hundred." On page 143 it reads, "The adult female is rather smaller than the male." It should read, "The adult female is about same size as the male. These errors are entirely my own.—GEORGE H. MACKAY, *Nantucket, Mass.*

Lagopus lagopus in Maine.—A male Willow Ptarmigan in full winter plumage was shot at Kenduskeag, Maine (a village about eight miles from Bangor), on April 23, 1892. It was brought into this city to be mounted. The man who killed it reported that it showed little or no alarm at his approach, and in fact seemed quite as tame as a domestic fowl. This is, I believe, the first instance of this species being taken in Maine, and will therefore probably be of interest.—HARRY MERRILL, *Bangor, Maine*.

Occurrence of the Black Gyrfalcon in Rhode Island.—I beg to report the occurrence on November 22, 1891, of the Black Gyrfalcon (*Falco rusticolus obsoletus*) on the little island of Conanicut near Newport, Rhode Island. The specimen secured was a female, in splendid black plumage. It was shot while perched on a haystack on Capt. Audley Clarke's farm, not far from Jamestown, which is a seaside town right opposite Newport on Conanicut Island in Narragansett Bay. The person who shot it

reported it had captured a rat and was feeding thereon at the time. Several rat skins were noticed in the neighborhood, from which it may be inferred that the bird had had a considerable meal on rats. The mate, reported to me to have presented the same dark, almost black appearance, was not in sight when the female was killed, but is said to have appeared about the locality repeatedly, after November 22, 1891, up to March 20, 1892. Several local gunners tried to obtain it, but it was too wild and wary to allow any one within shot. He thus seems to have remained for four months in the vicinity, in the apparent hope of once more meeting his female companion, who may have accompanied him from the far shores of Labrador. The weather was clear on the day the bird was shot, but the climatic conditions had been unsettled and stormy for several days previous.

The specimen, which reminds one of an Eagle in miniature and is a noble-looking bird, has been mounted admirably by Messrs Southwick and Critchley of Providence. It was secured for the Museum of the Natural History Society of Newport, where an ornithological collection is now in process of formation.—A. O'D. TAYLOR, *Newport, R. I.*

The Carolina Paroquet (*Conurus carolinensis*) in Missouri.—On a recent visit to Stone County in southern Missouri I was informed by Mr. Thurman S. Powell that two Paroquets were seen by him at the old Linchpin camping ground in that county last fall (1891). He was on horseback at the time and the birds were in the road ahead of him. As he approached, they flew up into an oak tree, but soon flew down to the ground again and began feeding on acorns. He told me that they were green Parrots similar to those he had seen in Georgia during the war, and were the first he had seen in this neighborhood.—C. HART MERRIAM, *Washington, D. C.*

***Aphelocoma californica* in Washington.**—On April 13, 1892, I shot near Vancouver, Clarke County, Washington, two California Jays (*Aphelocoma californica*). They were in a field, near a thick growth of wild rose bushes, on the bank of the Columbia. This is, I believe, the first record of this bird for Washington.—R. H. LAWRENCE, *Portland, Oregon.*

***Carduelis elegans* in Connecticut.**—On May 9, 1892, I took a very full-plumaged male European Goldfinch in an orchard near here. The bird was in full song, and did not bear any evidence of having ever been in captivity, as it was not particularly tame, the plumage was perfect, even to the tips of the tail-feathers, and the legs and feet were those of a wild bird. It seems to me probable that it was a straggler from some of the localities where they have been introduced and have become naturalized, as I have never seen any near here before.—G. E. VERRILL, *New Haven, Conn.*

Zonotrichia albicollis in California.—Mr. L. Belding has sent to the National Museum a specimen of this species shot by him at Stockton, California, April 22, 1892. It is an adult (apparently a male) in full spring plumage, and is quite identical in coloration and other characters with Eastern specimens. This is apparently only the third Pacific Coast record for the species, the first having been published only a few years since by Mr. W. Otto Emerson of Haywards, California.—ROBERT RINGWAY, *Washington, D. C.*

Abnormal Plumage of *Habia ludoviciana*.—On May 17, 1892, at Stamford, Connecticut, I shot a Rose-breasted Grosbeak, a male (as proved by dissection), which presented certain peculiarities of plumage. It showed the brown wing feathers of the immature bird, but the rose color was exceedingly prominent. Its size was large: 7.5-8 inches in length, and 4.1-2 inches wing. It differed from ordinary specimens of the second year in the following particulars: top of head, crown and neck black flecked with rose; a large rose-white patch specked with black at back of neck; rump rosy white; tail coverts black with white tips; tail as in old male; lower parts and chest as in adult male; throat entirely rose red; chin black; long quills of wing brown as in second year plumage; rest of wing as in adult male; shoulder with one or two rose flecks; a rose-white streak starting at base of lower mandible, extending down the throat to the chest, then abruptly turning across the neck, past the shoulder, and terminating in the white patch at back of neck; a second stripe starts at base of upper mandible, continues over the eye, and down the neck to the white patch. This second stripe is narrow, but bright rose-red from the bill to the eye, and then becomes broader and lighter as it extends down the neck.—LOUIS H. PORTER, *Stamford, Conn.*

On the Breeding of *Helminthophila pinus* with *H. leucobronchialis* at Englewood, New Jersey.—As additional evidence in this puzzling case, I desire to record the breeding of a typical male of *H. pinus*, with a non-typical female of *leucobronchialis*. The nest was found on the west slope of the Palisades at Englewood, New Jersey, June 12, 1892. It was placed on the ground in a small bushy opening in a piece of mixed woodland, and contained three eggs (one of which was broken) of the rightful owners and one of the Cowbird. In construction it agreed with typical nests of *pinus*. The eggs are similar to those of *pinus*, but are somewhat more heavily spotted than the average eggs of that species. The female was closely examined both while she was on the nest and in the bushes and trees near it. In coloration she was intermediate between *pinus* and *leucobronchialis*; the underparts were washed with pale yellow, the upper back was bluish, the rump grayish; the wing-bars were white. She was flushed from the nest three times, and on each occasion was at once joined by a typical male *pinus* which shared her anxiety. Frequently they were so close to each other that they were both in the field of my glass at the same time, and I thus had an excellent opportunity

to compare them. The broken egg and the egg of the Cowbird were removed. On returning to the nest June 19, it was found to be deserted.

While interesting in itself and of importance as a fact in the history of the relationships which exist between these two birds, this record has no decisive bearing on the case, and it would be unwise therefore to attempt to draw inferences from it.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Warblers Destroyed by a 'Norther.'—Thousands of Warblers undoubtedly perished here last week during the 'norther,' which lasted three days, commencing on March 16. On the evening of that day flocks of Warblers were noticed around the gardens and houses here, and the next day many were found dead or were caught in a half-perished condition. About fifty per cent of them were Black-and-white Warblers (*Mniotilta varia*). The remainder were about equally divided between Parulas (*Compsothlypis americana*) and Sycamore Warblers (*Dendroica dominica albilora*). Many Sycamore Warblers and Parulas were captured alive in the houses.

On the 19th, among many dead Warblers which were brought to me were a specimen of the Louisiana Water-thrush (*Seiurus motacilla*) and one Hooded Warbler (*Sylvania mitrata*). Many Yellowrumps were in company with the rest, and, though much tamer than usual, none were found dead or were captured. On the 19th I made a trip for the purpose of observation, and found many Black-and-white Warblers and Parulas lying dead on the ground at the foot of live-oak trees.

From many of the ranches in the country round here, came reports of similar occurrences, and many dead birds of the species mentioned have been sent to me.—H. P. ATTWATER, *Rockport, Aransas Co., Texas.*

Seiurus noveboracensis notabilis in New Jersey.—On the 30th of May 1889, I shot at Raritan, New Jersey, four Water-thrushes. The skin of one I have since shown to Dr. J. A. Allen of the American Museum of Natural History, New York, and he pronounces it, without a doubt, Griennell's Water-thrush (*Seiurus noveboracensis notabilis*).—WILLIAM C. SOUTHWICK, *Raritan, New Jersey.*

Melanism in a Caged Wood Thrush.—A melanistic specimen of *Turdus mustelinus* (American Museum, No. 57,507, New York, June 20, 1892, presented by W. Warren Brown) differs from normal specimens of this species as follows: Two primaries, one entire secondary and a part of the outer web of three others of the right wing, and one primary of the left wing, are dull grayish; the auriculars are black, lightly tipped with fulvous; half the feathers of the chin are wholly black: the throat is normal, the sides of the neck are slightly blacker than is usual, the exposed portion of the feathers of the breast, flanks, under wing-coverts, and crissum are black with narrow tips or borders of tawny which on the breast are reduced to the minimum.

The bird-dealer from whom Mr. Brown purchased this specimen told him it was one of a nest of four he procured in June, 1891, and the following December or January they all changed to the same color as the example just described. There are a number of recorded instances of black Robins,* but so far as I am aware melanism has not before been noticed in the Wood Thrush.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Water Birds at Nantucket, Massachusetts.—*Larus argentatus smithsonianus.*—May 1, 1892, I saw eight Herring Gulls, two of which were adults, the others young in the gray plumage, resting in the Hummuck Pond. They frequent the large ponds to rest, as do also the Great Black-backed Gulls (*Larus marinus*).

Larus philadelphia.—At Tuckernuck and Nantucket Islands the first Bonaparte Gulls this spring appeared May 10, 1892, four or five pairs, during a heavy southeast rainstorm.

Sterna hirundo.—At Tuckernuck and Nantucket the first arrivals this spring of the Common Tern appeared May 10, 1892. They came in flocks of fifty or more, drifting sidewise before a heavy southeast rainstorm. They sailed around several times, screaming, before alighting.

Merganser serrator.—May 1, 1892, I saw about thirty Red-breasted Mergansers in the Hummuck Pond, and on May 4 there were still quite a number living there.

Anas americana.—Feb. 22, 1891, I saw two Baldpates and shot one, a young male, the stomach of which contained only a little white sand. In former years they used to be fairly abundant here, but are now rather scarce.

Aythya americana.—Feb. 22, 1891, I saw three male Redheads in full plumage which were shot from a flock of about forty. They had been frequenting Coskata Pond in the eastern part of the island. These Ducks were fairly numerous here in former years; a few are at times seen here during the winter.

Aythya marila nearctica.—May 1, 1892, I saw two flocks of American Scaup, about twenty-five in each flock; they were resting in the Hummuck Pond. They were probably the remainder of those which have been in this locality all winter, numbering fully five hundred. I saw several hundred of them in the same pond on Feb. 21. There have been more of these Ducks about the island during the winters of 1891 and 1892 than for many years. In times past they were abundant every year. I noted a good many more of them during the past autumn, winter and spring than in the previous year. They appear early in November and are mostly gone by May 1.

Aythya affinis.—Feb. 22, 1892.—I have not noted any of these Ducks here before. While shooting at the Hummuck Pond on the above date, a single Lesser Scaup came to the decoys and was secured. There were a number of *A. m. nearctica* in the pond at the time.

*Deane, Bull. N. O. C., I, 1876, p. 24; Coues, *ibid.*, III, 1878, p. 48; Barrows, Auk, I, 1884, p. 90; II, 1885, p. 303; Faxon, *ibid.*, III, 1886, p. 284.

Clangula hyemalis.—There have been a large number of Old-squaws frequenting most of the larger ponds on the Island this winter (1891-92),—in the Long Pond as many as seven or eight hundred,—also a large number in the Hummuck and Miacomet Ponds. They came in from the outside (Sound) before sunrise and went out again about sunset to roost at night in the Sound. While they frequent the ponds more or less every winter, nothing like the present numbers have been noted before. They preferred to submit to almost any amount of shooting at them rather than abandon the ponds where they had been living. Even on May 1, 1892, I noted as many as forty or fifty in each of the three ponds above mentioned.

Oidemia deglandi.—Feb. 20, 1891.—Off the entire north side of the island from Great Point to Muskeget Island where they had been living during the winter, I saw so many thousands of these Ducks, that for the first time in my life I gave up in despair at being unable to arrive at any satisfactory conclusion regarding their numbers. I will, however, state (for that I am certain of) that there were several hundreds of thousands. They remained until March 22, 1891. Nothing like such numbers has ever before been seen here. They were for the greater part, as far as my observation showed, immature birds. In November, 1890, some five or six hundred (estimated) frequented the Hummuck Pond until driven out by continual shooting at them. On Oct. 6, 1891, during a severe storm about four hundred came into the Hummuck Pond, and continued to frequent it, increasing to about fifteen hundred by Nov. 1, 1891. During the entire winter of 1892, there have been none to speak of living along the north shore of the island, and I account for it by their having eaten up all the shell-fish food last winter. In February, 1892, however, some thousand Scoters were in the habit of coming into the harbor in the early morning to pass the day, returning again to the Sound about half past three to four o'clock in the afternoon. Many of them were mated at this date.

Somateria dresseri.—April 2, 1892. The American Eiders which have been living off the north shore of this island departed last night. (Last year they left on March 28, 1891.) On the previous afternoon I saw one hundred and fifty (estimated). On the afternoon of May 1, 1892, I saw nine at the south side of the island, flying east.

Branta bernicla.—Dec. 12, 1891. While at the extreme western point of this island, I saw one flock of nine, one of fourteen, and one of three Brant. On Feb. 22, 1891, there were about forty living in the harbor, and about seventy-five more living at Muskeget Island. A few winter here in ordinary seasons.

Bartramia longicauda.—May 1, 1891, I saw in the western part of the island four Bartramian Sandpipers, and shot a pair of them, male and female. They were in beautiful plumage. I have reason to believe that a few of these birds breed regularly here every year, the nest, eggs and young having been taken. They also breed on Tuckernuck Island. When the nest is discovered the female exhibits much solicitude, hovering

in near proximity. One of the birds seen by me alighted on a rail fence, which I have frequently observed them do before. In May they will at times mount up into the air, say one hundred to one hundred and fifty feet, where they will quiver in nearly the same place and give vent to a song, or perhaps I might say a good clear whistle with a varied trill of three or four notes, lasting ten or twelve seconds. I have never known of their uttering it at any other season of the year than in the spring. At Essex, Mass., April 28, 1892, one of my friends saw one flying.

Tringa canutus.—Three Knots, the first noted this spring were seen on Tuckernuck Island, May 11, 1892. Three also were seen on the 27th. On the 28th I saw a full-plumaged adult flying, well up, towards the south; the wind was southwest, strong breeze.

Numenius hudsonicus.—A Hudsonian Curlew was seen on or about April 10, 1892 (I cannot fix the exact date), flying towards the west. It had probably been here for several days.

Charadrius squatarola.—During the northwest rain storm of May 19, 20, and 21, 1892, about one hundred and fifty Black-bellied Plover landed on Tuckernuck Island. By the 26th more than half of them had departed. The first one this spring was noted on the ninth of May in this locality. The birds in the vicinity of Tuckernuck have resorted to the uplands more than usual this year. The first one noted on Cape Cod was on April 20, 1892. It was alone, and was an adult male. No others were seen for several weeks after, but this one remained around undisturbed. This is the earliest date I have ever heard of.

Ægialitis meloda.—May 1, 1892, I saw one Piping Plover on the beach at the south head of the Hummuck Pond. On March 29, 1891, I saw one at the same place.

Arenaria interpres.—May 1, 1892. There were four Turnstones in full adult plumage, standing on the rocks of the Western Jetty this morning. They are the first arrivals this season, and it is an unusually early date for them to appear. On May 27, 1891, I shot eleven at the west end of the island.

On Tuckernuck Island during the northeast rainstorm of May 19-21, 1892, about three hundred Turnstones landed. By the 26th about two thirds of them had departed. Strong southwest winds prevailed for the period after the 21st.—GEORGE H. MACKAY, *Nantucket, Mass.*

Brief Notes from Long Island.—The spring of 1892, peculiar in many respects, has brought a number of rare birds to Long Island. On May 16, at Parkville, Queens County, I secured a typical male of Brewster's Warbler (*Helminthophila leucobronchialis*). So far as I can find out, this form has never before been taken on Long Island, though found occasionally in New Jersey and the Hudson River valley. I had no opportunity to observe its habits, as it was migrating with other species in the tree tops, and I shot it at once for identity.

On April 30, in the same locality, I secured a male Hooded Warbler (*Sylvania mitrata*), and Mr. A. H. Helme, of Miller's Place, Suffolk

County, tells me that he observed one at South Setauket in May, but could not secure it. Neither of us ever met the bird before, and it is quite rare.

Other notable captures are the Bay-breasted Warbler, of which I have secured one and Mr. Helme four, and the Nashville Warbler of which I have seen two.

The season has been very late, the majority of the May migrants not appearing until the 16th, when there was a large flight. They continued to come to the very last of the month; a large flight occurred on the 26th, a smaller one on the 27th, and a considerable number of migrants, mostly Blackpoll Warblers, were observed on the 30th.—ARTHUR H. HOWELL, *Brooklyn, N. Y.*

Spring Arrivals at Washington, D. C.—The first individuals of several spring migrants seen in the vicinity of Washington during the present season having been noted, the dates of their arrival are given herewith, as being of probable interest to readers of 'The Auk.' For some of the records I am indebted to other observers, whose names are given in connection therewith.

Spizella socialis.—April 3.

Thryothorus bewickii.—April 5. A male of this species was heard singing near my house in Brookland (one of the suburbs of Washington), but was purposely not collected. It is an excessively rare bird in this part of the country, only three specimens having been obtained (two at Arlington, Virginia, April 10, 1882, and April 6, 1883, by Mr. William Palmer, and one in Washington, April 8, 1888, by Mr. M. M. Green).

Chelidon erythrogaster.—April 7.

Stelgidopteryx serripennis.—April 8.

Troglodytes aëdon.—April 17.

Polioptila cærulea.—April 17. (W. Palmer).

Harporhynchus rufus.—April 18.

Chætura pelagica.—April 23.

Seiurus aurocapillus.—April 24.

Progne subis.—April 24. (N. R. Woods).

Seiurus noveboracensis.—April 24. (W. Palmer).

Antrostomus vociferus.—April 24. (W. Palmer).

Geothlypis trichas.—April 24. (W. Palmer).

Setophaga ruticilla.—April 24. (W. Palmer.)

Mniotilta varia.—April 24. (W. Palmer).

Dendroica æstiva.—April 26. (C. I. Goodale).

Turdus mustelinus.—April 28. (W. Palmer).

Vireo gilvus.—April 30.

Galeoscoptes carolinensis.—April 30.

Dendroica discolor.—April 30.

Myiarchus crinitus.—May 1.

Piranga rubra.—May 1. (Takoma, D. C.; R. W. Shufeldt).

Helmitherus vermivorus.—May 1. (Takoma, D. C.; R. W. Shufeldt).

- Contopus virens*.—May 2.
Passerina cyanea.—May 2.
Dendroica caerulescens.—May 2. (Norbeck, Md.; C. Abert).
Habia ludoviciana.—May 3.
Icteria virens.—May 3.
Vireo olivaceus.—May 3.
Icterus spurius.—May 3. (C. I. Goodale).
Trochilus colubris.—May 3. (C. I. Goodale).
Chordeiles virginianus.—May 3.
Dendroica blackburnie.—May 4. (Takoma, D. C.; R. W. Shufeldt).
 As showing the considerably earlier migration west of the Alleghanies, it may be mentioned that the National Museum has just received a specimen of this bird, shot April 22 at East Saginaw, Michigan, by Mr. Peter Lepp, of that place.
Tyrannus tyrannus.—May 4.
Icterus galbula.—May 4. (Takoma, D. C.; R. W. Shufeldt).
Melanerpes erythrocephalus.—May 4.
Compothlypis americana.—May 4. (C. I. Goodale).—ROBERT RIDGWAY, *Washington, D. C.*

Notes on some Birds of Grays Harbor, Washington.—An important paper on the avifauna of the Northwest Coast has been recently published by Mr. R. H. Lawrence,* entitled: 'A Preliminary List of the Birds of the Gray's Harbor Region, Washington.' It contains the results of observations made at various times between April, 1890, and July, 1891, and includes notes on 92 species.

While collecting on the Northwest Coast in the summer of 1889, for the U. S. Department of Agriculture, I spent two weeks and a half at Aberdeen on Grays Harbor, and although the time was mainly devoted to collecting mammals, several species of birds not mentioned in Lawrence's list came under my observation. On account of the peculiar interest of the birds of this region which is within the area of maximum rainfall of the Northwest Coast, the following notes, published through the courtesy of Dr. C. Hart Merriam, Chief of the Division of Ornithology of the Department of Agriculture, may be of interest as supplementing those of Mr. Lawrence.

Aberdeen, the largest town on Grays Harbor, is built on a 'tide flat' on the north side of the Chehalis at the mouth of the Wishkah River. At the time of my visit (August 5-22, 1889) it was practically in the midst of an extensive coniferous forest, the only outlook being down the Chehalis River which furnished almost the only means of communication between the neighboring towns of Cosmopolis and Hoquiam, since the trail through the 'timber' to the latter place was seldom used. In the dense forests, which consist mainly of gigantic spruces (*Picea sitchensis*), hemlocks (*Tsuga mertensiana*), and cedars (*Thuja gigantea*), carpeted

* Auk, IX, Jan. 1892, 39-47.

with a luxuriant growth of mosses and ferns, birds were scarce, and almost the only species met with were Sooty Grouse (*Dendragapus obscurus fuliginosus*), Harris's Woodpeckers (*Dryobates villosus harrisi*), Steller's Jays (*Cyanocitta stelleri*), Oregon Jays (*Perisoreus obscurus*), and Winter Wrens (*Troglodytes hiemalis pacificus*). Along the banks of the Chehalis River, and back of the town on the tide-flat or marsh which was several acres in extent and formed the largest opening in the forest in this vicinity, birds were abundant, and among those observed were four species not given in Lawrence's list, viz., *Phalacrocorax pelagicus robustus?*, *Rallus virginianus*, *Chordeiles virginianus henryi*, and *Piranga ludoviciana*. To the notes on these species have been added remarks on a few species of special interest.

Larus occidentalis. WESTERN GULL.—This species is given by Lawrence as a "winter resident. Very common on tide water" . . . Gulls, presumably of this species, were abundant early in August, and at Astoria at the mouth of the Columbia River during the last week in July. It is probable that the Western Gull is absent for only a short time during the summer, and is almost a resident in this vicinity as at other points along the coast, but whether it breeds near the Harbor is uncertain.

Phalacrocorax pelagicus robustus. VIOLET-GREEN CORMORANT.—On August 20 two flocks of Cormorants, about twenty-five in all, were seen flying down the Chehalis River. Two days later, while going up the river about sunset, the steamer passed a large roost a few miles above the town of Cosmopolis. The birds were roosting near the tops of the spruce trees along the bank, and as the boat passed, with the whistle blowing, a gun was discharged and one hundred and fifty to two hundred Cormorants took wing, startled by the unwonted noise. Unfortunately no opportunity for procuring specimens was had, and the identity of the species is somewhat in doubt. A Cormorant collected by Mr. Clark P. Streator, who found it common in October or November of the same year at Ilwaco, only a short distance south of Grays Harbor, proved to be *P. robustus*.

Rallus virginianus. VIRGINIA RAIL.—On August 13 a Virginia Rail was flushed on the tide-flat just back of the town. The bird rose but a few feet from me, and was plainly seen.

Colaptes cafer saturator. NORTHWESTERN FLICKER.—The Flicker, supposed to be *C. c. saturator* was common, but unfortunately no specimens were collected at this locality. Mr. Lawrence, however, refers it to *Colaptes cafer*.*

Chordeiles virginianus henryi. WESTERN NIGHTHAWK.—Not very common, only one or two seen.

Zonotrichia leucophrys gambeli. GAMBEL'S SPARROW.—This is one of the most abundant and characteristic birds of the coast region from San

* [Mr. Lawrence has sent to me quite a series of these birds, which were of course *C. c. saturator*. It was an oversight that the form recorded by Mr. Lawrence in his 'notes' was not so given.—J. A. ALLEN.]

Francisco northward to British Columbia. It seems doubtful whether the bird which breeds on the Washington coast is *Zonotrichia l. intermedia*, as given by Lawrence, although this form is probably common in winter. The *Zonotrichias* which I found breeding at Astoria and at several points on the coast of northern California proved to be *Z. l. gambeli*, and Mr. John Fannin* considers the coast bird of British Columbia *Zonotrichia l. gambeli*, while *Z. l. intermedia* is given as "very common east of Cascades." It should be added, however, that specimens of *Z. l. intermedia* were collected by Streator† at Westminster Junction, Mt. Lehman, and Vancouver, B. C.

Piranga ludoviciana. LOUISIANA Tanager.—A single bird, either a female or a young of the year, was observed near the sawmill on the bank of the Chehalis River on August 15.

Dendroica auduboni. AUDUBON'S Warbler.—Of this species Mr. Lawrence says: "Summer resident. Not common. One shot April 22 on Stevens Prairie, the only one noted." While it is probable that it does not breed very commonly in the spruce forests along the coast, young birds—doubtless migrants—were abundant at Aberdeen on August 14, 1889.

Salpinctes obsoletus.—ROCK WREN.—Mr. Lawrence gives this species as a "summer resident? A few observed on Wishkah River, and on the East Humptulips in June, 1890; no specimen shot. Not seen in 1891 on the East Humptulips." Is it possible that these notes refer to some other species? It is distinctly stated that no specimens were secured, a fact greatly to be regretted, since this locality is beyond the usual range of *Salpinctes obsoletus*. During my collecting on the Northwest Coast from San Francisco to British Columbia I never saw or heard a specimen in the spruce forest belt. Mr. Streator obtained it only east of the Cascades, and Mr. Fannin states (l. c., p. 42): "I secured a specimen of this bird in June, 1884, at Burrard Inlet, the only one I ever saw on the coast. It is common east of Cascades."

Certhia familiaris occidentalis. CALIFORNIA Creeper.—The Creeper is given in Lawrence's list as uncommon, and as a doubtful resident. He observed a few in January on the East Humptulips. This species was tolerably common at Aberdeen in August, 1889, and it is probable that further observations will show it to be a common resident.

Sialia mexicana. WESTERN Bluebird.—Mr. Lawrence records but a single specimen, and questions whether it is a migrant. The Western Bluebird was common at Aberdeen in August, 1889, and probably breeds in this locality.—T. S. PALMER, *Washington, D. C.*

* Check List of British Columbia Birds. Sept., 1891, p. 36.

† Bull. Am. Mus. Nat. Hist., III, No. 1, Oct., 1890, pp. 145, 157, but the bird is given as a "rare spring and fall migrant."

NOTES AND NEWS.

DR. JOHN AMORY JEFFRIES, one of the original Active Members of the A. O. U., died of pneumonia, March 26, 1892, at his home in Boston, after an illness of but a few days. Dr. Jeffries was born in Milton, Massachusetts, Sept. 2, 1859, and was the youngest son of John and Anna Lloyd [Greene] Jeffries. He entered Harvard College in 1877, and graduating with honors in 1881, began immediately the study of medicine at the Harvard Medical School. He received the degree of M. D. in 1884 and then went to Europe where for two years more he continued his studies, spending most of the time in Vienna and Berlin. In 1886 he returned to Boston, and from that time until his death was busily engaged in the practice of his profession. He was married, Sept. 26, 1889, to Emily Augusta, daughter of the late Frederick Eustis of Milton, who with one son survives him.

Dr. Jeffries' interest in ornithology developed early, and the active field work which he and his brother, Mr. W. A. Jeffries, carried on together gave him, even before he entered college, an unusually thorough knowledge of local ornithology as well as a very considerable collection of birds. His love of outdoor study continued always, but as time went on he turned his attention more and more to anatomical and biological work. During the years of college and medical school he found time to do a surprising amount of anatomical and embryological work upon birds, giving his attention largely to the development of feathers and other epidermal structures. Although but few of the results of these studies ever appeared in print, yet a number of articles in the *Bulletin of the Nuttall Ornithological Club* and one important paper, 'The Epidermal System of Birds' (*Proc. Boston Soc. Nat. Hist.*, Vol. XXII, 1883, pp. 203-241), serve to show the principal directions his investigations took.

The training in biological methods that he acquired in this work, together with his love of research, very naturally led him, as his medical studies advanced, into the new field that was opening in bacteriology. To this he devoted much time in the laboratories of Vienna and Berlin, and after his return to Boston he carried out important investigations, which it would be out of place to detail here, but which made him well known among bacteriologists and early led to his election to membership in the American Pediatric Association. His other medical work, aside from the labor of a growing practice, was largely in nervous diseases. Here, up to the time of his death, he had written but little, but with characteristic assiduity had done a great amount of laborious histological study, with the intention of thoroughly grounding himself in the very complex anatomy of the central nervous system.

Dr. Jeffries possessed mental gifts well qualified to raise him above his fellows, a quick apprehension, a clear logical sense, and sound judgment. but it was fully as much to certain moral qualities as to his intellectual

force that he owed his successes and the promise of a brilliant career that opened before him. He was a hard worker and a most persevering one, never discouraged by drudgery that would appal most men, and in consequence a comprehensive thoroughness in details characterized all his work. He possessed one strong element of success in his absolute fearlessness, both physical and mental. No risks or difficulties dismayed him, or stood in the way of undertakings from which other men shrank back, but which his courage and tenacity of purpose enabled him to carry to a successful end. He also possessed in a high degree a spirit of scientific scepticism that made him cautious of accepting unconfirmed statements of others without testing them by personal observation of his own, and induced him to repeat, as far as opportunity offered, every important observation recorded by previous workers in the line of research he might be following. The advantage he gained in a securer foundation for his work and in a greater practical familiarity with his subject, can hardly be overestimated.

It is not merely the partiality of friendship that makes us see in his early death a great loss to his profession and to science. Superior intellectual qualities, unappeasable thirst for knowledge, reverence for truth, and an earnest devotion to work, hold the sure promise of a life of high usefulness and honor. Of the warm heart and absolute sincerity that gave him so strong a hold upon those who knew him well, this is not the place to speak. Indeed only those who have shared his friendship can fully comprehend the loss his death involves.

WE LEARN that Mr. B. Quaritch of 15 Picadilly, London, will shortly commence the publication of a new edition of Elliot's 'Monograph of the Pittidae,' which was originally completed about thirty years ago. The new work will contain all the known species of the family, a large number of which have been described since the original work was completed, and the text will be entirely re-written by Mr. Elliot, bringing the whole subject up to date. The book will be issued in parts containing ten plates each, and it is expected to finish the work in five parts. Information can be obtained regarding the book from Mr. Quaritch.

DR. ERNST HARTERT, having finished his Catalogue of the Caprinulgidae for the British Museum Catalogue of Birds, has sailed for Venezuela, where he intends remaining a year to collect the birds of that country and adjoining islands. He has selected a most inviting field, and we doubt not his labors will be well rewarded.

THROUGH the kindness of Mr. George B. Sennett, we are able to present with this number a colored plate of the Rio Grande Turkey, described by Mr. Sennett in the last number of the 'Auk' (Vol. IX, pp. 167-169).



FISH HAWK'S NEST, PLUM ISLAND, N.Y.



PIPER HAWK'S NEST, BULLOCK ISLAND, N.Z.

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BREEDING HABITS OF THE FISH HAWK ON
PLUM ISLAND, NEW YORK.

BY CHARLES SLOVER ALLEN.

(*With Plates IV and V.*)

EVEN the wildest and most independent of our feathered friends rarely fail to show a proper appreciation of our demonstrations of kindness and good-will toward them. Wherever thorough protection is afforded to both them and their young during the breeding season their confidence in our good intentions is simply wonderful, and we are trusted as soon as we have conclusively shown ourselves to be worthy of their confidence. They quickly learn when and where safety is to be found and whom to trust or fear. The German Stork is exceedingly wild and cautious in the fields, woods, and along the river marshes, yet confidently builds its nest upon the housetops and churches in the villages and towns, and often struts about the dooryards. In Germany it has taken centuries to bring about this result; but I know of an island, less than one hundred miles from New York, where Fish Hawks, prior to 1885, had been protected for over thirty years, and where they were almost as tame as the German Storks. In this year Plum Island (the island in question) was sold to a syndicate who planned the construction of large hotels and cottages; since then all has completely changed. For about forty years Plum Island had belonged to the Jerome family, and the Fish Hawks had been protected and in every way encouraged to occupy the island as a nesting place.

I paid my first visit to this island home of the Fish Hawks in May, 1879. It was then owned, with the exception of an acre or two around the lighthouse, by Mr. Jerome, then an old man, whose main hobby and object in life seemed to be the protection of his pets and 'mascots,' the Fish Hawks and their nests, even to the extent, it was reported, of using a shot gun or rifle if necessary. He claimed that fully two thousand nightly roosted on the island, and that over five hundred nests had been built there. I finally reduced these numbers one half. At last I won him over, with good cigars, a thorough appreciation of his pets, and various other more powerful arguments, until he finally gave me permission to investigate their nesting habits on his island.

At this time on nearing the island, even while ten or fifteen miles away, one was struck with the number of Fish Hawks that were to be seen on all sides, and they became more and more numerous as the island was approached. All the way down Gardiner's Bay they were seen sailing through the air in every direction, or perched on the stakes of the fish pounds.

The island is three miles long, east and west, narrow and high to the eastward, broadening to the westward, where is a lighthouse on a high bluff or sand cliff. To the south of this a rolling sandy meadow extends for a mile, some parts of which are nearly level and others, especially near the beach, form a series of sand hills. Near the center of the island, to the westward, is a swamp, partly clear water, partly boggy and overgrown with bushes, across which was a much used causeway, called Love Lane. Near the swamp, and almost enclosed by it, was a piece of woodland of perhaps twenty acres in extent. The north shore of the island is high sand cliffs, with great boulders, ten to forty feet high, on the beach and out in the water. The south side is lower.

The first Fish Hawk's nest shown to me by Mr. Jerome was fairly in his dooryard, close by his front gate, and only about fifty yards from his house. It was placed upon an old pile of fence rails, rotted to black mould in the center, but kept up by the yearly addition of fresh rails. Mr. Jerome said that to his knowledge this nest had been occupied every year for forty years. It likewise had been added to yearly until its bulk of sticks, sods, cow dung, decayed wood, seaweed, etc., would amount to at least three cartloads, in addition to what had rotted and fallen to

the ground. The nest was only seven or eight feet from the ground, so that by stepping on a projecting rail I could readily see the three beautifully spotted eggs within, which I promised not to disturb. Mr. Jerome could pass close to the pile of rails without the birds leaving the nest, while I could not get nearer than thirty or forty feet. They would dive down near my head, uttering a shrill cry, and at the same time threateningly stretching out their claws; and while flying nervously about they constantly uttered a sound resembling the call of a young chicken or turkey when lost from its mother. They would alight on the nest again before I was fifty yards away.

Out on the sandy meadow to the southward were what at a distance appeared to be two gigantic mushrooms about seventy-five yards apart. A nearer approach disclosed the fact that they were cedar trees twenty feet high; the trunks were about one foot in diameter and without a limb for the first ten feet. The whole top of each tree was involved in a huge nest. These nests, Mr. Jerome said, had been occupied every year for forty years, each year the Hawks repairing them and adding to their bulk. These nests were so unusually large that they are worthy of description. Each nest involved the whole tree, even to the lowest branches. At the base loose sticks, six to twelve feet in length, were spread out so as to form a projecting platform ten to fifteen feet in diameter, forming complete protection from below. The base of the solid portion of the nest was about eight feet across, sloping up to the level top, which was about four feet across, and very firm and solid, and readily bearing my weight. The bulk of this nest was about equal to three cartloads. The central part of the nest consisted of a mass of sand and decayed matter from the old nests, much of which had fallen through to the ground. The base of the nest consisted of long sticks, oyster stakes, etc., loosely put together and extending beyond the longest limbs of the tree, making it over twelve feet in diameter. Each year for many years the nest had been repaired and built up with every kind of material that had been washed ashore or could be picked up in the fields. The center of the nest, nearly five feet high, was composed of clods and sand and the decayed remains of material added many years before. The sloping edges of the nest showed its composition to be of rough sticks, some of them quite long, rope, barrel staves, pieces of net floats, corks from seines, seaweed, kelp, long

strings of the eggs of the conch, an old rake, a blacking-brush, part of an oar, a toy boat (schooner) foremast and sail with jib still attached; boards from boxes, an old used-up broom, a small board with a fish line wound on it and fish hooks still attached; corn stalks with roots and earth adhering; large masses of sod with *growing* grass as turned up by the plow; many long bones and ribs of sheep and cattle from the hill pastures; large quantities of cow dung, and, strangest of all, bleached skulls of sheep on the top of the nest, apparently placed there, on account of their whiteness, for purpose of ornamentation; a shoe, pieces of sail and clothing, etc.; in short, everything that could be found on the beach, in the fields, or about the dooryard was included. The trees were overweighted and ready to fall, and in 1885 I found both overturned and new nests built upon the old ones that had fallen. (One of these is shown in Plate V.)

The birds were so tame that they would not only alight but settle down on one of the nests while I was examining the other. The parent bird showed little fear and continued to swoop down at me in a menacing way while I was on the top of the nest. The nest proper was about four feet across, nearly level, with a depression in the center six inches in diameter and about three inches deep, lined with seaweed, dry grass, sheep's wool and feathers.

In the wooded part of the island the nests were very numerous, the larger trees in the interior being all occupied, while near the edge of the wood nearly every tree had a nest, and some of them two or three each. On the outer edges of the wood and out in the open land were isolated low scrub-oak and thorn trees, which also were used for nesting sites, the nests in such instances being not over five to ten feet from the ground. Some of them I could see into readily from the ground; and if I waited patiently for half an hour the birds would alight on the nests within thirty feet of me. One of these nests contained an old broken axe which had been noticed by Mr. Franklin Benner two years before, a boot-jack and an old straw hat.

Back of these woods was a sheep barn, on the roof of which, at the south end, was a bulky Fish Hawk's nest, which I examined in 1879. By Mr. Jerome's request it was entirely destroyed in 1881, but I found it rebuilt in 1885. The barn was in constant use. Near it was a small wild cherry tree on which was a small nest. It was occupied each year I saw it.

Out on the sandy plain to the south of the woods, and south-east of the lighthouse, were one hundred or more nests built on the ground. Some were on the tops of the sand hills at the water's edge, others in the valleys or on the ridges. Those on the low ground were usually placed very close to some stake, a dead tree or stump, or even piece of timber from an old wreck. Some of the nests in the valleys were mere depressions in the sand, like a Gull's nest, near a post or stake, with a few feathers or straws in or near it, and a few sticks and bones scattered around. These were new nests. Other old nests on the ground were four to five feet high, having been added to yearly by the birds, and by loose sand blown into them by storms. In some instances the nests had caught the sand year after year, while the sticks, etc., had rotted until there remained apparently simply a cone some three or four feet high, level at the top, which had a breadth of two and a half to three feet, with a depression in the center, in which some grass was growing, while sticks, bones, etc., were scattered around its edges. Some of the newer nests were found only by the bird flying up from them as I approached, the nest being merely a small hollow in the sand.

On the north shore, where the beach is strewn with large boulders, nearly every large rock — even some that were far out in the water — was occupied with a small nest. The waves breaking over these rocks during heavy storms, the nests were frequently washed away, thus preventing any large accumulation of materials. In photographing some of these nests I secured a view of one with the bird flying over it, and another view of the same nest when the bird had just alighted on it. This was a large nest, situated on a boulder nearly forty feet high. In both instances the bird came out well in the photograph. It was almost impossible to reach this nest, but I finally succeeded in getting to it, the Hawks meanwhile darting within three or four feet of my head, thrusting out their claws towards me in a threatening manner as they fairly brushed me with their wings. The eggs were found to be protected in a singular manner, being covered and nearly concealed by a Crow's wing, the owner of which had not been killed over forty-eight hours. This nest was out of the reach of the waves and very bulky, with a deep depression in the center. It was comparatively safe from attack from below, but exposed from above. I have no evidence that the Hawks had

killed the Crow and placed the wing in the nest as a warning to the many marauding Crows which visited the island daily to rob the nests of the Night Heron and other birds breeding there. Indeed, I found a few Hawks' nests that had been robbed, but no Crow had molested this one.

In the swamp near the Fish Hawks' nests was a colony of Night Herons, nesting in the smaller trees near the swamp. Almost daily a flock of Crows from Connecticut were accustomed to rob this heronry, covering the ground with the shells of the eggs they had eaten, and occasionally treating a few Fish Hawks' nests in the same way. The Fish Hawks seemed to unjustly accuse the Herons of the robbery, as the Herons were constantly persecuted by the Hawks. Whenever a Heron appeared he was instantly set upon by one or more of them, and the Herons would seek safety in the thick underbrush where the Hawks could not follow them. Herons were killed, however, almost daily by the Hawks.

The lighthouse keeper gave the date of the arrival of the Fish Hawks as early in April, the time varying but a few days from year to year, the males coming first, followed two or three days later by the females. I always found that by June 21 most of the nests had their full complement of eggs, and some sets were more or less incubated. The number in the set varied from one to four, usually numbering two or three, though I once found five. The eggs also vary greatly in color; some are of an almost uniform dark chocolate brown, varying in places to brownish black. In most instances the ground color was a creamy or bluish green, thickly spotted and blotched with various shades of purplish brown and dark chocolate brown, the latter prevailing about the larger end. Certain nests had the local reputation of always having one or more white eggs in them. In 1879 I found a nest in a high oak containing one so-called white egg. In 1881 I found in the same nest two white eggs and one that was beautifully mottled. In each instance the Fish Hawk was found on the nest. I have found nests with one white egg and two of the usual coloration; also one nest (in a tree) where all three eggs were without trace of any markings. The parent bird had been incubating the set for a week and was often seen on the nest. I also bought a set of three unmarked eggs taken from the same nest the previous year.

On approaching some of the nests the old birds silently left them

and did not return till all was quiet, simply soaring high in the air without uttering a sound; in other cases the birds were noisy and combative, constantly darting down at one's head, but they would return to their eggs when I remained quiet, even if only fifty feet away.

The Fish Hawks were not lacking in neighbors willing to share with them their domicile. A pair of Fish Hawks of my acquaintance occupied a nest situated on the bank of a very sluggish stream at the edge of the piece of wood already described, and adjoining a denser thicket to the westward. The nest was old and large, and was probably an inheritance from former generations. It was thoroughly protected from below by the long projecting sticks at the base and the imperviousness of the mass. A pair of Herons, wiser than their kin, built their nest under the Fish Hawk's nest, only some fifteen inches below it, and in a place the Fish Hawks could not possibly reach without tearing away a portion of their own nest. The Heron's nest was thus thoroughly protected from storms and from hostile attack from above. The Fish Hawk's nest contained three eggs, the Heron's four eggs. In the crevices of this same Fish Hawk's nest were five nests of the Purple Grackle, one Wren's nest, and an English Sparrow's nest. Herons are often killed by Fish Hawks, but they could not get at these, and when I robbed the whole series of nests, they all laid again in the same nests and were allowed to raise their young. In fact, the Fish Hawks do not seem to mind being robbed, as they will not desert their nests if allowed to raise their brood during the season. They seemed much bolder in open places and along the rocky shore than in the woods, as in exposed situations they could better see the character of their enemy.

In every Fish Hawk's nest, except those on the ground, I always found from two to eight or ten nests of the Purple Grackle. They were situated in crevices among the sticks under the edges of the nest, or even beneath the nest itself, so as to secure protection from rain and bad weather. They were very bold in collecting fragments from the table of their powerful neighbors. English Sparrows also often bred there, and I have more than once found nests of the House Wren in the deeper interstices.

The two plates accompanying the present article are from photographs selected from a considerable series, taken on the

island, of Fish Hawks' nest and their surroundings. Plate IV represents a nest situated in an old and partly dead oak at the edge of the woods and overhanging a fresh water pond. In taking the picture the camera was hidden near the tree and a long line attached, the exposure being made just as the Hawk had settled upon the dead top of the tree a little above the nest. The birds were comparatively tame, and a number of fairly good photographs were obtained of both nests and birds.

Plate V represents one of the two 'mushroom' nests already described, taken after the great weight of the nest had overturned the tree. The tree fell in October, 1883. The birds rebuilt upon the fallen nest in 1884, and had added to it new materials when again examined in 1885.

As already said, the Fish Hawks were thoroughly at home on the island for a long period prior to the time when the island was sold by Mr. Jerome to the syndicate, and had become very unsuspecting. I have seen them alight on the flagpole and on the fence posts within easy gunshot of the lighthouse; and on two occasions visitors to the lighthouse are said to have killed one of the birds with a stone. As stated above, the nests were placed almost anywhere—on the tops of the highest trees, or on their lowest branches, only five or six feet from the ground; on stunted trees only a few feet in height, on isolated trees far out in the open land, as well as in the woods; on the sheep barn, and on an old pile of rails by the gate of the farm house; while thirty to forty per cent were actually on the ground. These latter varied from a slight depression in the ground, as in the case of newly formed nests, to conical mounds, four or five feet high, formed by materials added year after year by the birds, filled in with sand blown by the winds. High rocks on the shore, and low rocks far out in the water, scarcely above high tide and swept by the autumn storms, were also chosen as situations for nests. A large buoy, with a lattice-work top, near the west end of Fisher's Island, was also occupied for many years by a nest of these birds, greatly to the advantage of sailors and fishermen, who were warned in thick weather of the position of the buoy by the screaming of the Fish Hawks.

The Jeromes, father and sons, rigidly protected the Fish Hawks as long as the island remained in their possession, it being generally understood [that any one attempting to rob their

nests did so at the peril of his life. They even destroyed the rookery of Night Herons, because it attracted gunners to the island, to whom a Fish Hawk sailing over often presented a shot too tempting for them to resist. Since the sale of the island, and the removal of protection, the Fish Hawks have for the most part gone elsewhere, few now breeding there. Gardiner's Island, still thoroughly protected, is now their favorite breeding place.

The varied character of the materials used in nest-building has already been mentioned at some length, but I append the following more detailed list, made up from notes taken during my three visits to the island, the objects mentioned having all been personally observed and noted: sticks, branches of trees, from three to five feet long, a few ten to twelve feet long, for protecting the base of the nest; brushwood, barrel staves, barrel heads, and hoops; bunches of seaweed, long masses of kelp, mullein stalks and cornstalks; laths, shingles, small pieces of boards from boxes; parts of oars, a broken boat-hook, tiller of a boat, a small rudder, and parts of life preservers; large pieces of fish nets, cork, and cedar net floats, and pieces of rope, some of them twenty feet in length; charred wood, sticks from hay bales, and short, thick logs of wood; a toy boat, with one sail still attached; sponges, long strings of conch eggs, and eggs of sharks and dogfish; a small axe with broken handle, part of a hay rake, old brooms, an old plane, a feather-duster, a deck swab, a blacking-brush, and a bootjack; a rubber boot, several old shoes, an old pair of trousers, a straw hat, and part of an oil skin 'sou'wester'; a long fish line, with sinkers and hooks attached, wound on a board; old bottles, tin cans, oyster shells, and large periwinkle shells, one rag doll, shells and bright colored stones, a small fruit basket, part of an eel pot, a small worn out door mat; wings of ducks and gulls, sometimes with parts of the skeleton attached, and one fresh crow's wing, as already related. A strange feature was the frequent presence of *bleached bones* from the pasture, as the ribs and long bones of sheep and cattle, and especially *sheep skulls*. Nearly all the old nests had masses of dried cow dung, and large pieces of sod, with the grass still growing.

A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA.

BY GEORGE K. CHERRIE.

(*Concluded from p. 251.*)

94. *Milvulus tirannus*.—At a slightly lower altitude it nests abundantly. A nest with three fresh eggs taken by Don Anastasio Alfaro at Tambor, Alajuela, May 2, 1889, was placed in a small tree, about ten feet from the ground. The parent bird left the nest only very reluctantly and not until almost within the grasp of the collector. The nest is constructed of a mixture of small dry grass and weed stems and soft dry grass rather compactly woven together, with a lining of a few fine rootlets. It measures outside 5 inches in diameter by 2½ deep, inside 2¼ in diameter by 2¼ deep. The eggs are white, sparsely spotted and blotched, chiefly about the larger end, with chestnut of slightly varying shades. In form the eggs are ovate, and they measure .66 × .88, .65 × .88, and .63 × .89 inch.

95. *Tityra personata*.—From time to time found about San José, its presence or absence being due to the ripening of certain fruits. My observations have been that the bird feeds chiefly on fruits. The species is found on both coasts, and in the interior up to an altitude of 6000 feet.

Young males resemble the females.

My observations are at variance with those of Mr. Salmon, in regard to the color of the egg being white, as given by Salvin and Godman in their 'Biologia Centrali-Americana.' March 22, 1892, I found a nest of this species at Terraba (southwestern Costa Rica), containing one egg; the bird was shot and a second egg badly broken removed from the oviduct. In these the ground color is a dark pinkish buff; the ground color is almost completely hidden by irregular markings, lines, and blotches, of chestnut brown, these blotches darkest and most abundant about the larger end. The eggs measure 1.16 × .83 inch. The nest was probably a deserted Woodpecker hole, and was situated about six feet from the ground in an old stump. The bottom of the nest was about ten inches below the opening. It was without any lining whatever. However, I saw a second pair of birds carrying nesting material into a hole in another tree.

96. *Chiroxiphia linearis*.—A rare straggler at San José. Tolerably common on the Pacific slope clear to the coast. Young birds resemble the adult female.

97. *Momotus lessoni*.—Common resident. The nests are built in the ground, some bank, like the side of a stream, being selected. The entrance tunnel extends back horizontally sometimes for a distance of six feet. At about half its length there is a sharp bend upward for some six inches, then the course is again horizontal as far as the chamber occupied by the nest. The nest space is twelve or fourteen inches in diameter, being round, and about six inches high with level floor and ceiling. A few

rather coarse dry twigs are strewn over the floor. The eggs I am not acquainted with. Mr. José C. Zeledon, to whom I am indebted for the above notes, also tells me that if one of these nests be opened at about the time the young are ready to leave the nest, it is found to be one of the dirtiest, foul smelling places that can well be imagined. The young birds occupy the centre of the nest, while all about them and especially at the sides of the opening are piles of the excrement mixed with the pellets, composed of the hard chitinous parts of beetles and other insects composing the chief food of the 'Bobos,' that are ejected from the mouth. This mass is reeking with maggots.

At the time the young leave the nest they are able to fly pretty well. They have the same colors as the adults. But the bill is much shorter, more depressed, and the edges without the serration seen in the adults. The tail is shorter than the wings and nearly square. The eye is sepia brown, not chestnut as in the old bird.

On the 8th of May, 1889, I bought four live young birds, the pin feathers not yet concealed and the eye light sepia brown. By the 25th of the same month the iris had changed to a decided chestnut shade, they were fully feathered and the tail of one of the birds measured 3.55 inches. On the 28th the birds commenced imitating the notes of the adults; their eyes had become bright chestnut. With the first utterances of the notes of the adults the peculiar jerky motions of the tail commenced. It was most amusing to watch the four birds sitting in a row together, almost motionless, only giving the tail first a jerk to this side, then to that, now up, and now down, to see it held for the space of a couple of minutes almost at right angles to the body, and then go with a whisk to the other side, the birds all the time uttering their peculiar cooing notes.

May 30, I measured the tail of one of the birds and found it to be 4.25 inches, an increase of .70 inch in five days. I fed the birds on raw meat, and about this time they began to fight vigorously for their shares. If two happened to get hold of the same piece, neither was willing to let go and each would close its eyes and hang on for dear life, both squealing as hard as they could. June 3, the serration of the bill began to show. June 16, the tails were apparently fully grown, and the birds began to tear at the webs at the points of the middle pair of feathers. By the 1st of July the tail-feathers were fully trimmed. My Bobos are often restless at night. Frequently, when at work in the museum until eleven or twelve at night, I have heard them jumping about in their cage and answering to each other's notes.

On one occasion I found the stomach of a bird I had shot filled with snails of a species having a delicate, easily crushed shell. The birds I have in confinement greedily eat earth worms. And one day when I had placed a small live Warbler in the cage, I returned in about half an hour's time and found the feet and tail of my Warbler protruding from the mouth of one of the Bobos!

98. *Ceryle cabanisi*. — Tolerably common resident. The Costaricans call them 'Correo de Agua.' I have not succeeded in finding the nest.

Young birds differ but slightly from the adults; in young males the brown band across the chest is but ill defined. The species is found on both coasts and to an altitude of 8000 feet.

99. *Chordeiles texensis*.—I have never met with the species myself. There are, however, two examples in the collection of the Museo Nacional. Both were collected at San José by Sr. Don Anastasio Alfaro, the first (a male) Nov. 6, and the second (a female) Nov. 7, 1888.

100. *Nyctidromus albicollis*.—Abundant resident, found from an altitude of about 8000 feet down to both coasts. Known here by the name 'Cuyéo.'

There are many superstitions, current among the country people, regarding the Cuyeo. For example, it is a very bad omen to have the Cuyeo cross your path in the evening. And foolish indeed would be he rash enough to shoot at this agent for working untold evil; fortunate might he consider himself did he escape with no greater mishap than the breaking or twisting of his gun barrel! Yet in spite of all evils attributed to the bird, *if* one can be secured its happy possessor is overjoyed with the consciousness of holding the wherewithal to work a charm infallible—to bind, with cords as true as steel, heart the most fickle, change coldest disregard into fond caressing. To work this miracle the heart is removed and dried over a slow fire until it may be crushed into a powder. The body of the bird is buried for a time sufficiently long for the soft parts to decay. Then the bones are carefully collected together, washed, dried, tied into a bundle, and carried in the pocket. All is now ready. The object of the lover's fancy is invited to a drink. A little of the powdered heart is secretly sprinkled in the liquor. Once drunk, the fires of love begin to burn!

The heart of the Cuyeo, dried, and bones of the Lechusa (Owl), carried in the pocket give one success in love affairs. But the philter that "is absolutely certain" in its working is composed of a powder made from the dried hearts of the Cuyeo, Lechusa, and Gorrion (Hummingbird).

101. *Chætura brunneitorques*.—Resident about San José, but not common.

102. *Cypseloides niger*.—There is a single specimen in the Museo Nacional collection, taken at San José by Mr. J. C. Zeledon. There is a note on the back of the label stating that the bird was breeding.

103. *Campylopterus hemileucurus*.—Rare visitant about San José. Tolerably common at a little lower altitude.

104. *Floricola longirostris*.—I took a single specimen Sept. 16, 1891.

105. *Floricola constanti*?—A rather common resident. In the ten examples before me all have the chin blackish and the throat metallic crimson with the feathers tipped with gray. This character, according to Elliot's 'Synopsis,' belongs to *F. leocadiæ*, and not to *constanti*, the form supposed to be found in Costa Rica.

106. *Trochilus colubris*.—Very rare visitant at San José.

107. *Lophornis adorabilis*. Mr. J. C. Zeledon took a single example at San José. The bird is tolerably common in the open prairie country about Boruca in southwest Costa Rica.

108. *Amazilia fuscicaudata*.—The most abundant species about San José, and indeed the most abundant species found on either coast and up to an altitude of about 6000 feet. I believe that this species is nesting in every month in the year. Nests are usually placed about fifteen feet from the ground in either orange or lemon trees. A nest before me is constructed of some soft fibre much resembling hemp tow. There are a few lichens covering the outside, and an inner lining of a little native cotton. The nest, somewhat elliptical in form, measured $1\frac{1}{2}$ inches deep, by 2 inches long, and $1\frac{1}{2}$ wide. Inside $1\frac{1}{4}$ by $\frac{7}{8}$, by $\frac{1}{2}$ deep. The two eggs, white in color and elliptical ovate in form, measure $.53 \times .37$ inch.

109. *Amazilia sophiæ*.—Tolerably common resident.

110. *Chlorostilbon salvini*.—Tolerably common resident.

111. *Chlorostilbon angustipennis*.—Resident. Not common.

112. *Crotophaga sulcirostris*.—The 'Tijo' of the Costaricans is one of the most abundant birds found in the country, ranging, as it does, from both coasts to an altitude of about 7000 feet.

Mr. Alfaro has kindly given me his manuscript notes on the nesting of this species, which I have translated from the Spanish and present below.

"The Zopilotillo [so-pee-lo-tée-yo], also known as 'Tijo, tijo' [tee-ho] in imitation of its peculiar notes which seem to repeat the word *tijo* over and over again, is very abundant in the fields near Tambor (a little town about twenty miles northwest of San José) where along the hedgerows and in the scrubby timber, as well as on the skin of the cattle they find those insects which constitute their food. The woodticks, or garropatos, from the legs and about the head and neck of the cattle are esteemed above all else a favorite morsel. In this locality I have collected three nests during the month of May, the first with nine eggs, the second with eleven, and the last with thirteen. Some years ago I remember seeing a nest, situated in the branches of a mango tree, that contained fourteen eggs.

"The nests that I have collected agree with the observations made by Zeledon. The structure is voluminous, composed chiefly of coarse dead twigs, but presents one peculiarity not observed in any other bird, namely the nest being lined with fresh green leaves. My three specimens were all placed in low trees, and neither was found at a greater height than three metres. One had been built above an old nest of one of the larger Tyrannidæ.

"It will not be without interest, I think, to insert my observations relative to one of these nests. On the 20th of May I noticed a Zopilotillo with a dry stick in its bill, which was immediately carried to a point in the hedgerow where it was deposited with three others. After assuring myself that the bird was building its nest there, I retired, with the intention of returning at a more opportune moment. And when one week later I returned to the same spot, what was my surprise to see not only the nest completed and containing six eggs, but more than this: in the thorns and leaves about it were scattered seven more egg! As a consequence, if that collection was not the work of the Zopilotillos collectively,

the poor owner, would have had to deposit three eggs daily! In the finding of some of the eggs scattered in the leaves was revealed one of the architect's peculiarities. A hole had been left in the centre of the nest and only recently filled with leaves whose fresh green color testified that they had been cut and placed there later than the others forming the carpeting to the bottom of this common incubator.

"The eggs were all fresh, the six occupying the nest having the characteristic rough white calcareous surface perfectly clean and without the slightest variation in color. Not so with the eggs found about the outside of the nest. Those found in contact with the leaves had taken on a dirty yellowish tinge. Those held suspended among the leaves and thorns showed various spots and lines of the lustrous blue color forming the base for the chalky external coat. The scratches had been caused by a too close contact with the thorns. In form the eggs vary from an oval to an elliptical oval; while the following dimensions taken from various eggs of the set will serve to give an approximate idea of the great variation in size: 35×25 , 32×26 , 32×23 , 30×25 , and 29×23 mm."

113. *Diplopterus nævius*.—A rare straggler at San José. Tolerably common at lower altitudes and as far as the coast on the Pacific side. Young birds do not differ from the adults, young males resembling adult males, and young females resembling adult females.

114. *Piaya cayana mehleri*.—An abundant species, found on both coasts and in the interior to an altitude of about 6500 feet.

Young birds resemble the adults.

From Señor Alfaro's manuscript I take the following notes regarding this bird: "The Pajaro Ardilla [squirrel bird], like *Crotophaga sulcirostris*, according to Zeledon is insectivorous, and is found in all parts of the country. It is so arrogant and confident in its habits as to have merited the not over flattering name of 'bobo' [fool]. Its cinnamon color and long tail, together with the habit it has at times of running along the branches, gives it a certain resemblance to a squirrel that justifies the application of the more common vernacular name. Like the Zopilotillo's the nest of this species is built in low trees, is very bulky, and has but little of the artistic about it.

"On the 28th of May while searching about in some scraggy timber along the banks of the Rio de Poas I found a nest of this bird. When discovered, the female was on the nest, but she immediately deserted her post, not, however, going so far that she could not watch our movements, a precaution on her part that assisted in the collecting, in order to determine the sex, after assuring myself that the nest contained eggs.

"The nest was placed about nine feet from the ground in the branches of a small tree, and was well concealed by the broad leaves of some climbing plant. In its construction there was employed nothing but half decayed leaves, making its removal and preservation impossible. The two eggs, which were fresh, are an opaque white, without markings, elliptical oval in form, and measure 35×24 and 33×24 mm."

115. *Coccyzus minor*.—Very rare about San José. Found on both

coasts. Birds from the Atlantic coast seem to be decidedly the darkest (rather a dark buff below), those from the Pacific coast considerably paler, while specimens from the interior are palest.

116. *Coccyzus americanus*.—I have taken three examples at San José, all females, on Sept. 10, Sept. 28, and Oct. 20, 1890.

117. *Coccyzus erythrophthalmus*.—I took a specimen in San José, Oct. 1, 1890. It is found, as well, on both coasts, but is very rare.

118. *Campephilus guatemalensis*.—Accidental at San José, but common on both the Atlantic and Pacific slopes down to the coast line.

119. *Dryobates jardinii*.—I include this bird in the list with some doubts. In the collection of the Museo Nacional there is a series of forty-six specimens, all, with the exception of four examples labeled as from San José, coming from a much higher altitude.

120. *Centurus hoffmanni*.—Tolerably common resident. Found on both coasts, and in the interior to an altitude of 6,500 feet.

May 12, 1889, I found a nest of this species about 25 feet from the ground in an old rotten snag. This nest contained two fresh eggs. May 26, 1889, I found a second nest containing three fresh eggs. This nest was only about three feet above the ground, in an old stump. It was one foot deep and the entrance opening was two inches in diameter. There was no lining. The male was on the nest when found, and was shot, but the female was not seen. The eggs are elliptical ovate in form, glossy white, and measure $1.02 \times .70$, $1.03 \times .70$, and $1.04 \times .71$ inch.

121. *Conurus petzii*.—Irregular visitant about San José. Most commonly met with during the months of May and August.

122. *Conurus finschi*.—Rare straggler about San José.

123. *Strix pratincola guatemalæ*.—Tolerably common resident.

124. *Syrnium virgatum*.—Tolerably common resident. Nesting probably begins in the latter part of April, as young birds are found by the first of June.

125. *Megascops brasilianus*.—Tolerably common resident.

126. *Megascops nudipes*.—Very rare. Usually found at a higher altitude.

127. *Lophostrix stricklandi*.—Rather rare resident.

128. *Glaucidium phalænoides*.—Tolerably common resident. This species seems to be as much awake as any other bird during the daylight. Frequently in the middle of the day I have found individuals perched in the branches of some dead tree, in the full glare of the sun, and at such times they are very alert. As soon as one appears in sight they commence their peculiar jerky motion of the tail, and usually fly before one is within range. Not infrequently I have noticed this species perched very much after the manner of a Woodpecker. Ordinarily the food consists of insects, but I shot one specimen having the stomach full of the remains of some small bird.

129. *Falco albicularis*.—A straggler at San José, and, as far as I am aware, found only on the Pacific slope. August 10, 1890, I took a young male at San José. There were the remains of a bird in the stomach.

130. *Falco columbarius*.—Dec. 4, 1890, Sr. Don Manuel Carranza brought a fine example to the museum. This is the only specimen I have seen in Costa Rica.

131. *Falco sparverius*.—In no part of the country is this Hawk resident, although on the coasts it is not absent for more than four months of the year. At San José it is met with from the first of October until the last of February. The females predominate very greatly in numbers. In the series of forty-one specimens belonging to the collection of the museum there are eight males and thirty-three females. The head of one of the males (Cartago, March, 1886) is without any sign of the rusty crown patch; the under parts are very pale, buffy; ochraceous; the spots, of a rounded form, cover the entire chest. The remaining seven specimens all show the rusty crown patch more or less well defined. In all of these the spotting of the lower parts extends to the front of the chest, but in these the spots are linear, only varying very much in size and in number in the different specimens.

132. *Polyborus cheriway*.—Rather rare about San José. When seen, usually in company with the Black Vultures.

133. *Circus hudsonius*.—Tolerably common from the first of October until the end of February.

134. *Accipiter bicolor*.—There are three specimens in the museum collection that were taken at San José.

135. *Accipiter velox*. There is a single specimen in the museum collection, taken at San José, Jan. 8, 1884.

136. *Spizaetus ornatus*.—Occasionally met with at San José.

137. *Thrasaetus harpyia*.—A. von Frantzius in his list of birds of Costa Rica mentions a specimen taken near San José.

138. *Urubitinga anthracina*.—A specimen was shot just north of San José on Nov. 29, 1890.

139. *Urubitinga urubitinga ridgwayi*.—A rare straggler about San José.

140. *Rupornis ruficauda*.—Not common at San José, but from a slightly lower altitude down to the Pacific coast very common. Not found on the Atlantic side.

141. *Parabuteo unicinctus harrisi*.—There is one specimen belonging to the museum collection that was taken at San José.

142. *Buteo swainsoni*.—Seen occasionally from the first of November until February 25.

143. *Buteo latissimus*.—Noted from the last of November until the first of May.

144. *Buteo brachyurus*.—Sept. 10, 1888, Señor Alfaro collected a fine male of this species at San José.

145. *Catharista atrata*.—Abundant resident, not only at San José, but in all parts of the country.

146. *Cathartes aura*.—Not common, and only single individuals seen, always in company with the Black Vultures.

147. *Columba albilinea*.—Rare about San José. At a slightly higher altitude abundant. Not uncommon at an altitude of 13,000 feet, at the very top of the volcano of Irazu.

148. *Egyptiila verreauxi*.—Tolerably common resident.
149. *Peristera cinerea*.—Tolerably common resident.
150. *Columbigallina passerina*.—Common resident.
151. *Zenaidura macroura*.—Seems to be resident, as specimens are taken every month in the year. Not having found either the nest or young birds, I do not know whether it breeds here or not.
152. *Colinus leylandi*.—Common resident.
153. *Charadrius dominicus*.—Never common at San José, but a few are seen from October 20 until December 15.
154. *Ægialitis vocifera*.—Common at San José from about Oct. 15 until March 15.
155. *Gallinago delicata*.—Not uncommon from the first of October until February 15.
156. *Totanus solitarius*.—Tolerably common from the first of September until the first of May, and I believe there are some individuals that remain all the year.
157. *Actitis macularia*.—Common from about Sept. 1 until March 1. A few individuals remain all the year and breed.
158. *Bartramia longicauda*.—Tolerably common from about Sept. 5 until November 14.
159. *Tringa maculata*.—Arrives and disappears with the Bartramian Sandpiper.
160. *Tryngites subruficollis*.—Arrives and disappears in company with the two preceding species.
161. *Ardea egretta*.—Sometimes seen about San José toward the end of the rainy season and the beginning of the dry season, that is between November and January inclusive. At a lower altitude it is resident.
162. *Ardea herodias*.—As with the preceding species, seen occasionally from November to January.
163. *Ardea cœrulea*.—Not rare during December and January; however, only birds of the year are met with at San José.
164. *Ardea virescens*.—Tolerably common resident at San José.
165. *Nycticorax violaceus*.—Resident about San José. Adult birds, however, are seldom seen.
166. *Porzana carolina*.—Mr. J. C. Zeledon secured an example at San José in 1881.
167. *Anas discors*.—I saw a Blue-winged Teal just south of San José on Oct. 27, 1889.

HABITS OF THE OLDSQUAW (*CLANGULA HYEMALIS*) IN NEW ENGLAND.

BY GEORGE H. MACKAY.

THIS sprightly little salt water Duck frequents the New England coast during the colder half of the year, where it is well known under the cognomens of Oldsquaw, Oldwife, and Quandy. It is the swiftest flying as well as the noisest (in the spring) of all the sea fowl which tarry with us. While flying, their wings are moved with such short and rapid strokes that it is difficult to follow the movement with the eye. As a result they pass from one place to another in an incredibly short time, especially if flying with the wind; and even when flying against it, I have found it necessary when shooting to make an allowance of six to eight feet ahead and two feet over them in order to land my charge of shot in a passing flock at fifty yards, which serves as an illustration of the rapidity of their movement under such conditions. Their flight is frequently uneven, being on an upward and then on a downward plane, and as a rule near the water, generally dodging when a shot is fired at them.

In the spring as flocks flew past my boat, I have often been much interested and amused at their scolding or talking, if I may so designate their curious notes, *o-unc-o-unc-ough-egh-ough-egh*. In calm warm mornings in April and May I have often seen them playing together, rushing at each other half out and half under water, and so vigorously engaged as to cause the water to fly in every direction. When wounded, they are most difficult to capture and extremely tenacious of life, diving at the flash of a gun, skulking with body submerged and head and neck extended and level with the surface of the water, and displaying an endurance almost incredible. When shot at while flying, although unhurt, they will occasionally dive from the wing; if wing-broken, they will frequently do so. An attempt to retrieve them under such conditions is usually unsuccessful, and if it is a male bird and the long tail feathers are perceived to be erected as it sits on the water, prepare for a long and doubtful chase, for such birds will turn around while under water and swim in an opposite direction, and have recourse to every stratagem to escape capture.

It is the current belief that these birds, as also the Scoters, Eiders, and other similar diving birds, can escape a charge of shot fired at them by diving before it reaches them; this is only partially true, and applies only to distances over twenty yards. I have never yet seen one quick enough to get under water at that distance or less without getting hit, even if the bird was on the alert. I have reached this conclusion after a long experience in capturing wounded birds.

In the autumn Oldsquaws appear about the middle of October, and occasionally a little earlier; but generally it is not until there has been a hard frost that they appear in numbers. The first arrivals as a rule are gentle and tame, and easily approached. I think these birds migrate mostly by night, as I have not heard of many such flocks being seen in the daytime. I personally have noticed only an occasional one. At such times they were flying very high, the flocks numbering about seventy-five to one hundred birds. On reaching a locality where they desire to remain, they circle around three or four times before alighting, after which they remain together for an hour or so, and then break up into groups of a dozen or more. These Ducks have a habit of towering both in the spring and in the autumn, usually in the afternoon, collecting in mild weather in large flocks if undisturbed, and going up, in circles so high as to be scarcely discernible, often coming down with a rush and great velocity, a portion of the flock scattering and coming down in a zigzag course similar to the Scoters when whistled down. The noise of their wings can be heard for a great distance under such conditions. In one such instance at Ipswich Bay, Mass., a flock of several hundred went up twice within an hour. A somewhat similar occurrence took place at Wood Island, near Saco Beach, Maine. Also at Scarborough, Maine, on May 1 a flock of several hundred birds went up in circles out of sight in this manner at 11 A.M., and remained away until afternoon when they returned to the same locality in the neighborhood of the beach, coming with a perfect rush. All of the above places used to be favorite resorts of these birds, as was Coggles Harbor, Shelter Island, Long Island, N. Y. Another resort is near Long Beach Point, Orient, Long Island, N. Y. At Biddeford, Maine, where they are abundant in May, certain tides carry them during the night to the westward near Old Orchard. This necessitates their flying back the next morn-

ing towards the east to their feeding ground in Saco Bay. This movement is taken advantage of by sportsmen who, by locating in their 'fly line,' frequently secure considerable numbers of them. In 1886 they were unusually abundant in October off Revere Beach, Mass., there being one or more acres of them. The probable reason for this was to be found in the abundance of the short razor-shell-fish (*Siliqua costata* Say) which seems to appear in this locality about every third year.

Let me transport my readers, if I may, to a spot where I was but a short time since; it is one that is in accord with what I most enjoy. It is here that you can see (under favorable conditions) more Oldsquaws than you supposed existed in New England waters; and on such a morning as I will select for two hours such a continued stream of bird life shall pass that you will be more than satisfied. Close to your feet as you lie ensconced in a sand-built stand, as near the wash as prudence permits, roll in the mighty waves of the broad Atlantic; in front is the battle ground of the tides and winds. We are at the opening at Smith's Point (Nantucket Island, Mass.) on the brink of which we stand. Yet watch how gracefully and easily, regardless of winds or waves, the Oldsquaws, those little flashes of light, for such they truly seem to be as the morning sun shines on them, pass us with gauged flight just above the turbulent waves, now up now down, and then beyond. If you would shoot them as they pass, note well their rate of speed and make due allowance, at least eight feet ahead, and two feet over is not too much, for they are flying swiftly and are farther than they seem; with nine tenths of those missed the shot fall behind. It is the acme of skill in wild fowl shooting to take them singly or in pairs as they pass, but take my word for it, one must have the taste inborn, and serve a long apprenticeship before success can be attained. Do not let us, however, forget those Oldsquaws, shot early in the morning, which were rapidly carried by the tide from our view through those seething waters, and apparently lost; some of them will meet an eddy which will carry them sufficiently out of the current to give the wind and waves an opportunity to cast them on the shore from half a mile to a mile below us. We must be on the lookout, for there are other eyes, sharper than ours, on the watch for them also, I mean the Herring and Great Black-backed Gulls, and the Crows; they are all of them fond of Ducks to eat,

and you will be surprised to learn, if you have not had the experience, how little time is requisite for them to tear open the breast of a Duck where the neck joins the body, and strip off every particle of flesh to the bone.

Off the south side of Nantucket Island the Oldsquaws collect in countless myriads. On Feb. 19, 1891, I saw a flock of Oldsquaws estimated to contain two thousand birds off the south shore of Nantucket about five miles from the island, and I know of no better place to observe them in numbers. They arrive about the third to the last week in October according to the weather, and remain until the latter part of November; most of them then move further south. The height of their abundance is the first half of November. They congregate on 'Old Man's Rip' and on 'Miacomet Rip,' shoal ground two to three miles from the south shore of the island, the water there being three to four fathoms deep. Here they live in security, with an abundance of food, during the day. About three o'clock P.M. they commence to leave this place for the Sound (the movement continuing until after dark) where they regularly roost, flying around that part of the island which affords them at the time the greatest shelter from the wind, returning on the following morning to their feeding ground by whichever route is the most favorable. An examination of the stomachs of some of those Oldsquaws which I shot in the early morning coming from the Sound, showed them to be empty. I think occasionally on clear calm nights they remain on their feeding grounds, and do not go into the Sound to roost. They apparently prefer to feed in water not more than three to four fathoms deep or shallower, unless compelled in order to obtain food. I have noticed north of Cape Cod during the winter months that some Oldsquaws will feed and remain just back of the line of breakers on the beaches, and also around the rocks, but generally they are in small and detached groups of but few individuals.

Oldsquaws do not seem to be at all particular in regard to their food, eating quite a variety, among which are the following. A little shell fish, very small, resembling a diminutive quahog (*Venus mercenaria*), but not one; sand fleas; short razor shells (*Siliqua costata*); fresh water clams; small white perch; small catfish; penny shells (*Astarte castanea*); red whale bait (brit); shrimps; mussels; small blue-claw crabs; and pond grass.

In the spring Oldsquaws appear early in April, that is those which have wintered farther south. There are more or less of them which live on our coast during the entire winter. They remain until the middle of May, a very few sometimes as late as June 17, which is the latest record I have known. The extraordinary difference between their plumage at this season (I have seen this change half completed by April 18) and during the winter has been so often remarked and described that it is unnecessary to make particular mention of it here. The females are a little smaller than the males, and have no long tail feathers. The young males resemble the female in their winter plumage, having no long tail feathers or elongated scapulars the first year. I do not think they attain their full plumage before the second or third year, and I lean to the longer time, judging from the diversity of immature plumage.

Oldsquaws have a manner of alighting peculiar to themselves, suddenly dropping into the water from the wing with a splash which enables one to identify them when too distant to be seen distinctly. These Ducks like the American Eider (*S. dresseri*) avoid passing over shoals or sand spits when the sea is breaking sufficiently to make white water, preferring to pass around or on one side of them. I have remarked that these Ducks prefer to keep entirely by themselves, rarely mixing with other kinds, the American Eider (*Somateria dresseri*) being the only one I have ever known to be with them, and then only an occasional bird, whose abilities were apparently being taxed, when flying, to keep up with its little companions.

Although, as their Latin name expresses, they are particularly a cold weather bird, it is a matter of interest that Ducks with such Arctic proclivities should find the effects of the climate so rigorous at times on the New England coast that they are unable to sustain life and are in consequence obliged to succumb. Yet such is the case. It was during the winter of 1888, when, standing on the high land of Nantucket Island and looking seaward in any direction, nothing but ice was visible; for a month the harbor was closed and there was sleighing on it. There was no open water in sight except an occasional crack in the ice caused by the change of tides; most of the seafowl had left this locality during the early stage of the severely cold weather. Many Oldsquaws remained, however, until they

were incapacitated through lack of food and consequent loss of strength from doing so. As a result it was a common occurrence to find them lying around dead or dying on the shore. Those that were alive were so weak they could not fly, and on examination proved to be nothing literally but skin and bone, others apparently had starved to death. Those found were always females or young males which, like the females and young of the Black Duck (*Anas obscura*) and the American Goldeneye (*Glaucionetta clangula americana*), are unable to endure as much hardship as the adult males, they generally being the first to succumb, while the adult males, when shot under similar conditions were found on examination to be in fairly good condition and not so emaciated. During the above-mentioned winter on a certain occasion the tide caused a crack in the ice adjacent to the jetty on the north shore of the island of Nantucket, leaving a small surface of open water which was soon crowded with half starved Oldsquaws in quest of anything which might sustain life. This collection of Ducks was noticed by two men who planned to capture them in a rather novel way. Having walked out on the ice to the spot, each being provided with a sheet and a fishing pole, they drove out the Ducks; and wrapping themselves in their sheets they lay down on the ice beside the crack. As soon as the Ducks had returned in sufficient numbers, which they did almost immediately, they jumped up and with their fishing poles beat down as many as came within reach, repeating the operation a number of times till they had secured about sixty in a little over an hour, when they desisted, repeating the operation on the following day with a like result. They found, however, on examination that the Ducks were valueless except for their feathers owing to their emaciated condition. It would also appear that even these Ducks, boreal as they are in their habits, cannot endure the porridge ice which forms at times in these waters, for they are frequently found under similar conditions on the shores in other winters than the one above described. They apparently must have considerable open water in order to exist. It was during the early part of the severe winter of 1888 that many Oldsquaws sought the land. Alighting on the uplands adjacent to the north shore of the island, they came in flocks of a hundred or less, in order that they might obtain and eat the dried fine top grass (*Anthoxanthum odoratum*) which grows wild there;

when engaged in plucking it their movements while on the ground were far from awkward, in fact rather graceful, as they ran quickly about gathering the grass some of which was still in their mouths when shot.

Although the Oldsquaw is generally conceded to be a salt water Duck, they will like some others of similar habits frequent fresh water ponds which are near the shore, as also the large inland lakes. Such was the case to a greater extent than I have ever heard of or known before during the latter part of the winter of 1892. In the month of March they accumulated in numbers in most of the larger ponds on Nantucket Island, and in two instances several frequented very small ponds near the shore. In the Long Pond there were eight hundred (estimated) birds living, also a large number in the Hummuck and Miacomet Ponds. Their habit was to fly into the ponds very early in the morning, and fly out about sunset to roost in the sound, or on the ocean. As late as May 1 I saw several flocks of them, aggregating about one hundred, still living in the above ponds. So accustomed had they become to them that it was next to impossible to drive them out, although frequently shot at. Such unwillingness to leave is shared by all such sea fowl after they have once become attached to such places. In this vicinity it would seem that they first seek the ponds for shelter during severe and stormy weather, and becoming accustomed to them, continue to frequent them if plenty of food can be obtained. In those ponds most frequented by them on Nantucket Island two kinds of grass grow beneath the surface, both of which these birds eat. The leaf of one of these resembles myrtle ivy, and the other a little pine tree spread. They also find the freshwater clam, those about the size of a quarter of a dollar and smaller being selected.

Of the Oldsquaws I noticed living in these ponds on May 1, 1892, I remarked most of them had not turned into the black plumage to any great extent, yet on April 18, 1892, of three I shot, an adult male and female, and a young male, the two former were to a great extent turned at that date. The natural inference is that such moult is irregular, and may cover more or less time, each bird being as it were a rule unto itself.

As an instance (which occurred in the spring) showing the attachment of the female for the male (in my experience, most unusual) I relate an occasion when a female Oldsquaw returned four

times to her dead mate which had been shot, before finally being killed herself; during this time she alighted a little distance away and, swimming up to the dead male, kept continually honking and calling to him. As there were at the time several flocks of these Ducks not far distant, resting on the water, and as in flying about she had passed quite close to them, she might have joined them had she been so disposed, but she would not. The incident stands out alone in my experience, a most unusual exhibition of attachment on the part of the female for the male, it almost invariably being the other way with sea fowl.

Oldsquaws are also very numerous in October in some of the great inland lakes (Ontario). I have also a record of shooting five from a flock of six on October 24, 1869, at Missisquoi Bay, Lake Champlain, Vermont, near the boundary line of Canada.



LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS.

BY H. P. ATTWATER.

[*Concluded from p. 238.*]

118. *Spinus tristis*. AMERICAN GOLDFINCH.—Common migrant, and winter resident.

119. *Spinus psaltria arizonæ*. ARIZONA GOLDFINCH.—Rare migrant and winter resident.

120. *Spinus psaltria mexicanus*. MEXICAN GOLDFINCH.—Rare winter resident, but more numerous than *arizonæ*. It is also a rare summer resident among the hills twenty-five miles northwest of San Antonio; a male, shot June 8, 1890, which was feeding its young, is said to be "probably as typical as any United States specimens." I have taken all three forms (*tristis*, *arizonæ* and *mexicanus*) in winter, feeding together in the same flock, inside the city limits of San Antonio.

121. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.—Common migrant.

122. *Rhynchophanes mccownii*. MCCOWN'S LONGSPUR.—Rare winter resident.

123. *Pooecætes gramineus*. VESPER SPARROW.—Common migrant and winter resident.

124. *Pooecætes gramineus confinis*. WESTERN VESPER SPARROW.—Abundant migrant and winter resident.

125. *Ammodramus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—Abundant migrant, and common winter resident. I have no record of the eastern form, which I think probably occurs during migration.

126. *Ammodramus savannarum passerinus*. GRASSHOPPER SPARROW.—Abundant migrant, and rare summer resident. Found nesting a few miles west of the city.

127. *Ammodramus savannarum perpallidus*. WESTERN GRASSHOPPER SPARROW.—Abundant migrant.

128. *Chondestes grammacus*. LARK SPARROW.—Common migrant.

129. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.—Common winter resident, very abundant during migration, and also an abundant summer resident. The greater portion of the migrating birds are intermediate or the Mississippi Valley form. The western form breeds here. They always nest in trees, probably for protection against snakes. One nest with three eggs also contained a Mockingbird's egg.

130. *Zonotrichia querula*. HARRIS'S SPARROW.—Common winter resident, more abundant during migration.

131. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—Very abundant migrant and winter resident.

132. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Common winter resident.

133. *Spizella socialis*. CHIPPING SPARROW.—Rare summer resident, not noticed during migration; found nesting twenty miles west of San Antonio among the hills.

134. *Spizella socialis arizonæ*. WESTERN CHIPPING SPARROW.—Rare winter resident.

135. *Spizella pallida*. CLAY-COLORED SPARROW.—Abundant migrant.

136. *Spizella pusilla*. FIELD SPARROW.—Abundant winter resident and migrant. There is a paler form (not *S. p. arenacea*) which can easily be distinguished from typical eastern birds, which is common here in summer and breeds among the hills. A nest, taken April 22, 1889, contained four fresh eggs.

137. *Junco hyemalis*. SLATE-COLORED JUNCO.—Common migrant.

138. *Amphispiza bilineata*. BLACK-THROATED SPARROW. Common resident.

139. *Peucea cassini*. CASSIN'S SPARROW. Common migrant and summer resident.

140. *Peucea ruficeps eremœca*. ROCK SPARROW.—Common summer resident, and may winter, in the rocky country among the hills north and northwest of San Antonio. A nest with three young, found May 14, 1891, was placed on the ground in a tuft of grass near a running stream, and was composed of fine grass and lined with a few horse-hairs. It was very similar to the nest of the Vesper Sparrow. The note or short song of this bird is unlike that of any other Sparrow I know of.

141. *Melospiza fasciata*. SONG SPARROW.—Common winter resident.

142. *Melospiza lincolni*. LINCOLN'S SPARROW.—Abundant migrant, and common winter resident.

143. *Melospiza georgiana*. SWAMP SPARROW.—Rare migrant. A few probably winter here.

144. *Passerella iliaca*. FOX SPARROW.—Common winter resident.

145. *Pipilo erythrophthalmus*. TOWHEE.—Rare migrant.

146. *Pipilo maculatus arcticus*. ARCTIC TOWHEE.—Common winter resident.

147. *Pipilo chlorurus*. GREEN-TAILED TOWHEE.—In the spring of 1885, during the last week in February, I shot several of these birds at a place near the Medina River, fifteen miles south of San Antonio, and saw others. I have not met with it since. They were scratching among the leaves in the thick underbrush, and were extremely shy. They may possibly occur regularly in this particular locality, but I have not been there since the occasion referred to.

148. *Cardinalis cardinalis*. CARDINAL.—Common resident, much more abundant in summer than in winter. During the migration they are particularly numerous, passing by in flocks. On Feb. 3, 1890, I shot a male the plumage of which is peculiar; it resembles a caged bird which Mr. Ridgway says he once saw. I saw another similar to the one taken, at the same time, but was unable to get a shot at it. They were in company with other Cardinals.

149. *Pyrrhuloxia sinuata*. TEXAN CARDINAL.—Common resident, but very rare north of San Antonio. The eggs of this bird cannot be distinguished from those of the common Cardinal, except perhaps that the brown markings are as a rule much clearer and of a deeper shade, and cluster more thickly toward the larger end. In regard to size, I have been unable to discover any difference. The nest, however, of the Texan Cardinal is always built of much finer material than that used in the construction of nests of *C. cardinalis*.

150. *Habia ludoviciana*. ROSE-BREADED GROSBEAK.—Rare migrant.

151. *Guiraca caerulea eurhyncha*.—WESTERN BLUE GROSBEAK. Rare summer resident.

152. *Passerina cyanea*. INDIGO BUNTING.—Tolerably common migrant.

153. *Passerina ciris*. PAINTED BUNTING.—Common summer resident.

154. *Spiza americana*. DICKCISSEL.—Very abundant migrant, and common summer resident. They begin to arrive about the middle of April, and within a week after their first appearance their monotonous notes may be heard from daylight till dark, while hundreds of flocks are to be seen passing continually. At this time they play particular havoc among the oats, which begin to ripen at this season. A farmer on the Medina River told me last year that he considered one fourth of his crop (about twenty acres) was taken by these birds.

155. *Calamospiza melanocorys*. LARK BUNTING.—Common winter resident.

156. *Piranga erythromelas*. SCARLET Tanager.—Rare migrant.

157. *Piranga rubra*. SUMMER Tanager.—Common summer resident. They are commonly known as 'Bee Birds' here, from their habit of catching honey bees, of which they seem extremely fond.

158. *Progne subis*.—PURPLE MARTIN.—Common summer resident.
159. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Abundant summer resident.
160. *Chelidon erythrogaster*. BARN SWALLOW.—Common migrant; I have seen it early in June, but have found no nests here.
161. *Tachycineta bicolor*. TREE SWALLOW.—Common migrant.
162. *Clivicola riparia*. BANK SWALLOW.—Rare migrant.
163. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—Common migrant.
164. *Ampelis cedrorum*. CEDAR WAXWING.—Abundant migrant, and common winter resident.
165. *Lanius ludovicianus*. LOGGERHEAD SHRIKE.—Rare migrant; probably a few remain during winter.
166. *Lanius ludovicianus excubitorides*.—WHITE-RUMPED SHRIKE.—Common winter resident.
167. *Vireo olivaceus*. RED-EYED VIREO.—Common migrant, and rare summer resident.
168. *Vireo flavifrons*. YELLOW-THROATED VIREO.—Common migrant. On June 8, 1891, I found a nest, and shot the male bird, about thirty miles northwest of San Antonio.
169. *Vireo solitarius*. BLUE-HEADED VIREO.—Common migrant.
170. *Vireo atricapillus*. BLACK-CAPPED VIREO.—Rare during migration at San Antonio, but found tolerably common and nesting in the hilly country west and northwest of San Antonio.
171. *Vireo noveboracensis*. WHITE-EYED VIREO.—Common migrant and summer resident.
172. *Vireo bellii*. BELL'S VIREO.—Abundant summer resident.
173. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—Common migrant.
174. *Helminthophila pinus*. BLUE-WINGED WARBLER.—Tolerably common migrant.
175. *Helminthophila ruficapilla*. NASHVILLE WARBLER.—Tolerably common migrant.
176. *Helminthophila ruficapilla gutturalis*. CALAVERAS WARBLER.—Common migrant, much more numerous than the Nashville Warbler.
177. *Helminthophila celata*. ORANGE-CROWNED WARBLER.—Abundant migrant and rare winter resident.
178. *Helminthophila peregrina*. TENNESSEE WARBLER.—Rare migrant.
179. *Compsothlypis americana*. PARULA WARBLER.—Tolerably common migrant and rare summer resident. Found nesting in localities where the 'Spanish,' or 'hanging,' 'moss' covers the trees.
180. *Dendroica æstiva*. YELLOW WARBLER.—Common migrant.
181. *Dendroica coronata*. MYRTLE WARBLER.—Abundant migrant, and common winter resident.
182. *Dendroica maculosa*. MAGNOLIA WARBLER.—Rare migrant. One male, taken May 12, 1891, is my only record of this species.

183. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER. — Rare migrant.

184. *Dendroica dominica albilora*. SYCAMORE WARBLER. — Common migrant, and rare summer resident. On May 22, 1889, I shot a female which was picking up nest material. I have observed them on several occasions in the month of June, in the sandy, black oak region, and I shot a male singing on June 7, 1891. I have no doubt I shall find their nests.

185. *Dendroica chrysoparia*. GOLDEN-CHEEKED WARBLER. — The nearest point to San Antonio that I have observed this bird, is about twenty miles west of the city. I have also taken them in Medina, Banderá, Kerr, Kendall, and Comal Counties. They are nowhere abundant, and only to be met with in the thickest cedar brakes, and as these are fast being cut and burnt out, the bird will no doubt become still more rare. They breed in all the counties I have named, as I have observed them feeding young birds at localities in all of them, but I was too late to get eggs both in 1890 and 1891. I can give no account of the migration of this species; the nearest approach to a migratory movement that I have observed was on May 13, 1891, when I obtained a male, ten miles from thick cedar, in company with Redstarts, Blue-headed Vireos, and a Wilson's Warbler. (The migration of birds in 1891 was unusually late.) In 1889 I obtained them in the middle of April.

Upon examining the stomachs of a number of young birds which were being fed, I found they all contained (with other insects), a number of small black lice (*Aphis* sp.) which I watched the old birds collecting from the green cedar limbs.

The adult female must be an extremely shy bird, as I have met with it only when feeding its young. The actions of the male Golden-cheeked Warbler are similar to those of most Warblers, flying from tree to tree in search of insects, and at short intervals uttering its note, which when once heard is not easily forgotten, nor easily described. It consists of four parts, and is unlike any other Warbler's note I have heard. In addition to this there is the usual alarm note common to so many other Warblers and small birds.

Breeding in the same localities with the Golden-cheeked Warblers I found Rock Sparrows, Black-capped Vireos, and Mexican Goldfinches.

186. *Dendroica virens*. BLACK-THROATED GREEN WARBLER. — Common migrant.

187. *Dendroica vigosii*. PINE WARBLER. — Rare migrant. Only two specimens noticed, both in 1890, a female Feb. 8, shot in a huisache tree, and a male on March 10 in a willow tree close to the river.

188. *Seiurus aurocapillus*. OVENBIRD. — Common migrant. Abundant in 1890.

189. *Seiurus noveboracensis*. WATER-THRUSH. — Common migrant.

190. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER-THRUSH. — Rare migrant. Only one specimen recorded, a male, shot May 17, 1889, fifteen miles south of San Antonio.

191. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—Rare migrant. A male obtained on April 9, 1889, is the only one I have taken. It was shot close to the Medina River, eighteen miles southwest of San Antonio.

192. *Geothlypis formosa*. KENTUCKY WARBLER.—Tolerably common summer resident. They make their nests among the tall weeds in the river bottom lands. One of the few birds whose nests are made on the ground in this region.

193. *Geothlypis philadelphia*. MOURNING WARBLER.—Rare migrant.

194. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER.—Rare migrant. Probably occurs regularly, though I did not meet with it till 1891, when I procured several specimens, all females. It must be a late migrant, as the first were taken May 18 and again on May 20.

195. *Geothlypis trichas*. MARYLAND YELLOWTHROAT.—Yellowthroats are very common during migration, the greater number of them being intermediate between *trichas* and *occidentalis*. A few remain all winter among the rushes along the river.

196. *Geothlypis trichas occidentalis*. WESTERN YELLOWTHROAT.—Common migrant. Two late records in 1891 are May 16, male, and May 20, female.

197. *Icteria virens*. YELLOW-BREADED CHAT.—Common summer resident.

198. *Sylvania mitrata*. HOODED WARBLER.—Rare migrant, common in 1890.

199. *Sylvania pusilla*. WILSON'S WARBLER.—Tolerably common migrant.

200. *Sylvania canadensis*. CANADIAN WARBLER.—Rare migrant.

201. *Setophaga ruticilla*. AMERICAN REDSTART.—Common migrant.

202. *Anthus pensilvanicus*. AMERICAN PIPIT.—Common winter resident, and abundant during migrations.

203. *Anthus spragueii*. SPRAGUE'S PIPIT.—Rare migrant.

204. *Oroscoptes montanus*. SAGE THRASHER.—Rare migrant. I took one of these birds in 1884, and observed another with it, but have never come across it since.

205. *Mimus polyglottos*. MOCKINGBIRD.—Abundant resident, and a great nuisance around vineyards. Mr. Toudouze shot and poisoned nearly five hundred of these grape robbers among his vines in 1890.

206. *Galeoscoptes carolinensis*. CATBIRD.—Migrant; tolerably common.

207. *Harporhynchus rufus*. BROWN THRASHER.—Rare migrant and winter resident.

208. *Campylorhynchus brunneicapillus*. CACTUS WREN.—Common resident.

209. *Salpinctes obsoletus*. ROCK WREN.—Rare migrant and summer resident. In a rock quarry a mile north of the city several pairs of these birds breed every year.

210. *Catherpes mexicanus conspersus*. CAÑON WREN.—These birds are common among the hills west and northwest of the city, where they

breed. Several pairs also build nests in the large lumber yards in San Antonio, and also in the buildings on the Fair Ground. I have noticed them in November, but am not sure that they remain all winter.

211. *Thryothorus ludovicianus*. CAROLINA' WREN.—COMMON resident.

212. *Thryothorus bewickii bairdi*. BAIRD'S WREN.—Abundant migrant and resident. The resident birds are much lighter in color, and easily distinguished from those which pass through during the spring migrations. In 1889 I paid particular attention to the nesting habits of this species. I placed about two dozen old tin cans in brush heaps and crotches of trees on the outskirts of the city, and in every case they were occupied by these birds. In some instances I took the eggs, shook out the nest, and placed the can in a fresh place close by, when they soon built another nest. In one particular case two nests and two sets of eggs of six each, were taken from an old coffee pot, and then another nest was made in the same pot, and a brood raised, by the same parents. It was noticed that, in order to get them to start again in the same can, it was always necessary to put it in a fresh place, which was sometimes only a few steps away; when the nest was taken, and the can left in the same position, they would not commence a new nest.

213. *Troglodytes aëdon*. HOUSE WREN.—Rare migrant.

214. *Troglodytes aëdon parkmanii*. PARKMAN'S WREN.—Rare migrant.

215. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—COMMON migrant, and rare winter resident.

216. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—Rare migrant. Taken in 1884, but not observed since.

217. *Cistothorus palustris*. LONG-BILLED MARSH WREN.—Tolerably common migrant. A specimen taken on November 14, 1890, is marked "intermediate,—*C. palustris* as to bill, *paludicola* as to coloration."

218. *Certhia familiaris americana*. BROWN CREEPER.—COMMON migrant. All specimens I have taken have throats more or less glossy white, and are marked "approaching *mexicana*."

219. *Sitta canadensis*. RED-BREADED NUTHATCH.—Rare migrant.

220. *Parus bicolor texensis*. TEXAN TUFTED TITMOUSE.—COMMON in winter.

221. *Parus atricristatus*. BLACK-CRESTED TITMOUSE.—COMMON resident. The favorite food of the Black-crested Titmouse during winter is the pecan nut; they hold them on the horizontal limbs, or place them in the cracks of the bark, and break them open by knocking with their bills, like Woodpeckers. They make their nests in hollow trees as a rule, but on two occasions I have found them nesting in Wren boxes close to houses, and once in the roof of a house occupied by a family with whom I was staying.

The habitat of *P. bicolor texensis*, given in Ridgway's 'Manual of North American Birds' is "Southeastern Texas (Bee County)." Now as Bee County is about south of Bexar County, it would more properly be said to be in southwestern Texas. The character of the country surrounding

both points, and between the two counties, is similar, and the result of my observations thus far goes to show that both birds are liable to be found together over a considerable portion of southwestern Texas.

222. *Parus carolinensis agilis*. PLUMBEOUS CHICKADEE.—Common resident, more numerous in winter than in summer.

223. *Auriparus flaviceps*. VERDIN.—Common resident. As winter approaches, the nests of these birds, which have been used to sleep in, like all other nests become worn out, decayed, and often considerably damaged by the wind. When this occurs, new nests are immediately built in the place of the old ones. These winter nests, however, are not nearly as bulky or as nicely made as the ones in which the broods are raised in the spring. In regard to the number of eggs laid by this bird in this locality, I once took a set of five, but this is the only instance that has come under my notice, four eggs in a set, and occasionally three, being the usual number here.

224. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Common migrant. Not observed in winter earlier than the first week in February.

225. *Regulus calendula*. RUBY-CROWNED KINGLET.—Abundant migrant, and common in winter in suitable localities.

226. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Abundant migrant; a few remain all winter in sheltered spots. It is also a rare summer resident. I have taken several nests.

227. *Turdus fuscescens*. WILSON'S THRUSH.—Rare migrant. The only specimen I have taken was in company with Olive-backed Thrushes, on May 18, 1891.

228. *Turdus aliciae*. GRAY-CHEEKED THRUSH.—Common migrant.

229. *Turdus ustulatus swainsonii*. OLIVE-BACKED THRUSH.—Migrant. Not as common as the Gray-cheeked Thrush.

230. *Turdus aonalaschkæ*. DWARF HERMIT THRUSH.—Migrant. Tolerably common.

231. *Turdus aonalaschkæ auduboni*. AUDUBON'S HERMIT THRUSH.—Migrant. Typical specimens are rare. A few probably winter here, as I have taken them early in February. The Hermit Thrushes that are most abundant are an intermediate form between *auduboni* and *pallasii*; these are quite common in winter, and numerous during migration.

232. *Turdus aonalaschkæ pallasii*. HERMIT THRUSH.—Rare migrant and winter resident. The following notes on the migration of the different forms of Hermit Thrush for 1890 will prove interesting from the fact that all the twenty-five specimens were taken in the same place, a small patch of under-growth, among the tall pecan trees on the river, about two miles south of the city.

T. aonalaschkæ, first taken Feb. 3; next March 4, 18, 19, 24; last April 2; total, 6 specimens.

T. a. auduboni, first taken Feb. 8; next, March 24, 28; last April 8; total, 4 specimens.

Intermediates between *auduboni* and *pallasii*, first Feb. 3; next Feb. 4, 10, 14, 20, 25, March 10, 13, 14; last March 19; total, 12.

T. a. pallasi, first January 31; next and last, Feb. 10; total, 3.

233. *Merula migratoria*. AMERICAN ROBIN. — Abundant migrant; occasionally seen, but not common, in winter.

234. *Sialia sialis*. BLUEBIRD. — Common migrant and rare summer resident.

Since this list was prepared last winter I am able to record the following birds from this locality, all of which (with the exception of the Ibis) no doubt occur regularly during migration in Bexar County.

235. *Podilymbus podiceps*. PIED-BILLED GREBE.

236. *Gelochelidon nilotica*. GULL-BILLED TERN.

237. *Aythya marila nearctica*. BLUEBILL. SCAUP DUCK.

238. *Erismatura rubida*. RUDDY DUCK.

239. *Anser albifrons gambeli*. WHITE-FRONTED GOOSE.

240. *Plegadis guarauna*. WHITE-FACED GLOSSY IBIS.

241. *Macrorhamphus scolopaceus*. LONG-BILLED DOWITCHER.

242. *Tringa bairdii*. BAIRD'S SANDPIPER.

SUMMARY.—The total number of birds I have myself observed, exclusive of Swans, Grebes, Gulls, Terns and others which have been seen but not identified, is two hundred and forty-two. Of these eighty-four are known to breed within thirty miles of San Antonio. About thirty species may be considered as common residents all the year round. Of the total number about one half occur as regular migrants. It would be a difficult matter to classify the whole, with any degree of satisfaction, as so many of the migrants are also winter or summer residents more or less numerous. Then there are the regular summer residents, which leave in the fall, and are not counted with the transients, though many of them pass on further north. Lastly there are the rare stragglers and occasional visitors which have appeared at different times of the year.

HABITS OF THE HUDSONIAN CURLEW IN MASSACHUSETTS.

BY GEORGE H. MACKAY.

OF THE various shore birds which are visitants to New England during migration the most difficult to take, on account of its extreme vigilance, is the Hudsonian Curlew (*Numenius hud-*

sonicus). I refer to the adult birds, the young being gentle and tame in comparison. As a consequence comparatively few 'Jacks,' as they are commonly called, are taken in New England; one of the largest receivers of game in Boston informing me that in his opinion not over a hundred, if as many, that have been shot in this vicinity, are annually brought into the market. Speaking for Nantucket and Tuckernuck Islands, as far as I am aware, not over fifteen or twenty of these birds a year, on an average, have been shot there during the past seventeen years, and the local saying, that "it does not pay to go after them," is true, they being too shy and too limited in number to make it any object, either for gain or for pleasure. During these seventeen years there have never been more than one hundred birds on an average living on the above islands each year, and for the past few years I have noticed a falling off from this number. Many of them have, I think, passed one or more summers on these islands, for they appear about the same date and in the same numbers, frequenting the identical localities, and flying from place to place in about the same manner. Thirty-five years or more ago there used to be many more than at present, and according to a reliable account there were some fifteen hundred birds, during the summer of 1833, living on the two islands.

They were apparently as shy then as now, for even then it was considered essential in order to take them to mortise a hole in the ground for concealment in the locality which they frequented or passed over, care being taken to remove the soil taken out to some distance in a wagon in order that the place might appear perfectly natural. Stands were dug in the centre of a clump of bushes, as being less noticeable. In times past, on Cape Cod, I have used a hog'shead, sunken level with the marsh, from which to shoot them, but even under such conditions I never secured more than nine in one day, and that only once. The Hudsonian Curlew is a very observing bird and perceives at once anything strange and out of harmony with the natural surroundings of any locality which it has been in the habit of frequenting, and in order to get a flock up to the decoys considerable care must be exercised. Single birds or pairs will, however, decoy fairly well if they have not been harassed. These birds have a way of setting their wings stationary and sailing, when headed for the decoys, at a distance of one hundred yards or more, the flock

separating out so that there are scarcely any two birds together, and then hanging, as it were, in the air. During this time they are most carefully listening and scanning the decoys and surroundings. A movement causes them to spring up in the air several feet, and as this is generally when aim is being taken they are apt to be missed by being undershot. In order to get them as near as possible I have frequently set my decoys only a few feet to windward of my stand, as it is customary for them when heading for the decoys to keep falling off to leeward of them. They are not an easy bird to kill, being strong and powerful, and as the distance is usually great at which they are shot at, owing to their vigilance, many go off wounded and are not recovered. Should one or more be wing broken, they frequently commence calling, which causes the remainder of the flock to hover around for a short time, apparently to give encouragement to the wounded ones, and while their attention is thus absorbed they will often afford the sportsman a second shot, if he keeps concealed. Were it not for the satisfaction of getting so shy a bird, for as a rule they are but indifferent eating, there would be little inducement to waste the time necessary to obtain an occasional one. I take a few every year by getting out of my wagon into some place of concealment, when I observe a flock in the distance on the ground, and letting my companion drive around the other side and start them towards me. Long familiarity with the ground enables me to form some idea as to what course they are likely to pursue, and I have obtained more or less in this manner.

They make two notes, one a very clear, penetrating, staccato whistle, repeated four or five times in quick succession, and which is very far-reaching. It is given when flying, also when alarmed, and on taking flight. The other consists of two, low, straight whistles or notes, when a flock is alighting. Flocks also make a rolling note, lasting as long as it would take to count six or seven. The sound is similar to that produced by a boy's lead bird whistle filled with water. It is uttered when the birds approach, and are over a marsh or feeding ground, at an altitude of sixty or seventy yards. I have never heard of its being made by single birds.

The Hudsonian Curlew is a tide bird, frequenting the sand flats near the edge of the water, when they become uncovered,

and resorting to the marshes and uplands when driven from the former by the in-coming tide. They feed on fiddler crabs, grasshoppers, and the large gray sand spiders (*Lycosa*) which live in holes in the sand among the beach grass adjacent to headlands, huckleberries, which they pick from the bushes, and beetles (*Lachnosterina*, Scarabæidæ), all of which are usually mixed with coarse gravel. When a flock of these birds is on the ground where they have been feeding, they become scattered, twenty-five or thirty birds covering fifteen or twenty yards' space. At such times they do not appear to be particularly active, moving about in a rather slow, stately manner, although I have once in a while seen them run. During such times I have occasionally noticed one or more birds fly away from the flock, although undisturbed. At other times I have seen a single one or a pair pass over the flock which was resting on the ground and neither pay the slightest attention to the other, which seems peculiar as I should expect the ones flying to join those on the ground. I am informed, on what I consider good authority, that by keeping concealed, the whole of a flock of young birds, when on the ground, may be killed by repeated shots without their taking flight; I have never had an opportunity of testing it, but it certainly would be impossible to accomplish such a result with the old birds. These young birds may be distinguished from the adults by their generally younger appearance and lighter colored plumage. Their legs also will bend when the older ones' will break. They are known to the local gunners as 'Blue-legs,' from their legs being lighter colored than those of the adults, and also as 'Foolish Curlew,' the latter on account of their tameness in comparison with the older birds.

When passing to and from their feeding grounds they usually fly at an altitude of about thirty yards, unless it is quite windy, when they keep within a few feet of the ground, or water, if they are passing over it. I have seen them flying only a few feet above the water during their migration south in July. As the season advances the birds frequent the beach grass near the shore, and at such times the young birds can be driven up to with horse and wagon; but rarely, if ever, can the adult birds be so approached. The adults appear about the fifteenth of July, the greater portion going south by the end of the month, and it seems to require from three to four weeks before all have passed.

When on migration they fly similarly to Geese and Ducks at such times. The young birds first appear about the end of August, and continue coming until into October. I have never seen these young birds in flocks on Nantucket Island, nor associated with the adults, there usually being not over five or six birds, or even less, together.

Some Hudsonian Curlews migrate along the New England coast in the spring on their way to the north, appearing as early as the fourteenth of May, and I have heard of instances when two were shot on April 20, 1891, on Muskeget Island, and twelve seen on April 23, 1891, standing on Stony Point, Nantucket Island; also one noted on April 10, 1892, at Nantucket Island. These dates are the earliest which have come to my notice. About the twentieth of May is a more probable date to expect them. When noted in the spring it is generally on very fine, warm, and clear mornings. They are seldom seen in stormy weather, but usually before it. That these birds are powerful and enduring fliers is evidenced by their long, pointed wings. It may be of interest if I quote from Mr. Robert O. Cunningham's book ('Notes on the Natural History of the Strait of Magellan,' 1871, Nassau). This gentleman writes (page 334) that he "observed on March 30, 1868, large flocks of small Curlew (*Numenius hudsonicus*) feeding on the mud flats uncovered by the tide." Again he mentions (page 432) seeing on Nov. 16, 1868, "an enormous flock of the small Curlew seen on former occasions"; this was off Punta Arenas, Ancud Bay. From the above the inference is that the Hudsonian Curlew winters to a greater or less extent in Patagonia.

Hudsonian Curlews vary considerably in size, for I have shot specimens nearly as large as some small Long-billed Curlew (*N. longirostris*), and some but little larger than a large Eskimo Curlew (*N. borealis*). Their bills also vary in length.

As it may be of interest to hear something regarding this bird's movements in South Carolina I would add that they arrive in the vicinity of Port Royal on their northern migration, from the fourteenth of April to the middle of May, departing about the twenty-second of May, the height of abundance being about May first. In this locality they always leave the marshes about sunset, unless the tide drives them off earlier, to fly to their roosting place, some sand bank on the coast. At such times they depart in flocks of

twenty-five to three hundred birds, and late every afternoon some five thousand in the aggregate have been seen going to roost, that being about the number living in this vicinity. They come mostly from Broad River.

It may not be out of place to say a few words regarding the occurrence of the Long-billed Curlew (*N. longirostris*) in Massachusetts. As far as my experience shows, it is a rare bird in New England, and has been for many years. Personally I have seen but three of them taken. One of a pair (a friend shooting the other) I killed at Farmer's Pond, Swampscott, Mass., a number of years ago. A lone bird was shot about five years ago on Nantucket Island, which I saw. These examples were all taken during the summer.

I append the following notes, those from 1858 to 1876 inclusive are for Cape Cod, Mass. They were given to me in 1877 by my old shooting friend Mr. A. Denton. The others are my own, taken, unless otherwise stated, at Nantucket.

- 1858, July 20.—First birds shot.
 1859, July 20.—First birds shot, most killed July 20 to August 21.
 1860, July 20.—First birds shot, most killed July 20 to August 21.
 1861.—No birds of any account.
 1862.—No birds.
 1863, July 15 to Aug. 10.—A few shot.
 1864.—No birds.
 1865.—Birds scarce in July, but nine shot in August.
 1866.—No birds.
 1867.—Birds very scarce, scarcely any.
 1868, July 24.—Shot some birds.
 1869.—But few birds, a few shot in August.
 1870.—No birds to speak of.
 1871.—No birds in July, but some shot in August.
 1872.—Birds very scarce.
 1873, Aug. 16.—First birds shot.
 1874.—No birds in July or August.
 1875.—Very few birds in July or August, shot two in September.
 1876.—No birds; very dry.
 1877, July 18.—Saw several small flocks, Patchogue, Long Island, N. Y.
 “ July 19.—Shot five at Patchogue, Long Island, N. Y.
 “ July 20.—Shot two, Patchogue, Long Island, N. Y.
 “ July 30, Nantucket, Mass.—Saw twelve, shot three.
 “ Aug. 23.—Saw twelve, shot one.
 “ Aug. 25.—Saw ten, shot one.
 1878, July 25.—Shot one, saw a flock.

- 1878, July 26.—Shot two, saw a small flock.
 “ Aug. 26.—Shot two, all I saw.
 “ Aug. 27.—Shot one.
 “ Sept. 20.—Shot one.
- 1880, July 21.—First birds shot (two).
 “ July 25.—Shot four; there are two flocks living here (Nantucket), one in the east, and one in the west part of the island.
- 1880, Aug. 1.—Shot three.
 1881, Aug. 6.—First birds shot.
 “ Aug. 8.—Shot one, saw ten.
 “ Aug. 9.—Shot one.
 “ Aug. 11.—Shot two, saw four or five.
- 1882, July 26.—First birds shot (two), saw twenty.
 “ July 28.—Shot five, saw thirty.
 “ Aug. 26.—Shot one.
- 1883.—No record of any.
 1884, July 22.—First birds shot, one flock here.
 1885, Aug. 16.—Shot three, saw twenty-four.
 “ Aug. 23.—Shot one, saw eight.
 “ Sept. 2.—Shot one.
- 1886.—No notes.
 1887, August.—Shot three, saw eight, no date.
 1888, Aug. 11.—Shot two.
- 1889, Aug. 4.—Saw a flock of about thirty, shot one.
 “ Aug. 25.—A few, shot one.
 “ Sept. 22.—Saw two and shot both.
- 1890, July 16.—First birds seen.
 “ July 27.—Saw thirty-three.
 “ Aug. 2.—Saw eighteen, shot one.
 “ Aug. 10.—Shot one.
 “ Aug. 11.—Saw twelve.
- 1891, April 20.—Two shot at Muskeget Island.
 “ April 23.—Twelve seen on Stony Point, Nantucket.
 “ July 13.—Saw four, the earliest I have known them.
 “ July 31.—Saw twenty, shot one.
 “ Aug. 6.—Saw six five miles off Marblehead Neck, Mass., flying south.
- 1891, Aug. 16.—About thirty living on Tuckernuck Island.
 “ Sept. 14.—Five shot.
- 1892, April 10 (?).—One seen on or about this date.
 “ June 1.—One seen flying towards the east, well up; it whistled twice.
- 1892, June 25 (?).—Seven seen on or about this date, Tuckernuck Island.
- 1892, July 17.—First bird seen, two or three heard to whistle, eastern part of Nantucket; wind west by north.

1892, July 27.—Eight seen at Quay's Point, Nantucket.

“ July 29.—One seen at west end of Nantucket.

“ Aug. 2.—Muskeget Island, Mass., saw twenty-three, shot one.

“ Aug. 3.—Muskeget Island, saw about forty in the afternoon. They come here to roost, arriving from 4 to 7 P. M. in several flocks. They depart in the morning about 4.15 A. M..

1892, Aug. 4.—Sixteen seen, eastern part of Nantucket.

“ Aug. 6.—One seen high in the air, eastern part of Nantucket.

“ Aug. 21.—Saw two, shot one.

“ Aug. 26.—Saw seven, shot one.

“ Aug. 28.—Saw one and shot it.

There were about twelve birds living between the Miacomet and Hummuck Ponds during August. They were all adult birds. They left this locality on Sept. 4.

1892, Sept. 7.—One seen and shot at Hummuck Pond.

“ Sept. 16.—I heard one today at the south side of Nantucket. I should estimate that in all there had been about seventy birds living around Nantucket, Tuckernuck and Muskeget Islands this summer.

FURTHER NOTES ON BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON.

BY R. H. LAWRENCE.

ON APRIL 29, 1892, wishing further to study the birds of the Gray's Harbor region, I went by rail to South Aberdeen, taking a steamer that evening to Ocosta, the remaining miles of track not being quite ready for traffic. Most of my time was spent in the partly cleared land back of town and on the marshes about it. I left Ocosta May 5, going to Hoquiam, and next day left the Harbor. The great body of Ducks had migrated six or seven weeks before; but I saw a few flights of Geese,—some winter in the harbor. A few Gulls were seen at a distance. April 30 I noted forty-three kinds of birds, most of them being land birds. *Trochilus rufus* was very common; I counted over forty that day; it far outnumbers the other Hummers. On May 5 I was quite sure I heard *Empidonax difficilis* in a tree near the Ocosta pier.

Some notes made by me at South Bend, chiefly in February, are included here. South Bend has about two thousand inhabitants. It is on the Willapa River, three miles from its mouth Willapa (Shoalwater) Bay, into which the river empties, is but ten miles south of the southern end of Gray's Harbor. It is vast and shallow, and reaches southward within four miles of the Columbia River at Baker's Bay. Ocosta, five miles from the bar, has about four hundred people, and has a fine view of the Olympic Mountains and the ocean. While in the field, sixty-three kinds of birds were noted.

Urinator pacificus. PACIFIC LOON.—Winter resident. Common on the Willapa, at South Bend, in February. One seen March 16, on Willapa Harbor (Shoalwater Bay), but not later. A skin seen, got at South Bend.

Urinator lumme. RED-THROATED LOON.—Winter resident. Not common. A mounted bird seen, shot on Gray's Harbor. Four *U. imber* seen during my stay at Ocosta.

Ptychoramphus aleuticus. CASSIN'S AUKLET.—Rare. Two skins examined of birds found dead on the beach below Point Chehalis, by Mr S. A. Wye, after severe December storms. There were two or three dozen of this species lying about. A small Diver noted at South Bend in February and later, was probably *Brachyramphus marmoratus*.

Rissa tridactyla (*pollicaris*?). KITTIWAKE.—A little flock of Kittiwakes were noticed feeding in a pond of shallow water at South Bend, Feb 12. They picked, daintily, floating particles from the surface. Seen afterwards. Were probably all *R. tridactyla pollicaris*.

Phalacrocorax ———? ——— CORMORANT.—Pretty common at South Bend in February. One or two seen on the Willapa, March 26. These birds in February perched by the hour on channel piles, with wings hanging down loosely. Some had a conspicuous white patch on the flank.

Pelecanus californicus. CALIFORNIA BROWN PELICAN.—Two mounted birds seen at South Bend,—one shot in November, on Willapa Harbor, where they are pretty common in the fall. They are not uncommon then on Gray's Harbor.

Anas carolinensis. GREEN-WINGED TEAL.—Common on Willapa Harbor and Gray's Harbor throughout the winter. Hunters brought in a good many at South Bend in February. One seen, shot near Ocosta, May 2.

Dafila acuta. PINTAIL.—Very common on Willapa Harbor throughout the winter. The gunners brought in many. A few probably breed at Gray's Harbor, and some must winter there.

Glaucionetta clangula americana. AMERICAN GOLDENEYE.—A large flock of Ducks, about one hundred and fifty, seen near the shore at Ocosta,

April 30, I referred mostly to this species. It is rather common in the winter on Willapa Bay.

Clangula hyemalis. OLDSQUAW.—Several seen March 16, and a pair March 26, on Willapa Harbor. Hunters say they winter there.

Oidemia americana. AMERICAN SCOTER.—Winter resident. Not common. One seen at Ocosta May 5, a male.

Oidemia deglandi. WHITE WINGED SCOTER.—Winter resident. Very common. All the Scoters go north in summer, I think. Several seen on Gray's Harbor, April 30, and after. It was common in February at South Bend. Black Brant and Mallards also were common on Willapa Bay in February.

Macrorhamphus scolopaceus. LONG-BILLED DOWITCHER.—Very common about Ocosta during my stay. One shot May 2. Most of the 'Snipe' brought in were of this species. It associated with great flocks of Sandpipers of all sizes. *Gallinago delicata* was pretty abundant in a wet meadow for a few days. I noted this last species at South Bend in February.

Tringa minutilla. LEAST SANDPIPER.—April 30, I shot two out of a flock of about eighteen. At the time there were scores of large flocks of small Sandpipers on the marsh about me. During my stay I found that *Ereunetes occidentalis* was the most common of the Sandpipers. I think it outnumbered all combined. Sandpipers winter on Willapa Harbor. One *Tringa alpina pacifica* shot at South Bend, Feb. 25, out of a flock, was brought to me. It was said to be common.

Totanus melanoleucus. GREATER YELLOWLEGS.—One examined, shot May 1, near John's River, on a marshy island. Five or six others were seen by the gunner, at the same time, in a large mixed flock.

Numenius longirostris. LONG-BILLED CURLEW.—At this marshy island I examined two, May 3, just killed; and shortly after I saw several flying about.

Ægialitis vocifera. KILLDEER.—Rare. One, only, seen Feb. 16, on the muddy bank of the Willapa. It flew away, giving its familiar cry.

Ægialitis semipalmata. SEMIPALMATED PLOVER.—A little flock seen on the shore (beach) near Ocosta April 30. A few seen afterward with flocks of Sandpipers. Three shot May 2.

Arenaria melanocephala. BLACK TURNSTONE.—On May 3 five or six of these birds were seen in a great flock of Sandpipers and Dowitchers on a marshy island at John's River. I got very close to several on the beach near Ocosta on May 5.

Accipiter velox. SHARP-SHINNED HAWK.—While standing in the woods at South Bend, Feb. 17, one of this species dashed from cover and swept across the open and partly around me. Small and large Hawks are common on the marshes there and at Gray's Harbor.

Buteo borealis calurus. WESTERN REDTAIL.—One, pursued by three Crows, was shot, Feb. 14, on the marsh near South Bend. Two large Hawks seen at Ocosta, May 1, were probably of this species. Another

there, May 4, hovering over a wet meadow, looked like a *Circus hudsonius*.

Falco peregrinus anatum. DUCK HAWK.—I examined a mounted bird of this species shot near Ocosta in November (?). It was an immature bird.

Asio accipitrinus. SHORT-EARED OWL.—Common in February on the extensive salt marshes below South Bend. The birds flew about much in misty weather, looking as big as Eagles. They sat much on the edges of the many deep sloughs waiting for a species of rat. I found many evidences of their success in getting them. This Owl has a shrill, barking call like the 'ki-yi' of a little dog. This was heard only while it flew high above, sporting, or chasing some large bird (Hawk?). I shot two Feb. 21. The ovary of the female was coarsely granulated. Said to be common at Ocosta in winter.

Bubo virginianus saturatus. DUSKY HORNED OWL.—Resident. Pretty common. Specimens seen shot near Ocosta and South Bend.

Nyctea nyctea. SNOWY OWL.—I have seen several fine specimens, shot in winter near South Bend and Ilwaco, when they are often pretty common along the seashore.

Ceophlæus pileatus. PILEATED WOODPECKER.—Resident. Rather rare. A mounted bird seen, shot near South Bend. The railroad engineer there said he had seen them now and then, while camped on the upper Willapa. A pair was reported to keep near town, but I could never find them.

Melanerpes torquatus. LEWIS'S WOODPECKER.—Rare. In a wet meadow near Ocosta I shot one of these showy and strange birds, April 30. It was first seen on a fence, catching insects by making short sallies. I have seen this bird at Vancouver, Clarke County, in January.

Cyanocitta stelleri frontalis. BLUE-FRONTED JAY.—Resident. Common. A Jay shot at Ocosta, May 3, seems better referred to *C. stelleri*; but one examined at South Bend, and two shot at Ilwaco, March 13, are certainly '*frontalis*.' I think the latter race predominates.

Sturnella magna neglecta. WESTERN MEADOWLARK.—Common at South Bend, in February, on the salt marshes below town, and reported as at Ocosta a few weeks before I came. Dr. Cooper says they only winter on the coast. They sing finely the year around.

Ammodramus sandwichensis? SAVANNA SPARROW.—Not common. I saw a few of the larger-sized Savanna Sparrow while at Ocosta, and shot one May 2. Its measurements were: length 154.0 mm., extent 233.0, wing 75.0, tail 56.0, tarsus 20.0, bill 10.5. The bird was set aside, but overlooked, and it spoiled. A series of little accidents prevented my getting another. *A. s. alaudinus* was very common on the marshes about, and in full song.

Carpodacus purpureus californicus. CALIFORNIA PURPLE FINCH.—I saw and heard from six to a dozen nearly every day at Ocosta. One, shot May 1, was feeding in an unkept garden in a wet meadow. Generally one would sing pleasingly from the tiptop of some dead tree at the 'opens' about.

Spinus tristis. AMERICAN GOLDFINCH.—Not common. At Ocosta, May 4, a pair flew over a small meadow and alighted in a tree near me.

Spinus pinus. PINE SISKIN.—Resident. Hardly common. I shot one of two seen feeding in some willows at Ocosta, May 4. No others noted on Gray's Harbor. At South Bend, several times in February, I noted a flock of over thirty. These birds swarm in the orchards about Vancouver, Clarke County.

Zonotrichia leucophrys gambeli. GAMBEL'S SPARROW.—Summer resident. Common. Many seen at Ocosta on and along the edge of a low hill which was 'slashed' and burned over a year or two ago. They were singing well, and some seemed to be nesting. The testes of a male shot April 30 were well developed, as were also those of a *Z. l. intermedia* shot the same day; but those of a *Z. coronata* shot then were very small. *Z. l. gambeli* should have been in my 'Preliminary List' (Auk, IX, 39-47). I had hoped long ago to correct my own error, but Mr. Palmer anticipates me (Auk, IX, 309). One or two skins of the White-crowned Sparrow I sent Dr. Allen from Humptulips in April, 1891, and they were found by him to be *Z. l. intermedia*. Part or most of my notes on *intermedia* evidently should have been used for *gambeli*. Illness at that time prevented my getting a series of skins of these birds, and my trips to the harbor were usually hurried. I did not hear *Z. l. intermedia* sing, but saw several at Ocosta, and a few at Hoquiam, May 6. The song of *Z. l. intermedia* is a little different, I think, from that of *Z. gambeli*.

Zonotrichia coronata. GOLDEN-CROWNED SPARROW.—At and about Ocosta, April 30, I found three flocks of this species—in all about sixty individuals. A good many were seen on other days. The only sound they gave was a plaintive, querulous call of several notes. I shot one April 30. I have always found this species so fat as to make skinning difficult.

Pipilo maculatus oregonus. OREGON TOWHEE.—Resident. Not common. Feb. 17, I saw one at South Bend, and March 25, three more. The bird has an odd mewling call.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Summer resident, not very common. I saw four or five brown Swallows at Ocosta, April 30; one had a piece of straw in its mouth. May 4 I shot a similar Swallow near there, which was of the above species. Dr. Cooper noted no *Clivicola riparia* in Washington, so that name may have to be eliminate from the list. *T. thalassina* was common at Ocosta, April 30. I saw two of this species at Astoria, Oregon, March 27. It is the most abundant Swallow in western Washington. After it comes *Chelidon erythrogaster* which I first noted, at Ocosta, May 3, two being seen. *Petrochelidon lunifrons* I have found nesting at the mouth of Lewis River, Clarke County, but never on the coast or Sound. *Progne* breeds at Olympia, but I have not seen it elsewhere.

Geothlypis trichas occidentalis. WESTERN YELLOWTHROAT.—Summer resident. Not common. One shot, another heard in and near some

bushes on the marsh at Ocosta, April 30. *Helminthophila c. lutescens* seemed to be the most common Warbler during my stay. Then came *Dendroica auduboni*, and after May 2, I often saw or heard *Sylvania p. pileolata*. At Hoquiam, May 6, I saw two *Dendroica nigrescens*, and shot one.

Thryothorus bewickii spilurus. VIGORS'S WREN.—Resident. Not common. One seen at Ocosta May 2; a few others heard. At South Bend I saw one, Feb. 18. Besides its harsh, grating call this Wren has a song represented somewhat by the following: *tr-twe, tr-twe, che-we', che-we', che-we'*. It is generally sung from the top of a tall bush or other high perch.

Cistothorus palustris paludicola. LONG-BILLED MARSH WREN.—Shot one of a pair seen Feb. 14 on the salt marsh below South Bend. At Ilwaco, March 9, I saw one, and listened to its song while it clung to a reed. Its song was a queer medley of grating, Wren-like notes, followed by clear little peeps,—animated, unique.

In regard to *Salpinctes obsoletus*, given in my 'Preliminary List' (Auk, IX, 47), Mr. Palmer suggests (Auk, IX, 310) that Gray's Harbor is much out of its usual range. It is; but the species was present in 1890. I have but once since met this bird: at Seattle, Nov. 15, 1891, when a single individual allowed for some minutes a close inspection. It moved about on a gravelly bank on Renton Hill.

BIRDS OF SOUTHWESTERN NEW MEXICO.

BY A. W. ANTHONY.

As faunal lists of the birds of our southwestern border are by no means as numerous as is desirable, those treating of the desert regions being especially rare, I have considered the following notes as perhaps worthy of publication. The region embraced in the present paper lies to the southward of the Southern Pacific Railroad, in the extreme southwestern part of Grant County, New Mexico, where that Territory extends its lines to the south into Mexico, making a 'pan handle' of forty miles north and south, by the same distance east and west.

This region is an extensive plain, having a mean elevation of about 5500 feet, and is broken by numerous short ranges of mountains usually not extending more than a few miles before

breaking away into the plain again; few of them have elevations of over 1500 feet above the surrounding country, the Animas and Sierra Hachita or Big Hachita ranges being notable exceptions to this rule. The former is the longest and most extensive range in this part of the country, being about forty miles in length and having peaks of perhaps 5000 feet elevation, while the Sierra Hachita extends its peaks to about 7000 feet.

Most of my observations were made in a small range of low mountains, known as the Apache Hills, lying five miles north of the national boundary. A description of these hills would answer for any of the ranges within a radius of forty miles. Lying with their greatest extent north and south, like nearly all of the ranges in this region, the Apache Hills cover an area of about thirty square miles, their highest elevation being about 1500 feet above the surrounding plain. The lower slopes are covered with a scattered growth of yucca, agave, and ocotillo,—a species of *Euphorbia*,—the dry blossom stalks of the two first-mentioned furnishing the only nesting sites for *Dryobates scalaris bairdi* and *Myiarchus cinerascens*.

Along the dry arroyos a few dwarfed mesquite bushes were found, with an occasional thorny shrub, none reaching a height of over six or seven feet. A few solitary dwarf junipers struggled for life on some of the highest slopes, and in one valley on the northern side of the range a dozen or more stunted evergreen oaks drew a miserable existence from the scanty soil. Even the various species of cactus usually so abundant in arid regions seemed to be less abundant and hardy than usual; a few chollas were found in nearly all of the arroyos, and small patches of *Opuntia* grew in several places on the lower slopes.

Water was not to be found in the entire range, our supply for camp use being drawn in wagons from a small spring in the Little Hachita mountains, ten miles west of Apache. During the winter season water was sometimes caught in small basins in the limestone, forming tanks which held more or less water for perhaps three months after a very wet winter, but during the remainder of the year no water was obtainable nearer than the above-mentioned spring.

The list is therefore, aside from the migrants, largely of species that live for the greater part of the year entirely without

water, raising broods of young that reach maturity, perhaps, before the rains of September introduce water as an article of every day use.

My observations extend from the last week in February to the last of October in 1886 and from the last of September to December 16 in 1889. During the months of June and July, and until August 15, the temperature during the day ranged from 110° Fahr. to 118° with frequent records of 125°. No rains fell until the latter part of August, when heavy storms of short duration formed several small ponds in the valleys, the lower part of the Playa Valley, sixteen miles west of Apache, being a sheet of water twenty miles in length by three miles wide, having a depth of not over ten inches, and lasting until late September. Here were found several species of Ducks and Geese, birds not properly belonging to the region, as it is only in unusually wet seasons that there is sufficient water to induce them to stop.

With the August rains came the first green grass; the landscape which since February had presented a burned, dead appearance, soon began to show signs of a coming springtime. The agaves sent up their blossom stalks, which in many cases reached a height of twenty-five feet; the ocotillos ventured to put out a fringe of small oval leaves, the first they had worn for eight months; and in an incredibly short time the agaves were crowned with a pyramid of waxy yellow flowers, furnishing an unfailling repast for thousands of Hummingbirds that had suddenly appeared on their southward journey. Cassin's Sparrows became common about the mouths of the arroyos where the grass was the greenest, and many species not noticed during the spring migration became more or less abundant.

Owing to hostile Apaches it was necessary to avoid the higher mountain ranges—the Hachita and Animas, as well as favorable points in the Sierra Nevada just south of the boundary. Many interesting records were thus lost, and the list becomes one of species inhabiting the barren hills and desert plains of southwestern New Mexico.

1. *Anas carolinensis*. GREEN-WINGED TEAL.—One was shot from a flock of *A. discors*, September 13, on a small pond seven miles east of Apache; two were taken at Hachita ten miles west of that point in October, 1889.

2. *Anas discors*. BLUE-WINGED TEAL.—A flock of about twenty was found, September 7 and 15, seven miles east of camp. Many species of Ducks and Geese were reported from the Playa Valley in September, but as I did not visit that locality until after they were gone I cannot be sure as to the species.

3. *Plegadis guarauna*. WHITE-FACED GLOSSY IBIS. — A company of three was found September 7 on the pond seven miles east of Apache, and an adult and young secured.

4. *Ardea candidissima*. SNOWY HERON.—A specimen was brought to me from the Playa Valley, September 24.

5. *Fulica americana*. AMERICAN COOT.—On September 13 a flock of ten was found at the pond east of camp.

6. *Recurvirostra americana*. AMERICAN AVOCET.—A flock of a dozen was started from a mud hole near camp, September 7.

7. *Gallinago delicata*. WILSON'S SNIFE.—One was seen for several days in October, 1889, about a mud hole near Hachita.

8. *Tringa maculata*. PECTORAL SANDPIPER.—A large flock was found near Apache, September 13.

9. *Tringa minutilla*. LEAST SANDPIPER.—A large flock in company with the preceding species.

10. *Numenius longirostris*. LONG-BILLED CURLEW.—On March 25 a pair was seen on an immense prairie dog town in the valley west of Apache.

11. *Charadrius squatarola*. BLACK-BELLIED PLOVER.—A pair was seen in the above-mentioned dog town late in March.

12. *Ægialitis vocifera*. KILLDEER. — One alighted near my cabin at Apache, September 4, in an almost exhausted condition, evidently a stray migrant. Three days later a large flock was found on the plain east of the Apache range.

13. *Callipepla squamata*. SCALED PARTRIDGE. — Rather abundant through most of the region explored, but more common in and near the mountains. Once or twice I found a flock several miles out on the plains, but I think they seldom wander far from the hills. A set of eight fresh eggs was taken on July 13 from a nest under a dead mescale (agave) on a high ridge. The nest was a mere hollow with a little dry grass to keep the eggs from contact with the hot rocks. I think that, late as it was, this must have been the first set, as no young were seen until the last of July, while birds but a few days old were taken as late as September 28.

C. gambeli and *Cyrtonyx montezumae* were described to me from the Sierra Hachita, but none were met with. The Mexican Turkey is also said to be abundant in all of the ranges west and south of the region explored, and to have wandered on several occasions into the Sierra Hachita.

14. *Zenaidura macroura*. MOURNING DOVE.—Very abundant until May 5, after which date none were seen until August 20 when they arrived in large numbers on their way south. Eighty per cent of the females

taken at this time contained eggs that would have been deposited within a day or two. One bird was found incubating two eggs on September 6. Unfortunately, however, these eggs were destroyed by some animal, and I am unable to say whether they would have hatched. As no young were seen, I am inclined to think that most if not all of the eggs deposited at this late date were infertile. (See Zoe, Vol. I, p. 380.)

15. *Cathartes aura*. TURKEY VULTURE.—After its appearance in April it was common, and it probably nested in the region, as young were taken in August.

16. *Circus hudsonius*. MARSH HAWK.—Very abundant in September and October, but very rare or not noticed during the spring migration.

17. *Accipiter velox*. SHARP-SHINNED HAWK.—One seen on September 23 at Apache.

18. *Buteo borealis calurus*. WESTERN REDTAIL.—Probably most of the Redtails seen were winter residents. Rather common after late September and until April.

19. *Buteo abbreviatus*. ZONE-TAILED HAWK.—A few were seen all summer, but they were rather more plentiful in April, and seemed to be moving north. A favorite resort was about a large prairie dog town in the valley west of Apache.

20. *Buteo swainsoni*. SWAINSON'S HAWK.—But few were seen during the spring and summer, but when the fall migration began they were very abundant. On September 19, during a ride of forty miles across the plains, several hundred large Hawks were seen, all moving southward in companies of from two or three to fifteen. The percentage of species was about: *B. swainsoni* .75, *B. borealis calurus* .15, *Circus hudsonius* .10.

22. *Falco mexicanus*. PRAIRIE FALCON.—A single bird seen at Apache.

23. *Falco fusco-cærulescens*. APLOMADO FALCON.—A pair was seen in the valley between Apache and Hachita, June 2.

24. *Falco sparverius*. AMERICAN SPARROW HAWK.—Abundant as a migrant.

25. *Pandion haliaetus carolinensis*. AMERICAN OSPREY.—Frequently seen in spring and early summer; one shot April 14. The presence of this species in the midst of this arid plain, seventy-five miles from the nearest stream of water, was something of a surprise to me, and I am still at a loss to account for their presence. It is quite possible that they may have been passing from the Rio Grande to the Gila River.

26. *Asio wilsonianus*. AMERICAN LONG-EARED OWL.—One shot in the Little Hachita range, April 30.

27. *Bubo virginianus subarcticus*. WESTERN HORNED OWL.—Rather common in all of the ranges, seeking shelter in the scrubby junipers during the day.

A *Megascops* was several times seen at Apache, but I am in doubt as to the species.

28. *Speotyto cunicularia hypogæa*. BURROWING OWL.—More or less common in all of the dog towns.

29. *Micropallas whitneyi*. ELF OWL.—One shot near Apache on September 6 is the only record.

30. *Geococcyx californianus*. ROADRUNNER.—No roadrunners were seen in the Apache Hills, although their tracks were seen on one or two occasions. At Hachita and in the little Hachita Mountains, however, they were not uncommon. At Hachita a pair came regularly to one of the mines for water, a small pool having been formed near the shaft, from the pumps. The visit was made at nearly the same hour each forenoon, and was eagerly looked forward to by a fox hound owned by one of the workmen. The dog never failed to give chase as soon as the birds were sighted, and the race was as much enjoyed by the birds as by the dog; they seemed to have no difficulty whatever in keeping well out of danger without taking wing, and usually found time during the chase to stop at the water hole and get their daily drink, after which they quickly disappeared.

31. *Ceryle alcyon*. BELTED KINGFISHER.—One seen near the railroad, September 23.

32. *Dryobates scalaris bairdi*. BAIRD'S WOODPECKER.—Rather common wherever yuccas or agaves afforded nesting sites. A nest was found, May 19, in the dry blossom stalk of an agave, containing four or five young not over two days old.

33. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.—One seen near Hachita, September 30, 1889.

34. *Colaptes cafer*. RED-SHAFTED FLICKER.—Not seen after April 1. Common during winter and spring.

35. *Phalænoptilus nuttalli nitidus*. FROSTED POORWILL.—Poorwills were not uncommon about Apache after April 6, and one was seen in the Sierra Hachita or Big Hachita range as late as November 24.

36. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—Two were seen flying south, July 26, which with one shot August 18 completes the record.

37. *Chordeiles texensis*. TEXAS NIGHTHAWK.—At Deming this species fairly swarmed in June and July, and was doubtless nesting. They were rather rare at Apache, however, being seen there on May 17 and on only one or two subsequent occasions. There seem to be but few of the habits of the Eastern Nighthawk that are shared by this species. *C. texensis* flies low and does much of his hunting within two feet of the ground, while a large part of his bill of fare is obtained by jumping up from the ground and catching passing insects, without taking wing—a habit also noticed in *Phalænoptilus*. The flight of *texensis* also is unaccompanied by the many aerial evolutions and booming notes so common in *virginianus*. The only note I have ever heard from *texensis* was a low chippering, uttered when a pair were chasing each other.

38. *Micropus melanoleucus*. WHITE-THROATED SWIFT.—A few were seen during the spring at Apache and again in October (1-15) about Hachita, ten miles west of the former camp.

39 *Trochilus alexandri*. BLACK-CHINNED HUMMINGBIRD.—Not uncommon about the blossoms of the mescales in August. It is quite probable that a few may have nested in the Apache Hills, as a female was taken July 9 that showed signs of having incubated quite recently.

40. *Trochilus platycercus*. BROAD-TAILED HUMMINGBIRD. — The only Hummingbird noticed during the spring migration. A few were seen hovering about the flaming red blossoms of the ocotillo, but it was more often heard screeching by overhead. It was abundant in August, feeding in company with all other Hummers upon the insects attracted by the mescale blossoms.

41. *Trochilus rufus*. RUFIOUS HUMMINGBIRD.—None noticed until the last of July, when the first mescale blossoms appeared. Arriving by hundreds in early August, it fairly took possession of every blossom to the exclusion of all other species. The blossoms of the agave were considered the especial property of *rufus*, nor were his rights often contested. If an unfortunate Broadtail or Calliope happened to be feasting upon a choice bunch of flowers when a Rufous appeared upon the stage, his angry demand to vacate was seldom ignored. Occasionally a Hummer more hardy than the rest ventured to give battle, but the fight was always short and the victory to the Rufous. On November 4 a Hummer flew by me, over the top of the Little Hachita, that was either this species or the following.

42. *Trochilus calliope*. CALLIOPE HUMMINGBIRD.—First seen on July 15, and abundant after that date. Unlike the preceding, the present species was very shy and silent.

43. *Tyrannus verticalis*. ARKANSAS KINGBIRD.—More or less common during both migrations in all of the low ranges.

44. *Tyrannus vociferus*. CASSIN'S KINGBIRD.—In company with the preceding, and in and about the same numbers.

45. *Myiarchus cinerascens*. ASH-THROATED FLYCATCHER.—Abundant after April 14.

46. *Sayornis saya*. SAY'S PHŒBE.—After March 12 and during the spring migration Say's Phœbe was fairly common in nearly all of the cañons and along the rocky hillsides. A nest was taken on May 26, and young were seen later. No *Sayornis* were seen, however, after June 15 until the first fall migrant appeared August 30, they all having made a second migration in early June (see *Zoe*, Vol. I, p. 380).

47. *Contopus borealis*. OLIVE-SIDED FLYCATCHER.—Several were seen in a cañon east of Apache on September 6.

48. *Contopus richardsonii*. WESTERN WOOD PEWEE.—Seen only in fall; rather common from August 14 until the last of September.

49. *Empidonax difficilis*. WESTERN FLYCATCHER.—I have but one spring record, May 21. A few were seen and taken at Apache in August and September.

50. *Empidonax pusillus*. LITTLE FLYCATCHER.—A few were taken from July 30 to September 6. No spring records.

51. *Empidonax hammondi*. HAMMOND'S FLYCATCHER.—A few were taken from August 31 to September 15.

52. *Empidonax wrightii*. WRIGHT'S FLYCATCHER.—The most abundant of the genus from April 6 until the 30th, and from August 18 to September 16.

53. *Empidonax fulvifrons pygmæus*. BUFF-BREASTED FLYCATCHER.—Several were seen in August, and one taken on the 16th.

54. *Otocoris alpestris adusta*. Common on the plains and valleys throughout the region.

55. *Aphelocoma woodhousei*. WOODHOUSE'S JAY.—Common in the piñon growth in the Sierra Hachita and Animas range.

56. *Corvus corax sinuatus*. AMERICAN RAVEN.—Common throughout the region visited.

57. *Corvus cryptoleucus*. WHITE-NECKED RAVEN.—More common than the preceding. Old nests were frequently seen in the tall yuccas between Apache and the railroad. A nest was found on June 2 with one egg. On July 3 this same nest contained two young not over two or three days old. I am satisfied that this was the first brood, though what could have caused such late nesting I am unable to say. Nor was the tardiness confined to this single pair. During July nests were frequently seen with young still unable to fly, and it was not until August that young were seen on the wing.

58. *Molothrus ater*. COWBIRD.—Rare about camp in spring, but more common in late summer. No specimens were taken, and I am not sure whether *M. a. obscurus* occurred.

59. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.—Rather common during most of the summer, usually in company with Brewer's Blackbird about the corrals.

60. *Agelaius phœniceus*. RED-WINGED BLACKBIRD.—A single bird on April 27 and one on October 19 complete the record; both were with Brewer's Blackbirds.

61. *Sturnella neglecta*. WESTERN MEADOWLARK.—A few Meadowlarks were seen in March and April, and but one or two in October.

62. *Icterus parisorum*. SCOTT'S ORIOLE.—First seen on April 26, and very common after the first of May. They were found chiefly in the ocotillos along the lower hills, after the migration had subsided, and were remarkable for their extreme shyness. Specimens taken the last of August were moulting and scarcely able to fly.

63. *Icterus bullocki*. BULLOCK'S ORIOLE.—A single male shot in a growth of ocotillos at Apache, May 15.

64. *Scolecophagus cyanocephalus*. BREWER'S BLACKBIRD.—Abundant at Apache and in all of the ranges of hills after April 20, and even throughout the summer with the exception of a short time the last of June and first of July.

65. *Carpodacus mexicanus frontalis*. HOUSE FINCH.—Common in the hills everywhere until about April 15.

66. *Spinus psaltria*. ARKANSAS GOLDFINCH.—A few were seen about Thompson's Spring, a water hole in the Little Hachita, April 26-30.

67. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.—In 1886 large flocks were seen along the railroad and on the plain between Apache and Hachita, remaining until April 10. They were very abundant in the same localities as early as October 1, 1889.

68. *Rhynchophanes maccownii*. MCCOWN'S LONGSPUR.—Only observed along the line of the Southern Pacific from October until February.

69. *Poocætes gramineus confinis*. WESTERN VESPER SPARROW.—A very abundant species in all of the region visited during the spring migration, confined largely to the lower ranges. They were still rather rare at the time of my leaving Apache, October 19.

70. *Ammodramus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—A Savanna Sparrow was seen at Apache on two occasions in May, but as it was not taken its identity is, perhaps, somewhat doubtful.

On several occasions a small Sparrow was seen on the plain below Apache which I was strongly inclined to think was *A. bairdii*. No specimens were taken however.

71. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.—Very abundant at Apache during both migrations, more so in spring than in fall, flocking with Vesper Sparrows along the cañons and hillsides.

72. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—White-crowns were very abundant about Apache from late February until the last of April, and I think *Z. l. intermedia* and *Z. leucophrys* were equally common. As few specimens were taken the status is somewhat doubtful.

73. *Spizella socialis arizonæ*. WESTERN CHIPPING SPARROW.—Very abundant as a migrant.

74. *Spizella pallida*. CLAY-COLORED SPARROW.—Rather common as a migrant, staying more along the plain and edges of the higher land than the preceding species, which confined itself largely to the slopes of the lower mountains.

75. *Spizella breweri*. BREWER'S SPARROW.—More common than *pallida*, with which it was found.

76. *Spizella atrigularis*. BLACK-CHINNED SPARROW.—A single specimen secured October 9, 1889, from the top of the Little Hachita, and one seen November 24 in the Sierra Hachita or Big Hachita twenty-five miles south of the first-named locality, are my only records.

77. *Junco hyemalis shufeldti*. SHUFELDT'S JUNCO.—Rather common as a winter resident about Apache and in the ranges to the west.

78. *Junco annectens*. PINK-SIDED JUNCO.—Common as a winter resident, and found in all of the ranges of low hills and mountains visited.

79. *Junco caniceps*. GRAY-HEADED JUNCO.—Common with the preceding as winter resident.

80. *Junco ridgwayi*. RIDGWAY'S JUNCO.—On March 16 a Junco was taken near Apache that in the absence of further material I was obliged to

regard as a hybrid between *caniceps* and *annectens*, although I was reasonably sure that a second was seen on May 21. Upon my return to the region in 1889 the first Junco taken was a fine *ridgwayi*, from a mixed flock of Juncos at Granite Gap, in the Little Hachita, ten miles west of Apache. The species is probably more or less common in all of the mountain ranges in this region, wintering with *caniceps*, *annectens*, and *shufeldti*.

81. *Peucaea cassini*. CASSIN'S SPARROW.—Cassin's Sparrows were first seen at Apache on July 19, and were common in favorable localities after that date until late fall, being in full song until the last. One or two were seen on the plain below Apache, but their favorite resort was a flat at the mouth of a large arroyo south of camp, where the late summer rains had produced a fairly respectable growth of grass and a few vines. Here a few were always to be seen and heard.

82. *Peucaea ruficeps boucardi*. BOUCARD'S SPARROW.—Common at Apache during all of my residence in 1886, but not noticed either at that point or in the Hachita ranges in October or November, 1889. At Apache they seemed to prefer the rocky hillsides, seldom or never venturing below camp. Young in first plumage were taken August 30.

83. *Pipilo maculatus megalonyx*. SPURRED TOWHEE.—A few seen along the arroyos during migrations.

84. *Pipilo chlorurus*. GREEN-TAILED TOWHEE.—During both migrations, more common in fall.

85. *Pipilo fuscus mesoleucus*. CAÑON TOWHEE.—Abundant in all of the mountainous regions visited. Nests found on June 8 and July 31 with nearly fresh eggs. Favorite nesting sites were thick bunches of cholla cactus and between the leaves of yuccas.

86. *Habia melanocephala*. BLACK-HEADED GROSBEAK.—A few during both migrations.

87. *Passerina amoena*. LAZULI BUNTING.—A few were seen in female or immature plumage during the migrations.

88. *Calamospiza melanocorys*. LARK BUNTING.—During the spring migrations but few were seen, but after August 1, and until late in October flocks of thousands were seen on the plains south of the railroad.

89. *Piranga ludoviciana*. LOUISIANA Tanager.—Met with occasionally in the arroyos about Apache from July 26 until Sept. 26. Most of them were young birds or females.

90. *Piranga hepatica*. HEPATIC Tanager.—A single adult male was seen near Apache, September 14, and was the only full-plumaged male met with. Young birds and females were not uncommon during the fall migration, but were very shy.

91. *Petrochelidon lunifrons*. CLIFF SWALLOW.—A few were seen September 30.

92. *Chelidon erythrogaster*. BARN SWALLOW.—Seen on one or two occasions at Apache and Deming. A few were seen nesting at the latter place, where large numbers were seen flying south as late as October 1.

93. *Tachycineta thalassina*. VIOLET-GREEN SWALLOW.—Rare during migrations.
94. *Clivicola riparia*. BANK SWALLOW.—A single bird at Apache, July 26.
95. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Seen only as a migrant.
96. *Vireo solitarius cassinii*. CASSIN'S VIREO.—During fall migrations, rather common.
97. *Vireo solitarius plumbeus*. PLUMBEOUS VIREO.—Fall migrant, seen as late as September 25.
98. *Vireo vicinior*. GRAY VIREO.—Rare. A few were taken during spring and summer.
99. *Helminthophila virginiae*. VIRGINIA'S WARBLER.—A male shot near Apache, August 23, is the only record.
100. *Helminthophila celata* (?). ORANGE-CROWNED WARBLER.—Occurred only as a rare migrant, one taken during each migration.
101. *Dendroica æstiva*. YELLOW WARBLER.—Seen only in the fall, when females were not uncommon. No males observed.
102. *Dendroica auduboni*. AUDUBON'S WARBLER.—A common migrant throughout the region, frequently seen far out on the plain foraging in the greasewood.
103. *Dendroica nigrescens*. BLACK-THROATED GRAY WARBLER.—Seen but once during spring, but not uncommon in the juniper growth during the fall migration.
104. *Dendroica townsendi*. TOWNSEND'S WARBLER.—Specimens were taken at Apache April 23 and August 2, and at Hachita September 28. It is, perhaps, not rare as a migrant.
105. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER.—With the possible exception of *Sylvania pusilla*, the most abundant of the Warblers, being flushed by dozens from every bunch of mesquite and greasewood along the arroyos and well into the higher hills. Most abundant from August 3 to October 12.
106. *Geothlypis trichas occidentalis*. WESTERN YELLOWTHROAT.—Two specimens were taken at a water hole in the Little Hachita, April 30 and May 31.
107. *Icteria virens longicauda*. LONG-TAILED CHAT.—Seen but once, September 15, near Apache.
108. *Sylvania pusilla* (?). WILSON'S WARBLER.—Very abundant as a migrant. Usually seen with Macgillivray's Warbler along the arroyos.
109. *Setophaga picta*. PAINTED REDSTART.—A fine male was taken August 31. Probably more common in the Sierra Hachita.
110. *Anthus pensilvanicus*. AMERICAN PIPIT.—A few were seen in October on the plains and along the line of the railroad.
111. *Oroscoptes montanus*. SAGE THRASHER.—At Apache I found Sage Thrashers abundant from the time of my arrival, February 28, until the last of March, and after September 1. They showed a marked prefer-

ence for the arroyos and rocky hillsides, but were frequently seen on the plain several miles from the mountains.

112. *Harporhynchus curvirostris palmeri*. PALMER'S THRASHER.—Several pairs of Palmer's Thrashers were found at Apache during the spring migration. At Hachita I found them on several occasions in October and November, but owing to their extreme shyness very few were secured.

113. *Harporhynchus crissalis*. CRISSAL THRASHER.—Found in about the same numbers and at the same time as the preceding species. Neither of them bred in the vicinity of Apache. At Deming, however, the present species was found in comparative abundance throughout the season.

114. *Campylorhynchus brunneicapillus*. CACTUS WREN.—Common throughout the region, showing a marked preference, however, for the lower ranges of the mountains. Nests were found in mesquite or other thorny bushes as well as cactus. Usually from four to ten nests were seen in the same bush or in the immediate vicinity, a circumstance I was at a loss to account for until I discovered that the birds were in the habit of patching up nests of the preceding seasons and rebuilding them for use as shelters during winter. (See Zoe, Vol. II, p. 133.)

115. *Salpinctes obsoletus*. ROCK WREN.—Very abundant in all of the mountain ranges, and to a large extent resident; more common, however, in winter. A nest was found, July 11, several feet below the surface of the ground in a mine that was being worked day and night. How the nest and eggs escaped being destroyed by the blasts, which were fired within a few yards of them several times each day, is a puzzle to me.

116. *Catherpes mexicanus punctulatus* (?). DOTTED CANON WREN.—A few were seen on the Hachita ranges in October and November, 1889.

117. *Thryothorus bewickii bairdi*. BAIRD'S WREN.—Rather common at both Apache and Hachita during the migrations, frequently seen far out on the open plain.

118. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—Rather rare, but seen during both migrations.

119. *Auriparus flaviceps*. VERDIN.—Well distributed throughout the region, but by no means common at any point visited. Evidently resident, but no nests were discovered.

120. *Regulus calendula*. RUBY-CROWNED KINGLET.—Rather abundant in the mountains during the migrations. All of those taken show a marked grayness on the upper parts, not noticed in specimens from other regions.

121. *Polioptila cærulea* (?). BLUE-GRAY GNATCATCHER.—First seen April 1. Although not so abundant, during summer as in spring, many were seen throughout the season, and several broods of young were noted.

122. *Polioptila plumbea*. PLUMBEOUS GNATCATCHER.—A pair seen, and the male secured, April 4. I do not think it was again met with.

123. *Polioptila californica*. BLACK-TAILED GNATCATCHER.—In my note-book, under the date of April 4, I find the record of the capture of a bird

of this species. The specimen has been mislaid, however, and I am unable to verify the identification at the present time, which leaves the record somewhat doubtful.

124. *Myiadestes townsendii*. TOWNSEND'S SOLITAIRE.—Seen at Hachita on one or two occasions in October and November, and on the plain east of Apache, April 30.

125. *Turdus aonalaschkæ*. DWARF HERMIT THRUSH.—A few were met with in the hills until late in May.

126. *Turdus aonalaschkæ auduboni*. AUDUBON'S HERMIT THRUSH.—Rather less common than the preceding.

127. *Merula migratoria propinqua*. WESTERN ROBIN.—A few were seen at Apache the first week in April. Not again met with until August 7. Rare at Hachita in October.

228. *Sialia mexicana*. WESTERN BLUEBIRD.—Abundant everywhere during both migrations.

129. *Sialia arctica*. ARCTIC BLUEBIRD.—Abundant with the preceding species. A few probably winter in the mountain ranges.

OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES.

BY W. E. D. SCOTT.

II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS.

(Continued from p. 277.)

In the July number of 'The Auk' it was stated that Mr. Taylor's notes on some of the birds there treated had not come to hand, and would be given later. They have since been received and are as follows.

124. *Crotophaga ani* (*Linn.*).—The Ani appears to be abundant in all parts of the island. It is one of the commonest birds near Kingston; and in most open or sparsely wooded lands, or in the vicinity of cultivated clearings, little groups or companies may nearly always be seen. Blackbirds are invariably present wherever cattle are pastured. I cannot recollect an instance in which I have noted a herd of cows at pasture without a flock of these birds appearing in company with them or in their immedi-

ate vicinity. This association is doubtless chiefly for the purpose of feeding on the ticks and other parasites on the animals, a good work largely shared by the Grackles (*Quiscalus crassirostris*). It is most interesting to watch a company of Blackbirds when thus engaged. Many are perched on the backs of the cattle (two or three sometimes on one cow), others are on the ground hopping about fearlessly among the grazing herd, searching for insects at the roots of the herbage or capturing those disturbed by the feet of the cattle. At this time one or more individuals are stationed on some tree close by, from which they now and again call to those in the open with that remarkable cry, variously syllabicated by some, but which I have at times thought strangely like the wailing of a young cat. Insects of all orders and their larvæ, ticks, grubs, etc., form their chief food. Occasionally perhaps a few small lizards are taken, and, I believe, the eggs of other birds, as I once found in the stomach of a female portions of an egg, apparently that of some small bird. Gosse records having seen these birds eating the ripe berries of the fiddle wood, but I have not noticed them at any time eating vegetable food.

The Blackbirds at their best have a very lean and shabby appearance, and are slow and awkward in their movements. I have watched an individual make several ineffectual attempts to alight on the frond of a cocoanut palm; but even among the branches of other trees their actions appear awkward. Their flight is slow and gliding, somewhat labored, and of little duration, the birds often appearing to fall short of the point originally aimed at. Yet they will chase the large yellow butterflies, and I was shown a large green locust that one of these birds was seen to capture in flight and afterwards drop. In the progress of a flock from place to place they do not usually fly all together, but move away in straggling groups or couples. One or more individuals first start off with their wailing call, followed soon after by two or three; after a little delay then two more go; another pause, then one, then three, and so on. If a tree has very dense foliage they alight (with much awkward scrambling) on the tops or extremities of the highest branches, where they may gain a clear and uninterrupted view, and this is usually the case when they are traversing very open country.

Their nesting habits are exceedingly curious and interesting. Many individuals (possibly members of one flock) work together in the construction of a large nest in which all the females of the company lay their eggs. The number of eggs deposited in different nests varies greatly but is of course dependent on the number of birds in a company. Six and eight eggs are commonly found. I once took eleven, and in August last year I saw a clutch of twenty-one that had been taken from a single nest! It is probable that normally not more than two eggs are deposited by each bird, but nothing definite can be said on this point. The nest, which is usually placed high up in a tall tree, very frequently in a clump of mistletoe on a bastard cedar, is a large, loosely constructed mass of twigs, entirely lined with dried leaves. But the most remarkable circumstance in connection

with the nesting of these birds is the deposition of the eggs in *regular layers* with leaves between. This custom I had long heard of before an opportunity offered for personal observation. In the first nest I examined, the eggs were in two distinct layers, separated by a deep bed of dry leaves; the bottom layer consisted of four eggs and these, strange to say, were all infertile. I believe this singular habit is practised in all cases where a large number of birds resort to the same nest. The eggs are a deep bluish green, but when freshly laid are covered with a white chalky coat which soon becomes much scratched and erased on all. Now what seems very singular is that comparatively little of this chalky covering gets rubbed off the sides, where from the turning over of the eggs in the nest we should expect to see the greatest extent of denudation, whereas *one or both ends* are nearly always *wholly* denuded. That this circumstance is not merely accidental I feel sure, as in a large series of clutches that I have examined more than two thirds of the number of eggs show this peculiarity. So cleanly and evenly is it done, and to such an extent, that I feel confident it is the work of the birds themselves, their beaks alone being able to accomplish it. At the same time it is easy to see that the marks and scratches at the sides are the result of friction with the twigs and leaves of the nest. Average measurements of the eggs are 1.33×1.20 inches. I have found eggs and young, in February and throughout the succeeding months to August, two or three broods probably being reared. I have also seen young, fully fledged but unable to fly, hopping about the branches of the nesting tree, and on another occasion, some, more advanced, searching for insects in the grass at the roots of a large guango tree in company with many old birds.

125. *Saurothera vetula* (Linn.).—The habits of this bird have been well described by Gosse. I am most familiar with it as a resident of the lowlands, though doubtless it is well dispersed over mountain and plain. At one time it occurred commonly in many of the dry gullies near Kingston as well as in some dense and unfrequented tracts of forest along the base of the Long Mountain; of late, however, I have not met with it again in these localities. This species seems to prefer the thickest woods, where it can pass by short flights from tree to tree. On alighting in a bush or tree, it traverses the branches with facility by a succession of vigorous jumps, when it appears active enough. Usually, however, it will sit on a twig in a dull and sluggish manner, scarcely if at all disturbed by the approach or passing of people. If observed too closely, it will move slowly from branch to branch, peering down through the leaves with the greatest apparent curiosity, all the while assuming very odd postures in its desire to scrutinize the intruder. I can fully bear out the remarks by Gosse as to the fierceness of this bird when taken in the hand. One that had been struck down by a stone from a catapult, and only stunned, could not be held until its beak had been secured; this individual I kept in a cage for a few days. It appeared quite reconciled to confinement, and greedily devoured lizards and roaches, snatching

eagerly at the former the instant they were presented. I always offered the lizards alive, tied at the end of a short thread, when they would be seized and instantly swallowed. Although the object of constant and diligent search, I never succeeded in finding the nest of this species, and I had even begun to despair of obtaining any reliable particulars concerning its mode of nesting. Late in the year 1890, however, a friend, then resident in the Vere district of the Parish of Clarendon, wrote me, saying that he had discovered a nest of this bird, which he described as a loose, flat structure of twigs; it was placed high up on a large tamarind tree and contained one egg. The egg remained in his possession for some time and was eventually broken, so that little more than half of the shell came into my possession. In shape it appeared to have been round-oval, the surface rough or chalky, and in color wholly dull white. I judged it to have been about the size of an average egg of the Savanna Blackbird (*Crotophaga ani*).

126. *Coccyzus minor* (Gmel.).—This Cuckoo I have found to be fairly common in the lowlands of Kingston and St. Andrew. At Port Henderson we frequently met with it among the mangrove thickets, and in the low, swampy lands near the seashore. I am not satisfied, however, that all the examples seen can be safely referred to this species; some individuals appeared smaller and paler and may have been representatives of the Florida variety, *C. m. maynardi*. As, however, I did not procure specimens for identification, the point remains unsettled. Between the months of June and August, several Cuckoos' nests with eggs were taken in the localities just mentioned. Of these a certain proportion can doubtless be safely ascribed to the present species, but in many cases the question of identity was invested with difficulty, *C. americanus* being also a common resident species, frequenting the same localities and nesting in just the same manner as *C. minor*; the points of difference, too, between the species are not such as could be clearly indicated to or appreciated by the native collectors, to whom we were indebted for most of the eggs obtained. Nests were occasionally found in mangrove clumps, more often in the spreading cashaw trees; they were always of the rudest possible construction, just half a dozen or more slender twigs laid without any pretense to arrangement, barely serving to accommodate the eggs; these differ in no appreciable respects from those of *C. americanus*.

127. *Coccyzus americanus* (Linn.).—The Yellow-billed Cuckoo, as stated above, frequents the woods and mangrove thickets at Port Henderson, where we met with it daily. Of the few well authenticated eggs obtained, four now in my possession, taken as late as August 1, were fresh. I have already referred to this Cuckoo as a resident species, though in all probability it may be found to be partially migratory. When at the Morant Cays in April, 1890, one or more of these birds haunted the low bushes along the shores, disappearing, however, in the course of a few days.

128. *Hyetornis pluvialis* (Gmel.).—No notes. I have not met with this species.

129. *Ceryle alcyon* Linn.—Occurs commonly in Kingston harbor during the winter months. Individuals remain certainly until late in April.

130. *Todus viridis* (Linn.).—The Green Tody, or 'Robin' as it is familiarly called, appears to be very generally dispersed throughout the island and may even be said to be common in most parts. In all localities that I have visited, whether on the mountains at high elevations or among the woods of the plains, it has appeared equally abundant at all seasons. Banks of ravines and gullies, where the fringing forest is of dense and varied, but slender, growth, hedges with deep banks, woods and thickets bordering many roadways, and especially the steep, narrow bridle paths that wind up the mountain sides, where the banks are high, may be mentioned as some favored haunts. But of all localities there are few perhaps where these birds occur constantly in such numbers, or which offer more perfect situations for nesting than the gullies before mentioned. Many of these dry water-courses, that during prolonged rains become transformed into rushing, impassable torrents, are of considerable extent, and their sandy beds may be traced for miles inland. One gully in particular, where most of my observations on the habits of the Todies have been made, has a wide and tortuous course and banks that vary in places from low weed-covered mounds, to precipitous cliffs of clay between ten and twenty feet in height. In their choice of a situation for nesting, the birds are somewhat particular, preference being given to low, overhanging, weed-covered banks where the soil is light and friable. The tunnels are rarely, if ever, in high situations, but on the contrary may frequently be found at the sides of the shallow ditches and hollows that are commonly formed in soft soil during heavy rains. I have often surprised the Todies at work. In beginning a tunnel they cling in an awkward manner to the face of the cliff or bank, fluttering the wings frequently as if for support. So far as I have been able to observe, in digging they appear to employ the beak only, and I once took a Tody that had almost the entire half or side of the upper mandible worn away; this, however, was during a period of drought, when all vegetation was burnt and shrivelled, and the earth hard and unyielding. In most cases the whole work of excavation would seem to be performed by the birds, yet, I have noticed (in the gullies at least) that those portions of the banks usually selected for nesting are nearly always riddled with holes and cavities of different depths. Whether the birds ever take possession of one of these, or enlarge others to suit their needs, I have not discovered, but such a proceeding would seem highly probable in view of the labor which the work of excavation frequently entails. When digging into some of these holes in a search for the true nest of a Tody, I often find them in the occupation of strange tenants, such as field mice, lizards and spiders; the latter, black repulsive looking objects, are of common occurrence, especially in the depressions formed by the falling away of stones, etc.; so that some little caution is necessary in prosecuting a search for the eggs of the

bird. The burrows run horizontally and to a considerable depth, but invariably (so far as my experience goes) turn at right angles at a few inches from the entrance. The tunnel terminates in a somewhat rounded cell, where, upon a little heap or bed of fine soft earth, *without any lining whatever*, the eggs are laid; these are usually three or four in number, almost globular, glossy, and of a beautiful pearly white, except that, when fresh, the contents impart a delicate pink tinge to the shell; they are in fact miniature Kingfishers' eggs. Average measurements: .59 × .48 inch.

The Tody breeds early in the year. I have seen young in the nest in April, and have also taken fresh eggs in June, so that probably more than one brood is reared in a season. Below are a few dates on which I have found or taken sets of eggs, all fresh: May 19, clutch of 3; May 20, 3; and May 24, 4; June 2, 2.

The account of the nesting of the Tody, communicated to Gosse by the late Richard Hill ('Birds of Jamaica,' p. 77), is in some respects incorrect, and obviously is not the result of personal observation, for it is difficult to understand how any one familiar with the nesting of the birds could fall into the error of speaking of the eggs as "grey, brown-spotted." With respect to the "nest" or lining of "pliant fibres and dry moss and cotton" which Hill expressly states is used, I can only say that my experience does not bear out that assertion. On no occasion have I found anything like an attempt at a nest or lining, as described above, and I have examined scores of nest-holes of this bird in many different localities.

The tameness of the Tody is well known, but, as Gosse well remarks, this seems rather the tameness of indifference than of confidence. I have accomplished the capture of specimens with a butterfly net at different times with little difficulty, and frequently a Tody has permitted so near an approach that I have been tempted to put out my hand in the hope of taking it.

The Todies keep in pairs, if not constantly, for the greater part of a season at least, and during nidification seem to range over a very circumscribed space. Their food appears to consist exclusively of small insects which they usually pursue and take after a short flight, returning constantly to the same twig, where they will patiently sit and watch, with head drawn in and beak pointing obliquely upwards, the plumage much puffed out; the wings meanwhile being flirited by a continuous, rapid, vibratory movement.

132. *Sphyrapicus varius* (Linn.).—A winter visitor, concerning whose habits I have no notes. Specimens in the Museum are labelled St. Georges, Portland, January.

133. *Centurus radiolatus* (Wagl.).—A bird of common occurrence in all well wooded districts, though I have never noted it near Kingston. Among the spreading guango trees that shade the large grass pastures of many cattle-pens in the lowlands, this Woodpecker may nearly always be seen. In one such situation near Port Henderson where there was quite a forest of guango trees, including many of unusual size, I have

counted more than a dozen of these birds within an area considerably less than an acre in extent. In the same locality, too, I have on more than one occasion surprised a Woodpecker feeding on the brilliant scarlet berries of the 'clammy-cherry'; they will also eat the berries of the pimento and, as I am assured, the fruit of the wild fig.

I have seen the nest holes of this species but the situations were always too inaccessible to admit of my examining them. Three eggs in my collection, from the Parish of St. Thomas, measure 1.11 X .74 inch.

RECENT LITERATURE.

Bendire's 'Life Histories of North American Birds.'*—The first of a series of volumes, entitled as above, is now before us. It treats of 146 species and subspecies, beginning with the Grouse and ending with the Owls, thus including the Gallinaceous Birds, the Pigeons, and the Birds of Prey. This long contemplated work, all things considered, could not have fallen to better hands, or appeared under more favorable auspices. It early interested the late Professor Baird, who for many years cherished the plan of publishing, under the auspices of the Smithsonian Institution, a comprehensive work on this subject. It was begun, indeed, as early as 1857, when a small volume was published on the Hawks and Owls, under the authorship of the late Dr. T. M. Brewer. It was found necessary, however, to discontinue the enterprise, for lack of sufficient material. During the thirty-five years that have since elapsed, not only has our knowledge of the subject greatly increased, but the materials for description and illustration have multiplied many fold. While there are still deficiencies, they are comparatively few, and perhaps the best way to supply them is to publish what is known and thus the more pointedly draw attention to the gaps in our knowledge of the subject. In a work of this magnitude it is a great thing to have made a start, and we trust the present volume is but the forerunner of a series of volumes to appear at frequent intervals till the grand undertaking is completed.

Captain Bendire's method of treatment seems well chosen; the matter, as too often is the case in 'egg-books,' is not limited to a description of nests and eggs, but includes, as the title implies, the general life histories of the species treated—their geographical distribution, their migrations,

* Smithsonian Institution. | United States National Museum. | Special Bulletin No. 1. | — | Life Histories | of | North American Birds | with special reference to | their Breeding Habits and Eggs, with | Twelve Lithographic Plates. | By | Charles Bendire, Captain, U. S. Army (Retired), | Honorary Curator of the Department of Oölogy, U. S. National Museum, | Member of the American Ornithologists' Union, | — | Washington: | Government Printing Office. | 1892.—4to, pp. viii, 414, and 12 colored plates.

their breeding ranges, their nesting habits, and their food. In many cases, in respect to materials, as in the case of well-known species, there is an embarrassment of riches, and the question is what to select and how much is really worthy of reproduction. In many cases, however, it is far otherwise, and the striking feature of Captain Bendire's work is the amount of wholly new material it contains, drawn either from his many years of personal experience in the field, largely in comparatively unknown portions of the Far West, or from the letters of his many correspondents in all parts of the country. Much of this original information has evidently been especially solicited for the present work.

Captain Bendire's style is simple and direct, with no attempt at embellishment or literary effect, but this is more than compensated by the care and thoroughness with which every aspect of the subject is presented. Doubtless there are some deficiencies of detail that might have been remedied, but as a whole the book is eminently satisfactory as a compendium of the subject of which it treats. It is unencumbered with tables of synonymy and bibliographical references, although due credit is given in foot notes to the sources from which previously published information has been drawn. In his official capacity as Curator of the Department of Oölogy in the United States National Museum, recently so greatly enriched by his own unrivalled collection, he has had the fullest access to abundant material, which, however, he has been able to supplement when necessary by that of scores of willing collaborators in the same field. The illustrations are on a liberal scale, and in execution are above criticism. It is perhaps safe to say that they are the best egg plates, taking the series as a whole, ever produced, at least in this country and probably anywhere.—J. A. A.

Ridgway's 'The Humming Birds.*'—Under this title Mr. Ridgway has made a most welcome contribution to the literature of this fascinating group of birds, giving as it does a general account of their structure and habits, and a detailed account of the species met with in the North American fauna, as limited in the A. O. U. Check-List. He gives first a brief summary of the literary history of the group, extracted largely from Coues's well-known bibliography of the family, followed by remarks on 'Geographical Distribution' and 'Migrations.' Then follows an account of their 'Habits,' their general traits being discussed under the minor headings, 'Actions and Attitudes,' 'Manner of Flight,' 'Disposition,' 'Intelligence,' 'Nests and Eggs,' and 'Food,' the whole occupying about twenty pages. The nidification of Hummingbirds is illustrated by fourteen plates of nests, three of which are original and the rest from Gould. Under 'Characters and Relationships' are discussed their affinities to

* The Humming Birds. By Robert Ridgway, Curator, Department of Birds. Report of the U. S. National Museum for 1890, pp. 253-383, with pl. xliii and 47 cuts in the text. [July, 1892.]

other birds, this section including also a contribution on the anatomy of Hummingbirds by Mr. Frederic A. Lucas (pp. 290-294, pl. xv, and figs. 1-4). Under 'Variations' are described and profusely illustrated the wide range of external structure, as affecting the general size, the form and structure of the bill (figs. 5-14), the wing (figs. 15-25), and the tail (figs. 26-29, and pls. xvi-xxiv, in all 45 figures), and also the head and throat ornaments, etc., (Figs. 30-46, and pls. xxvi-xxxiv). By means of the copious illustrations a very good idea is conveyed of the very diverse forms of structure of bill, wings, tail, and head ornaments present in the various groups of this exceptionally numerous and diversified family. A few pages are given to 'Colors of the Plumage,' and 'Cause of the Changeable Hues of Humming Birds,' with brief descriptions of some of the more brilliantly colored species.

The last half of the paper (pp. 312-383) is devoted to 'Humming Birds of the United States.' These number seventeen species, of which only seven can be considered as characteristic of the region, the other ten either barely crossing our border or being of purely casual occurrence. The 'Key to the Genera' given, however, includes all of the genera found in Mexico, Cuba, and the Bahamas, as well as in the United States, being in fact an 'adaptation' of that given in the same author's 'Manual of North American Birds.' Uncolored original figures are given (pls. xxxv-xlvi) of thirteen of the species, including *Trochilus violajugulum* Jeffries, and *Selasphorus floresii* Gould, the former known only from the type, the other "accidental near San Francisco, California," and known only from this and one other specimen, the latter from Bolaños, Mexico.

Detailed descriptions are also given of several species wrongly attributed to North America, namely: *Lampornis nigricollis* (Vieill.), a South American species attributed to Florida by Audubon; *Atthis heloisa* (L. & DeL.), of Eastern Mexico, wrongly attributed to El Paso, Texas, through misidentification of a young example of *Stellula calliope*; and *Agyrtria tobaci* (Gm.), of northern South America, supposed (in all probability erroneously) to have been taken at Cambridge, Mass.

A vast amount of general information about Hummingbirds is thus brought together, in addition to an elaborate and very detailed account of those occurring north of the West Indies and Mexico, with some account of their nearest congeneric allies found in the contiguous regions to the southward.—J. A. A.

Merriam on the Life Areas of North America.—In his recent Presidential Address before the Biological Society of Washington Dr. Merriam* resumes consideration of the geographic distribution of life in North America, a subject already treated by him at some length in 'North Amer-

* The Geographic Distribution of Life in North America with Special Reference to the Mammalia. Annual Presidential Address, delivered at the Twelfth Anniversary Meeting of the Biological Society of Washington, February 6, 1892. By C. Hart Merriam, M. D. Proc. Biol. Soc. of Washington, Vol. VII, pp. 1-64, with map. April, 1892.

ican Fauna' (No. 3, Sept. 1890, and No. 5, Aug. 1891. See Auk, VIII, pp. 95-98). In this paper he gives (after a few pages of introductory remarks) a general historical review of the subject (pp. 6-21), followed by an extended discussion of the 'Life Regions and Zones of North America' (pp. 21-38), and closing with an exposition of the 'Causes controlling Distribution,' including 'Remarks respecting some of Wallace's Fallacies' (pp. 39-64). The historical synopsis of the proposed faunal and floral divisions of North America gives, in tabular form, the views of 56 different writers on the subject, ranging in date from 1817 to 1891, of whom 31 were zoölogists and 25 botanists. From this synopsis it appears "that a number of zoölogists and botanists, basing their studies on widely different groups, and as a rule ignorant of the writings of their predecessors, have agreed in the main in the recognition of at least seven (7) life areas in extratropical North America, namely: (1) an *Arctic area* north of the limit of tree growth; (2) a *Boreal transcontinental coniferous forest region*; (3) an *Atlantic or Eastern wooded region*, stretching westward from the Atlantic to the Great Plains; (4) a *Central or Middle region* reaching from the Plains to the Sierra Nevada and Cascade Mountains; (5) a *Pacific or Californian division*, covering the area between the east base of the Sierra and the Pacific Ocean; (6) a *Louisianian or Austroriparian division*, comprising the South Atlantic and Gulf States south of latitude 36°; (7) a *Sonoran division*, occupying the high table land of Mexico and stretching northward over the dry interior far enough to include the southern parts of California, Nevada, Arizona, New Mexico, and Texas" (p. 21). In addition to this it has of late been the custom of zoölogists, or more particularly ornithologists, to subdivide the eastern portion of North America into a series of lesser divisions or faunas, as (1) the Arctic, (2) the Canadian, (3) the Alleghanian, (4) the Carolinian (5) the Louisianian, and (6) the Floridian.

Dr. Merriam's investigations have led him to adopt a somewhat different classification, which may be presented in tabular form somewhat as follows :

I. BOREAL REGION.

1. *Arctic Division.*
2. *Boreal Coniferous Forest Region.*
 - a. Hudsonian Zone.
 - b. Canadian Zone.
 - c. Timber-line Zone.

Neutral or Transition Zone.

II. SONORAN REGION.

1. *Upper Sonoran Zone.*
 - a. Humid Upper Sonoran.
 - b. Arid Upper Sonoran.
2. *Lower Sonoran Zone.*
 - a. Humid Lower Sonoran.
 - b. Arid Lower Sonoran.

III. TROPICAL REGION.

The Boreal Region, as defined by Dr. Merriam, "extends obliquely across the entire continent from New England and Newfoundland to Alaska and British Columbia, and from about latitude 45° north to the Polar Sea," the southern border, however, receding northward "to about latitude 54° on the plains of the Saskatchewan." It extends southward in three long arms down the "three great mountain systems of the United States—an eastern arm in the Alleghanies, a central arm in the Rocky Mountains, and a western arm in the Cascades and Sierra Nevada." This latter bifurcates, "the main fork following the lofty Cascade and Sierra ranges to about latitude 36° , the other following the coast, gradually losing its distinctive characters . . . until it disappears a little north of San Francisco" (pp. 22, 23). It is divided into (1) an Arctic division, and (2) a Boreal Coniferous Forest division (p. 24). The Arctic division corresponds to the 'Arctic Realm,' 'Arctic Region,' 'Arctic Province,' etc., of nearly 30 previous writers on the subject, of whom about three fourths have accorded it a rank of the first class, and about one fourth as a region of the second class or grade, as is done by Dr. Merriam. The Boreal Coniferous Forest division is about equivalent to the Hudsonian and Canadian faunas (of most recent writers) combined, with their extension westward to the Pacific coast. These subdivisions are referred to by our author as forming "at least two transcontinental zones," called by him respectively 'Hudsonian Zone' and 'Canadian Zone'; he also says "a third or Timberline Zone may be differentiated from the Hudsonian proper" (p. 24).

The Sonoran Region is described as stretching "across the continent from Atlantic to the Pacific, covering nearly the whole country south of latitude 43° and reaching northward on the Great Plains and Great Basin to about latitude 48° ," excepting of course the areas along the three principal mountain systems occupied by the southward extension of the Boreal Region, as already explained. "To the southward it occupies the great interior basin of Mexico and extends into the tropics along the highlands of the interior," and covers all but the extreme southern part of the peninsula of Lower California (p. 26). The Sonoran Region is divisible "into two principal transcontinental zones (*a*) *Upper Sonoran*, and (*b*) *Lower Sonoran*; and each of these may again be subdivided into *arid* and *humid* divisions" (p. 27). The 'humid division' of the Upper Sonoran "comprises the area in the eastern United States commonly known as the Carolinian Fauna," and merges into the 'arid division' of the Upper Sonoran near the 100th meridian. The arid division spreads over the Great Plains, reaching an altitude of about 4000 feet along the eastern foot of the Rocky Mountains in the latitude of Colorado, and extending obliquely northward along the Missouri through North Dakota and into eastern Montana. "Another subdivision of the arid Upper Sonoran occupies the greater part of the Great Basin between the Rocky Mountains and the High Sierra, reaching northerly . . . to and including the plains of the Columbia and Snake Rivers." There is also another area

in the interior basin of California, occupying the valley of the Sacramento and San Joaquin Rivers, and a branch extends along the coast between Monterey and the Santa Barbara plain (p. 30).

The 'humid' division of the Lower Sonoran corresponds to what has been commonly termed the Lousianian Fauna, or the 'Australoriparian' of some writers. "It begins on the Atlantic seaboard at the mouth of the Chesapeake Bay and stretches thence southwesterly, embracing the alluvial lands of the South Atlantic and Gulf States below what geologists know as the 'fall line,' rising in the Mississippi bottom as far as the junction of the Ohio with the Mississippi, and following the former in a narrow strip to the point where it receives the Wabash. On the west side of the Mississippi it crosses Arkansas, reaching southern Missouri and southeastern Kansas, and spreads out over Indian and Oklahoma Territories and Texas, where it loses its moisture and merges insensibly into the arid Sonoran" (p. 28). The 'arid' Lower Sonoran extends thence westerly, "covering southern New Mexico and Arizona south of the plateau rim (sending a tongue up the Rio Grande to a point above Albuquerque), the west side of which it follows northerly to the extreme northwestern corner of Arizona and the southwestern corner of Utah (where it is restricted to the valley of the lower Santa Clara, or St. George Valley), and thence westerly across Nevada, . . . and thence curving southwesterly . . . covers the whole of the Mohave and Colorado Deserts and all the rest of southern California except the mountains." It also includes most of the peninsula of Lower California, and occupies a small area in the San Joaquin and Sacramento Valleys (p. 28). Respecting Lower California he adds: "It is evident, however, that the peculiar fauna of the peninsula of Lower California entitles it to rank as a minor subdivision of the Lower Sonoran Zone. It is in effect an insular fauna of recent origin, bearing the same relation to that of the main land as do several of the adjacent islands" (p. 30).

Between the Boreal and Sonoran Regions Dr. Merriam recognizes what he terms a 'Neutral or Transition Zone,' which has also a humid and an arid division. The former corresponds to what is generally known as the Alleghanian Fauna, while the arid division is its western equivalent. It forms for the most part a pretty broad belt, characterized by the overlapping of boreal and 'Sonoran' types. This 'Transition Zone,' as described in the text and as laid down on the accompanying map, suggests one or two troublesome queries. How, for example, is this 'Transition Zone' to be classified—as a part of the 'Boreal Region' or as a part of the 'Sonoran Region?' or does it belong to neither? If so, what is its status? Obviously, so far as nomenclature goes, it is that of a minor region interposed between, and thus wholly separating, two primary regions! It is apparently co-ordinate in rank with the 'Upper Sonoran' and the 'Lower Sonoran' Zones, respectively, and also with the 'Hudsonian' and 'Canadian' zones. While we are willing to accord it this rank, and are thus in agreement with our author so far as the facts are concerned, we should much

prefer to assign it definitely to one or the other of the contiguous regions, and if called upon to make the assignment we should with little hesitation add it to the so-called 'Sonoran' Region, with which on the whole it seems to be most closely related.

In this connection we would reiterate our protest (see Auk, VIII, p. 98, last part of last paragraph) against the use of the term *transitional* as a specific designation for any faunal area of whatever grade or character. Until nature devises some means of erecting hard and fast barriers abruptly limiting the habitats of animals, there must be between any two contiguous faunal areas a belt of neutral or transitional territory, more or less marked according to circumstances. The Hudsonian Zone, for example, is a 'transition' zone between the Arctic and Canadian, or at least its northern half may be so considered, while the Lower Sonoran Zone is likewise 'transitional' between the Tropical Region and the Upper Sonoran; and so on.

"The Tropical Region reaches the United States at two remote points—Florida and Texas. In the former it exists as a narrow subtropical belt encircling the southern half of the Peninsula from Cape Malabar on the east to Tampa Bay on the west. In Texas it crosses the Lower Rio Grande from Mexico and extends north to the neighborhood of the Nueces River. In western Mexico the Tropical Region reaches Mazatlan" (p. 33).

Dr. Merriam considers his subject especially from the standpoint of mammals, and tabulated lists of the genera and species distinctive of the different zones and life areas are given. Yet his consideration of the subject is by no means limited to this class of animals, but relates as well to plants and land animals in general. After passing in review the special subject of his address, he devotes considerable space to the consideration of general subjects, discussing at some length the influence of the glacial period upon the present character and distribution of life in North America and the origin of its present fauna. He also considers the causes controlling distribution, and emphatically identifies himself with the long list of eminent authorities who believe that the solution of the whole question may be found in climatic conditions. In this connection attention is called to Mr. A. R. Wallace's assumption that temperature has comparatively slight influence upon the distribution of animal and vegetable life, and especially to his various misstatements and erroneous assumptions respecting the distribution of life in North America and the limiting effects of mountain barriers to its distribution. In commenting on the so-called 'Nearctic' and 'Palæartic' Regions of Sclater, he shows that of the 31 'boreal' genera of North American mammals 77 per cent are common to Boreal America and Boreal Eurasia. Facts of similar import are cited in reference to insects. In conclusion Dr. Merriam observes: "I see no reason why a homogeneous circumpolar fauna of great geographic extent should be split up into primary regions possessing comparatively few peculiar types simply because a water separation happens to exist in the present geologic period; nor is it evident why one of the resulting feeble divisions should be

granted higher rank than a region of much less geographic extent comprising several times as many peculiar types. Hence the divisions here recognized, and the rank assigned them, are based as far as possible upon the relative numbers of distinctive types of mammals, birds, reptiles, and plants they contain, with due reference to the steady multiplication of species, genera, and higher groups from the poles toward the tropics."

Dr. Merriam's studies of the life areas of North America have evidently had a wide scope, and have been prosecuted systematically and with great thoroughness. His historical review of what has been done in this field by previous workers, including a collation and tabulation of their results, is alone a most useful and important contribution to the subject, as well as an admirable preparation for further research. His experience in the field also has given him the rare advantage of a personal knowledge of a large part of the area he attempts to treat, and the opportunity of studying on a grand scale the relation of cause and effect in the distribution of animal and vegetable life. Besides possessing great familiarity with the literature of the subject, he has at his command a mass of as yet unpublished details resulting from years of field work on the part of himself and a large corps of collectors and assistants, systematically directed for the express purpose of accumulating data bearing on the distribution of life in North America. With such resources at his command one may well hesitate to criticise his results, as unfolded in his several papers above cited. Yet there are some points we had hoped to see settled that are still left in abeyance, one being a consistent and well-grounded system of nomenclature for the various life areas recognized. Hitherto each writer has adopted such designations as seemed to him most convenient, with little regard to preceding systems and terminology. As we hope soon to treat this phase of the subject somewhat in detail in another connection, we will merely add here that so far as Dr. Merriam's areas are concerned, their boundaries, and in the main their assumed relationships, we are in hearty accord with his results. As regards his classification and nomenclature, we should prefer sundry changes, which, however, may not be in conflict with Dr. Merriam's own views. Evidently he has not thus far attempted to present a systematic scheme of terminology, his designations for different areas being descriptive and provisional rather than the outgrowth of a broad scheme of classification, as regards their relative rank and systematic terminology. — J. A. A.

Suchetet on Hybridity in Birds.—The third part of M. Suchetet's work on 'Hybridity among Birds in a Wild State'* treats of the Passeres, and forms about 280 octavo pages. It shows a vast amount of painstaking

* Les Oiseaux Hybrides | rencontrés a l'état sauvage | par | André Suchetet | — | Troisième Partie | Les Passereaux | — | Extrait des Mémoires de la Société Zoologique de France | Tome V. page 253, année 1892. | — | Lille | Imprimerie typographique et lithographique le Bigot Frères | 68, rue Nationale, et 9-II, rue Nicolas-Leblanc | 1892. — 8vo., pp. 179-451 + i-v.

research, and seems to cover very thoroughly the literature of the subject. He appears to weigh the evidence, for the most part, very judiciously, but, as he himself deplores (p. 191), he is seriously handicapped in his task by the fact that he is not professionally an ornithologist, and is thus untrained in the technique of the science. He is hence hopelessly at sea where questions of nomenclature, synonymy, and classification are concerned, the status of species and subspecies and of questionable forms proving frequent and troublesome stumbling-blocks in his way. He has, however, brought together a large amount of information bearing on the subject in hand, which, aside from its intrinsic interest, will be a valuable aid to any investigator desirous of pursuing the subject further.

After sifting the available evidence, he reaches the conclusion (p. 442) that the authentic instances of crossing in a state of nature between birds of unquestioned specific distinctness number only 24, many of which are between species commonly referred to distinct genera. Among types which he considers merely races or varieties of the same species he adduces 20 cases, to which he adds 7 others he thinks should be entered in the same category. He cites 34 additional alleged cases where to him the evidence is not, for one reason or another, wholly satisfactory. His work is well worthy of careful examination by those especially interested in the subject of hybridity. Unfortunately the text is greatly marred by incorrect spelling of personal and geographical names, to such an extent indeed as to give the effect of careless composition and a generally unscholarly appearance.—J. A. A.

Minor Ornithological Publications.—

American Field.

'The American Field' was last noticed here in Vol. VIII, pp. 387-392, where the record was carried through Vol. XXXIV. Since then it has not contained much ornithology, the only contributions worthy of mention in Vols. XXXV-XXXVII (Jan., 1891, -June, 1892) being the following (Nos. 2452-2465).

2452. *Birds Observed in Alabama*. By W. C. A[very]. 'American Field,' Vol. XXXV, No. 1, Jan. 3, 1891, p. 8; No. 2, Jan. 10, 1891, p. 32; No. 3, Jan. 17, 1891, p. 55. — An interesting 'local list.' For the previous parts of the paper see Auk, VIII, 392, No. 2111.

2453. *Days with the Waterfowl of America*. By Dr. F. Henry Yorke. *Ibid.*, No. 2, Jan. 10, 1891, pp. 25-27, No. 3, Jan. 17, 1891, pp. 49-51, No. 4, Jan. 24, 1891, pp. 73-74, No. 5, Jan. 31, 1891, pp. 97-99, [*Anas discors*]; No. 6, Feb. 7, 1891, pp. 121-123, No. 7, Feb. 14, 1891, pp. 145-147, [*Anas boschas*]; No. 8, Feb. 21, 1891, pp. 169-171 [*Anas boschas*, *Grus mexicana*, *Botaurus lentiginosus*]; No. 9, Feb. 28, 1891, pp. 193-195, No. 10, March 7, 1891, pp. 217-219, No. 11, March 14, 1891, pp. 245-247, [*Anas boschas*]; No. 12, March 21, 1891, pp. 269-271, No. 13, March 28, 1891, pp. 293-295,

[American Field.—Continued.]

[*Aythya marila nearctica et al.*]; No. 14, April 4, 1891, pp. 317-319, No. 15, April 11, 1891, pp. 341-343, [*Dafila acuta*]; No. 16, April 18, 1891, pp. 365-367, No. 17, April 25, 1891, pp. 389-391, [*Aythya americana*]; No. 18, May 2, 1891, pp. 413-415 [*Aythya collaris*]; No. 19, May 9, 1891, pp. 453-455 [*Aythya vallisneria*]; No. 20, May 16, 1891, pp. 485-487, No. 21, May 23, 1891, pp. 509-511, [*Aix sponsa*]; No. 22, May 30, 1891, pp. 533-535 [*Anas carolinensis*]; No. 23, June 6, 1891, pp. 561-563 [*Auser albifrons gambeli* and *Chen hyperborea*]; No. 24, June 13, 1891, pp. 589-591, No. 25, June 20, 1891, pp. 613-615, [*Branta canadensis*]; No. 26, June 27, 1891, pp. 641-643 [*Branta canadensis*, *Olor columbianus* and *O. buccinator*].—Narratives of duck-shooting, containing considerable information upon the habits of the species above noted. See Nos. 2459 and 2460.

2454. [*Self-domestication of Colinus virginianus*]. By Kaiser. *Ibid.*, No. 3, Jan. 17, 1891, p. 55.

2455. *The Need of a More Thorough Study of the Muscular System in Birds*. By R. W. Shufeldt. *Ibid.*, No. 5, Jan. 31, 1891, p. 104.

2456. *The American Swan*. By John Dean Caton. *Ibid.*, No. 7, Feb. 14, 1891, pp. 150-151. — *Olor columbianus* and *O. buccinator*.

2457. *American Swans*. By Thos. G. Farrell. *Ibid.*, No. 12, March 21, 1891, pp. 274-275.

2458. *A Long-ago Visit to Lake De Smet*. By R. W. Shufeldt. *Ibid.*, No. 13, March 28, 1891, pp. 299-300. — In Wyoming. Various birds mentioned.

2459. Dr. Yorke's Articles. Editorial. *Ibid.*, Vol. XXXVI, No. 2, July 11, 1891, p. 25. — Critical of No. 2453. See also No. 2460.

2460. Dr. Yorke's Letters. By Thos. G. Farrell. *Ibid.*, p. 27.

2461. [Habits of *Gallinago delicata*]. By Naumkeag. *Ibid.*, p. 31.

2462. [*Colinus virginianus* breeding in domestication.] By W. N. Waller. *Ibid.*

2463. [Connecticut shore birds.] By A. W. J. *Ibid.*, No. 7, Aug. 15, 1891, p. 151. — *Totanus flavipes*, *Charadrius dominicus* and *Numenius hudsonicus*.

2464. Hatching and Rearing Quails in Captivity. *Ibid.*, No. 11, Sept. 12, 1891, p. 250. — From the Philadelphia 'Public Ledger.'

2465. How Snipes Rise. By Dace. *Ibid.*, No. 21, Nov. 21, 1891, p. 494. — *Gallinago delicata*.

Forest and Stream.

The last notice of 'Forest and Stream' was in pages 66-69 of the present volume. In Vols. XXXVII and XXXVIII (July, 1891, - June, 1892) are the following (Nos. 2466-2517).

2466. *Those Grouse Chicks*. By Jay Beebe. 'Forest and Stream,' Vol. XXXVII, No. 1, July 23, 1891, p. 4. — *Bonasa umbellus*.

2467. *The Carolina Paroquet*. By Frank M. Chapman. *Ibid.*, No. 3, Aug. 6, 1891, p. 44. — Request for information concerning it.

[Forest and Stream.—Continued.]

2468. *Leaves from a Note-book.* By Shoshone. *Ibid.*, No. 4, Aug. 13, 1891, pp. 63-64. — Notes on *Dendragapus obscurus* and *Anas boschas*.
2469. *Carolina Paroquet.* By Theodore Gordon. *Ibid.*, p. 64.
2470. *Rearing Quail in Confinement.* By O. O. S. *Ibid.*, No. 5, Aug. 20, 1891, p. 83.
2471. *Pennsylvania Notes.* By W. *Ibid.* — Birds breeding at Kane, McKean Co.
2472. *Rearing Game Birds.* By M. B., Hugh D. Auchincloss, Ernest E. Thompson, et al. *Ibid.*, No. 7, Sept. 3, 1891, pp. 123-124. — Golden Pheasant, Mongolian Pheasant, Sharp-tailed Grouse, Bob-white, and other species.
2473. *Ways of the Ruffed Grouse.* By Dorp. *Ibid.*, p. 126.
2474. *Chen rossii in Montana.* By George Bird Grinnell. *Ibid.*, No. 8, Sept. 10, 1891, p. 144.
2475. *Ways of the Ruffed Grouse.* By Dorp. *Ibid.*, No. 9, Sept. 17, 1891, p. 163.
2476. *Pennsylvania Bird Notes.* By W. *Ibid.*, No. 10, Sept. 24, 1891, pp. 182-183. — *Thryothorus bewickii* and *Corvus c. principalis*, among other species.
2477. *Late Birds' Nests.* By D. W. D. *Ibid.*, p. 183. — *Colinus virginianus*.
2478. *The Carolina Paroquet in Florida.* By John M. McCrary and August Koch. *Ibid.*
2479. *Notes from the Game Fields.* By T. H. B[ean?] et al. *Ibid.* — Notes *Oidemia deglandi* and *Ectopistes migratorius* summering at Wood's Holl, Mass.
2480. *Fishing with Trained Cormorants.* By F. S. Dugmore. *Ibid.*, p. 186; No. 11, Oct. 1, 1891, p. 208; No. 12, Oct. 8, 1891, pp. 231-232; No. 13, Oct. 15, 1891, p. 252.
2481. *Ways of the Ruffed Grouse.* By Dorp. *Ibid.*, No. 11, Oct. 1, 1891, p. 207.
2482. *Birds of the Chehalis Forests.* By Robert H. Lawrence. *Ibid.*, No. 13, Oct. 15, 1891, p. 247. — In western Washington.
2483. *Ways of the Ruffed Grouse.* By E. W. L. and Dorp. *Ibid.*
2484. *A Virginia Rail in New York City.* By Spencer Aldrich. *Ibid.*
2485. *Stalking of the Drumming Grouse.* By F. G. H. *Ibid.*
2486. [*Notes from Cando, N. D.*] By E. T. Judd. *Ibid.*, p. 250. — Migration of Snow, Hutchins's, and Canada, Geese.
2487. *Some New Varieties of Bird Song.* By Julia M. Hooper. *Ibid.*, No. 14, Oct. 22, 1891, p. 268.
2488. *A Nesting Woodcock.* By H. E. P. *Ibid.*
2489. *The Antics of a Tame Jay.* By D. W. D. *Ibid.*, No. 16, Nov. 5, 1891, p. 307.
2490. *Nest of Ruby-crowned Kinglet.* By H. Austen. *Ibid.*, No. 19, Nov. 26, 1891, p. 368.

[Forest and Stream.—Continued.]

2491. *Ways of the Ruffed Grouse*. By Dorp. *Ibid.*, No. 20, Dec. 3, 1891, p. 390.
2492. *Ways of the Ruffed Grouse*. By Dorp. *Ibid.*, No. 21, Dec. 10, 1891, p. 410.
2493. *Ways of the Ruffed Grouse*. By Dorp. *Ibid.*, No. 22, Dec. 17, 1891, p. 426.
2494. [*Ways of the Grouse.*] By Dorp. *Ibid.*, No. 24, Dec. 31, 1891, p. 469.
2495. *Wildfowl at Cohasset*. By E. H. Clark. *Ibid.*, Vol. XXXVII, No. 1, Jan. 7, 1892, p. 9.
2496. *Gambel's Partridge*. By Chas. E. Bendire. *Ibid.*, No. 2, Jan. 14, 1892, p. 27.
2497. *The Summer Roosts of Birds*. By Hermit. *Ibid.*, No. 3, Jan. 21, 1892, p. 52.
2498. *Shore Birds near Toronto*. By C. W. Nash. *Ibid.*, No. 4, Jan. 28, 1892, p. 77. — An annotated list of 31 species.
2499. *The Bald Eagle*. By Chas. E. Bendire. *Ibid.*, No. 8, Feb. 25, 1892, p. 172.
2500. *Wild Geese in Winter*. By Annie E. Preston and the editor. *Ibid.*, No. 9, March 3, 1892, p. 196.
2501. *The Instinct of the Cowbird*. By M. A. Walton. *Ibid.*, No. 12, March 24, 1892, pp. 271-272.
2502. *Tamed Hummingbirds*. By Julia M. Hooper. *Ibid.*, p. 272. — *Trochilus colubris*.
2503. *The Brown Pelican*. By Morris Gibbs. *Ibid.*, No. 13, March 31, 1892, p. 296.
2504. *The Ousel in Oregon*. By O. O. S. *Ibid.*, No. 14, April 7, 1892, p. 319.
2505. *Birds in Central New Brunswick*. By W. H. Moore. *Ibid.* — Near Scotch Lake.
2506. *Seen From My Window*. By Immer Dein. *Ibid.*, p. 320. — Winter birds at Comox, British Columbia.
2507. *Chickens Using Among Cattle*. By Charles Hallock. *Ibid.* — *Tympanuchus americanus*.
2508. *Spring Weather in the Adirondacks*. By R. S. Spears. *Ibid.*, p. 324. — Spring arrivals at Northwood, N. Y.
2509. *Taming Hummingbirds*. By Didymus. *Ibid.*, No. 15, April 14, 1892, p. 348. — *Trochilus colubris*.
2510. *Young Woodcock in March*. By Charles Hallock. *Ibid.* — In North Carolina.
2511. *The White Swan*. By Pigarth and the editor. *Ibid.*, No. 16, April 21, 1892, p. 372. — *Olor columbianus* at Harrisburg, Penn.
2512. *The Water Ousel*. By S. H. Greene. *Ibid.*, No. 17, April 28, 1892, p. 395.
2513. *Wild Pigeons*. By Taxi. *Ibid.*, No. 18, May 5, 1892, p. 418. — At Larimore, N. D.

[Forest and Stream.—Continued.]

2514. *Massachusetts Sharptail Grouse*. By Newton Dexter. *Ibid.*, No. 22, June 2, 1892, p. 517. — Contains a note on *Phalaropus lobatus*.
2515. *Ways of the Ruffed Grouse*. By Dorp. *Ibid.*, p. 520.
2516. *Prot[h]oontary Warbler in Massachusetts*. By C. E. B. *Ibid.*, No. 24, June 16, 1892, p. 562.
2517. *Butcher Birds and Hawks*. By Didymus. *Ibid.*, No. 25, June 23, 1892, p. 588. — *Lanius ludovicianus*. — C. F. B.

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GENERAL NOTES.

Habits of the Herring Gull. — In Mr. G. H. Mackay's very interesting article on the Herring Gull, in the July number of 'The Auk', he states that it is with some hesitation that he regards them as gregarious, for they apparently only come together when there is some particular reason for so doing, and not because they *like* to. My own impression was just the reverse of this, but I must admit that my observations have been made but casually, and that I have not observed the Gulls with the care that Mr. Mackay has devoted to the subject. I should have said that Gulls scattered in search of food at high water, but came together sociably at other times.

At Plymouth, Mass., it used to be no uncommon sight to see the greater part of the Gulls in the neighborhood gathered in one vast flock on the outer side of the long sand spit, known as the 'Beach.' This, if my memory serves me aright, usually took place some little time after low water. The Gulls were not feeding, but resting and preening their feathers, and, unless disturbed by man, they would remain until driven away by the advancing tide.

At high water the Gulls were widely scattered, searching for floating food, and as the flats in the harbor were left bare by the receding tide the Gulls would gather here and there in small flocks looking for food. At

nightfall the Gulls seemed to fly in one direction,—northward,—as if they roosted together, and when low water came at night, they might be heard at intervals calling from the flats. At Mingan and Percé the Herring Gull breeds in colonies, and here, too, their querulous cries might be heard at all times throughout the night.

The term "wary and observing bird" is applicable to most Gulls, even where they are not especially sought after. In Valparaiso harbor, where the rules of the port prohibit the firing of guns, *Larus dominicanus* was extremely tame, feeding about the vessels and frequently alighting on their jib-booms. Just without the harbor they were shy and vigilant. Here, too, the greater part of the Gulls departed toward nightfall in one direction, apparently for the purpose of roosting together, sometimes leaving in flocks of fifty or more. — F. A. LUCAS, *Washington, D. C.*

Another Specimen of the Labrador Duck.—As an addition to Mr. Dutcher's list of specimens of *Camptolaimus labradorius* present in other collections (see 'The Auk. 1891, p. 201), I beg to state that the Dresden Museum possesses a female example, as to the history of which, however, I am only able to say that it was in Dresden before the year 1850 when Reichenbach published a figure of it in his 'Handbuch der speciellen Ornithologie: Natatores.' It has all the appearance of an antique specimen, and, that it is so, is further shown by the handwriting on the old label, according to which it came from Labrador. — A. B. MEYER, M. D., *Dresden, Saxony.*

Ereunetes occidentalis in Connecticut.—Mr. C. C. Hamner, while collecting shore birds with me at Lyme, Conn., Sept. 4, 1889, shot three birds of this species. There were six of them in all, and they were quite noticeable among the *Ereunetes pusillus* with which they were associated, on account of their longer bill. These birds were kindly identified by Dr. J. A. Allen, and are now in the collection of Mr. John H. Sage, Portland, Conn. — WILLARD E. TREAT, *East Hartford, Conn.*

Totanus flavipes and Charadrius dominicus.—Mr. William S. Kimball of Rochester, N. Y., informs me that while shooting at Martin's Point, near Swan Island, North Carolina, he noted a large migration of the Smaller Yellowleg passing south on August 29, 1892. On the same date he shot two American Golden Plover, and later in the day another, all that he saw. The wind was southeast with drizzling rain. — GEORGE H. MACKAY, *Nantucket, Mass.*

Tryngites subruficollis—I have met with and taken but few Buff-breasted Sandpipers in my shooting experience on the Massachusetts coast; my record shows but eleven during the last seventeen years, all of them having been shot on the island of Nantucket. Six of these were taken on

Sept. 8, 1875; one on Aug. 26, 1879; one on Aug. 28, and one on Sept. 1, 1886; one on Sept. 5, 1892. I am consequently inclined to regard them as not very abundant in the above locality. Of the few which I have seen I have remarked their extreme gentleness and desire to be in company with other birds. On one occasion I had one alight among my Plover decoys on the upland (which they seem very fond of frequenting) and, not wishing to shoot it, I allowed it to remain for quite a while so I could watch it. During this time it moved about with unconcern, apparently not being aware that its supposed companions were of wood. It seemed so gentle that I determined to see how near it would permit me to approach, and it was not over five or six feet from me when it flew away, but only for a short time, however, for it returned and alighted in the course of ten or fifteen minutes. Having no desire to shoot it, I allowed it to remain until it departed not to return. All the birds that I have seen come immediately to the decoys on perceiving them, and alight without hesitation or fear. Their flight is rapid, with many turns and zigzag movements, and near the ground, constantly turning up so as to show their entire under parts.

They vary greatly in size, so much so that, speaking from memory, I should say some of those I have recorded were nearly two thirds larger than others. I think the plumage of the younger birds is rather lighter colored all over than the adults'. I have never observed more than seven or eight birds in a flock, and then only once. With their noticeable, clean-cut outline, and peculiarly soft, blended plumage, they are one of our most graceful and attractive Sandpipers.—GERRIE W. MACKAY, *Nantucket, Mass.*

A Specimen of *Numenius arquatus* Said to have been Taken on Long Island, N. Y. — The collection of the New York State Museum contains a specimen of Curlew labelled "*Numenius longirostris*, Long-billed Curlew, male, taken on Long Island in 1853." The specimen proves to be a European Curlew (*Numenius arquatus*). Mr. William Dutcher has compared the specimen with specimens of *Numenius arquatus* in the American Museum of Natural History in New York City, and says there is not the slightest doubt that the bird belongs to that species. This being the case, the statement on the label that the bird was taken on Long Island becomes an interesting one. Mr. Brewster, Mr. Ridgway and Dr. Merriam inform me that, so far as they know, the species has never been recorded as occurring in an American locality.

The annual reports of the New York State Museum (or Cabinet) record but three specimens of Long-billed Curlew, *Numenius longirostris*, as having been received into the State collection, viz., one specimen (without data of any kind) recorded in the 1st Report, p. 17, 1848; one male, recorded as part of the De Rham collection, 4th Report, p. 36, 1851; one male, recorded in the 7th Report, p. 17, 1854. This last specimen was received in 1853 as it is recorded in "Appendix A. Catalogue of the quad-

rupeds, birds, reptiles, amphibians, fishes, etc., added to the State Cabinet of Natural History, from January 1st, 1853, to January 1st, 1854."

At the present day there are three specimens in the State collection labelled "*Numenius longirostris*, Long-billed Curlew," viz., one without data of any kind—corresponding in this respect to the entry in the 1st Report; one in the De Rham collection, marked "male"—corresponding to the entry in the 4th Report; the third is the specimen of *Numenius arquatus* under consideration, and is labelled "Male, taken on Long Island in 1853"—corresponding *in sex and date* to the entry in the 7th Report. The report contains no record of the locality in which the specimen was taken. The writer does not consider this omission as of any importance except that it may be looked upon as in a measure supporting the supposition that the bird came from some locality within the State of New York. The older Reports of the State Cabinet do not contain records of localities for animals, except when the occurrence of a species in a certain locality was considered remarkable. The Reports give evidence that the specimen of *Numenius arquatus* was believed to be the common Long-billed Curlew (*Numenius longirostris*) known to occur more or less plentifully within the State, so that the locality in which the specimen was taken was not thought worthy of remark.

The writing on the label is apparently very old, and is in the hand of the late John Gebhard, who was curator of the State Cabinet at the time the bird was received. Mr. Gebhard was in the employ of the institution at the time of his death in 1887, in the capacity of guide; and was believed to be familiar with the history of most of the zoölogical specimens. About ten years ago the birds and their labels were marked with corresponding numbers. The work was done by Mr. Martin Sheehy, who is still in the employ of the museum, and at a time when Mr. Gebhard was connected with the institution. On account of the position which he held—that of guide—Mr. Gebhard's eyes were upon the collection almost every day. Under such circumstances it is hardly possible that there could have been any confusion of labels without attracting his attention.—WM. B. MARSHALL, *New York State Museum, Albany, N. Y.*

The above notes were read at the last Congress of the American Ornithologists' Union, November, 1891, and the specimen in question also was exhibited. The identity of the specimen being beyond question, the only other point to be decided is, whether the claim that it was taken in North America is well founded. In addition to the facts submitted above by Mr. Marshall, he also found in the Comptroller's Office in Albany, a bill made by James A. Hurst, dated June 8, 1853, for certain specimens of mammals, birds, etc., among which is this item, "Long-billed Curlew, male, very fine, \$5.00." Mr. Hurst who sold this specimen to the State Museum was in the employ of the State Cabinet at the date of the bill and for many years afterward in the capacity of taxidermist. It is evident neither Mr. Gebhard, the curator, nor Mr. Hurst, the taxidermist, were aware that the specimen added to the collection at that time was the European

Curlew, as they labelled it 'Long-billed Curlew.' If they had been acquainted with its identity, it is fair to assume they would have labelled it correctly, from the greater interest that would have been attached. We can also assume with certainty that Mr. Gebhard, in whose handwriting the label is, when the specimen was purchased, asked the taxidermist, Mr. Hurst, the locality the bird came from, and at the time when the fact was fresh in the mind of Mr. Hurst the locality 'Long Island' was added to the record. Mr. Hurst could have had no object in substituting a specimen of the European Curlew for our own form in the New York State collection, as a specimen of the Long-billed Curlew would be much easier to obtain, and further, the cost of a specimen of the European form would have been much greater. That he could have made the substitution knowingly is out of the question, as he was a man of the utmost probity of character and one whose statements could be depended upon implicitly. To further substantiate the fact that this specimen was taken in America it was submitted to Mr. William Palmer, taxidermist of the National Museum, Washington, D. C., and Mr. Jenness Richardson, taxidermist of the American Museum of Natural History, New York, who were present at the Congress, and they without hesitation, after examination, pronounced the specimen to have been mounted from a bird freshly killed and not from a dried skin. —WM. DUTCHER, *New York City*.

Notes on *Syrnium occidentale*. — Some fifty miles N. N. E. of San Diego Bay is a mountain known locally as Smith Mountain, or sometimes as Mt Palomar. It is the culmination of a broken, mountainous region, rising to an altitude of perhaps 6,000 feet, though some distance to the north and southeast are higher peaks. On the mountain are a number of small valleys which are often partially bordered by heavy forests of fir, cedar and oak, especially on the northern slopes.

Last June a small party of us spent a few days on Smith Mountain, selecting one of the smaller uninhabited valleys as our camp ground. The first night there two ladies of the party who, unaccustomed to camping out, were kept awake by sounds that they thought were made by a fox or an Owl, they could not tell which. I had heard the note of an Owl during the night, but sleepily decided that it was the Great Horned Owl. The next night I did not sleep so soundly, and heard the sounds distinctly and knew that I was listening to a bird note new to me. From the sounds made I thought that there was a pair of the birds as one set of notes was deeper than the other. We were camped at the base of a very steep slope at the mouth of a little gulch. The Owls appeared to be up toward the head of the gulch. In the morning I explored the locality from which the sounds came, and found among the large trees a dense growth of small firs and cedars of a quarter of an acre or so in extent which I thought was where the Owls probably were. Before dark I took my stand at the lower edge of the thicket and soon heard the hissing note of a young Owl, apparently calling for food. I was cautiously working my way up the steep

mountainside, when the young bird flew out toward me and lit on the dead branch of a cedar in short range. I fired and it fell, catching a branch below and hanging suspended by one foot just out of my reach. While hunting a stick to pull it down with, a *hoo* sounded close at hand, and one of the parents, carrying something in its claws, passed over my head and lit on the same branch from which I had just dropped the young bird. It was awfully short range, but a rare bird badly shot up is better than no specimen. Fortunately my shot did not damage it as badly as I had feared. There was light enough yet for me to see that I held in my hand my first Spotted Owl (*Syrnium occidentale*). By feeling around in the twigs and leaves I found the object it had carried in its claws; this proved to be a wood rat (*Neotoma fuscipes*) with head wanting, and cold, so it evidently had been caught the previous night and kept for later use.

Toward morning I heard the other Owl, and early the next evening I started for my post again, but before reaching it I heard the call of the Owl. I soon found and shot him. During the remainder of our stay we heard no more sounds of either young or adult of this species.

The ordinary notes heard were a succession of three syllables, alike in tone and volume, the first followed quickly by the second and then a pause of considerable length before the third—*hoo, hoo, —hoo*. The other series of notes is different and has a curious canine quality of tone; they were usually four, uttered rather rapidly, becoming emphatic toward the end, and may be represented by the formula: *oh, oo, ou, ow*.

The altitude of the place where I shot the Owls is about 5,000 feet, and the heavily timbered mountainside faces the north, so it is cool and shady. From my brief experience with the species I should think that the Spotted Owl, like its eastern congener the Barred Owl, is abroad earlier in the evening and later in the morning than the Great Horned Owl. How similar the notes are to the Barred Owl's I cannot say, as it is so many years since I heard the Barred Owl that I have forgotten its note. — F. STEPHENS, *Santa Ysabel, Cal.*

Coccyzus americanus occidentalis in Washington. — On July 8, 1892, I saw and positively identified a California Cuckoo (*Coccyzus americanus occidentalis*) at Ridgefield, Clarke County, Washington. The bird, an adult, and probably a female, flew out from a strip of small firs, and took a low perch on the edge of the woods, about twenty-five feet from where I was standing. It stayed some time, preening its feathers. The night of July 9—a bright moonlit one—I heard the *knck, knck* of a Cuckoo coming from the treetops of this grove of small firs. The note was rapidly given four or five times in succession; and the call several times repeated. The call was not rolled out to such length as that of the bird given in my Gray's Harbor List (*Auk*, Jan., 1892).

On July 18, my cousin, Mr. Harold L. Gilbert of Portland, Oregon, was attracted to this same spot by the birds' calls, and discovered a family of five—two adults and three youngsters. He shot the adults and one young

bird. The other young escaped. On July 19 Mr. Gilbert caught one of these young birds alive. It lived through the day, probably dying from starvation, as enough caterpillars could not be found for it. The adult female measured 18 inches in extent and 13 inches in length. Its stomach, Mr. Gilbert says, contained the remains of caterpillars. This is, I believe, the first record of the capture of this species in Washington. — R. H. LAWRENCE, *Portland, Oregon.*

Original Description of Lewis's Woodpecker. — This is found in the 'Journal' of Patrick Gass (12 mo., Pittsburgh, 1807, p., 224); consequently four years before it was named *Picus torquatus* by Wilson (Am. Orn. III, 1811, p. 31, pl. 20, fig. 3), and seven years before Lewis and Clarke's own notice (Hist. of the Exped., 1st Am. ed., II, 1814, p. 187). Gass was the famous Irish Sergeant of the Expedition of 1804-'6; his 'Journal' notices many of the mammals and birds which we are in the habit of supposing to have been first described in the narrative of his commanding officers which did not appear till seven years after his own book. The 'Journal' went through at least four American (1807, 1810, 1811, 1812) editions, and an English one (1808). All the American editions were identical (pp. i-viii, 9-262) and may be cited by pages indifferently. Gass describes the bird thus: ". . . and woodpeckers of a different kind from any I had ever seen before. They are about the size of the common red-headed woodpecker; but are all black except the belly and neck, where the ends of the feathers are tipped with a deep red but this tipping extends to so short a distance on the feathers that at a distance the bird looks wholly black." The locality is the headwaters of Clearwater River, in the Bitter Root Mountains, Idaho; the date of entry in the Journal is June 12, 1806. — ELLIOTT COUES, *Cranberry, N. C.*

Myiarchus nuttingi in Arizona.—During a recent trip through southern Arizona, Mr. J. Alden Loring and the writer had occasion to stop at Tucson for a few days. The objective point near that place was Rillito Creek, which lies a few miles north of the town and which is, except during the rainy season, a dry wash. It was visited on June 12, 1892, through the kindness of Mr. Herbert Brown who, besides showing many other favors, devoted the entire day to driving about among the groves of mesquit and giant cactus, so we might collect what specimens we wanted. While thus occupied we flushed a Flycatcher from an old Woodpecker's hole in a giant cactus, and secured it, together with four fresh eggs.

On comparing the specimen with the type in the National Museum it proved to be *Myiarchus nuttingi*, a small southern representative of *M. cinerascens*, a species not yet recorded from the United States. Subsequently Mr. Loring took another female at Prescott, Arizona, on June 22, and in the Department of Agriculture Collection there is still another female specimen taken by Mr. Vernon Bailey, at Oracle, Arizona, June 15, 1889. It would seem, therefore, that the species is not rare in portions of Arizona.—A. K. FISHER, *Washington, D. C.*

Perisoreus canadensis in Massachusetts. — While on Mount Graylock, in Berkshire County, Massachusetts, June 18, 1892, Mr. Wm. W. Colburn and myself observed the presence of a Canada Jay. — ROBERT O. MORRIS, *Springfield, Mass.*

Up to Date. — My friend, Mr. Wood, tells me that on two occasions he has seen the English Sparrow catching insects at night about an electric light and carrying them to her young; while the chirping of the young in other nests indicated that they, too, were accustomed to being fed at night. Raising vegetables by electric light may be a good thing, but raising English Sparrows in this manner is of more than doubtful utility. — F. A. LUCAS, *Washington, D. C.*

Abnormal Eggs of *Spizella socialis*. — On July 4, 1892, at Lake Grove, Long Island, New York, I secured a remarkable set of four eggs of the Chipping Sparrow (*Spizella socialis*). Instead of the normal greenish blue, the ground color of the eggs is a dirty or greenish *white*; they are thickly specked, spotted and blotched all over, more thickly at the larger end, where the spots become confluent, with dark russet-brown and a few faint blotches of lavender. Their average size, $.73 \times .55$ inch, is slightly greater than the average of six sets in my collection, which is $.68 \times .53$ inch. Their shape is rather more pointed than is usual in eggs of this species, yet they can be quite closely matched, both in shape and size, by eggs from my collection. They were nearly hatched. I saw the bird on the nest on four or five different occasions, as I wished to fully satisfy myself of the identity of the eggs. — ARTHUR H. HOWELL, *Brooklyn, N. Y.*

Vireo olivaceus in British Columbia and Washington. — Mr. Chapman's recent record (Bull. Amer. Mus. Nat. Hist., N. Y., Vol. III, 1890, p. 149) of the presence of the Red-eyed Vireo at Ducks and Ashcroft, British Columbia, was the first intimation that has been given of this bird's occurrence anywhere west of the Rocky Mountains; and though the western limit of its known range was thus greatly extended, it remained a doubtful question whether the species was to be found throughout the intermediate country, or whether these localities might not be isolated, outlying portions of its habitat. The latter view seems improbable in the light of the facts I have now to record.

On July 27 and 28, 1891, I made a trip on a small steamboat from Golden, B. C., a little town on the Canadian Pacific Railway, up the Columbia River to its source in Lake Windermere, about a hundred miles southeast of Golden, and on the 29th I returned by the same route. The deck of a moving steamboat is not the most favorable point from which to observe the small birds on the river's bank, yet on the way up I heard five Red-eyes singing, and on the return trip I noted nine. Several of them I was able to see satisfactorily. This upper reach of the Columbia, lying in a narrow valley between the Rockies and the Selkirks, is about a hundred and fifty miles east of Ducks.

Again a few days later (Aug. 4), several, hundred miles farther down the Columbia, at the Little Dalles, Washington I heard a Red-eye singing in some large trees at the edge of the river. This latter place is nearly two hundred miles to the south of Golden and about the same distance south-east of Ashcroft.

These facts make it seem at least probable that the species will be found in all favorable situations throughout the intermediate region.—C. F. BATCHELDER, *Cambridge, Mass.*

The Chestnut-sided Warbler Nesting in Missouri. — Central Illinois is generally considered to be the southernmost limit in the Mississippi Valley of the summer home of this Warbler, and thus far there appears to be no record for southern Iowa. I desire to say, however, that while in Missouri the past June (1892) I observed *D. pensylvanica* on two occasions and under circumstances that point most conclusively to the probability of its nesting in that State. On June 3, while visiting the woods skirting the River Des Peres near St. Louis, in company with Mr. O. Widmann of Old Orchard, Mo., a male was discovered singing in the top of a tree on the edge of a blackberry thicket and to all appearances settled for the season, Mr. Widmann's attention being first directed to it by the peculiarity of its song as a summer resident for that locality.

Later, on the 19th of the month, while riding by wagon in Reynolds County, Mo., from Edge Hill to Middlebrook, and about half way between those points a male and a female were detected by me in the act of copulation, the locality being a tract of country formerly cleared of its timber by charcoal burners, but now growing up with brush. This was in a region about ninety miles south by southwest from St. Louis. Mr. Widmann again saw a male (probably the original bird) in the first locality herein mentioned on June 21, and we were informed by Mr. Philo W. Smith, Jr., of St. Louis, that he had taken as many as six nests of the Chestnut-sided Warbler in one day at Greenwood, a small suburb a few miles west of the city.

In the light of our previous knowledge, the foregoing notes will serve to extend considerably the known breeding range of this bird.—B. F. GAULT, *Glen Ellyn, Du Page Co., Illinois.*

Two Cape Cod Records. — *Rallus elegans*. — Mr. P. L. Small of Provincetown, Mass., has presented me with the remains of a King Rail that was caught in a muskrat trap in North Truro early in February, 1892. The skin has been badly damaged by mice, but enough is left unhurt to make the identification certain. Mr. Small received the bird in the flesh a few days after it was taken. The early part of the winter of 1891-1892 was very mild in eastern Massachusetts, and I am told that until the middle of February there was no ice in the marshes where the Rail was captured.

Cathartes aura. — During the latter part of June, 1892, while spending a few days at North Truro, I was told that a Portuguese family in the village had a living 'Bald Eagle' which they had caught slightly wounded. My informant assured me that the bird must be a Bald Eagle, for he had seen it and had noticed particularly that it had no feathers on its head. On looking into the matter I found, as I expected, a Turkey Buzzard. The bird had been caught near the boundary line between North Truro and Provincetown about June 20, but refused all food and died the night before my visit (June 26). It proved to be an adult male in good plumage, but had evidently received a charge of No. 8 shot, nearly a dozen of which were lodged in various parts of the body. — GERRIT S. MILLER, JR., Cambridge, Mass.

Notes on a Few Birds from Northern Ohio. — These notes are presented as being supplementary in some degree to Dr. Wheaton's admirable report in Vol. IV of the Ohio State Geological Survey, to which the reader is referred for the previous history of these birds in this region.

Glucionetta islandica. — An adult female was brought to me by Mr. Warden of Lorain, Ohio, March 30, 1892.

Clangula hyemalis. — In December, 1891, a large flock of these Ducks stayed for a time near Lorain, and numbers were entangled and drowned in the gill-nets that are set in about fifty-four feet of water. One fish-boat brought in twenty-seven taken in this way in one day.

Oidemia deglandi. — Three, two males and a female, were brought to me May 11, 1892, that had been taken in Mr. Warden's gill-nets near Lorain.

Ardea cœrulea. — There is a fine specimen of this bird in spring plumage in Mr. Jump's collection, that was taken near Oberlin about ten years ago.

Tringa canutus. — I have two records of this 'maritime' species, one based on a head that I picked up on the shore of Lake Erie in October, 1890, the other on a bird killed by Mr. Harry Warden, of Lorain, and presented to Oberlin College, Sept., 1891.

Tringa bairdii. — I took several specimens Aug. 30, 1890, near Lorain, and have seen them at other times. I do not think it can be classed as 'rare.'

Loxia leucoptera. — Prof. J. T. Shaw identified as this species a bird that his cat brought in on April 10, 1892. The specimen was thoroughly examined, but unfortunately was not preserved.

Chondestes grammacus. — I noticed this bird for the first time this year (1892), when I found two pairs building nests near Oberlin.

Helminthophila celata. — Mr. G. D. Wilder took a specimen of this western species near Oberlin May 11, 1892.

Dendroica palmarum hypochrysea. — Mr. G. D. Wilder took a well-marked specimen April 16, 1892, near Oberlin. This is, Mr. Ridgway tells me, the first record for west of the Alleghanies. — L. M. McCORMICK, Oberlin, Ohio.

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

Robert W. Shufeldt, 3d.

TO THE EDITORS OF THE AUK:—

Dear Sirs:—At a recent session of the Faculty of Marietta College the following minute was adopted:—

“It is with a deep sense of personal loss that the Faculty of Marietta College extend heartfelt sympathy to Dr. R. W. Shufeldt and his family in view of their great bereavement in the death of Robert W. Shufeldt, 3d. who for six months has been connected with Marietta Academy as a student and with Marietta College as taxidermist and collector for the Natural History Museum. The Faculty wish to put on record their high estimate of his character and his work. His sudden death by drowning, July 11, 1892. while on an ornithological expedition, has taken from the scientific world an ambitious young scientist of unusual promise. It gives us great pleasure to accept from Dr. R. W. Shufeldt of Takoma Park, D. C., the private ornithological collection of his son in whose memory it shall be preserved in the College Museum as ‘The Shufeldt collection.’”

By order of the Faculty,

T. F. MCKENNEY, *Secretary.*”

Permit me to add a few personal reminiscences of Mr. Robert Shufeldt with whom it was my privilege to work in ‘The Marietta Scientific Association,’ in the College Museum and in the field. He was a young man well fitted for the work to which he was determined to give his life. I do not remember ever seeing a man so young who had so definitely in mind just what he wanted to make a life work. He eagerly grasped at every opportunity that would assist him in his chosen calling. He was invited to come to Marietta College last January to assist in putting the ornithological collection of the college into shape and, by giving to this work his leisure, to win his own way to a thorough collegiate education. His strong will power induced him to endeavor to abridge the preparatory course by extra study, and he would have succeeded. He entered upon his scientific work with alacrity and in a short time has brought order out of chaos in the Museum. During these few months the collection of birds trebled in size, and as the summer vacation came on we were preparing to do extensive work in the field. Our object was to secure adequate specimens of every object of natural history, within the radius of one hundred miles around Marietta, as a basis for larger collections through gift and exchange. Mr. Shufeldt entered most intelligently and successfully into the plan and in the end would have become a specialist in this region of the country.

His sudden death, however, has cut short a career of the greatest promise. When news came to Marietta that he was drowned at the head of Kerr Island in the Ohio, just below the dam on the West Virginia side, there was great excitement; several boats started immediately for the scene of the accident and later a large company started for the place in a chartered steamboat. It was the old story of a treacherous hole in the river-bottom, inability to swim, and no one near to help. The remains were taken to Takoma Park, D. C., by Professor David H. Jones, Associate Principal of Marietta Academy. They were laid at rest beside the grave of his mother in the Rock Creek Cemetery near Washington. The Trustees and the Faculty of the College join with the large circle of friends in expressions of deepest sympathy with Dr. Shufeldt and his family. The College hopes by the aid of friends to make 'The Shufeldt Collection' an enduring monument to the brilliant young ornithologist.

Robert W. Shufeldt, Jr., was born on the 7th of June, 1877, at Omaha, Nebraska. He received his scientific training from his father, Dr. R. W. Shufeldt, who is well known to the scientific world as a specialist in ornithology. What is the loss of Dr. Shufeldt is the common loss of us all and especially of American science in the years to come.

Very respectfully yours,

HENRY WOODWARD HULBERT.

Marietta College, July 20, 1892.

NOTES AND NEWS.

DR. HERMANN BURMEISTER, a Corresponding Member of the A. O. U., died at Buenos Ayres May 1, 1891, in his eighty-sixth year, he having been born at Stralsund, Germany, Jan. 15, 1807. He was educated at Greifswald and Halle, and for a time was professor of zoölogy in the University of Halle, succeeding the ornithologist Nitzsch. He was a prominent actor, siding with the 'Liberals,' in the political troubles of 1849-50, and in consequence was obliged to leave Germany. He traveled for some time in Brazil, and though visiting Europe for short intervals on two or three occasions, spent most of his life in South America. He finally settled in Buenos Ayres, where he founded the well-known National Museum of Natural History, of which he was made Director in 1861, and in 1870 became the head of the faculty of science in the University of Cordoba. His writings cover a wide field, his earlier work relating mainly to entomology, but later he wrote many papers and works pertaining to physical geography and vertebrate palæontology and zoölogy. Some years since he met with an accident which made it necessary for him to resign his position as Director, "and the community, by which his services were highly appreciated, took care that he was properly pensioned. He was buried at the cost of the State, and the President was present at his funeral."

Dr. Burmeister was the editor of Nitzsch's 'Pterolographie,' published in 1840, and was the author of a 'Systematische Uebersichte der Thiere Bra-

siliens,' (Halle. 1856), in five volumes, of which two are devoted to birds. He also published a number of special papers on the birds of Brazil and the Argentine Republic.

READERS of 'The Auk' will deeply sympathize with Dr. R. W. Shufeldt in the loss of his son by death from drowning in the Ohio River, near Marietta, Ohio, July 11, 1892, while on a collecting trip for birds for the Museum of Marietta College. The particulars of the sad event are detailed by Professor H. W. Hulbert of Marietta College, in a letter to 'The Auk' published on a preceding page, who pays a high tribute to the worth and memory of this enthusiastic and promising young naturalist.

THE POTOMAC VALLEY ORNITHOLOGICAL CLUB of Washington, D. C. was formally organized on February 1, 1892. The purpose of the Club, as expressed in its constitution, is "the study of ornithology in general, and especially the promotion of a better knowledge of the avifauna of the region within twenty miles of the Capitol at Washington." The following officers were elected: President, William Palmer; Vice-President, F. H. Hitchcock; Secretary, E. M. Hasbrouck. The membership of the Club has increased from nine to twenty-three. Meetings are held on the first and third Mondays of each month, with a recess during July and August.

The following papers have been read: By William Palmer, A two days trip on the Island of St. Paul, Bering Sea; Occurrence of *Contopus richardsonii*? in the District of Columbia; Summer Birds of Golden Gate Park, San Francisco, Cal.; Summer Birds of Hanover County, Va. By F. E. L. Beal, Polygamy in the group Passeres; The Usefulness of Seed-Eating Birds. By T. S. Palmer, Remarks on the Birds of Golden Gate Park, San Francisco, Cal. By E. J. Brown, the Summer Birds of Cobb's Island, Va. By W. E. Clyde Todd, The Ruddy Duck in Beaver County, Pa.; The Blue-gray Gnatcatcher. By E. M. Hasbrouck, Remarks upon Dichromatism; The *Helminthophila* of the District of Columbia; rare captures in the District of Columbia for 1892.

TWO ADDITIONAL volumes of the British Museum Catalogue of Birds have recently been published, namely, Volumes XVI and XVII. The former contains the Hummingbirds, by Mr. Osbert Salvin, and the Swifts, Goat-suckers, and their allies, by Mr. Ernst Hartert. Volume XVII contains the Rollers, Bee-eaters, Kingfishers, Motmots and Colies, by Mr. R. Bowdler Sharpe, and the Hornbills and Trogons, by Mr. W. Ogilvie Grant. These volumes will be noticed at length in a later issue of this Journal.

THE TENTH CONGRESS of the American Ornithologists' Union will be held in Washington, D. C., beginning Tuesday, November 15, 1892. The meetings will be held at the U. S. National Museum. Members intending to present papers are requested to send the titles of the same to the Secretary, Mr. John H. Sage, Portland, Conn., at least one week prior to the date on which the Congress convenes, in order to facilitate the preparation of a programme of papers to be read before the Congress. A large attendance is anticipated, and papers of special interest will be presented.

INDEX TO VOLUME IX.

- ACCIPITER atricapillus*, 67.
 bicolor, 328.
 cooperi, 212, 233, 288.
 gundlachi, 272.
 velox, 43, 74, 212, 233, 328,
 354, 361.
Actitis macularia, 14, 43, 212, 232,
 329.
Æchmophorus clarkii, 65.
 occidentalis, 41.
Ægialitis meloda, 15, 212, 306.
 nivosa, 192.
 semipalmata, 15, 147, 212,
 354.
 vocifera, 14, 48, 134, 204, 212,
 233, 272, 290, 329, 354, 360.
 wilsonia, 15, 48, 212.
Agelaius gubernator, 45.
 humeralis, 272.
 phæniceus, 30, 35, 38, 133,
 136, 204, 205, 237, 286, 364.
 phæniceus bryanti, 213.
 xanthomus, 229.
Agyrtria tobaci, 377.
Aithya polytmus, 277.
Aix sponsa, 42, 66, 74, 211, 232, 272,
 384.
Ajaja ajaja, 9, 211.
Alca impennis, 198.
 Allen, C. S., the breeding habits of
 the Fish Hawks on Plum Island,
 New York, 313.
 Allen, J. A., notice of his 'The
 North American species of the
 genus *Colaptes*', etc., 177.
Amazilia fuscicaudata, 325.
 sophieæ, 325.
Amazona agilis, 128.
 collaria, 128.
Amblycercus holosericeus, 249.
 American Ornithologists' Union,
 ninth congress of, 56.
 American Ornithologists' Union
 Check-List of North Amer-
 ican Birds, fourth supple-
 ment to the, 105.
- Ammodramus bairdii*, 365.
 caudatus becki, 107, 175.
 caudatus nelsoni, 107.
 henslowii, 31, 39, 213.
 henslowii occidentalis, 106.
 princeps, 204.
 sandwichensis, 45, 355.
 sandwichensis alaudinus, 45,
 338, 355, 355.
 sandwichensis savanna, 33,
 36, 133, 137, 204, 213.
 savannarum passerinus, 28,
 31, 39, 137, 213, 338.
 savannarum perpallidus, 338.
Ampelis cedrorum, 138, 213, 340.
Amphispiza belli, 288.
 belli nevadensis, 288.
 bilineata, 234, 338.
Anas americana, 42, 160, 165, 198,
 211, 231, 304.
 boschas, 41, 160-162, 165,
 198, 211, 231, 354, 383, 385.
 breweri, 162.
 carolinensis, 198, 199, 211,
 231, 353, 359, 384.
 cyanoptera, 232.
 discors, 69, 211, 231, 329, 359,
 360, 383.
 fulvigula, 211, 214.
 hyperboreus, 196.
 maxima, 165.
 obscura, 74, 165, 223, 231,
 335.
 penelope, 165.
 strepera, 42, 152, 191, 198, 231.
Anhinga anhinga, 192, 211, 231,
 288.
Anhinga, 191, 231.
Ani, 273, 369.
Anous stolidus, 211, 289.
Anser albatrus, 196.
 albifrons gambeli, 345, 384.
 Anthony, A. W., birds of south-
 western New Mexico, 357.
Anthus pensilvanicus, 28, 33, 37,
 46, 214, 342, 367.

- Anthus richardi*, 289.
spragueii, 342.
Antrostomus carolinensis, 35, 213, 235, 276.
rufomaculatus, 174.
sericeocaudatus, 175.
vociferus, 35, 174, 201, 213, 218, 235, 307.
Aphelocoma californica, 301.
californica obscura, 188.
floridana, 213.
woodhousei, 364.
Aquila chrysaetos, 43, 200, 201, 287.
fulva, 186.
Ara tricolor, 129.
Aramus giganteus, 11, 212.
Arbelorbina cyanea, 23.
lucida, 23.
Ardea candidissima, 10, 211, 360.
cœrulea, 10, 194, 211, 232, 272, 286, 329, 397.
egretta, 10, 211, 329.
herodias, 9, 42, 232, 286, 329.
occidentalis, 9, 211, 272.
rufescens, 10, 211.
tricolor ruficollis, 10, 48, 211.
virescens, 10, 48, 134, 211, 232, 272, 290, 329.
wardi, 211.
wuerdemanni, 211.
Arenaria interpres, 15, 48, 147, 212, 306.
melanocephala, 354.
Arremon aurantirostris, 173.
aurantirostris saturatus, 173.
Asio accipitrinus, 234, 355.
wilsonianus, 234, 361.
Atthis heloisa, 377.
Atticora cyanoleuca montana, 22.
 Attwater, H. P., list of birds observed in the vicinity of San Antonio, Bexar County, Texas, 229, 337; Warblers destroyed by a 'norther,' 303.
 Auk, Great, 100.
 Auklet, Cassin's, 353.
Auriparus flaviceps, 344, 368.
flaviceps ornatus, 287.
Avocet, American, 12, 232, 360.
Aythya affinis, 42, 211, 232, 304.
americana, 162, 232, 304, 384.
collaris, 74, 162, 211, 232, 384.
marila nearctica, 42, 198, 304, 345, 384.
vallisneria, 42, 162, 198, 232, 384.
BALDPATE, 42, 231, 304.
Bartramia longicauda, 14, 31, 48, 212, 232, 289, 305, 329.
Basileuterus delatritii, 22, 173.
salvini, 173.
 Batchelder, C. F., *Thryothorus ludovicianus* in Massachusetts, 73; *Virco olivaceus* in British Columbia and Washington, 395.
 Beetle-head, 144.
 Bendire, C. E., notice of his 'Directions for collecting, preparing, and preserving birds' eggs and nests, 175; notice of his 'Life histories of North American birds', 375.
 Bird, Bee, 339.
 Butcher, 387.
 May, 274.
 Phêbee, 286.
 Reed, 286.
 Tropic, 229.
 Whale, 294.
 White Bank, 299.
 Bittern, American, 9, 42, 232, 290.
 Cory's, 141.
 Least, 9.
Blacicus caribæus, 272.
 Blackbird, 369.
 Bicolored, 45.
 Brewer's, 45, 238, 364.
 Red-winged, 30, 35, 38, 133, 136, 237, 364.
 Savanna, 273.
 Yellow-headed, 237, 364.
 Blakiston, T. W., death of, 75.
 Bluebill, 345.
 Bluebird, 31, 141.
 Arctic, 369.
 Mountain, 47.
 Western, 47, 310, 369.
 Blue-legs, 348.
 Bobo, 323, 326.
 Bobolink, 33, 35, 72.
 Bob-white, 120, 385.
 Texan, 233.
 Bolles, F., notice of his 'Land of the lingering snow,' 62; young Sapsuckers in captivity, 109.
Bonasa umbellus, 67-69, 134, 384-387.
umbellus sabini, 43.
umbellus togata, 194.
Botaurus exilis, 9, 142, 211.
lentiginosus, 9, 42, 211, 232, 290, 383.
neoxenus, 141, 211, 214.
Brachygalba fulviventris, 184.
Brachyramphus marmoratus, 353.

- Brant, 305.
 Black, 42, 354.
 Branta bernicla, 305.
 canadensis, 42, 232, 334-386.
 canadensis hutchinsii, 385.
 nigricans, 42, 354.
 Brimley, H. H., *Parvoscilla pugnax*
 in North Carolina, 299.
 Buarremon gutturalis, 25.
 Bubo virginianus, 212.
 virginianus saturatus, 355.
 virginianus subarcticus, 234,
 361.
 Bufflehead, 42, 232.
 Bull-head, 144.
 Bulweria bulweri, 176.
 Bunting, Indigo, 138, 339.
 Lark, 339, 366.
 Lazuli, 231, 366.
 Painted, 236, 339.
 Snow, 68, 282.
 Burmeister, H., death of, 399.
 Buteo abbreviatus, 361.
 borealis, 28, 30, 126, 212, 234.
 borealis calurus, 354, 361.
 brachyurus, 212, 328.
 latissimus, 212, 328.
 lineatus, 135.
 lineatus alleni, 212, 234.
 lineatus elegans, 234.
 swainsoni, 234, 328, 361.
 Butler, A. W., notes on the range
 and habits of the Carolina Par-
 akeet, 49; some notes concern-
 ing the Evening Grosbeak, 238.
 Buzzard, Red-tailed, 126.
 Turkey, 125, 203, 204, 397.

 CAIRINA moschata, 165.
 Calamospiza melanocorys, 339, 366.
 Calcarius lapponicus, 282.
 ornatus, 337, 365.
 Calidris arenaria, 13, 72, 212.
 Callipepla californica, 43, 196.
 gambeli, 198, 360, 386.
 squamata, 360.
 squamata castaneogastris,
 233.
 Calliothrus robustus, 25, 26, 237,
 250.
 Campephilus guatemalensis, 327.
 principalis, 67, 68, 212, 218.
 Camptolaimus labradorius, 194,
 389.
 Campylorhynchus brunneicapillus,
 288, 342, 368.
 Campylopterus hemileucurus, 324.

 Canvasback, 42, 198, 232.
 Capito salvini, 184.
 Caracara, Audubon's, 234.
 Cardinal, 31, 339.
 Gray-tailed, 106.
 Texan, 339.
 Cardinalis cardinalis, 31, 204, 213,
 339.
 cardinalis canicaudus, 65,
 106.
 Carduelis elegans, 301.
 Carpodacus hæmorrhous, 196.
 mexicanus, 196.
 mexicanus frontalis, 287, 364.
 purpureus, 29, 137.
 purpureus californicus, 355.
 Catbird, 140, 342.
 Catharista atrata, 126, 204, 212, 215,
 233, 328.
 Cathartes aura, 125, 190, 203, 204,
 212, 215, 233, 272, 328, 361,
 397.
 Catherpes mexicanus conspersus,
 287, 342.
 mexicanus punctulatus, 368.
 Cedarbird, 138.
 Centropus purpureus, 184.
 Centurus bahamensis, 270.
 blakei, 270.
 hoffmanni, 327.
 radiolatus, 275, 374.
 superciliaris, 272.
 Ceophlæus pileatus, 135, 213, 218,
 286, 355.
 Certhia familiaris americana, 29,
 134, 140, 343.
 familiaris mexicana, 343.
 familiaris occidentalis, 47,
 310.
 Ceryle alcyon, 44, 48, 135, 212, 234,
 274, 362, 373.
 cabanisi, 234, 323.
 Chætura brunneitorques, 324.
 pelagica, 136, 205, 213, 235,
 285, 307.
 Chamberlain, M., notice of his
 revised edition of Nuttall's 'Man-
 ual,' 59.
 Chapman, F. M., notice of his
 paper on the birds of Corpus
 Christi, 65; notice of his paper,
 'On the color pattern of the
 upper tail-coverts in *Colaptes*
 auratus,' 66; notice of his 'Origin
 of the avifauna of the Bahamas,
 179; notice of his 'Preliminary
 study of the Grackles of the

- subgenus *Quiscalus*, 180; on the breeding of *Helminthopila pinus* with *H. leucobronchialis*, at Englewood, New Jersey, 302; melanism in a caged Wood Thrush, 303.
- Charadrius dominicus*, 14, 17-20, 144, 147, 148, 199, 212, 232, 289, 329, 384, 389.
- squatarola*, 14, 143, 212, 300, 306, 360.
- vanellus*, 289.
- Charitonetta albeola*, 42, 211, 232.
- Chat, Long-tailed, 367.
- Yellow-breasted, 342.
- Chaulelasmus streperus*, 191.
- Chelidon erythrogaster*, 22, 46, 48, 138, 206, 213, 307, 340, 356, 366.
- Chen hyperborea*, 196, 232, 384, 385.
- hyperborea nivalis*, 196, 211.
- rossii*, 385.
- Cheney, S. P., notice of his 'Wood notes wild', 280.
- Cherrie, G. K., a preliminary list of the birds of San Jose, Costa Rica, 21, 247, 322; notice of two papers by him on Costa Rican birds, 173.
- Chickadee, 67, 281.
- Black-capped, 140.
- Carolina, 35, 37.
- Chestnut-backed, 47.
- Mountain, 47.
- Plumbeous, 344.
- Chicken, Prairie, 66, 189, 231, 283.
- Chiroxiphia linearis*, 322.
- Chlorostilbon angustipennis*, 325.
- salvini*, 325.
- Chondestes grammacus*, 213, 338, 397.
- grammacus strigatus*, 338, 365.
- Chordeiles minor*, 276.
- texensis*, 235, 324, 362.
- virginianus*, 136, 190, 205, 276, 308.
- virginianus chapmani*, 213, 276.
- virginianus henryi*, 235, 309.
- Chrysolophus pictus*, 385, 362.
- Chrysotis festiva*, 89.
- levallanti*, 288.
- Chuckle-head, 144.
- Chuck-will's-widow, 35, 235, 276.
- Cinclus mexicanus*, 46, 386.
- Circus hudsonius*, 212, 233, 289, 328, 355, 361.
- Cistothorus marianæ*, 214.
- palustris*, 204, 214, 286, 343.
- palustris paludicola*, 343, 357.
- stellaris*, 202, 204, 214, 284, 343.
- Clangula hyemalis*, 191, 305, 330, 354, 397.
- Clivicola riparia*, 46, 213, 340, 356, 367.
- Coccythraustes vespertinus*, 67, 68, 187, 190, 203, 238, 283.
- Coccyzus americanus*, 48, 135, 205, 212, 234, 274, 327, 372.
- americanus occidentalis*, 44, 393.
- dominicæ, 184.
- erythrophthalmus*, 135, 212, 327.
- minor, 184, 212, 274, 326, 372.
- minor dominicæ, 184.
- minor maynardi, 48, 184, 372.
- Cœreba bahamensis*, 48, 49.
- Colaptes auratus*, 30, 36, 38, 66, 135, 161, 163, 177-179, 204, 205, 213, 235.
- cafer*, 44, 99, 161, 163, 177-179, 235, 309, 362.
- cafer saturator*, 177, 179, 309.
- chrysocaulosus*, 178, 272.
- chrysoides*, 177-179.
- gundlachi*, 178.
- hybridus*, 161, 163.
- mexicanoides*, 177, 178.
- mexicanus saturator*, 196.
- rufipileus*, 177, 179.
- Colinus cubanensis*, 271, 272.
- leylandi*, 329.
- virginianus*, 67, 68, 120, 204, 281, 283, 384, 385.
- virginianus floridanus*, 212.
- virginianus texanus*, 233.
- Columba albilinea*, 328.
- caribea*, 122.
- fasciata*, 43.
- inornata*, 122.
- leucocephala*, 48, 122, 212, 272.
- livia*, 164.
- rufina*, 123.
- Columbigallina passerina*, 48, 72, 123, 124, 212, 233, 272, 329.
- passerina bahamensis*, 124.
- Colymbus auritus*, 211.
- nigricollis californicus*, 192.
- Compsothlypis americana*, 31, 35, 37, 38, 48, 138, 213, 273, 303, 308, 340.
- Contopus biancolii*, 229.
- borealis*, 236, 251, 363.

- Contopus brachytarsus*, 251.
richardsonii, 44, 236, 251, 363.
richardsonii peninsulae, 106.
virens, 136, 213, 236, 251, 281, 308.
Conuropsis carolinensis, 278.
Conurus carolinensis, 49, 206, 212, 218, 278, 301, 384, 385.
chloropterus, 228.
finschi, 327.
flaviventer, 129.
gundlachi, 229.
nanus, 128.
petzii, 327.
 Coombs, F. E., notes on a few Louisiana birds, 204.
 Coot, 12.
 American, 12, 232, 360.
 Cormorant, Double-crested, 192.
 Violet-green, 309.
 Correo de Agua, 323.
Corvus americanus, 33, 69, 136, 222, 231, 283, 287, 317, 318, 332, 354.
americanus floridanus, 213.
caurinus, 45.
corax, 88.
corax principalis, 385.
corax sinuatus, 45, 62, 136, 364.
cryptoleucus, 364.
hawaiiensis, 282.
ossifragus, 213.
 Cory, C. B., a list of birds taken on Maraguana, Watling's Island, and Inagua, Bahamas, during July, August, September, and October, 1891, 48; remarks on a collection of birds made by Wilmot W. Brown, Jr., on Mona and Porto Rico during February and a part of March, 1892, 228; description of an apparently new *Centurus* from Great Bahama Island, Bahamas, 270; in Cuba with Dr. Gundlach, 271.
 Coues, E., wintering of the Canvasback in Arizona, 198; nesting of the Golden Eagle in Arizona, 201; original description of Lewis's Woodpecker, 394.
 Cowbird, 136, 237, 302, 364, 386.
 Bronzed, 25, 237.
 Dwarf, 237.
 Crane, Little Red-eyed, 11.
 Minute, 11.
 Striated, 11.
 Crane, Sandhill, 42, 232.
- Creagrus furcatus*, 172.
 Creeper, Brown, 29, 140, 343.
 Californian, 47, 310.
 Crossbill, American, 45, 137, 190, 196.
Crotophaga ani, 272, 273, 369.
sulcirostris, 325.
 Crow, 69, 126, 136, 283, 287, 317, 318, 332, 354.
 American, 33, 222.
 Carrion, 204.
 John, 125.
 Northwest, 45.
Crymophilus fulicarius, 67, 294-299.
 Cuckoo, Black-billed, 135.
 Black-eared, 274.
 California, 44, 393.
 Mangrove, 274.
 Yellow-billed, 234, 274, 372.
 Curlew, Black, 14.
 Eskimo, 16.
 European, 390.
 Foolish, 348.
 Hudsonian, 21, 43, 306, 345.
 Long-billed, 14, 232, 350, 354, 360, 390.
 Cuyé, 324.
Cyanocitta cristata, 136, 231, 385.
cristata florincola, 213.
stelleri, 45, 309, 355.
stelleri frontalis, 355.
Cyanocorax cayanus, 282.
 cyanomelas, 282.
 cyanopogon, 282.
 heilprini, 282.
Cyclorhis flavipectus subflavescens, 23.
Cypseloides niger, 276, 324.
Cypselus phœnicobius, 272, 276.
Cyrtonyx montezumæ, 231, 360.
- DAFILA *acuta*, 74, 198, 211, 232, 335, 384.
Deconychura typica, 173.
Dendragapus canadensis, 190.
 obscurus, 385.
 obscurus fuliginosus, 43, 309.
Dendrocynna arborea, 272.
 fulva, 69.
Dendroica æstiva, 21, 46, 138, 213, 286, 307, 340, 367.
 æstiva morcomi, 65.
 audubonii, 46, 310, 357, 367.
 blackburniæ, 21, 35, 37, 38, 49, 132-134, 139, 213, 308, 341.
 cærulea, 21, 35, 213.

- Dendroica cærulescens*, 36-38, 132-134, 138, 139, 213, 273, 308.
castanea, 37, 307.
chrysoparia, 341.
coronata, 33, 37, 132, 204, 213, 303, 340.
discolor, 36, 48, 49, 214, 273, 307.
dominica, 21, 31, 32, 35, 48, 49, 213, 273.
dominica albilora, 303, 341.
kirtlandi, 63.
maculosa, 49, 133, 134, 139, 213, 340.
negrescens, 46, 357, 367.
nigrifrons, 207.
occidentalis, 46.
palmarum, 29, 36, 49, 214, 273.
palmarum hypochrysea, 214, 273, 397.
pensylvanica, 35, 36, 133, 139, 396.
petechia gundlachi, 48, 49.
striata, 37, 38, 49, 213, 307.
tigrina, 38, 49, 213.
townsendi, 367.
vigorsii, 28-30, 139, 213, 341.
virens, 31, 36-38, 49, 132, 133, 139, 213, 341.
- Dendrognis lawrencei*, 173.
lawrencei costaricensis, 173.
mentalis, 288
nana, 173.
nana costaricensis, 173.
- Dickcissel, 234, 339.
 Diplopterus navius, 326.
 Dipper, American, 46.
 Doctor-bird, 277.
Dolichonyx oryzivorus, 33, 35, 48, 72, 213, 286.
 Doughbird, 16.
 Dove, 69.
 Blue, 125.
 Blue-headed, 271.
 Ground, 72, 123, 124, 233.
 Inca, 233.
 Mourning, 135, 233, 360.
 Partridge, 124.
 Pea, 123.
 Red-necked, 125.
 White-winged, 123, 124, 233.
 Zenaida, 123.
- Dowitcher, 13.
 Long-billed, 13, 345, 354.
- Dryobates borealis*, 212.
jardinei, 327.
pubescens, 37, 69, 114, 135, 195, 212.
- Dryobates scalaris bairdi*, 234, 358, 362.
 villosus, 135.
 villosus audubonii, 212.
 villosus harrisi, 44, 309.
- Duck, American Scaup, 42.
 American Scoter, 157.
 Black, 165, 223, 231, 335.
 Fulvous Tree, 69.
 Harlequin, 69.
 Labrador, 194, 389.
 Lesser Scaup, 42, 232.
 Muscovy, 165.
 Pied, 194.
 Ring-necked, 232.
 Ruddy, 42, 345.
 Scaup, 345.
 Scoter, 157.
 Wood, 42, 74, 232.
- Dutcher, W., a specimen of *Numenius arquatus* said to have been taken on Long Island, N. Y., 390.
- Dwight, J., Jr., summer birds of the crest of the Pennsylvania Alleghanies, 129; the Prairie Horned Lark in northeastern Pennsylvania, 202.
- Eagle, Bald, 43, 135, 386.
 Golden, 43, 200, 201, 287.
- Ectopistes migratorius*, 67, 286, 385, 386.
- Egret, American, 10.
 Reddish, 10.
- Eider, American, 305, 334.
 Pacific, 198.
- Elainea pagana subpagana, 250.
- Elanoides forficatus*, 126, 212, 233.
- Elanus leucurus*, 212, 233.
- Elliot, D. G., the inheritance of acquired characters, 77; hybridism and a description of a hybrid between *Anas boschas* and *Anas americana*, 160; *Pitta granatina* Temminck et auctores, 218.
- Emberiza leucocephala*, 176.
 pusilla, 176.
- Empidonax acadicus*, 213, 236, 251.
 difficilis, 44, 352, 363.
 flaviventris, 134, 136, 236, 251.
 fulvifrons, 196.
 fulvifrons pallescens, 196.
 fulvifrons pygmaeus, 196, 364.
 hammondi, 288, 364.
 minimus, 136, 236.
 pusillus, 44, 363.
 pusillus traillii, 136, 236.
 wrightii, 364.
- Egyptiila jamaicensis*, 123.
 verreauxi, 329.

- Ereunetes occidentalis*, 13, 43, 212, 354, 389.
 pusillus, 13, 212, 389.
Erismatura rubida, 42, 211, 345.
Eucorystes wagleri, 249.
Eucetheia bicolor, 48.
 canora, 272.
 lepida, 272.
 pusilla, 247.
Euphonia affinis, 23, 24.
 annæ, 23, 24.
 elegantissima, 24.
 gnatho, 23, 24.
 gouldi, 23.
 gracilis, 24.
 hirundinacea, 24.
 lanirostris, 23, 24.
 luteicapilla, 23, 24.
 minuta, 23, 25.
Euplocamus albocristatus, 162.
 horsfieldi, 162.
 lineatus, 162.
 melanonotus, 162.
FALCO *albigularis*, 327.
 caribbæarum, 253, 254.
 columbarius, 43, 127, 205, 212, 328.
 columbarius suckleyi, 65.
 dominicensis, 252-254, 260, 261.
 fusco-cærulescens, 361.
 mexicanus, 361.
 pealei, 176.
 peregrinus anatum, 127, 212, 234, 355.
 rusticolus gyrfalco, 282.
 rusticolus obsoletus, 203, 300.
 sparverioides, 252, 272.
 sparverius, 43, 135, 205, 212, 234, 252-263, 266, 267, 328, 361.
 sparverius æquatorialis, 254, 257, 268-270.
 sparverius australis, 257, 263, 267-269.
 sparverius cinnamominus, 257, 268, 269.
 sparverius deserticolus, 257, 262-267.
 sparverius isabellinus, 260, 262.
 sparverius peninsularis, 257, 267.
Falcon, Aplomado, 361.
 Prairie, 361.
Fannin, J., notice of his 'Check list of British Columbia birds,' 65.
Faxon, W., the Prairie Horned Lark (*Otocoris alpestris praticola*) breeding in New Hampshire and Massachusetts, 201.
Finch, California Purple, 355.
 Grass, 137.
 House, 287, 364.
 Purple, 29, 137.
Fisher, A. K., *Myiarchus nuttingi* in Arizona, 394.
Flicker, 30, 36, 38, 135, 235.
 Northwestern, 309.
 Red-shafted, 44, 235, 362.
Floricola constanti, 324.
 leocardia, 324.
 longirostris, 324.
Flycatcher, Acadian, 236.
 Ash throated, 236, 363.
 Buff-breasted, 364.
 Crested, 136, 236.
 Hammond's, 364.
 Least, 136, 236.
 Little, 44, 363.
 Mexican Crested, 236.
 Olive-sided, 236, 364.
 Scissor-tailed, 235.
 Traill's, 136.
 Vermilion, 236.
 Western, 44, 363.
 Wright's, 364.
 Yellow-bellied, 136, 236.
Fregata aquila, 211.
Fulica americana, 12, 212, 232, 360.
Fuligula ferina, 162.
 ferinoides, 162.
 homeyeri, 162.
 nyroca, 162.
GADWALL, 42, 198, 231.
Galeoscoptes carolinensis, 140, 214, 273, 307, 342.
Gallinago delicata, 12, 31, 42, 68, 69, 199, 212, 232, 329, 354, 360, 384.
Gallinula galeata, 12, 49, 212, 232, 272.
Gallinule, Florida, 12, 232.
 Martinico, 290.
 Martinique, 290.
 Purple, 12, 232.
 Scarlet-fronted, 12.
Gallus ferrugineus, 164.
Gannet, 229.
Gault, B. F., the Chestnut-sided Warbler nesting in Missouri, 396.
Gelochelidon nilotica, 48, 211, 345.
Geococcyx californianus, 234, 362, 362.
 mexicanus, 288.

- Geothlypis agilis*, 202.
beldingi, 180, 188.
caninucha icterotis, 22.
formosa, 21, 342.
macgillivrayi, 22, 46, 342, 367.
palpebralis, 107.
philadelphia, 22, 133, 134, 139, 342.
poliocephala palpebralis, 107.
trichas, 21, 31, 139, 214, 273, 307, 342.
trichas ignota, 214.
trichas occidentalis, 342, 356, 367.
Geotrygon cristata, 125.
montana, 124.
Glaucidium gnoma, 170.
gnoma californicum, 44.
phalænoides, 327.
siju, 272.
Glaucionetta clangula americana, 335, 353.
islandica, 42, 397.
Gnatcatcher, Black-tailed, 368.
Blue-gray, 31, 35-37, 344, 368.
Plumbeous, 368.
Golden-eye, American, 335, 353.
Barrow's, 42.
Goldfinch, American, 137, 337, 356.
Arizona, 337.
Arkansas, 365.
European, 301.
Mexican, 337, 341.
Western, 106.
Goose, Canada, 42, 232, 385.
Hutchins's, 385.
Lesser Snow, 232.
Sea, 298.
Snow, 385.
White-fronted, 345.
Wild, 69, 386.
Goshawk, 67.
Gowrie, Ringed, 276.
Grackle, Bronzed, 238.
Great-tailed, 205, 238.
Purple, 136, 319.
Grallaria guatemalensis, 175.
Grallaria lizanoi, 173.
Granatellus francescæ, 288.
Grebe, American Eared, 192.
Pied-billed, 345.
Western, 41.
Grosbeak, Black-headed, 366.
Blue, 36.
Evening, 67, 68, 187, 190, 203, 238.
Rose-breasted, 138, 302, 339.
Western Blue, 339.
Grouse, Canada, 190.
Oregon Ruffed, 43.
Ruffed, 67-69, 134, 385-387.
Sharp-tailed, 189, 385, 387.
Sooty, 43, 309.
Grus mexicana, 42, 212, 232, 383.
Guara alba, 9, 14, 211, 271, 272.
rubra, 9.
Guinea-fowl, 121.
Guiraca cærulea, 36, 213.
cærulea eurhyncha, 339.
Gull, American Herring, 221.
Bonaparte's, 41, 304.
Glaucous-winged, 41.
Great Black-backed, 223, 304, 332.
Herring, 99, 304, 332, 388.
Western, 41, 309.
Gymnocichla chiroleuca, 175.
Gyrfalcon, 282.
Gyrfalcon, Black, 203, 300.
HABIA ludoviciana, 27, 48, 138, 213, 302, 308, 339.
melanocephala, 366.
Habropyga melpoda, 229.
Hæmatopus palliatus, 48, 212.
Haliaeetus leucocephalus, 43, 135, 212, 386.
Harporhynchus crissalis, 368.
curvirostris palmeri, 368.
rufus, 32, 140, 214, 307, 342.
Hartert, E., notice of his 'Katalog des Vogelsammlung im Museum der Senckenbergischen Naturforschenden Gesellschaft,' 185.
Hawk, American Sparrow, 43, 234, 257, 361.
Chilean Sparrow, 268.
Cooper's, 233.
Desert Sparrow, 263.
Duck, 127, 234, 355.
Ecuador Sparrow, 269.
Fish, 286, 313.
Florida Red-shouldered, 234.
Harris's, 233.
Marsh, 233, 361.
Mexican Black, 127.
Pigeon, 43, 127.
Red-shouldered, 135.
Red-tailed, 28, 30, 126, 234.
St. Lucas Sparrow, 267.
Sharp-shinned, 74, 233, 354, 361.
South American Sparrow, 267.
Sparrow, 135, 252.
Swainson's, 234, 361.

- Hawk, West Indian Sparrow, 253.
Zone-tailed, 361.
- Helinaia swainsoni, 191, 213.
- Helminthophila bachmani, 213.
celata, 213, 340, 367, 397.
celata lutescens, 46, 357.
chrysoptera, 35, 213.
leucobronchialis, 302, 306.
peregrina, 213, 340.
pinus, 213, 302, 340.
ruficapilla, 307, 340.
ruficapilla gutturalis, 340.
virginiae, 367.
- Helmitherus vermivorus, 34, 35,
49, 213, 307.
- Hemiprocne zonaris, 276.
- Hen. Clucking, 11.
Heath, 67, 203.
Mangrove, 11.
- Heron, Black-crowned Night, 10,
42, 232.
Great Blue, 9, 42, 232.
Great White, 9.
Green, 10, 134, 232.
Little Blue, 10, 194, 232.
Louisiana, 10.
Night, 318, 319, 321.
Snowy, 10, 360.
White, 126.
Yellow-crowned Night, 10,
232.
- Hesperiphona vespertina, 190.
- Hesperocichla nœvia, 47.
- Himantopus mexicanus, 12, 48, 212,
215.
- Hirundo rustica, 108.
- Histrionicus histrionicus, 69.
- Hitchcock, F. H., the Black Tern
at Prince Edward Island, 71.
- Holden, E. F., *Junco hyemalis* in
eastern Massachusetts in June, 72.
- Howell, A. H., brief notes from
Long Island, 306; abnormal eggs
of *Spizella socialis*, 395.
- Hulbert, H. W., Robert W. Shufeldt,
3d, 398.
- Hummingbird, 69, 136, 195.
Allen's, 44.
Black-chinned, 235, 363.
Broad-tailed, 363.
Calliope, 44, 363.
Long-tailed, 277.
Mango, 277.
Ruby-throated, 235.
Rufous, 44, 363.
Vervain, 277.
- Hydrochelidon nigra surinamensis,
71, 211.
- Hyetornis pluvialis, 274, 372.
- Ibis alba, 14.
- Ibis, Scarlet, 9.
White, 9, 271.
White-faced Glossy, 192, 345,
360.
Wood, 9.
- Icteria virens, 22, 308, 342.
virens longicauda, 367.
- Icterus audubonii, 238.
bullocki, 237, 238, 364.
galbula, 213, 250, 290, 308.
hypomelas, 272.
parisorum, 364.
spurius, 35, 36, 213, 236, 238,
250, 308.
- Ictinia mississippiensis, 107, 126,
192, 212, 233.
plumbea, 107.
- Ionornis martinica, 12, 212, 232,
289, 290.
- JACANA spinosa, 15, 272.
- Jack, 346.
- Jäckel, A. J., notice of his 'System-
atische Uebersicht der Vögel Bay-
erns,' etc., 186.
- Jay, Blue, 136.
Blue-fronted, 355.
California, 301.
Canada, 395.
Oregon, 45, 309.
Steller's, 45, 309.
Woodhouse's, 364.
- Jeffries, J. A., death of, 311.
- Junco annectens, 365, 366.
caniceps, 365, 366.
carolinensis, 107.
hyemalis, 32, 67, 72, 133, 134,
137, 338.
hyemalis carolinensis, 107,
137.
hyemalis oregonus, 45.
hyemalis shufeldti, 365.
hyemalis thurberi, 106, 288.
ridgwayi, 365.
townsendi, 188, 287.
- Junco, 133.
Gray-headed, 365.
Oregon, 45.
Pink-sided, 365.
Ridgway's, 365.
Shufeldt's, 365.
Slate-colored, 32, 137, 338.
Thurber's, 106.
Townsend's, 287.
- KEYSER, L. S., notice of his 'Bird-
dom,' 63.

- Killdeer, 14, 134, 233, 354, 360.
 Kingbird, 68, 136, 236, 280.
 Arkansas, 236, 363.
 Cassin's, 363.
 Kingfisher, Belted, 44, 135, 234, 274, 362.
 Texan, 234.
 Kinglet, Golden-crowned, 38, 140, 344.
 Ruby-crowned, 38, 47, 344, 368, 385.
 Western Golden-crowned, 47.
 Kite, Mississippi, 126, 233.
 Swallow-tailed, 126, 233.
 White-tailed, 233.
 Kittiwake, 353.
 Knot, 13, 146-148, 289, 306.
- LAGOPUS lagopus, 300.
 rupestris reinhardti, 282.
 Lampornis mango, 277.
 nigricollis, 377.
 Lanius ludovicianus, 213, 340, 387.
 ludovicianus excubitorides, 46, 340, 367.
 robustus, 194.
 Lapwing, European, 289.
 Lark, Horned, 194.
 Prairie Horned, 28, 31, 38, 201, 202, 237.
 Streaked Horned, 45.
 Larus argentatus, 225.
 argentatus smithsonianus, 99, 211, 221, 304, 332, 388.
 atricilla, 48, 211.
 delawarensis, 211.
 dominicanus, 389.
 glaucescens, 41.
 marinus, 223, 304, 332.
 occidentalis, 41, 309.
 philadelphia, 41, 211, 304.
 Lawrence, R. H., a preliminary list of the birds of the Gray's Harbor region, Washington, 39; *Aphelocoma californica* in Washington, 301; further notes on birds of the Gray's Harbor region, Washington, 352; *Coccyzus americanus occidentalis* in Washington, 393.
 Legatus albicollis, 250.
 Leverkühn, P., notice of his 'Fremde Eier im Nest,' 185.
 Limosa fedoa, 212.
 sp., 13.
 Limpkin, 11.
 Longspur, Chestnut-collared, 337, 365.
 Lapland, 282.
 McCown's, 337, 365.
- Loomis, L. M., a further review of the avian fauna of Chester County, South Carolina, 28.
 Loon, 41, 286, 292.
 Pacific, 353.
 Red-throated, 353.
 Lophodytes cucullatus, 211, 231.
 Lophornis adorabilis, 324.
 Lophortyx californicus brunneescens, 196.
 Lophotrix stricklandi, 327.
 Lophotriccus squammirostratus minor, 173.
 zeledoni, 173.
 Lorius garrulus, 90.
 rajah, 90.
 Loxia curvirostra bendirei, 196.
 curvirostra minor, 45, 134, 137, 190.
 leucoptera, 397.
 Loxigilla violacea, 48, 49.
 Lucas, F. A., notice of his 'Notes on the osteology of the Paridæ, *Sitta* and *Chamaea*,' 172; notice of his paper, 'On the structure of the tongue in Hummingbirds,' 172; notice of his 'Catalogue of skeletons of birds collected at the Abrolhos Islands,' etc., 172; an egg of the Great Auk, 198; habits of the Herring Gull, 388; up to date, 395.
 Lunda cirrhata, 41.
- MACFARLANE, R., notice of his notes on Arctic birds, 64.
 Mackay, G. H., habits of the Eskimo Curlew (*Numenius borealis*) in New England, 16; *Calidris arenaria* in Massachusetts in winter, 72; habits of the Black-bellied Plover (*Charadrius squatarola*) in Massachusetts, 143; *Anas carolinensis* and *Gallinago delicata* in winter, 199; the migration of *Charadrius dominicus* in Massachusetts in 1891, 199; habits of the American Herring Gull (*Larus argentatus smithsonianus*) in New England, 221; migration of *Urinator imber*, 292; the spring migration of the Scoters in 1892, 292; the Red Phalarope (*Crymophilus fulicarius*) on Nantucket Island, Massachusetts, 294; correction, 300; water birds at Nantucket, Massachusetts, 304; habits of the Oldsquaw (*Clangula hyemalis*) in New England, 330;

- habits of the Hudsonian Curlew in Massachusetts, 345; *Totanus flavipes* and *Charadrius dominicus*, 389; *Tryngites subruficollis*, 389.
- Macrorhamphus griseus*, 13, 212, 290.
- scolopaceus*, 13, 212, 345, 354.
- Mallard, 41, 165, 198, 231, 354.
- Margarops fuscatus*, 48, 49.
- Margornis brunnescens*, 173.
- Marshall, W. B., some birds recently added to the collection of the New York State Museum, 203; a specimen of *Numenius arquatus* said to have been taken on Long Island, N. Y., 390.
- Martin, Purple, 138, 340.
- McCormick, L. M., notes on a few birds from northern Ohio, 397.
- Meadowlark*, 30, 38, 136, 237, 271.
- Western, 237, 355, 364.
- Mearns, E. A., a study of the Sparrow Hawks (subgenus *Tinnunculus*) of America, with especial reference to the continental species (*Falco sparverius* Linn.), 252.
- Megarhynchus pitangua*, 251.
- Megascops asio*, 189.
- asio aikeni*, 108.
- asio floridanus*, 212, 216.
- asio macfarlanei*, 108.
- asio mccallii*, 234.
- asio saturatus*, 108.
- brasilianus*, 327.
- flammeolus*, 170.
- flammeolus idahoensis*, 105, 169.
- nudipes*, 327.
- Melanerpes aurifrons*, 235.
- carolinus*, 201, 213.
- erythrocephalus*, 29, 135, 213, 231, 308.
- torquatus*, 355, 394.
- Melanotis caerulescens*, 288.
- Meleagris gallopavo*, 72, 169, 196, 286.
- gallopavo elliotti*, 167, 233.
- gallopavo mexicana*, 168, 169, 233, 360.
- gallopavo osceola*, 105, 169, 212, 215.
- Mellisuga minima*, 277.
- Melopelia leucoptera*, 123, 124, 233.
- Melophyrha nigra*, 272.
- Melospiza fasciata*, 37, 38, 68, 85, 138, 338.
- fasciata fallax*, 85.
- Melospiza fasciata guttata*, 45, 86.
- fasciata heerinanni*, 85.
- fasciata montana*, 85.
- fasciata rivularis*, 86, 188.
- fasciata samuelis*, 86.
- georgiana*, 204, 213, 339.
- lincolni*, 338.
- Merganser americanus*, 41.
- serrator*, 211, 223, 304.
- Merganser*, American, 41, 223.
- Hooded, 231.
- Red-breasted, 304.
- Merriam, C. H., the Dwarf Screech Owl (*Megascops flammeolus idahoensis* Merriam), 169; the Carolina Paroquet (*Conurus carolinensis*) in Missouri, 301; notice of his 'The geographical distribution of life in North America with special reference to the mammalia,' 377.
- Merrill, H., *Pelecanus erythrorhynchos* in Maine, 292; *Lagopus lagopus* in Maine, 300.
- Merula migratoria*, 29-33, 141, 204, 206, 214, 286, 290, 304, 345.
- migratoria propinqua*, 47, 69, 369.
- Meyer, A. B., another specimen of the Labrador Duck, 389.
- Micropalama himantopus*, 13, 212, 232.
- Micropallas whitneyi*, 362.
- Micropus melanoleucus*, 362.
- Miller, G. S., Jr., *Melanerpes carolinus* in Madison County, New York, in winter, 201; *Crymophilus fulcarius* in Provincetown Harbor, 298; two Cape Cod records, 396.
- Miller, O. T., notice of her 'Little brothers of the air,' 279.
- Milvulus forficatus*, 235.
- tyrannus*, 251, 322.
- Mimocichla rubripes*, 272, 273.
- Mimus gundlachi*, 48, 49.
- polyglottos*, 28, 30, 36, 39, 68, 74, 214, 236, 285, 338, 342.
- polyglottos orpheus*, 48.
- Minor ornithological publications, 66, 187, 282, 383.
- Mitrephorus pallescens*, 196.
- Minotilta varia*, 31-33, 35, 48, 138, 213, 273, 303, 307, 340.
- Mockingbird, 28, 30, 36, 39, 68, 74, 236, 285, 338, 342.
- Molothrus ater*, 136, 204, 213, 237, 302, 364, 386.
- ater obscurus*, 237, 364.

- Molothrus cabanisii*, 202.
Momotus lessoni, 322.
 Morris, R. O., notes from Springfield, Massachusetts, 74; *Perisoreus canadensis* in Massachusetts, 395.
 Mountain-witch, 125.
Muscicapa fulvifrons, 196.
Myiadestes townsendii, 369.
Myiarchus cinerascens, 236, 358, 363.
 cinnatus, 136, 213, 218, 236, 251, 307.
 lawrencei nigricapillus, 251.
 lawrencei olivascens, 196.
 mexicanus, 236.
 mexicanus magister, 196.
 nuttingi, 394.
 sagrae, 49, 272.
Myiodynastes audax, 251.
 luteiventris, 250.
Myiozetetes texensis, 250.
Myrmiceza intermedia, 173.
- NEWTON, A., notice of his 'Fossil birds,' 183.
 Nighthawk, 136, 190.
 Cuban, 276.
 Texas, 362.
 Western, 235, 309, 362.
Nomonyx dominicus, 272.
Numenius arquatus, 390.
 borealis, 16, 212.
 hudsonicus, 14, 21, 43, 212, 306, 345, 384.
 longirostris, 14, 212, 232, 350, 354, 360, 390.
Numida meleagris, 121, 272.
 Nuthatch, Red-breasted, 38, 343.
 White-breasted, 37, 140.
Nyctala acadica, 44, 170.
Nyctea nyctea, 67-69, 135, 286, 355.
Nyctibius jamaicensis, 275, 276.
 pallidus, 276.
Nycticorax nycticorax naevius, 10, 42, 212, 232, 318, 319, 321.
 violaceus, 10, 48, 212, 232, 329.
Nyctidromus albicollis, 324.
- OBERHOLSER, H. C., the Golden Eagle in Ohio, 200.
Oceanodroma leucorhoa macrodactyla, 187.
- Oidemia americana*, 153-158, 293 354.
 bimaculata, 159.
 deglandi, 154, 156-160, 293, 294, 305, 354, 385, 397.
 fusca, 158.
 nigra, 157.
 perspicillata, 42, 154, 156-160, 293, 294.
 Old-man-bird, 274.
 Young, 274.
 Oldsquaw, 305, 330, 354.
 Oldwife, 330.
Olor buccinator, 384.
 columbianus, 42, 384, 386.
Oporornis formosa, 21.
Oreortyx pictus, 43.
 pictus confinis, 188, 287.
 Oriole, Audubon's, 238.
 Baltimore, 290.
 Bullock's, 237, 238, 364.
 Orchard, 35, 36, 236, 238.
 Scott's, 364.
Oroscoptes montanus, 342, 367.
 Osprey, 289.
 American, 43, 127, 286, 361.
Otocoris alpestris, 194, 204.
 alpestris adusta, 364.
 alpestris praticola, 28, 31, 38, 201, 202, 237.
 alpestris strigata, 45.
 Oustalet, E., notice of his work on the birds of Patagonia, 281.
 Ouzel, 386.
 Ovenbird, 35, 139, 341.
 Owl, American Barn, 43, 234.
 American Long-eared, 234, 361.
 Barn, 127, 128, 202, 276, 288.
 Barred, 4, 135.
 Burrowing, 234, 361.
 California Pygmy, 44.
 Dusky Eared, 127.
 Dusky Horned, 355.
 Dwarf Screech, 105, 169.
 Elf, 362.
 Flammulated Screech, 170.
 Florida Barred, 234.
 Florida Burrowing, 1.
 Great Gray, 44.
 Pygmy, 170.
 Sawwhet, 44, 170.
 Screech, 127, 189.
 Short-eared, 234, 355.
 Snowy, 67-69, 135, 355.
 Spotted, 393.
 Texan Screech, 234.
 Western Horned, 234, 361.

- PACHYRAMPHUS albinucha*, 175.
 ornatus, 173.
 Packard, A. S., notice of his 'Labrador coast,' 171.
 Pajaro Ardilla, 326.
 Pale-belly, 144, 199.
 Palmer, T. S., notes on some birds of Grays Harbor, Washington, 308.
Pandion haliaëtus carolinensis, 43, 127, 212, 286, 289, 313, 361.
Parabuteo unicinctus harrisi, 205, 233, 328.
 Paroquet, Carolina, 278, 301, 384, 385.
 Yellow-bellied, 128.
 Parrakeet, Carolina, 49, 206.
 Parrot, Black-billed, 128.
 Yellow-billed, 128.
 Partridge, 125, 194.
 California, 43.
 Chestnut-bellied Scaled, 233.
 Gambel's, 386.
 Massena, 231.
 Mountain, 124.
 San Pedro, 287.
 Scaled, 360.
 Spanish, 125.
 Water, 11.
 Parula, 303.
Parus atricapillus, 67, 140, 204, 281.
 atricapillus turneri, 195.
 atricristatus, 343.
 bicolor, 36, 214.
 bicolor texensis, 343.
 carolinensis, 35, 37, 204, 214.
 carolinensis agilis, 344.
 gambeli, 47.
 rufescens, 47.
Passer domesticus, 137, 206, 231, 286, 319, 395.
Passerella iliaca, 204, 213, 339.
 iliaca unalascensis, 288.
Passerina amoena, 231, 366.
 ciris, 205, 213, 236, 339.
 cyanea, 138, 213, 247, 283, 308, 339.
Pavoncella pugnax, 299.
Pediocætes phasianellus, 189, 385, 387.
 phasianellus campestris, 196, 283.
Pelecanus californicus, 353.
 erythrorhynchos, 192, 292.
 fuscus, 206, 211, 386.
 Pelican, American White, 292.
 Brown, 386.
 California Brown, 353.
 Pelzeln, A. v., death of, 74.
Perisoreus canadensis, 395.
 obscurus, 45, 309.
Peristera cinerea, 329.
Petrochelidon lunifrons, 138, 340, 356, 366.
Peucaea aestivalis, 213.
 aestivalis bachmanii, 31, 73, 213.
 cassini, 73, 338, 359, 366.
 ruficeps boucardi, 366.
 ruficeps eremæca, 73, 338, 341.
 Pewee, Large-billed Wood, 106.
 Western Wood, 44, 236, 363.
 Wood, 136, 236, 281.
Phaëthon flavirostris, 229.
Phalacrocorax dilophus, 192.
 dilophus albociliatus, 196.
 dilophus floridanus, 48, 211.
 pelagicus robustus, 309.
 sp., 353.
Phalacroptilus nuttalli, 235.
 nuttalli nitidus, 235, 362.
 Phalarope, Northern, 295, 298.
 Red, 67, 294-299.
Phalaropus lobatus, 295, 296, 298, 299, 387.
 Pheasant, Chinese, 66, 67.
 Golden, 385.
 Japanese, 68.
 Mongolian, 385.
Philohela minor, 12, 66, 69, 212, 286, 385, 386.
 Phœbe, 236.
 Say's, 236, 363.
 Phœbe-bird, 136.
Phœnicophæus erythrognathus, 184.
Phœnicopterus ruber, 211.
Piaya cayana, 184.
 cayana mehleri, 326.
Picolaptes compressus, 173, 175.
 gracilis, 173, 175.
Picus torquatus, 394.
 Pigeon, Band-tailed, 43.
 Blue, 122.
 Ring-tailed, 122.
 White-bellied, 123.
 White-crowned, 122.
 Wild, 67, 286, 386.
 Pintail, 232, 353.
Pipilo chlorurus, 339, 366.
 erythrophthalmus, 29, 138, 339.
 erythrophthalmus alleni, 213.
 fuscus mesoleucus, 366.
 maculatus arcticus, 339.
 maculatus magnirostris, 107.

- Pipilo maculatus megalonyx*, 107, 366.
maculatus oregonus, 356.
Pipit, American, 28, 33, 37, 46, 342, 367.
 Richard's, 289.
 Sprague's, 342.
Piranga bidentata, 25.
erythromelas, 138, 213, 339.
hepatica, 366.
leucoptera, 25.
ludoviciana, 309, 310, 366.
rubra, 25, 35, 213, 307, 339.
Pitangus caudifasciatus, 272.
derbianus, 250.
Pithys bicolor olivaceus, 175.
Pitta coccinea, 220.
granatina, 218.
granatina borneensis, 221.
Platyparis aglaiae hypophæus, 175.
aglaiae obscurus, 175.
Plautus impennis, 100, 198.
Pleasants, J. H., Jr., an overlooked volume, 206.
Plectrophenax nivalis, 68, 282.
Plegadis autumnalis, 211.
guarauna, 192, 345, 360.
Plover, American Golden, 14, 17-20, 144, 147, 148, 199, 232, 289, 389.
 American Killdeer 290.
 Black-bellied, 14, 143, 300, 306, 360.
 Piping, 15, 306.
 Ringneck, 147.
 Semipalmated, 15, 354.
 Wilson's, 15.
Podilymbus podiceps, 211, 214, 345.
Polioptila cærulea, 31, 35-37, 48, 214, 273, 307, 344, 368.
californica, 368.
plumbea, 368.
Polyborus cheriway, 212, 215, 234, 328.
Poocætes gramineus, 31, 137, 204, 213, 337.
gramineus confinis, 337, 365.
Poorwill, 235.
 Frosted, 235, 362.
Porphyrio smaragnotus, 290.
 Porter, L. H., abnormal plumage of *Habia ludoviciana*, 302.
Porzana carolina, 11, 212, 232, 329.
concolor, 11.
coturniculus, 108, 175.
flaviventris, 11.
jamaicensis, 11, 212.
jamaicensis coturniculus, 108, 175.
Porzana noveboracensis, 67.
spilonota, 175.
Potoo, 127, 275.
 Brown, 127.
 White, 127, 276.
 White-headed, 276.
Premnoplex brunnescens, 173.
Priotelus temnurus, 272.
Progne chalybea, 22.
cryptoleuca, 213.
subis, 138, 205, 213, 307, 340.
subis hesperia, 356.
Protonotaria citrea, 191, 213, 387.
Psaktriparus grindæ, 196.
minimus californicus, 195, 287.
Pseudoscops grammicus, 127.
Pseudogryphus californianus, 288.
Psilorhinus mexicanus, 250.
Ptarmigan, Greenland, 282.
 Willow, 300.
Ptilopus melanauchen, 81.
melanocephalus, 81.
melanospilus, 81.
xanthorrhous, 81.
Ptilorhis magnifica, 282.
wilsoni, 282.
Ptychoramphus aleuticus, 353.
 Publications received, 70, 196, 290, 387.
 Puffin, Tufted, 41.
Pyrgisoma cabanisi, 248.
leucotis, 249.
Pyrocephalus rubineus mexicanus, 236.
Pyrrhuloxia sinuata, 339.
 QUAIL, 67, 68, 120, 271, 281, 385.
 Gambel's, 198.
 Quail-dove, Blue-headed, 125.
 Ruddy, 124.
 Quandy, 330.
Quiscalus crassirostris, 370.
gundlachi, 272.
macrourus, 238.
major, 205, 213.
quiscula, 136, 180-182, 319.
quiscula æneus, 136, 180-182, 238.
quiscula aglæus, 180-182, 213.
 RAGSDALE, G. H., distribution of the species of *Peucaea* in Cooke County, Texas, 73.
 Rail, Black, 11.
 Carolina, 11.
 Clapper, 74.
 Farallon, 175.

- Rail, King, 396.
 Red, 11.
 Virginia, 309, 385.
 Yellow, 67.
- Rain-bird, 273, 274.
- Rallus crepitans, 74, 212.
 elegans, 68, 212, 272, 396.
 longirostris caribæus, 11,
 scottii, 212.
 virginianus, 68, 212, 309, 385.
- Raub, M. W., the Golden Eagle in
 Pennsylvania, 200.
- Raven, 62, 88, 136.
 American, 45, 364.
 White-necked, 364.
- Recurvirostra americana, 12, 232,
 360.
- Redbreast, 147, 148.
 Robin, 274.
- Redhead, 232, 304.
- Redstart, 341.
 American, 34-36, 140, 342.
 Painted, 367.
- Redtail, Western, 354, 361.
- Regulus calendula, 38, 47, 134, 214,
 344, 368, 385.
 satrapa, 38, 140, 344.
 satrapa olivaceus, 47.
- Rhoads, S. N., the breeding habits
 of the Florida Burrowing Owl
 (*Speotyto cunicularia florida*), 1.
- Rhodinocichla rosea, 288.
- Rhynchophanes mcconnii, 337, 365.
- Ridgway, R., notice of his papers
 on Central American and South
 American Birds, 174; notice of
 his 'Directions for collecting
 birds,' 175; *Zonotrichia albicollis*
 in California, 302; spring ar-
 rivals at Washington, D. C.,
 307; notice of his 'The Humming
 Birds', 376.
- Rissa tridactyla pollicaris, 353.
- Roadrunner, 234, 362.
- Robin, 29-33, 68, 286, 304, 373.
 American, 141.
 Western, 47, 369.
- Rostrhamus sociabilis, 212.
- Ruff, 300.
- Rupornis ruficauda, 328.
- Rynchops nigra, 211.
- SALPICHTES guadalupensis, 84.
 obsoletus, 47, 310, 357, 368.
- Saltator grandis, 27.
 magnoides, 27.
- Salvadori, T., notice of his cata-
 logue of the Parrots, 277.
- Sanderling, 13, 72.
- Sandpiper, Baird's, 345.
 Bartramian, 14, 31, 232, 305-
 Buff-breasted, 389.
 Least, 13, 232, 354, 360.
 Pectoral, 13, 232.
 Red-backed, 43, 147, 149.
 Semipalmated, 13.
 Solitary, 13, 232.
 Spotted, 14, 43, 232,
 Stilt, 13, 232.
 Western, 43.
 White-rumped, 13.
- Sapsucker, 109.
 Williamson's, 362.
 Yellow-bellied, 37, 235.
- Sarcoramphus papa, 288.
- Saurothera merlini, 272.
 vetula, 273, 369.
- Saxicola œnanthe, 282.
- Sayornis aquatica, 250.
 phœbe, 136, 205, 213, 236,
 286.
 saya, 236, 363.
- Scardafella inca, 233, 288.
- Scaup, 198.
 American, 304.
 Lesser, 304.
- Schlegelia wilsoni, 282.
- Sciater, P. L., notice of his papers
 on the geographical distribution
 of birds, 183.
- Sclater, P. L., and Shelley, G. E.,
 notice of their catalogue of the
 Scansores and Cocyges, 184.
- Scolecophagus carolinus, 205,
 cyanocephalus, 45, 238, 364.
- Scoter, American, 153, 156, 293,
 354.
 Black, 158.
 Surf, 42, 157, 293, 294.
 Velvet, 159.
 White-winged, 157, 293, 294,
 354.
- Scotiaptex cinerea, 44.
- Scott, W. E. D., observations on
 the birds of Jamaica, West Indies.
 II. A list of birds recorded from
 the Island, with annotations, 9,
 120, 273, 369; a description of the
 adult male of *Botaurus neoxenus*
 (Cory), with additional notes on
 the species, 141; notes on the
 birds of the Caloosahatchie region
 of Florida, 209.
- Scytalopus argentifrons, 175.
- Seiurus aurocapillus, 21, 35, 49,
 139, 214, 273, 307, 341.

- Seiurus motacilla*, 21, 34, 139, 214, 303, 342.
noveboracensis, 21, 133, 134, 139, 214, 307, 341.
noveboracensis notabilis, 303, 341.
Selasphorus floresii, 377.
 Sennett, G. B., description of a new Turkey, 167.
Setophaga picta, 367.
ruticilla, 22, 34-36, 140, 214, 273, 307, 341, 342.
 Shelley, G. E., see Sclater, P. L.
 Shoveler, 198, 232.
 Shrike, Loggerhead, 35, 340.
 White-rumped, 46, 340, 367.
 Shufeldt, R. W., notice of his 'Myology of the Raven,' 62; notice of his 'Contributions to the comparative osteology of arctic and subarctic water-birds,' 173; notice of his papers on the osteology and classification of the North American Pigeons, Woodpeckers, and Kites, 174.
 Shufeldt, R. W., 3d., death of, 398, 400.
Sialia arctica, 47, 231, 369.
mexicana, 47, 310, 369.
mexicana anabelæ, 188.
sialis, 31, 141, 194, 204, 214, 345.
Siphonorhis americanus, 276.
 Siskin, Pine, 356.
Sitta canadensis, 38, 140, 191, 343.
carolinensis, 37, 140.
carolinensis aculeata, 107.
carolinensis lagunæ, 107.
pusilla, 214.
pygmæa leuconucha, 188.
Sittasomus æquatorialis, 175.
amazonus, 175.
chapidensis, 175.
olivaceus, 175.
 Skua, Richardson's, 289.
 Snipe, 69.
 Red-breasted, 390.
 Wilson's, 12, 31, 42, 68, 199, 232, 260.
 Snow, F. H., the Pacific Eider in Kansas, 198.
 Snowbird, 67, 72.
 Solitaire, Townsend's, 369.
Somateria dresseri, 305, 334.
spectabilis, 68, 289.
v.-nigra, 198.
 Sora, 232.
 Southwick, W. C., *Seiurus noveboracensis notabilis* in New Jersey, 303.
 Sparrow, Bachman's, 31.
 Bell's, 288.
 Black-chinned, 365.
 Black-throated, 234, 338.
 Boucard's, 366.
 Brewer's, 365.
 Cassin's, 338, 359, 366.
 Chipping, 72, 137, 281, 338, 395.
 Clay-colored, 338, 365.
 English, 137, 319, 395.
 Field, 31, 137, 338.
 Fox, 339.
 Gambel's, 309, 356.
 Golden-crowned, 356.
 Grasshopper, 28, 31, 39, 137, 338.
 Harris's, 338.
 Henslow's, 31, 39.
 Intermediate, 45.
 Lark, 338.
 Lincoln's, 338.
 Rock, 338, 341.
 Rusty Song, 45.
 Sage, 288.
 Savanna, 33, 36, 133, 137, 355.
 Song, 37, 38, 68, 138, 338.
 Swamp, 339.
 Thick-billed, 288.
 Vesper, 31, 337.
 Western Chipping, 338, 365.
 Western Grasshopper, 338.
 Western Henslow's, 106.
 Western Lark, 338, 365.
 Western Savanna, 45, 338, 365.
 Western Vesper, 337, 365.
 White-crowned, 338, 356, 365.
 White-throated, 33, 132, 281, 338.
Spatula clypeata, 198, 211, 232.
Speotyto cunicularia floridana, 1, 212, 216.
 cunicularia hypogæa, 6, 234, 361.
Sphæcotheres flaviventris, 282.
Sphyrapicus thyroideus, 362.
varius, 37, 109, 134, 135, 205, 213, 235, 275, 374.
Spindalis pretrii, 272.
zena, 48.
Spinus mexicanus, 249.
 pinus, 204, 355.
 psaltria, 365.
 psaltria arizonæ, 337.
 psaltria mexicanus, 249, 337, 341.

- Wheatear, 282.
 Whippoorwill, 35, 201, 235.
 Widgeon, 165, 198.
 American, 165.
 Willet, 14, 149.
 Wilson, S. B., notice of his 'Aves
 Hawaienses,' 63.
 Woodcock, 66-69, 286, 385, 386.
 American, 12.
 Woodpecker, Baird's, 234, 362.
 Downy, 37, 69, 114, 135, 195.
 Golden-fronted, 235.
 Hairy, 135.
 Harris's, 44, 309.
 Lewis's, 355, 394.
 Pileated, 135, 286, 355.
 Radiolated, 275.
 Red-headed, 29, 135.
 Yellow-bellied, 109, 135, 275.
 Woodruff, L. B., some bird notes
 from Litchfield, Connecticut, 202.
 Wren, 319.
 Baird's, 343, 368.
 Bewick's, 29, 30, 36.
 Cactus, 288, 342, 368.
 Cañon, 287, 342.
 Carolina, 73, 343.
 Dotted Cañon, 368.
 House, 140, 319, 343.
 Long-billed Marsh, 343, 357.
 Parkman's, 343.
 Rock, 47, 310, 342, 368.
 Short-billed Marsh, 284, 343.
 Vigors's, 288, 357.
 Western House, 343, 368.
 Wren, Western Winter, 47.
 Winter, 132, 133, 140, 309.
 XANTHOCEPHALUS xanthocephalus,
 237, 364.
 Xantholaema intermedia, 184.
 Xenopsaris albinucha, 175.
 Niphidiopicus percussus, 272.
 Xiphocolaptes albicollis, 175.
 procurvus, 175.
 Xiphorhynchus pusillus, 250.
 YELLOWLEGS, 13, 232.
 Greater, 13, 149, 232, 354.
 Smaller, 389.
 Yellowrump, 303.
 Yellowthroat, Maryland, 31, 139,
 342.
 Mirador, 107.
 Western, 342, 356, 367.
 ZENAIDA zenaida, 123.
 Zenaidura macroura, 69, 135, 204,
 212, 233, 272, 329, 360.
 Zonotrichia albicollis, 33, 132, 281,
 302, 338.
 capensis costaricensis, 248.
 coronata, 356.
 leucophrys, 273, 338, 365.
 leucophrys gambeli, 309, 356.
 leucophrys intermedia, 45,
 310, 356, 365.
 querula, 338.
 Zopilotillo, 325.

ERRATA.

- Page 127, lines 23 and 45, for "PATO" read "POTO".
 " 205, line 35, for "Great-tailed" read "Boat-tailed."
 " 229, " 3, " "*Phæton*" read "*Phæthon*."
 " 276, " 8, " "*flammeola*" read "*flammea*."
 " 294, " 32, " "Hammuck" read "Hummuck."
 " " " 33, " "on" read "over."
 " 295, transfer the two sentences in lines 35, 36, and 37, beginning,
 "One May 10," and ending, "flying about," to end of paragraph, line 42.
 Page 296, line 23, for "loral space" read "patch."
 " 306, " 16, for "northwest" read "northeast."

- Thamnophilus albicrissa*, 175.
 doliatus, 250.
 trinitatis, 175.
Thrasaëtus harpyia, 328.
 Thrasher, Brown, 32, 140, 342.
 Crissal, 368.
 Palmer's 368.
 Sage, 342, 367.
 Thrush, Audubon's Hermit, 344,
 369.
 Dwarf Hermit, 344, 369.
 Gray-cheeked, 344.
 Hermit, 33, 66, 132, 133, 141,
 202, 344.
 Olive-backed, 132, 140, 141,
 344.
 Russet-backed, 47.
 Varied, 47.
 Wilson's, 35, 140, 344.
 Wood, 38, 132, 140, 141, 303.
Thryothorus bewickii, 29, 30, 36,
 307, 385.
 bewickii bairdi, 343, 368.
 bewickii spilurus, 288, 357.
 ludovicianus, 73, 204, 343.
 ludovicianus miamensis, 214.
 Tick-bird, 273.
 Tijo-tijo, 325.
 Tit, California Bush, 287.
 Titmouse, Black-crested, 343.
 Texan Tufted, 343.
 Tufted, 36.
Tityra personata, 322.
Todirostrum cinereum, 250.
Todus multicolor, 272.
 pulcherrimus, 275.
 viridis, 274, 373.
 Tody, Green, 274, 373.
 Sharpe's, 275.
Totanus flavipes, 13, 48, 49, 212,
 232, 384, 389.
 melanoleucus, 13, 149, 212,
 232, 354.
 solitarius, 13, 212, 232, 329.
 Towhee, 29, 138, 339.
 Arctic, 339.
 Cañon, 366.
 Green-tailed, 339, 366.
 Oregon, 356.
 Spurred, 366.
 Treat, W. E., *Ereunetes occiden-*
talis in Connecticut, 389.
Tringa alpina pacifica, 43, 147, 149,
 212, 354.
 bairdii, 345, 397.
 canutus, 13, 146-148, 212, 289,
 290, 306, 397.
 fuscicollis, 13, 212.
 maculata, 13, 48, 212, 232,
 329, 360.
 maritima, 212.
 minutilla, 13, 48, 49, 212,
 232, 354, 360.
Trochilus alexandri, 235, 363.
 alleni, 44.
 calliope, 44, 363, 377.
 colubris, 69, 136, 191, 195,
 205, 213, 235, 308, 324, 386.
 floresii, 108, 377.
 heloisa, 377.
 platycercus, 363.
 rubromitratus, 108.
 rufus, 44, 352, 363.
 violajugulum, 377.
Troglodytes aëdon, 140, 214, 307,
 319, 343.
 aëdon aztecus, 343, 368.
 aëdon parkmanii, 343.
 hiemalis, 132-134, 140.
 hiemalis pacificus, 47, 309.
 insularis, 288.
 Trumbull, G., our Scoters, 153.
Tryngites subruficollis, 329, 389.
Turdus aliciae, 214, 344.
 aonalaschkæ, 344, 369.
 aonalaschkæ auduboni, 107,
 344, 369.
 aonalaschkæ pallasii, 33, 66,
 132-134, 141, 202, 214, 344,
 345.
 fuscescens, 35, 140, 214, 344.
 migratorius, 290.
 mustelinus, 38, 132, 140, 141,
 214, 303, 307.
 sequoiensis, 107, 188.
 ustulatus, 47.
 ustulatus swainsonii, 132,
 134, 140, 141, 214, 344.
 Turkey, Florida Wild, 105.
 Mexican, 233, 360.
 Rio Grande, 167.
 Wild, 72.
 Turnstone, 15, 147, 306.
 Black, 354.
 Turtur risoria, 125.
Tympanuchus americanus, 66, 386.
 cupido, 67, 203.
 pallidicinctus, 231.
Tyranniscus parvus, 250.
Tyrannus dominicensis, 48, 213.
 maguirostris, 272.
 melancholicus satrapa, 251.
 tyrannus, 68, 136, 205, 213,
 236, 280, 308.
 verticalis, 236, 363.
 vociferus, 363.

URIA lomvia, 68.
 Urinator imber, 41, 211, 286, 292, 353.
 lumme, 211, 353.
 pacificus, 353.
 Urococcyx erythronathus, 184.
 Urubitinga anthracina, 127, 328.
 urubitinga ridgwayi, 328.

VERDIN, 287, 344, 368.
 Verrill, G. E., *Carduelis elegans* in Connecticut, 301.
 Vireo altiloquus barbatulus, 213.
 atricapillus, 340, 341.
 bellii, 236, 237, 340.
 crassirostris, 48, 49.
 flavifrons, 23, 31, 35, 192, 213, 340.
 flavoviridis, 22, 288.
 gilvus, 46, 213, 307.
 gundlachi, 273.
 huttoni obscurus, 288.
 noveboracensis, 31, 213, 340.
 noveboracensis maynardi, 213.
 olivaceus, 22, 36, 37, 48, 49, 138, 213, 283, 308, 340, 395.
 philadelphicus, 23, 138.
 solitarius, 37, 38, 133, 138, 213, 340, 341.
 solitarius alticola, 138, 213.
 solitarius cassinii, 367.
 solitarius lucasanus, 106.
 solitarius plumbeus, 367.
 superciliaris, 173.
 vicinior, 367.
 vicinior californicus, 108.
 Vireo, Bell's, 236, 237, 340.
 Black-capped, 340, 341.
 Blue-headed, 37, 38, 340, 341.
 Cassin's, 367.
 Gray, 367.
 Plumbeous, 367.
 Red-eyed, 36, 37, 138, 340, 395.
 St. Lucas Solitary, 106.
 Solitary, 133, 138.
 Warbling, 46.
 White-eyed, 31, 340.
 Yellow-throated, 31, 35, 192, 340.
 Volatinia splendens, 27.
 Vulture, Black, 126, 233, 328.
 John Crow, 126.
 Turkey, 126, 190, 233, 361.

WARBLER, Audubon's, 46, 310, 367.
 Bay-breasted, 307.
 Black-and-white, 31-33, 35, 138, 303, 340.
 Blackburnian, 35, 37, 38, 132, 133, 139, 341.
 Black-fronted, 207.
 Blackpoll, 37, 38, 307.
 Blackthroated Blue, 36-38, 132, 133, 138.
 Black-throated Gray, 46, 367.
 Black-throated Green, 31, 36-38, 132, 133, 139, 341.
 Blue-winged, 340.
 Brewster's, 306.
 Calaveras, 340.
 Canadian, 132, 133, 139, 342.
 Cape May, 37.
 Cerulean, 35.
 Chestnut-sided, 35, 36, 133, 139, 306.
 Golden-cheeked, 341.
 Golden-winged, 35.
 Hermit, 46.
 Hooded, 235, 303, 306, 342.
 Kentucky, 342.
 Kirtland's, 63.
 Lutescent, 46.
 Macgillivray's, 46, 342, 367.
 Magnolia, 133, 139, 340.
 Mourning, 133, 139, 342.
 Myrtle, 33, 37, 132, 340.
 Nashville, 307, 340.
 Orange-crowned, 340, 367.
 Palm, 29, 36.
 Parula, 31, 35, 37, 38, 138, 340.
 Pileolated, 46.
 Pine, 28-30, 139, 341.
 Prairie, 35.
 Prothonotary, 191, 387.
 Swainson's, 191.
 Sycamore, 303, 341.
 Tennessee, 340.
 Townsend's, 367.
 Virginia's, 367.
 Wilson's, 60, 341, 342, 367.
 Worm-eating, 34, 35.
 Yellow, 46, 138, 340, 367.
 Yellow-throated, 31, 32, 35.

Water-thrush, 133, 139, 341.
 Grinnell's, 303, 341.
 Louisiana, 34, 303, 342.

Waxwing, Cedar, 340.
 Wayne, A. T., late breeding of *Columbigallina passerina*, 72; a belated migrant, 72; the Whip-poorwill wintering near Charleston, South Carolina, 201.

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BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

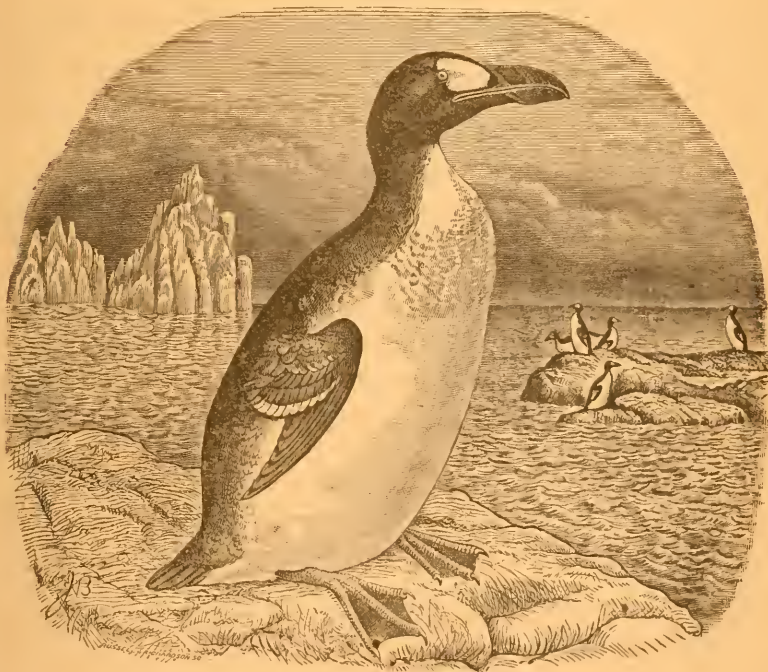
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- Spinus tristis*, 137, 213, 337, 355.
tristis pallidus, 106.
Spiza americana, 234, 248, 339.
Spizaetus ornatus, 328.
Spizella atrigularis, 365.
 breweri, 365.
 pallida, 338, 365.
 pusilla, 31, 137, 204, 213, 338.
 pusilla arenacea, 338.
 socialis, 72, 137, 213, 281, 307,
 338, 395.
 socialis arizonæ, 338, 365.
 Spoonbill, Roseate, 9.
Sporadinus maugæi, 229.
 riccordii, 272.
Sporophila moreleti, 27.
 Sprigtail, 198.
Sturnæna cyanocephala, 125, 271,
 272.
 Steinadler, 186.
 Stejneger, L., notice of his 'Notes
 on Japanese birds,' etc., 176;
 notice of his 'Notes on the cubital
 coverts in the Birds of Paradise
 and Bowerbirds,' 176.
Stelgidopteryx serripennis, 22, 46,
 213, 307, 340, 356.
Stellula calliope, 277.
 Stephens, F., notes on *Syrnium*
occidentale, 392.
Stercorarius parasiticus, 211, 214,
 289.
Sterna antillarum, 211.
 dougalli, 211.
 fluvialis, 191.
 forsteri, 191, 211.
 fuliginosa, 211, 289.
 hirundo, 211, 304.
 maxima, 191, 211.
 sandvicensis aculflavida, 211.
 tschegrava, 211.
 Stilt, Black-necked, 12.
 Stone, W., notice of his 'Summer
 birds of Harvey's Lake, Luzerne
 Co., Pennsylvania,' etc., 176; a
 correction, 202; winter birds of
 Cape May, New Jersey, 203;
 notice of his 'Catalogue of the
 Corvidæ, Paradiseidæ, and Ori-
 olidæ in the collection of the
 Academy of Natural Sciences of
 Philadelphia,' 282; notice of his
 'Birds collected by the West
 Greenland expedition,' 282.
Strix flammea furcata, 127, 128, 276.
 pratinnola, 43, 202, 212, 216,
 234, 288.
 pratinnola furcata, 272.
 pratinnola guatemalæ, 327.
Sturnella hippocrepis, 271, 272.
 magna, 36, 38, 136, 204, 237.
 magna mexicana, 213, 250.
 magna neglecta, 237, 355,
 364.
 Suchetet, A., notice of his 'Les
 oiseaux hybrides,' etc., 382.
Sula sula, 229.
 Sultana, 12.
 Swallow, Bank, 46, 340, 367.
 Barn, 46, 138, 340, 366.
 Cliff, 138, 340, 366.
 Rough-winged, 340, 356.
 Tree, 46, 138, 340.
 Violet-green, 46, 367.
 Swan, Whistling, 42.
 Swift, Black, 276.
 Chimney, 136, 235, 285
 Palm, 276.
 White-collared, 276.
 White-throated, 362.
Sylvania canadensis, 22, 132-134,
 139, 342.
 mitrata, 214, 235, 303, 306,
 342.
 pusilla, 60, 341, 342, 367.
 pusilla pileolata, 22, 46, 357.
Symphemia semipalmata, 14, 48,
 149, 212.
 semipalmata inornata, 212.
Syrnium nebulosum, 135.
 nebulosum alleni, 4, 205,
 212, 234.
 occidentale, 392.
 virgatum, 327.
 TACHYCINETA *bicolor*, 46, 138, 206,
 213, 286, 340.
 thalassina, 46, 356, 367.
 Tanager, Hepatic, 366.
 Louisiana, 310, 366.
 Scarlet, 138, 339.
 Summer, 35, 339.
Tanagra cana, 25.
Tantalus loculator, 9, 211.
 Taylor, A. O'D., occurrence of the
 Black Gyr Falcon in Rhode Island,
 300.
 Teal, Blue-winged, 231, 360
 Cinnamon, 232.
 Green-winged, 198, 199, 231,
 353, 359.
Teretistris fernandinæ, 273.
 Tern, Black, 71.
 Common, 304.
 Gull-billed, 345.
 Noddy, 289.
 Sooty, 289.

CONTENTS.

	PAGE
THE BREEDING HABITS OF THE FLORIDA BURROWING OWL. (<i>Speotyto cunicularia floridana</i>). By Samuel N. Rhoads	1
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By W. E. D. Scott	9
HABITS OF THE ESKIMO CURLEW (<i>Numenius borealis</i>) IN NEW ENGLAND. By George H. Mackay	16
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By George K. Cherrie.	21
A FURTHER REVIEW OF THE AVIAN FAUNA OF CHESTER COUNTY, SOUTH CAROLINA. By Leverett M. Loomis	23
A PRELIMINARY LIST OF THE BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON. By R. H. Lawrence	39
A LIST OF BIRDS TAKEN ON MARAGUANA, WATLING'S ISLAND, AND INAGUA, BAHAMAS, DURING JULY, AUGUST, SEPTEMBER, AND OCTOBER, 1891. By Charles B. Cory	48
NOTES ON THE RANGE AND HABITS OF THE CAROLINA PARRAKEET. By Amos W. Butler.	49
NINTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION	56
RECENT LITERATURE.—The New Nuttall, 59; Shufeldt's 'Myology of the Raven', 62; Bolles's 'Land of the Lingering Snow', 62; Keyser's 'Bird-dom', 63; Scott B. Wilson's <i>Aves Hawaiienses</i> , 63; MacFarlane's Notes on Arctic Birds, 64; Fannin's 'Check List of British Columbia Birds', 65; Chapman on the 'Birds of Corpus Christi', 65; Chapman 'On the Color Pattern of the Upper Tail-coverts in <i>Colaptes auratus</i> ', 66; Minor Ornithological Publications, 66; Publications Received, 70.	
GENERAL NOTES.—The Black Tern at Prince Edward Island, 71; <i>Calidris arenaria</i> in Massachusetts in Winter, 71; Late Breeding of <i>Columbigallina passerina</i> , 72; A Related Migrant, 72; <i>Junco hyemalis</i> in Eastern Massachusetts in June, 72; Distribution of the Species of <i>Peucaea</i> in Cooke County, Texas, 73; <i>Thryothorus ludovicianus</i> in Massachusetts, 73; Notes from Springfield, Massachusetts, 74.	
NOTES AND NEWS.—Obituary,—August von Pelzeln, 74; Captain Thomas Wright Blakiston, 75.	
SUPPLEMENT.—THE INHERITANCE OF ACQUIRED CHARACTERS. President's Address. By D. G. Elliot	
FOURTH SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS	77 105
LISTS OF OFFICERS AND MEMBERS OF THE A. O. U.	

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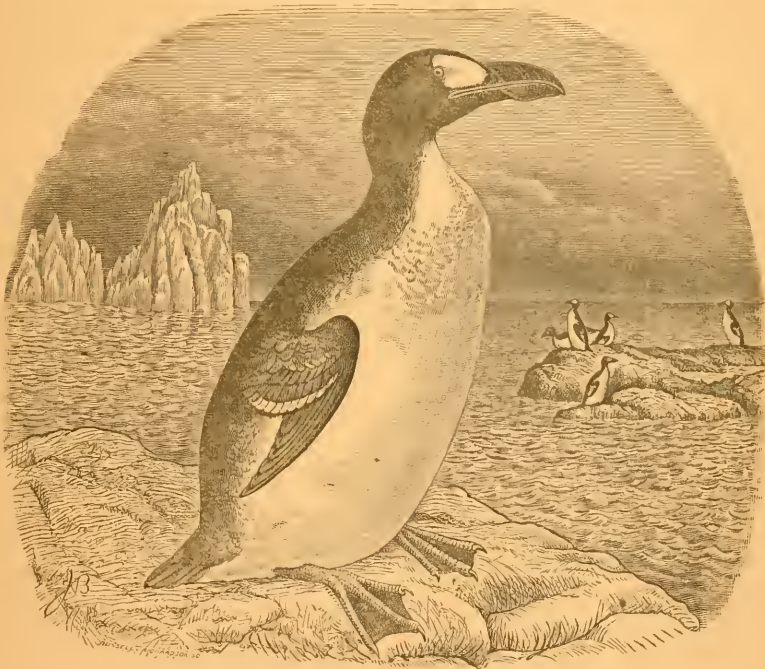
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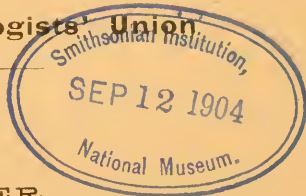


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CONTENTS.

	PAGE
YOUNG SAPSUCKERS IN CAPTIVITY. By <i>Frank Bolles</i>	109
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i>	120
SUMMER BIRDS OF THE CREST OF THE PENNSYLVANIA ALLEGHIANES. By <i>Jonathan Dwight, Jr.</i>	129
A DESCRIPTION OF THE ADULT MALE OF <i>Botaurus neovexus</i> (CORY), WITH ADDITIONAL NOTES ON THE SPECIES. By <i>W. E. D. Scott</i>	141
HABITS OF THE BLACK-BELLIED PLOVER (<i>Charadrius squatarola</i>) IN MASSACHUSETTS. By <i>George H. Mockay</i>	143
OUR SCOTERS. By <i>G. Trumbull</i>	153
HYBRIDISM, AND A DESCRIPTION OF A HYBRID BETWEEN <i>Anas boschas</i> AND <i>Anas americana</i> . By <i>D. G. Elliot</i>	160
DESCRIPTION OF A NEW TURKEY. By <i>George B. Sennett</i>	167
THE DWARF SCREECH OWL (<i>Megascops flammeolus idahocensis</i> MERRIAM). By <i>Dr. C. Hart Merriam</i> . (Plate II.)	169

RECENT LITERATURE.—Packard's 'The Labrador Coast', 171; Lucas on the Osteology of the Paridae, *Sitta*, and *Chamaea*, 172; Lucas on the Structure of the Tongue in Hummingbirds, 172; Lucas on the Bird Skeletons Collected by the U. S. Fish Commission Steamer 'Albatross', 172; Cherric on Costa Rican Birds, 172; Shufeldt on the Osteology of Arctic and Sub-Arctic Water Birds, 173; Shufeldt on the Osteology and Classification of the North American Pigeons, Woodpeckers, and Kites, 174; Ridgway on New or Little-known Central American and South American Birds, 174; Ridgway and Bendire's Directions for Collecting and Preparing Birds and their Eggs and Nests, 175; Stejneger on a Collection of Birds from Japan, 176; Stejneger on the Cubital Coverts in the Birds of Paradise and Bower Birds, 176; Stone on the Birds of Harvey's Lake, Luzerne County, Pennsylvania, 176; Allen on the North American *Colaptes*, 177; Chapman on the Origin of the Avifauna of the Bahamas, 179; Chapman on the Grackles of the Subgenus *Quiscalus*, 180; Newton on 'Fossil Birds', 183; Sclater on the Geographical Distribution of Birds, 183; Sclater and Shelley on the Scansores and Coccoyges, 184; Hartert's Catalogue of the Birds in the Museum of the Senckenberg Natural History Society, 185; Leverkühn's 'Fremde Eier im Nest', 185; Jäckel's Birds of Bavaria, 186; Minor Ornithological Publications, 187; Publications Received, 196.

GENERAL NOTES.—An Egg of the Great Auk, 198; Wintering of the Canvasback in Arizona, 198; The Pacific Eider in Kansas, 198; *Anas carolinensis* and *Gallinago delicata* in Winter, 199; The Migration of *Charadrius dominicus* in Massachusetts in 1891, 199; The Golden Eagle in Pennsylvania, 200; The Golden Eagle in Ohio, 200; Nesting of the Golden Eagle in Arizona, 201; *Melanerpes carolinus* in Madison County, New York, in Winter, 201; The Whippoorwill Wintering near Charleston, South Carolina, 201; The Prairie Horned Lark (*Otocoris alpestris praticola*) Breeding in New Hampshire and Massachusetts, 201; The Prairie Horned Lark in Northeastern Pennsylvania, 202; A Correction, 202; Some Bird Notes from Litchfield, Connecticut, 202; Some Birds Recently Added to the Collection of the New York State Museum, 203; Winter Birds of Cape May, New Jersey, 203; Notes on a Few Louisiana Birds, 204; An Overlooked Volume, 206.

NOTES AND NEWS.—Plate of *Dendroica nigrifrons*, 207; The Audubon Monument, 207; A New Organization, 207; A New Monograph of the Birds of Paradise, 207; Ornithological Explorations, 208.

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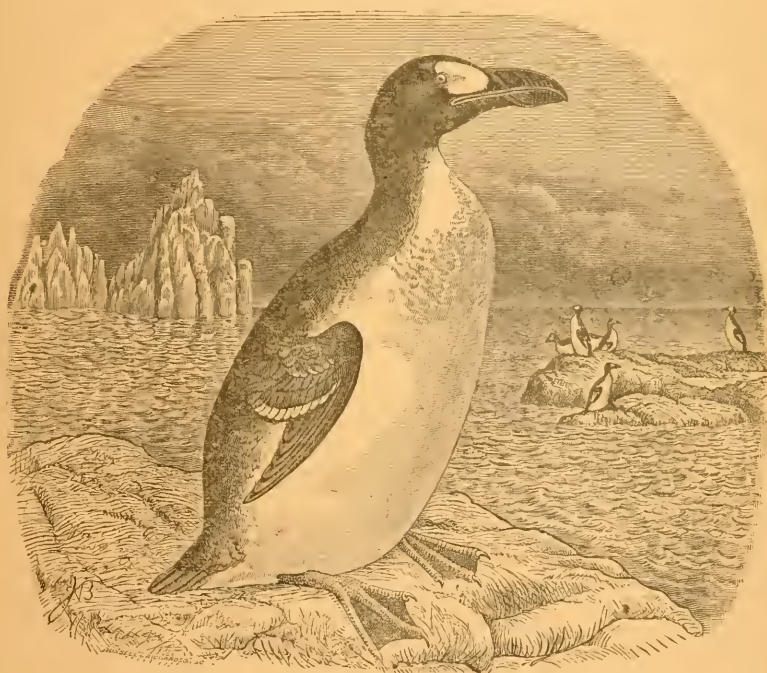
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CONTENTS.

	PAGE
NOTES ON THE BIRDS OF THE CALOOSAHATCHIE REGION OF FLORIDA. By <i>W. E. D. Scott</i>	209
<i>Pitta granatina</i> TEMMINCK ET AUCTORES. By <i>D. G. Elliot</i>	218
HABITS OF THE AMERICAN HERRING GULL (<i>Larus argentatus smithsonianus</i>) IN NEW ENGLAND. By <i>George H. Mackay</i>	221
REMARKS ON A COLLECTION OF BIRDS MADE BY WILMOT W. BROWN, JR., ON MONA AND PORTO RICO DURING FEBRUARY AND A PART OF MARCH, 1892. By <i>Charles B. Cory</i>	228
LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS. By <i>H. P. Atwater</i>	229
SOME NOTES CONCERNING THE EVENING GROSBEAK. By <i>Amos W. Butler</i>	238
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By <i>George K. Cherrie</i>	247
A STUDY OF THE SPARROW HAWKS (SUBGENUS <i>Tinnunculus</i>) OF AMERICA, WITH ESPECIAL REFERENCE TO THE CONTINENTAL SPECIES (<i>Falco sparverius</i> LINN.). By <i>Edgar A. Mearns</i>	253
DESCRIPTION OF AN APPARENTLY NEW <i>Centurus</i> FROM GREAT BAHAMA ISLAND, BAHAMAS. By <i>Charles B. Cory</i>	270
IN CUBA WITH DR. GUNDLACH. By <i>Charles B. Cory</i>	271
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i>	273

RECENT LITERATURE. — Salvadori's Catalogue of the Parrots, 277; Mrs. Miller's 'Little Brothers of the Air,' 279; 'Wood Notes Wild,' 280; Oustalet on the Birds of Patagonia, 281; Stone on the Crows, Birds of Paradise, and Orioles in the Museum of the Philadelphia Academy of Natural Sciences, 282; Stone on Birds collected by the West Greenland Expedition, 282; Minor Ornithological Publications, 282; Publications Received, 290.

GENERAL NOTES. — Migration of *Urinator imber*, 292; *Pelecanus erythrorhynchos* in Maine, 292; The Spring Migration of the Scoters in 1892, 292; The Red Phalarope (*Crymophilus fulvicarius*) at Nantucket, Massachusetts, 294; *Crymophilus fulvicarius* in Provincetown Harbor, 298; *Pavonella pugnax* in North Carolina, 299; Correction, 300; *Lagopus lagopus* in Maine, 300; Occurrence of the Black Gyrfalcon in Rhode Island, 300; The Carolina Paroquet (*Conurus carolinensis*) in Missouri, 301; *Aphelocoma californica* in Washington, 301; *Carduelis elegans* in Connecticut, 301; *Zonotrichia albicollis* in California, 302; Abnormal Plumage of *Habia ludoviciana*, 302; On the Breeding of *Helminthophila pinus* with *H. leucobronchialis* at Englewood, New Jersey, 302; Warblers destroyed by a 'Norther,' 303; *Sciurus noveboracensis notabilis* in New Jersey, 303; Melanism in a Caged Wood Thrush, 303; Water Birds at Nantucket, Massachusetts, 304; Brief Notes from Long Island, 306; Spring Arrivals at Washington, D. C., 307; Notes on some Birds of Grays Harbor, Washington, 308.

NOTES AND NEWS. — Obituary, Dr. John Amory Jeffries, 311; Elliot's Monograph of the Pittide, 312; Dr. Ernst Hartert, 312; Plate of the Rio Grande Turkey, 312.

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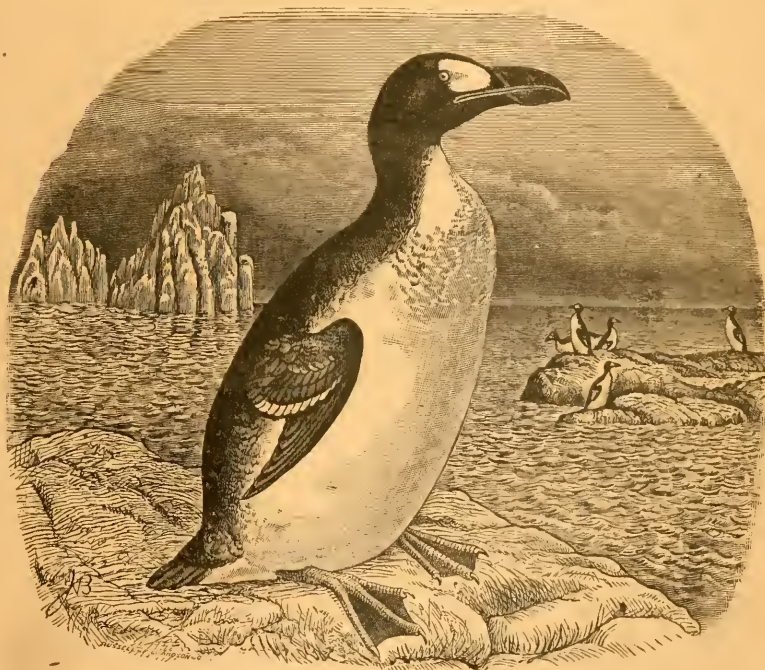
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CONTENTS.

	PAGE,
BREEDING HABITS OF THE FISH HAWK ON PLUM ISLAND, NEW YORK. By <i>Charles Slover Allen</i> . (Plates IV and V).	313
A PRELIMINARY LIST OF THE BIRDS OF SAN JOSÉ, COSTA RICA. By <i>George K. Cherrie</i> .	322
HABITS OF THE OLDSQUAW (<i>Clangula hyemalis</i>) IN NEW ENGLAND. By <i>George H. Mackay</i> .	330
LIST OF BIRDS OBSERVED IN THE VICINITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS. By <i>H. P. Altwater</i> .	337
HABITS OF THE HUDSONIAN CURLEW IN MASSACHUSETTS. By <i>George H. Mackay</i> .	345
FURTHER NOTES ON BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON. By <i>R. H. Lawrence</i> .	352
BIRDS OF SOUTHWESTERN NEW MEXICO. By <i>A. W. Anthony</i> .	357
OBSERVATIONS ON THE BIRDS OF JAMAICA, WEST INDIES. II. A LIST OF THE BIRDS RECORDED FROM THE ISLAND, WITH ANNOTATIONS. By <i>W. E. D. Scott</i> .	369

RECENT LITERATURE.—Bendire's Life Histories of North American Birds, 375; Ridgway's 'The Hummingbirds,' 376; Merriam on the Life Areas of North America, 377; Suchetot on Hybridity in Birds, 382; Minor Ornithological Publications, 383; Publications Received, 387.

GENERAL NOTES.—Habits of the Herring Gull, 388; Another Specimen of the Labrador Duck, 389; *Ereunetes occidentalis* in Connecticut, 389; *Totanus flavipes* and *Charadrius dominicus*, 389; *Tryngites subruficollis*, 389; A Specimen of *Numenius arquatus* Said to have been Taken on Long Island, N. Y., 390; Notes on *Syrnium occidentale*, 392; *Coccyzus americanus occidentalis* in Washington, 393; Original Description of Lewis's Woodpecker, 394; *Myiarchus nultingi* in Arizona, 394; *Perisoreus canadensis* in Massachusetts, 395; Up to Date, 395; Abnormal Eggs of *Spizella socialis*, 395; *Vireo olivaceus* in British Columbia and Washington, 395; The Chestnut-sided Warbler Nesting in Missouri, 396; Two Cape Cod Records, 396; Notes on a Few Birds from Northern Ohio, 397.

CORRESPONDENCE.—Robert W. Shufeldt 3d., 398.

NOTES AND NEWS.—Obituary, Dr. Hermann Burmeister, 399; R. W. Shufeldt, 3d., 400; Potomac Valley Ornithological Club, 400; British Museum Catalogue of Birds, 400; Tenth Congress of the A. O. U., 400.

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