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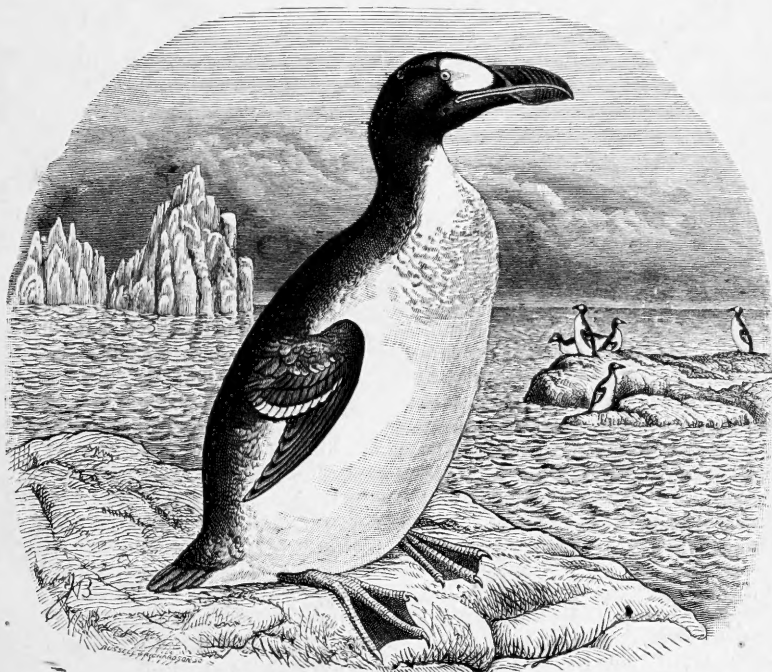
OLD SERIES, } CONTINUATION OF THE { NEW SERIES,
VOL. XV. } BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB { VOL. VII

The Auk

A Quarterly Journal of Ornithology

EDITOR,
J. A. ALLEN

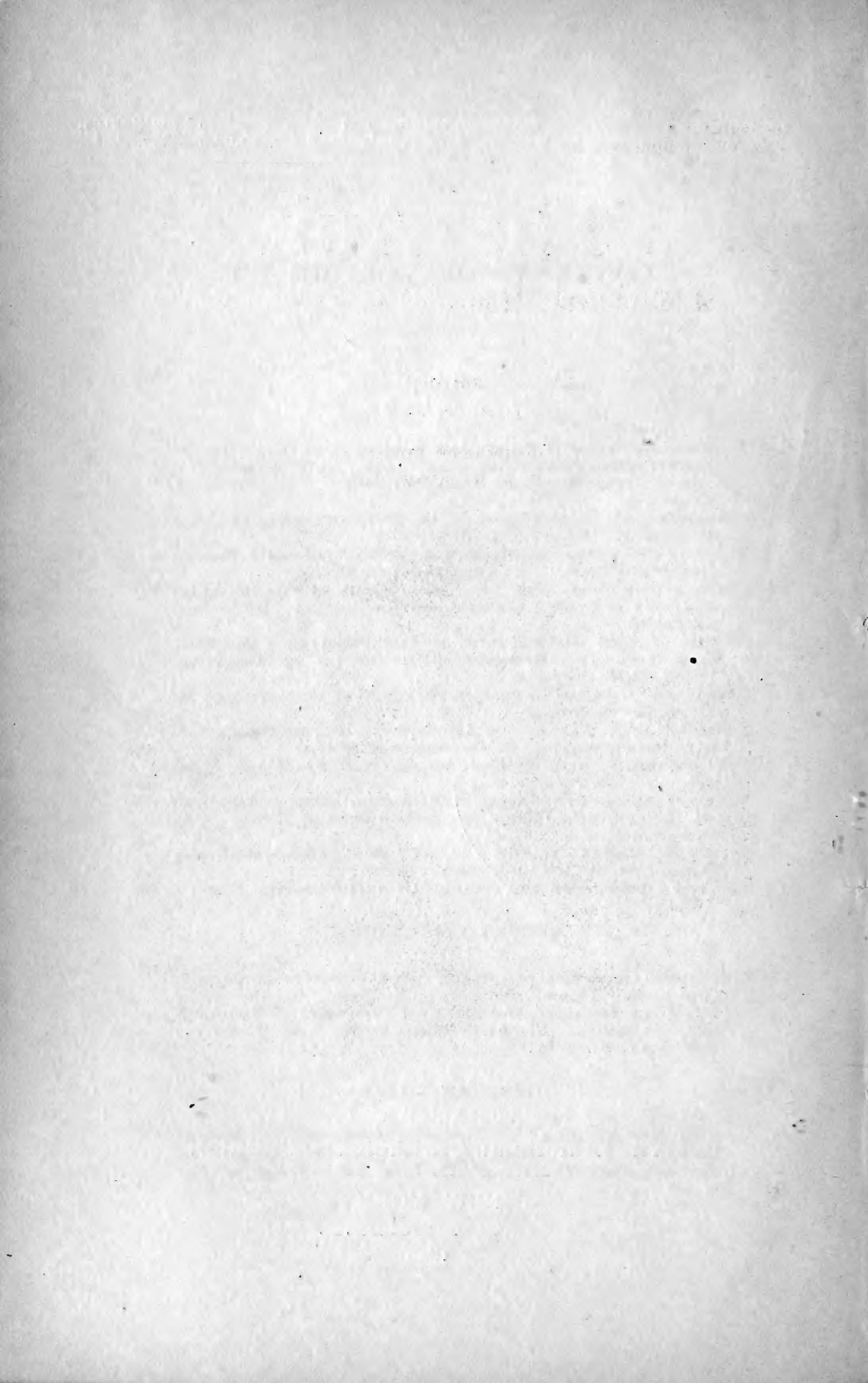
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VOLUME VII
PUBLISHED FOR
The American Ornithologists' Union

NEW YORK
L. S. FOSTER
1890

211



CONTENTS OF VOLUME VII.

NUMBER I.

	PAGE
TO WHAT EXTENT IS IT PROFITABLE TO RECOGNIZE GEOGRAPHICAL FORMS AMONG NORTH AMERICAN BIRDS. By <i>J. A. Allen</i>	1
ON THE EASTERN FORMS OF <i>Geothlypis trichas</i> . By <i>Frank M. Chapman</i>	9
A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA. By <i>W. E. D. Scott</i>	14
NOTES ON <i>Pipilo fuscus mesoleucus</i> AND <i>Pipilo aberti</i> , THEIR HABITS, NESTS AND EGGS. By <i>Capt. Charles E. Bendire</i>	22
OBSERVATIONS ON SOME OF THE SUMMER BIRDS OF THE MOUNTAIN PORTIONS OF PICKENS COUNTY, SOUTH CAROLINA. By <i>Leverett M. Loomis</i>	30
ON THE WINTER DISTRIBUTION OF THE BOBOLINK (<i>Dolichonyx oryzivorus</i>), WITH REMARKS ON ITS ROUTES OF MIGRATION. By <i>Frank M. Chapman</i>	39
OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA. By <i>Dr. Edgar A. Mearns</i>	45
ADDENDUM TO 'A LIST OF THE BIRDS OF THE HUDSON HIGHLANDS, WITH ANNOTATIONS.' By <i>Dr. Edgar A. Mearns</i>	55
NOTE ON THE NESTING OF <i>Buteo brachyurus</i> AT ST. MARKS, FLORIDA. By <i>C. F. Pennock</i>	56
A NEW WREN FROM THE LOWER RIO GRANDE, TEXAS, WITH NOTES ON BERLANDIER'S WREN OF NORTHEASTERN MEXICO. By <i>George B. Sennett</i>	57
SECOND SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS	60
SEVENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION	66

RECENT LITERATURE.

Waterhouse's 'Index Generum Avium,' 71; Blanchard on the Nomenclature of Organized Beings, 73; Ridgway's Ornithology of Illinois, 74; Menzbier's Ornithology of Turkestan, 77; Nehrling's Bird Biographies, 78; Minor Ornithological Publications, 79; Publications Received, 86.

GENERAL NOTES.

An Early date of a Rare Bird in South Carolina, 88; The Mottled Duck in Kansas, 88; Capture of the Widgeon (*Anas penelope*) on the James River, Virginia, 88; The King Eider (*Somateria spec-*

tabilis) at Erie, Pennsylvania, 88; The Little Brown Crane (*Grus canadensis*) in Rhode Island, 89; Baird's Sandpiper at New Haven, Connecticut, 89; *Callipepla squamata* in Northeastern New Mexico, 89; The Key West Quail-Dove (*Geotrygon martinica*) at Key West, 90; *Buteo brachyurus* and *B. fuliginosus*, 90; New York City Owls, 90; *Megascops asio maxwelliae*, 91; The American Hawk Owl near Washington, D. C., 91; Note on *Cyanocitta stelleri litoralis* Maynard, 91; Capture of a Canada Jay (*Perisoreus canadensis*) near Cambridge, Massachusetts, 91; A Second Nest and Eggs of *Picicorvus columbianus* taken in Colorado, 92; Bullock's Oriole in Maine, 92; Notes upon *Coccothraustes vespertina* as a Cagebird, 93; Intergradation between *Zonotrichia leucophrys* and *Z. intermedia*, and between the latter and *Z. gambeli*, 96; Mortality among Bank Swallows, 96; Capture of a Specimen of the Orange-crowned Warbler (*Helminthophila celata*) in the vicinity of Washington, D. C., 96; A Curious Specimen of the Yellow-throated Warbler (*Dendroica dominica*), 97; The Nest and Eggs of *Regulus calendula*, 97; *Myadestes townsendii* Wintering in Montana, 98.

NOTES AND NEWS.

Obituary, John G. Bell, 98; Specimens Exhibited at the A. O. U. Congress, 99; Photographs of Birds, 99; Dr. E. A. Mearns's Collections, 100; Ornithologists at the American Museum, 100; The Late Mr. Snowdon Howland's Collection of Eggs, 100; Davie's 'Nests and Eggs of North American Birds,' 100.

NUMBER II.

BARRED OWLS IN CAPTIVITY. By <i>Frank Bolles</i>	101
A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA. By <i>W. E. D. Scott</i>	114
ON THE CHANGES OF PLUMAGE IN THE BOBOLINK (<i>Dolichonyx oryzivorus</i>). By <i>Frank M. Chapman</i>	120
OBSERVATIONS ON SOME OF THE SUMMER BIRDS OF THE MOUNTAIN PORTIONS OF PICKENS COUNTY, SOUTH CAROLINA. By <i>Levertt M. Loomis</i>	124
A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL. By <i>Clarence B. Riker</i> . With Annotations by <i>Frank M. Chapman</i>	131
THE HORNED LARKS OF NORTH AMERICA. By <i>Jonathan Dwight, Jr.</i>	138
A NEW VIREO FROM CALIFORNIA. By <i>F. Stephens</i>	159
A STUDY OF THE GENUS <i>Dendroornis</i> AND ITS SPECIES. By <i>D. G. Elliot</i>	160

RECENT LITERATURE.

Salvin and Godman's *Biologia Centrali-Americana*—Aves, 189; Saunders's *Manual of British Birds*, 195; Notes on Sport and Ornithology, 196; Doan's *Birds of West Virginia*, 197; The

Quadrat Bone in Birds, 198; Minor Ornithological Publications, 198; Publications received, 201.

GENERAL NOTES.

The Appearance of the Razor-billed Auk (*Alca torda*) on the Coast of North Carolina, 203; The Great Auk in the U. S. National Museum, 203; Eggs of the Florida Dusky Duck, 204; Another Capture of the Widgeon (*Anas penelope*) on the Atlantic Coast, 204; Capture of a Specimen of *Somateria dresseri* in the vicinity of Ottawa, Canada, 204; The Red Phalarope on Lake Erie, 204; Recent Occurrence of the Turkey Vulture in Eastern Massachusetts, 204; Harlan's Hawk a Race of the Red-tail, and not a Distinct Species, 205; Capture of a Third Specimen of the Barn Owl in Massachusetts, 205; The Great Gray Owl in Lewis County, New York, 206; *Picoides arcticus* in Central New York, 206; The Red-bellied Woodpecker in Northwestern New Jersey, 206; Food of Young Hummingbirds, 206; Remarks on certain Species of *Dendrognathus*, 207; The Purple Grackle at Charleston, South Carolina, 208; *Quiscalus quiscula æneus* Killing and Catching Goldfish, 208; The Evening Grosbeak at Montreal, 209; *Coccothraustes vespertina* in Erie County, N. Y., 209; Evening Grosbeaks in Vermont, 210; *Coccothraustes vespertina* at Amherst, Massachusetts, 210; Evening Grosbeaks in Hampden County, Massachusetts, 210; The Evening Grosbeak in Connecticut, 211; Evening and Pine Grosbeaks in Ontario, 211; The Ipswich Sparrow in Georgia, 211; The Acadian Sharp-tailed Sparrow and Scott's Seaside Sparrow on the Coast of South Carolina, 212; *Passer domesticus* in Cape Breton, 212; Shrikes of Minnesota, 213; Notes on some Minnesota Birds, 213; Note on Pacific Coast Birds, 214.

CORRESPONDENCE.

Recording the Number of Birds Observed, 216.

NOTES AND NEWS.

Obituary, Dr. Ladislas Tackzanowski, 218; Amendments of the A. O. U. By-Laws, 218; A Study of the Genus *Junco*, 219; Minor Ornithological Publications, 219; Record Sheets, 220; Fourth Edition of Dr. Coues's 'Key to North American Birds,' 220; 'Ornithologisches Jahrbuch,' 220; 'The Observer,' 220. Mr. W. E. D. Scott's Explorations, 220; Pileated Woodpecker, 220.

NUMBER III.

AN ACCOUNT OF FLAMINGOES (*Phoenicopterus ruber*) OBSERVED IN THE VICINITY OF CAPE SABLE, FLORIDA. By W. E. D. Scott 221
CAPE COD BIRD NOTES. By G. S. Miller, Jr. 226

ADDITIONAL NOTES ON THE BIRDS OF ONEIDA COUNTY, NEW YORK. By <i>William L. Ralph</i> and <i>Egbert Baggs</i> . . .	229
NOTES ON THE NESTING HABITS OF SEVERAL BIRDS OF SAN JOSÉ, COSTA RICA. By <i>George K. Cherrie</i> . . .	233
NOTES ON THE FRINGILLIDÆ OF WESTERN ILLINOIS. By <i>Otho C. Poling</i> . . .	238
DESCRIPTIONS OF A NEW SPECIES AND THREE NEW SUBSPECIES OF BIRDS FROM ARIZONA. By <i>Dr. Edgar A. Mearns</i> , U. S. A. . .	243
OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA By <i>Dr. Edgar A. Mearns</i> , U. S. A. . .	251
TWO SPECIES OF SWALLOW NEW TO NORTH AMERICA. By <i>W. E. D. Scott</i> . . .	264
A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL. By <i>Clarence B. Riker</i> . With annotations by <i>Frank M. Chapman</i> . . .	265

RECENT LITERATURE.

Ridgway on the Genus *Xiphocolaptes*, 271; Ridgway on the Genus *Sclerurus*, 272; Ridgway on Birds from the Galapagos Islands, the Abrolhos, the Island of Santa Lucia, and from the Straits of Magellan, 273; Chapman on the Genus *Xiphorhynchus*, 274; Berlepsch on some Neotropical Birds in the U. S. National Museum, 275; Stejneger on European Titmice, 275; Stejneger on Hawaiian Birds, 275; Stejneger's 'Review of Japanese Birds,' 276; Lucas on the Osteology of the Thrushes and Wrens, 277; Shufeldt on the Osteology of the Ardeinæ, 277; Shufeldt on the Relationships of the Genus *Chamaea*, 278; Shufeldt's Studies of the Macrochires, 278; Shufeldt on the Osteology of the North American Passeres, 279; Maynard's 'Eggs of North American Birds,' 280; Bryant's 'Catalogue of the Birds of Lower California,' 281; Anthony on New Birds from Lower California, 281; Sennett on Bird Legislation, 282; Publications Received, 282.

GENERAL NOTES.

Black Guillemot in Connecticut, 283; the Widgeon (*Anas penelope*) near Baltimore, Md., 283; The King Eider (*Somateria spectabilis*) at Brunswick, Ga., 284; The Snow Goose (*Chen hyperborea nivalis*) on the Coast of Maine, 284; Former Abundance of the Wild Pigeon in Central and Eastern New York, 284; Harlan's Hawk, 285; Habits of the Barred Owl, 286; *Phalaenoptilus nuttalli nitidus* Breeding in Kansas. Is it a Valid Race, or a Color Phase of *P. nuttalli*?, 286; Food and Habits of the Ruby-throated Hummingbird, 286; Snake Skins in the Nests of *Myiarchus crinitus*, 288; Wintering of the Red-winged Blackbird near Cambridge, Mass., 288; (*Coccothraustes vespertina* in Taunton, Massachusetts, 289; The Evening Grosbeak (*Coccothraustes vespertina*) near Springfield, Mass., 289; *Junco hyemalis shufeldti* in Maryland, 289; Seaside Sparrows at Monomoy Island, Cape Cod, 289; Young Cedarbirds and Great Crested Flycatchers in Captivity, 290; Song of the Female Butcher Bird, 290; *Helminthophila celata* at Montreal, 290; The Song of *Helminthophila leucobronchialis*, 291; *Dendroica caerulescens* again in the District of Columbia, 291; *Cistothorus stellaris* at Washington, D. C., 291; Capture of the Hudsonian Chickadee in Worcester County, Mass., 291; A Yellow-crowned *Regulus calendula*, 292; The Breeding Ranges and Songs of Three Thrushes in Montana, 292; Additional Notes

on the Probable Breeding of *Saxicola ananthe* near Godbout, Province of Quebec, Canada, 294; Notes on Several Species of Water Birds at Muskeget Island, Massachusetts, 294; Notes on Several Birds in the Catskill Mountains, 295; Notes on Birds observed in the Colorado Desert in Winter, 296.

CORRESPONDENCE.

The Delaware Valley Ornithological Club, 298.

NOTES AND NEWS.

Obituary, John Henry Gurney, 299; *Zoe*, a Biological Journal, 300; A New Book by Capt. Bendire, 300.

NUMBER IV.

ON BIRDS OBSERVED AT THE DRY TORTUGAS, FLORIDA, DURING PARTS OF MARCH AND APRIL, 1890. By <i>W. E. D. Scott</i> . . .	301
A SUPPOSED NEW SPECIES OF HUMMINGBIRD IN THE ROYAL ZOÖLOGICAL MUSEUM OF DRESDEN. By <i>A. B. Meyer</i> . . .	315
<i>Somateria dresseri</i> , THE AMERICAN EIDER. By <i>George H. Mackay</i> . . .	315
ON A COLLECTION OF BIRDS FROM FORT CHURCHILL, HUDSON'S BAY. By <i>W. Eagle Clarke</i> . . .	319
THE NESTING OF THE YELLOW-THROATED WARBLER AT RALEIGH, N. C. By <i>C. S. Brimley</i> . . .	323
BIRDS FOUND BREEDING ON SEVEN MILE BEACH, NEW JERSEY. By <i>Charles S. Shick</i> . . .	326
NOTES ON HABITS AND NESTING OF <i>Vireo flavoviridis</i> (CASS.). By <i>George K. Cherrie</i> . . .	329
NORTH AMERICAN BIRDS FOUND AT SAN JOSÉ, COSTA RICA, WITH NOTES ON THEIR MIGRATION. By <i>George K. Cherrie</i> . . .	331
NOTES ON HABITS OF A FEW BIRDS OF ORANGE COUNTY, FLORIDA. By <i>D. Mortimer</i> . . .	337
DESCRIPTION OF A NEW SPECIES OF <i>Icterus</i> FROM ANDROS ISLAND, BAHAMAS. By <i>J. A. Allen</i> . . .	343
A LIST OF BIRDS FROM NORTHEAST BORNEO, WITH FIELD NOTES BY MR. C. F. ADAMS. By <i>D. G. Eliot</i> . . .	346
SUMMER ROBIN ROOSTS. By <i>William Brewster</i> . . .	360
ON A COLLECTION OF BIRDS MADE DURING THE WINTER OF 1889-90 BY CYRUS S. WINCH, IN THE ISLANDS OF ST. THOMAS, TORTOLA, ANEGADA, AND VIRGIN GORDA, WEST INDIES. By <i>Charles B. Cory</i> . . .	373
DESCRIPTION OF A NEW SUBSPECIES OF WILD TURKEY. By <i>W. E. D. Scott</i> . . .	376
A NEW SUBSPECIES OF THE SOLITARY SANDPIPER. By <i>William Brewster</i> . . .	377

RECENT LITERATURE.

Sclater's Catalogue of the Tracheophonæ, 379; Allen on Birds from Quito, 380; Allen on Birds collected in Bolivia, 381; Allen on the Genus *Cyclorhis*, 382; Allen's Descriptions of New South American Birds, 384; Allen on Individual and Seasonal Variation in the Genus *Elainea*, 385; Allen on the Maximilian Types of South American Birds, 386; Dionne's Catalogue of the Birds of Quebec, 387; Proceedings of the Linnæan Society, 387; Minor Ornithological Publications, 388; Publications Received, 398.

GENERAL NOTES.

The Little Black Rail (*Porzana jamaicensis*) at Key West, Florida, 400; The Dowitcher at Ottawa, 400; The American Barn Owl near Troy, New York, 400; *Strix pratincola* in Western New York, 400; A Correction, 400; Breeding of the Pileated Woodpecker in Worcester County, Massachusetts, 400; *Melanerpes aurifrons* in Young Co., Texas, in 1878, 401; Notes on *Eugenes fulgens*, 402; The Philadelphia Vireo in Vermont, 403; Spotted Eggs of Swainson's Warbler, 403; *Helminthophila chrysoptera* in Manitoba, 404; Was he a Philanthropist? 404; Capture of a Second Specimen of the Hooded Warbler in Massachusetts, 407; Interesting Nesting Site of a Winter Wren (*Troglodytes hiemalis*), 407; The Hudsonian Chickadee (*Parus hudsonicus*) in Vermont and Massachusetts, 407; (*Myadestes townsendii* in Nebraska, 408; The Long-billed Marsh Wren, Maryland Yellowthroat, Nashville Warbler, and Great Blue Heron in Eastern Massachusetts in Winter, 408; Two Notes from South Carolina, 410.

CORRESPONDENCE.

A Query in regard to the Least Tern, 410.

NOTES AND NEWS.

Obituary, William Kitchen Parker, 411; Eighth Congress of the A. O. U., 412; Second International Ornithological Congress, 412; Sparrow Legislation, 413; New Books, 414; Work of the Division of Economic Ornithology and Mammalogy, 414; Mr. Jonathan Dwight, Jr., 414.

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FERRARI-PEREZ, Prof. FERNANDO, Naturalist Mexican Geol. Expl. Commission, Pueblo, Mexico	1885
FREKE, PERCY EVANS, Rosemount, Dundrum, County Dublin, Ireland	1883
GADOW, Dr. HANS, The New Museums, Cambridge, England	1884
GIRTANNER, Dr. A., St. Galle, Switzerland	1884
GODMAN, F. DU CANE, 10 Chandos Street, Cavendish Sq., London ..	1883
GODWIN-AUSTEN, Lieut.-Col. H. H., Shalford House, Guilford, England	1884
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris ..	1883
GURNEY, JOHN HENRY, Jr., Keswick Hall, Norwich, England	1883
*HAAST, Dr JULIUS VON, Christ-Church, New Zealand	1884
HARGITT, EDWARD, Broadwater Lodge, Broadwater, Worthing, Sussex, England	1884
HARTING, JAMES EDWARD, Linnæan Society, Burlington House, Piccadilly, London	1883
HARVIE-BROWN, JOHN A., Dunipace House, Larbert, Stirlingshire, Scotland	1883
HAYEK, Dr. GUSTAV VON, Vienna	1884
HENSON, HARRY V., Yokohama, Japan	1888
HOLUB, Dr. EMIL, Vienna	1884
*HOMEYER, Dr. E. F. VON, Stolp, Germany	1884
KNUDSON, VALDEMAR, Kauai, Hawaiian Ids.	1888
KRUKENBERG, Dr. E. F. W., Würzburg, Germany	1884
KRÜPER, Dr. THEOBALD J., University Museum, Athens, Greece ..	1884
LAYARD, E. L., H. B. M. Consul, Noumea, New Caledonia	1884
LYTTLETON, THOMAS, Lord LILFORD, Lilford Hall, Oundle, England	1889
MACFARLANE, ROBERT, Winnipeg, Manitoba	1886
MADARÁSZ, Dr. JULIUS VON, National Museum, Budapest, Hungary ..	1884
MALMGREN, Dr. A. J., University, Helsingfors, Finland	1884
*MARSHALL, Graf A. F., Wallzeil, 33, Vienna	1884
MENZBIER, Dr. M., Moscow, Russia	1884
MEYER, Dr. A. B., Königl. Zool. Museum, Dresden	1884
MIDDENDORF, Dr. A. VON, Dorpat, Russia	1884
MOJSISOVICS, Dr. A. VON, Gratz, Austria	1884
NAMIYE, M., Tokio, Japan	1886
NICHOLSON, FRANK, 62 Fountain St., Manchester, England	1884
OATES, E. W., 6 Tenterden St., Hanover Sq., London	1884
OUSTALET, Dr. EMILE, Jardin des Plantes, 55 Rue de Buffon, Paris ..	1883
PALMÉN, Prof. J. A., Helsingfors, Finland	1883
PHILIPPI, Dr. R. A., Santiago, Chili	1884
*PRJEVALSKI, General N. M., Acad. of Science, St. Petersburg, Russia	1884

*Deceased.

*PRYER, HARRY, Yokohama, Japan.....	1884
RADDE, DR. GUSTAV FERDINAND, Tiflis, Russia.....	1884
RAMSEY, E. P., Sydney, New South Wales, Australia.....	1884
REICHENOW, DR. ANTON, Königl. Mus. für Naturkunde, Invaliden Str., 43, Berlin.....	1884
RINGER, FREDERIC, Nagasaki, Japan.....	1888
SCHRENCK, DR. LEOPOLD VON, St. Petersburg, Russia.....	1884
SELYS-LONGSCHAMPS, BARON EDMOND DE, Liège, Belgium.....	1884
*SEVERTZOW, DR. N., Moscow Russia.....	1884
SHALOW, DR. HERMAN, 31 Paul Str., N. W., Berlin, Germany.....	1884
SHELLEY, CAPT. G. E., 6 Tenterden St., Hanover Sq., London.....	1884
*STEVENSON, HENRY, Unthank's Road, Norwich, England.....	1884
THEEL, DR. HJÄLMAR, University of Upsala, Upsala, Sweden.....	1884
TRISTRAM, REV. CANON H. B., The College, Durham, England.....	1884
TSCHUSI ZU SCHMIDHOFFEN, COUNT VICTOR RITTER VON, near Hal- lein, Salzburg, Austro-Hungary.....	1884
WHARTON, HENRY T., 39 St. George's Road, Kilburn, London, N. W.	1884
ZELEDON, DON JOSÉ C., San José, Costa Rica.....	1884

ASSOCIATE MEMBERS.

ADNEY, E. T., University Building, New York City	1885
ALLEN, DR. CHARLES S., 21 E. 28th St., New York City	1888
ALLEN, FRANCIS H., West Roxbury, Mass	1888
AMERY, CHARLES F., 'Forest and Stream' Pub. Co., 318 Broadway, New York City	1886
ANTHONY, A. W., San Diego, Cal.	1885
ARCHER, W. C., 252 7th St., Jersey City, N. J.	1888
*ATKINS, DR. H. A., Locke, Ingham Co., Mich.....	1883
ATKINS, J. W., Key West, Florida	1887
AVERILL, C. K., Jr., Bridgeport, Conn.....	1885
EVERY, DR. WM. C., Greensboro, Ala.....	1887
AYER, ED. E., 234 So. Water St., Chicago, Ill.....	1889
BAGG, EGBERT, 187 Genesee St., Utica, N. Y.	1883
BAILEY, VERNON, Elk River, Minn.....	1887
BAILY, WM. L., 212 So. 3d St., Philadelphia, Pa.	1886
BANGS, E. A., 31 Pemberton Sq., Boston, Mass.	1884
BANGS, OUTRAM, 31 Pemberton Sq., Boston, Mass.....	1884
BANKS, J. W., Portland, N. B.	1887
BARNARD, JOB, 500 5th St., N. W., Washington, D. C.	1886
BARNES, HON. R. M., Lacon, Ill.	1889
BEAL, F. E. L., Lunenburg, Mass.	1887
BEARD, DANIEL C., 110 Fifth Av., New York City.....	1887
BEARD, J. CARTER, 347a Quincy St., Brooklyn, N. Y.....	1889
*BECKHAM, C. W., Bardstown, Ky.....	1883

* Deceased.

BELL, JAMES P. H., Gainesville, Fla.....	1889
BELLOWS, ED. D., 215½ 4th St., Jersey City, N. J.	1889
BENNER, FRANKLIN, 517 Nicollet Av., Minneapolis, Minn.	1883
BENSON, Lieut. H. C., U. S. A., West Point, N. Y.....	1886
BENT, ARTHUR C., Taunton, Mass.....	1889
BERGTOLD, Dr. W. H., 1192 Delaware Av., Buffalo, N. Y.	1889
BERIER, DeLAGNEL, Bay Ridge, Kings Co., N. Y.	1885
BILL, CHARLES, Springfield, Mass.	1889
BISHOP, Dr. LOUIS B., Box 235, New Haven, Conn.	1885
BOARDMAN, G. A., Calais, Maine	1884
BOGERT, M. T., Flushing, Queens Co., N. Y.....	1889
BOLLES, F., Harvard College, Cambridge, Mass.....	1889
BOND, FRANK, Cheyenne, Wyoming	1887
BRADFORD, M. B. L., Providence, R. I.	1889
BRANDRETH, FRANKLIN, Sing Sing, N. Y.	1886
BRASHER, REGINALD I., 142 Montague St., Brooklyn, N. Y.	1889
*BRESEE, WM. L., Islip, Suffolk Co., N. Y.	1888
BRIMLEY, C. S., Raleigh, N. C.	1888
BROCKUNIER, SAML. H., Wheeling, West Virginia	1889
BROWN, HERBERT, Tucson, Arizona	1885
BROWN, HERBERT H., 445 Yonge St., Toronto, Can.	1889
BROWN, JOHN CLIFFORD, 85 Vaughan St., Portland, Me.....	1888
BROWNE, FRANK C., Framingham, Mass.	1883
BULLY, REGINALD H., Canton, Ohio	1889
BUTLER, AMOS W., Brookville, Ind.	1885
CAIRNS, JOHN S., Weaverville, N. C.....	1889
CAMP, ROBERT D., Box 726, Stamford, Conn.	1888
CANTWELL, GEORGE G., Lake Mills, Jefferson Co., Wis.....	1889
CHAMBERLAIN, C. W., 51 Lincoln St., Boston, Mass.	1885
CLARK, HUBERT L., Amherst, Mass.....	1886
CLARK, J. N., Saybrook, Conn.....	1885
CLUTE, WILLARD N., 11 Jarvis St., Binghamton, N. Y.....	1889
COALE, H. K., 101 Washington St., Chicago, Ill.....	1883
COBB, W. H., Albuquerque, New Mexico.....	1888
*COE, W. W., Portland, Conn.....	1883
COLBURN, W. W., Springfield, Mass.....	1889
COLBY, EDWARD A., 4130 Drexel Boulevard, Chicago, Ill.....	1886
COLEMAN, GEO. A., London, Neb.....	1888
COLLINS, Capt. J. W., Smiths. Inst., Washington, D. C.....	1888
COLTON, WM. N., Biddeford, Me.....	1889
COMEAU, NAP. A., Godbout, P. Q., Can.....	1885
CONKLIN, Dr. WM. A., Director of Menagerie, Central Park, New York City.....	1885
COPE, ALBAN, Germantown, Pa.....	1885
COPELAND, A. M., Springfield, Mass.....	1889

COUES, ELLIOTT BAIRD, care of Dr. E. Coues, Smiths. Inst., Washington, D. C.....	1886
COUES, WM. PEARCE, 14 Ash St., Cambridge, Mass.....	1888
COX, D. G., 367 Ontario St., Toronto, Can.....	1888
COX, PHILIP, Newcastle, New Brunswick.....	1887
CURTIS, FRED W., Wauwatosa, Wis.....	1889
DAENZER, CARL, 13 No. 3d St., St. Louis, Mo.....	1888
DAGGETT, FRANK S., Duluth, Minn.....	1889
DANA, ROY, Warren, Ohio.....	1889
DAVIE, OLIVER, Columbus, Ohio.....	1889
DAVIS, EDWIN C., Box 277, Gainesville, Texas.....	1888
DAVISON, J. L., Lockport, Niagara Co., N. Y.....	1885
DAY, E. L., Buckhannon, W. Va.....	1888
DELAFIELD, JOSEPH L., 475 5th Ave., New York City.....	1888
DENSLOW, H. C., Am. Mus. Nat. Hist., New York City.....	1889
DICKINSON, EDWIN, Springfield, Mass.....	1885
DOAN, WM. D., Coatesville, Chester Co., Pa.....	1885
DRAKE, JOHN N., Mutual Life Ins. Co., 32 Nassau St., New York City.....	1886
DREW, FRANK M., Bloomington, Ind.....	1885
DURFEE, OWEN, 46 Maple St., Fall River, Mass.....	1887
DUTCHER, BASIL HICKS, 51 Liberty St., New York City.....	1886
DYCHE, Prof. L. L., Lawrence, Kansas.....	1886
EAMES, EDWIN H., Bridgeport, Conn.....	1888
EDDY, N. A., 615 North Grant St., Bay City, Michigan.....	1885
EDSON, JOHN M., Sehome, Washington.....	1886
*ELLIOTT, S. LOWELL, 466 8th St., South Brooklyn, N. Y.....	1888
EMERSON, W. OTTO, Haywards, Cal.....	1885
EPPLEY, KURTZ, Orange, N. J.....	1888
EVANS, EVAN M., Englewood, N. J.	1888
EVERMANN, Prof. B. W., Terre Haute, Ind.	1883
FAIRBANKS, Hon. FRANKLIN, St. Johnsbury, Vt.	1885
FANNIN, JOHN, Provincial Museum, Victoria, B. C.....	1888
FISHER, WM. HUBBELL, 12 Wiggins Block, Cincinnati, Ohio	1883
FLINT, H. W., Yale National Bank, New Haven, Conn.	1888
FORBUSH, EDW. H., 424 Main St., Worcester, Mass.	1887
FOX, Dr. WM. H., 1517 L St., Washington, D.C.	1885
FREEMAN, WM. H., 216 Reid Ave., Brooklyn, N.Y.....	1889
FURNESS, WALTER ROGERS, Wallingford, Delaware Co., Pa.....	1888
GALE, DENIS, Gold Hill, Boulder Co., Colorado.....	1886
GAULT, B. F., 878 Washington Building, Chicago, Ill.....	1885
GESNER, Rev. A. H., 22 East 131st St., New York City.....	1885
GIBSON, LANGDON, Flushing, Queens Co., N. Y.....	1887
GILBERT, CARLETON, 116 Wildwood Ave., Jackson, Mich.....	1889
GOODALE, JOS. L., Saco, Maine.....	1885
Goss, B. F., Pewaukee, Waukesha Co., Wis.....	1883

*Deceased.

GOULD, JOSEPH E., 281½ No. High St., Columbus, Ohio.....	1889
GRANT, U. S., 200 West 19th St., Minneapolis, Minn.....	1885
GREEN, MORRIS M., Dept. of Agriculture, Washington, D. C.....	1887
GREGG, DR. WM. H., 143 West 21st St., New York City.....	1885
HAGARUP, A., Greenland, via Norrevold 46, Copenhagen, Denmark..	1888
HANMER, C. C., Burnside, Conn.....	1888
HARDY, MISS FANNIE P., Brewer, Maine.....	1886
HARDY, MANLY, Brewer, Maine.....	1883
HASBROUCK, EDWIN M., U. S. Geol. Survey, Washington, D. C.....	1887
HAUPT, LOUIS, 61 Liberty St., New York City.....	1888
HAWLEY, A. H., Vineland, N. J.....	1886
HAZARD, R. G., 2d, Peace Dale, R. I.....	1885
HEIMSTREET, DR. T. B., 14 Division St., Troy, N. Y.....	1888
HELME, ARTHUR H., Millers Place, Suffolk Co., N. Y.....	1888
HENDRICKSON, W. F., 860 Broadway, New York City.....	1885
HICKS, GEO. J., New Brighton, Richmond Co., N. Y.....	1887
HICKS, HENRY, Westbury Station, Queens Co., N. Y.....	1889
HICKS, JOHN D., Old Westbury, Queens Co., N. Y.....	1888
HIGGINS, ALGERNON S., 1227 Fulton St., Brooklyn, N. Y.....	1888
HOLBROOK, Judge S. T., Norwich, Conn.....	1885
HOLMES, E. S., D. D. S., 103 Ottawa St., Grand Rapids, Mich.....	1885
HOLTERHOFF, G., Jr., San Diego, Cal.....	1883
HOLZINGER JOHN M., State Normal School, Winona, Minn.....	1887
HOOPES, JOSIAH, West Chester, Pa.....	1889
HORNADAY, W. T., U. S. Nat. Mus., Washington, D. C.....	1888
HOUGH, ROMEYN B., Lowville, N. Y.....	1883
HOWELL, ARTHUR H., 212 Madison St., Brooklyn, N. Y.....	1889
*HOWLAND, SNOWDON, Newport, R. I.....	1883
HOY, DR. P. R., Racine, Wis.....	1883
HOYLE, CHARLES E., Millbury, Mass.....	1889
HOYT, WM. H., Stamford, Conn.....	1888
HULL, WALTER B., Milwaukee, Wis.....	1889
HURTER, JULIUS, 2346 So. 10th St., St. Louis, Mo.....	1888
HVOSLEF, DR. J. C., Lanesboro, Minn.....	1885
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., Box 712, San Diego, Cal.....	1885
JACKSON, THOS. H., West Chester, Pa.....	1888
JACOBS, J. WARREN, Waynesburg, Pa.....	1889
JAMES, HOWARD K., Courant Building, Hartford, 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
JENNINGS, ALLEN H., 2101 Oak Ave., Baltimore, Md.....	1886
JOHNSON, ALBERT I., Hydeville, Vt.....	1885
JOHNSON, FRANK, Parkville, Kings Co., N. Y.....	1888
JOHNSON, FRED. O., Oakland, Cal.....	1888

* Deceased.

JOHNSON, LORENZO N., Evanston, Ill.....	1888
JOHNSON, Prof. O. B., Seattle, Washington Territory.....	1885
JOHNSON, ROBERT W., Colorado Springs, Col.....	1888
JONES, LYND, Grinnell, Iowa.....	1888
JORDAN, A. H. B., Willsborough, Essex Co., N. Y.....	1888
JORDAN, Prof. D. S., Bloomington, Ind.....	1885
JOUY, P. L., Smiths. Inst., Washington, D. C.....	1883
KEELER, CHRALES A., Berkeley, Alameda Co., Cal.....	1889
KELLOGG, VERNON L., Lawrence, Kan.....	1888
KENDALL, W. C., Freeport, Cumberland Co., Me.....	1886
KEYES, C. R., Des Moines, Iowa.....	1885
KING, MISS ELLEN, Great Neck, Queens Co., N. Y.....	1888
KING, GEORGE GORDON, Newport, R. I.....	1888
KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C.....	1883
KOHN, GUSTAVE, 14 Carondelet St., New Orleans, La.....	1886
KUMLIEN, LUDWIG, Busseyville, Wis.....	1888
*KUMLIEN, THURE, Milwaukee, Wis.....	1883
LADD, SAM'L B., West Chester, Pa.....	1889
LAMB, CHARLES R., Cambridge, Mass.....	1885
LANTZ, Prof. D. E., Manhattan, Kansas.....	1885
LAWRENCE, FRANK M., Moriches P. O., Suffolk Co., N. Y.....	1888
LAWRENCE, ROBT. B., Mills Building, New York City.....	1883
LAWRENCE, WM. M., 51 Liberty St., New York City.....	1888
LEWIS, E. G., Trinity College, Hartford, Conn.....	1888
*LINDEN, Prof. CHARLES, Buffalo, N. Y.....	1884
LLOYD, WILLIAM, Marfa, Texas.....	1885
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
MABBETT, GIDEON, Rodney, Jefferson Co., Miss.....	1888
MACKAY, Prof. A. H., Pictou, Nova Scotia.....	1885
MACOUN, Prof. J., Geol. and Nat. Hist. Surv., Ottawa, Can.....	1883
MCGREGOR, R. C., 2847 Champa St., Denver, Col.....	1889
McLENNAN, CHAS. A., Truro, Nova Scotia.....	1889
MAITLAND, ROBERT L., 44 Broad St., New York City.....	1889
MALI, CHARLES M., 329 Broadway, New York City.....	1889
MARLATT, CHAS. LESTER, Manhattan, Kansas.....	1888
MARSHALL, ALFRED, 115 Liberty St., New York City.....	1886
MASON, EDWARD C., Arlington, Mass.....	1888
MATHERS, Dr. J. R., Buckhannon, W. Virginia.....	1888
MERRIAM, MISS FLORENCE A., Locust Grove, Lewis Co., N. Y.....	1885
MERRILL, HARRY, Bangor, Maine.....	1883
METCALFE, WM. C., 21 Cortlandt St., New York City.....	1886
MILLER, G. S., Jr., Peterboro, N. Y.....	1886

* Deceased.

MILLER, MRS. OLIVE THORNE, 236 Greene Ave., Brooklyn, N. Y....	1887
MINOT, H. D., Care of St. Paul, Minneapolis and Manitoba R. R. Co., St. Paul, Minn.....	1883
MOORE, J. PERCY, 1931 Judson Place, Philadelphia, Pa.....	1886
MORCOM, G. FREAM, 870 North Park Ave., Chicago. Ill.....	1886
MORRIS, GEO. SPENCER, Olney, Philadelphia, Pa.....	1887
MORRIS, ROBT. O., Springfield, Mass.....	1888
MORTIMER, BENJAMIN, 1523 T. St., N. W., Washington, D. C.....	1888
MURDOCH, JOHN, Smiths. Inst., Washington, D. C.....	1883
NICHOLAS, GEORGE LAWRENCE, Mt. Sinai Hospital, Lexington Ave., New York City.....	1888
NORRIS, J. PARKER, 723 Walnut St., Philadelphia, Pa.....	1886
NORTON, RICHARD, Cambridge, Mass.....	1888
OVERHOLSER, HARRY C., Red Bank, N. J.....	1888
ONG, PLUMMER L., Clarence, Shelby Co., Mo.....	1888
PAINE, AUGUSTUS G., Jr., Champlain Fibre Co., Willsborough, N. Y.....	1886
PALMER, T. S., Dept. of Agriculture, Washington, D. C.....	1888
PALMER, WM., U. S. Nat. Mus., Washington, D. C.....	1888
PANNACKER, D. E., 2513 N. 12th St., Philadelphia, Pa.....	1888
PARK, AUSTIN F., 31 Boardman Building, Troy, N. Y.....	1885
PEACOCK, W. F., Marysville, Cal.....	1888
PENNOCK, C. J., Kennett Sq., Chester Co., Pa.....	1888
PERKINS, CHAS. E., Hartford, Conn.....	1888
PERRY, TROUP D., 22 Bull St., Savannah, Ga.....	1889
PETERSON, J. P., Luck, Wis.....	1885
PETTIT, A. E., 15 Cortlandt St., New York City.....	1889
PIERS, ARTHUR, 288 St. James St., Montreal, Can.....	1888
PINDAR, L. O., Hickman, Ky.....	1886
PLEASANTS, J. H., Jr., 606 Cathedral St., Baltimore, Md.....	1888
POPENOE, Prof. E. A., Manhattan, Kansas.....	1886
PRICE, WM. W., Riverside, Cal.....	1888
PRIME, Rev. WENDELL, D. D., 38 Park Row, New York City.....	1889
RADCLIFFE, CARLETON R., 132 W. 58 St., New York City.....	1888
RAGSDALE, G. H., Gainsville, Texas.....	1885
RAINE, WALTER, Hayden St., Toronto, Can.....	1889
RALPH, DR. W. L., 26 Court St., Utica, N. Y.....	1888
RATHBUN, FRANK R., 40 Franklin St., Auburn, N. Y.....	1883
RAWSON, CALVIN L., Norwich, Conn.....	1885
RESSELL, CYRUS B., Ercildown, Chester Co., Pa.....	1888
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
RICHMOND, CHAS. W., U. S. Geol. Surv., Washington, D. C.....	1888
RIECKER, ERNST, 900 So. 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., Jr., Newport, R. I.....	1885

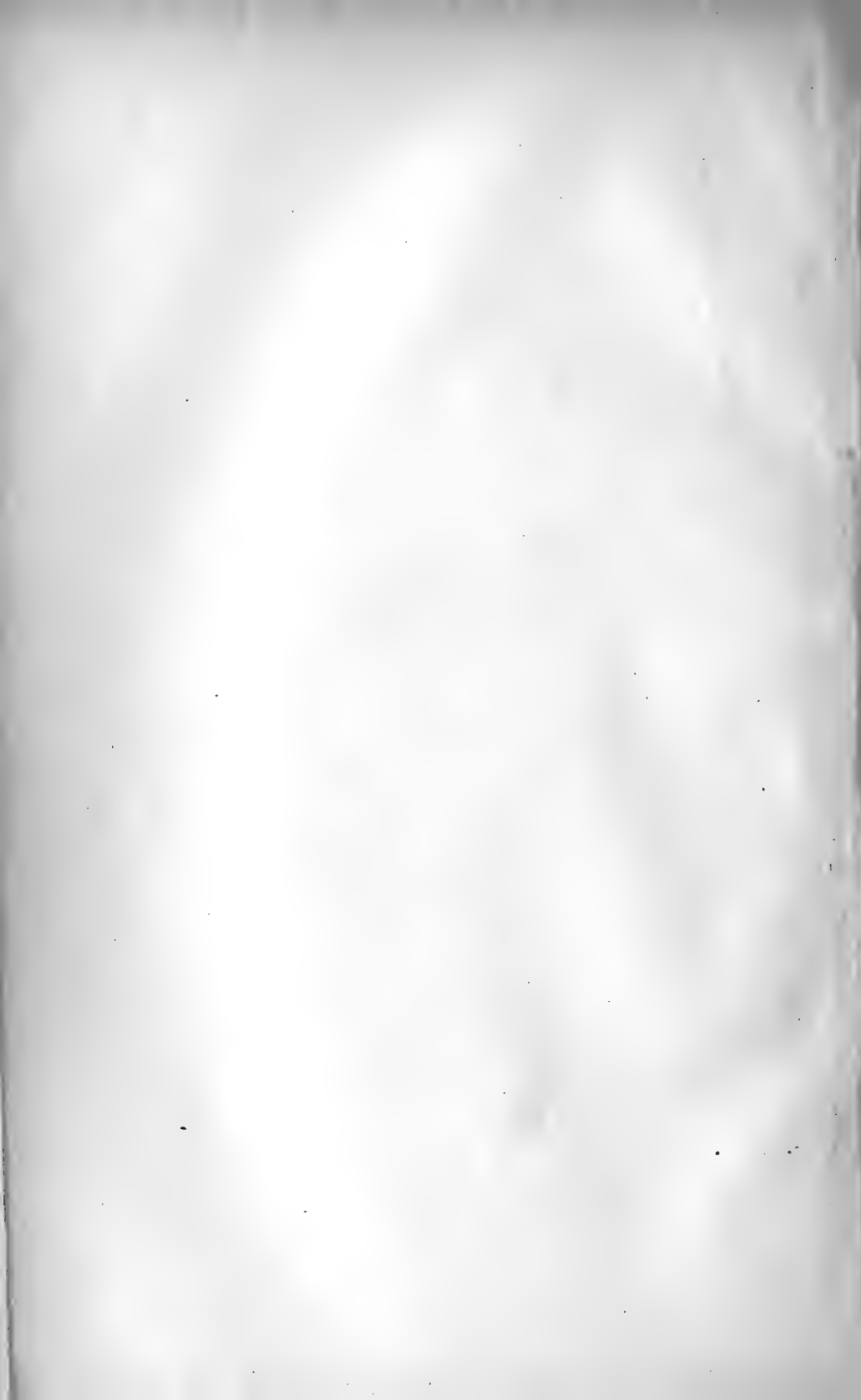
ROBBINS, WM. A., 528 Golden Gate Ave., San. Francisco, Cal.....	1888
ROBERTS, W. F., 503 E St., N. W., Washington, D. C.....	1888
ROOSEVELT, THEODORE, Oyster Bay, Queens Co., N. Y.....	1888
ROWLEY, J., Jr., Am. Mus. Nat. Hist., New York City.....	1889
RUSSELL, GEO. C., 144 W. 7th St., Erie, Pa.....	1888
SAGE, HENRY M., 274 Lawrence Hall, New Haven, Conn.....	1885
SAUNDERS, DeALTON, Alfred Centre, N. Y.....	1889
SCHICK, CHAS. S., Sea Isle City, N. J.....	1889
SCHLEGEL, Miss MATHILDE, 134 16th St., Buffalo, N. Y.....	1889
SCOTT, W. L., 86 Sparks St., Ottawa, Can.....	1883
SEE, ABRAHAM W., Arlington, N. J.....	1888
SEITER, PHIL. J., Chattanooga, Tenn.....	1888
SHARP, Miss ALDA M., Gladbrook, Iowa.....	1889
SHELTON, GEO. H., Seymour, Conn.....	1888
SHORES, Dr. E. I., Soldiers' Home, Hampton, Va.....	1883
SHURR, THEO. A., 66 Grand St., Waterbury, Conn.....	1888
SLADE, JOHN A., 1134 Herkimer St., Brooklyn, N. Y.....	1888
*SMALL, EDGAR A., Hagerstown, Md.....	1883
SMITH, CLARENCE A., 241 W. 74th St., New York City, N. Y.....	1889
SMITH, HORACE G., Jr., 2918 Lafayette St., Denver, Col.....	1888
SMITH, Dr. HUGH M., 1248 New Jersey St., Washington, D. C.....	1886
SMITH, JAMES E., Putnam, Conn.....	1889
SMITH, S. SIDNEY, 59 Wall St., New York City.....	1888
SORNBORGER, JEWELL D., Andover, Mass.....	1888
SOUTHWICK, E. B., Arsenal Bldg., Central Park, New York City....	1888
SPELMAN, H. M., 62 Sparks St., Cambridge, Mass.....	1883
STANTON, Prof. J. Y., Bates College, Lewiston, Me.....	1883
STEBBINS, EDWARD W., Minneapolis, Minn.....	1889
STEPHENS, F., Ballena, San Diego Co., Cal.....	1883
STONE, WITMER, Fisher's Lane, Germantown, Pa.....	1885
STREATOR, C. P., Garrettsville, O.....	1889
STRODE, Dr. W. S., Bernadotte, Ill.....	1889
STRONG, REUBEN M., Wauwatosa, Wis.....	1885
STUDER, JACOB H., 103 W. 14th St., New York City.....	1888
SWIFT, EDWARD A., Elmira, N. Y.....	1888
SWINBURNE, JOHN, St. Johns, 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
TENNANT, EDW., Attleboro Falls, Mass.....	1889
THOMPSON, ERNEST E., 86 Howard St., Toronto, Can.....	1883
THOMPSON, FRANK J., Menagerie, Central Park, New York City....	1885
THORNE, Capt. PLATTE M., 22d Inf., U. S. A., Ft. Keogh, Montana..	1885
THURBER, N. CARLETON, Gladstone, Colfax Co., New Mex.....	1886
TODD, LOUIS M., Calais, Me.....	1887

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TOPPAN, GEO. L., 138 Jackson St., Chicago, Ill.....	1886
TORREY, BRADFORD, Melrose Highlands, Mass.....	1883
TOWNSEND, C. H., Smiths. Inst., Washington, D. C.	1883
TREAT, WILLARD E., East Hartford, Conn.....	1885
TROMBLEY, JEROME, Petersburg, Mich.....	1885
TROTTER, DR. SPENCER, Prof. Nat. Hist. Swathmore College, Swathmore, Pa.....	1888
TURNER, DR. M. H., Hammondville, Essex Co., N. Y.....	1885
TURNER, DR. T. S., Huntington, N. Y.....	1889
VAN CORTLANDT, MISS ANNIE P., Croton Landing, Westchester Co., N. Y.....	1885
VELIE, DR. J. W., Academy of Sciences, Chicago, Ill.....	1886
*VENNOR, H. G., Montreal, Can.....	1883
VERRILL, ALPHEUS H., 86 Whaley Ave., New Haven, Conn.....	1888
VILARO, DR. JAUN, Prof. Nat. Hist., Habana Univ., Habana, Cuba....	1888
VOORHEES, CLARK G., 59 E. 75th St., New York City.....	1888
WADSWORTH, D. S., Box 1061, Hartford, Conn.....	1885
WAKEFIELD, J. R., Dedham, Mass.....	1885
WALKER, DR. R. L., Mansfield Valley, Pa.....	1888
WARREN, DR. B. H., West Chester, Pa.....	1886
WEBSTER, FREDERIC S., 1345 Pa. Ave., Washington, D. C.....	1886
WEEKS, W. T., Yaphank, Suffolk Co., N. Y.....	1889
WELLS, DR. JOHN A., Englewood, N. J.....	1888
WEST, LEWIS H., Roslyn, Queens Co., N. Y.....	1887
WEST, SAM'L H., 76 Devoe St., Brooklyn, N. Y.....	1889
WHEELER, DAVID E., St Paul's School, Concord, N. H.....	1888
WHITE, HARRY GORDON, U. S. Fish Comm., Gloucester, Mass.....	1889
*WILLARD, S. W., West DePere, Wis.....	1883
WILLIAMS, J. B., 23 St. Vincent St., Toronto, Can.....	1889
WILLIAMS, ROBERT S., Great Falls, Montana.....	1888
WINTLE, ERNEST D., 11 Hospital St., Montreal, Can.....	1887
WINTON, REV. GEORGE, Beverly, San Luis Potosi, Mexico.....	1889
WOLFE, WALTER M., Box 162, Kearney, Neb.....	1888
WOOD, A. H., Painted Post, N. Y.....	1887
*WOOD, DR. WILLIAM, East Windsor Hill, Conn.....	1883
WOODRUFF, LEWIS B., Yale University, New Haven, Conn.....	1886
WORTHINGTON, WILLIS W., Shelter Island, Suffolk Co., N. Y.....	1889
WRIGHT, Capt. J. W. A., Livingstone, Ala.....	1888
ZEREGA, DR. LOUIS A., Bellevue Hospital, New York City.....	1884

*Deceased.

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THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. VII.

JANUARY, 1890.

No. I.

TO WHAT EXTENT IS IT PROFITABLE TO RECOGNIZE GEOGRAPHICAL FORMS AMONG NORTH AMERICAN BIRDS?*

BY J. A. ALLEN.

IN THE early days of natural history minute differences of structure, size or color received little attention, and the groups looked upon in early times as species now take, in not a few instances, the rank of a genus, the one wide-ranging species of the early authors having been found to include several species, each with its own circumscribed habitat. Buffon, for example, considered the exotic forms of life which closely resembled European types either as being degenerate forms of the latter, or as slight modifications of them, due to climatic influences, differences of food, etc. Even the species of Linnæus, and of his contemporaries and immediate followers, were often groups of a highly composite character. It was not till much later that the importance of nicer discriminations became apparent.

By the middle of the present century the smallest appreciable deviations became of specific import, and even a difference of habitat was not unfrequently thought to be sufficient ground for the presumption of specific diversity. Consequently individual variations were unwittingly made the basis of specific distinctions.

* Read at the Seventh Congress of the American Ornithologists' Union, Nov. 15, 1889.

In the progress of descriptive zoölogy the quest for new species and new genera became rampant. The distinction of imposing a new name, to be followed by *nobis* or *mihi*, led always to a search for differences. It was natural, in such a scramble, that resemblances should be overlooked, and that the study of individual variation should receive little attention. The synonyms that form such an array in our modern systematic treatises on zoölogy attest the result.

But not all descriptive naturalists erred equally or in the same way. There always have been, of course, both splitters and lumpers, the one class more or less at arms with the other, the one holding the other more or less in contempt. But aside from this individual diversity among naturalists there have been periodic phases of change in the matter of excessive splitting and the reverse, which may be likened to the oscillations of a pendulum. This is especially true in respect to our own country, and notably in regard to North American ornithology during the last half century. Within this period there have been at least three well-defined oscillations of the ornithological pendulum. The first, in the direction of excessive subdivision, reached its culmination about the year 1870. A reverse oscillation immediately followed, sweeping in character, and of strong and sudden impetus. It gradually spent itself during the latter part of the following decade. A third oscillation, in the direction of the first, feebly set in soon after, and, slowly acquiring momentum, now seems to have reached a degree of force that challenges candid consideration.

In this connection a brief review of the progress of our science during the last fifty years may not be out of place.

Fifty years ago there were no large collections of birds, either in public museums or in private cabinets, anywhere in America. About this time the Government instituted a series of transcontinental surveys, extending in nearly parallel lines across the continent from about the 90th meridian westward to the Pacific coast, these lines being run at rather wide intervals from the Mexican border on the south to the British boundary on the north. These several military surveying parties were usually accompanied by good field naturalists and collectors. Also at about the same time the Smithsonian Institution, through the influence and direction of the late Professor Baird, secured correspondents and collectors at many points in British America. All of the collections thus

made were deposited in the National Museum, then commonly known as 'The Smithsonian.' In a few years a large amount of new material was thus brought together from the far West and the remote North. These were the first collections of any magnitude ever received from trans-Mississippian North America. Material from east of the Mississippi River was still scanty, and hence the proper means for careful comparison of eastern and western forms was often lacking.

During the elaboration of this material, derived from hundreds of isolated localities, the discovery of new forms, both generic and specific, was the paramount incentive in the investigation. Not till some years later did the subject of climatic influences upon animals, in other words the evolution of species by environment, receive much consideration. Nor could it have been otherwise. We have first to gather our facts before we can generalize. By these seeming strictures no discredit is intended to the naturalists of that period, nor any condemnation of their methods. They were the pioneers, conducting a careful reconnaissance, and preparing the way for the occupation of the field by the grand army of workers who followed later.

Variations, even when slight, are facts of great import, whether they be individual, climatic, or specific, in the usually accepted sense of this last term; and when, except in the case of purely individual variation, they are made the basis of a name their availability in the discussion of profounder questions is thereby greatly enhanced. Down to as late as 1865, a collection of individuals indicated by a binomial name was a species, theoretically, at least, distinct and definable from any other similar group. An occasional intermediate, when found, was a great stumbling block, usually to be accounted for on the theory of hybridization. Varieties, in the geographical sense of today, were rare indeed, and the term subspecies was almost unknown in zoölogy.

Between the years 1865 and 1870 the question of what was a species had already become a very troublesome one. Many of the then-currently recognized species were found to be as elusive as the proverbial flea. The increase of material and better opportunities for investigation showed that the range of individual variation had been underrated, and that many of the alleged differences on which species had been founded were of little or no value, while in many other cases closely allied so-called species

were merely local, intergrading, geographical forms, correlated with special features or conditions of environment.

During the three years including and following the year 1871 ornithological opinion on the subject of species and subspecies, or respecting the status of a large proportion of the birds of North America, experienced a radical disruption. The first great wave, which for generations had been increasing in volume and force, met a barrier against which it recoiled and subsided with phenomenal suddenness, giving place to a strong and sweeping counter current. The key-note to the situation had been struck, and after a brief period of wavering a happy medium course was hit upon, which seemed to solve most of the difficulties that had beset the general subject of species. This was no less than the reduction of numerous so-called species to the rank of geographical races or subspecies, namely such as were found to intergrade with other forms, or which it seemed probable, on general principles, might so intergrade. Immediately inveterate splitters became bold lumpers, and the ornithological pendulum swung quickly back with a momentum sufficient to carry it somewhat beyond the vertical. The term 'var' interposed between the name of the original species (in the sense of the earliest described species) and its various local offshoots was the magic link which was to connect and duly correlate the discordant bird elements of our North American fauna. This, of course, was the origin and first phase of our present trinomial system of nomenclature, which ten years later was formally endorsed and adopted by the American Ornithologists' Union.

While this great step — little less than a revolution in its results — was in the main in the right direction, it led to some rash conclusions, theoretical reasoning now and then overstepping the hard line of facts. Consequently in a few instances species were unduly merged, and it has been necessary to reconsider these hasty rulings. The oscillation in the direction of unwarrantable lumping, however, soon reached its extreme limit; the pendulum settled back, and for a time remained at what we may consider as very near its normal point of equilibrium. For nearly a decade, dating from 1875, the deflections were slight and variable, now to one side, and now slightly to the other. This period of comparative stability includes the work of the A. O. U. Committee, in the years 1883-84, on the status of the described forms of North

American birds. As some hard-and-fast line in respect to subspecies was necessary it was very properly agreed by the Committee that no species should be reduced to a subspecies except on proof of intergradation. This kind of proof is sometimes lacking where its existence is a theoretical certainty. Yet it seemed better to leave such questions open to be settled by a later increase of material.

The work of the A. O. U. Committee on the nomenclature and status of North American birds yielded as satisfactory results as could have been anticipated, nearly nine-tenths of its decisions being reached by practically unanimous consent. The outcome of its deliberations, as embodied in the A. O. U. Code and Check-List, has well stood the test of time, there having been found thus far very few cases where subsequent discoveries have necessitated any revision of the Committee's decisions. A few forms then considered as ineligible to subspecific rank, and therefore rejected, have since been admitted, in consequence of the acquisition of material from new localities rendering their proper status more evident; while others have been described and added to the list. Some of these later discoveries have proved, indeed, little less than startling. These facts, and the very great increase of material during the last five years, have had possibly a too stimulating effect; they have unquestionably started the pendulum again in the direction of finer discriminations and excessive splitting. The majority of the old A. O. U. Committee, the authors of the Check-List, will doubtless now admit forms to subspecific rank they would not have admitted in 1884, had they been then placed before them. They certainly know much more about North American birds at present than they did five years ago, but is their judgment as sound and are their tendencies as rationally conservative?

If any be without sin, let him cast the first stone. Conscious of my own changed tendencies, it has seemed to me well to raise the above question for brief consideration, since it can do no harm to survey the field calmly and take note of the present drift in respect to a very important subject.

Recent investigations have taken me over fields I worked, with some care, ten to fifteen years ago. In the meantime material has greatly increased; series of specimens have been obtained from localities then unknown; thus I find myself looking at

things in a new light, but from, I trust, a more advanced position. My former tendencies, in common with those of others at that time were in the direction of reducing doubtful forms to synonyms, and closely related species to geographical forms. Now, with much additional experience, some increase of knowledge in respect to particular points at issue, and much more abundant material, some of my former conclusions seem open to revision, as I now realize that the resources then at command were far less adequate for the settlement of questions at issue than I then supposed them to be.

The discoveries made during the last five years show that the subject of North American ornithology is far from exhausted, even in respect to the cataloguing of its numerous forms of bird life, and especially as regards their distribution. To show how much we did not know five years ago of the birds of even our long-settled southeastern States, I have but to instance five or six species—namely, Swainson's Warbler, Bachman's Warbler, Leconte's Sparrow, the Raven, and the Seaside Finches. Add to this the new forms recently brought to light in this supposed well-known area, and we must conclude that we are still only on the threshold of a thorough knowledge of the birds of our South Atlantic and Gulf States. What do we as yet know of the distribution of many of the southern subspecies of this area, and of their lines of inosculation with the northern forms? Nothing, with exactness. What do we yet know of the breeding ranges of the summer birds south of the Ohio Valley? Practically nothing. To how slight an extent are we able to unravel the many perplexing problems of the bird fauna of the great State of Texas, so peculiarly situated in relation to the East and the West, the North and the South, as regards North America at large. The great Southwest and the great Northwest, with their opposite extremes of climatic conditions and peculiarities of environment, as compared with the region to the eastward, still present to us many perplexing problems.

Under such a condition it is no wonder that the pendulum again tends in the direction of refined subdivision. We are alert for differences, with our wits sharpened to recognize slight variations in size, in form, and in tones of color. Our material is constantly becoming more ample, and the meaning of slight variations is thus more apparent than it otherwise would be. When large

series of specimens of any species from distant points are compared, in cases where the environment is more or less diverse, we are accustomed to find appreciable differences—in some cases slight, in others so well-marked as to be obvious at a glance. In many instances, however, the differences are apparent only when large series are available for comparison; the differences being merely average differences; a greater or less proportion of the specimens of the two series are practically indistinguishable, the range of individual variation in either series overlapping the difference characterizing the two slightly differentiated forms. In other cases the occurrence of specimens that cannot be easily referred, without knowing their origin, to one or to the other, is exceptional.

These being the general facts in the case we are at once confronted with a serious question and a grave danger. The splitters of an earlier time regarded every form, however slightly differentiated, as a species. We arbitrarily define a species as a group of individuals standing out distinct and disconnected from any similar group, within which, though occupying different parts of a common habitat, we recognize other forms characteristic of, and restricted to particular areas. These reach a maximum degree of differentiation at some point in the habitat, and thence gradually shade into other conspecific forms geographically contiguous.

The distinction we thus make between species and subspecies, though a purely conventional one, forms an indispensable basis for the convenient recognition of the various minor stages in the evolution of organized beings. The serious question is where to draw the line in recognizing local forms in nomenclature. While it is important to discover, and in some way record, even the very slight differences due to peculiarities of environment, there is obviously a reasonable limit to the naming of such forms by the use of the trinomial system of nomenclature. How well-marked then, must be a set of intergrades to entitle them to recognition? On this point no arbitrary hard-and-fast line can be laid down. Much, at least for the present, must be left to the discretion of the investigator. We are still groping in the dark; our steps are, in the main, tentative and provisional. We cannot act decisively in respect to the bird life of North America, or of any large area, till we know thoroughly the phases of variation throughout every nook and corner of the area in question. At present new forms

are coming to light, often where least expected; every considerable series of specimens from any locality previously known only superficially presents us with, if not new nameable forms, at least a new set of puzzling intergrades, tending to unsettle opinions we thought were safely grounded, and showing that every question touching the status of species and subspecies is still more or less open to revision.

Unquestionably the tendency at present is to name forms which six years ago would have been considered too slightly differentiated to require such recognition. On the other hand, differences long since noticed, have but recently come to be properly understood. In the light of new material they prove to have a significance previously unappreciated, owing to the absence of the requisite data.

It is still evident, however, that great caution should be exercised in bestowing trinomials, in order to guard against drawing too fine distinctions. Very little is gained by naming races distinguishable only by experts, aided by a large amount of material, or where the differentiation is largely a matter of a slight average difference between forms contiguous in habitat—forms which nine out of ten ornithologists of average acuteness and experience, and with only ordinary resources, will be more or less unable to satisfactorily distinguish. In fact, a form based on a certain series of specimens may seem to any investigator of this same material well founded, but when judged by other material not unfrequently loses much of the distinctness it seemed to present when tested by the first set of specimens.

There are necessarily, in cases of wide-ranging species which run into well-marked geographical forms, numerous connectent series, made up of intergrades of all degrees of relationship to the more extreme phases. Some of these intergrades may seem different enough from either extreme to warrant recognition as an additional subspecies. By such a course what do we gain? We bridge the difficulty by doubling it; we get rid of one set of of troublesome intergrades by creating two others; leading the way to further subdivision of like character, and increasing the difficulties. Obviously the situation is not in this way improved. Yet the tendency to this sort of division is evidently increasing, each step in this direction making the next one easier. Only the exercise of due discretion can prevent the reduction of "our bene-

ficient system of trinomials" to an absurdity. It is much easier to name a dozen new species or subspecies than to get rid of one, though erected on a false basis. Let us then weave our ornithological net so open-meshed that the undesirable small fry of incipient local forms may readily pass through and escape till further differentiation, in future ages, shall render them desirable captures.*

ON THE EASTERN FORMS OF *GEOTHTYPIS TRICHAS*.

BY FRANK M. CHAPMAN.

THREE years ago I obtained in Florida several Maryland Yellowthroats which apparently differed from northern specimens of this bird. During succeeding winters additional examples were secured, but being unable to obtain summer specimens, which without fear of error could be considered resident birds, I was unwilling to call attention to what I supposed was an undescribed form of this species resident in Florida. Thus the matter rested until recently, when Mr. W. E. D. Scott very courteously placed at my disposal his entire series of Florida specimens. In attempting now with the aid of this additional material to determine the status of the Florida bird, I found it would also be necessary to ascertain the relationships of the Mississippi Valley bird, to which the Audubonian name *roscoe* has recently been applied. To this end, therefore, through the kind offices of fellow naturalists, I have accumulated a large amount of material, in all somewhat over three hundred specimens.

The relationships of the Mississippi Valley bird.— From this region I have a series of some sixty specimens, of which thirty-eight are adult males in breeding plumage; with these I shall make my comparisons. Occupying an intermediate geographical position between the true *patriæ* of both the eastern and the

* In this connection I would call attention to the sagacious note of warning sounded by Dr. Coues in 1884, in the Preface to his 'Key to North American Birds' (p. xxvii, second paragraph).

western forms, the birds themselves are in a degree intermediate, as Mr. Ridgway has already shown.* In the extent of the yellow markings of the underparts, they approach *occidentalis*; in the restriction and coloration of the ashy band bordering the black facial mask, and in measurements, they agree with true *trichas*. In order to express the approximate degree of relationship they bear to each form, I have adopted the following method: Selecting from the Mississippi Valley lot two series, each of five specimens, representing respectively the extremes of coloration of both upper and under surface with their connecting stages, I have given to each stage a purely nominal, but relative, value. Thus the most highly colored specimen in either series I have rated at five, the next at four, and so on. These representative series I have used as a standard of comparison for (1) a series of true *trichas* from the Atlantic States, for (2) the Mississippi Valley series, and for (3) a small but representative series of *occidentalis*, taken throughout its range. In the appended table I present an average of the results obtained, including also the average measurements of these specimens, all of which are adult males in breeding plumage.

	Wing	Tail	Tarsus	Exposed Culmen	Extent of Yellow	Ashy border
20 specimens						
from Atlantic States	2.20	2.04	.77	.42	2.65	3.33
38 specimens						
from Mississippi Valley	2.20	2.02	.77	.42	3.73	3.36
10 specimens						
of <i>occidentalis</i>	2.25	2.14	.77	.42	4.60	4.60

An examination of this table shows how well it sustains the previous conclusion that the Mississippi Valley birds, as a whole, are nearer the eastern than the western form. Considering them now individually, I find there is not a specimen in the series of thirty-eight males which I cannot match in the series from the Atlantic States, nor is there a specimen in this latter series which does not find its counterpart among the birds from the Mississippi Valley. In neither series do I find a specimen as highly colored as are the extreme examples of *occidentalis*. I think, therefore, we may safely refer the Mississippi Valley bird to *Geothlypis trichas verus*.

*Manual N. A. Birds, p. 523, foot-note.

The *Sylvia* (*Geothlypis*) *roscoe* of Audubon, based on an *immature* male specimen taken in Mississippi in September, I do not consider identifiable; if the description does refer to the Mississippi Valley bird, I am at a loss to see on what characters its separation can be urged, and I do not, therefore, consider it worthy of recognition. The *Geothlypis trichas roscoe* of Hasbrouck, the types of which I have examined, based on winter specimens from Florida, I hope to show is referable to the resident Florida form, and not to the bird occupying the Mississippi Valley.

On the relationships of the Florida bird. — For the resident Florida bird, which I consider worthy of recognition, I propose the name

***Geothlypis trichas ignota*, subsp. nov. FLORIDA
YELLOW-THROAT.**

Geothlypis trichas roscoe HASBROUCK, Auk, VI, 1888, p. 167 (in part; not *Sylvia roscoe* AUD. Orn. Biog., I, 1831, p. 124, Pl. xxix).

SUBSP. CHAR. — Similar to *Geothlypis trichas* (Linn.), but with longer tarsus, tail, and bill; yellow of underparts of a deeper shade and greater extent; flanks of a much darker color; the upper parts browner; the facial mask wider, with its ashy border (in summer specimens) slightly paler and of greater extent. First primary shorter, equalling the eighth instead of the sixth, as in *Geothlypis trichas*.

Adult male in breeding plumage. — Type No. 3982, Coll. W. E. D. Scott, Tarpon Springs, Florida, May 19, 1887. Above olive green with a slight rusty tinge, somewhat lighter on the rump and tail; wings brownish, the feathers edged with the color of the back, the outer web of the first primary whitish, the carpal bend yellow. A broad black facial mask includes laterally the eyes, auriculars, and sides of the throat, reaching on the forehead to near the posterior margin of the eyes, and is bordered by a band of hoary ash, which has no abrupt posterior termination but, suffusing the crown, changes gradually into the color of the back. Under parts rich yellow, whitish on the centre of the abdomen; flanks rich ochraceous brown, the sides of the breast slightly washed with the same color. *Measurements.*: Wing, 2.26; tail, 2.32; tarsus, .84; exposed culmen, .50 inch.

Remarks. — In this plumage I have three specimens: No. 6070, in Mr. Scott's collection, taken at Tarpon Springs, June 12, 1888, is in very-worn plumage, and largely for this reason differs from the type in having much less ashy color on the crown, in being greener above and in having the flanks paler, the yellow, however, being of about equal extent. No. 61,135 of the U. S. National Museum, taken by Prof. Leconte in Liberty County, on

the coast of middle Georgia, is without date of capture, but is evidently a spring bird. It differs from the type in the greater extent of the ashy border which, mixed with yellowish, reaches to the nape.

Adult female in breeding plumage.—Type No. 3462, Coll. W. E. D. Scott, Tarpon Springs, Florida, May 27, 1887. Similar in color to the male, but without the black mask and ashy border, the crown being rusty brownish, paler on the forehead. The under surface is very similar to that of the average spring male specimen of *Geothlypis trichas*, but the yellow is of a deeper shade. *Measurements*: Wing, 2.14; tail, 2.15; tarsus, .84; exposed culmen, .48 inch.

First plumage.—No. 3844, Coll. W. E. D. Scott, Tarpon Springs, Florida, July 16, 1886. Similar to young of *Geothlypis trichas* in same stage of plumage, but throat, breast, and upper parts of a darker color.

Adult male in winter. Similar to adult male in the spring but darker above, the ashy band bordering the black mask restricted to a narrow line; crown rich rusty brown, brighter anteriorly, where also the feathers have more or less ashy and yellowish bases,—and fading gradually into the color of the back; abdomen somewhat paler. *Measurements*,—average of fourteen specimens: wing, 2.20; tail, 2.23; tarsus, .82; exposed culmen, .47 inch.

Remarks.—An examination of the types *Geothlypis trichas roscoe* Hasbrouck, kindly loaned me for examination by Mr. Hasbrouck, shows that it is based on a bird in winter plumage. That this is not the northern bird in winter plumage is apparently evident on comparing it with adult fall specimens of *trichas* from the northern States, from which it may be distinguished (1) by its size and much browner color above, particularly on the crown; (2) by the somewhat greater width of the black mask, and restriction and slightly deeper shade of its bordering ashy band; (3) by the extent and greater intensity of the colors of the underparts; and by the wing formula, the first primary equalling the eighth, and not the sixth as in *trichas*.

A specimen from Liberty County, Georgia (U. S. Natl. Mus., No. 32,232, Leconte) resembles the Florida birds in coloration but has the first primary somewhat longer than the average. A specimen from New Orleans, Louisiana, (U. S. Natl. Mus. No. 90,665, Nov. 26, Shufeldt) is fully as dark above as the Florida bird, but differs in having the ashy border to the black mask wider, with the yellow of the underparts somewhat lighter in color and of less extent, there being consequently more white on the abdomen, and the wing formula does not agree with that of Florida

specimens. A second specimen from New Orleans (Coll. Gustave Kohn, Oct. 30, 1889) is very similar to the bird just mentioned. Two adult males in the collection of Dr. A. K. Fisher (Nos. 2585 and 2586, June 1, 1886), from the same locality, agree in coloration with typical eastern specimens of *trichas*; No. 2585 has the abdomen lightly washed with yellow, but in No. 2586, this color is restricted to the throat, breast and crissum. The measurement of wing and tail correspond with those of northern examples, but the bill is nearly as large as any Florida specimen I have examined. These Louisiana specimens are very puzzling, and without the aid of further material it will be impossible to accurately determine the exact relationships of birds from this region.

Mr. Hasbrouck's collection contains examples of *ignota* from Palatka and Big Lake George, Florida; I have taken specimens at Gainesville, finding also as late as April 29 typical specimens of *trichas*. Six birds taken on the east peninsula opposite Micco, Brevard County, are apparently all referable to the northern form, though several are intermediate. They were, however, taken in a heavy growth of 'sedge' (*Borrichia frutescens*), while the resident bird, I think, favors the low growth of scrub-palmettos (*Chamærops serrulata*) which affords it excellent opportunities for concealment. Mr. Scott's collection contains nine adult winter males, six of which are referable to *ignota*, while the others are apparently more northern wintering birds. These six specimens, four taken in October and two in February, agree very closely among themselves, having the ashy crown band much restricted, the tail as long or longer than the wing, and tarsus .80 inch or more.

Adult female in winter.—Similar to adult fall specimens of *trichas*, but darker above, with the yellow of the breast and underparts washed with brownish.

Immature birds.—Immature birds of both sexes are not readily distinguishable from wintering northern specimens, and from the nature of the case there are at this season specimens showing every degree of intergradation, both as regards size and coloration. Generally speaking the resident birds are slightly darker above, with the marking of the under-surface deeper in color and of greater extent.

I am so deeply indebted for the loan of material that it is difficult for me to adequately express my thanks. Mr. Scott's splendid series of some sixty Florida specimens alone made this paper

possible; Mr. Ridgway sent me from the U. S. National Museum a large number of Mississippi Valley birds, and from the same region I also received specimens from Mr. Ruthven Deane, Mr. Gustave Kohn, Dr. A. K. Fisher, and Dr. F. W. Langdon. Mr. E. M. Hasbrouck permitted me to examine his types of *roscoe*; I had access to a large series of *trichas* containing many fall specimens, in the collection of Mr. J. Dwight, Jr., and have also examined the collections of Mr. George B. Sennett and Dr. E. A. Mearns. To all these gentlemen I return my most grateful thanks; their uniform courtesy in complying with my request has made the gathering of material a pleasure rather than a task.

A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA.

BY W. E. D. SCOTT.

(Continued from Vol. VI, p. 252.)

Lanius ludovicianus. **LOGGERHEAD SHRIKE.**—A common resident species at all points visited on the Gulf Coast. In the vicinity of Tarpon Springs they begin to breed by the last of March. They were common and bred at Punta Rassa, but Mr. Atkins has no records of the species at Key West.

Vireo altiloquus barbatulus. **BLACK-WHISKERED VIREO.**—A regular and common migrant, breeding on the Gulf coast of Florida at least as far north as Anclote Keys, where the birds are *common* during the summer months. They arrive at this point from the south about the last of any of the birds, not appearing till May 18, which is the earliest record, and not becoming common until the first week in June. The species seems to be confined to the low mangrove keys at this point, and rarely visits the main land. Yet it has been taken at Tampa, and I have observed it on two occasions in the town of Tarpon Springs, both times late in the summer of 1886.

Mr. Atkins has observed and taken the birds at both Punta Rassa and Key West, where it is by no means uncommon. He says: "Arrived at Punta Rassa about May 18, 1886. Breeds in low thick growths of mangrove, both on the main land and on outlying keys. Last noted September 5, 1886. Taken at Key West, April 10 and 26, 1887, and observed

throughout June, 1888, and in the summer. Taken on September 5, 1888, and several times after, the latest being September 13." The birds have a song not unlike *Vireo olivaceus*, but usually delivered even more deliberately than the song of that species.

Vireo olivaceus. RED-EYED VIREO. — In the region about Tarpon Springs this is a common spring and fall migrant, arriving from the middle to last of March, and a number find a summer home at this point. Observed and taken throughout the summer of 1886. Took a young female, No. 5877, full-grown, June 3, 1888. Mr. Atkins says it is a common migrant both at Punta Rassa and at Key West, often being associated with *Vireo altiloquus barbatulus*.

Vireo gilvus. WARBLING VIREO. — Apparently a rare spring migrant in the vicinity of Tarpon Springs. Not observed in the fall. Mr. Atkins has not met with it at Punta Rassa or at Key West.

Vireo flavifrons. YELLOW-THROATED VIREO. — A rare migrant. At Tarpon Springs, April 26, 1887, I took an adult female, No. 3926. This is my only record. Mr. Atkins took it at Punta Rassa on April 5, 1886, and at Key West on April 1 and October 5, 1887.

Vireo solitarius. BLUE-HEADED VIREO. — A not uncommon migrant, and remains throughout the winter in small numbers in the vicinity of Tarpon Springs. The only point where Mr. Atkins has met with the species is Key West where he took a single bird on February 3, 1888.

Vireo noveboracensis. WHITE-EYED VIREO. — This bird appears to be, in the vicinity of Tarpon Springs, a rather rare migrant and winter resident. I have before me eight representatives taken, four in April and four in October, which are identical with White-eyed Vireos in my collection taken near Washington, D. C. These are all the Vireos that I have collected in this region which I can refer to true *noveboracensis*. They are about equally divided as to sex. Of the spring specimens two are males and two females, and the latter had not yet laid nor would they have laid for several weeks. It seems proper from these facts and those about to be presented in regard to *V. noveboracensis maynardi*, to consider true *noveboracensis* as a migrant and not as the form *breeding* in this part of Florida.

Vireo noveboracensis maynardi. KEY WEST VIREO. — Mr. Atkins has kindly sent me from the Island of Key West twenty-two representatives of this subspecies. Of these all but two were taken in April and May, and are doubtless all breeding birds. The other two specimens were taken in January and February and are very typical of this subspecies. Mr. Atkins finds the birds common, resident, and breeding in numbers. He has also sent me four White-eyed Vireos from Punta Rassa which match in all particulars the series of *Vireo noveboracensis maynardi* taken at Key West. I have before me twelve White-eyed Vireos taken at Tarpon Springs in the months of April, May, June, July, and September that so nearly match in all particulars the Key West birds of Mr. Atkins that they can only be looked upon as representatives of this subspecies. Three of these birds are fully fledged young birds of the year. The ear-

liest taken is No. 3370, ♀ *Juv.*, May 5, 1887. This bird, though only just fully grown, is quite recognizable as the subspecies in question, having the much more robust bill conspicuously developed. This and other characteristics of the subspecies are also clearly to be seen in the two other young birds, taken on June 12 and July 26 respectively. From the foregoing data it would seem probable that the breeding White-eyed Vireos of the Gulf coast, at least from Tarpon Springs south, are more properly referable to the subspecies *maynardi* than to the true *noveboracensis*.

Mniotilta varia. BLACK-AND-WHITE WARBLER. — This is a common migrant, but has not been observed in winter at Tarpon Springs. In the spring the birds arrive at this point about the last of March and are common until early in May, when for a short time they disappear. I have notes of their common occurrence in the third week of July, so they probably find a breeding ground at no very great distance.

Mr. Atkins has found the species to be common at both Punta Rassa and Key West at all times of the year except from May 2, when the last migrants to the north were noted, until July 13-16, when the birds returned in large numbers — both adults and young birds of the year.

Protonotaria citrea. PROTHONOTARY WARBLER. — During the spring migration, from March 30 until the latter part of April, and again from the last of July to the 20th of September, I have taken and observed this species in the vicinity of Tarpon Springs, but at no time can it be deemed a common bird at this point. Mr. Atkins has found it sparingly both at Punta Rassa and at Key West on the following dates: "Punta Rassa — August 28 and 29, 1886, and September 13 and 17 of the same year; Key West — April 6 and 11, and July 28, 1888; August 8, 1889, a single bird seen." These are all of his records.

Helinaia swainsonii. SWAINSON'S WARBLER. — I have been unable to detect the presence of Swainson's Warbler at or near Tarpon Springs at any time of the year. Mr. Atkins considers the species as very rare at Punta Rassa. At Key West on September 18 and 20, 1888, two birds were taken by him on each date, and during the present season, 1889, he writes of meeting with the birds but once, about the middle of September.

Helmitherus vermivorus. WORM-EATING WARBLER. — A rather uncommon migrant in the vicinity of Tarpon Springs. Appears about the 25th of March, remaining till late in April. I have not met with it at this point in the fall.

At Punta Rassa, Mr. Atkins found it a rather common migrant in the spring, and much rarer in the fall, when it appeared September 15 and remained but a few days. At Key West, he says: "1887, April 11, noted. Again on April 18. Returning, arrived August 30, and are more or less common until October 1." It is probable that a few individuals winter at Key West.

Helminthophila bachmani. BACHMAN'S WARBLER. — This bird has not been observed as yet on the Gulf coast in the vicinity of Tarpon Springs.

For records of its occurrence and capture by Mr. Atkins, on the Island of Key West during the seasons of 1887 and 1888, the reader is referred to 'The Auk,' Vol IV, p. 348, and Vol. V, pp. 428-430. During the season of 1889 Mr. Atkins has again had the opportunity to study this little-known and rare species, and has kindly sent me the following notes to be used in this connection: "Key West, Florida, 1889. First arrival from north, July 17, one adult male and one young female. Next observed July 23, three birds. Not seen again until July 31, though I was watching for them almost continually; three birds again on this date. August 4, found them more common, perhaps a dozen birds in all were seen. From this time till August 25 inclusive, I found them regularly in small numbers. On August 8, 11, and 25 they were most abundant, particularly so on the first-named date, when as many as twenty-five or thirty birds were seen. After the 11th there was a decline in the numbers until the 25th, when they were again almost as numerous as on the 8th, but none were observed after the 25th."

The following biographical notes, also made by Mr. Atkins, are submitted. "Bachman's Warbler in its habits is very much like the Parula Warbler (*Compsothlypis americana*). The resemblance is more noticeable when feeding and in search of food. The birds will then penetrate a thick bunch of leaves and go through, over and all around in the most thorough manner in their exploration after insects that appeal to their taste. They are very active, and constantly in motion. They are also quarrelsome, and resent the intrusion of other species. Frequently I have noticed them fighting away the White-eyed Vireo, and where two or more Bachman's Warblers are observed together, one is pretty sure to see them chasing and fighting among themselves. When disturbed or alarmed they are at once alert; a sharp alarm note, something like that of a Yellow-throated Warbler (*D. dominica*), is uttered, but more forcible and clear cut in its delivery. This is accompanied with a few jerks of the tail, and the bird is off to a neighboring tree. They are found alike in the trees, low bushes, and shrubbery, sometimes on or quite near the ground, and seem to prefer the heavy and more thickly grown woods to trees or bushes more in the open. Young birds were quite tame, but the adults as a rule were very shy and difficult to approach after having been once disturbed."

Mr. Atkins secured a series of some forty odd of these interesting birds during the fall migration above alluded to, *i. e.*, during July and August, 1889.

During the season of 1888 the birds remained at Key West somewhat later, the last observed being on September 5.

Helminthophila pinus. BLUE-WINGED WARBLER. — Apparently rare on the Gulf coast of Florida. I have been unable to detect its presence in the vicinity of Tarpon Springs. Mr. Atkins did not meet with it at Punta Rassa, and has only found it on a single occasion at Key West, August 30, 1887, when he secured a single bird and saw no others.

Helminthophila chrysoptera. GOLDEN-WINGED WARBLER. — Another

rare migrant on the Gulf coast. Not met with in the vicinity of Tarpon Springs, nor at Punta Rassa. Mr. Atkins secured an adult female bird at Key West, August 25, 1889. This is the only time he has met with the species at this point.

Helminthophila celata. ORANGE-CROWNED WARBLER. — Not observed at Tarpon Springs, but Mr. Atkins has found it at Key West, as a not uncommon fall migrant. "Common at Key West on October 5, 1887, and for a few days after." "First arrival, Key West, September 8, 1889." — J. W. Atkins.

Helminthophila peregrina. TENNESSEE WARBLER. — Not common as a migrant in the vicinity of Tarpon Springs. Mr. Atkins took examples at Punta Rassa on April 10, 1886, but says "the birds were rare." Again he found them at Key West in October, 1887, associated with *H. celata*, though not nearly as common as that species.

Compsothlypis americana. PARULA WARBLER. — A rather common migrant in the spring and fall on the Gulf coast of Florida. Spring arrival at Tarpon Springs late March and early April, remaining about a month. Returns in late August or the first week of September. No noted in the winter. Mr. Atkins noted the bird as a migrant at Punta Rassa at approximately the same dates, and did not observe it there during the winter. He also finds the species at Key West, and remarks as follows: "Found more or less all winter at Key West, but migrants begin to arrive from the south by the middle of March, and all have passed by May 1. Returned July 30, 1888, and soon became very common. First seen returning from north on August 4, 1889."

Dendroica tigrina. CAPE MAY WARBLER. — Not an uncommon migrant in spring in the vicinity of Tarpon Springs, but not so common in the fall. Records for three years at this point give the extremes of dates on which this species was taken or noted as from April 17 to May 4.

At Punta Rassa Mr. Atkins did not find it at all common, and I append his notes from that point. "First spring arrival April 16, 1886. Returning in fall, first seen October 5, 1886." The following observations made at Key West, by the same gentleman are of interest. "At Key West the birds appeared April 11, 1887, and were observed till May 4. They returned October 14 and were here till about November 1. Were common; on October 23, 1887, I took eight specimens without moving from my position. Last year (1888) they arrived and departed about the same time."

Dendroica æstiva. YELLOW WARBLER. — Not common as spring migrants in the vicinity of Tarpon Springs, but a few remain to breed in the neighborhood. After July 20 they become more abundant, the representatives being mostly young birds of the year. After September 15 I have not observed them. Mr. Atkins says: "They are very common fall migrants at both Punta Rassa and Key West, but not noted in either place in the spring. First noted at Key West on July 26, 1889."

Dendroica cærulescens. BLACK-THROATED BLUE WARBLER. — A rather rare spring migrant in the vicinity of Tarpon Springs where I have

observed it sparingly from the 2d to the 10th of May in different years. Most of the individuals noted have been males. Not observed in the fall. Mr. Atkins says of the species: "Rare migrant in spring at Punta Rassa, recorded but once, on May 4, 1886; but in fall it is common at this point, and at Key West it is very common on both migrations and is sometimes to be found in the winter."

Dendroica coronata. MYRTLE WARBLER. — Abundant migrant and common winter resident at all points on the Gulf coast of Florida. The capture of an adult female in worn breeding plumage at Key West, July 28, 1888, by Mr. J. W. Atkins, is of interest and has been recorded in 'The Auk,' Vol. V, p. 430.

Dendroica maculosa. MAGNOLIA WARBLER. — This species is apparently a very rare spring migrant along the Gulf coast of Florida, and though not common in fall is of regular occurrence at that season. Mr. Atkins did not find the species at Punta Rassa, but has detected it at Key West twice in the spring, May 17, 1887, and April 27, 1889, a single bird being taken on each occasion. He sends me no records of it from Key West in the fall.

Dendroica cærulea. CERULEAN WARBLER. — I have not detected the presence of this species at Tarpon Springs or at other points that have been visited on the Gulf coast. Mr. Atkins did not find the bird at Punta Rassa, but took one at Key West, April 16, 1887, and another on April 29, 1889, these being all of his records.

Dendroica striata. BLACK-POLL WARBLER. — A common migrant in both spring and fall on the Gulf coast in the vicinity of Tarpon Springs and at other points where investigations have been carried on. At Tarpon Springs they arrive in spring about the last week in April and remain till about May 12-15.

In this connection it is of interest to record a great mortality among the representatives of this species, during the spring migration of 1888. It is so rare that one finds any birds dying or dead from other than accidental causes, generally connected in some way with innovations caused by the settlement of a country, as telegraph wires, light-houses, and the like, that it seems worth while to give the following details of the epidemic. It was apparently confined, so far as I am aware, to representatives of this species alone, and only to those individuals which visited the Anclote Keys and Hog Island. These Keys are four in number, and are four miles from the main land, in the Gulf, and extend in a north and south line for about twenty-five miles. I found in late April and early May many *D. striata* dead, and others apparently ill unto death on these islands, and though there was an infinite variety of other bird-life represented at the same points, yet no other species seemed to be suffering or was found dead. Of *Dendroica striata* I picked up dead on April 29, 1888, in a short walk on South Anclote Key, upwards of twenty-five.

In the fall the birds pass late in September and during October in numbers.

Mr. Atkins considers the birds as rare spring migrants at Punta Rassa,

but common in the fall, and at Key West they are very common on both migrations.

Dendroica blackburniæ. BLACKBURNIAN WARBLER. — I have but few records of the occurrence of the Blackburnian Warbler at Tarpon Springs and these are subjoined. No. 3847, ♀, *ad.*, September 1, 1886; No. 3704, ♂, *ad.*, October 1, 1886; No. 3705, ♂, young of year, October 1, 1886; No. 3934, ♂, *ad.*, October 15, 1886. Mr. Atkins did not get the birds at Punta Rassa, but has taken them twice at Key West, a single bird on October 21, 1887, and a second on July 29, 1889.

Dendroica dominica. YELLOW-THROATED WARBLER. — A rather common resident bird in the vicinity of Tarpon Springs, and breeds in numbers. Young birds of the year are fully fledged by June 7, No. 6050 of my collection being a male young of the year, taken on this date, and very like an old bird in appearance. Mr. Atkins says the species is a common resident at Punta Rassa and at Key West, particularly in winter. At Key West they do not apparently breed, as they are absent for a short time in early summer returning again about July 25.

Dendroica dominica albilora.—SYCAMORE Warbler.—At Key West on March 27, 1888, Mr. Atkins secured an adult male of this subspecies which he has kindly sent to me and which is No. 5457 of my collection. This is the only record that I am aware of from the region under consideration.

Dendroica virens. BLACK-THROATED GREEN WARBLER. — A rare migrant in the vicinity of Tarpon Springs. My only record is No. 3919, male young of year, October 15, 1886. Mr. Atkins did not meet with it at Punta Rassa and gives it as rare at Key West, where he secured single birds on October 14, 1887, and on January 28 and April 1, 1888.

Dendroica vigosii. PINE WARBLER. — A common resident in the vicinity of Tarpon Springs, breeding very abundantly. Young female birds of the year in fresh unworn plumage, taken at Tarpon Springs, have the buff shade of the underparts particularly pronounced. This phase seems quite transient, as by the middle of October, or by November 1 at latest, the color has faded very decidedly, and a yellowish wash, before this time not apparent, appears on the throat and fore part of the breast of most individuals of the sex and age referred to.

Dendroica palmarum. PALM WARBLER.—Common migrant and winter resident in the vicinity of Tarpon Springs, and at both Punta Rassa and Key West Mr. Atkins's experience is of a like nature. In the vicinity of Tarpon Springs the first arrivals in fall are about the 22d of September, and in a few days the birds are common. They remain at this point in numbers till from the 5th to 18th of April.

Dendroica palmarum hypochrysea. YELLOW PALM WARBLER.—The examples of this subspecies that I have met with in the vicinity of Tarpon Springs are of rare occurrence, but they regularly appear in small numbers late in March and early in April, remaining but a few days. I have no fall records. Mr. Atkins has sent me notes regarding these birds from both Punta Rassa and Key West, that are of similar import to the above conclusion.

Dendroica discolor. PRAIRIE WARBLER. — An abundant migrant, and many breed, in the neighborhood of Tarpon Springs. At this point I have no records of the species in winter, and it is most common in August and September. At Punta Rassa and at Key West it is abundant as a migrant, and it breeds sparingly at the former point. It winters at both places. This information is kindly furnished me by Mr. Atkins. For further remarks on this species, see Auk, Vol. IV, pp. 134-135.

Seiurus aurocapillus. OVEN-BIRD. — A rather common spring and fall migrant about Tarpon Springs, appearing in late March and early April and in September. Mr. Atkins, speaking of the species at Punta Rassa and at Key West, says: "Winters more or less commonly at both places, and is an abundant migrant, especially at Key West in fall. First arrivals at this latter point, August 19, 1889, several birds."

Seiurus noveboracensis. WATER-THRUSH. — A not common migrant in the vicinity of Tarpon Springs, where it occurs in April and in September and October. Mr. Atkins says: "It is one of the most abundant migrants at both Punta Rassa and Key West, but is represented in larger numbers at the latter than at the former point, and the fall migration is greatly in excess of the spring flight. First migrants return to Key West from the north about August 16, 1889."

Seiurus motacilla. LOUISIANA WATER-THRUSH. — I have not met with this species in Florida. Mr. Atkins regards it as rare at Key West, and he did not secure it at Punta Rassa. Key West records are July 16, 1888; April 6, 1889. "Returned from north July 16, and after this time I met with from one to four specimens, but never more than four, and that on but one occasion, every time I collected up to the latter part of August."

Geothlypis formosa. KENTUCKY WARBLER. — A rare migrant on the Gulf coast of Florida. The only record I have is of an adult male taken at Tarpon Springs, April 6, 1886. Mr. Atkins has not met with the species.

Geothlypis agilis. CONNECTICUT WARBLER. — A rare migrant. The only record that I am aware of from the Gulf coast of Florida is that of an adult female, No. 3443, taken at Anclote Keys, May 24, 1887. See Auk, Vol. V, p. 187.

Geothlypis trichas. MARYLAND YELLOW-THROAT. — A common resident species on the Gulf coast of Florida [*G. l. ignota* Chapman], supplemented during the migrations by many individuals on their way north and south. It is, Mr. Atkins says, a migrant at Key West and Punta Rassa, remaining in the winter, but probably does not breed at these points.

My friend, Mr. Chapman of the American Museum of Natural History, New York, has been studying the geographical variations of this species for some time, and to aid him in his investigations I have placed all the material which I have collected in Florida pertaining to the matter at his disposal. He promises an early report which will doubtless be novel, exhaustive, and of great interest.

Since the above was written, Mr. Chapman has concluded his investiga-

tions, which are published in this number of 'The Auk.' See *antea*, pp. 9-14.

Icteria virens. YELLOW-BREASTED CHAT. — The evidence of the occurrence of the Yellow-breasted Chat on the Gulf coast of Florida is so far of a negative character. I have been unable to detect its presence nor has Mr. Atkins found out anything with regard to its occurrence at either of the points where he has so carefully collected. It is not a little remarkable that so conspicuous a species, which breeds but little to the north of the region under consideration, and which apparently winters to the south of the United States, should be unknown at these points as a migrant.

Sylvania mitrata. HOODED WARBLER. — A rather common spring migrant in and about Tarpon Springs, but rare in the fall. It appears here late in March or early in April and remains about three weeks. I have no record of its breeding in the area under consideration. The latest fall date is on September 17, 1886. At Punta Rassa Mr. Atkins did not meet with this species, nor has he found it at all common at Key West. At that point his records are March 18, April 1 and 3, August 30, and September 13, 1887, a single bird on each day. "1889, arrived from north August 19, two or three seen later."

Setophaga ruticilla. REDSTART. — A not very common spring and fall migrant in the country about Tarpon Springs. In the spring it passes through here during the first two weeks in May, and appears again returning about August 5 to 10 and remains till the first of November. Mr. Atkins gives it as a rare spring and common fall migrant at Punta Rassa and as equally common both spring and fall at Key West. His notes in regard to the latter point are: "Last migrants northward May 21, 1887. Returned August 9, 1887; young birds of year, both sexes, taken. 1889, July 22, young of year and adult female; July 30, adult male."

(To be continued.)

NOTES ON *PIPILO FUSCUS MESOLEUCUS* AND *PIPILO ABERTI*, THEIR HABITS, NESTS AND EGGS.

BY CAPT. CHARLES E. BENDIRE.

THE CAÑON TOWHEE is a common resident throughout the year, in the southern portions of Arizona at least, and I found it especially abundant during the breeding season in 1872 in the vicinity of the present site of Camp Lowell, near Tucson, the principal town in the Territory at the time. The bird was first obtained by Dr. Kennerly, the naturalist of the Pacific Rail-

road expedition along the 35th Parallel, on Bill Williams Fork, Arizona, February 5, 1854, and was shortly afterwards described by Prof. Spencer F. Baird, as *Pipilo mesoleucus*. In the A. O. U. Code and Check-List it is placed as one of the races of the Brown Towhee (*Pipilo fuscus*). These, besides the bird in question, are *Pipilo fuscus albigula*, found in Lower California, and *Pipilo fuscus crissalis* in California proper.

If eggs counted for anything in the relationship of birds, *Pipilo fuscus mesoleucus* then would certainly have to be classed as a distinct species from the other two forms, and I always held that it should till recently, after examining a series of skins of these three forms in the National Museum collection, I found that the California race, *P. fuscus crissalis*, was the darkest colored, as well as the largest in size, showing more of a rufous tint generally. *P. fuscus mesoleucus* comes next in size, but is much paler than the former, especially about the throat, and has a distinct reddish cap on the head. *P. fuscus albigula* is the smallest of the three, has the reddish cap also, and is generally still paler colored throughout than *P. fuscus mesoleucus*, but comes very close to this in general appearance, and if a number of unmarked skins of these two forms were mixed together, it would certainly be difficult to tell where one race began and the other ended. Now one might reasonably presume that the eggs of the last two races at least would resemble each other closely, but they do not.

The eggs of *P. fuscus crissalis* and *P. fuscus albigula* resemble each other both in their ground color and in markings. The ground color is a light greenish blue, very similar to that of the eggs of *Agelaius phœniceus*. They are sparsely spotted or blotched with a very dark brown, almost a black, the markings being principally confined to the larger end of the eggs; occasionally these spots are connected with fine hair-like lines; there are also a few lighter colored shell markings of lavender and purple to be found in most of the specimens. Their shape varies from ovate to elliptical ovate. The average measurement of fifty specimens of *P. fuscus crissalis* is $.98 \times .72$ inch, the largest egg measuring $1.03 \times .78$ inch, the smallest $.91 \times .70$ inch. The average measurements of twenty-three specimens of *Pipilo fuscus albigula* are as follows: average size $.90 \times .66$, largest egg $.98 \times .69$, smallest $.80 \times .64$ inch. In the eggs of the Saint Lucas Towhee, the ground color is a trifle paler also, due no doubt to fading out by age. For the purpose of better comparison I gave the description of the above races, although not

strictly within the scope of this paper. It will be seen that the eggs of *P. fuscus mesoleucus* are entirely different, both in ground color and in the amount of markings, from the other two races. Similar cases occur in the genera *Spinus*, *Aphelocoma*, *Harporhynchus*, as well as others, showing conclusively that the egg alone cannot always be relied upon, to point out the relationship of species.

But to come back to the subject proper. No mention, as far as I am aware, has been made of the eggs of this subspecies by the earlier ornithological writers, excepting Dr. J. G. Cooper who says in his 'Ornithology of California,' page 248, as follows: "This species is very abundant in southern Arizona, where its habits are much like those of *P. aberti*. The eggs resemble those of *P. fuscus*," The late Dr. T. M. Brewer published the first correct description of these eggs on page 516, Appendix to Vol. III, 'History of North American Birds' by Baird, Brewer and Ridgway, from specimens collected by the writer in 1872, in the vicinity of the present site of Camp Lowell, about seven miles northeast of Tucson, Arizona. Here I found the Cañon Towhee nesting quite abundantly on the more or less open plains immediately back from the Rillitto Creek bottom, which are here covered with straggling mesquite trees and bushes of various kinds, some of them attaining a height of ten or twelve feet, interspersed here and there with cacti and yuccas of different species, the cholla cactus predominating. The nests were usually found from one to two hundred yards distant from the creek bottom and scarcely ever more than a mile away from this, but never in the bottom proper, the chosen home of *Pipilo aberti*. According to Mr. W. E. D. Scott, who has done so much excellent work in Arizona in more recent years, the Cañon Towhee is equally abundant in the neighboring mountains and ranges well up to the pine forests. He found his first nests in the Catalina Mountains at an altitude of 3500 feet, about the middle of March, and according to him the breeding period extended well into July.* To explore the same localities that Mr. Scott did in 1883, would have been exceedingly unwholesome in 1872, on my second visit to Arizona, and still more so in previous years. The chances would have been more than even, that an inquisitive naturalist, venturing into the recesses of the Catalina Mountains, even

* Auk, Vol. IV, No. 3, July 1887, p. 204.

with a fair-sized and well-armed party, would have been himself collected sooner or later by one of Chief Cachise's enterprising cut-throats who then roamed over these mountain ranges more or less at their own sweet will. The ornithologist collecting in Arizona at the present day cannot imagine the changes that twenty years have brought about in that country, and it is hard to realize the difficulties under which the earlier explorers labored. It would take too much space to enumerate even a few of these here, but having entered Arizona myself as early as 1857, although I had no means to collect anything then, I am quite competent to judge what risks and discomforts the pioneer naturalists of Arizona, Drs. Coues, Cooper, and Palmer, underwent in the interests of science. Only on my second visit to the Territory in 1872 was I enabled to add a little to our knowledge of the avifauna of that even then still little known region. Fortunately there was a cessation of hostilities on our part, only, however, against the hostile Apaches, for a portion of the year, as peace commissioners had been sent out from Washington to make terms with the hostiles, which enabled me to make a few interesting discoveries which I could not have done otherwise.

I found my first nest of *Pipilo fuscus mesoleucus* on June 4, 1872; it contained two fresh eggs, and was placed in a mesquite bush about four feet from the ground and not particularly well concealed. According to my observations (I examined some seventy nests) by far the greater majority were placed in low mesquite trees, sometimes close to the trunk, in the forks of limbs, and again well out on a branch, rarely more than eight feet from the ground. An occasional nest was placed in a cholla cactus. None were found directly on the ground. The nest is a large one for the size of the bird, loosely constructed externally. It is composed of weed stalks and coarse, dry grasses, and is lined with fine thread-like rootlets and horse-hair, when the latter is obtainable. It is an unusually deep nest. One collected by Lieut. H. C. Benson, 4th Cav., U. S. Army, at Fort Huachuca, Arizona, April 9, 1887, and now before me, measures outwardly $5\frac{1}{2}$ inches across, inner diameter 3 inches, outer depth $3\frac{1}{2}$ inches, inner 2 inches. Externally it is principally constructed of the stems and dry blossoms of a species of *Gnaphalium*, small twigs, leaves, etc. The inner lining consists of the seed-tops of grasses belonging to the genus *Fistuca* and hemp-like plant fibres.

The eggs are usually three in number; about one nest in ten contains four; occasionally I have found the bird sitting hard on but two, probably a second or third brood. On comparing notes with Mr. Herbert Brown of Tucson, an enthusiastic naturalist, who has made careful and extended observations over pretty much the same ground I did in 1872, I found the nesting season of 1872 must have been an unusually late one, as he has since then found many species breeding there fully two months earlier than I did. Nests of this species with perfectly fresh eggs were found by me as late as Sept. 11, and it is reasonable to presume that as many as three broods are raised by some of these birds at least.

The ground color of the eggs of the Cañon Towhee is a very pale bluish white, or very light pearl gray, scarcely an egg in a series of one hundred and three specimens can be called pure white. As far as markings are concerned, these eggs can be divided into two types. In one the spots are sharp, well defined, occasionally connected with each other by lines and scrawls, and principally concentrated about the larger end. Their color is a very deep brown, almost a black. This pattern includes the less heavily marked specimens. In the second type, the markings are less clearly defined, more irregular in shape, mere blotches, and much more profuse. The color is less deep, more of a claret brown or vinaceous rufous. In addition fine shell markings of lavender and heliotrope purple are scattered more or less profusely over the entire egg in both types. The eggs bear a certain resemblance to those of *Sturnella*, especially to heavily marked specimens of the western race, *Sturnella magna neglecta*. Nearly all the eggs of *Pipilo fuscus mesoleucus* are much more heavily marked than those of the other two races, aside from the radical difference of the ground color, which is also more lustrous. In a series of one hundred and three specimens before me, all but eleven collected by myself, there is considerable difference both in size and shape. The eggs are mostly ovate, some elliptical ovate. The average size of the series before me is $.92 \times .69$ inch. The largest egg measures $1.04 \times .71$, the smallest $.81 \times .66$ inch, and a runt egg of this species in the collection measures but $.70 \times .56$ inch.

In its habits and its call notes the Cañon Towhee does not differ materially from *Pipilo aberti*. Neither can be called a songster. It is more or less terrestrial at all times, rather shy,

sticking close to the underbrush, but not nearly as much so as *Pipilo aberti*. It is much more easily obtained, as the localities frequented by it during the breeding season are much more open and free from undergrowth and creeping vines than the bottoms where the former lives. During winter I have noticed it frequently associated with other ground-feeding species like *Zonotrichia leucophrys* and *intermedia*, *Melospiza fasciata fallax*, *Calamospiza melanocorys*, *Peucaea carpalis* and *arizonæ*, and *Amphispiza bilineata*, as well as others. Large flocks composed principally of the species mentioned would frequently alight on the open ground about my camp, especially about the picket line where the cavalry horses were tied up at night and fed, and at such times they would allow themselves to be approached rather closely, and it was generally an easy matter to select such specimens as one wanted while they were searching for food.

Pipilo aberti.

The life history of Abert's Towhee seems to be much better known than that of the Cañon Towhee; a pretty full account of its habits is given in Vol. II, 'History of North American Birds,' Baird, Brewer and Ridgway, pp. 128-130. It appears that its nest and eggs were first discovered by Dr. J. G. Cooper, and described by him from specimens taken near Fort Mohave, Arizona, April 1, 1861. The types, Nos. 7275 and 7276, are still in the National Museum collection, in a good state of preservation.

Abert's Towhee is the largest of the plain colored Pipilos of the Pacific coast, and a quite different looking bird from the Cañon Towhee, its most striking characters being its uniform pale cinnamon color, only relieved by a slight edging of black around the base of the bill, and its unusually long tail. I found it a quite common resident, and breeding abundantly, in the vicinity of my camp on Rillitto Creek, if possible even more common than the Cañon Towhee. In its habits it is one of the shyest birds I know, and although I could readily find one of its nests, every hundred feet, in a certain limited area, it was quite a different matter to secure the parent for identification. I wasted more than one hour in watching for these birds. Their loud alarm note of *huit, huit*, indicated their whereabouts readily enough, but getting a good view of them was another thing. Even during the winter

months they were hard to secure, and not by any means as social in their habits as the Cañon Towhee. I found my first nest with eggs on May 13, 1872, placed in a willow thicket, about three and a half feet from the ground. Outwardly this was composed exclusively of the soft inner bark of the cottonwood, resting on a slight platform of small sticks and dry weed stalks. Inside the nest was lined with finer material of the same kind, and a few horse-hairs. This first nest was a rather flimsy affair; most of those found subsequently were much better constructed, principally dry weed stalks, the soft inner bark of dry cottonwood logs, swamp grasses, fibres of wild hemp, an occasional leaf, and fine roots, entering into the composition of the nests. A few only were lined with horse-hair, a material probably furnished by my herd which grazed in the vicinity and was daily driven into the creek bottom to water. The measurements of a nest taken by myself are $5\frac{1}{2}$ inches across externally by 4 inches in depth. Inner diameter, 3 inches; depth, $2\frac{1}{2}$. The inner cavity is very small for the size of this bird, scarcely large enough to accommodate the body. Its long tail sticks up out of the nest, when sitting on its eggs, at a perfect right angle, and it certainly must be an uncomfortable position for the bird to stay in for any length of time.

All the nests I have found, about eighty in number, were placed in the densest thickets in the creek bottom proper, with but one single exception. This I found in the forks of a mesquite bush about four feet from the ground, on the open plain fully four hundred yards from its customary breeding places, and as this nest contained the only set of four eggs I found of this species, I made certain of the perfect identity of the parent by shooting it finally, after a tedious wait of over an hour. Fully sixty of these nests were placed in willow thickets, or on willow stumps around the tops of which young green sprouts had grown out again, the top of the stump itself making an excellent base for the nest. I found many such stumps in the creek bottom, cut off about three or three and a half feet from the ground. With the characteristic laziness of the native Arizonian, I presume, they found it easier to cut them at that height, as it obviated bending their backs to a certain extent. These young willow trees were from five to six inches in diameter, and were used for stringers or rafters on their adobe huts, to support the heavy dirt-covered roofs. I did not find a single nest directly on the ground; usually they were from two and a half to three and a half feet above it, and seldom more than five

feet up. After willows, a species of ash was the next favorite, and I found one nest in such a tree fully twenty-five feet from the ground, placed in a fork in its topmost branches. Now and then a nest was placed in a bushy mesquite tree, and a couple of nests I found in wild currant bushes.

The usual number of eggs laid by Abert's Towhee is three, sets of only two are by no means unusual, however; in but a single instance, already mentioned, I found four. Their ground color is a pale clay-blue, paler than in the eggs of *Pipilo fuscus crissalis* and *P. f. albigula*. The markings, as in those, are sparse, sharp, and well defined, generally heaviest about the larger end, in color very dark brown, almost black in some, in others these dark spots are less intense and margined with vinaceous and rufous about the edges. In some specimens these spots are connected with each other by fine hair-like lines and tracings of different shades of brown or vinaceous, giving a very pretty effect. There are also some paler shell markings of lavender and purple to be found on some specimens, but in a majority of eggs these are wanting. The shape of most of the eggs is ovate, a few are elliptical, others elongate ovate. The average size of eighty-three specimens, all but six collected by myself, is $.94 \times .70$ inch. The largest egg measures $1.08 \times .70$, the smallest $.82 \times .69$ inch.

I believe fully three broods are raised during the season, as I found a perfectly fresh set of eggs on Sept. 10. Several other species also were laying then. Abert's Towhee has many enemies to contend against during the breeding season, and it is questionable after all, if they ever succeed in raising more than a couple of full broods. Small parties of Arizona Jays, from the mountains in the vicinity, were more than once met with by me, evidently bent on an egg-hunting expedition themselves, and no doubt some of the numerous species of Hawks, Owls, squirrels, and snakes, especially some of the latter, destroy a good many of their young as well as the eggs. The shrill cry of alarm uttered by these birds when in distress, was more than once heard by me, when still quite a distance from the nest, due no doubt to the presence of some other intruder than myself. I frequently found broken eggshells lying at the foot of the empty nest, where a day or two previously I had seen a single egg and had left it for the set to be completed.

OBSERVATIONS ON SOME OF THE SUMMER
BIRDS OF THE MOUNTAIN PORTIONS
OF PICKENS COUNTY, SOUTH
CAROLINA.

BY LEVERETT M. LOOMIS.

SOMEWHAT over a dozen years ago, having become interested in the birds of the neighborhood of my home, the plan was conceived of making an ornithological survey of the State—a systematic study of the avifauna of the various sections exhibiting distinctive physical characteristics. With the progress of my researches in Chester County, it became evident that the Piedmont Belt was an exceptionally inviting field—a veritable *terra incognita* of surprising richness,—and that years of continuous effort should be devoted to its investigation. In consequence all thought of work in the mountainous districts was deferred until the time when further observation appeared to warrant an enlargement of territory. In the early part of July, 1886, I made a reconnaissance of the portions of the mountain region lying in Pickens County in the vicinage of Mt. Pinnacle—the highest point in the State—and the following season I made a second visit of a week beginning June 18, and on June 4, 1888, a third visit of three days. In 1889 I again continued my investigations, but instead of proceeding, as on former occasions, by rail to the point most convenient to Mt. Pinnacle—Easley, seventeen miles distant—I travelled across the country with a team of mules and a heavy covered wagon. Accompanied by a young colored man as a helper, I set out from Chester, June 3, and accomplished the journey in four days and a half. The influence of the mountains became early apparent, as I advanced, in the diminishing abundance of *Mimus polyglottos* and in the increasing prominence of *Turdus mustelinus*, and also by the presence of *Pipilo erythrophthalmus* near Spartanburgh. I began work on the afternoon of my arrival, June 7, and continued without interruption until July 2, the time of my departure for home. The second day after reaching the scene of my labors a long drought which had been prevailing terminated, and, with but few exceptions, rain fell in some part of every day during my entire stay.

But in spite of this drawback field-work was diligently pressed, though I was compelled to put up at the house of a friend at the foot of Mt. Pinnacle instead of camping out as I had intended. The mules I had with me, however, enabled me to reach the summits and other places more remote without great loss of time.

The mountain region of South Carolina may be briefly defined as a wedge-shaped territory, about one hundred and fourteen miles in length and from eight to twenty-one miles in width, stretching along the North Carolina boundary from the vicinity of Henry's Knob and the King's Mountain chain on the east to the Georgia line on the west, traversing the counties of York, Spartanburgh, Greenville, Pickens, and Oconee. Within this region there are two distinct districts; an outer one characterized by widely isolated elevations arising from a country essentially similar in general aspect to the Piedmont section, and an inner one, truly mountainous and properly a part of the Blue Ridge system, extending in an irregular belt — nowhere, perhaps, exceeding a dozen miles in width — along the border from the State of Georgia to the northwestern corner of Spartanburgh County.

About Mt. Pinnacle the mountains assume the form of successive ranges, broken up by gaps into numerous peaks, and separated from one another by narrow valleys. Mt. Pinnacle, proper, is but a single point, with lateral spurs, in a chain lying between the Oolenoy and the South Fork Saluda. Table Rock, several miles away, is at the eastern terminus, the general trend of the range being east and west. The sides, which are very steep, are broken up into narrow ridges and hollows; the numerous brooks flowing from the latter rendering the region one exceptionally well watered. The summits culminate in mere points and sharp roof-like ridges — the apex of Mt. Pinnacle tapering to a surface of only a few square rods in extent. As would naturally be inferred from the name, Table Rock furnishes a partial exception to this statement. Just below the highest portion, and at a spot where a fine spring issues from the soil, there is a wooded area, comparatively level, of upwards of twenty-five acres. On the slopes, near the crest of the range, a few acres of fairly even ground are a rarity. Such places, forming little 'benches' and coves, are always compensated for by sudden drop-offs, crags and cliffs abounding. The most noteworthy precipice of the locality, as well as of the whole mountain region, is at Table Rock, where

there is a sheer descent, according to local measurement, of nine hundred feet. The other ranges of the immediate vicinity do not differ strikingly from the Mt. Pinnacle range, though some are less precipitous and offer more favorable opportunities for agriculture. The absence of plateaus and other extended levels adds greatly to the difficulty of studying the avian fauna of the mountaintops. A few shots generally drive the birds to the steeper declivities where prolonged pursuit is not feasible. Often birds will be plentiful a few hundred feet below the station occupied, in situations practically inaccessible, or which can be reached only by long detours entailing exhausting exertion.

The Oolenoy Valley (or Oolenoe as formerly spelled by some writers), so often referred to in the subjoined notes, is a fertile bottom following the Oolenoy Creek from its junction with the Saluda (a branch of the Broad) to the watershed separating its south fork from the headwaters of an affluent of the Savannah in Reedy Cove. The High-low Gap, also frequently mentioned, is a dividing ridge between the north prong of the Oolenoy and the south branch of the Saluda.

It will be seen that the territory actually covered by my explorations is very limited; the whole tract, bounded by Table Rock on the east, Reedy Cove on the west, the High-low Gap on the north, and the Oolenoy Valley on the south, perhaps aggregating not above twenty-five square miles.

Except where the ground is sterile or rocky, the mountains are covered with woods of hardwood growth. There are but few clearings, the settlements being almost exclusively confined to Reedy Cove and the Oolenoy and Saluda Valleys. Mt. Pinnacle is wholly uninhabited, although there is a little 'deadening' near the summit where a few acres of hillside were formerly cultivated. Though there are fine forests, as at the top of Mt. Pinnacle and on Rich Mountain at Reedy Cove, still the timber is not of great age. Men of advanced years can remember when 'Bald Knob' (the local appellation of Mt. Pinnacle) was, in fact, truly bald. The name, 'Mt. Pinnacle,' is of very recent origin, having been bestowed by the engineers of the United States Coast and Geodetic Survey. For fear of unduly extending these preliminary remarks, allusion is made only to such floral features as forcibly arrested an eye accustomed to the woodlands of the lower country. Of the deciduous trees — aside from the oaks and hickories — the chestnut is

the most conspicuous. On the higher elevations, in some places, it predominates over all other kinds of growth. Hemlocks, solitary or in small groups, occur at all altitudes in the ravines and coves, interspersed among the hardwood. Scattered through these hollows and on their sides, in smaller numbers, are white pines, while in the damper locations an occasional black spruce towers mast-like amid the other trees. On the poorer ridges the Jersey or scrub pine abounds. The rarer Table-Mountain pine is accounted among the wonders of Table Rock. Rhododendrons everywhere border the wooded streams. The last season the first blossoms were noticed June 15.

Of the mammals, I have but little of pertinence to note. I did not meet with *Sciurus hudsonius* or *Lynx borealis canadensis*, but both species are probably present, as I was told that the 'boomer' was found on the mountains west on the Big Estatoe, and that a large cat, differing distinctively from the common one, was sometimes taken about Mt. Pinnacle by the wild-cat hunters. The ground squirrel (*Tamias striatus*) is abundant and the ground hog (*Arctomys monax*) common.

Three avifaunæ meet in the South Carolina highlands—the Louisianian, Carolinian, and Alleghanian. The first-named is not prominent, the local ornis being characterized by species representative of the Carolinian and Alleghanian, those of the former preponderating. The general influence of the mountains is of a nature so potent as to preclude the division of the two thousand feet, more or less, arising above the Oolenoy Valley into distinct faunal zones—sharp distinctions of this kind not existing. In considering the relation between distribution and altitude, woodland birds alone are of significance, for these mountain slopes do not supply the conditions essential to birds inhabiting open situations—a modifying circumstance always to be kept in mind in the perusal of the statements that follow. However, irregular lines of limitation with abrupt sinuosities may be drawn for a few species, the Alleghanian being confined above 2000 feet and the Carolinian chiefly below 2500 feet. While these boundaries appear to be well sustained locally, still a wider field would probably show, in some cases at least, a more general distribution. The universal dispersion of *Dendroica virens* in the vicinage of Mt. Pinnacle and its reported restriction to the Canadian fauna in the higher mountains of North

Carolina, give peculiar emphasis to the fact that a single locality cannot safely be accepted as a criterion in the determination of vertical distribution, local conditions — not always obvious — often exercising greater influence than does mere elevation. The rigid adherence of *Seiurus aurocapillus* to the belt above 2000 feet — a circumstance naturally not to be expected, if altitude were absolutely paramount, of a species occurring within the bounds of the Carolinian Fauna — strongly contrasts with the wide ranging of *Dendroica virens*. The uniform allotment of *Helminthophila vermivorus*, *Seiurus motacilla*, *Geothlypis formosa*, *Thryothorus ludovicianus*, *Parus bicolor*, *Parus carolinensis*, shows what little weight height actually has in these mountains in governing the upward range of some of the characteristic components of the Carolinian fauna. Of species whose range seems definitely restrained by altitude, it would naturally be expected that there would be a gradual diminution in abundance in receding from base or summit, but this is not strictly the case — the highest and lowest points often exhibiting, in a given area, numbers not unequal. The pushing up along the barren ridges of *Sitta pusilla* of the Louisianian fauna strikingly illustrates the force exerted by floral surroundings. It should be added, further, that the streams of larger size are apparently as influential in extending the altitudinal range, in certain instances, as are rivers the latitudinal. The north fork of the Oolenoy well exemplifies this, the extreme limits, so far as noted, of a number of species being attained on this water-course near the High-low Gap.

To summarize, while the predominant factor in the constitution of the bird-fauna of these mountains is altitude, still it does not strictly control vertical distribution, its immediate force being modified,

1. By the combined effect of the mountains, this collective influence pervading the lower grounds to such a degree as to check the extension of the more susceptible Carolinian forms and to increase that of some Alleghanian.

2. By the flora, conditions of this nature — often of great potency where local habitat is concerned — extending or curtailing the general range.

3. By streams (natural highways encouraging extension of range) and other surface features, upon which depends the pres-

ence or absence of certain species—local environment in some instances counterbalancing disadvantages of elevation.

4. By artificial circumstances, such as are brought about through the agency of man.

5. By influences not apparent, as manifested in the selection of one locality as a place of residence and the rejection of another, to all appearance not dissimilar.

6. By inherent power of adaptation in certain Carolinian species, notably *Parus bicolor* and *Parus carolinensis*, to the conditions incident to altitude, irrespective of other modifying considerations.

LIST OF ELEVATIONS.

Mt. Pinnacle	.	.	.	.	.	.	.	.	3436 feet.
Table Rock	.	.	.	.	.	.	.	.	3124 "
Pickens Court House	.	.	.	.	.	.	.	.	1162 "
Spartanburgh Court House	.	.	.	.	.	.	.	.	887 "
High-low Gap	.	.	.	.	.	.	.	.	2763 "
Reedy Cove	.	.	.	.	.	.	.	.	1810 "
Oolenoy at foot of Mt. Pinnacle	.	.	.	.	.	.	.	.	1123 "

I am indebted for the first four of the above measurements to the U. S. Coast and Geodetic Survey. The last three were kindly supplied by a friend who obtained them directly from the engineers engaged in making the preliminary surveys of the projected Carolina, Cumberland Gap, and Chicago Railroad.

A few words of explanation are necessary to a proper understanding of the appended notes. In general, when no year is given, 1889 is meant. Large birds, when spoken of as common, are not to be regarded so in the same sense as smaller ones.

1. *Ardea herodias*. GREAT BLUE HERON. 'CRANE.'—July 1, one was seen in the Oolenoy Valley at the foot of Mt. Pinnacle. The day following another—perhaps the same bird—was observed lower down the valley opposite Table Rock. From what I learned by inquiry, I judge that this species is not as plentiful as in the Piedmont Region. It is said to occur chiefly during wet spells.

2. *Ardea virescens*. GREEN HERON.—This Heron was met with during June, 1887, and again in June, 1889, along the Oolenoy, where its presence appears to be not infrequent.

3. *Colinus virginianus*. BOB-WHITE. 'PARTRIDGE.'—While this bird is very common, especially about the settlements, still it is apparently not as abundant as in Chester County and other portions of the upper country away from the mountains.

4. *Bonasa umbellus*. RUFFED GROUSE. 'PHEASANT.'—The Pheasant is fairly entitled to be ranked as common in this section. It is not confined to the mountain tops during the month of June but is found from base to summit, and is not more numerous at the higher elevations than the lower. At this season the mulberry trees are in fruit, and are much resorted to. Two of these trees at the foot of Mt. Pinnacle were visited daily by Pheasants during my stay. At the base of Rich Mountain, in Reedy Cove, I rode up to three that were feeding on wild strawberries in a little cove on the edge of the woods. Huckleberries also form a part of their diet at this season, and dogwood berries are said to be a favorite addition to their fare in the autumn. From what I gleaned from hunters, it seems that the wild-cat is the great enemy of the Pheasant. I was informed that both old and young were preyed upon, and that a young brood was often totally destroyed. They suffer but little from the gun, as they are not regularly pursued as objects of sport. (For previous notice, see 'The Auk,' Vol. III, Oct., 1886, p. 483.)

I did not meet with the Wild Turkey, and, from all accounts, I judge that it is not as abundant as in the lower country. Its increasing scarcity is attributed to the hunters and to the wild-cats.

5. *Zenaidura macroura*. MOURNING DOVE. 'DOVE.'—Only tolerably common, and noted principally in the cultivated valleys.

6. *Cathartes aura*. TURKEY VULTURE. 'BUZZARD.'—This species is independent of altitude, and is very common over the highest peaks as well as in the lowest valleys.

7. *Catharista atrata*. BLACK VULTURE. 'CARRION CROW.'—The Carrion Crow is well known throughout this region, but is not regarded as common. It is seen most frequently, I have been assured, about large carcasses. The mountain sides and tops serve as a stock range for the settlements in the valleys, and it not infrequently happens that cattle venture too near the cliffs and lose their footing and fall over, thus furnishing a continual source of supply to the carrion-feeding birds. I did not meet with this Vulture except on one occasion, June 22, when two individuals and a Turkey Buzzard were seen soaring over the valley of the Saluda, as I sat on the verge of the precipice at Table Rock. In their gyrations they finally drew near, and skirted along the face of the cliff on a level with the place where I was sitting.

The Swallow-tailed Kite (*Elanoides forficatus*) is a summer visitant at times in the Oolenoy and other valleys. I did not ascertain, however, whether it was known to breed. Aug. 6, two were shot, a friend writes, on Little Estatoe Creek, three miles west of Mt. Pinnacle. The tail of one of the specimens was forwarded to me at Chester for examination.

8. *Accipiter cooperi*. COOPER'S HAWK. 'CHICKEN HAWK.' 'BLUE-TAILED HAWK.'—About the settlements, apparently as plentiful as elsewhere in the State. During the latter part of my last visit one harassed the chickens daily at the house where I was stopping.

9. *Buteo borealis*. RED-TAILED HAWK.—Rather common and generally distributed.

10. *Falco peregrinus anatum*. DUCK HAWK. 'SPARROW EAGLE.'—As my guide and myself were picking our way in a dense fog along the broken trail at the foot of the precipice at Table Rock on the 15th of June, three Duck Hawks with loud cries bore down upon us from the mist-hidden crag above. They flew about in a manner that plainly indicated that our presence filled them with anxiety. Occasionally one would alight for a few moments on a dead tree. Several shots were fired, but the towering cliff led me to miscalculate the distance, and the only effect produced was to frighten them away. In about half an hour they reappeared, screaming as before. In the meantime the fog lifted and the surface of the cliff became distinctly visible. The object of their solicitude was soon apparent, for one of them, with a ground squirrel in its talons, alighted in a crevice in the massive wall of rock. Several unsuccessful attempts were made to obtain a specimen, which resulted finally in driving them from the scene. Four days later I visited the spot a second time hoping to secure one with a rifle, but they had grown extremely shy, remaining out of sight at the top of the precipice. On the 22d I rode across the range from Mt. Pinnacle to Table Rock and, when the brink of the cliff was reached, the three Falcons were again encountered, but the efforts put forth to capture one were as unavailing as were those on the former occasions. I did not find this bird elsewhere in my excursions about the mountains.

I was told that the Bald Eagle in the past bred at Table Rock. There is a great hole—affirmed to have been formerly a nesting site—in an inaccessible part of the cliff which still bears the name of 'the eagle hole.' The presence of an Eagle now, at any season, is an exceptional occurrence, and is of sufficient interest to awaken general comment. The Golden Eagle probably occurs during winter, if not at other times of the year. The Eagle, however, spoken of by my mountain friends is asserted to be a white-headed one.

11. *Falco sparverius*. AMERICAN SPARROW HAWK.—So far as my observation extended, the Sparrow Hawk was not numerous.

12. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. — Tolerably common. Familiarly known throughout the region as the 'Rain Crow.'

13. *Ceryle alcyon*. BELTED KINGFISHER: 'KINGFISHER.'—One was seen July 9, 1886, along the Oolenoy at the bottom of Mt. Pinnacle.

14. *Dryobates villosus audubonii*. SOUTHERN HAIRY WOODPECKER. —Although the Hairy Woodpecker is common and generally dispersed, I did not satisfactorily ascertain whether other than the southern form was present. A female, shot June 6, 1888, at an altitude somewhat above 3000 feet measured in length, 9 in., tail, 3.4 in., dimensions that are indicative of the typical *D. villosus*, but the wing measurement (chord) of this example was only 4.6 inches.

15. *Dryobates pubescens*. DOWNY WOODPECKER.—Observed from the valleys up the mountain sides to their summits; moderately common.

16. *Ceophlæus pileatus*. PILEATED WOODPECKER. 'WOOD HEN,' etc.—For so large a bird, common. Generally distributed. Though ordi-

narily wary, sometimes they appear to lose their caution, I have been informed, and several, as if actuated by an overpowering curiosity, will follow a squirrel hunter about from place to place, keeping up such a clamor that he is compelled to resort to his gun to free himself from their annoying attentions.

17. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—A few were noticed in the Oolenoy Valley. They were more abundant in the lower part of the County away from the mountains.

18. *Melanerpes carolinus*. RED-BELLIED WOODPECKER.—The lower elevations seemingly preferred; tolerably common.

19. *Colaptes auratus*. FLICKER. 'YELLOW-HAMMER.'—I found the Flicker common, ranging from the lower valleys over the mountain tops.

20. *Antrostomus vociferus*. WHIP-POOR-WILL.—In the neighborhood of the house where I stayed the characteristic notes of the Whip-poor-will greeted the ear nightly. It did not appear to be a very common bird, however.

The Chuck-will's-widow was not heard, but of its occurrence I was well assured. It is known as 'Dutch Whip-poor-will,' and its notes were imitated in such a manner as to leave no doubt in my mind as to the reliability of the statements made concerning its presence. It was reported as being rare.

21. *Chordeiles virginianus*. NIGHTHAWK. 'BULL-BAT.'—Only seen in the lower part of the County. Said to visit the Oolenoy Valley at times.

22. *Chætura pelagica*. CHIMNEY SWIFT. 'CHIMNEY SWEEP.' 'CHIMNEY SWALLOW.'—Common; its distribution uninfluenced by elevation. According to local information, it breeds in chimneys about the settlements, and in hollow trees back in the mountains. I spent a day in making a trip to Reedy Cove, expressly to see one of these trees. The tree, a 'poplar,' was a mere living trunk, and stood in the edge of a field on a little brook at the foot of a wooded mountain. It inclined fully 30° from a perpendicular, and was about forty feet high and eleven feet in circumference and hollow from the ground upward. The top was broken off, affording an entrance to the hollow within. I learned that it was chiefly a roosting tree, and that the fall was the principal time of the year when it was occupied. Then, at the close of day, I was told, "two or three hundred" would circle around and, at brief intervals, a few would detach themselves from the main body and enter the cavity. At last the whole flock would be settled there for the night. I saw but a single Swift near the place during the time of my visit, midday.

23. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Equally common over the wooded mountains and in the open valleys below. I did not try the experiment, but it is averred that corn whiskey, with sugar dissolved in it, placed in flowers much affected by these little pygmies intoxicates them so effectually that their capture by the hand is rendered an easy matter.

24. *Tyrannus tyrannus*. KINGBIRD. 'BEE-BIRD.'—Not particularly

common, and restricted to the cultivated valleys. It is said to be most numerous about places where bees are kept.

25. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Of universal dispersion throughout the region; common.

26. *Sayornis phœbe*. PHŒBE.—About the town of Chester, I have never met with the Phœbe during the month of June. In my wagon tour across the country it was first encountered, June 5, at Fair Forest, five miles west of Spartanburgh. On the same day its loud cries were heard at the South Fork of Tiger River, also in Spartanburgh County. June 4, 1888, a pair were found established at a small mill-pond midway between the villages of Easley and Pickens. At Mt. Pinnacle, it is common in the vicinage of water, ranging up to about 2500 feet. Back on the heights, sheltered situations in the walls of rock are frequently selected as nesting places. Young birds, just ready to leave the nest, were seen as late as June 23 in 1887.

27. *Contopus virens*. WOOD PEWEE.—Conspicuously common everywhere in the woods.

28. *Empidonax acadicus*. ACADIAN FLYCATCHER.—Most widely dispersed at the lower levels. Along the larger streams it reaches a higher elevation than elsewhere in the mountains. On the north fork of the Oolenoy, near the High-low Gap, it was common at 2500 feet, the highest point at which the species was observed.

(To be continued.)

ON THE WINTER DISTRIBUTION OF THE BOBOLINK (*DOLICHONYX ORYZIVORUS*) WITH REMARKS ON ITS ROUTES OF MIGRATION.

BY FRANK M. CHAPMAN.

AMONG our summer resident land birds the Bobolink is in its migrations remarkable for two things; first, the extent of its wanderings during the winter; second, the comparatively late date at which its spring migration is completed. These are both well-known facts, and I shall here simply endeavor to bring forward and arrange the records on which they are based, adding some new data furnished by an examination of the material in the American Museum of Natural History. It is to be regretted that a large proportion of the extra-limital records consist merely of mention of the bird's name and the locality of its

capture without giving the data of its occurrence, thus rendering impossible a satisfactory study of its migration or an accurate knowledge of the area it inhabits during the winter.

In the neighborhood of New York City the Bobolink commences its southern migration in July, great numbers flocking at this season in the wild rice (*Zizania aquatica*) marshes, and here many remain until early October, at which date their less tardy comrades have already reached the island of Jamaica. From Dr. Merriam's report* we learn that our bird, now a Rice-bird, appears in the rice fields of South Carolina and Georgia from August 15 to 21, and here, apparently content with their surroundings, they remain for several weeks without making further advance. In Cuba Gundlach† records their arrival in September in immense flocks, which remain only for a short time and then continue their journey southward.

Now appears an interesting question concerning their further line of flight. Three routes are open to them; (1) they may go to the westward, following the Cuban coast, thence, crossing to Cozumel and Yucatan, pursue their migration along the Central American coast to Panama, etc.; (2) they may go to the eastward through Hayti, San Domingo, and Porto Rico, and thence southward through the Windward Islands; or (3) they may strike out boldly and take the more direct course, crossing the sea to Jamaica and then in one extended flight reach the mainland of northern South America. An examination of the published records of the bird's occurrence shows that all three routes are followed to a greater or less extent, but it is apparent that comparatively few birds go as far east as the Windward Chain, while perhaps as many go through Jamaica as pass down the Central American coast. The records, however, from the last-named region are too brief to permit of satisfactory conclusions being drawn from them, and I merely present them as they stand. From Cozumel the Bobolink is recorded by Salvin,‡ who also states§ that many examples were taken by Gaumer in Yucatan and on the islands off the east coast of Honduras. From Hon-

* Dept. of Agriculture, 1886. Report of the Ornithologist and Mammalogist, pp. 248-249.

† Journal für Ornithologie, 1874, p. 129.

‡ Ibis, 1885, p. 191.

§ Biologia Centrali-Americana, Aves, p. 448.

duras we also have another record by the same author,* to which I will refer later, and we find the species included by Zeledon† in his list of the birds of Costa Rica. Swainson's‡ record from the highlands of Mexico, which probably refers to the western race, *D. o. albinucha*, completes the Mexican and Central American records with which I am familiar.

Turning now to the second route, leading through the Windward Islands, we find that from Hayti, San Domingo, or Porto Rico we have as yet no notice of the bird's appearance. Our first record, therefore, is from the small island of Sombrero in the Virgin group, where Lawrence§ records it, and in the Catalogue of the British Museum|| a specimen is cited from Nevis; both records are without data, but there is a specimen in the American Museum labelled, "Sombrero, Sep. 17, 1862, Julien," on which the first was probably based. From Guadeloupe and Martinique the bird is given by L'Herminier,¶ and this completes the Windward Island records until we come to the last of the chain, Grenada. From this island we have some very welcome and valuable information by Wells,** who during three years' observations had met with the species on only one occasion, when he captured one from a flock of five birds. Reference to this specimen in the American Museum collection shows it to have been taken October 1, 1885.

Passing now to a consideration of the data from the third, or last route mentioned, we find that great numbers of birds select this more direct line of migration. After leaving the island of Cuba the birds' first resting place would be the Caymans, distant about one hundred and seventy-five miles. Mr. Cory writes me that his record of their occurrence on Little Cayman†† is based on two specimens, a male taken April 29, and a female taken April 30, and while it is probable that they also visit these islands in the fall, we may presume that the greater numbers follow the Cuban coast to at least Cape Cruz, or to a point directly north of

* Ibis, 1866, p. 194.

† Proc. U. S. Nat. Mus., VIII, 1885, p. 107.

‡ Phil. Mag., New Ser., I, p. 435.

§ Ann. N. Y. Lyc., 1864, p. 99.

|| Cat. Brit. Mus., XI, p. 332.

¶ Cf. Lawrence, Proc. U. S. Nat. Mus., I, 1878, p. 450.

** Ibid., IX, 1886, p. 616.

†† Auk, VI, 1889, p. 31.

Jamaica, distant now only eighty miles, nearer indeed than are the Caymans from this island.

The Jamaican records are, in comparison to many of those already cited, detailed and exceedingly satisfactory; Gosse* reports the arrival in October of vast numbers of Bobolinks which remain until early November. They feed on the seeds of the 'guinea grass,' are called 'Butter-birds,' and their flesh is highly esteemed. March's† notes coincide with those of Gosse, but he says the birds remain only for a few days. There is a specimen in the American Museum taken by this collector labelled "Spanish Town, ♂ Sep. 25, 1865." A further Jamaican record of a female taken in October, is given by Sclater.‡

After leaving Jamaica the route, considered as a regular highway of migration, is perhaps the most interesting and remarkable of any chosen by our migratory land birds, for at no other time during their entire journey from north to south, or *vice versa*, are they necessarily so far from land, unless driven from their course by storms or adverse winds. The South American coast is now distant four hundred miles, the way unmarked by islet, shoal, or reef. This is to the south; to the southwest, leading to the Costa Rican coast, are two or three small reefs or islands which may tempt some of our birds to follow this course while others take the more direct route to South America. Nor can we doubt their ability to perform without resting this more extended flight, for Darwin§ found a Bobolink in the Galapagoes, distant nearly six hundred miles from the nearest mainland. Further, the records from northern South America apparently indicate that some birds appear directly upon the coast instead of entering this country by way of Panama or Trinidad. Commencing at the westward these records are as follows: In the British Museum Catalogue|| specimens are cited from Chepo and Paraiso on Panama; Sclater¶ mentions a specimen from Sta. Martha, and referring again to the British Museum Catalogue, we find specimens mentioned from Caracas and Cayenne. Salvin**

* Birds of Jamaica, 1847, p. 229.

† Proc. Phil. Acad. Sc., 1863, p. 299.

‡ P. Z. S., 1861, p. 74.

§ Voyage of the Beagle, 1841, Vol. III, p. 106.

|| Cat. Brit. Mus., XI, p. 332.

¶ Cat. Am. Birds, 1862, p. 134.

** Ibis, 1885, p. 218.

gives the bird from British Guiana and this, with the Cayenne record, seems to form the eastern limit of its range, there being, as far as I know, no records for eastern Brazil or the lower Amazon, while Darwin's record, already referred to, of a specimen taken in October, 1835, on James Island in the Galapagoes, is the only one with which I am familiar from west of the Andes. Indeed our bird's further wanderings seem now to be largely confined to the eastern slope of this range of mountains and the head waters of the Amazon, until it reaches what may be its true winter quarters in southern or southwestern Brazil. Proceeding with our records, we find a specimen mentioned by Sclater* from Merida, about forty miles from the coast in Venezuela; there is a specimen in the British Museum† from Bogota, and Sclater and Salvin‡ mention its occurrence at Antioquia. Sclater§ also gives it from the Rio Napo, and there are two specimens from this locality in the American Museum collection, both adult males in spring plumage. Cassin|| cites a specimen from the Rio Negro, and in the British Museum Catalogue a specimen is mentioned from the Rio Javari in eastern Ecuador. All these records are absolutely without data and we may therefore welcome an exceedingly important and interesting note by Berlepsch,¶ who records the capture by Garlepp, of an adult male in fresh and unworn plumage, at Tonantins on the upper Amazon, on May 6, 1884, and also, in the same locality, of a second specimen in female plumage but without a label. From Paucotambo, in southern Peru, we have a record by Sclater,** and the same author, in his Catalogue,†† mentions a specimen from Bolivia. In the American Museum there is an adult male, taken March 1, 1886, by Smith at Corumba Matto Grasso, while Natterer‡‡ observed it in the same Province in November. This collector also found it on the Madeira in November; at Maribitanas noted a single one on April 4, and on the 13th saw a great flock of these birds in black plumage.

* P. Z. S., 1870, p. 781.

† Cat. Brit. Mus., XI, p. 332.

‡ P. Z. S., 1879, p. 509.

§ Ibid., 1858, p. 72.

|| Proc. Phil. Acad. Sc., 1866, p. 16.

¶ Journal für Ornithologie, 1889, p. 99.

** P. Z. S., 1876, p. 16.

†† Cat. Birds, 1862, p. 134.

‡‡ Cf. Pelzeln, Orn. Brazil, iii, p. 199.

Cassin's* mention of a specimen taken by Page on the La Plata, marks the southern limit of our bird's distribution and concludes the South American records with which I am acquainted. On the return migration we have comparatively few data to assist us; those relating to South America, which I have already presented, apparently indicate that the journey is commenced early in April, but that some individuals linger until May, and on the 20th of that month Salvin, as before mentioned, found a pair on the coast of Honduras. Gosset† says they return to Jamaica in April, but stay only a short time, and this record renders it probable that the line of flight chosen in the fall is simply retraced in the spring. Gundlach‡ reports their arrival in Cuba in May, and says they remain only a few days, just how many is not stated, but he elsewhere says§ they are present when the last of the "Sylvicolidae" depart.

We might now suppose that the southern coast of Florida would prove the sole entering port to the eastern United States; probably the larger number of birds do choose this route, but others pass northwards through the Bahamas, where they are true transients, scarcely pausing to rest in their journey. In the American Museum there is a male, collected on Andros Island by C. J. Maynard, April 25, and labelled by this collector as the "first of the migration." At Nassau on New Providence, Bryant|| first notes their appearance May 6, when he saw a number of flocks flying to the westward, and on May 7 the country was filled with them, all being males. Numerous flocks continued to arrive May 8; on the 9th many females were killed; on the 10th only a few were observed, and May 11, they had entirely disappeared.

It now only remains to call attention to the bird's stay in localities far south of their southern breeding limits where, tempted by an abundance of food, they linger to an unusually late date. At Gainesville, Florida,¶ I found both sexes in great numbers, feeding in the oat-fields as late as May 25, and we are familiar with

* Proc. Phil. Acad. Sc., 1866, p. 16.

† Birds Jamaica, 1847, p. 229.

‡ Journal für Ornithologie, 1874, p. 129.

§ Ibid., 1872, p. 419.

|| Proc. Bost. Soc., VII, 1859, p. 119.

¶ Auk, V, 1888, p. 272.

Dr. Merriam's* records from the rice fields of South Carolina and Georgia, which the birds frequent until May 29, a date at which we generally consider the migration to be nearly completed and when their earlier comrades are already well established in their summer housekeeping.

OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA.

BY EDGAR A. MEARNS, M. D.

THESE observations are confined to the alpine regions of Arizona, which I explored during a residence of over four years in the Territory.

The mountain system of Arizona is a continuation of both the Rocky Mountain chain and the Sierra Nevada. In $43^{\circ} 30'$, north latitude, the Wind River range of the Rocky Mountains divides about the remote sources of the Great Colorado River. One branch trends southward, and passing around the sources of the Platte, the Arkansas, and the Rio Grande, is merged in the Guadalupe Mountains, and at last loses itself in the great prairie plains of the southwest. The other branch, turning to the west and south forms the Wasatch range, the eastern rim of the Utah Basin, and, widening out to the level of the great plateau, reaches the cañon of the Colorado, near 112° of longitude.

A branch of the Sierra Nevada deflects from that range east of Owens River, and, with a general trend to the southeast, passes by the head of the Virgin River, becomes merged in the plateau, and unites with the Wasatch at the Grand Cañon of the Colorado. These united ranges form the mountain system of Arizona, and south of the Colorado River break up into parallel ridges, isolated groups, detached spurs and peaks, which are again united in one massive chain in the Mother of Mountains in northern Mexico.

The San Francisco peak, volcanic in its origin, may be considered the apex of the Arizona mountain plateau, and the

*Dept. of Agriculture, 1886. Report of the Ornithologist and Mammalogist, pp. 248-249.

northern limit of the numerous ranges extending from the 35th parallel to the Sonora line, and from the 109th to the 113th degree of longitude. Grouped around it are numerous lesser peaks, mostly volcanic also, highest of which is Mt. Kendricks, having an altitude of about 10,200 feet.

From the San Francisco Mountains, a ridge extends southeast which separates the waters of the Little Colorado from those of the Gila. This is known as the Mogollon Range, while its southeastern spurs are known as the White Mountains. These ranges are well wooded, containing some of the finest timber to be found in the Territory. They are also fairly well watered by streams and springs, are adorned with many beautiful parks and elevated valleys, and covered with rich grasses and herbage.

West of the Mogollon, and running parallel with that range, is the Sierra Mazatzal. Its course is east of the Verde River, and south to Salt River. Its slopes and summit are covered with an abundance of pine, juniper, and oak; water is found in several streams and springs, and its valleys and foot-hills are covered with a fine growth of grasses and vegetation.

Between the Mazatzal and Mogollon are several detached spurs and short ranges. The largest of these—the Sierra Ancha, situated in what is known as Tonto Basin—is a flat-topped mountain, some thirty miles in length, covered with one of the largest and finest bodies of pine timber in Arizona.

Between the Salt and Gila Rivers are many mountain groups, some of which attain a considerable elevation. The most prominent are the Superstition Range, which rears its lofty and rugged front east of the great plains, stretching between the Salt and the Gila; the Pinal Range, which runs nearly parallel with the Gila, and whose northern slopes are heavily timbered; the Salt River and Apache Mountains, south of Salt River; the Gila Range, Sierra Natantes, and the Sierra de la Petahaya. Nearly all of these offshoots from the main ranges are well watered and timbered.

The vast region west of the Verde River, and extending from the Great Colorado to the Gila, is crossed by numerous mountain ranges. Running parallel with the former stream, and west of it, are the Verde Mountains. The northern end of this ridge is called the Black Hills, and is a massive elevation, covered with a heavy growth of timber. The northern slope of the Black Hills is

washed by the Verde, and running north of that stream is a range of hills that culminates in the Bill Williams Mountain, a prominent peak west of the San Francisco cone. The next range to the west of the Verde Mountains is the Bradshaw and the Sierra Prieta. This is one of the most magnificent mountain chains in Arizona. It may be said to begin at Granite Peak, ten miles north of Prescott and extends in a southeasterly direction to the wide plains which stretch along Salt River near its junction with the Gila, being about fifty miles in length by about twenty in average width, and clothed with fine pines, junipers and cedars. North of the Sierra Prieta, and thence to the Colorado Cañon, are numerous ranges, culminating in high, heavily timbered ridges, forming a considerable forest area to the south of the Colorado River.

The above enumeration, including all of the high ranges of mountains that lie between the Gila and Colorado Rivers in Arizona, defines the geographical limits under consideration. In ascending these mountain slopes, from the lower plateaus or *mésas*, the vegetation is seen to change in character with the altitude, giving rise to a remarkable succession of vegetable zones, following each other with more or less precision. When the forest region is attained, the western cedars (*Juniperus occidentalis* var. *monosperma* and *J. Californica*) and piñon or nut pine (*Pinus monophylla*) are the first trees encountered; then a zone of evergreen-oaks (*Quercus oblongifolia*, *Q. chrysolepis*, *Q. hypoleuca*, etc.), succeeded by belts of rough-barked juniper (*J. pachyphloea*), deciduous oaks (*Quercus Gambelli*, etc.), pine (*P. ponderosa*), aspen (*Populus tremuloides*), firs (*Pseudotsuga taxifolia* and *Abies concolor*), and spruce (*Picea Engelmanni*), in the order named. The belt of yellow or bull pine (*P. ponderosa*), which constitutes the bulk of the forested areas of Arizona, is usually reached at an altitude of 5000 to 6000 feet above the level of the sea. Its lower limit coincides with the scope of this paper, which deals with the birds residing during the summer months within, or above, the zone of pine timber.*

As it is my object to emphasize the peculiar ornithological features stamped upon these elevated localities, those species which

**Pinus ponderosa* is the species referred to, when speaking of the pine belt. Several other species occur sparingly, among them *Pinus flexilis* and *P. reflexa* (white pines) at high altitudes, *P. Chihuahuana* interdigitating with the yellow pine along its lower margin, and *P. Murrayana* (black pine) forming considerable forests near the Colorado River.

barely reach the pine forests and are much more characteristic of the lower *mésas* and valleys are excluded,* although not a few of them breed occasionally among the oaks and pines at the lower border of this territory. These, together with the winter visitors and migrants passing through during spring and fall, would perhaps treble the number of species here given.

The summer residents of the mountain forests of northeastern Arizona comprise two marked classes; one representing a southern extension of the avifauna of the Rocky Mountains; the other a northern extension of the avifauna of the mountains of northern Mexico, along the Mogollon range. Those not included in either of these classes are mainly inhabitants of the surrounding regions, whose distribution is general. A few species, like the Californian Woodpecker (*Melanerpes formicivorus bairdi*), extend their habitat to this region from the west; while others, such as the Massena Partridge (*Cyrtonyx montezumæ*), reach it from the east or southeast; and a few appear to be mainly or wholly confined to this particular region during their season of reproduction, among them the Red-backed Junco (*Junco cinereus dorsalis*).

The following species are common to the Rocky Mountain region:—

Colymbus nigricollis californicus, *Merganser americanus*, *Anas boschas*, *Anas strepera*, *Anas americana*, *Anas discors*, *Spatula clypeata*, *Dasyla acuta*, *Erismatura rubida*, *Porzana carolina*, *Dendragapus obscurus*, *Aquila chrysaetos*, *Haliaeetus leucocephalus*, *Nyctale acadica*, *Bubo virginianus subarcticus*, *Glaucidium gnoma*, *Dryobates villosus hyloscopus*, *Dryobates pubescens oreæcus*, *Picoides americanus dorsalis*, *Sphyrapicus thyroideus*, *Melanerpes torquatus*, *Colaptes cafer*, *Chordeiles virginianus henryi*, *Trochilus platycercus*, *Contopus*

*To be included in this category are the following species, all of which breed, at least occasionally, in the lower edge of the pine belt:—

Ardea virescens, *Callipepla gambeli*, *Urubitinga anthracina*, *Pandion haliaetus carolinensis*, *Geococcyx californianus*, *Dryobates scalaris bairdi*, *Trochilus rufus*, *Sayornis saya*, *Aphelocoma woodhousei*, *A. sieberii arizonæ*, *Carpodacus mexicanus frontalis*, *Spizella atrigularis*, *Peuceea ruficeps boucardi*, *Pipilo maculatus megalonyx*, *Petrochelidon lunifrons*, *Stelgidopteryx serripennis*, *Lanius ludovicianus excubitorides*, *Helminthophila lucia*, *Dendroica æstiva sonorana*, *Dendroica nigrescens*, *Geothlypis macgillivrayi*, *Geothlypis trichas occidentalis*, *Icteria virens longicauda*, *Sylvania pusilla pileolata*, *Mimus polyglottos*, *Catherpes mexicanus punctulatus*, *Thryothorus bewickii bairdi*, *Parus inornatus griseus*, *Parus wollweberi*, *Psaltiriparus plumbeus*, *Poliioptila cærulea*.

borealis, *Contopus richardsonii*, *Empidonax difficilis*, *Cyanocitta stelleri macrolopha*, *Perisoreus canadensis capitalis*, *Corvus americanus*, *Picicorvus columbianus*, *Cyanocephalus cyanocephalus*, *Xanthocephalus xanthocephalus*, *Sturnella magna neglecta*, *Scolecophagus cyanocephalus*, *Coccothraustes vespertina*, *Carpodacus cassini*, *Leucosticte australis*, *Spinus pinus*, *Spinus psaltria*, *Poocætes gramineus confinis*, *Zonotrichia leucophrys*, *Spizella socialis arizonæ*, *Pipilo chlorurus*, *Habia melanocephala*, *Piranga ludoviciana*, *Progne subis*, *Tachycineta thalassina*, *Vireo gilvus swainsoni*, *Vireo solitarius plumbeus*, *Dendroica auduboni*, *Salpinctes obsoletus*, *Troglodytes ædon aztecus*, *Certhia familiaris montana*, *Sitta carolinensis aculeata*, *Sitta canadensis*, *Sitta pygmæa*, *Parus gambeli*, *Regulus calendula*, *Turdus aonalaschkæ auduboni*, *Merula migratoria propinqua*, *Sialia arctica*.

In connection with this group of Rocky Mountain birds it should be remarked that the alpine mammals of these parts of Arizona afford an even more striking illustration of the southern extension of the Rocky Mountain fauna, as they are chiefly* sedentary species, occupying these peaks and elevated ridges throughout the year. The mammalian family *Sciuridæ* furnishes an interesting example: several Rocky Mountain forms — *Sciurus aberti*, *S. hudsonius mogollonensis*,† *Tamias asiaticus quadrivittatus* and *T. lateralis*—have their range in this region restricted to the high mountain-tops, where they are exceedingly plentiful. These highest points would appear, upon a map representing the geographical distribution of these species, as a chain of small islands in a sea having a widely different faunal character.

The flora of this region, which has been recently investigated, affords an exactly parallel case, these mountains appearing like islands in a region of more southern floral aspect.

The following species of mountain birds extend their habitat from northern Mexico into the mountains of this region: — *Meleagris gallopavo mexicana*, *Myiarchus lawrencei olivascens*, *Loxia curvirostra stricklandi*, *Piranga hepatica*, *Dendroica oliva-*

* Several of the larger animals, as the antelope, deer, and bears, descend to the lower valleys and mesas during the severest winter weather.

† A form of the red squirrel, intermediate between the common eastern chickaree and var. *fremonti* of the southern Rocky Mountain region.

cea, *Dendroica gracia*, *Setophaga picta*, *Cardellina rubrifrons*.

As restricted, the summer avifauna of this mountain region comprises, according to my observations, a hundred species.* This number will doubtless be considerably augmented upon thorough exploration.

Colymbus nigricollis californicus. AMERICAN EARED GREBE.—This handsome Grebe is very numerous on Stoneman's and the Mormon Lakes, where great numbers of them breed, as they also do at a small lake near Flagstaff. Their nests bear so close a resemblance to small floating masses of mud and herbage that they are difficult to discover, for which reason I overlooked them for some time. The eggs are covered, and the parents seldom go near them, at least during the daytime. On Stoneman's Lake they were so abundant that a couple of dozen were shot in an evening, three being killed at one shot. I caught one diving bird, as it came to the surface close beside my boat, but released it after obtaining its photograph.

Merganser americanus. AMERICAN MERGANSER.—I found this bird breeding in various mountain streams which pay tribute to the Verde and Salt Rivers. It also breeds on the upper courses of both of these rivers, nestlings having been procured as low as the vicinity of Fort Verde, on the Verde River.

Anas boschas. MALLARD.—This was found commonly on several lakes and streams in the Mogollons, during the months of May and June; and I think they were breeding, although I did not secure nestlings or eggs.

Anas strepera. GADWALL.—This species was common on the mountains, where there was water in sufficient quantity, and was probably breeding, although we failed to discover its nest.

Anas americana. BALDPATE.—A number of Baldpates were shot by my party at Mormon Lake during the latter part of May, 1887, at which time they were doubtless breeding. This lake is a shallow body of water, about fifteen miles in circumference, occupying a basin in the Mogollon Mountains, some forty miles southeast of the San Francisco peak. It is of variable size and depth, depending upon the rainfall, and was then so grown up with tulé, cat-tail, and other aquatic vegetation, that it resembled an immense field or marsh. As our only boat was a hollow log, so heavy that progress was both slow and laborious, our examination of this lake was far from being either complete or satisfactory. I felt sure that these Ducks were breeding there, although we could not find their nests. A male, shot on the 28th of May, was bleached to a pale drab color, with the markings much obscured, the green on sides of head not being apparent at all. Its quills were so worn and abraded that it certainly

* Probably several of these species do not breed in Arizona, their breeding having been inferred from their presence there in summer. The facts are so stated in all such cases.

could not have flown to any other body of water, as it was barely able to rise from the surface when closely pressed.

Anas discors. BLUE-WINGED TEAL.—Several were seen on each of the mountain lakes that we visited, but no positive proof of their breeding there was obtained, although it is probable that they do.

Anas cyanoptera. CINNAMON TEAL.—This remarkably handsome Duck was found breeding abundantly on the small lakes of the Mogollon Mountains during May and June.

Spatula clypeata. SHOVELLER.—Very abundant in the lakes of the Mogollons during May and June. They were probably breeding, although I obtained no other proof of it than their presence there in numbers at that season.

Dafila acuta. PINTAIL.—We learned from persons living near the Mormon Lake, that several kinds of Ducks breed in such considerable numbers on the lake that the Mormon settlers make a practice of gathering their eggs. The best season is during the latter part of May, and we were informed that an egg hunt had taken place about a week before our arrival, which perhaps accounts for our lack of success as eggers, they having gone over the same ground that we did. Although several species of Ducks, including the present one, were abundant, we found no eggs save those of the Teal.

Erismatura rubida. RUDDY DUCK.—A number of these beautiful Ducks were shot on Stoneman's Lake, at an altitude of 6200 feet, late in the month of May. They had acquired their full nuptial plumage, and undoubtedly would soon have been nesting, as a female taken contained an egg of considerable size. On Mormon Lake, also, a few were shot about the first of June; and we met with it again at Duck Lake, near Flagstaff, later in the season.

Plegadis guarauna. WHITE-FACED GLOSSY IBIS.—On the last day of May, 1887, we rode entirely around the Mormon Lake, exploring the edge as far as possible. Large flocks of these Ibises were found, and they were probably on their breeding ground. A wounded one was carried along by a member of the party, but it died, presumably of cold, on San Francisco Mountain.

Botaurus lentiginosus. AMERICAN BITTERN.—Breeds commonly in suitable places throughout these mountains. It was especially abundant at Mormon Lake, where it finds a most congenial home.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.—Several were shot at Mormon Lake during the last days of May. There are several rookeries of this species in the cañons of the upper Verde and its tributaries. It is a permanent resident in the Verde Valley.

Grus mexicana. SANDHILL CRANE.—A few pairs breed at Mormon Lake, where a Mormon settler took its eggs in 1886.

Porzana carolina. SORA.—The Soras were abundant and very tame at the time of our visit to Mormon Lake. They were also found in several of the smaller lakes, and probably bred at Stoneman's Lake, where I took a pair on May 24.

Fulica americana. AMERICAN COOT.—Breeds abundantly in every reedy pool, at all altitudes. Several floating nests were found, but most of them were strongly moored to the reeds. At Mormon Lake a number of interesting nests were seen, which were protected from the fierce sun by a thatch of broken cat-tails. The dusky younglings, with their bright bills and orange-ornamented down, were seen in great numbers, in all stages of growth, during the months of May and June, playing at hide-and-seek amongst the rushes.

Actitis macularia. SPOTTED SANDPIPER.—These birds were apparently breeding at a small lake, in a crater-like depression at the summit of a volcanic peak arising near the western base of the San Francisco cone, the lake being at an altitude of from 10,000 to 10,500 feet. Near Baker's Butte, in the Mogollon range, I saw a young of the year, on the 28th of August, at the altitude of about 8,000 feet. It was in a thickly wooded place, where the only water was a little rill resulting from a recent rain storm. This bird also breeds in the low valleys of Arizona.

Ægialitis vociferus. KILLDEER.—Breeds in moist places up to 7000 feet. I cannot recall having seen it above that level.

Cyrtonyx montezumæ. MASSENA PARTRIDGE.—Rather scarce in most portions of Arizona. Its habit of squatting motionless upon the ground whenever an enemy approaches, renders it an easy prey to raptorial birds and other predacious animals, and this possibly accounts for its scarcity. It ranges downward into the foot-hills in winter; but in summer I have found it along the crest of the Mogollon ridge at various points. I have also known it to breed just below the pine belt, its lower range, therefore, slightly overlapping that of Gambel's Partridge. I did not meet with it on San Francisco Mountain, but its comparative scarcity and peculiar habits may have caused it to be overlooked.

Dendragapus obscurus. DUSKY GROUSE.—In the White Mountains of eastern Arizona, this Grouse is abundant. I searched for it in vain elsewhere. I fully expected to find it common on the San Francisco peaks. Our party ransacked them quite thoroughly, however, without discovering it, and we were told by the people who live there that none have been found. I learned from the Indians that there is another species of Grouse in the White Mountains, which I have not seen.

Meleagris gallopavo mexicana. MEXICAN TURKEY.—The Turkey breeds throughout these mountains. On the west side of San Francisco Mountain I found it nearly up to the timber line, and was informed by two shepherds who herded their sheep on the mountain that it occasionally even crosses the highest notches between these peaks, and so reaches the deep valley which they enfold upon the eastern side. It may be found at watering places in large flocks.

Columba fasciata. BAND-TAILED PIGEON.—A common resident of the pine forests of Arizona. It feeds largely on acorns and hence spends much time in the lower border of the pine zone, where oaks are numerous. While encamped on the Mogollon Mountains during the months of July and August, 1887, I observed that large numbers of Band-tailed Pigeons

roosted on the mountain at night, returning to their feeding ground amongst the oaks of Tonto Basin, about 2000 feet below, in the morning; late in the day they again resorted to the pine trees on the mountain. I did not find its nest in the pines, but procured both young and eggs in the cypress brakes on the mountain sides near the Natural Bridge on Pine Creek, in Tonto Basin, somewhat below the pine forests. It was quite common in the highest Mogollons and around the base of the San Francisco cone in May and June, at which season it spent much time in aspen groves.

Zenaidura macroura. MOURNING DOVE. — This Dove breeds, but is not generally common in the mountains. It was occasionally seen in open valleys at high levels. In an open space where I camped, on the base of the San Francisco cone, they were so numerous that one of the soldiers with me shot enough for a pot-pie for the whole party. The altitude of this camp was not far from 11,000 feet.

Cathartes aura. TURKEY VULTURE. — Seen soaring around the San Francisco peaks, and the highest backbone of the Mogollon range; but it generally breeds below the pine timber, often selecting caves for the purpose.

Accipiter velox. SHARP-SHINNED HAWK. — Occasionally seen in the mountains at all seasons.

Accipiter cooperi. COOPER'S HAWK. — Although resident through the pine belt, this Hawk is more common in the lower country, breeding abundantly in the wooded cañons of the foot-hills.

Accipiter atricapillus striatulus. WESTERN GOSHAWK. — An immature specimen, perhaps young of the year, started from an aspen thicket, not far from the timber line on San Francisco Mountain, June 7, 1887. An adult was seen, June 3, about five miles from the base of the mountain, in the pine woods. Another adult was seen in the upper edge of the cedar forest, below Stoneman's Lake, on May 21. All were too shy to be shot.

Buteo borealis calurus. WESTERN RED-TAIL. — Breeds commonly throughout the belt of pine timber, as well as on the lower mesas and in the deep valleys and cañons of Arizona.

Aquila chrysaetos. GOLDEN EAGLE. — A young one, recently taken from a nest in a pine-tree in the great San Francisco forest, was seen in confinement by our party. We frequently saw a pair of these Eagles about the San Francisco peaks, in June. They were sometimes seen flying over the highest peaks. I once saw one fly towards a Clarke's Crow that sat on a dead tree. The Nutcracker made more clatter and outcry than a Flicker chased by a Hawk.

Haliaeetus leucocephalus. BALD EAGLE. — A pair of these birds has bred for many years past in a pine-tree near Stoneman's Lake, altitude 6300 feet. Possibly this represents the extreme southwestern limit of its known breeding range.

Falco mexicanus. PRAIRIE FALCON. — On the 4th of June, 1887, the windiest day I ever experienced, I succeeded with a companion in reaching the summit of Humphrey's Peak — the highest land in Arizona* —

*Altitude 12,562 feet (Wheeler).

and crawled up behind the monument built by Lieutenant Wheeler's party. We looked down upon the remaining half-dozen cones, joined by a ridge of horseshoe form, which constitute the San Francisco group, and into the cratered peaks arising from the surrounding plain, while snow-like masses of clouds rushed past us, and the pile of rocks behind which we were cowering vibrated in a gale so fierce that large pieces of volcanic scoria, thrown into the air, were swept along over the brink of a precipice in front of us. The only living things in sight, besides some mountain sheep, were two birds, in point of size inclining to extremes of the ornithological scale,—a Prairie Falcon and a Broad-tailed Hummingbird, which latter sought momentary shelter with ourselves. These, only, braved the wind and cold at the summit. The name of 'Prairie' Falcon scarce accords with my recollection of that scene.

On another occasion I climbed to the top of Agassiz Peak, which rises far above the timber line, being second only to Humphrey's Peak, and enjoyed a striking contrast of conditions. A calmer day one rarely sees, and I was glad to observe the birds that haunted this interesting spot of earth. A pair of Golden Eagles occasionally came into view; the glistening forms of Violet-green Swallows described endless figures and geometric designs; White-throated Swifts darted in and out amid the jagged rocks of the awful chasm enfolded by these peaks; and the vibrating notes of Rock Wrens drew my attention to a pair that climbed sturdily over rough piles of colored lavas. No other birds were seen; and the only mammal, save the mountain sheep, was a large spermophile (*Spermophilus grammurus*) whose sounding whistle proclaimed his presence far and near. Butterflies were very numerous; and bees and flies made bold to share my meagre lunch.

Falco peregrinus anatum. DUCK HAWK. — Resident at all altitudes, breeding on cliffs both in the mountains and in the low valleys of Arizona. It breeds regularly on the cliffs about Fort Verde, at the altitude of 3400 feet; and a specimen shot at the city of Tucson, May 7, 1885, was perhaps breeding in the neighboring Santa Catalina Mountains.

Falco sparverius. AMERICAN SPARROW HAWK. — Breeds very commonly throughout these mountains, as well as in the low districts of Arizona. At Forest Dale, near Fort Apache, I saw an interesting albinistic specimen having the entire body creamy white, except the rufous pattern of the back and tail, which was nearly of normal color.

Nyctale acadica. SAW-WHET OWL. — This Owl was heard regularly around the San Francisco Mountain where, near the north spring, I saw one sitting on a tall pine stump, ogling me from a deserted Flicker's burrow. It proved to be the female parent of three young and an egg, which form a series exhibiting the different stages of growth from the egg to a nearly full-fledged nestling.

Bubo virginianus subarcticus. WESTERN HORNED OWL. — Breeds commonly throughout Arizona; rather abundant in the timbered areas.

Glaucidium gnoma. PYGMY OWL. — Breeds regularly on these mountains. It is more apt to be discovered by its spiteful little enemies, the

Pygmy Nuthatches, than by ornithologists; and I am indebted to these little birds for most of my specimens. I took a female at Whipple Barracks, March 21, 1884; an old male was taken from an oak-tree on Pine Creek, in Tonto Basin, March 29, 1886; another captured at Banghart's Station, in Chino Valley, while surrounded by belligerent Plain Titmice, in a cottonwood hedge, on November 5, 1884; and one was killed at Baker's Butte, on the Mogollon Mountains, July 26, 1887. Its pleasant note was heard in the pine-trees overhead nearly every night while I was exploring the San Francisco group of mountains.

(*To be continued.*)

ADDENDUM TO 'A LIST OF THE BIRDS OF THE HUDSON HIGHLANDS, WITH ANNOTATIONS.*'

BY DR. EDGAR A. MEARNS.

[204. 1.] *Phalacrocorax dilophus* (Sw. and Rich.). DOUBLE-CRESTED CORMORANT.—An adult specimen taken at Cornwall, on the Hudson, October 10, 1883; others seen on the upper Hudson November 4, 1889. Measurements (No. 2627, Cornwall-on-Hudson, October 10, 1883, E. A. M.): length, 33.60; alar expanse, 53.65; wing, 12.90; tail, 7.80; culmen, 2.30; gape, 3.60; tarsus, 2.40; middle toe and claw, 3.20; middle claw, .47; outer toe and claw, 3.90; outer claw, .38; inner toe and claw, 2.33; inner claw, .47; hallux with its claw, 1.57; claw of hallux, .50 inch. Irides green. Feet and claws jet black. Gular pouch orange.

[52.1.] *Piranga rubra* (Linn.). SUMMER TANAGER.—I took a female in perfect plumage, at Highland Falls, New York, May 12, 1883. Measurements (No. 2583, E. A. M.): length, 7.00; alar expanse, 11.40; wing, 3.60; tail, 2.80; culmen, .60; gape, .77; tarsus, .74; middle toe and claw, .75; claw alone, .22 inch. Irides hazel. Bill greenish olive. Legs and feet bluish gray; claws brownish.

[52.2.] *Piranga ludoviciana* (Wils.). LOUISIANA TANAGER.—On December 21, 1881, while standing on a high point beside the Hudson, at Fort Montgomery, New York, I noticed a bird flying strongly from the north. It alighted in a tree top near me, and appeared animated and shy; thinking it was about to fly away, I shot it at once, and it proved to be a young male Louisiana Tanager, in good plumage, and fairly well nourished†. Measurements (No. 2244, E. A. M.): length, 7.45; alar expanse,

*Published in Bulletin of Essex Institute, Vols. X to XIII, 1878 to 1881.

†For its only previous capture east of the Mississippi River, see 'Forest and Stream,' Vol. X, p. 95.

11.35; wing, 3.62; tail, 3.00; culmen, .65; bill from nostril, .48; gape, .75; tarsus, .82; middle toe and claw, .80; middle toe without claw, .58; middle claw, .25 inch. Iris hazel. Bill with maxilla dusky brown, yellowish on edges, mandible yellow. Tarsi and toes bluish lead color. This bird was in the plumage of the female, but careful dissection proved that it was a young male.

[17.1.] *Cistothorus stellaris* (Licht.). SHORT-BILLED MARSH WREN.—A summer resident; not rare at Cornwall, on the Hudson, where its nests and eggs were taken by Mr. Eltinge Roe, in June, 1882, as recorded in the Bulletin of the Nuttall Ornithological Club, Vol. VIII. p. 179.

79. *Ammodramus caudacutus nelsoni* Allen. NELSON'S SPARROW.—The Sharp-tailed Sparrows recorded by me from the Hudson Highlands have recently been referred by Mr. Jonathan Dwight, Jr., to this form, although he considers them to be intermediate between subspecies *nelsoni* and *subvirgatus*, approaching a little more closely to *nelsoni*.

NOTE ON THE NESTING OF *BUTEO BRACHYURUS* AT ST. MARKS, FLORIDA.

BY C. J. PENNOCK.

EARLY in April, 1889, while on a collecting trip at St. Marks, Florida, I spent several days in the swamps that line the Gulf coast.

April 3, I noticed a small black Hawk fly to a nest in a pine tree about three miles back from the coast. On climbing to the nest I found the tree had formerly been occupied by Herons, there being three old nests besides the one occupied by the Hawk, which also I took for an old Heron's nest. It had evidently been added to recently, and contained two or three fresh twigs of green cypress on the bottom. At this time there were no eggs. I again visited the nest April 8. The old bird was seen near, and this time she showed some concern, flying around us above the tree tops as we approached, and several times uttering a cry somewhat resembling the scream of the Red-shouldered Hawk, but finer and not so prolonged. The nest had received further additions of cypress twigs, but was still empty. My boatman wrote me May 2, stating that after three visits he had shot the bird on the nest

and taken one egg. He skinned her, but found no more eggs. I shortly received both the skin and egg and sent the former to the Ornithologist of the U. S. Department of Agriculture for positive identification. It is the form heretofore known as *Buteo fuliginosus*, now believed to be merely a dark color phase of *B. brachyurus* (see W. E. D. Scott, Auk, VI, July, 1889, 243-244).

The egg is dull white, showing blue when held against strong light. It is spotted on the larger end with reddish brown, in small spots and blotches, over about one fourth of the surface. A few finer spots extend to the middle of the smaller end where, however, they can hardly be seen unless closely examined. The egg measures 55×41 mm.

Until recently this tropical species was regarded as a rare if not accidental visitor in Florida. The first positive record of its breeding in the United States appeared in the last number of 'The Auk,' where Mr. W. E. D. Scott states that he found a pair building at Tarpon Springs. The present record is of special interest inasmuch as it not only increases the probability that the species breeds regularly along the Gulf Coast of Florida, but carries its range northward to St. Marks, which is in western Florida, north of the Gulf. It would not be surprising if future field work showed the breeding range of this species to extend westward throughout the Gulf States wherever suitable localities exist.

A NEW WREN FROM THE LOWER RIO GRANDE, TEXAS, WITH NOTES ON BERLANDIER'S WREN OF NORTHEASTERN MEXICO.

BY GEORGE B. SENNETT.

FEW BIRDS have been more puzzling than the specimens of *Thryothorus* which I collected on the Rio Grande in 1877, and gave to the National Museum after sending them to Dr. Coues for identification. Many examples, all of the same general character, have since been obtained from the same locality. Certainly these birds cannot be placed with *T. ludovicianus*,—Carolina Wren,—

nor do they agree with *T. l. berlandieri* (see Baird, Birds of North Am., 1858, p. 362, pl. lxxxiii, fig. 1). The type and two other specimens collected by Lieut. Couch in 1853 are in the collection of the National Museum. (For previous records of these Rio Grande Wrens, see Bulletin U. S. Geological and Geographical Survey, Vol. IV, No. 1, p. 8, and note by Dr. Coues; also *ibid.*, Vol. I, No. 3, p. 383; also Ridgway's 'Manual of North American Birds,' foot-note on p. 550.)

After the capture of three specimens of *T. l. berlandieri* in 1853, so long an interval elapsed before any more specimens were taken that Mr. Ridgway considered the form not well enough established to be given a place in his 'Manual.' Last year I obtained from my collectors three fine specimens of *berlandieri* from Victoria, Tamaulipas, Mexico, and this year I have received fifteen adults and one young from Nuevo Leon, Mexico, from the exact localities visited by Lieut. Couch in 1853. *Thryothorus l. berlandieri* can assuredly now be considered what Mr. Ridgway predicted,—a good tenable race; in fact it seems to me to be worthy the full specific rank given it by Prof. Baird. It is this accumulation of *berlandieri* specimens from northeastern Mexico that makes it possible to recognize the real status of the Rio Grande birds, for which I propose the name

***Thryothorus ludovicianus lomitensis*. LOMITA WREN.**

SP. CHAR.—*Adult breeding plumage*: Upper parts grayish brown, grayer on head, reddish on rump; white spots on rump numerous and not wholly concealed. Auriculars brown; sides of neck behind auriculars conspicuously streaked (sometimes barred) with white and black. Wings and tail lighter than back; edges of wing and tail barred conspicuously with white and black; tail bars broken up more or less, showing great irregularity. Under parts: throat and breast white, the latter faintly washed with buff; belly buff; flanks barred more or less indistinctly with brown; under tail-coverts barred black and white.

Adult winter plumage: Upper parts chocolate brown, the under parts more strongly washed with buff and occasionally becoming quite tawny. On account of the seasonal variation of these Wrens I have designated three examples as types: a male and a female in the faded plumage of the breeding season, and a male in the darker plumage of winter.

Types: ♂, No. 2598 of my collection, taken by myself at Lomita Ranch, Hidalgo Co., Texas, April 24, 1878. ♀, No. 2592 of my collection, taken by myself at Lomita Ranch, Hidalgo Co., Texas, May 15, 1878. ♂, No. 2599 of my collection, taken by M. A. Frazar, at Lomita Ranch, Hidalgo Co., Texas, Feb. 23, 1880.

HABITAT. Lomita Ranch and Hidalgo, Texas, on the Rio Grande.

Compared with *T. ludovicianus* this race is much lighter in its general appearance; the color of the back is also different, *ludovicianus* being reddish brown or bright cinnamon, while *lomitensis* is of the chocolate order of browns, fading into grayish brown during the breeding season. There is also more white on *lomitensis* than on *ludovicianus*; the barring of the tail is also different. In *ludovicianus* the bars of black are wonderfully regular, extending across both webs in a continuous line, while in *lomitensis* the bars of black are joined by a shading of white or creamy and are broken and irregular, thus giving the general mottled appearance and lighter color. The flanks, too, in all old birds of *lomitensis* show a decided tendency to barring, while in *ludovicianus* this is wanting.

As compared with *T. l. berlandieri*, *lomitensis* is lighter all over; *berlandieri* is dark tawny below and very dark chocolate brown above, while *lomitensis* is buff below and a lighter brown above. Then, too, the flanks of adult *berlandieri* are distinctly barred, while the bars of *lomitensis* are not so clearly defined.

As compared with the southern Florida form, *miamensis*, the latter is larger, darker, with a stouter bill, and has much less white on the upper parts; the flanks, however, are barred pretty much the same. It will be seen that *lomitensis* is about intermediate between *T. ludovicianus* on the north, and the extralimital *T. l. berlandieri* of Mexico on the south. The large series of the forms on and adjacent to the Rio Grande now in my collection renders this separation not only possible but, I think, wholly tenable.

The average sizes of the four forms are as follows:

		Wing.	Tail.	Exp.cul.	Trs.
<i>T. ludovicianus</i>	per Ridgway's 'Manual'	2.35	2.09	.64	.81 inch.
<i>T. l. miamensis</i>	" "	2.61	2.43	.78	.88 "
<i>T. l. lomitensis</i>	26 adults	2.24	2.05	.625	.83 "
<i>T. l. berlandieri</i>	20 "	2.26	2.11	.65	.81 "

This new race seems to be resident in that part of the Rio Grande Valley lying adjacent to the river where the forest is heaviest, for none of the forms of this genus has been taken either above or below this timber tract. Hidalgo, where I

first obtained the birds, and Lomita Ranch, where I secured the greatest number, are situated only eight miles apart on the Texas side of the river. In this locality the heavy timber is near the river, and north of it the chaparral extends for a distance of about fifteen miles; next, still northward, lies a desert of sand reaching more than fifty miles until it meets the strong vegetable growth of the valley of the Nueces River. The Wrens of this group found in the valley of the Nueces are typical *T. ludovicianus*, as also are those found along the Gulf coast from Corpus Christi to Galveston. *Berlandieri* seems to be resident in the timber tracts of higher altitudes, and I should hardly expect to find it nearer the United States than Monterey. *Lomitensis* will probably reach into Mexico only so far as extends the heavy timber of the lower Rio Grande. I have named the bird from the place where I found it to be most abundant.

My thanks are due Mr. Allen of the American Museum and Mr. Ridgway of the National Museum for the loan of specimens.

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

THE MATTER of publishing an annual supplement to the American Ornithologists' Union Check-List of North American Birds was referred by the Union to the Council at the meeting of the Union held in Washington in 1888. At a meeting of the Council held in New York City, Nov. 11, 1889, the Council by unanimous vote requested the Committee on Publications to prepare a report on the species, subspecies, and changes of nomenclature proposed during the year (Nov. 1888 to Nov. 1889), to be published as the Second Supplement to the American Ornithologists' Union Check-List, in 'The Auk,' for January, 1890.

In accordance with this authority the Committee on Publications held a meeting for this purpose, at the American Museum

of Natural History, on the day following the close of the Seventh Congress of the Union, and formulated the following report. A few questions were deferred for want of the necessary data to enable the Committee to reach satisfactory decisions.

In accordance with the wishes of the Council, the Committee, in the case of the rejection of proposed changes or additions, gives its reasons for considering them inadmissible.

The present supplement therefore consists of I, *Additions*; II, *Eliminations*; III, *Changes of Nomenclature*; IV, *Species and subspecies considered as not entitled to recognition*. The numbers at the left of the name 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.)

J. A. ALLEN.
WILLIAM BREWSTER.
ELLIOTT COUES.
ROBERT RIDGWAY.
JOHN H. SAGE.

I. ADDITIONS.

134 a. *Anas fulvigula maculosa* (SENN.).

Mottled Duck.

Anas maculosa SENNETT, Auk, VI, July, 1889, 263.

[B 577, *part*, C 489, *part*, R 602, *part*, C 708, *part*.]

HAB. Eastern Texas and north to Kansas.

292 b. *Oreortyx pictus confinis* ANTHONY.

San Pedro Partridge.

Oreortyx picta confinis ANTHONY, Proc. Cal. Ac. Sci. 2d. ser. II, Oct. 11, 1889, 74.

[B—, C—, R—, C—.]

HAB. San Pedro Mountains, Lower California.

[322.1.] **Geotrygon montana** (LINN.).

Ruddy Quail-dove.

Columba montana LINN. S. N. ed. 10, I, 1758, 163.*Geotrygon montana* BONAP. Consp. I, 1850, 72.

[B—, C—, R—, C—.]

HAB. Tropical America in general, including West Indies, north to Cuba and Eastern Mexico; accidental at Key West, Florida. (Cf. SCOTT, Auk, VI, April, 1889, 160, 161; July, 1889, 246.)

394 b. **Dryobates pubescens oreæcus** BATCH.

Batchelder's Woodpecker.

Dryobates pubescens oreæcus BATCH. Auk, VI, July, 1889, 253.[B 77, *part*, C 299a, *part*, R 361a, *part*, C 441, *part*.]

HAB. Rocky Mountain region of United States.

FAMILY COTINGIDÆ. THE COTINGAS.

GENUS **Platypsaris** SCLATER.*Platypsaris* SCL. P. Z. S. 1857, 72 (*ex* BONAP., 1854, = *nomen nudum*). Type, *Pachyrhamphus latirostris* BP.441.1. **Platypsaris albiventris** (LAWR.).

Xantus's Becard.

Hadrostomus albiventris LAWR. Ann. Lyc. N. Y. VIII, 1867, 475.*Platypsaris albiventris* RIDGW. Man. N. Am. B. 1887, 325.

[B—, C—, R—, C—.]

HAB. Western and Southern Mexico, north to Southern Arizona.

469.1. **Empidonax griseus** BREWST.

Gray Flycatcher.

Empidonax griseus BREWST. Auk, VI, April, 1889, 87.

[B—, C—, R—, C—.]

HAB. Lower California and portions of Sonora; Arizona?

481 *b.* **Aphelocoma californica obscura** ANTHONY.

Belding's Jay.

Aphelocoma californica obscura ANTHONY, Proc. Cal. Ac. Sci. 2d ser. II, Oct. 11, 1889, 75.

[B—, C—, R—, C—.]

HAB. San Pedro Mountains, Lower California.

571.1. **Junco townsendi** ANTHONY.

Townsend's Junco.

Junco townsendi ANTHONY, Proc. Cal. Ac. Sci. 2d. ser. II, Oct. 11, 1889, 76.

[B—, C—, R—, C—.]

HAB. San Pedro Mountains, Lower California.

583 *a.* **Melospiza lincolni striata** BREWST.

Forbush's Sparrow.

Melospiza lincolni striata BREWST. Auk, VI, April, 1889, 89.[B 368, *part*, C 167, *part*, R 234, *part*, C 242, *part*.]

HAB. British Columbia.

611 *a.* **Progne subis hesperia** BREWST.

Western Martin.

Progne subis hesperia BREWST. Auk, VI, April, 1889, 92.[B 231, *part*, C 117, *part*, R 152, *part*, C 165, *part*.]

HAB. California (Ojai Valley) and Lower California.

681 *b.* **Geothlypis trichas ignota** CHAPM.

Florida Yellow-throat.

Geothlypis trichas ignota CHAPM. Auk, VII, Jan., 1890, 11.[B 170, *part*, C 97, *part*, R 122, *part*, C 141, *part*.]

HAB. Florida, north to Southern Georgia.

718 b. **Thryothorus ludovicianus lomitensis** SENN.**Lomita Wren.***Thryothorus ludovicianus lomitensis* SENN. Auk, VII, Jan., 1890, 58.[B 265, *part*, C 47, *part*, R 60, *part*, C 68, *part*.]

HAB. Southeastern Texas.

730 a. **Sitta pygmæa leuconucha** ANTHONY.**White-naped Nuthatch.***Sitta pygmæa leuconucha* ANTHONY, Proc. Cal. Ac. Sci. 2d. ser. II, Oct. 11, 1889, 77.[B 281, *part*, C 41, *part*, R 54, *part*, C 61, *part*.]

HAB. San Pedro Mountains, Lower California.

751 a. **Polioptila cærulea obscura** RIDGW.**Western Gnatcatcher.***Polioptila cærulea obscura* RIDGW. Proc. U. S. Nat. Mus. V, March 21, 1883, 535, foot-note.[B 282 *part*, C 23, *part*, R 27, *part*, C 36, *part*.]

HAB. California, Arizona, and Western Mexico.

II. ELIMINATIONS.

15. (Hypothetical List, p. 353). **Buteo fuliginosus** SCL.
Little Black Hawk.

This has been conclusively shown to be a melanistic phase of *B. brachyurus* VIEILL. (Cf. SCOTT, Auk, VI, July, 1889, pp. 243-245, and RIDGW., Auk, VII, Jan., 1890, p. 90.)

III. CHANGES OF NOMENCLATURE.

211. **Rallus longirostris crepitans** (GMEL.). This becomes**Rallus crepitans** GMEL.*Rallus crepitans* GMEL. S. N. I. 1788, 713; SENNETT, Auk, VI, April, 1889, pp. 163, 165.

211 *a*. **Rallus longirostris saturatus** HENSH. This becomes

Rallus crepitans saturatus (HENSH.).

Rallus crepitans saturatus SENNETT, Auk, VI, April, 1889, pp. 164, 166.

211 *b*. **Rallus longirostris scottii** SENN. This becomes

211.1. **Rallus scottii** (SENN.).

Rallus scottii SENNETT, Auk, VI, April, 1889, pp. 165, 166.

469. **Empidonax obscurus** (SWAINS.). This becomes

Empidonax wrightii BAIRD.

Empidonax wrightii BAIRD, B. N. Am. 1858, 200 (in text).
(Cf. BREWST., Auk, VI, April, 1889, p. 89.)

555. **Zonotrichia intermedia** RIDGW. This becomes

554 *a*. **Zonotrichia leucophrys intermedia** RIDGW.

Satisfactory evidence of the intergradation with *Z. leucophrys* of both this and the following has been seen by the Committee.
(Cf., RIDGWAY, Auk, VII, Jan. 1890, 96.)

556. **Zonotrichia gambeli** (NUTT.). This becomes

554 *b*. **Zonotrichia leucophrys gambeli** (NUTT.).

Zonotrichia leucophrys var. *gambeli* COUES, Key N. Am. Bds. 1872, 145.

Cf. RIDGWAY, Auk, VII, Jan. 1890, 96.

IV. SPECIES AND SUBSPECIES CONSIDERED AS NOT ENTITLED TO RECOGNITION.

Dryobates pubescens fumidus MAYNARD (Ornithologist and Oölogist, Apr. 1889, 58).

This was unanimously considered by the Committee to be a synonym of *Picus gairdnerii* Aud.

Cyanocitta stelleri litoralis [sic] MAYNARD (Ornithologist and Oölogist, Apr. 1889, 59).

This was unanimously rejected by the Committee, as being based on unstable characters, the same difference being observable, as an individual variation, in all the geographical races of this species. (Cf. CHAPMAN, Auk, VII, Jan. 1890, 91.)

Geothlypis trichas roscoe (AUD.) HASBROUCK, Auk, VI, April, 1889, 167, 168.

Rejected on the ground that *Sylvia roscoe* of Audubon is a synonym of *G. trichas* (Linn.), the Mississippi valley bird being not sufficiently different from that of the Atlantic coast to merit subspecific separation. The birds described by Mr. Hasbrouck belong to the Florida race, recently named by Mr. Chapman *G. trichas ignota*, Mr. Hasbrouck's error (for which he was not wholly responsible) being in identifying his birds with *Sylvia roscoe* Aud.

Sialia mexicana anabelæ ANTHONY (Proc. Cal. Ac. Sci. 2d ser. II, Oct., 1889, 79.)

Characters deemed not sufficiently constant.

Final action on the following was deferred, owing to lack of evidence respecting their status.

Turdus sequoiensis BELDING, Proc. Cal. Ac. Sci. 2d ser. II, June 11, 1889.)

550 a. *Anmodramus maritimus peninsulæ* ALLEN, vs. *Anmodramus peninsulæ*. (Cf. SCOTT, Auk, VI, Oct., 1889, 322.)

611.1. *Progne cryptoleuca* BAIRD, vs. *Progne subis cryptoleuca*. (Cf. SCOTT, Auk, VI, Oct., 1889, 325.)

SEVENTH CONGRESS OF THE AMERICAN ORTHOLOGISTS' UNION.

THE SEVENTH CONGRESS of the American Ornithologists' Union was held at the American Museum of Natural History, New York City, Nov. 12-15, 1889, the President in the Chair. The meeting was attended by twenty Active Members and thirty-two Associate Members.

The Secretary's report showed the status of membership at the opening of the Congress to be as follows: Active Members, 49; Honorary Members, 25; Corresponding Members, 68; Associate Members, 258.

During the year just past the Union lost by death one Corresponding Member, Dr. Eugen Ferdinand von Homeyer,* of Stolp, Pomerania, and two Associate Members, as follows: Mr. Wm. L. Breese,† of Islip, Suffolk Co., N. Y., and S. Lowell Elliott, Ph.D.,‡ of Brooklyn, N. Y. Since the founding of the Union one death has occurred among the Honorary Members, three among the Active Members, eight among the Corresponding Members, and twelve among the Associate Members. The Secretary presented a tabular statement of the membership at the opening of each congress of the Union, and the attendance at the meetings, which shows a steady and encouraging increase in respect to both membership and attendance, the statistics being as follows:

Number of Members.

	<i>Active.</i>	<i>Honorary.</i>	<i>Corre- sponding.</i>	<i>Associate.</i>	<i>To t</i>
1883	23				23
1884	44	20	16	63	143
1885	47	25	65	64	201
1886	45	25	69	112	251
1887	46	25	70	143	284
1888	45	25	67	161	298
1889	49	25	68	258	400

Present at Meetings.

		<i>Active Members.</i>	<i>Associate Members.</i>	<i>Total.</i>
1883,	New York	21	0	21
1884,§	"	16	4	20
1885,	"	16	6	22
1886,	Washington	20	13	31
1887,	Boston	17	12	29
1888,	Washington	20	17	37
1889,~	New York	20	32	52

* For obituary note see 'The Auk,' Vol. VI, p. 341.

† See 'The Auk,' Vol. VI, p. 81.

‡ See 'The Auk,' Vol. VI, p. 206.

§ Two Honorary Members also were present.

The single vacancy in the Active list was later filled by the unanimous election of Dr. Arthur P. Chadbourne, of Cambridge, Mass. Four Corresponding Members were elected, as follows: Edward Bartlett, of Maidstone, Kent, England; W. Eagle Clark, of Leeds, England; Thomas Lyttleton, Lord Lilford, of London, England; and F. H. Waterhouse, Librarian to the Zoölogical Society of London, England. Eighty new members were added to the list of Associates.*

The Treasurer's report showed the finances of the Union to be in good condition, there being no outstanding bills and a small balance in the treasury.

The election for officers resulted in the unanimous re-election of the President, Vice-Presidents, Secretary, and Treasurer. The Secretary, Dr. C. Hart Merriam, however, declined, greatly to the regret of the Union, to accept a re-election. Mr. William Brewster was then unanimously chosen as his successor, but also declined to serve. The third ballot resulted in the choice of Mr. John H. Sage. A single change was made in the list of Councilors, Dr. C. Hart Merriam being elected in place of Mr. McIlwraith.

Under the call for reports of Standing Committees, Dr. Merriam, Chairman of the Committee on the Geographical Distribution and Migration of North American Birds, rendered a verbal report of progress. The work of collating and mapping the data hitherto collected respecting the geographical distribution of North American birds, is being carried on as a part of the work of the Division of Economic Ornithology and Mammalogy of the U. S. Department of Agriculture, as rapidly as the limited force of the Division will permit; the Migration Schedules are sent out as usual, but the returns have not as yet been to any great extent elaborated, owing to lack of proper clerical assistance.

The report of the Committee on Avian Anatomy (Dr. Elliott Coues, Chairman), was made by the Secretary of the Committee, Dr. R. W. Shufeldt. This consisted of a brief but comprehensive review of the work done during the last year in this important field, throughout the world.

*The names of the new Associate Members, so far as they have qualified to date will be found in the Membership lists issued with the present number of 'The Auk.'

Mr. George B. Sennett, Chairman of the Committee on the Protection of North American Birds, made a verbal report of progress. The Committee is continuing its efforts to educate the public and influence legislation in behalf of better protection of birds. The law on this subject recently enacted by the State of Pennsylvania, in a measure through the influence of the Committee, was commended as the best thus far adopted by any of the States.

In behalf of the Audubon Monument Committee (Dr. George B. Grinnell, Chairman) Mr. Sennett, in the absence of the Chairman, recapitulated the work of the Committee during the past year. The contributions received had been small, and the interest in the project disappointingly weak. It was hoped that plans now under consideration by the Committee of the New York Academy of Sciences would stimulate new interest in the movement.

The first day of the Congress was wholly devoted to routine business, including action on various amendments to the By-Laws proposed at the preceding Congress, and the proposal of others for final consideration next year. The second, third, and fourth days were occupied with the reading and discussion of scientific papers, a number of which proved of special importance and interest. Following is a list of the papers, those marked with an asterisk being read by title, or presented only in abstract:

Remarks on San Francisco Mountain and vicinity (Arizona) from the Faunal standpoint. Dr. C. Hart Merriam.

Observations on the Avifauna of Arizona. Dr. Edgar A. Mearns.

The Winter Distribution of the Bobolink (*Dolichonyx oryzivorus*), with Remarks on its Routes of Migration. Frank M. Chapman.

On the Changes of Plumage in the Bobolink. Frank M. Chapman.

To what extent is it profitable to recognize Geographical Variation among North American Birds? J. A. Allen.

Birds that have struck the Statue of Liberty, Bedloe's Island, New York Harbor. Jonathan Dwight, Jr.

On the Forms of the *Thryothorus ludovicianus* group of Wrens. J. A. Allen.

On the Eastern Forms of *Geothlypis trichas*. Frank M. Chapman.

Observations on some of the Summer Birds of the Mountain Portions of Pickens County, South Carolina. Leverett M. Loomis.

*Notes upon *Coccothraustes vespertinus* as a Cage-bird. Dr. R. W. Shufeldt.

Remarks on Waterhouse's 'Index Generum Avium.' J. A. Allen.

Remarks on Dr. Blanchard's Report to the Congrès International de Zoologie, on a Code of Nomenclature, presented at the Paris Session, 1889. J. A. Allen.

*On Peculiarities of Coloration in the Woodpeckers of the Genus *Dryobates* from the Northwest Coast. Frank M. Chapman.

Note on *Cyanocitta stelleri litoralis* Maynard. Frank M. Chapman.

On the Western Form of the Warbling Vireo. Dr. Edgar A. Mearns.

*On Seasonal and Individual Variation in certain Flycatchers of the Genus *Elænea*. J. A. Allen.

Abundance of the Wild Pigeon in Central and Eastern New York in 1835. Prof. R. P. Whitfield. (By invitation.)

Phalacroptilus nuttalli nitidus.—Is it a valid Race? Col. N. S. Goss.

The Mottled Duck in Kansas. Col. N. S. Goss.

Some Michigan Birds observed near the Straits of Mackinac during 1888. Jonathan Dwight, Jr.

*Notes on the Habits of some of the Birds of Orange County, Florida. B. Mortimer.

The Little Brown Crane (*Grus canadensis*) in Rhode Island. William Brewster.

Capture of the Canada Jay (*Perisoreus canadensis*) near Cambridge, Mass. William Brewster.

*The Maximilian Types of South American Birds in the American Museum of Natural History. J. A. Allen.

Mr. Brewster exhibited and made remarks upon the Western form of the Purple Martin (*Progne subis hesperia*), and Mr. Sennett showed various interesting birds from Mexico, including Motmots (*Momotus cæruleiceps*) and Trogons (*Trogon am-*

biguus and allies). He called attention to specimens of the former in which the middle tail-feathers had not been denuded into the usual racket-shaped form, and stated the prevailing theories offered in explanation of the racket-shaped tail-feathers in the Motmots. He also called attention to a peculiar, dark-colored, and otherwise abnormal specimen of the Carolina Rail taken at Erie, Pennsylvania.

On the afternoon of the third day some time was spent in informal session in examination of the Thrushes and Horned Larks sent in by various members for exhibition at the meeting.*

Resolutions were adopted extending the thanks of the Union to the President and Trustees of the American Museum of Natural History for the use of the Museum building as a place of meeting, and for other courtesies; to the Linnæan Society of New York for the collation daily provided for the members; and to Dr. C. Hart Merriam in recognition of his untiring labors as Secretary during the last six years, to which the success of the Union is so largely to be ascribed.

In point of attendance, and in the number and character of the papers presented, the Seventh Congress proved the most successful of the series.

It was voted to hold the next meeting in Washington, on the third Tuesday of November, 1890.

RECENT LITERATURE.

Waterhouse's 'Index Generum Avium.'† The character, scope, and purpose of this extremely useful work cannot be better expressed than by the quotation of a paragraph from its preface by Mr. P. L. Selater. "It will be observed that, as its title implies, the 'Index Generum Avium,' consists merely of an alphabetical list of about 7000 terms that have been employed or suggested by various authors, since the date of the twelfth edition of Linnæus's 'Systema Naturæ,' as generic and subgeneric names for birds, and references to the places and dates of their publication. No attempt has been made to discriminate between these various terms as to

*See further on this matter a paragraph under 'Notes and News' of this issue of 'The Auk.'

† Index Generum Avium. [— | A List | of the | Genera and Subgenera of Birds. | By | F. H. Waterhouse, A. L. S., | Librarian to the Zoölogical Society of London. | — | London: | R. H. Porter, 18 Princes Street, Cavendish Square. | 1889.—8vo. 311, + pp. 240.

which of them should be most correctly employed. Such points are left for the decision of those who use the 'Index.' But so much time is often lost in ascertaining where and when a generic name was first given, that it is believed that the information thus accumulated in a handy form cannot fail to be of much practical value.

"The author does not profess that the 'Index' is complete, but as Librarian of the Zoölogical Society of London, and thus with one of the best series of ornithological books in the world at his command, he has done his utmost to render it free from errors and omissions. Except in the few cases [ten only!] where they are marked with an asterisk, all the references have been personally verified."

Mr. Sclater states that the plan and execution of the work "are entirely due to Mr. Waterhouse," and that he has "only assisted him by general advice, by looking over the proof-sheets, and by writing these few words of preface."

With such facilities, and with the aid of such previous compilations in the same line as those of G. R. Gray, Agassiz, Bonaparte, Giebel, Marschall, and Scudder, there should certainly be very few omissions, and very few errors of citation, yet the work being of human origin a few such imperfections should be inevitable, but so far as we have examined they are extremely rare.*

The most serious defect in the work and, we cannot help feeling, a glaring one, relates to its plan and scope, by which all work (except Brissonian) done prior to the twelfth (1766) edition of Linnæus's 'Systema Naturæ' is ignored; — and this too in the year 1889, in face of the fact that three fourths of the biologists, taking the world at large, begin with the tenth (1758) edition of Linnæus's great work, or earlier, as the starting point for generic names! Consequently over forty Linnæan generic names adopted in the tenth (1758) edition are ascribed to the twelfth (1766), and some twenty others to Brisson, who adopted them in 1760, mostly from Linnæus, or some earlier writer.

Another defect to which it seems necessary to call attention is the occasional citation of purely vernacular French names (mostly from Cuvier and Lesson) as though they were proper generic terms. This reprehensible fashion was started by G. R. Gray in 1840 (in 'A List of the Genera of Birds', etc.); these are not only cited in the work under notice (many of them in fact properly enough, being in a certain sense adopted as, or at least treated as, generic or subgeneric names by Gray), but we meet with a number of new ones, as, *e. g.*, 'Barbacous,' 'Cacatoes,' and 'Jabirus' from Cuvier, and 'Caïaca' (= "Les Caïacas" Less.), 'Papegais', etc., from Lesson. Gray Latinized and adopted many such terms, and they

* *E. g.*, *Buceros*, Linn., 1758, is ascribed to Brünnich, 1772; *Phaethon*, Linn., 1758, is ascribed to Illiger, 1811; *Bombycilla*, a Brissonian name, is credited to Vieillot, 1807; "*Abia*, Agassiz, 1840," is incorrectly given as "=*Habia* Cuv." Turning to *Habia* (p. 91) we find it there credited to Vieillot, 1817, where, however, it is employed as merely a French vernacular name. *Habia*, as a proper generic name, dates really from Reichenbach, 1850, as fully shown some five years ago by Dr. Stejneger in 'The Auk' (Vol. 1, 1884, p. 366).

should hence take their date and authority from Gray, and not from their prior use in a vernacular sense by the French authors.

Variations in orthography, due to emendations or to typographical errors, are quite freely given, but by no means exhaustively; thus in such striking cases as *Sayornis* and *Sayiornis*, *Pediocates* and *Pediæcetes*, not infrequently only the original form is cited, while in the case of *Poocætes* and *Poæcetes*, both forms are given.*

As a whole Mr. Waterhouse's 'Index' is a work of great merit, involving an immense amount of patient, painstaking, arduous labor, for which systematic ornithologists the world over will be truly grateful.—J. A. A.

Blanchard on the Nomenclature of Organized Beings.†—This 'Report' is more general in its scope than the 'Code of Nomenclature' of the American Ornithologists' Union, dealing as it does with Botany and Palæontology as well as with living animals, and hence has to confront questions arising from the peculiar conditions met with among the lower forms of animal life (where larval forms have been made the basis of species and genera, and in Palæontology, where species and genera have been based on parts of an organism), which the A. O. U. Committee were not especially called upon to consider. It is pleasant to find, however, the present report in nearly complete harmony with the rulings of the A. O. U. Committee, as regards not only leading principles but in special cases, where the ground covered is the same.

The chief points of difference from the A. O. U. 'Code' relate to the starting point for the beginning of the binomial system, and the matter of emendation of names. As to the first, the 'Report' takes the tenth (1758) edition of Linnæus's 'Systema Naturæ' as the real starting point (as does also the A. O. U. 'Code') but makes reservations in favor of (1) Tournefort (Botany, 1700; Mollusks, 1742), (2) Lang (Mollusks, 1752), (3) Klein (Mollusks, 1753), (4) Clerck (Spiders, 1757), and (5) Adanson (Mollusks, 1757), the works of these authors conforming strictly to the binomial system. The action of the 'Law of Priority' is thus not strictly limited in point of time, but by the following conditions: "Article XI. Le nom attribué à chaque Genre et à chaque Espèce ne peut être que celui sous lequel ils ont été le plus anciennement désignés, à la condition: *a.*—Que ce nom ait été divulgué dans une publication où il aura été clairement et suffisamment défini; *b.*—Que l'auteur ait effectivement entendu appliquer les règles de la nomenclature binaire."

In discussing the 'Law of Priority' Dr. Blanchard revives and emphasizes the strictures made by M. Chaper in his report on the same subject‡

* Singularly, however, the change of *Poocætes* to *Poæcetes*, is ascribed to Sharpe, 1888, though made by Coues some ten years earlier.

† De la Nomenclature des êtres organisés. Rapport présenté au Congrès International de Zoologie par le Dr. Raphaël Blanchard, Professeur-Agrégé à la Faculté de Médecine de Paris, Secrétaire général de la Société Zoologique de France. > Congrès International de Zoologie, Paris, 1889. Rapports présentés au Congrès International de Zoologie. July, 1889, pp. 87-157.

‡ De la nomenclature des êtres organisés. 8vo, pp. 37, 1881.

to the Société Zoologique de France, in 1881, he very justly ascribing to Tournefort "la gloire d'avoir fondé la nomenclature binaire," which for so many years has been wrongfully assigned to Linnæus, the latter merely formulating the rules in a more precise and general manner than had been done by any of his predecessors. While he, in his rules, insisted upon the strict observance of the rule of propriety, he, "sans autre motif que de satisfaire à sa vanité" rejected genera and species firmly established by his predecessors, who were often far better zoölogists than was Linnæus.

Dr. Blanchard regretfully considers the use of trinomials, and even quadrimomials, admissible (see pp. 94-96, and 150) in special cases,* as in descriptive works where it is necessary to distinguish diverse forms belonging to the same species. Indeed, he believes the adoption of the system inevitable, its use is already so extended.

In respect to the emendation of names, Dr. Blanchard's ruling is radically opposed to that favored by the A. O. U. 'Code.' He says: "Article XIV. Tout barbarisme, tout mot formé en violation des règles de l'orthographe, de la grammaire et de la composition devra être rectifié" (p. 147). Again he says (p. 157), all such words should be *rejected* ("rejeté"). Dr. Blanchard and our 'Code,' which says the "original orthography of a name is to be rigidly preserved, unless a typographical error is evident," thus represent the two extremes of this question. We still believe the ruling of the A. O. U. Committee on this point is sound in principle, but yet susceptible of a slight modification in the interest of uniformity in respect to genitive terminations, and in the transliteration of Greek vowels.—J. A. A.

Ridgway's Ornithology of Illinois.†—From Prof. Forbes' 'General Introduction' we quote: "This volume is the first to appear of a series on the zoölogy and cryptogramic botany of the State of Illinois, authorized and provided for by the Thirty-fourth General Assembly.‡

"The series is intended to summarize the facts relating to the natural history of Illinois which have been accumulated by general investigations made in the districts of which the State forms a part, by the studies of local naturalists, and by the operations of the State Laboratory of Natural History In the preparation of the volumes of the report it will be our main final object to furnish the materials for a full and accurate picture of the native plant and animal life of Illinois as it actually exists in our fields, woods, and waters, and to bring most prominently into view those parts of the subject which have a peculiar educational or economic value. . . .

"The volume here presented is due to the generous and disinterested

* "Dans les cas spéciaux où il est utile de distinguer des variétés, l'adjonction d'un troisième nom à ceux du genre et de l'espèce est permise" (p. 150).

† Natural History Survey of Illinois, | State Laboratory of Natural History, | S. A. Forbes, Director. | — | The | Ornithology | of Illinois. | — | Part I, Descriptive Catalogue, | By Robert Ridgway. | Part II, Economic Ornithology, | By S. A. Forbes. | — | Volume I. | — Published by Authority of the State Legislature. | — | Springfield, Ill.: | H. W. Rokker, Printer and Binder, | 1889, Roy. 8vo. pp. i-viii, 1-520, colored frontispiece, plates, i-xxxii.

‡ "Laws of the State of Illinois, 1885, p. 23, sec. 3."

labors of Dr. Robert Ridgway, formerly of Mt. Carmel, Illinois,—an ornithologist whose long and eminent service in the Smithsonian Institution and the United States National Museum seems only to have intensified his interest in the promotion of the study of his favorite science in his native State. . . .

"The long delay in the publication of Volume I has been due partly to the pressure of other duties and to lack of office assistance, but chiefly to the destruction by fire in the printing office in February, 1889, of an entire edition of the volume and of the plates and cuts from which it was printed.

"To the characteristic generosity of the honored and lamented Dr. Spencer F. Baird, we owe the illustrations of this volume, with the exception of the frontispiece,—all being printed from copies of cuts loaned to the Laboratory by the Smithsonian Institution."

In the preface which follows, the author speaks of the conditions under which his task was performed, and of the material on which it is based, making here full acknowledgment for the permission to use the specimens contained in the National Museum, and in the private cabinets of various students residing in the State, who have also placed at his disposal the results of their observations.

"On account of the limited time allotted" for the completion of the work (one year) the author has "found it necessary to draw to a certain extent upon previous publication," but we do not observe that he has more than properly availed himself of this privilege, the quoted technical portions being mainly restricted to generic, subgeneric or specific diagnoses from the History of N. A. Birds, and descriptions of first plumages from Mr. Brewster's well-known paper, which in each case are accredited to their source.

The work now opens with an introduction of 36 pages, which is divided into two parts, concludes with a bibliography, and is a model for future faunal works of this nature. 'Part I, the Physical Features of the State' is subdivided into four sections which under the headings of 'General,' 'The Lake Shore District (by E. W. Nelson),' 'The Prairies,' 'The Southern Bottom Lands,' and 'Climate,' treat of the State from physiographical, floral, faunal, and climatal standpoint. 'Part II, Characteristic Features of the Avifauna of the State,' presents a series of analytical table which divide the birds recorded from the State as follows: 'A. Species which have been observed in Winter over the greater portion of the State, many of them regular Winter residents,' 91. 'B. Species which have been observed in Winter only in the Southern portion of the State (latitude of Mount Carmel, or further South),' 63. 'C. Species occurring in Winter in the Northern portion of the State, but not yet observed as far South as Mount Carmel,' 31. 'D. Summer residents of General Distribution,' 148. 'E. Summer residents confined mainly, so far as known, during that season to the Northern portion of the State,' 44. 'F. Summer residents which, so far as known, are confined mainly to the Southern portion of the State,' 13. 'G. Summer visitants to the Southern portion of the State, but not ascertained to breed within our limits,' 10. 'H. Irregular or casual visitants from the Western Province,'

14. 'I. Regular residents or visitants which intrude from the Westward,' 11, of which 4 are "observed only in summer," 3 "only in winter or during migration," and 4 "irrespective of season." 'J. Stragglers and doubtful species, the former including those of which not more than one specimen has been taken or observed,' 14. 'K. Species formerly occurring, but possibly not now to be found in the State,' 5.

The second section of this part treats of the State's "position with regard to Faunal Provinces or Districts." Illinois is considered to lie far within the Eastern, or Atlantic, Province, and were it not for the prairies the fauna would probably not possess the slightest tincturing of western forms." This last is no doubt very true, but we fail to see why the effect should not be recognized when the cause is so evident. In the same manner we might say that without the southern bottom-lands, which the author further mentions, certain species from the southern portions of the State would not exhibit an approach toward Florida or Gulf Coast forms, which the author states is observable. It seems to us that this eastern extension of the prairies, bringing with it as regular visitants such prairie-loving species as *Chondestes grammacus*, *Ammodramus lecontei*, *Spizella pallida*, *Sturnella magna neglecta*, etc., marks an eastern extension of the Campestrian Sub-province which the author characterizes on page 246. The State is further considered to be "wholly embraced within the 'Carolinian Fauna,'" although the author's table 'E' includes among its 44 summer residents of the northern portions of the State at least 40 species which are not generally considered to characterize this fauna. With regard to what the author designates "so-called geographical variation," "Illinois likewise belongs strictly to the Eastern or Atlantic Province, none of the resident or summer resident species showing any tendency toward the representative forms which belong to the Western Province, except very rarely or sporadically, and apparently not more frequently than along the Atlantic coast itself," the single exception "being the case of *Geothlypis trichas*, the Illinois form of which seems to be the western race, *G. trichas occidentalis* Brewst., which apparently replaces true *G. trichas* everywhere west of the Alleghanies," a statement with which, in this particular case, we cannot agree. Section three of Part II relates to migration, and presents tables, chronologically arranged, showing the times of arrival and departure of transient species, and also the dates of flowering of certain plants and trees. The observations of Messrs. Henshaw and Palmer at Washington, and of Mr. Otto Widmann at St. Louis are here included for comparison with similar observations made by the author at Mount Carmel, Illinois, and Wheatland, Indiana.

This excellent introduction, containing more valuable information than is usually compassed by an entire volume of this nature, concludes with a bibliography which, from 1853 to 1885, enumerates the titles of 44 publications "actually consulted" by the author.

The remaining 457 pages are devoted to brief biographies, and the systematic treatment of the 216 land birds included in this volume. The nomenclature of the A. O. U. Check-List is adopted, but the order therein

followed is reversed and altered, the first species mentioned being *Turdus mustelinus*, the last, *Zenaidura macroura*. The author's vast experience in descriptive work permits him to handle his subject in a masterly manner; there are analyses to the higher groups, families, and genera, and keys to the last which define all the then recognized species and subspecies of Eastern North American birds belonging to them. This is new matter; the generic, subgeneric, and specific diagnoses and descriptions, as before stated, are frequently quoted, but they are taken from a worthy source, and the birds have not to our knowledge changed perceptibly since they were written, though, it is true, we do now see many things in the light of a new understanding, which were then obscure. We would not then, for instance, have considered *Sturnella magna neglecta* a species, in fact its recognition as a race was open to question, but we find on page 314, it is accorded full specific rank. Nor would we then have admitted the author's earlier view, to which he now returns, concerning the specific distinctness of *Quiscalus quiscula æneus*. It is true these views are not yet accepted; but there is evidently a tendency in this direction. It will be quite useless here to go further into this portion of the work; the author's name is a sufficient guarantee of its value and accuracy, and we hope the edition will permit its being placed in the hands of every student of North American ornithology, if not in the hands of every student of ornithology whatever be the country to which he devotes himself, for the model here presented is in every respect worthy his attention. It is a reviewer's duty to speak with equal candor of both the good and bad sides of the book before him, but we must confess this volume is possessed of a one-sidedness which renders it barren ground for the most fault-finding critic; the typographical errors are for the greater part unimportant and evidently beyond the author's control, and when we consider the limited time allowed him for the completion of his task, which was further curtailed by the official duties of a busy life, we can only admire the energy and ability which has enabled him to accomplish it so quickly and so well. — F. M. C.

Menzbier's Ornithology of Turkestan.*—The first part of Menzbier's great work on the ornithology of Turkestan, recently received, contains four colored plates and over one hundred pages of text, besides the long preface explanatory of the origin and scope of the work. The author has set before himself the serious task of treating monographically all the species of Turkestan, and the lands adjacent, — a region extending from the Lower Volga to Mongolia, and from southwest Siberia to Pamir. The work is based primarily on the immense collections and notes gathered by the late Dr. N. A. Sewertzow during his twenty-one years' exploration of this region under the auspices of the Russian Government. Dr. Sewertzow unfortunately died at the beginning of his work on his ornithological collections, leaving it to be carried forward by his devoted friend,

*Ornithologie du Turkestan et des Pays adjacents. Par M. le Docteur M. A. Menzbier. Premier livraison, Avec un Atlas de 4 Planches, Moscow, 1888, 4to, pp. viii + 12.

Dr. Menzbier. As already stated (Auk, Vol. V, p. 447), the work will comprise six large quarto volumes, with about eighty colored plates. Volume I will consist of a biography of Sewertzow, a list of the birds of his collection, and a general summary of the fauna of Turkestan, the remaining five volumes treating in detail of the birds in systematic order, beginning with the Birds of Prey.

The first livraison of Volume II contains the Vultures and Eagles, sixteen species of which are treated, the text ranging from four to twelve pages to each.

A very full citation of bibliographical references is followed by detailed descriptions of the various phases of plumage each species presents, while much space is given to the geographical distribution of each and to bibliographical observations.—J. A. A.

Nehrling's Bird Biographies.*—Final judgment upon this notable undertaking must be deferred until the completion of the work. At present, we can form a tolerably clear opinion of what it will be, if the promise of the prospectus is fulfilled. The early parts, which came to hand some months ago, fully sustain the publisher's announcement, and we shall watch with interested attention the progress of an enterprise which commends itself to all true lovers of bird-life. We see no reason why Mr. Nehrling should not re-gather the lines which dropped from this hand twelve years ago, and weave them into a useful, attractive and enduring fabric.

Mr. Nehrling's name is not a new one in ornithological literature, though perhaps better known to the German than to the American public as a writer on American birds. Many sketches and some more formal bird biographies of his have already appeared in German periodicals, showing him to be a careful and faithful observer, a competent author, and above all a feeling writer, in full touch with the spirit of the beautiful airy beings whose lives he portrays. The present writer has spent too many years in the technicalities and formalities of ornithology to be misunderstood as depreciating the value of such tough fibre in the development of our science. Yet there is a 'height beyond,' which the ornithologist must reach before he can understand any bird, no matter how intricate and consummate may be his knowledge of the partialities, peculiarities and particularities of many birds. Wilson and Nuttall and Audubon each reached that height; so did Michelet and Thoreau; so have John Burroughs, W. L. Shoemaker and Wilson Flagg; all told the story from a keen ether, above the clouds of synonymy and diagnoses; while Nehrling follows, at no appreciable interval.

Only those who are in the secret will realize how high is the praise we

*North American Birds. By H. Nehrling. 4to. Pub. in parts, paper, 40 to 48 pp. text in each, with 3 pl. col'd. (Prospectus calling for 12 parts, 36 plates, to be completed in 1890.) Parts I, II, pp. 1-96, and six plates. Milwaukee: Geo. Brumder, 1888. Also published simultaneously in German, *Die Nord-Amerikanische Vogelwelt*, u. s. w., Verlag von Geo. Brumder.

pleasurably seek to give here. "Ideas rule the world absolutely;" but they never rule more effectually or more lastingly than when they appeal to the emotional nature. Sternly rational ideas on which the judgment stamps the seal of approbation are necessary; but they are inert in comparison with the momentum of vivid sentiment, they move nothing, not even themselves; they lack life; they lack the luxury of sentiment, of enthusiasm, of inspiration, of poetry, and consequently have no kinship with man's best consciousness. Therefore is it true that, given the luxuries of life, we can dispense with its necessities.

Mr. Nehrling seems to have a message to deliver. If this be so, and the message he brings be a true one, he will not want for hearers. If we may whisper a word of suggestion, thus early in the course of his study, it would be to keep the technicalities of the subject in the background, wholly subordinated to the main plot. His forte is the life of birds, not their dead bodies, still less their checkered synonyms. A very little such pig-iron will be ballast enough to keep things snug and trim. A terse identifiable description and one select scientific name are all the formality this history needs to stand upon, for the rest let it use wings.

With our author are the fruitful results of much personal experience, thought and feeling, shapen with a living pen. We recall no other one who has written so well in a foreign language. It makes us wish we could follow him with equal ease and pleasure in his mother tongue. For his work enjoys the distinction, perhaps singular in American ornithological literature, of original composition and simultaneous appearance both in English and in German. This argues a faith in his audience which we trust the event will justify when the publisher shall have brought his enterprise to successful conclusion. * We may then return to the subject. This preliminary notice must be scarcely more than a word of encouragement, commendation and hearty welcome. Were we in more critical or fastidious mood, the plates of the work might feel the prick of the pen, unless we should keep in mind the price at which they are offered to the public.—E. C.

Minor Ornithological Publications.—In the last few years the Country has been almost flooded by 'amateur' periodicals devoted to natural history, especially to oölogy. Some of these are the productions of youthful collectors whose good intentions are only equalled by their ignorance. Others are issued largely as advertising mediums by dealers in specimens and 'curiosities.' They contain much matter that is unreliable, owing to inexperience and perhaps occasionally to dishonesty on the part of the writers. There is more which relates to well-known habits of common birds, and though extremely useful to the beginners in ornithology who make up the bulk of the readers, is of no scientific importance. Among all this chaff there are nevertheless here and there items of considerable interest and value which ought not to be overlooked.

One of the best of these journals, *The Sunny South Oölogist*, edited and published by Edwin C. Davis at Gainesville, Texas, although it showed

much promise of excellence, had a brief career of only three months (March-May, 1886). In these three numbers the following articles and notes (Nos. 1487-1507) are worthy of reference:—

1487. *The Waxwings*. By W. L. Kells. '*The Sunny South Oölogist*,' Vol. I, No. 1, March, 1886, pp. 1-2.

1488. *Collecting Among the Sea Birds of Maine*. By V. E. Piston. *Ibid.*, pp. 2-3.—Birds breeding near Rockland, Maine.

1489. *Chuck-will's-widow*. By F. D. Foxhall. *Ibid.*, p. 3.

1490. *The American Goldfinch*. By George H. Selover. *Ibid.*, pp. 6-7.

1491. *Colorado Birds. Black-billed Magpie*. By Fred. M. Dille. *Ibid.*, pp. 7-8.

1492. *The Blue Grosbeak*. By J. A. Singley. *Ibid.*, p. 9.—Nesting habits.

1493. *Nesting of White Eye or Florida Towhee*. By G. Noble. *Ibid.* p. 9.

1494. *Notes from Southern California*. By A. M. Shields. *Ibid.*, No. 2, April, 1886, pp. 13-14.—On some winter birds.

1495. *Egg Collecting in Colorado*. By Fred. M. Dille. *Ibid.*, p. 15.

1496. *Nesting of Brown-headed Nuthatch*. By G. Noble. *Ibid.*, pp. 15-16.

1497. *Early Finds*. By J. A. Singley. *Ibid.*, pp. 16-17.—Dates of nesting in Texas.

1498. *The Scissor-tailed Flycatcher*. By E. C. Davis. *Ibid.*, p. 17.

1499. *The Road-runner; Chaparral Cock*. By J. A. Singley. *Ibid.*, p. 24.

1500. *The Orioles*. By Wm. L. Kells. *Ibid.*, No. 3, May, 1886, pp. 25-28.—A popular account of *Icterus galbula*, *I. spurius*, *Sturnella magna* and *Molothrus ater*, as observed in Ontario.

1501. *Bell's Vireo*. By E. C. Davis. *Ibid.*, p. 28.

1502. *Colorado Birds*. By Fred. M. Dille. *Ibid.*, p. 29.—*Calamospiza melanocorys* and *Ægialitis montana*.

1503. [*Larus atricilla* near Gainesville, Texas.] Editorial. *Ibid.*, p. 30.

1504. *The Evening Grosbeak*. By F. A. Patton. *Ibid.*, pp. 31-32.

1505. *The Red Crossbill*. By F. A. Patton. *Ibid.*, p. 32.

1506. *Interesting Items from a Dakota Note-book*. By George Wilder. *Ibid.*, pp. 36-37.—Brief notes on nesting habits of a dozen species.

1507. [*Red-shafted Flicker* and *Rocky Mountain Screech Owl*.] By Fred. M. Dille. *Ibid.*, p. 39.—Nesting in the eaves of a house.

'*The Bay State Oölogist*,' edited and published monthly by W. H. Foote, at Pittsfield, Mass., was first issued in January, 1888, and closed its existence with Vol. I, No. 6, June, 1888. We note the following (Nos. 1508-1518).

1508. *Notes on Some Birds of Texas*. By J. A. Singley. '*The Bay State Oölogist*,' Vol. I, No. 1, Jan., 1888, pp. 1-3; No. 2, Feb., 1888, pp. 8-11; No. 4, April, 1888, pp. 25-26; No. 5, May, 1888, pp. 42-43; No. 6, June, 1888, pp. 48-49.

1509. *The White-breasted Nuthatch*. By J. W. Jacobs. *Ibid.*, pp. 3-4.—Nesting habits.

1510. *Nesting of the Traill's and Acadian Flycatchers.* By Philo W. Smith, Jr. *Ibid.*, pp. 5-6.

1511. *The Kentucky Warbler.* By E. F. Koch. *Ibid.*, p. 7.

1512. *Nesting of the Rough-winged Swallow in St. Louis, Mo.* By Philo [W.] Smith, Jr. *Ibid.*, No. 2, Feb., 1888, p. 11.

1513. *A Day with the Fish Hawks on Seven Mile Beach.* By C. S. Schick. *Ibid.*, pp. 13-15.—Various species noted breeding on the New Jersey coast.

1514. *Tufted Titmouse.* By J. W. Jacobs. *Ibid.*, p. 15.—Including a note on *Molothrus ater*.

1515. *Among the Raptores.* By Dr. W. S. Strode. *Ibid.*, No. 3, March, 1888, pp. 17-19.—At Bernadotte, Ills.

1516. *Nesting of the Fish Crow.* By C. S. Schick. *Ibid.*, p. 24.

1517. *The Pileated Woodpecker.* By J. W. Jacobs. *Ibid.*, No. 4, April, 1888, p. 31.

1518. *The Blue-gray Gnatcatcher.* By J. W. Jacobs. *Ibid.*, No. 6, June, 1888, pp. 46-47.—Nesting habits.

In May, 1884, Frank H. Lattin began publishing, as a monthly, 'The Young Oölogist' at Gaines, N. Y. At the close of Vol. I the place of publication was changed to Albion, N. Y. After the issue of Vol. II, No. 2, June, 1885, the publication was suspended, but it was resumed January, 1886, as a bi-monthly, with a change of name to 'The Oölogist,' beginning now as Vol. III. Since January, 1888 (Vol. V, No. 1) it has again been issued as a monthly. It may be well to call the attention of bibliographers to the facts that sometimes two numbers have been issued in one, that the pagination sometimes, but not always, includes the advertising pages, and that in Vol. IV it skips, apparently by a printer's blunder, from p. 14 to p. 71. Vols. I-VI inclusive (1884-1889), contain the following notes and articles (Nos. 1519-1635) that are worth referring to.

1519. *Great Horned Owl.* Editorial. 'The Young Oologist,' Vol. I, No. 1., May, 1884, p. 5.

1520. *Ground Dove (Chamæpelias passerina).* By T. D. Perry. *Ibid.*, p. 10.

1521. *Painted Bunting or Nonpareil (Passerina ciris).* By Troup D. Perry. *Ibid.*, No. 2, June, 1884, p. 21.

1522. *California Mottled Owl.* By H[arry] R. T[aylor]. *Ibid.*, p. 23.

1523. *Chewink, Sora Rail, Cooper's Hawk.* By E[d.] S. B[owman]. *Ibid.*, p. 28.

1524. *Oological Items from Waterville, Maine.* By C[hables] B. W[ilson]. *Ibid.*, No. 3, July, 1884, p. 35.

1525. *Yellow-shafted Flicker.* By W. B. K[enrick]. *Ibid.*, p. 35.

1526. *Orchard Oriole (Icterus spurius).* By T. D. Perry. *Ibid.*, p. 38.

1527. *Turkey Buzzard.* By M. A. S[herman]. *Ibid.*, p. 39.

1528. *The Black Stilt.* By A. M. Shields. *Ibid.*, p. 41.

1529. *The Summer Yellowbird and Cowbird Again.* By E[d.] S. B[owman]. *Ibid.*, No. 4, Aug., 1884, p. 53. Notes a double nest of Vireo, containing two Cowbird's eggs.

1530. *Cardinal Grosbeak.* By T. D. Perry. *Ibid.*, p. 57.
1531. *Backman's Finch.* By T. D. Perry. *Ibid.*, No. 6, October, 1884, p. 83.
1532. *Dove vs. Robin.* By H. E. Deats. *Ibid.*, p. 83.—Mourning Dove laying in a deserted Robin's nest.
1533. *A Singular Duel.* By C. B. Wilson. *Ibid.*, No. 7, Nov., 1884, p. 98.—Between a Blue Jay and a Sharp-shinned Hawk.
1534. *Spurred Towhee; Least Tit.* By H. R. Taylor. *Ibid.*, p. 100.
1535. '*Lettuce Bird.*' By E. T. Adney. *Ibid.*, p. 100.—A name for *Spinus tristis*.
1536. "*Dove vs. Robin;*" *White Robin Eggs.* By J. L. Hollingshead. *Ibid.*, p. 103.
1537. *A Four-story Nest of the Summer Yellowbird.* By L[ewis] H. A[dams]. *Ibid.*, p. 107.
1538. *Blue Grosbeak.* By T. D. Perry. *Ibid.*, p. 107.
1539. *Flickers in a Church Tower.* By G. F. B[renniger]. *Ibid.*, p. 108.
1540. *Dove vs. Robin.* By George P. Elliott. *Ibid.*, No. 8, Dec., 1884, p. 113.
1541. *Summer Red-bird.* By T. D. Perry. *Ibid.*, p. 117.
1542. *A Five-story Nest of the Summer Yellow-bird.* By W. L. Scott. *Ibid.*, p. 120.
1543. *Fottings from the Note-book of a Collector in Texas.* By J. A. Singley. *Ibid.*, No. 9, Jan., 1885, p. 122.—Dates of nesting, etc.
1544. *The Barn Owl in Southern California.* By Joseph L. Edmiston. *Ibid.*, p. 125.
1545. *Nesting of the Winter Wren.* By William L. Kells. *Ibid.*, No. 10, Feb., 1885, p. 133.
1546. *Prehensile Power of the Feet of the Crow.* By Montague Chaimberlain. *Ibid.*, p. 137.
1547. *The Black Snowbird.* By H. H. McAdam. *Ibid.*, p. 140.
1548. *Notes from Kansas.* By [D. E.] L[antz]. *Ibid.*, No. 11, March, 1885, p. 146.
1549. *Ornithological Synonyms.* By Dr. [E. A.] P[atton]. *Ibid.*, p. 147.—Several vernacular names.
1550. *From California.* By J. L.— and J[ulius] S[chneider]. *Ibid.*, p. 147. Early nesting.
1551. *Meadow Larks in Winter.* By T[homas] McD. P[otter]. *Ibid.*, p. 147.
1552. *From Wisconsin.* By C[hables A.] K[eeler]. *Ibid.*, p. 147.—Notes on *Ampelis garrulus*, *Lanius borealis*, *Larus philadelphia*, and *Zonotrichia querula*.
1553. *The Red-tailed Hawk.* By Geo. H. Selover. *Ibid.*, p. 161.
1554. *The Marsh Hawk.* By Fred. S. Odle. *Ibid.*, p. 161.
1555. *South Carolina Notes.* By W. W. Worthington. *Ibid.*, Vol. II, No. 1., May, 1885, pp. 3-8.—A list of 103 species observed in March and April at St. Helena Island.

1556. *Scientific Names*. By Montague Chamberlain. *Ibid.*, pp. 8-9.
1557. *Nesting of the Great Horned Owl*. By 'Ortyx' [=C. J. Pennock]. *Ibid.*, pp. 10-11.
1558. *From Georgia*. By T. D. P[erry]. *Ibid.*, p. 16.—On *Megascops asio* and *Ampelis cedrorum*.
1559. *Interesting Happenings*. By W. G. T[almadge]. *Ibid.*, p. 22.—Habits of Crow and Spotted Sandpiper.
1560. *A Newsy Letter from Texas*. By J. A. Singley. *Ibid.*, pp. 23-24.—Chiefly about nesting habits.
1561. *Notes from California*. By E. H. Fiske. *Ibid.*, No. 2, June, 1885, pp. 29-30.—Nesting habits.
1562. *Wrens on the War Path*. By H. K. Landis. *Ibid.*, p. 31.
1563. *The Redhead*. By A. M. Shields. *Ibid.*, pp. 32-33. Nesting of *Aythya americana*.
1564. *Pygmy Nuthatch*. By T. D. Perry. *Ibid.*, p. 44.—Nesting habits.
1565. *Ferruginous Rough-leg*. By F. M. Dille. *Ibid.*, p. 44.
1566. *One Day on Chester Island with the Marsh Wrens*. By Harry G. Parker. 'The Oölogist' [continuation of 'The Young Oölogist'], Vol. III, No. 1, Jan. and Feb., 1886, pp. 1-2.
1567. *Birds of Cortland Co., N. Y.* By M. D. M[urphy], Jr. *Ibid.*, pp. 2-6.—An annotated list of 109 species.
1568. *Summer Birds about Washington, D. C.* By J. H. Langille. *Ibid.*, pp. 10-11.
1569. *Vagary of a Collector*. *Great Horned Owls; Climbing Strap*. By Ortyx [=C. J. Pennock]. *Ibid.*, No. 2, March and April, 1886, pp. 19-20.
1570. *Birds of Cortland Co., N. Y.* By F. W. Higgins. *Ibid.*, p. 21.—Additions to list referred to above (No. 1567).
1571. *A Popular Nest*. By C. A. Babcock. *Ibid.*, pp. 21-22. The same nest used successively by a Grackle, a Heron and a Dove.
1572. *Whip-poor-will*. By H. A. Koch. *Ibid.*, p. 23.
1573. *An Unusual Friendship*. By L[ewis] P. B[rill]. *Ibid.*, p. 23.—Robin and House Sparrow sharing a nest.
1574. *A Warm Place for a Nest*. By M[aurice] G. K[ains]. *Ibid.*, p. 25.—Wrens nesting in lamp-posts.
1575. *Nest of the Brown Creeper*. By Wm. L. Kells. *Ibid.*, p. 25.—Mention of various other species.
1576. *Cannibalism of the Red-headed Woodpecker*. By L[ansing] B. F[ontaine]. *Ibid.*, p. 29.
1577. *The History of a Bird Box*. By Harry G. Parker. *Ibid.*, No. 3, May and June, 1886, pp. 31-32.—Notes on *Progne subis*.
1578. *Spring Notes*. By J. H. Melsheimer. *Ibid.*, No. 4, July and August, 1886, pp. 44-45.—At Hanover, Penn.
1579. *Turkey Buzzards*. By C. A. Babcock. *Ibid.*, p. 46.—Nesting in old coyote holes in banks at Danville, Kansas.
1580. *Chewink Nests in a Tree*. By H. A. Koch. *Ibid.*, p. 49.
1581. *Marsh Wrens*. By 'Ortyx' [=C. J. Pennock]. *Ibid.*, No. 5, Sept. to Nov., 1886, p. 58.

1582. *Birds of Chester County, Penn.* By C. J. Pennock. *Ibid.*, Vol. IV, No. 1, Jan. and Feb., 1887, pp. 1-10.—A briefly annotated list of 234 species, "compiled from the writer's observations and the lists of the late Vincent Barnard, the venerable Ezra Michener, M. D., and that of Dr. [B.] H. Warren."

1583. *Very Late Nesting.* By Charles A. Keeler. *Ibid.*, p. 12.—*Sialia sialis*, Oct. 26, at Milwaukee.

1584. *Wonderful Peculiarities of the Ruby-throat Hummingbird.* By James B. Purdy. *Ibid.*, No. 2, March-May, 1887, p. 72.

1585. *Notes from College Hill, Ohio.* By H. A. Koch. *Ibid.*, pp. 80-81.—Nesting of various species.

1586. *Hawking.* By Philo [W.] Smith, Jr. *Ibid.*, Nos. 3-4, June-Sept., 1887, pp. 92-93.—Records of nesting of *Bubo virginianus*, *Cathartes aura*, *Buteo borealis*, and *Buteo lineatus*.

1587. *Crow Roosts of New Jersey.* By E. M[artin]. *Ibid.*, pp. 94-95.

1588. *Swainson's Warbler—Its Discovery—Rediscovery.* By Thomas D. Porcher. *Ibid.*, p. 95.

1589. *Nesting of the Traill's and Acadian Flycatchers.* By Will. C. Brownell. *Ibid.*, pp. 96-97.

1590. *Experience with a Great Horned Owl.* By H. B. Hurd. *Ibid.*, p. 97.

1591. *Fottings from Florida.* By A. L. Quaintance. *Ibid.*, Vol. V, No. 1, Jan., 1888, pp. 5-6.—Notes on nesting of various species.

1592. *Ground Dove.* By L. S. Morrison. *Ibid.*, p. 7.—Nesting habits.

1593. *Among the Arctic Terns.* By Henry E. Berry. *Ibid.*, p. 9.—Near Damariscotta, Maine.

1594. *From Lincoln County, Maine.* By Henry E. Berry. *Ibid.*, p. 12.—Dates of nesting, etc.

1595. *Acadian Flycatcher.* By J. W. Jacobs. *Ibid.*, p. 13.—Records of fourteen sets of eggs taken at Waynesburg, Penn[sylvani]a., in 1887.

1596. *Icterus spurius—Eastern Race.* By J. M. W. [=C. L. Ravson]. *Ibid.*, No. 3, March, 1888, pp. 37-38.—In Connecticut.

1597. *Nesting of the Cardinal Grosbeak.* By F. W. Clay. *Ibid.*, pp. 39-40.

1598. *An Odd Nesting Place.* By W. J. S[impson]. *Ibid.*, p. 40.—House Wrens nesting in a vane.

1599. *Two-storied Nests of the Meadow Lark.* By Lorie P. Akers. *Ibid.*, p. 41.

1600. *A Large Set of Eggs of the Red-headed Woodpecker.* By R. C. McGregor. *Ibid.*, p. 44.

1601. *Nidification of Ictinia mississippiensis.* By H. Y. B[enedict]. *Ibid.*, No. 5, May, 1888, p. 74.

1602. *House Wren.* By C[arleton] G[ilbert]. *Ibid.*, pp. 74-75.—Egg-laying.

1603. *Nesting of a Pair of Chimney Swifts.* By W. N. C[lute]. *Ibid.*, p. 75.

1604. *The Family Rallidæ in Michigan.* By 'Scolopax' [=Morris Gibbs]. *Ibid.*, No. 6, June, 1888, pp. 85-88.

1605. *Brown-headed Nuthatch*. By A. L. Q[ua]intance]. *Ibid.*, p. 91.—Nesting habits.
1606. *Loon; Great Northern Diver*. By 'Scolopax' [=Morris Gibbs]. *Ibid.*, No. 7, July, 1888, pp. 103-105.
1607. *Eggs of Mississippi Kite*. By J. A. S[ingley]. *Ibid.*, p. 105.
1608. *Reminiscences of 1886*. By H[arry] T[rippett]. *Ibid.*, Nos. 8 and 9, Aug. and Sept., 1888, pp. 119-120.—Nesting habits of *Trochilus colubris*, *Myiarchus crinitus*, and *Icterus galbula*.
1609. *Notes from Alachua Co., Florida*. By T. G. P[earson]. *Ibid.*, Nos. 10 and 11, Oct. and Nov., 1888, p. 150.—Records of egg collecting.
1610. *Two Large Sets of Quail Eggs*. By J. V[an] D[enburgh]. *Ibid.*, p. 156.—*Callipepla californica* in confinement.
1611. *An Unusual Nesting Site; Peculiar Eggs*. By W[ill]. N. C[olton]. *Ibid.*, Vol. VI, No. 1, Jan., 1889, p. 9.—*Galeoscoptes carolinensis*.
1612. *Birds of Broome Co., N. Y.* By Willard N. Clute. *Ibid.*, pp. 10-11.—Contains one or two interesting notes.
1613. *Notes from an Alabama Collector*. By C[harles] W[ise]. *Ibid.*, pp. 14-15.
1614. *The Raptores of Michigan*. By Morris Gibbs. *Ibid.*, No. 2, Feb., 1889, pp. 29-30; No. 4, April, 1889, pp. 67-69.
1615. *Nesting of the Tufted Tit*. By J. Warren Jacobs. *Ibid.*, No. 4, April, 1889, pp. 72-73.—At Waynesburg, Pa.
1616. *Avifauna of Orleans County, N. Y.* By Neil F. Posson. *Ibid.*, No. 5, May, 1889, pp. 87-93.—A briefly annotated list of 174 species, one third of which are given on the authority of J. H. Langille, George H. Hedley, Frank H. Lattin, and others. The compiler himself seems to be conscientious, though evidently inexperienced.
1617. *A Murderous Red-headed Woodpecker*. By John A. Morden. *Ibid.*, No. 6, June, 1889, p. 113.
1618. *Arkansas Notes*. By 'Arkansas Hoosier' [=C. E. Pleas]. *Ibid.*, No. 7, July, 1889, p. 130.
1619. *The Burrowing Owl*. By A[rthur] L. S[taley]. *Ibid.*, p. 131.
1620. *Notes on the Eggs and Birds of Hillsborough Co., Florida*. By C[harles] S. M[cPherson]. *Ibid.*, No. 8, August, 1889, pp. 147-149.
1621. *The Shore Lark in Canada*. By John A. Morden. *Ibid.*, p. 149.—Early nesting.
1622. *Can Quails be Domesticated?* By L[ilhe] I. C[onley]. *Ibid.*, pp. 150-151.
1623. *Red-tailed Hawk*. By D. B. R[ogers]. *Ibid.*, pp. 151-152.
1624. 'Old Abe,' Jr. By R. D. Goss. *Ibid.*, No. 9, Sept., 1889, pp. 167-168.—Bald Eagle in captivity.
1625. *Bell's Vireo*. By Albert O. Garrette. *Ibid.*, p. 169.
1626. *A Curious Nesting Place*. By R[euben] C. M[ooman]. *Ibid.*, p. 176.—*Sialia sialis*.
1627. *List of the Winter Birds Found in Kalamazoo County, Mich.* By Scolopax [=Morris Gibbs]. *Ibid.*, No. 10, Oct., 1889, pp. 187-189.—63 species observed during December, January and February.

1628. *American Long-eared Owl*. By A. C. Murchison. *Ibid.*, pp. 190-191.—Nesting habits.
1629. *The Thick-billed Grebe*. By L[eslie] Dart. *Ibid.*, No. 11, Nov., 1889, pp. 205-206.
1630. *Incidents in Bird Life*. By Gus. Rapp. *Ibid.*, No. 12, Dec., 1889, p. 230.—A Robin attacking a flock of Cedarbirds.
1631. *The Prairie Horned Lark*. By J. V. Crone. *Ibid.*, p. 231.
1632. *Marsh Hawk*. By Alfred W. Comfort. *Ibid.*, pp. 234-235.
1633. *Thousands of Blackbirds*. By John Mykrantz. *Ibid.*, p. 236.—At Paola, Kansas.
1634. *Northern Phalarope*. By C[harles] C. T[rembly]. *Ibid.*, p. 236.—Striking an electric light tower at Utica, N. Y.
1635. *The Cedar Waxwing Eating Potato Bugs*. By George W. Vosburg. *Ibid.*, p. 237.

Publications Received.—Allen, J. A. Remarks on Individual and Seasonal Variation in a large Series of *Elainea* from Chapada, Matto Grosso, Brazil, with a Revision of the Species of the restricted Genus *Elainea*. (Bull. Am. Mus. Nat. Hist., II, No. 3, pp. 183-208.)

Belding L. The Small Thrushes of California. (Proc. Cal. Acad. Sci. 2d Ser. II, pp. 57-72.)

Berlepsch, Hans von. Notes on some Neotropical Birds belonging to the U. S. National Museum. (Proc. U. S. Nat. Mus., 1888. p. 559-566.)

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GENERAL NOTES.

An Early Date of a Rare Bird in South Carolina.—I shot on October 15, 1889, at Mt. Pleasant, S. C., a young male Red-throated Diver (*Urinator lumme*). The bird was very shy, and it was with great difficulty that secured it. It was in good condition, and had apparently been in the neighborhood for some time, as it was seen several times at a distance, but it was mistaken for a Florida Cormorant. The Red-throated Diver is one of the rarest of the winter birds that visit South Carolina. During the severe winter of 1886 several were taken, but they have not been found here since. This early date of capture is certainly surprising, as they have only been seen for a few weeks in January.—ARTHUR T. WAYNE, *Charleston, S. C.*

The Mottled Duck in Kansas.—In my 'Revised Catalogue of the Birds of Kansas' I entered this bird as the Florida Duck (*Anas fulvigula*). Mr. Sennett, in the July number of 'The Auk' for 1889, describes a new Duck from Texas, viz., Mottled Duck (*Anas maculosa*) to which, I find upon examination, the Kansas bird should be referred, instead of to the Florida Duck as given.—N. S. GOSS, *Topeka, Kansas.*

Capture of the Widgeon (*Anas penelope*) on the James River, Virginia.—At Washington Market, New York City, on January 25, 1879, I saw a male Widgeon among a lot of American Ducks which had just been received from a gunner on the James River, Virginia, by a dealer who was positive that the Widgeon had been killed with the other Ducks, as he had never handled any foreign game. The specimen was exhibited, in the flesh, to the Linnæan Society of New York, and is now in the collection of the American Museum of Natural History, New York. It is a young adult, and can be exactly matched in size and coloration from a series of Widgeons from Europe. Its fresh measurements were as follows: length, 495 mm.; alar expanse, 850 mm.; wing, 244 mm.; tail, 102 mm.; culmen, 35 mm.; tarsus, 39 mm.—EDGAR A. MEARN, M. D., *Fort Snelling, Minn.*

The King Eider (*Somateria spectabilis*) at Erie, Pennsylvania.—The great storm of Nov. 28 and 29, 1889, on the Great Lakes, brought into the Bay of Erie a flock of fifteen to twenty King Eider Ducks. They were seen about noon of Nov. 30 swimming in close to the Iron Ore Dock where numbers of men were at work unloading vessels. The hunters were soon down on the dock with guns and others put out in boats. So fearless or stupid were the Ducks that it was no trouble to shoot them, and at one discharge three were killed. Mr. James Thompson very kindly took two of the birds home with him and telephoned me that some very queer looking Ducks had been shot that day, placing at my disposal the pair he

had secured. The next day, Dec. 1, we went to the dock and to all the hunters we could get track of and captured all the specimens that had not already gotten into the pot. Out of fourteen that we could trace as having been killed, we were fortunate enough to obtain seven in good condition. The oldest hunters here do not remember to have seen any of the kind before. They call them Boobies, the same name they give to the Surf Ducks that are frequently taken here. No other Ducks were seen in the bay when the Eiders appeared. They are in all varieties of immature plumage, none appearing in anything like the breeding condition. The nearest approach to it was one male that showed pearl gray mixed with dark on top of head; he also had a distinct black V-shaped mark on the white throat. The other males had browner heads and fainter black V-shaped throat markings. Of the seven, six are males, and one a female in good typical plumage. I believe that none of this species has been recorded as taken on Lake Erie since 1879, when eighteen were shot at Buffalo, N. Y. (See note by J. A. Allen in Bull. Nutt. Ornith. Club, Vol. V, p. 62.)—GEO. B. SENNETT, *Am. Mus. Nat. Hist., New York City.*

The Little Brown Crane (*Grus canadensis*) in Rhode Island.—Under date of Oct. 14, 1889, Mr. F. T. Jencks writes me: "I saw today at Mr. J. M. Southwick's natural history store in Providence a finely mounted specimen of the Little Brown Crane (*Grus canadensis*) which Mr. Southwick informed me was shot the 8th or 9th of October by Benjamin Burlingame, at Natick Hill, Rhode Island."

I have since learned from Mr. Southwick that the bird belongs to the Superintendent of Public Schools at Natick where it will be preserved in an educational collection. As far as I am aware this species has never previously been reported from any part of New England, although the Whooping and Sandhill Cranes are supposed to have occurred rather numerous in the early colonial days.—WILLIAM BREWSTER, *Cambridge, Mass.*

Baird's Sandpiper at New Haven, Connecticut.—On October 19, 1889, I took a male *Tringa bairdii* at New Haven, Conn. It was flying high over a sand spit running out into New Haven harbor, in a flock of about twenty other Sandpipers, of what species I am unable to say.

Another specimen of this species, a female in the young plumage, now in the collection of Mr. C. C. Trowbridge, New Haven, was shot at the same locality, Oct. 28, 1887. These make the second and third records * of Baird's Sandpiper for Connecticut.—LEWIS B. WOODRUFF, *New Haven, Conn.*

Callipepla squamata in Northeastern New Mexico.—During the month of October, 1889, I found the Scaled Partridge to be a not uncommon bird at a place called 'Point of Rocks,' about eight miles south of Chico Springs, Colfax Co., New Mexico. They are probably extremely local, as

*For the first record see Averill, Auk, VI, 189.

I could hear of no others outside of that immediate locality. This is, I believe, the most northerly record for the species.—E. C. THURBER, *Alhambra, Cal.*

The Key West Quail-Dove (*Geotrygon martinica*) at Key West.—It is of interest to note the capture of an adult male of this species by Mr. J. W. Atkins at Key West on September 15, 1889. This is the only occasion, in some three years of careful field work, on which the species has been encountered by Mr. Atkins, and I append his notes on the subject.

"I went to the woods at daylight (September 15) to learn if Swainson's Warbler had arrived, and plunging into the lowest and thickest of the wood to look for that species I finally discovered one Swainson's Warbler, a very wild and shy bird. In the pursuit of the bird in question, while wending my way carefully and slowly through the thick underbrush, the Dove (*Geotrygon martinica*) was discovered on the ground about eight paces ahead of me. I secured it with dust shot from my 40 calibre gun. I saw but the one Swainson's Warbler and did not secure it."

Mr. Atkins has kindly sent me the bird, No. 3269 of my register. It is an adult male that has just completed the moult, and is in very fine unworn plumage.—W. E. D. SCOTT, *Tarpon Springs, Fla.*

Buteo brachyurus and B. fuliginosus.—The evidence presented by Mr. Scott in the July (1889) number of 'The Auk' (pp. 243—245), apparently removes all doubt as to these two very dissimilar birds being simply phases of one species, a view of their relationship which has for many years been held by leading European ornithologists,³ but which I could not share, for reasons fully explained by me on pages 209, 210 of Bulletin N. O. C. for October, 1881. Mr. Scott's suggestion, however, that "the bird known as *B. brachyurus* is the female, and that called *B. fuliginosus* the male" is certainly incorrect in that it implies that such is *always* the case; for I have examined males and females of both forms (see the article quoted above). I would add that as each phase is also represented by very young birds, the variation would appear to be a purely *individual* one, as in the cases of the two phases of the Screech Owl (*Megascops asio*) and of several other species of *Buteo*—the difference from the latter being that in the case of *B. brachyurus* the large majority of specimens are either typically one phase or the other, while in other *Buteones* examples of various intermediate character are decidedly the more numerous instead of exceptional.—ROBERT RIDGWAY, *Washington, D. C.*

New York City Owls.—*Strix pratincola*. **AMERICAN BARN OWL.**—On April 13, 1878, Mr. Joseph Wilde brought a fresh specimen to Mr. Edward Conway, taxidermist, of 55 Carmine St., New York City, stating that it was killed "just outside the City."

Nyctala acadica. **SAW-WHET OWL.**—While walking on the upper part of Manhattan Island, above High Bridge, on the Harlem River, March 13,

1881, I saw a fine Saw-Whet Owl which alighted on a stump among some red cedars and afterwards flew freely about without apparent inconvenience, the day being dark and cloudy.—EDGAR A. MEARN, M. D., *Fort Snelling, Minn.*

Megascops asio maxwelliæ.—Three ejected pellets of the Rocky Mountain Screech Owl, sent by Mr. Denis Gale from Gold Hill, Boulder Co., Colorado, for examination as to nature of food, and examined by Dr. A. K. Fisher of the Department of Agriculture, have been found to contain the following materials.

No. 1. The remains of a meadow mouse (*Arvicola*) and crawfish.

No. 2. Made up almost entirely of the remains of crawfish with a few fragments of beetles.

No. 3. Remains of crawfish.—CHARLES E. BENDIRE, *Washington, D. C.*

The American Hawk Owl near Washington, D. C.—It may be of interest to the readers of 'The Auk' that a fine specimen of *Surnia ulula caparock* was taken here in the District of Columbia on the 29th of November, 1889, and is now in the hands of Mr. Webster, the taxidermist of Washington. Is it not an unusual locality for it?—R. W. SHUFELDT, *Washington, D. C.*

Note on *Cyanocitta stelleri litoralis* Maynard.—In separating the Vancouver Island Jay as a new form, I fear Mr. Maynard was influenced by insufficient material. Comparison of six specimens from Vancouver Island with a series of some twenty *stelleri* taken in the adjoining coast region, and in British Columbia by Mr. Clark P. Streater, shows that the characters assigned the island bird are neither constant nor peculiar. In three of the six the bands across the tail are very evident; in the three remaining the bands are obsolete or appreciable only in certain lights, but these three specimens are exactly matched by several examples in my series from the mainland.

The same variation in markings is also shown by other members of this group, and I have examined specimens of *frontalis* from California, and *macrolopha* from Arizona and Sonora, in the collections of Mr. Brewster and the American Museum, in which the barring of wings and tail was reduced to the minimum.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Capture of a Canada Jay (*Perisoreus canadensis*) near Cambridge, Massachusetts.—Mr. James R. Mann has given me permission to announce the interesting fact that a Canada Jay was shot at Arlington Heights (within sight of Cambridge and less than four miles distant in an air line) by Mr. E. B. Winship, Oct. 17, 1889. The specimen was mounted, and is now in Mr. Mann's collection. It is a male in perfect autumnal plumage. The stomach was filled with the remains of "wasps or bees," but contained no traces of other food.

Mr. Maynard has reported (*Birds of E. N. A.*, 1879, p. 168) seeing a Canada Jay in Newtonville "in early summer" about 1875, but Mr. Mann's bird seems to be the first that has been actually taken in Massachusetts.—WILLIAM BREWSTER, *Cambridge, Mass.*

A Second Nest and Eggs of *Picicorvus columbianus* taken in Colorado.—Mr. Denis Gale, of Gold Hill, Boulder Co., Colorado, writes me that he found a second nest of Clark's Nutcracker, containing three fresh eggs, on April 16, 1889. He found the nesting site first on March 12, noticing one of the birds trying to break off a small twig from a dead tree, and watching the direction it took afterwards. The bird which came from behind him flew high over his head, and after waiting for some time he noticed both birds flying to and from a certain point fully five or six times. After a careful search he finally found a few twigs lying upon a horizontal limb in the dense top of a small scrubby pine-tree about twelve feet high and six inches in diameter. On visiting the place again a week later, at his approach one of the birds flew off a neighboring tree uttering his warning note, but upon inspection he found no changes or augmentation of the twigs, and concluded therefrom that a new nesting site had been selected, and when he visited the spot a week later still with the same results his conclusion seemed to be verified and he made an exhaustive search within a radius of a mile of this point, but all to no purpose, seeing neither nests nor birds. Four weeks later, on April 16, passing close to the place where the birds had commenced building first, he stopped to look once more at the site first selected by this pair of birds, and much to his surprise discovered a bulky nest in place of the few twigs first noticed, with the female on it and covering three eggs. The nest was placed about nine feet from the ground, and resembles the one taken in 1888 in every particular; perhaps it is a little more bulky still. The eggs bear a close resemblance to the first set found by Mr. Gale, excepting that the markings are possibly a little more decided and numerous. They measure $1.34 \times .90$, $1.37 \times .91$, and $1.39 \times .92$ inch. Mr. Gale's first nest, containing three fresh eggs also, was found on March 5, 1888, six weeks earlier and probably an unusually early case.—CHARLES E. BENDIRE, *Washington, D. C.*

Bullock's Oriole in Maine.—Mr. Manly Hardy writes me that a male Bullock's Oriole (*Icterus bullocki*) was shot "a few miles from Bangor, Maine, about the middle of November, 1889, and sent in the flesh to Mr. Crosby, the well-known Bangor taxidermist, by whom it was mounted." Mr. Hardy has lately examined the bird and compared it with a Western specimen, from which it differs only in being "a little more of a canary color."

This capture adds a species to the New England list as well as to the fauna of Maine. It also affords still another example of the curious fact that most of the Western and Southern birds which occur in New England as rare or purely accidental stragglers, are found in late autumn or early winter.—WILLIAM BREWSTER, *Cambridge, Mass.*

Notes upon *Coccothraustes vespertina* as a Cagebird.—In 'The Auk' for January, 1889, I presented a few notes having reference to the sudden appearance, at Fort Wingate, New Mexico, of the Evening Grosbeak in considerable numbers. The migration to which my remarks referred occurred in October and November, 1888, and I went on to say how fortunate I was upon that occasion in collecting quite a number of those beautiful birds. As the flocks became larger and more numerous I would, in firing into them with the fine dust shot I was using, often wound several individuals, but these were despatched in the usual way and either skins or skeletons made up from the specimens. Later, however, the thought struck me that it would be a good thing to try and save some of these slightly wounded ones with the view of making cage pets of them, and as luck would have it the very same afternoon I came upon a flock numbering considerably over a hundred. They were resting in an old, leafless piñon tree, and in the midst of the flock sat a stately male whose olive green coat was nearly black, it was so dark, and the white of his wings was dazzling in contrast, it was so very white. At the double report of my gun a dozen or fifteen came tumbling down through the tree, and fell upon the spotless, drifted snow beneath it;—such beauties! Among them, with his jet-black wings and tail spread out upon this powdery frozen carpet, lay the fine old patriarch of the flock, for I had made him the target of my first barrel. After all these specimens had been cared for, each placed with the due precautions in its separate paper cone, there was discovered sitting on a side-twig of another scrubby pine, near by, a fine female, that had evidently sustained some wounds. Upon capturing her these were found to consist in a broken wing and leg, and an oblique shot through the corner of the eye, but red-eyed and fractured as she was, I determined to take her home in her then condition and see what good nursing would do towards repairing her numerous injuries.

To shorten this part of my account, I will only add that in due time she made a most excellent recovery, and long before that came about she had become wonderfully gentle, and allowed me to handle her without biting me with her powerful beak, as she would do for a week or more just after her capture. She was kept upon a pine bough in the deep recess of a window in my study, and fed every day upon fresh cedar berries of which these birds are inordinately fond, and with which she would gorge herself as fast as she could see to pick them from the branches by the aid of her single good eye, and her crippled limbs to get about among the twigs with. Shortly her eye was much improved, and she would whistle shrilly as soon as she caught sight of me coming towards her with a fresh branch loaded with her favorite food. In eating the berries the outside skin and soft part are rapidly removed by rolling them deftly around between the powerful mandibles, when the seed is quickly swallowed, and the bird ducks over and picks a fresh one to extract the seed in the same manner, and this she would keep up until her alimentary canal seemed almost ready to burst with the unnatural distention. Some time

during the latter part of this same month of November I succeeded, by the same means, in securing a magnificent old male, he being in full autumnal plumage when taken, and his wound a tip on the wing with a single dust-shot. My delight can be well imagined, as I marched home with him and introduced his lordship to my first pet, who now seemed as happy as a lark in her open cage formed by the capacious window-recess with a goodly pine branch stretched across it. Soon it was to be seen which of the pair was to be 'cock of the walk,' and the male bird assumed the position, becoming master of the situation with no little display of tyranny, I thought. Towards myself, however, he was quite as gentle as his amiable mate, for he soon allowed me to hold him in my hand and stroke his pretty head with my finger. They soon came to be very fond of hemp-seed, and they frequently bathed with evident relish in a shallow dish of water placed at their disposal. During January of the following year, a freezing cold month, they were brought by me in a small cage of my own construction to Washington; the journey proved to be quite as eventful for the birds as it was for their owner. But they accommodated themselves marvelously well to the varying circumstances, and the first thing I did upon bringing them into their eastern home was to place the pair in a new and commodious cage.

When it came round to March a noteworthy change came over their night habits, for up to that date the pair invariably roosted together, with their heads under their wings, all night long. But during the early part of March the male only kept his perch, sleeping away, while the female bird nearly the entire night incessantly hopped from perch to perch in a restless, uneasy manner. This she persisted in for about a week, when she in turn kept quiet, and then it was the male, who had his week of nights devoted to the same performance.

It looked almost as if the migrating instinct were so strong in them that they had to give vent to it in some way or other, and this extraordinary behavior were the outcome of it. They were now in full feather, and thoroughly reconciled to their quarters; they ate heartily of any of the smaller, sweet seeds, such as apple, maple, hemp, and others, and so were fat and in good condition. Even when the thermometer was down to 32° F. they would bathe, this too, when the cage was hanging outside my window; the male in all such matters invariably serving himself first, driving off his patient partner with a loud, sharp snapping of his bill, and a few, plainly to be understood, threatening notes. Neither of these birds, however, for the entire time they have been in my possession (within a few days of a year now) has ever given vent to anything that might be considered a song. Both utter a kind of screech-whistle, not unlike one of the notes of the English Sparrow, and, indeed, it is usually called forth by one or more of those birds *shrieking* in their usual way in the neighborhood. Other birds, though, will also excite them when they come near the cage, and my Grosbeaks will frantically skip from perch to perch, and the peculiar note to which I refer may be heard for some considerable distance away. At other times they have a low, plaintive note

that is quite pleasing to my ear, as are some of their expressions of pleasure while feeding or bathing. In all this the female is just as often heard as the male, and her voice has precisely the same power, pitch, and tone. In May I was delighted on one occasion to observe the female receive the approaches of her mate, and I immediately supplied them with the most suitable building materials my mind could suggest, as well as a sheltered forked limb. In a few days the female started a nest of fine black roots, and slivers of cedar-bark. She had about half finished the structure when the male bird deliberately pulled it to pieces, and all my efforts to get her to try it once more, were entirely futile.

Much to my surprise they both began to moult by the third week in June, and by the middle of July they presented sorry figures indeed. This change I had dreaded for some time, as I felt sure the male would lose some of his original brilliancy of plumage, but as this latter began to come out again early in August, the only change I saw, which was as interesting as it was contrary to my liking, was a pure white elliptical spot as big as a cherry-stone on the lower third of the outer feather on either side of his otherwise dead black tail. In fact the green of his body color came out fully a shade darker. During the middle of August a cat nearly got both of them, and pulled out a great many of their feathers, and strange to say in the case of the male, who lost one of the white-spotted feathers on one side of his tail, when it came again it was as black as a coal all over, so that at the present writing he has the white area only on one side. No change occurred in the plumage of the female, who now (October 24, 1889) is in beautiful feather, and one of the most graceful birds I ever saw in a cage. They are passionately fond of small butterflies and common house flies, and will greedily take either from your fingers when held to them between the wires of their cage. A very curious habit is to be observed, that, so far, has only been indulged in by the male; sometimes when he is chilled after a shower, and the sun comes out warm and bright, and streams through the cage, he will, standing on a perch, tilt himself way over sidewise, open his bill, close his eyes, and fluff up all his feathers until he looks double his natural size, and he apparently greatly enjoys the heat of the sun as it can thus gain access to his skin. Since the moult the female has been the master of the cage, and now has things pretty much her own way, but on the whole they are a pretty amiably disposed pair of birds, and give me every reason to believe that they are eminently contented in their confinement; and they are certainly a source of daily pleasure to me, as some of their low notes are very sweet, and the lovely harmony of their plumage never tires me. I look eagerly for the coming of spring, as I still hope that I may get her to breed, or even, perhaps, to lay; and as soon as the season sets in a thoroughly quiet place will be set aside to hang their cage in, as *quiet* is the great secret of getting native birds to lay and breed in captivity.—R. W. SHUFELDT, *Washington, D. C.*

Intergradation between *Zonotrichia leucophrys* and *Z. intermedia*, and between the latter and *Z. gambeli*.—Material received at the National Museum within the past year proves extensive intergradation between the birds hitherto called *Zonotrichia intermedia* and *Z. gambeli*. It therefore becomes necessary to consider them as merely geographical races of one species. At the same time, a few examples have been seen which are clearly intermediate between *Z. intermedia* and *Z. leucophrys*; but considering the very great number of specimens of these two forms that have been collected in various portions of the West, the relatively small proportion of such specimens is astonishing. Possibly they are hybrids; but it is more probable that they indicate true intergradation between the two supposed species. If this view proves to be correct, the three would stand as follows: (1) *Zonotrichia leucophrys* (FORST.); (2.) *Z. leucophrys intermedia* RIDGW., and (3) *Z. leucophrys gambeli* (NUTT.).—ROBERT RIDGWAY, *Washington, D.C.*

Mortality among Bank Swallows.—Upon reading the article in 'The Auk' for October, 1889, on the 'Mortality among Eave Swallows' by Dr. F. H. Kimball, a similar instance was recalled to my mind of my experience with the Bank Swallows (*Clivicola riparia*) in this locality.

By referring to my note-book I find that June 3, 1888, I made a trip to a place where hundreds of these birds breed every year. I saw no birds about the holes, and at once concluded that they had not bred there that year, but as the holes seemed to have been excavated recently, I examined them, and found dead birds in nearly every hole that I dug into. Some of the birds were quite fresh, while others had the appearance of having been dead a long time. These birds were not in very good condition, but were far from being poor and emaciated. Almost all of the holes contained nests, but very few had eggs in them, and two were the most found in any one nest. As to the cause of their destruction I am wholly perplexed, as the weather at that time was mild, although there was a little more rain than usual.—WILLARD E. TREAT, *East Hartford, Conn.*

Capture of a Specimen of the Orange-Crowned Warbler (*Helminthophila celata*) in the Vicinity of Washington, D. C.—The writer secured a fine adult specimen of the Orange-crowned Warbler (*Helminthophila celata*) while collecting on October 13, 1889, in company with Mr. H. W. Henshaw, at Munson Hill, Virginia, a locality a few miles from this city.

It was one of a large flock of birds which included White-crowned, White-throated, Swamp, and Field Sparrows, Maryland Yellow-throats, Yellow-rumped Warblers, Kinglets, and Juncos.

When first seen it was in a thicket of small alders, blackberries, and thoroughworts, gleaning insects from among the flowers of the latter plant.—A. K. FISHER, M.D., *Washington, D. C.*

A Curious Specimen of the Yellow-throated Warble (*Dendroica dominica*).—On August 29, 1889, I shot near Charleston an adult male Yellow-throated Warbler in full autumn plumage with the back nearly jet black. The whole back is black, but concealed partially. Every feather has a large black spot with only a very small portion of the end marked with the usual color, *i. e.*, bluish gray. This is not the first specimen I have taken marked in that way, for I shot one in 1885 which also has a blackish back, but not nearly as pronounced as the one I now record. I have both of these birds in my collection.—ARTHUR T. WAYNE, Charleston, S. C.

The Nest and Eggs of *Regulus calendula*.—About the 20th of May, 1888, while at one of our cattle ranches on the White Mountains, Apache Co., Arizona, I noticed a pair of Ruby-crowned Kinglets busily engaged in picking up feathers from in front of the door of the ranch. These feathers they carried to a clump of tall spruce-fir trees about sixty yards from the house, but for some time I could not be certain as to which tree they were building in. Finally I noticed that the Kinglets stayed longer in one particular tree than in any of the others, so I climbed it and at last discovered the nest in a clump of fir cones near the top of the tree. I did not touch the nest as I knew it could not then contain eggs. Next day I was unfortunately obliged to return to the home ranch, thirty-five miles northeast of this place, preparatory to a trip to New Mexico, as we had to start on June 3. On June 1, that being the last day I could spare, I rode the thirty-five miles in the morning to the tree where the nest was, tied my horse to another tree, and ascended to the nest. It was blowing furiously, and the nest was so near the top of the tree that taking it became a matter of considerable difficulty. The nest was completely hidden by the fir cones surrounding it, and was placed about four feet out from the stem of the tree, at the end of a branch, so I ultimately found it necessary to cut off the branch, nest and all. The nest contained five fresh eggs. Cutting off the extreme end of the branch with the cluster of cones and nest still attached, I descended the tree but unfortunately broke an egg on the way down. Even after I had the nest down upon the ground, it was no easy matter to get the eggs out without breaking them. This, however, I finally succeeded in doing, and packing the eggs in my hat, I started on my long ride home rejoicing.

The nest, as before stated, was placed in a bunch of cones at the end of a small branch, in a spruce-fir tree, at an altitude of about sixty or seventy feet from the ground. It was semi-pensile, being attached to the branch above and also to the cones all round. Fine moss, lichens, cobwebs, etc., were its chief components, the interior plentifully lined with feathers, chiefly those of the Wild Turkey and Dusky Grouse. The external width of the nest was about 4 inches, internal width about 1.5 inches, depth from 1.5 to 2 inches. On my return from New Mexico I was annoyed to

find that mice had destroyed the nest, which I had left at the upper ranch.

The eggs were of a whitish ground color, very minutely spotted with pink or pale red chiefly at the larger end where they formed an indistinct band round the greatest width of the egg.

The locality where I found this nest is about twenty-two miles west of the town of Springerville, and at an altitude of about 8500 to 9000 feet above sea-level, just about where the pines (*Pinus ponderosa*) end and the spruces begin. This species is always to be found among the spruces high up in the White Mountains in summer, but I have never been able to find another nest although I have searched long and diligently several seasons.—JOHN SWINBURNE, *St. Johns, Apache Co., Arizona*.

Myadestes townsendii Wintering in Montana.—Not having seen a copy of 'The Auk' for April, 1889, till several months after publication, the following note on *Myadestes* in answer to a query by Mr. Frank Bond is somewhat delayed. The birds are found in Montana north at least to latitude 47°, during our coldest winters. They are not at all common, however, and are decidedly sluggish during cold spells. I have seen a bird sit motionless for hours near the extremity of a dead pine limb, with body and tail almost horizontal, the thermometer at the time scarcely marking above zero Fahr. in the middle of the day. They are very silent in winter, not even uttering their call notes, that I have observed, but these permanent residents begin their song early in spring, long before the snows have melted from the mountains, or any of their companions from the south have arrived. The song is loud, varied, and Thrush-like, and is uttered as they mount rapidly upward in short zigzag flights to a height far above the pines. I have never observed the birds to remain long at any one elevation while singing, nor have I ever heard anything but their call notes when perched.—R. S. WILLIAMS, *Great Falls, Montana*.

NOTES AND NEWS.

JOHN G. BELL, the venerable naturalist-taxidermist, died at his home at Sparkhill, Rockland County, New York, in October, 1889, in the seventy-eighth year of his age. A pioneer in the art of taxidermy, he was for many years a leader in this auxiliary branch of zoölogy, and his laboratory in New-York City was well known to almost every zoölogist of his day. The friend and associate of Audubon, Baird, Cassin, Giraud, LeConte, he rendered to them all valuable assistance in procuring and preparing natural

history specimens. The names given in his honor to Bell's Sparrow, Bell's Vireo, and Bell's Warbler, mark the esteem in which he was held by these eminent naturalists. As an aid and collector he accompanied Audubon on the famous journey to the Upper Missouri, securing with his own hands a large proportion of the new species described by Audubon as the result of this expedition.

Mr. Bell's tastes led him into the field and work-room rather than the study, but he freely gave to others the results of his experience, and the pages of our earlier works attest the keenness of his observation. Five years before his death he retired from active business in New York, and the remaining years of his life were passed at his home at Sparkhill. Here he erected a small building, placing in it the material then on his hands, amounting to several thousand specimens of birds and mammals. He was never again actively engaged in taxidermal work, though frequently sought for by his older patrons to preserve some pet or trophy of the chase. Being thus isolated from persons of kindred tastes he gave a warm welcome to visiting naturalists, and his eager enthusiasm on these occasions, when recounting early adventures in the field, testified alike to the charm of his presence and the undying character of an inborn love of nature.—F. M. C.

THE EXHIBITION OF SPECIMENS of Horned Larks, and of Thrushes of the *Turdus aliciae-bicknelli* group, proved an interesting feature of the late Congress of the A. O. U. Of the latter the number of specimens was small, but afforded fair material for the illustration of the relationship of these closely allied and not generally well understood forms. The Horned Larks thus brought together numbered over 1200 specimens. It was of course impracticable to attempt any elaboration of this material under the circumstances attending its display to the Union. The various forms as now recognized were pointed out and their affinities explained by Mr. Ridgway. In order to utilize this important material to the fullest extent practicable, the Committee of Arrangements, under whose auspices it was brought together, turned it over to Mr. Jonathan Dwight, Jr., for study, and to report upon in a special paper to be printed in 'The Auk.' Mr. Dwight, having entered at once upon the work, finds that the material adds much to our knowledge of the forms of this perplexing group, and throws much new light upon their character and geographical distribution. He finds the material from the region west of the Rocky Mountains, however, too scanty to enable him to reach wholly satisfactory conclusions respecting some of the Pacific Coast and Southwest forms, and solicits the loan of additional specimens from any part of this area for use in completing his monograph. Packages may be addressed to him, care American Museum Natural History, 77th St. and 8th Ave., New York City. A prompt response is desired. The specimens will be returned as soon as practicable, labelled with his identifications.

THE COMMITTEE OF ARRANGEMENTS for the Eighth Congress of the A. O. U., to be held next year in Washington, has been requested by a

vote of the Union to provide facilities for the exhibition of stereopticon views of birds and bird life from such slides as may be furnished by members; also to solicit, by a circular letter, from ornithologists and photographers, the loan of photographs of living birds and other animals for exhibition at the next meeting, and also the submission of communications detailing their personal experience in making photographs of living animals, and in their reproduction for purposes of illustration. Much interest was manifested by several members who spoke to the resolution, in the subject of the photography of birds from life, and its utility as an aid to the correct representation of birds when in action or at rest in a state of nature.

DR. EDGAR A. MEARNS, Capt. Med. Dept. U. S. A., now stationed at Fort Snelling, Minn., is spending several months at the American Museum of Natural History, working up his large natural history collections made during several years of field work in Arizona, principally in the vicinity of Fort Verde. These collections include, besides birds and mammals, a large collection of plants, ethnological material, and many reptiles. The birds alone number about 3500 skins and 1000 eggs, and the mammals about 600 specimens. Nearly all of this material he has very generously presented to the American Museum, besides many birds and eggs from other parts of North America and elsewhere, including about 1000 bird skins and about 1800 eggs from Arctic Europe. A list of his Arizona plants, including many new species, has already been published by Dr. N. C. Britton of Columbia College. Dr. Mearns hopes to have his preliminary report on the birds and mammals soon ready for publication.

Besides Dr. Mearns, and in addition to the Curator of Ornithology and his Assistant, there are now engaged in bird work at the Museum Mr. D. G. Elliot, Mr. George B. Sennett, Mr. Jonathan Dwight, Jr., and Mr. E. E. Thompson.

AMONG the recent important accessions received at the American Museum of Natural History is the valuable oölogical collection made by the late Mr. Snowdon Howland, of Newport, R. I. This is one of the richest and most carefully selected collections of North American birds' eggs ever brought together by a private collector, numbering nearly 1000 clutches. The Museum is indebted for this valuable gift to Mr. Howland's brother and executor, Clarence King, Esq., of New York, to whom Mr. Howland entrusted the final disposition of his collection.

WE ARE informed that the third edition of three thousand copies of Davie's 'Nests and Eggs of North American Birds' which was published in June, 1889, and reviewed in the last number of this journal, is entirely exhausted. In order to meet the constant demand for the work a fourth edition of one thousand copies has been issued from the same plates as the third, and when this is disposed of it will be followed by a fifth edition completely revised and augmented.

Old
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Vol. XV

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. VII

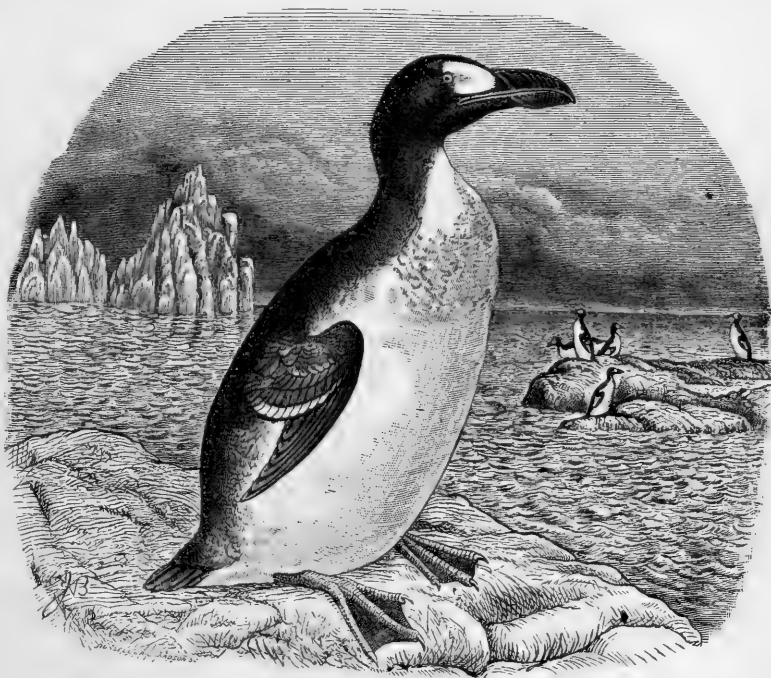
The Auk

A Quarterly Journal of Ornithology

Vol. VII

— APRIL, 1890 —

No. 2



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER



CONTENTS.

	PAGE
BARRED OWLS IN CAFTIVITY. By Frank Bolles.	101
A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA. By W. E. D. Scott.	114
ON THE CHANGES OF PLUMAGE IN THE BOBOLINK (<i>Dolichonyx oryzivorus</i>). By Frank M. Chapman.	120
OBSERVATIONS ON SOME OF THE SUMMER BIRDS OF THE MOUNTAIN PORTIONS OF PICKENS COUNTY, SOUTH CAROLINA. By Leverett M. Loomis.	124
A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL. By Clarence B. Riker. With Annotations by Frank M. Chapman.	131
THE HORNED LARKS OF NORTH AMERICA. By Jonathan Dwight, Jr.	138
A NEW VIREO FROM CALIFORNIA. By F. Stephens.	159
A STUDY OF THE GENUS <i>Dendrocinis</i> AND ITS SPECIES. By D. G. Elliot.	160

RECENT LITERATURE.—Salvin and Godman's *Biologia Centrali-Americana*;—Aves, 189; Saunders's *Manual of British Birds*, 195; Notes on Sport and Ornithology, 196; Doan's *Birds of West Virginia*, 197; The Quadratic Bone in Birds, 198; Minor Ornithological Publications, 198; Publications Received, 201.

GENERAL NOTES.—The Appearance of the Razor-billed Auk (*Alca torda*) on the Coast of North Carolina, 203; The Great Auk in the U. S. National Museum, 203; Eggs of the Florida Dusky Duck, 204; Another Capture of the Widgeon (*Anas penelope*) on the Atlantic Coast, 204; Capture of a Specimen of *Somateria dresseri* in the vicinity of Ottawa, Canada, 204; The Red Phalarope on Lake Erie, 204; Recent Occurrence of the Turkey Vulture in Eastern Massachusetts, 204; Harlan's Hawk a Race of the Red-tail, and not a Distinct Species, 205; Capture of a Third Specimen of the Barn Owl in Massachusetts, 205; The Great Gray Owl in Lewis County, New York, 206; *Picoides arcticus* in Central New York, 206; The Red-bellied Woodpecker in Northwestern New Jersey, 206; Food of Young Hummingbirds, 206; Remarks on certain Species of *Dendrocinis*, 207; The Purple Grackle at Charleston, South Carolina, 208; *Quiscalus quiscula aeneus* Killing and Catching Goldfish, 208; The Evening Grosbeak at Montreal, 209; *Coccothraustes vespertina* in Erie County, N. Y., 209; Evening Grosbeaks in Vermont, 210; *Coccothraustes vespertina* at Amherst, Massachusetts, 210; Evening Grosbeaks in Hampden County, Massachusetts, 210; The Evening Grosbeak in Connecticut, 211; Evening and Pine Grosbeaks in Ontario, 211; The Ipswich Sparrow in Georgia, 211; The Acadian Sharp-tailed Sparrow and Scott's Seaside Sparrow on the Coast of South Carolina, 212; *Passer domesticus* in Cape Breton, 212; Shrikes of Minnesota, 213; Notes on some Minnesota Birds, 213; Note on Pacific Coast Birds, 214.

CORRESPONDENCE.—Recording the Numbers of Birds Observed, 216.

NOTES AND NEWS.—Obituary, Dr. Ladislas Täckzanowski, 218; Amendments of the A. O. U. By-Laws, 218; A Study of the Genus *Junco*, 219; Minor Ornithological Publications, 219; Record-Sheets, 220; Fourth Edition of Dr. Coues's 'Key to North American Birds,' 220; 'Ornithologisches Jahrbuch,' 220; 'The Observer,' 220; Mr. W. E. D. Scott's Explorations, 220; Pileated Woodpecker, 220.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is conducted as a Magazine of General Ornithology. In general character it differs little from the late BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB, of which it forms virtually a Second Series.

'THE AUK' is edited by Mr. J. A. ALLEN, with the assistance of Mr. C. F. BATCHELDER.

TERMS:—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Members, and to Active and Associate Members of the A. O. U. not in arrears for dues.

Subscriptions and Advertisements should be addressed to the publisher, L. S. FOSTER, 35 PINE STREET, NEW YORK, N. Y. Foreign Subscribers may obtain 'THE AUK' through GURNEY AND JACKSON, 1 PATERNOSTER ROW, LONDON.

All articles and communications intended for publication and all books and publications for notice, should be sent to J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. VII.

APRIL, 1890.

No. 2.

BARRED OWLS IN CAPTIVITY.

BY FRANK BOLLES.

CHOCORUA is one of the boldest, most picturesque, and at the same time one of the most southerly, of the White Mountains of New Hampshire. At its southern foot are several small lakes fed by its streams. The chief of these streams is called Chocorua River, and its main lake Chocorua Lake. North of this water, fringing the river for half a mile, is a growth of yellow birch, beech, and hemlock of considerable age and size. The dainty Parula is frequently seen in its gray moss. Cooper's Hawks, Broad-winged Hawks, and Yellow-bellied Woodpeckers are common tenants of its shades. On June 1, 1888, while nest-hunting in its midst, I saw a Barred Owl sitting on the edge of a cavity in a beech. The tree was a giant. The cavity was about thirty-five feet from the ground, on the southwesterly side, and quite large. The Owl did not move, even after I threw a stick at her. Convinced that the cavity was worth exploring, I went home and returned with a friend, a ladder, and a gun. As a result two old birds were shot, and two young ones taken from the nest. The gun was quite necessary, for my friend would have fared badly in climbing if I had not shot the old birds before they could attack him. Their threatening cries and loud snapping of their beaks were quite enough to discourage an unarmed robber.

I wrapped the two young birds in a towel and later placed them side by side in an ordinary canary cage. They were savage, using beaks and claws vigorously. When released in my door-

yard they half hopped, half flew towards the nearest tree, making such rapid progress that I did not risk their loss by a second experiment. For their permanent prison I chose a case in which a piano had been boxed. By standing it upon its end, and nailing perches at different heights, ample space was given the captives. The front of the box was barred horizontally by laths.

On what could the Owls be fed? That was my first problem. Not sharing in the belief of my family that everything in feathers eats dough, I tried raw beef. The birds found it too tough to manage readily, and raw liver was substituted. Nothing could have suited them better, and for the best part of eighteen months liver and beef kidney have been the chief of their diet. For the birds' names the feminine half of my household agreed upon 'Puffy' and 'Fluffy.' At first the names were not of much use, for no one could tell one bird from the other, but it was not long before an event occurred which not only caused them to be readily distinguished, but led to a lifelong differentiation of their characters and careers. Puffy, or he who was thenceforth to be Puffy, caught his left wing between two of the laths, and by his struggles injured it so that it lost most of its usefulness as a wing and became rather an obstruction to his free locomotion. This happened about the middle of June, after my return to Cambridge, and I did not see the Owls again until the second week in July when my long vacation at Chocorua began. I found the birds fifty per cent larger than when I first handled them, and with tempers similarly developed. No one's fingers were safe inside the bars when the young gluttons were hungry. When satiated they were stolid, and did little beyond moving their heads and snapping their beaks. One interesting fact had been developed during my absence: the Owls not only drank water freely, but took prolonged baths whenever fresh water was given them. Their tank was a foot and a half long, a foot wide, and ten inches deep. Their reflections in this comparatively deep and dark pool greatly amused them for a time. On the arrival of fresh water Fluffy was usually the first at the brink, ready to drink several times, and then to step cautiously in. He would test the depth before ducking his head, and then, holding out his wings, he would pump the water under them, flapping his tail and otherwise drenching himself. When thus soaked he became about the size

of a plucked pigeon, the color of a Crow, and a dismal object to look upon. His eyes at such times would stand out from his drenched and drizzling feathers in a most unpleasant way. This habit of bathing has been maintained in all weathers and temperatures. I have seen both birds take their plunges on mornings when the mercury outdoors was not more than 10° F. On such occasions they shiver for hours before drying. After washing, it is their habit to preen each feather in their wings and tails with great care and precision.

During the summer and autumn of 1888, and at intervals since, I have tried various experiments in feeding the Owls. They reject all vegetable substances with the possible exception of cooked oatmeal, although they will sometimes play with apples, grape leaves, fresh twigs, corn silk and husks, tearing them up solely for amusement apparently, and flinging fragments in all directions. Mice they consider a rare treat, and they swallow them without hesitation, head foremost. With birds they are equally pleased, but if one is larger than a Redstart they are quite sure to crush the skull, sometimes eating the head separately, then to pull out the stiff feathers, and after feeling of the wing joints, to swallow head foremost. A Hermit Thrush thus prepared is about the limit of their single swallowing power. They sometimes, especially with larger birds, devour the contents of the abdominal cavity before swallowing the trunk. When an appetizing mouthful has been started on its downward journey the expression of gluttonous enjoyment thrown into their half-closed eyes and distended mouths is something beyond words. One seems to see them taste the morsel all the way down! If a mouthful sticks at first, they jerk their bodies up and down with considerable force, literally ramming it in by concussion. Sometimes the tail of a Warbler thus being lost to sight, remains in one corner of the Owl's mouth. The Owl's practice then is to turn his head towards it far enough to twist the unwilling feathers into the middle of his tongue, and then to swallow violently, always with effect.

With great interest in the result I placed nine live perch and bream in the Owls' tank one morning when they were about three months old. They had never seen fish before. As the light played upon the red fins and bright scales, the birds' excitement was amusing to see. In a very short time, however, they plunged

feet foremost into the water and with almost unerring aim lanced the victims with their talons and flew out with them. Then the head was crushed at its junction with the back bone, the spines were bitten into jelly, and the fish was swallowed. I have seen half a dozen small hornpout caught, disarmed, and swallowed by them in a comparatively short time. Generally all the fish in the tank were caught and killed before any were eaten. Live frogs called for more agility than live fish. When placed on the bottom of the cage or in the water tank, the frogs seemed to realize their danger, and as a rule remained motionless. The Owls would hang their great heads towards them, and eye them intently. The faintest sign of life would lead to a pounce or a desperate chase round the cage. When caught, the frog was subjected to a careful overhauling. Every joint was felt and crushed. As they slid the slippery legs through their beaks they seemed to be searching for spurs or horns which might prevent easy swallowing. Once found spurless, the frog soon vanished. The wood frog seems to be their favorite species, and the leopard frog the least well flavored. Once Puffy caught a toad in the grass, but the creature apparently tasted so unpleasant that it was quickly dropped, while for several minutes the Owl hopped about shaking his head and making motions with his mouth expressive of disgust or even pain. A small salamander was eaten without hesitation.

Once, when unusually hungry, the Owls devoured more than a pint of large, fat earthworms, taking them from my fingers, or picking them up singly with their claws with wonderful dexterity. A plump slug was taken readily by Puffy, but almost instantly flung from his mouth with disgust. Fresh water muskels, abundant in Chocorua Lake, were taken with some hesitation and, I fancied, made Puffy miserable.

Flies, harvest flies, dragon flies, grasshoppers, and beetles of various kinds all proved enjoyable tidbits. But of snakes and turtles the Owls stood in terror during the summer of 1888. The appearance of either led the birds to make desperate efforts to escape between the upper slats of their cage. What was my surprise then, in the summer of 1889, to find that so far as snakes were concerned, timidity was changed to curiosity, and curiosity quickly transformed into an eager desire to catch, kill, and swallow. Even a dead milk snake, three feet long and fat, was eaten

piecemeal until only the well-picked skeleton remained. This was done in August, 1889. Small green snakes were seized by their middle and swallowed doubled, while still writhing.

Generally fresh meat is greatly preferred to that which is stale. I have seen both Owls retire in disgust to the top of their cage when some thoroughly offensive liver was offered them. On the other hand they devoured the skinned carcass of a Broad-winged Hawk when it was in almost as advanced a stage of decay, and once recently, when I placed a piece of luminous kidney in their closet at night, Puffy instantly pounced upon it. I have no doubt from other experiments that the light of the decaying meat, and not its smell, was what attracted him.

On one occasion I found a large number of mice in a barrel of excelsior. Carefully taking out most of the packing, I placed Puffy in the bottom of the barrel. The mice spun round him in confusing circles, but with great coolness he caught one after another until nineteen were disposed of. The Owls between them ate the entire number within six hours. Puffy is also expert in catching and killing chipmunks, when placed with them in a barrel. After seeing one or two let out of a box trap for his benefit, the sight of the trap was enough to bring him to the door of the cage ready to act as executioner. The junction of the head and body of a vertebrate is the point always chosen for the first effective use of the beak. The struggles of a dying victim seem to cause a certain cat-like excitement and pleasure.

During the warm months the Owls require food daily, and in considerable quantities. As cold weather comes on, their demands grow more moderate, and in midwinter they eat little and seem drowsy most of the time. Once or twice I have failed to feed them for nearly a week after giving them a hearty ration. In summer, when fed frequently, and on mixed animal food, they often eject from their throats round pellets made up of the bones, hair, feathers, or other undigested portions of their preceding meal. Once or twice these ejections have been extremely offensive in odor. When hungry the owls betray the fact by whining cries. When fed, if both secure a hold on the first piece of liver, a spirited tug of war ensues, wings, beak, free foot, and tail all being used to gain ground. During such a scrimmage a queer chattering with an undertone of angry whining is kept up, but I never have seen either bird attempt to wound or really injure the

other. Food not required by one of the Owls for immediate use is always hidden in a corner, and often guarded with care against appropriation by the other.

Contrary to my expectations the Owls are not appreciably more active in twilight hours than at other times, and I think they are quiet, possibly asleep, at night. I am certain that in an ordinary degree of darkness they cannot see. If the light goes out while Fluffy is flying in my cellar in the evening, he is sure to crash into something or fall heavily to the ground. I have held Puffy close to a cat in the dark, and he was wholly unaware of her presence. Neither of them has ever shown a dislike for sunlight, and, as will be seen hereafter, they can see without difficulty in the face of the brightest natural light. While watching anything which interests them they have a most characteristic habit of throwing their heads far forward and then swinging them about like signal lanterns, or waving them back and forth and up and down, as if seeking the clearest avenue of vision to the object of interest. This trick is probably due to their ancestors' peering through thick branches in search of prey.

About the third week in September, 1888, the Owls were sent by freight from Chocorua to Cambridge. The journey failed to disturb them, and they took kindly to city life in a sunny corner of my cellar. Their near neighbors were my hens, who resented deeply my early experiments in letting the Owls out in their narrow dominion. The hens fought them bravely when brought to close quarters. My first test with the Owls at liberty proved that they neither feared me nor desired to attack me. They recognized me as their caterer, and hailed my approach with noisy demands for food. I began handling them with heavy gloves which their beaks and talons made little impression upon. Gradually I came to use my bare hands, and with Puffy especially I was soon on familiar terms. The way in which I accustomed him to handling was by first rubbing the top of his head with one finger, and then softly rubbing the back of his head and neck with my finger tips. During the process he seemed almost mesmerized, although occasionally he would recover himself and make a swift snap at my retreating fingers. In the course of a few weeks I gained sufficient influence over both birds to carry them about with great freedom, always beginning by pushing their heads down, and then clasping them round their bodies just be-

low the wings. If turned on their backs while thus held, they remain entirely quiet.

During the greater part of the long winter I keep them in a closet in my main cellar. I found to my cost that I could not keep them in the sunny cellar where my hens were, for the reason that they caught and ate some of my pullets and terrified the survivors so that their lives were a burden. Their only delicacies in these months are mice. Their attitudes in chasing a dead mouse dragged over the cellar by a string are striking. Fluffy sails noiselessly over the ground with feet pointed forward and claws ready to close, but Puffy, unable to fly, stalks across the floor, his head pushed forward, and his feathers drawn away from his legs.

As the spring of 1889 came on, the Owls became tuneful after their kind. The quality of their sounds suggested feline music, while their accent and metre often aroused my roosters to responsive crowing. They seldom hooted more than once or twice, and then in the early evening.

With the coming of warm weather and the return of birds in the spring of 1889 I began a series of experiments with Puffy which proved of considerable interest. I had found that he was willing to be carried about while perching on a short stick. Taking him in a basket to some woods in the suburbs of Cambridge, I displayed him to the Robins, Pigeon Woodpeckers, Vireos and Warblers which chanced to be at hand. No impresario ever was more delighted at the success of a new star. A full house gathered at once. Armed with a field glass I had the satisfaction of studying at short range the whole bird population of the neighborhood. The Robins, Brown Thrushes and Pigeon Woodpeckers were the noisiest, the Oven-birds and Red-eyed Vireos the most persistent, the Chickadees the most indignant. The Woodpeckers went so far as to fly past the Owl so close as to brush his feathers and make him jump at each charge. On May 12, during a three hours' walk, I saw over forty species of birds, many of which—as for example, Nashville and Prairie Warblers—I had unusual and ample time to study through my glass, thanks to their interest in the Owl and consequent indifference to me. It was not, however, until my long vacation in Chocorua, beginning July 6, that I really had time to ascertain the full value as a magnet of my patient little bird companion.

The Owls made the journey back to the mountains with perfect composure. On being returned to their piano-box cage they promptly sought their respective corners, and showed in many ways their recognition of old surroundings. This power of memory was even more strongly shown on their arrival in Cambridge in October, 1889, when Fluffy flew across the cellar in search of a favorite perch which had been removed, and the absence of which caused him to end his flight in an ignominious tumble.

On my arrival at Chocorua I began to keep systematic account of all birds seen each day, making careful allowance for birds seen twice in the same day. Between July 6 and Oct. 14, I recognized 9,782 birds, representing 95 species. On nearly half the days in this period Puffy was my companion on my walks and rides. At first it was not easy to induce him to leave his cage and accompany me, but after a few lessons he consented to step from his perch upon the short pine stick on which I used to carry him, and to remain clinging to it while I walked or ran, scrambled over ledges, or forced my way through thickets and brambles. He went more than once to the heights of Chocorua; passed hours travelling through dark woods and high pastures; or perched resignedly on the sharp prow of my Rushton boat, watching dragon-flies skimming the surface of the lake, and his own image reflected in the water. In the woods if I held him too near a tempting log or projecting branch he would hop off. Sometimes he would weary of my walking, and, jumping to the ground, would scurry away to cover and snap his beak angrily if I poked his perch in towards him and told him to "get on." As the summer wore on he grew more and more obedient and less inclined to nip my fingers on the sly as he had a way of doing when I first carried him about. This winter I have trained Fluffy to step up beside his mate and submit to being carried around the house on a perch.

Whenever on my summer walks I came to a spot which I wished to 'sample' for its birds, I would place Puffy on a bending sapling, and hiding in the neighboring foliage, I would 'squeak' by drawing in my breath over the back of my hand, and attract the attention of any birds which were near by. Usually in the deep woods the first comer was a Red-eyed Vireo, Chickadee, Hermit Thrush, or Oven-bird; but whichever it chanced to be, an alarm was almost sure to be given that would bring birds

from all directions eager to see the cause of disturbance. Even when I was imperfectly concealed, the irritated crowd paid little attention to me, provided I kept reasonably quiet. Sometimes I would leave the Owl in comparatively open ground on a boulder in a pasture, or a stump in a meadow. Then his favorite position was with his head tipped directly backward and his eyes, half closed, fixed either on the sun or a spot not ten degrees from it. I never could fully understand this attitude, but I soon found that the Owl was keenly alive to anything passing skyward, for if a Hawk or Crow came into view far away in the deep blue, Puffy's gaze was instantly turned full upon the growing speck, the eyelids partly closed and a most intent look coming into his eyes. Again and again Puffy has seen Hawks or Gulls overhead which my eyes, although unusually far-sighted, have at first been unable to discern. On one eventful day he showed me 334 Hawks sailing southwest under the pressure of a stiff northeast gale. It was September 10, one of the later of the days when the fires were raging among the forests along the St. John River. The Hawks were most of them flying very high. I saw none before 9 A. M. or after 2.15 P.M. I think Puffy saw every one of them. It mattered not whether they came singly or in bunches of twenty to forty, his ever ready eye was upon them as soon as they came into view. In spite of this marvellous power of detecting moving objects in a bright light, my pets often utterly ignore some dainty morsel merely because it does not move. Their sense of smell is either weak or uncertain in its action. Their hearing on the other hand is acute, although not depended upon in the same degree as their sight.

Of the various families of birds which Puffy annoyed during the summer of 1889 none were more distressed and angered by his presence than the Woodpeckers, Thrushes, and Vireos. In every hemlock swamp the Yellow-bellied Woodpeckers and Flickers said their say against his character with petulant emphasis. The Flickers often flew close to his head. Downies and Hairies liked him no better, but were less demonstrative. It was when a venerable and fiery-tempered Logcock caught sight of him on August 21, that the full force of Woodpecker eloquence was let out. Puffy seemed to recognize a hereditary foe, for before the Pileated came into my view the Owl suddenly changed his

appearance from rough-feathered and sleepy content to an astonishing resemblance to an old moss-grown stump. He effected the transformation by standing up very straight, nearly closing his eyes, and making his feathers lie absolutely sleek against his attenuated body. Once on another occasion when he ran away from me, he climbed to the top of a small oak stump and made himself look so like a continuation of it that I passed him four times without detecting his presence. Not so the Pileated, for with a shrieking cackle, his crest gleaming in the sunlight, he flew at the Owl so savagely that I expected to see my pet slain on the spot. He only ruffled Puffy's feathers, however, and made the poor bird unhappy for some time by his discordant cries and frequent flights and counter flights.

Of the Thrushes, the Robins took the Owl most to heart. More than once in black cherry time I have seen sixty to a hundred of them within twenty-five feet of him. Their blended cries always drew Hermits and Swainsons from the woods, Cedarbirds from their cherry feasts, and detachments of Warblers from woods and meadows. The Veeries seemed to care least about their enemy; the Hermits said little, but did some hard thinking. The Swainsons, especially after sunset, had a good deal to say in a refined way, flirting wings and tail meanwhile. The numerous Catbirds and occasional Thrashers were coarsely abusive. Through it all Puffy made no remarks, and seldom stirred; he found out long ago that he could not catch birds.

The ubiquitous Red-eyed Vireo never wearied of staring at Puffy, and firing at him his suspicious, expostulating 'cree'! By roadside and meadow, upland pasture, and in the deeps of the beeches, the Red-eye was always present. Even in the haunts of the Juncos and White-throated Sparrows on the high ledges of Chocorua he was not absent. My count of birds in July showed him to be inferior in numbers only to the Barn Swallow, the Cedarbird, and the Robin. Far less numerous, but a leader among the haters of the Owl, was the Blue-headed Vireo. I had seen little of the bird in previous seasons, but Puffy seemed to draw one or more of them from every considerable area visited. Their scolding reminded me of an angry June-bug in a bottle.

As a rule the Sparrows cared little for the Owl. Purple Finches would come and look him over, the female making a sweet little note of inquisitive protest, and then go away.

Goldfinches did about the same, showing no anger. Grass Finches sat about on boulders and said little, and their friends, the Field Sparrows, behaved similarly. In large swamps one or two Rose-breasted Grosbeaks generally came to see what caused so much outcry but they never approached close to the Owl. During the flight of Juncos, White-throats, and White-crowned Sparrows in October, these species seemed to care almost nothing about Puffy after a first bustling visit of inquiry.

A bird of great individuality and irregular distribution is found in the Chocorua country in considerable abundance. I refer to the Great-crested Flycatcher, which, by the way, always places snake skins in those of its nests that I find. No amount of bird clamor will bring this self-contained and suspicious citizen near my Owl. He has his own affairs to care for, and he has a contempt for brawls and gossip. Similar indifference was shown the Owl in a less marked way by the smaller Flycatchers, but the Kingbirds maintained their reputation for bullying, by attacking Puffy and striking him lightly again and again by well-directed darts from above.

The Swallows and Swifts delighted to tease the Owl by dashing past him and fanning him with their wings. They showed no fear or hatred. Kingfishers took no notice of him. The Black-billed Cuckoo came near, and had a good deal to say in a reproachful voice, but its controlling emotion seemed to be curiosity rather than fear. Late one afternoon in August (the 2d) I placed Puffy in the midst of a white birch grove near a brook. A Cuckoo opened the opera and brought some Vireos including two Solitaires. Their explosions were audible a long way, and for a moment or two the air seemed full of birds, nearly all Warblers, and all coming towards the Owl. I could not count them; they came by scores and swarmed about incessantly like bees. Most of them were Black-and-white Creepers, Black-throated Greens, Chestnut-sideds, Black-and-yellows, Canadians, and Redstarts, young birds predominating. I never expect to see more Warblers in one noisy bunch. As a rule, however, a glance or two seemed to satisfy them, and they went off after their suppers. Of all the Warblers, the Oven-birds were the only ones at all persistent in abusing Puffy. They would come quickly and stay long, with ruffled feathers and anxious notes. One day (July 14) while exploring some dense

spruce thickets on a high ridge of Chocorua I came across a pair of Blackpoll Warblers. They were much excited by the Owl and joined with Juncos and White-throats in prolonged complaining at his presence. A White-winged Crossbill, flying by at the moment, alit and looked us over, but was apparently not at all interested in Puffy.

Another bird which never showed any special emotion on seeing the Owl, no matter what the season, was the Scarlet Tanager. As a rule it took no notice of the Owl's presence. Cedarbirds were similarly indifferent even when the Owl was near their nests or young.

Crows and Blue Jays showed great hatred of the Owl. In the late summer the Jays prowled about in considerable flocks. By 'squeaking' I could draw them near enough to see the Owl, and then the harshest and most violent kind of bird abuse would be poured out on Puffy's head. Jays certainly have a broad knowledge of profanity. The Crows were scarcely less demonstrative; circling low over the Owl, they made the woods ring with their angry clamor. I found that I could attract them by hooting like my pets.

As a rule the Hawks cared little for the Owl. I shot one young Cooper's Hawk near its nest because my calling and the Owl's moving about induced the creature to fly up, tree by tree, until within range. On July 23 while 'squeaking' I was astonished to see an *Accipiter velox* make a dash at Puffy, scaring him into his stump-like condition of plumage and attitude. I continued to 'squeak', and the Hawk flew straight at my head, grazed my face, and lit near by. Soon a second came, but was more wary. I amused myself with them for half an hour, and again on another day a week later. On no other occasion do I remember a Hawk's taking any notice of Puffy, although in many instances he has betrayed their presence by his change of shape and expression. Once while walking with him along the shore of Chocorua Lake he changed his whole appearance in the twinkling of an eye, and as I turned to follow his gaze I saw an Eagle strike the water near by, dashing the foam high into the air.

About sunset on August 12, 1889, I heard a Barred Owl hooting near a small lake close to the foot of Chocorua. Two of us set out at once with guns and reached the crest of a kame near the lake just as the moon rose. After waiting quietly until weary,

I began hooting, and to my surprise and delight an Owl responded from a tree close by. I hooted again; it came nearer. Then I 'squeaked,' and the next second I hastened to hide my head in the bushes, for the wings of an Owl had brushed my face in the darkness, making cold shivers run down my back. We fired three times at this Owl and another which joined him, but failed to kill either. After amusing myself and others several evenings by calling the Owls in this way, I took Puffy with me and placed him on a swinging bough where he was plainly visible to crepuscular eyesight. Several Swainson's Thrushes found him out before twilight faded, and complained softly at his presence. When all was still, I hooted, and soon an Owl replied from the farther shore of the lake. Continuing to call, I had the satisfaction of seeing my bird fly close over Puffy's head and alight within easy range, another Owl at the same time beginning to hoot close by. I shot one and was satisfied. Puffy and Fluffy always show great excitement when wild Owls hoot at night, and occasionally Fluffy replies.

The only other Owl which I have seen thus far in the Chocorua region is the Acadian. On July 18, about six P.M., listening to four Great-crested Flycatchers signalling each other in a wooded pasture, I noted an unusual commotion among Robins, Hermits, and Vireos in a bunch of alders not far away. Creeping in, with Puffy held before me, I saw the scolds surrounding a buff-waistcoated young Acadian perched about five feet from the ground on an alder. He saw Puffy, and Puffy looked at him with interest and attention. The agony in the little bird's yellow eyes was pitiful. He gazed long, and then, turning his head slowly away, sailed noiselessly out of sight, followed by the gossips.

There are several of the Chocorua birds which I have not named in connection with the Owl. The Bluebirds seemed grieved to think anything so wicked could exist. They perched near him and seemed to be trying with their sweet tones to induce him to give up being an Owl. The Kinglets cared nothing for him, even when their curiosity was aroused by the abuse of Chickadees, who were among the noisiest of Puffy's visitors. Both Nuthatches are common near Chocorua, and both showed by brief, business-like remarks what they thought of Puffy. Winter Wrens told Puffy plainly that he was a thief. The Indigo-bird was one

of the few Finches which seemed much disturbed by him. The Towhee showed moderate excitement. The *Icteridæ* are uncommon in the Chocorua region, and none of them met Puffy in his native meadows. About Cambridge, however, Orioles, Red-wings, Crow Blackbirds, and Cow Buntings all showed marked excitement and anger at his presence. Nighthawks and Whip-poor-wills have not met Puffy. I hope next summer to arrange an interview with a Whip-poor-will who haunts my pasture bars. Once or twice Hummingbirds have buzzed a moment near Puffy's head, as if adding their small tribute of hatred to the general estimate of his character.

None of the few species of game and water birds found near Chocorua Lakes have seemed to show any interest in the Owls.

I have recently taken Puffy to Chocorua in the season of snow. Of the eight species of birds met only four saw the Owl. They were Chickadees, Red-bellied Nuthatches, Redpolls, and Blue Jays. They all scolded him, but not with the average summer emphasis. The Redpolls showed only mild curiosity which soon expended itself in gentle reproachful phrases. Puffy did not mind cold, but the light from the snow seemed to blind him. Indoors he held two young hounds at bay, and made their lives miserable by refusing to allow them to come near his corner without risking an attack from his beak and claws. With dogs and cats outdoors he always shows fear unless they come to close quarters; then, as indoors, he spreads and arches his wings, raises his feathers on his back, lowers his head, and snaps his beak, sometimes making swift rushes with an expression so fierce that I have yet to find any quadruped willing to defy him.

A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA.

BY W. E. D. SCOTT.

(Concluded from p. 22.)

***Anthus pensilvanicus*.** AMERICAN PIPIT.—In the interior of the State I have noted this species as early as November 1. This was at Ocala in 1879. On the Gulf coast the birds appear in small numbers the latter part

of November, but are apparently never very common; nor regular migrants as far as time of appearance is concerned. Mr. Atkins noted "a flock of ten or twelve individuals at Key West on December 7, 1888, and a similar flock later in the same month."

Mimus polyglottos. MOCKINGBIRD.—An abundant resident on the Gulf coast of Florida. In the region about Tarpon Springs the birds begin to mate and are in full song about February 1. The earliest note of birds in song at this point is January 17. There are at least two broods, and probably three in some cases, reared during the breeding season, which lasts from the first of February to the last of July. Then there is a period of about two months when it is unusual to hear the song, but in October and November a secondary season of song begins which seems to conclude with the latter month, the birds beginning to sing again about the middle of January.

Mr. Atkins found the birds abundant residents at Punta Rassa, and says that at Key West they are "common in winter and in spring, but not detected breeding." This was during the years of 1887 and 1888. Later observations, in 1889, revealed a *single* pair breeding on the Island, and this was the only pair observed during the past summer. It is, therefore, fair to conclude that the birds are rare during the breeding season on the Island of Key West.

Galeoscoptes carolinensis. CATBIRD.—A common migrant and winter resident in the vicinity of Tarpon Springs, but not detected on the Gulf coast during the breeding season. The first birds arrive early in September, and they remain in numbers till April 1 to 10. Mr. Atkins's observations at Punta Rassa and at Key West, coincide with the above notes, but at Key West he observed two on May 25, 1889; these were not seen later.

Harporhynchus rufus. BROWN THRASHER.—This species' time of appearance and leaving on the Gulf coast appears to coincide very closely with that of the Catbird. Mr. Atkins found it at Punta Rassa after October 10, 1886, but only met with the species on three occasions in the region about that place. He has not observed it at Key West.

Thryothorus ludovicianus miamensis. FLORIDA WREN.—In 'The Auk', Vol. V, p. 187, this subspecies was referred to as the representative form of all the Gulf coast of Florida at least as far north as the mouth of the Anclote River. Since then a very large series has come under my observation, confirming this opinion. This series of birds embraces individuals of both sexes, and approximately of all ages, and consequently the seasonal variation in coloration is clearly shown, as well as some interesting phases of individual variation, and finally the variation due to age. Mr. J. A. Allen has kindly examined and compared this material with representatives in the collection of the American Museum of Natural History in New York.

I quote as follows from letters from Mr. Allen, whose views coincide in detail with my own.

"Of the forty-six Wrens (*Thryothorus*) thirty are males and sixteen

are females; they include thirteen birds of the year, which differ from the adults in being much paler, as well as smaller. Below they are dull, rather strong, buffy white, with faint blackish edges to the feathers of the jugular region and sides of the throat, varying in distinctness in different specimens. Above, the head is darker, and the chestnut is of a duller, darker tone.

"The range of individual variation in color in the adults, especially of the lower surface, is very marked, the color below varying from very pale to very strong cinnamon, with or without blackish bars on the flanks. There is a less marked variation in the tone of the reddish chestnut of the upper parts.

"There appears to be no sexual variation in color, several of the strongest colored birds being females. There is, however, a slight average difference in size, the wing in the females averaging one sixth of an inch shorter than in the males.

"Two of your specimens are exceptional in having the flanks strongly barred with black. One is a male (No. 6052, Tarpon Springs, June 7, 1888), the other a female (No. 6064, Tarpon Springs, June 13, 1888). The female is dark cinnamon below, the male very pale cinnamon. Both are adult birds. A number of other specimens show traces, more or less distinct, of blackish bars on the flanks, apparently about one specimen in ten. Those with broad, heavy black bars on the flanks are apparently in the ratio of about one to twenty-five. The heavily barred, strongly colored No. 6064 bears a striking resemblance to Mexican (Tampico) specimens of *Thryothorus l. berlandieri*, the latter differing in smaller size, a longer, slenderer bill, less intense chestnut above, and grayer head, wings and tail.

"Your series shows in a very interesting way the seasonal variation in color between summer and winter plumage. The winter (December to April) birds are much more intensely red above, and much stronger (almost reddish) cinnamon below, than the summer (breeding) birds, taken in May, June and July.

"I refer all of your specimens, and also a considerable series collected near Micco, on the east coast of Florida, by Mr. Frank M. Chapman, to *Thryothorus ludovicianus miamensis*. On the other hand Mr. Chapman's series taken at Gainesville, Florida, in winter are all referable to true *ludovicianus*. How much below Gainesville *ludovicianus* may extend in winter, or how much above the Indian River district of the east coast, and Tarpon Springs on the west coast, *miamensis* is found, cannot at present be determined. It seems probable, however, that the habitat of *miamensis* will include at least the southern half of the Florida peninsula, and that *ludovicianus*, even in winter, may be restricted to the northern half and northward.

"As to the differences characterizing the two forms, *miamensis* is much the larger, and much more strongly colored. Thus ten males of *miamensis* taken in June and July average as follows: Wing, 2.46; tail, 2.19; culmen, .70 inch; while ten males of *ludovicianus* from various localities

(New Jersey southward to North Carolina) average: Wing, 2.27; tail, 2.04; culmen .63 inch.

"The Tarpon Springs birds are evidently less differentiated from *ludovicianus* than Miami birds, on which *miamensis* was originally based, yet they are already so different from even north Florida birds that it seems better to refer the Tarpon Springs birds to the southern race."

I am greatly indebted to Mr. Allen for the very careful diagnoses and observations above quoted, and heartily concur in all he says.

Mr. Atkins did not find representatives of this subspecies at all commonly at Punta Rassa, where his only record is one taken on April 12, 1886. He has furnished me with no records for the Island of Key West.

Troglodytes ædon. HOUSE WREN.—A common migrant, arriving later in the fall, remaining throughout the winter in numbers, and leaving early in April for the north. The latest spring record at Tarpon Springs is of a male bird taken April 12, 1886. This specimen was moulting. Mr. Atkins says the species is a common winter resident at both Punta Rassa and Key West.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—A rather common winter resident in suitable localities in the vicinity of Tarpon Springs. Here I have taken the birds in both salt and fresh water marshes, though marshes of sedge grass where the water is brackish and the sedge not very high nor dense seem to be preferred. The birds arrive at this point in September and remain until April 1 to 10. Mr. Atkins has not met with the species at either of the points where he has collected.

Of the thirty individuals that have come under my notice at this point, the only marked variation in color is in the intensity of the buffish of the under parts, which varies from pale but decided buff to a deep shade approaching cinnamon. There is also a decided tendency to blackish barring on the flanks, which though absent in many individuals is very decidedly conspicuous in others. About one third of the birds examined have this characteristic more or less pronounced.

Cistothorus palustris. LONG-BILLED MARSH WREN.—A rather rare winter visitor in the vicinity of Tarpon Springs. About fifteen individuals have been collected in December and January in the past few years. Mr. Atkins has been unable to detect the presence of this species at either Punta Rassa or Key West.

Cistothorus marianæ. MARIAN'S MARSH WREN.—This species is an abundant fall, winter, and spring bird in all suitable localities in the region about Tarpon Springs and to the north of the mouth of the Anclote River at least as far as Cedar Keys, and probably on the Gulf coast of the State from that point northward and westward. I have found them most commonly on the salt water marshes at the head of tide water, but have detected them in the saw-grasses of the fresh water lakes and ponds that I have investigated for at least ten miles back from the coast. It seems probable that a few representatives breed, at least in the vicinity of Tarpon Springs, for though no nests or eggs have been obtained, I

have seen in all three or four *old* nests of Marsh Wrens, and the birds are present, though rare, in the marshes in summer.

In habits they are very like their near allies. The period of song does not seem to be wholly suspended, so far as I am aware, at any season. The season of song, however, really begins about the last week in January, and after that time it may be heard constantly until the middle of March or first of April, when most of the birds have left this region.

In character the song is similar to that of *Cistothorus palustris*, but the difference, though difficult to describe, is easily appreciated by the listener.

Sitta carolinensis atkinsi, subsp. nov.

FLORIDA WHITE-BELLIED NUTHATCH.

After carefully considering the representatives of *Sitta carolinensis* that occur in the region about Tarpon Springs, there appear to be such constant and regular deviations in color, size, and relative proportions of the different parts, from the representatives of the species collected from Massachusetts southward to North Carolina, that I feel warranted in calling attention to so well marked a form as occurs in this portion of Florida, and in suggesting the recognition of a new subspecies to be called *Sitta carolinensis atkinsi*. This name is given to record in a slight way my great appreciation of the careful work done by my friend Mr. John W. Atkins of Key West, on the birds of that portion of Florida.

Types, 3940 (Coll. W. E. D. S.), ♂, Tarpon Springs, Florida, April 21, 1887; 3164 (Coll. W. E. D. S.), ♀, Sept. 27, 1886, Tarpon Springs, Florida.

General characteristics.—Average of wing, as compared with northern birds, .20 in. smaller in males, .15 in. smaller in females. Bill relatively much longer and slenderer. Light markings of tipping of the coverts and quills of the wings decidedly narrower. A little less white in the tail. In the female birds the *black* of the top of the head and nape is *pronounced*, and it is difficult to distinguish the sexes easily, and in some cases impossible, by the color of these parts.

Average size of *Sitta carolinensis* as given by Mr. Robert Ridgway (Manual N. A. Birds): Wing, 3.60; tarsus, .72-.75; culmen, .84 inch. Wing, culmen and tarsus of four males and five females from vicinity of Tarpon Springs:

				Wing.	Culmen.	Tarsus.
3940.	♂ ad.	Tarpon Springs, Fla.	April 21, 1887.	3.28	.72	.70
3163.	♂ ad.	" " "	Sept. 10, 1886.	3.40	.74	.68
7579.	♂ ad.	" " "	Jan. 1, 1890.	3.44	.71	.69
7578.	♂ ad.	" " "	" " "	3.38	.73	.71
3161.	♀ ad.	" " "	Sept. 17, 1886.	3.40	.69	.70
3165.	♀ ad.	" " "	" 27, "	3.34	.78	.70
3510.	♀ ad.	" " "	Oct. 21, "	3.30	Broken.	.72
3164.	♀ ad.	" " "	Sept. 27, "	3.21	.72	.68
5000.	♀ ad.	" " "	Feb. 13, 1888.	3.26	.73	.69

Of these five females 3161, 3165, 3164, and 5000 are all deep lustrous black on head and nape without traces of grayish or plumbeous washing, while 3510 has these parts slightly suffused with plumbeous.

A young male nestling bird taken on April 21, 1887, just after leaving the nest, has the black of head and nape only slightly less lustrous black than in the adult birds.

The variation in the Florida form is mainly in the direction of the western subspecies *aculeata*, but the bill is less attenuated; the gray of the secondaries is purer, and there are other minor differences of coloration.

The birds do not appear to be common about Tarpon Springs, but are residents, and breed early in March.

Sitta pusilla. BROWN-HEADED NUTHATCH.—A rather common though locally distributed species in the region about Tarpon Springs. Here the birds are resident, and breed from early March to the latter part of April. Mr. Atkins took the species at Punta Rassa, where he considered it rare, but has not found it on the Island of Key West.

Parus bicolor. TUFTED TITMOUSE.—A common resident on the Gulf coast, at least as far south as Charlotte Harbor. Mr. Atkins did not record it at Punta Rassa nor has he found it at Key West.

Parus carolinensis. CAROLINA CHICKADEE.—Not quite as common as the last but apparently of about the same distribution. Resident, and breeds, in the region about Tarpon Springs. Mr. Atkins has not met with it at either of the points where he has collected.

Regulus calendula. RUBY-CROWNED KINGLET.—Common migrant and winter resident about Tarpon Springs. Arriving about November 1, they remain in numbers till late in March. Mr. Atkins has not recorded them at the points where he has collected.

Polioptila cærulea. BLUE-GRAY GNATCATCHER.—A rather common resident in the region about Tarpon Springs breeding in April in numbers. Mr. Atkins regards it as a migrant at both Punta Rassa and Key West, at which points it is common. It is absent from these localities from about April 1 till the last of July or middle of August.

Turdus mustelinus. WOOD THRUSH.—A rather rare spring and fall (?) migrant on the Gulf coast of Florida. I have found them in the vicinity of Tarpon Springs in early April on two occasions. Mr. Atkins found them rather common at Key West on April 29, 1887, and saw the last ones on May 3, 1888.

Turdus fuscescens. WILSON'S THRUSH.—Not obtained in the vicinity of Tarpon Springs nor at Punta Rassa. Mr. Atkins found the birds common at Key West on April 28 and May 3, 1887. They were not observed later.

Turdus aliciae. GRAY-CHEEKED THRUSH.—Taken on rare occasions in the vicinity of Tarpon Springs in April. On April 28, 1887, two were noted, and one taken. Not recorded by Mr. Atkins at Punta Rassa nor at Key West.

Turdus ustulatus swainsonii. OLIVE-BACKED THRUSH.—Not observed

in the vicinity of Tarpon Springs, but Mr. Atkins found them at Key West rather commonly on April 28, 1887, and again saw them on May 3 of the same year.

Turdus aonalaschkæ pallasii. HERMIT THRUSH.—Common migrant and winter resident on the Gulf coast. Mr. Atkins found it common in winter at Punta Rassa and has a single record of it at Key West in January, 1889.

Merula migratoria. AMERICAN ROBIN.—An irregular migrant, but present in small numbers almost every year, and sometimes abundant. Appears late in December, and remains till the 10th of March which is the latest record. Mr. Atkins says it was irregular in its visits to Punta Rassa, but common at Key West in December and January, 1887.

Sialia sialis. BLUEBIRD.—A rather common resident, and breeds, at all points I have visited on the Gulf coast of Florida. Mr. Atkins has furnished me with no notes regarding the species.

In this paper I have attempted to bring down to date the latest information regarding the birds of the region in question, but notes accumulated which treat of the species dealt with in the preceding parts (the publication extending back some two years) seem worth presenting, and I hope to offer in an early number of 'The Auk' a synopsis of the series, with such additional information as will bring the latest knowledge obtained before the readers of this journal.

ON THE CHANGES OF PLUMAGE IN THE BOBOLINK (*DOLICHONYX ORYZIVORUS*).

BY FRANK M. CHAPMAN.

THE MARKED seasonal changes which occur in the plumage of the Bobolink have ever been made a prominent fact in the life-history of this well-known bird, but I am not aware that the subject has been studied with a complete series of specimens representing each stage of the bird's plumage as it appears throughout its range. For this reason, perhaps, we may account for the generally accepted statement, that the change in the male from the female-like plumage of winter to the black and yellow costume of spring, occurs without loss of feathers but by a change

of color in the feathers themselves, accompanied by a wearing away of their more exposed portions, resulting in the breeding dress with which we are familiar. That this is in part true, there can be no doubt, but that this change is attended by a complete moult, is apparently proved by the material before me.

Before further discussing the subject it may be well to briefly review the seasonal and sexual costumes assumed by the Bobolink. The nestlings of both sexes resemble each other and differ from the bird of the year in having the entire plumage, particularly below, of a more buffy color; there is a necklace of faint dusky spots across the breast and the flank streaks are almost indistinguishable. This plumage is soon followed by the well-known Reed-bird dress in which, perhaps, the males *average* slightly brighter. The black streaks on the flanks and sides are now clear and well defined, the feathers of the breast have generally a small, black, basal shaft-streak, and a spot of the same color occasionally appears on the feathers of the throat. In the winter this plumage by fading and abrasion loses much of its brightness and the bird then closely resembles the worn breeding female. It is not necessary in this connection to describe the costumes of the adult female, nor have I material to fully discuss the subject. As far as I know, the adult bird in the fall cannot be distinguished from birds of the year.

In calling attention now to the main object of this paper, the costumes of the male bird, without at this moment dwelling on his appearance in full nuptial dress, we will first consider the change which follows the close of the breeding season. The bird now undergoes a complete moult, losing his entire plumage even to remiges and rectrices, and acquiring a new dress which at first glance is very similar to that of the bird of the year. Closer examination, however, shows well-marked differences. In the adult bird the feathers of the crown, particularly those of the median line, have larger black areas and are less regularly bordered with brownish: the secondaries are not terminated with a narrow edging of white, and the tertials lack the whitish border which is generally seen on those of the young bird. On the sides and flanks the markings are somewhat heavier but resemble those of the young bird, while the black basal areas on the feathers of the throat and breast are larger and more numerous, in some cases occupying the basal three fourths of the feather,

the buff then appearing as a terminal and slightly lateral border: This plumage then, while more nearly like that of the young bird, is in a measure intermediate between it and the breeding male, and we can readily understand how an examination of this plumage alone would easily mislead one into supposing the bird was acquiring the black male dress by a change of pigment in the feathers, to be followed by a wearing away of their exposed yellowish borders.

Our interest now centres in an adult male specimen, No. 32,783 of the American Museum collection, taken March 1, 1886, by H. H. Smith at Corumbá in southwestern Brazil. This bird is undergoing a complete moult, but has nearly acquired a new plumage, its exact condition being as follows: Above, the tertials, four secondaries, the first primary and alula of either wing belong to the old plumage, the balance is entirely new, but the scapulars, some of the wing feathers, and the tail have not completed their growth. The plumage of the under surface is more nearly complete, the old feathers being confined to the sides of the throat, abdomen, and flanks; in its dorsal plumage this bird bears a striking resemblance to the adult fall male before described. The crown lacks a median line, but the feathers have an even wider border of brown which, however, is now strictly terminal. The feathers of the nuchal band are without black shaft streaks and the exposed portions are of a deep rusty brown color, fading gradually to a white base; the interscapulars are black with an almost complete border of brownish yellow, similar, therefore, to those of the fall bird, but the black is deeper and of greater extent; the scapulars which have appeared are white for their basal three fourths, with the terminal portion brownish yellow or olivaceous-brown; the wings and coverts, referring now to the new plumage, are similar to those of the adult spring male but the feathers have wider and darker borders; the lower back is in poor condition, but apparently resembles that of the breeding bird; the feathers of the rump resemble the scapulars already mentioned; the tail, so far as it has appeared, agrees with that of the spring male. Below, the bird's plumage is most interesting; its general appearance may be described as black, heavily veiled with yellow,—all the feathers having a long terminal fringe of this color, which in no instance descends to the side of the feather. On the feathers of the breast this fringe averages in

width .15 inch; the centre of the abdomen is still occupied by feathers of the winter plumage, which are faintly bordered with yellowish; in the flanks still remain a few longitudinally striped feathers of the winter dress, but these are being replaced by black feathers terminally fringed similarly to those of the breast. Allowing for the slight and unimportant changes a completion of the moult will cause, it will be seen that we have here a bird which, although it has acquired its final spring plumage as far as feathers are concerned, still differs greatly from the black, yellow and white Bobolink we are accustomed to see. My material fortunately illustrates the succeeding changes which occur before the bird may be said to have gained its perfect nuptial dress.

An examination of the brown- or yellow-tipped feathers shows that their barbs are separated for at least their apical third, and that the brown or yellow color commences at or near the point of separation. Being thus without the mutual support furnished by an interlocking of their delicate barbules, these fringe-like terminations soon disappear before the constant wear and tear to which they are subjected. As we might suppose there is some regularity in the manner in which succeeding parts of the bird's plumage lose these terminal barbs, and they disappear first from the more exposed portions and persist longest where they receive the most protection. The head and breast, therefore, seem to be the first to become fully black, while the most perfect specimen before me (one of several kindly loaned by Dr. A. K. Fisher) still shows traces of yellow on the sides, flanks, and lower abdomen. In the nuchal collar, scapulars, and rump abrasion is evidently assisted by a fading of the more exposed portion of the feather.*

All these changes are closely correlated with a change in the color of the bill. In the Corumbà specimen it resembles that of the fall and winter bird; the mandible is reddish brown, the maxilla flesh color. The final black first appears on the anterior portion of the mandible and reaches its base before a similar

*While the loss of these delicate terminations is largely effected by actual abrasion, or even by the mere action of flying, it is evident that, losing their vitality, and lacking protection, they become in a measure deciduous, and drop off without the assistance rendered by a mechanical abrasion. The subject is an important one and deserving of more attention than has been accorded it. A similar change occurs in many other genera, for instance: *Otocoris*, *Agelaius*, *Scolecophagus*, *Passerina*, *Junco*, etc.

change is effected in the color of the maxilla, which, however, does not attain the same degree of jet blackness.

The second complete moult of the year is now finished, and again we have the rollicking Bobolink of our fields and meadows.

OBSERVATIONS ON SOME OF THE SUMMER BIRDS OF THE MOUNTAIN PORTIONS OF PICKENS COUNTY, SOUTH CAROLINA.

BY LEVERETT M. LOOMIS.

(Concluded from p. 39.)

29. *Cyanocitta cristata*. BLUE JAY.—It is remarkable that this bird, in the mountains, seeks a home on the wild and remote summits away from the settlements, while at Pickens Court House, only a dozen miles away, it is a familiar inhabitant of the shade trees of the streets and door-yards.

30. *Corvus corax*——? RAVEN. — The Ravens of this district are eminently birds of the mountain tops, venturing into the settled valleys only during brief excursions in search of food. They are said to descend to these lower grounds to feed on carrion more freely in winter than in summer. Their more frequent presence at the former season is ascribed to increased scarcity in the food-supply, but probably they are actually more abundant, re-enforcements coming from the higher points of North Carolina. Whenever the chance offers, their nests are broken up and the young destroyed, but in spite of persecution they continue to hold their own, and may justly be ranked as tolerably common. (See also Auk, VI, 277.)

31. *Corvus americanus*. AMERICAN CROW. — Occurs as commonly here as elsewhere in the up-country during summer.

32. *Spinus tristis*. AMERICAN GOLDFINCH. 'LETTUCE-BIRD.'—Rather common, especially in the Oolenoy Valley.

33. *Spizella socialis*. CHIPPING SPARROW. — A very common songster in suitable situations. On Mt. Pinnacle its range extends along the barren ridges, among scattered pines, to the heavy hardwood growth crowning the summit.

34. *Spizella pusilla*. FIELD SPARROW.—In the Oolenoy Valley these Sparrows are very common, but on the heights above they are sparingly distributed, being limited to the clearings. Their musical efforts exhibited the peculiarities characteristic of the species in the lower country.

35. *Pipilo erythrophthalmus*. TOWHEE. 'JOE-REE.'—June 5, while *en route* for the mountains, I shot a male in full song three miles west of Spartanburgh Court House. Another was heard singing later in the day at a mill pond on the Middle Tiger, also in Spartanburgh County. As I was returning home, July 4, through the same County, the call-notes of one were heard on the outskirts of the court-house town, while another sang with effect at my noonday camp, five miles south of it on the Spartanburgh and Union Railroad.

In the vicinity of Mt. Pinnacle it was seen only in the Oolenoy Valley, where it inhabited the scrubby growth of the clearings. It did not appear to be very common. As further showing the extension of this species along the northern boundary of the State during the breeding season, it is pertinent to add that in the early part of July, 1888, I heard two males sing daily at All-Healing Springs, at the foot of Crowder's Mountain—a peak of the King's Mountain chain, just over the line in North Carolina, about forty miles north of Chester.

36. *Cardinalis cardinalis*. CARDINAL. 'REDBIRD.'—Not detected above 2500 feet; common. Though prominent as musicians, their performances lacked the spirit and unction of spring. Along with the 'Joe-ree,' held in considerable ill repute because of alleged depredations on newly planted corn.

37. *Guiraca cærulea*. BLUE GROSBEAK.—A single male was seen, July 2, in the Oolenoy bottoms opposite Table Rock. My attention was directed to it by its song.

38. *Passerina cyanea*. INDIGO BUNTING.—Its vertical range unrestricted. Very common, and in complete song.

39. *Piranga erythromelas*. SCARLET TANAGER. 'PINY WOODS RED-BIRD.'—Above 2000 feet these Tanagers were very common, but below this none were discovered. The males sang with unabated ardor through the whole of June. The testes of several examined toward the close of the month were fully developed. Young birds—just on wing—were obtained June 24.

40. *Piranga rubra*. SUMMER TANAGER. 'REDBIRD.'—Up to about 2000 feet they were very common, but above this elevation they appeared to be replaced by *erythromelas*. They continued in good voice during the whole of my last stay.

41. *Progne subis*. PURPLE MARTIN. 'BLACK MARTIN.'—Wherever gourds were put up for their accommodation they were present.

42. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW. 'CREEK MARTIN'; 'BANK MARTIN.'—Seen daily hawking for insects over the bottom-lands along the Oolenoy. Tolerably common.

43. *Ampelis cedrorum*. CEDAR WAXWING.—An example was taken June 22, 1887, on a rocky stream, skirted by rhododendrons, in a heavily wooded ravine near the foot of Mt. Pinnacle. A second specimen was procured, June 26, 1889, in the large timber investing the summit of that eminence, at an altitude of about 3000 feet.

44. *Vireo olivaceus*. RED-EYED VIREO.—The most conspicuous of all

the songsters of the region. Very abundant in woods everywhere, on the highlands and in the valleys.

45. *Vireo flavifrons*. YELLOW-THROATED VIREO.—Common, seemingly confined to the middle and lower elevations. Its strong clear notes were a constant feature in the general chorus.

46. *Vireo solitarius alticola*. MOUNTAIN SOLITARY VIREO.—The Mountain Solitary Vireo is the least abundant member of the family thus far met with in this locality. It is sparsely distributed, occurring chiefly above 2000 feet. Two specimens were secured in the Oolenoy Valley—a female, June 11, and a male, June 13. It is at all times a persistent vocalist. There is a charm in its voice that instantly arrests attention, a charm not alone of rarity, but of melody, singular in sweetness, and peculiar in power of penetration. I am convinced a second brood is occasionally, if not habitually, reared, for a female was taken, June 8, whose ovary plainly indicated that eggs were about to be deposited. The first offspring of this bird, which were well on wing, were still under the care of the parents.

Examples from these mountains—a region of heavy precipitation—show that *alticola* is a strongly marked race. A casual examination is sufficient to reveal the striking differences existing between it and *V. solitarius*. The dark plumbeous of the back and the large size of the bill distinguish it at a glance. There is considerable variation, in individuals, in the coloration of the upper parts. In the most characteristic specimen of my series, mottled plumbeous, dusky and blackish, are the prevailing colors, the green being barely discernible, except on the rump. In a second specimen, representing the other extreme, the plumbeous is of a dusky shade, and much restricted, the green predominating on the rump and blending prominently with the plumbeous on the lower neck and upper back. In one of the young birds referred to above the color of the upper portions is nearly uniform plumbeous-gray. In another, the gray of the back is tinged with green, which increases in intensity until it prevails over the plumbeous on the rump and upper tail-coverts. In typical examples of *solitarius*, and also in intermediate ones, from Chester County, the basal portion of the lower mandible, and frequently the whole of it except the tip, is plumbeous, while in adult mountain birds this part of the bill is uniformly black, or displays but very slight indications of plumbeous. Three birds of the year, however, have the bill similar in color to mature Chester specimens. In adult mountain birds the black in this member is also noticeably deeper. The whitish edging of the innermost secondaries, in adults, is greatly restricted. In several it is nearly obsolete. In the young of the year, so far as my knowledge goes, this edging is as extensive as in *solitarius*. It is noteworthy that the example, most eminently characteristic, came from the Oolenoy Valley. It would naturally be supposed that the lowlands would have yielded exemplifications less typical than the highlands. I have never seen an individual, in life, of either style having the tarsi and podium "blackish plumbeous." In every instance these extremities were light gray, usually decidedly plumbeous in cast.

MEASUREMENTS (in millimetres).

<i>Sex.</i>	<i>Length.</i>	<i>Extent.</i>	<i>Chord of Wing.</i>	<i>Chrd of Exp. Culmen.</i>
♂	154.94	256.54	81.28	11.68
♂	152.40	254.00	70.75	11.43
♂	152.40	254.00	79.25	11.68
♂	151.64	257.81	81.53	12.45
♂	149.86	254.00	79.50	11.43
♂	149.86	251.46	78.23	11.43
♀	152.40	248.92	77.21	12.19
♀	149.86	238.76	74.17	11.68

47. *Vireo noveboracensis*. WHITE-EYED VIREO.—So far as I am aware, it is confined to the Oolenoy Valley, where it is a common songster.

48. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—Noted at all elevations. Very common. Although individuals continued to sing to the end of my last visit, still, from the outset, the song season was markedly on the wane. An adult male sang so strangely at the summit of Mt. Pinnacle, June 22, that I found it necessary to shoot it in order to fully satisfy my mind as to its identity.

49. *Helminthus vermivorus*. WORM-EATING WARBLER.—Decidedly common, in the wooded ravines and coves, from the lower valleys to the crests of the mountains. Young birds—well clothed and steady of wing—were obtained early in June.

50. *Helminthophila chrysoptera*. GOLDEN-WINGED WARBLER.—An adult male in full feather and a bird of the year in ragged plumage were shot, June 29, in a thicket on the edge of a little clearing just below the High-low Gap, at an altitude of about 2500 feet.

51. *Compsothlypis americana*. PARULA WARBLER.—This bird was very common, and sang with vigor as long as I remained. The timbered hollows, from base to apex, were favorite haunts.

52. *Dendroica æstiva*. YELLOW WARBLER.—Rather common in the cultivated valleys. Not observed elsewhere. In full song.

53. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Only found at isolated points, and not lower than 2500 feet. The situation where they were most numerous was a small clearing near the High-low Gap. Here as many as five males were heard singing in the course of a few minutes. The testes of males procured June 13 and later were about the size of a small pea. In song through June.

54. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER. But three specimens were obtained—two adult males, in full dress, June 18 and 21, at about 2500 feet; a female, moulting, June 24, above 3000 feet. All were in hardwood timber. The testes of the males were not larger than a pin's head of ordinary size.

55. *Dendroica dominica albilora*. SYCAMORE WARBLER.—A pair, accompanied by their brood, was met with June 23, 1887, among a mixed

growth of pines and hardwood, on a spur of Mt. Pinnacle a few hundred feet above the Oolenoy. The parents and one of the young were secured. The superciliary stripe of the male, in the flesh, was slightly tinged over the lores with yellow for 6.3 mm. In the female the yellow tingeing was scarcely perceptible, and extended only 3.8 mm. In both the yellow was interrupted at the base of the bill by pure white. Dimensions as follows: Male, bill from nostril, 8.9 mm.; length, 127.0 mm.; wing, 64.3 mm.; longest rectrix, 52.1 mm. Female, bill from nostril, 9.1 mm.; length, 127.0 mm.; wing, 61.0 mm.; longest rectrix, 52.1 mm. While not typical illustrations, I have placed these examples, without question, under *albilora*, as, in my judgment, they approach that form more nearly than *dominica* proper.

56. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—I was much surprised to find that the Black-throated Green Warbler was a very common bird at the foot of the mountains, as well as over the higher slopes. Its peculiar song, which was uttered with unflinching emphasis during the entire month of June, rendered it one of the more prominent choristers of the woodland. A well-feathered bird of the year was taken June 10. The testes of all examined were not larger than a small pea.

57. *Dendroica vigosii*. PINE WARBLER.—Common in congenial situations. Like the Chipping Sparrow, it ranges along the sterile ridges on Mt. Pinnacle to the heavy timber.

58. *Dendroica discolor*. PRAIRIE WARBLER.—In the Oolenoy Valley and other lowlands of the immediate vicinity it is tolerably common in scrubby growth.

59. *Seiurus aurocapillus*. OVEN-BIRD.—On Mt. Pinnacle Oven-birds were very common near the top, but they did not appear to descend below 3000 feet, although locations possessing features similar in character to those occupied occur at lower elevations. On the Horse Mountain, just across the north fork of the Oolenoy from Mt. Pinnacle, they were common as low down as 2000 feet. Near the High-low Gap, at 2500 feet, they were very common. They were also detected at Table Rock. Deciduous woods, chiefly those free from undergrowth, were habitually frequented. In these haunts throughout the day their loud chant fell continually upon the ear. I did not find the young on wing until the last week in June. A female taken June 26, had ova as large as BB shot. This suggests that a second hatch is raised, if not regularly, at least occasionally.

60. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—The distribution of this species is not determined by altitude, but by the presence or absence of running water; thus it is common along the streams, among rhododendrons, at the base of the mountains and up their sides to above 3000 feet. Well-fledged young were taken in a little cove on the north side of Mt. Pinnacle, just below the highest point, on my first arrival, both in 1888 and 1889. At this early date, also, the adults were beginning to moult, and their generative organs were greatly diminished in size. In Reedy Cove (1800 feet) young, but very recently a-wing, were captured several days later, evidencing that the breeding season on the higher grounds is not necessarily tardier than on the lower.

61. *Geothlypis formosa*. KENTUCKY WARBLER.—Indifferent to elevation, these Warblers are everywhere abundant in the wooded hollows, coves, and ravines; these shady retreats constituting their true haunts, though during the cooler hours of the day individuals stray from the near proximity of the water courses to the sunny slopes of the adjacent hillsides. During the height of the season they have few rivals in persistency of song, but as June advances, and the young begin to be abroad, they sing with rather less frequency, though not with less force and spirit. Besides their loud chant, so commonly uttered, I think they have a second and more pleasing song, but of this I cannot speak with certainty, as I never succeeded in detecting one in the act of singing, for the song was repeated only at rare intervals, and always in the seclusion of the rhododendrons, but each attempt to discover the author invariably developed a Kentucky Warbler in the spot whence the sound had issued. When their haunts are invaded, they resent intrusion with loud querulous chirps which are as distinctive as their song notes. Though of retiring disposition, especially early in the season, when their young are hatched they often challenge observation by exhibiting themselves with boldness. The first bird of the year was shot June 20.

62. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—A common songster in June and July in the open bottoms among the willows and other shrubbery fringing the Oolenoy and its tributaries.

63. *Icteria virens*. YELLOW-BREASTED CHAT; 'MOCKINGBIRD.'—Abundant, particularly in the Oolenoy Valley, ranging along the mountain brooks in the more open places to above 3000 feet. Their presence is always a sure indication of water at the higher levels, and upon more than one occasion have my steps been directed, when thirsty, by their loud notes to spring-heads near the summits. Their eccentric aerial performances were noticed as late as the middle of June.

64. *Sylvania mitrata*. HOODED WARBLER.—At the base of the mountains they were very common in the lesser growth of the woods in the neighborhood of branches, straggling upward to about 2500 feet. The males were very prominent singers during each June. It seemed, however, that they sang less frequently the last year on my first arrival than in former years, but with the progress of the rains there appeared to come a revival of song. First young shot June 13.

65. *Mimus polyglottos*. MOCKINGBIRD.—Through Chester and Union Counties Mockingbirds were abundant along the wayside, constantly darting down at my bird dog as he trotted ahead of the wagon. As Spartanburgh Court House was approached, from the south, they became less and less numerous. Very few were seen between Spartanburgh and Greenville, though around the suburbs of the latter town they were quite plentiful. The three previous seasons I found them common about Easley, but none were observed nearer the Oolenoy Valley than Pickens Court House.

66. *Galeoscoptes carolinensis*. CATBIRD.—Common about the settlements. Continued in full song through June.

67. *Harporhynchus rufus*. BROWN THRASHER. 'THRASHER.'—Not abundant, and mainly confined to the open valleys. A male was shot, while singing, on the edge of a clearing at about 2000 feet, which was the highest altitude at which the species was discovered.

68. *Thryothorus ludovicianus*. CAROLINA WREN.—Met with everywhere—on the pinnacle of the highest point in the State, over the slopes, and in the valleys. Very common. As often happens, nests were found in curious locations. One was situated in a little wooden box nailed to a tree by the wayside for the reception of the mail of the owner of a house a little back from the roadway. The site of another was a tin gallon measure placed, upright, on a high shelf in an open log out-building. The parents did not seemingly object to the measure being taken down and the young inspected. Well incubated eggs, June 23, 1887, and young just hatched, July 10, 1886, apparently signify that second broods are habitual.

69. *Thryothorus bewickii*. BEWICK'S WREN.—The only records I have are July 12, 1886, and June 19, 1889. On the former occasion an individual was seen, and on the latter an adult male taken. Both were in the Oolenoy Valley at the foot of Mt. Pinnacle.

70. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Haunting particularly the hardwood forests, it was common at all heights.

71. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—This Nuthatch was tolerably common among the pines interspersed throughout the lesser deciduous growth, reaching upward, along the sterile ridges, to nearly or quite 2000 feet.

72. *Parus bicolor*. TUFTED TITMOUSE.—Abundantly and evenly dispersed over the wooded country, irrespective of elevation.

73. *Parus carolinensis*. CAROLINA CHICKADEE.—Like its congener, *P. bicolor*, of abundant and universal distribution. *P. atricapillus* was sought for in vain.

74. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Tolerably common in the valley of the Oolenoy. Not noted on the highlands.

75. *Turdus mustelinus*. WOOD THRUSH.—As the mountain region is approached, the Wood Thrush becomes more and more prominent, the cool hollows shaded by large oaks and other deciduous trees affording congenial residence. In the mountains, I found them most numerous from the mid-elevations upwards, but I think the local environment, more than the altitude, occasioned their abundance. So common were they that several performers were often heard at a time in a narrow area—even in the heat of midday. First young shot June 13.

76. *Sialia sialis*. BLUEBIRD.—Common. Owing to the nature of their haunts necessarily restricted in a large degree to the open lowlands. On Mt. Pinnacle occurred at about 3000 feet in a little chestnut 'deadening'—the only suitable nesting place near the summit.

A LIST OF BIRDS OBSERVED AT SANTAREM,
BRAZIL.

BY CLARENCE B. RIKER.

With Annotations by Frank M. Chapman.

IN JULY, 1884, I visited Santarem, a town of 5000 inhabitants, situated on the Amazon at the mouth of the Tapajos River, 500 miles from the ocean. I made a second trip in June, 1887, and remained until the end of July. At this season the easterly trade winds blow constantly, tempering to a remarkable degree the intense heat of the tropical sun. The two seasons, the wet and the dry, are well defined; the dry period lasting from the middle of May until the middle of November with but occasional showers. The remainder of the year is characterized by almost constant rain.

During the dry season many forest trees shed their leaves, and the grass and small shrubs wither, while the palms and the majority of other trees bear their fruit; a noticeable exception, however, is the mango, the fruit of which matures in February. The physical conditions of the location are peculiarly adapted to a much diversified fauna. The city is located on a sandy bluff, back of which, and extending about five miles, is a sandy campos dotted here and there with clumps of bushes or small groves of stunted trees. Back of this again lies a belt of dense forest extending about three miles further to the edge of a table-land rising abruptly three hundred feet. This plateau extends to the southeast for thirty miles without a stream to give variety to the dense forest of giant trees. There are but few small ponds within this forest region, so far as it has been explored, and during the dry season these mud-holes swarm with an abundance of game. About these ponds, feeding upon the fruit of a palm found growing only there, is the only place where I have ever seen the great Blue Macaw (*Ara hyacinthina*). The plateau extends about 150 miles parallel with the Tapajos, and lying between it and the river is the campos district, which is alternated with palm swamps and a description of forest I have termed semi-palm, being a mingling of the hard wood trees and the palms. At various points spurs of the table-land rise abruptly from the river.

Diamantina, the settlement at which I was located, is eight miles from Santarem, and four miles from the Amazon. At the foot of the plateau, or 'mountain' as locally termed, an arm of the Amazon, called the Igarapi Mahica, runs within two miles of the settlement, and during the rainy season, expands into a vast lake embracing many square miles of palm forest.

Devoting most of my efforts to the mountain and semi-palm forest, spending but few days near the water, and but three days collecting on the campos, I can account for the absence in my collection of many species recorded by others as very common at Santarem; the bulk of most collections having been made about the campos and adjacent forest. The very striking contrast between the fauna of these belts is at once noticeable; the great number of birds which one would meet in a morning's outing showed that they were each inhabited by a characteristic group. The same contrast is manifest in the distribution of the lepidoptera, of which I also collected a series.

There are sugar-cane fields and clearings on the 'mountain' corresponding to those of the low lands, and offering all the attractions for the congregation of small birds, Flycatchers, Hawks, etc., yet the altitude of 300 feet and distance of less than a mile, seem a barrier over which many species never cross. Many species of Toucans and Parrots, and both *Cassicus* and *Ostinops*, are found commonly in both localities.

The abundance or scarcity of a large number of species I found subject to daily fluctuation, dependent upon the presence of the army ant or some fruit suddenly ripening, there being scarcely two consecutive days when birds could be found plentifully on the same feeding ground.

Tanagra palmarum, *Tanagra episcopus*, *Cassicus persicus*, *Ostinops decumanus*, and some species of Doves and Parrots, migrate morning and night to and from feeding grounds, in flocks, varying from a dozen of Parrots to thousands of *Cassicus*.

With but few exceptions birds were remarkably unsuspicious and easy of approach, but the density of the vegetation affords them excellent opportunities for concealment, and leads the collector too close for the successful use of the gun, it being a difficult matter to retreat to fair shooting distance without losing sight of the bird. I have seen a score of Parrots alight in a tree and, after searching in vain, have in despair risked a shot at a moving bough

There appeared to be very little difference in the comparative abundance of birds on my two visits; on either occasion one could take the field and in a very short time secure sufficient specimens to keep him busily employed in skinning for the rest of the day.

The abundance of stinging ants, each kind of tree seeming to be inhabited by a species of its own, lends to the efforts of an oölogist a spirit of vituperation not tending toward enthusiastic and careful research. Until an effectual protection has been discovered, against the fiery stings of these tree ants, it will require more to induce a lazy Brazilian Indian to climb a tree than an enthusiastic oölogist can provide. The only species found breeding were: *Arundinicola leucocephala*, *Brotogerys virescens*, *Busarellus nigricollis*, *Leptoptila erythrothorax*, two species of *Crypturus*, and several species of Flycatchers.

My collections, amounting in all to about four hundred specimens, I forwarded to Mr. Robert Ridgway for determination, the resulting new genera and species being described by him in the 'Proceedings of the United States National Museum' (Vol. IX, 1886, p. 523, and Vol. X, 1887, pp. 493-494, 516-528, and 545). Certain additional specimens were identified by Mr. J. A. Allen, and I have now to thank my friend Mr. Frank M. Chapman for arranging my notes and for adding such remarks to this paper as a further study of my specimens renders necessary.

[In order to make the list of Santarem birds as complete as possible I have included certain species not met with by Mr. Riker, but found by other collectors who have worked in the same field, giving in every case the authority on which these records are based. The sources from which these additional data have been procured are as follows: (1) 'A List of Birds collected by Charles Linden, near Santarem, Brazil,'* by J. A. Allen; (2) a small collection of birds made by Mr. Williams, who collected at Santarem from May to October, 1883. Mr. Williams is not now living, and it is to be regretted that his collections have become dispersed. A portion of them were purchased by Mr. J. M. Southwick of Providence, Rhode Island, from whom Mr. Riker secured a number of specimens, and a small mounted collection was presented by Mr. Williams's parents to the Museum

*Bulletin Essex Inst. VIII, 8, 1876, pp. 78-83.

of Brown University. Through the courtesy of Prof. J. W. P. Jenks, the curator in charge, I have been enabled to examine these specimens at the college, and I have also to thank Mr. Southwick for permission to make use of the specimens remaining in his private cabinet. The number of Mr. Williams's specimens which I have examined, therefore, is about one hundred and fifty. (3) A collection of some eight hundred birds, made from January to April, 1889, by Mr. William Smith, who was sent to Santarem to collect by Mr. Southwick. A representative series of two hundred specimens from this collection was purchased by the American Museum of Natural History, and I am permitted by the authorities of the Museum to include here the species contained in this collection which were not found at Santarem by Mr. Riker. It will thus be seen that the collections formed at Santarem represent the presence in the field of one collector for about twelve months covering the period from January to October. In making these additions I have endeavored to preserve the strictly local character of this list, admitting no species which have not been found in the immediate vicinity of Santarem. This will, I think, give to the paper a peculiar value as indicating the avifauna of one limited locality, a character wanting in the majority of South American lists which, as a rule, present the results of observations over a more or less extended area.

Mr. Riker's experience is in the highest degree instructive; on his first trip, having little or no knowledge of South American birds or their ways, he collected without definite object and with only moderate success, securing one specimen of a species new to science. Possessed now of some experience and a knowledge of what were desirable birds and the most likely to prove new or interesting, he returned to Santarem and, collecting at practically the same season, procured fifteen species new to science of which two were the types of new genera. This comparison of results is suggestive, and illustrates the difference between indiscriminate collecting and well directed effort; how many other localities which we now suppose to have been more or less thoroughly explored, will prove on more careful and skilful investigation to be as fertile in novelties as Santarem has been, it is, of course, impossible to say.

Influenced by more recent discoveries, or additional material, I have in a number of instances revised the determination of the

species herein included, and should, therefore, be held responsible for the nomenclature as it now appears. For convenience the arrangement of Sclater and Salvin's 'Nomenclator' is followed, and with certain exceptions the nomenclature there employed is adopted.—F. M. C.]

1. *Merula fumigata* (Licht.).—Common in semi-palm growths; frequently observed flying low along the forest paths; making short flights and re-alighting before you.

[Three specimens are apparently typical of this species and agree closely with Maximilian's types of *Turdus ferrugineus*. Two individuals show a marked variation in size. A male taken June 25, 1887, measuring, wing, 4.29; tail, 3.48; tarsus, 1.21; exposed culmen, .78; while a female, taken July 1, 1887, measures, wing, 4.72; tail, 3.80; tarsus, 1.20; exposed culmen, .82 inch.—F. M. C.]

2. *Mimus saturninus* (Licht.).—A female, captured August 11, 1887, in a semi-palm thicket was the only one observed.

[This specimen measures (skin), length, 9.00; wing, 3.96; tail, 4.18; tarsus, 1.22; gonys, .41 inch; (mandible broken). It is evidently similar to the bird from Para on which Lichtenstein based his description of *Turdus saturninus*. Specimens from Bahia, to which the name *saturninus* has generally, but I believe wrongly, been given, differ greatly from the Santarem bird both in size and coloration. An example from Dr. Lacerda measures (skin), length, 11.00; wing, 4.38; tail, 5.10; tarsus, 1.40; exposed culmen, .82; gonys, .51 inch. It is much browner above and more buffy below than the Santarem bird. Lichtenstein gives the length of his Para bird as 9 inches, and says, "Cauda brevior quam in *T. polyglottos*." His description of "*T. polyglottos* Lin.," number 445 on the same page of the 'Verzeichniss' as the original description of *saturninus*, with the habitat given as "Am. sept.," enables us to recognize the bird with which he made his comparison as undoubtedly the *Mimus polyglottos* of recent authors. In this species the tail averages about 5 inches; longer, therefore, than in the Santarem bird, which thus agrees with Lichtenstein's type, but shorter than in the bird from Bahia. Aside from geographical reasons it is evident, therefore, that the name *saturninus* belongs to the Lower Amazonian bird and is not applicable to the bird from Bahia, which, being thus left without a name and being evidently worthy of recognition as a distinct species, may be called

Mimus arenaceus, sp. nov.

SP. CHARS.—Similar to *Mimus saturninus* (Licht.) but larger and much browner above, the feathers of the rump sandy brownish without darker centres, the underparts with a suffusion of buffy which is heavier posteriorly.

Description.—Type, No. 39,274, Am. Mus. Nat. Hist., Bahia, Brazil.

Lacerda, in fresh and unworn plumage. Above grayish brown, the feathers of the head with distinct, those of the back with obscure, darker centres; rump sandy brownish, the feathers without darker centres; wings fuscous-brown, the primaries and outer secondaries with their greater coverts edged with whitish, the inner secondaries and tertiaries terminated with whitish and edged with the color of the rump; lesser coverts with brownish white borders which are whiter terminally; tail somewhat darker than the wings, all but the outer pair of feathers margined externally with grayish brown, the outer feathers externally margined from near their bases with whitish and terminated by a white band which measures on their shafts 1.25 inches and decreases in width on the succeeding feathers until it appears merely as a slight apical tip on the pair next the median feathers on which it is entirely wanting; there are faint blackish moustachial streaks, and a blackish line from the corner of the mouth passes through the eye, includes the upper half of the auriculars, and is bordered above by a buffy white loreal line which widens posteriorly into a broader, slightly whiter postocular stripe; the underparts are buffy whitish, slightly grayer on the breast, the buffy suffusion growing heavier posteriorly and appearing as fulvous on the crissum; under wing coverts pale, clear, creamy buff; flanks buffy brown, heavily streaked with blackish; bill black, the maxilla lighter basally; feet black, the soles yellowish.

In southeastern Brazil and south to the Argentine Republic, *Mimus arenaceus* is evidently replaced by *modulator* of Gould, with which it may intergrade. So far, as my material goes, however, the two birds are distinct.

From true *saturninus*, *arenaceus* may be distinguished (1) by its larger size, (2) by the browner coloration of the upper surface, the feathers here having less distinct blackish centres, (3) by the presence of a buffy suffusion occupying to a greater or less extent all the white areas, and (4) by the yellow instead of plumbeous color of the soles of the feet.

Although Mr. Allen, in his 'List of Birds collected at Santarem by Charles Linden,' records *saturninus* as "common," Mr. Riker met with only a single specimen and it was not taken by Mr. Smith. Mr. Layard, in his list of birds observed at Para, † does not mention it, nor does Dr. Sclater give it in his list of the birds collected by Wallace on the Lower Amazon.‡ It is apparently not common in collections and I append therefore, a description of Mr. Riker's specimen.

Mimus saturninus (Licht.).

Coll. C. B. Riker, ♀, August 11, 1884, Santarem (Diamantina)

†Ibis, 1873, p. 374.

‡P. Z. S., 1867, p. 566.

Brazil. Plumage slightly worn. Above blackish brown, the feathers of the head with brownish, those of the back with grayish, margins; rump grayish brown, the feathers with darker centres; wings brownish black, the primaries edged with pure white, the first three with slight terminal white margins; outer secondaries with a narrower whitish margin, inner secondaries and tertiaries edged with brownish and tipped with whitish; exposed portion of the primary coverts with a broad margin of pure white, the lesser and greater coverts tipped with brownish white which is whiter terminally; tail somewhat browner than the wings, all but the outer feathers with slightly lighter external margins, the outer feathers from near their bases margined externally with white and terminated by a white band which measures 1.00 inch on their shafts, and is about the same width on the inner web of the next two feathers; on the fourth it is of less extent, on the fifth appears as a brownish white border, and is wanting entirely on the median pair of feathers; a moustachial streak is barely evident and a blackish line passing through the eye includes the upper half of the auriculars and is bordered above by a buffy loreal and grayish postocular stripe; the underparts are grayish white, deeper on the breast; crissum fulvous; under wing-coverts whitish with a slight buffy tint, the flanks buffy brownish, lighter than in *arenaceus*, and heavily streaked with blackish; bill black, the maxilla lighter basally; feet blackish, the soles dull plumbeous.—F. M. C.]

3. *Donacobius atricapillus* (Linn.).—July 7, 1887, male; June 27, 1887, female.

[4. *Campylorhynchus hypostictus* Gould.—Two specimens (Smith) February 6, and March 11, 1889, agree very closely with a specimen of *hypostictus* from Bogota, but are somewhat more heavily marked below, being, therefore, easily distinguishable from *variegatus* from Bahia.—F. M. C.]

5. *Cyphorinus griseolateralis* Ridgw.

Cyphorinus griseolateralis RIDGW., Proc., U. S. Nat. Mus., X, 1887, p. 518.

Two specimens taken July 10, 1887, amongst the debris of a fallen tree on the 'mountain,' and there were apparently several others. Their notes are more flute-like than those of any bird I have ever heard, varying from a high to a low note in a beautiful rippling song. Called by my guides, when first we heard it, the 'flute-bird,' and to it they attach a superstitious legend.

[The discovery of this species extends the range of the genus from the Upper to the Lower Amazon, where it evidently represents the Ecuadorian *Cyphorinus salvini* Sharpe.—F. M. C.]

(To be continued.)

THE HORNED LARKS OF NORTH AMERICA.

BY JONATHAN DWIGHT, JR.

SINCE Mr. Henshaw's review of this group six years ago (Auk, Vol. I, 1884, p. 254) his collection of birds has passed into the British Museum, and much of his valuable material has not been available for study in the present connection, but the loss of this has been more than compensated by the immense number of specimens kindly placed at my disposal by many members of the American Ornithologists' Union. Over 1200 were sent to the last meeting of the A. O. U., by request of the Committee of Arrangements, and since then I have examined many others, bringing the grand total up to 2012. Such a magnificent series of birds of one species has probably never before been brought together, and including, as it does, birds from all portions of the continent and at all seasons of the year, it affords a wonderful opportunity for the study of plumage and geographical variation, and at the same time brings one face to face with the question, as yet unsolved, of a nomenclature that, without being cumbrous, will fit the many groups, intergrading one with another, into which the North American genus *Otocoris* is certainly separable. Binomialism, based on the fixity of species, will not suit the Horned Larks, for from the Atlantic to the Pacific, and from the Arctic down into Mexico, I can form a chain of differing groups that, nevertheless, pass insensibly from one to the other, absolutely without break. Trinomialism gives relief, but it does not provide for exactly intermediate specimens, nor does it formulate a rule under which subspecies may be established, but leaves the matter to the varying taste of every student. However, it is not my purpose to discuss nomenclature, and I trust the conclusions I have reached will be sufficiently conservative to meet with the approval of those who have had to deal with the same difficulties.

Accepting trinomialism as it is today, I have applied the following rule to my study of the Horned Larks, *i. e.*, to recognize as races groups of birds that during the breeding season occupy definable areas over which similar conditions of climate and vegetation prevail, and that show differences of size or plumage at the centres of such areas, which may be readily recognized and

clearly described. This brings it down to a question of where to draw the circumscribing lines, and allowing the already described forms to stand as models, I have endeavored to draw them no closer than those laid down by Mr. Henshaw. The excellence of his work, based on 350 specimens, is attested by the fact that my material does little more than support his conclusions, and where I have arrived at different results, it is simply because I have specimens that were not then obtained. In fact I have had too many from certain localities, not enough from others. Breeding examples of the Arctic forms *alpestris* and *leucolæma* are few in number, and as for Mexico, there is next to nothing to show what real *chrysolæma* is. Mr. Henshaw's material only carried him as far south as Arizona and New Mexico, and he naturally supposed that *arenicola* passed into *chrysolæma*, there being nothing to show the existence of the well-marked desert race *adusta* which intervenes. The naming of such intermediate races as *adusta* and the dark race *merrilli* of eastern Oregon, Washington and British Columbia, the only new ones except *pallida* recognized in this paper, may be questionable, but they certainly are as well marked as already existing forms, and as matters stood *arenicola* was an intermediate race between *leucolæma* and *chrysolæma*, north and south, and between *praticola* and *strigata*, east and west. Among the surprises developed by the material before me, is the existence of a form on the eastern slope of the Sierra Nevada Mountains, referable directly to *praticola*. This is discussed under its proper head, and I now wish to call particular attention to two facts which seem to have escaped general notice, and are of great importance in understanding the plumage of birds of this genus. One is the fact that but one moult takes place in the year, the breeding plumage being the result of the wearing away of the tips of all the feathers acquired during the autumn moult. The effect is most striking on the black areas which, clouded and obscured with yellowish tips in the autumn, come out clear and defined in the spring. There is no evidence whatsoever of a spring moult. The other is that young birds in passing from first plumage, which is worn only a few weeks, moult wings and tail as well as the feathers, usually moulted. This fact and change of plumage without moult have not been attributed to the Horned Larks, so far as I know, and only in a general way is it known to be true of other species.

I have endeavored to prepare a key, but where differences are so slight that now and then the individual variation will amount to as much as the varietal, it is almost impossible to formulate descriptions of colors of which no two persons have the same idea. Ridgway's 'Nomenclature of Colors' has been my guide, and typical specimens have been directly compared with the plates of colors in this work. The birds measured have been principally those breeding at points where the races should be typical. The wing measurements of fully three quarters of the series have been roughly taken, and those that were strikingly large or small have received more careful consideration in making comparison with those of normal size and color. Those that were much worn I have endeavored to throw aside, but in some cases they are responsible for the apparently great variation of extremes.

It is not my purpose to treat the subject exhaustively, but merely to contribute to what we already know, the results obtained from a good many weeks' study upon the unexampled series before me. The facts of distribution are graphically represented on the accompanying map. Laboring as I have under the disadvantage of not having visited many of the areas, the study of topography and altitudes, of charts of rain-fall and forest distribution, and of the literature bearing upon the subject, has been imperative in properly understanding the relation of one race to another, and the map embodies my conclusions. The area over which each race may be expected to occur in the breeding season is indicated, the lines approaching closely where the material justifies it, and where it does not I have thought it best to leave considerable intermediate space. The greater the amount of the material studied, the closer together can these lines of arbitrary demarcation be drawn, my object being to include within them breeding birds that differ less from one another than they do from those of an adjacent area. Of course we must not expect to find Horned Larks everywhere, but only over such portions of a given area as are suitable to the birds' taste. To exactly map distribution will be a work of the future, and I hope my contribution to our knowledge of the genus *Otocoris* is only a beginning, and outlines what we may expect to see better done with every species when a sufficient amount of material is gathered. Even that at hand does not suffice to show winter distribution accurately. All the races show a greater or less southward movement at this sea-

son, overlapping and extending their ranges in a very puzzling manner. I am inclined to the belief that the mountain races usually descend to the lower plains, and besides are often urged southward by severity of weather or lack of food supply. *Leucolæma* and *alpestris* appear to leave entirely their summer haunts; *praticola*, and *arenicola* move south over only a part of their summer range; *giraudi*, *rubea* and *strigata* appear to be chiefly resident; and material is still wanting to determine the range of the other forms.

The yellowing and darkening effect of age upon some of the older skins, especially of young birds, is an element of danger to the student of limited series, and is well illustrated by some young *arenicola* which might be easily mistaken for *praticola*, were it not for later material from the same spot.

To all those fellow members of the A. O. U. who have placed material at my disposal my thanks are hereby extended, especially to Mr. Robert Ridgway for the loan of type specimens, to Mr. Wm. Brewster for specimens of *merrilli* and *adusta*, and to Mr. J. A. Allen who has aided me with suggestions and advice.

1. *Otocoris alpestris* (Linn.). HORNE LARK.

Habitat.—Northern Europe, Greenland, Newfoundland, Labrador, and Hudson's Bay region; southward in winter into eastern United States to about Lat. 35°.

The Horned Lark of northeastern North America is characterized at all seasons by its large size, dark colors and yellow eyebrows. The nape, shoulders, and rump are of a pink-vinaceous cinnamon; the white below, dull. In autumn it appears darker and less obviously streaked above, owing to the longer, grayish or pinkish edging and tips of the feathers; the black of the head is much obscured by buffy or yellowish tips, that of the breast less so; the yellow is much brighter, occasionally showing faintly below the jugular crescent, and often suffusing the whole of the upper parts, particularly the head. Young of the year are browner and more spotted, but cannot be distinguished with certainty from the adults. The amount and intensity of the yellow is purely individual, and independent of age, sex or season, but in this bird alone of the group it is always present.

Mr. Henshaw's conclusion that the European bird is identical with ours must stand, unless a good series should prove the contrary. I have seen but two specimens, and can infer nothing from them. They agree in size with our birds; one, a male in autumn plumage from Sweden, is more lilaceous, and that is all the difference observable. Our bird breeds far north of the United States, about the shores of Hudson's Bay, Labrador and Newfoundland, and in winter is found chiefly along the coast of the New England and Middle States, abundant to about Lat. 38°. West of the Appalachian mountain chain it is perhaps less abundant, though occurring, as shown by typical specimens, as far west as Manitoba. A few breeding birds from the Saskatchewan region and winter specimens from the Mississippi Valley, evidently bred in this intermediate region, are better referable to *leucolæma*, though dark and slightly tinged with yellow on the throat.

Average measurements of 11 breeding males: wing, 108.5 mm. (4.27 in.); tail, 72.1 mm. (2.84 in.); tarsus, 23.1 mm. (.91 in.); bill from nostril, 10.2 mm. (.40 in.).

Specimens examined: ♂, 328; ♀, 221; young in first plumage, 6. Localities represented: Sweden, Europe; *Ft. Chimo and *Davis Inlet, Labrador; *Penguin, Is., *Cape St. Mary, and *Canada Bay, Newfoundland; *Moose Fort, Hudson's Bay region; Hampton, N. H.; Ipswich, Revere, Chelsea, Watertown, Newtonville, Duxbury, Chatham, and North Truro, Mass.; Connecticut; Long Island (King's, Queen's, and Suffolk Cos.), Troy and Lockport, N. Y.; Haddonfield, N. J.; Bucks Co., Philadelphia, Carlisle, and Erie, Pa.; Delaware; Washington, D. C.; Raleigh, N. C.; Cleveland and Circleville, O.; Toronto and Rat Portage, Ontario; Ypsilanti, Mich.; Manitoba; Ft. Snelling, Minn.; Mt. Carmel, Ill.; and New Orleans, La.

2. *Otocoris alpestris leucolæma* (Coues). PALLID HORNED LARK.

Habitat.—Alaska and western British America; southward in winter into Western United States to about Lat. 40°.

This appears to be the largest form of all, and when typical shows no yellow. The back is very gray, and the nape, etc., are vinaceous or pinkish vinaceous in the males.

A few breeding birds from the Saskatchewan and Great Slave

*An asterisk denotes breeding birds.

Lake region, though tinged with yellow on the chin, are, on account of size and colors somewhat paler than *alpestris*, referable to *leucolæma*; so too are large dark birds with white eyebrows and pale yellow chins found in winter in the upper Mississippi Valley, coming as they doubtless do from an intermediate region between Hudson's Bay and Alaska. Breeding birds of these two races are few and limited mainly to those taken on Government expeditions; consequently I do not draw the lines on the map as closely together as with some of the other races better defined.

Two young in first plumage taken on the Arctic Coast east of the Anderson River may be referred to this race. While they are not as black and white as might be expected in Alaskan birds, they lack the general yellowishness of young *alpestris* from Newfoundland. In winter *leucolæma* is found as far south as the middle of the western United States, mostly east of the Sierra Nevada Mountains. Northwest coast specimens indicate that a small-sized *leucolæma* may breed in the mountains not far north of the United States boundary, though such birds may generally be referred to *merrilli*. A male in autumn plumage taken Aug. 26, at Chief Mt. Lake on our northern boundary, Long. 114° W., suggests the possibility of this form breeding also on the mountains at that point or not far to the north of it. It is not reported from Pt. Barrow, is rare at St. Michaels, Alaska, and is probably an interior race. A winter example from Long Island, N. Y., shows how far it may stray at that season, though this bird is hardly typical.

Average measurements of 9 breeding males: wing, 111.8 mm. (4.40 in.); tail, 74.7 mm. (2.94 in.); tarsus, 22.4 mm. (.88 in.); bill from nostril, 9.9 mm. (.39 in.).

Specimens examined: ♂, 38; ♀, 24; young in first plumage, 2. Localities represented: *Ft. Youkon and *St. Michaels, Alaska; *Arctic coast east of Ft. Anderson, *Harton River, and *Franklin Bay; *Ft. Reliance, *Ft. Resolution, and *Big Island (Great Slave Lake), Northwest Territory; *Saskatchewan region; Chilliwask, B. C.; Walla Walla, Wash.; Ft. Klamath, Ore.; Carson and Steamboat Valley, Nev.; Camp Floyd, Salt Lake City, and Ogden, Utah; Bitter Root Valley, Sun River, and Chief Mountain Lake, Mont.; La Rivière Lac, Souris River, N. Dak.; Ft. Randall and Vermillion, S. Dak.; Coyote Sta., Emporia, Ft. Riley, and Manhattan, Kan.; and Shelter Island (Long Island), N. Y.

3. *Otocoris alpestris praticola* Hensh. PRAIRIE
HORNED LARK.

' *Habitat*. — Upper Mississippi Valley and region of the Great Lakes.

This bird is a miniature *leucolæma*, somewhat darker, and with a pale yellow chin which is seldom bright, and is often white. Autumn birds seem to show more linear spots on the breast than do the other forms, but this is not a constant feature. It seems to have gradually extended its range eastward as the woods have disappeared, and we can see why it should be nearer to *leucolæma* than to *alpestris*. It has recently been found breeding in Vermont and on Long Island, and either of these localities is a long distance from Hudson's Bay or Newfoundland, and mountains intervene. However, as we go westward we find a direct gradation into *arenicola*, and this race passes directly into *leucolæma*. Now *leucolaema* passes into *alpestris* and somewhere in the Saskatchewan or Winnipeg regions we shall find, I venture to say, breeding birds that might be referred to any one of these four forms. It is birds that have wandered southward from such a point as this that are most difficult to determine, even with abundant material at hand for comparison. In winter *praticola* visits South Carolina and central Texas, though it seems to be largely resident throughout its range and at its northeastern limit in New York is a very early breeder. There are no records of its breeding south of southern Illinois, Missouri, and Kansas, and its western range practically coincides with the line where prairie ceases and plains begin, which is also nearly coincident with the north and south line of twenty inches annual rain-fall, passing through central Manitoba, Dakota, Nebraska and Kansas.

Strange as it may seem, it is a fact that several breeding birds from Carson, Nevada, must be considered of this race. Typical *arenicola* of the arid, elevated region of the Plains and Great Basin grades off to the eastward into *praticola*, a bird of moist, grassy regions, and to the westward into the Carson *praticola*, a bird of the eastern slopes of the Sierras, which are known to have about the same rain-fall as the prairies. The mountains form a barrier to the westward, and there is no intergradation with *rubea*, the race just across them in California. This, fortunately, perhaps, prevents further complication and we may call it a case of

interrupted distribution or consider the bird a dark *arenicola*, but the fact remains that birds breed at Carson which cannot be distinguished from those that breed in New York State. A couple of winter birds from the Mojave Desert might be referred to this form, but are as pale as typical *arenicola*.

Average measurements of 30 breeding males: wing, 103.6 mm. (4.08 in.); tail, 72.6 mm. (2.86 in.); tarsus, 21.1 mm. (.83 in.); bill from nostril, 9.4 mm. (.37 in.).

Specimens examined: ♂, 159; ♀, 72; young in first plumage, 30. Localities represented: North Truro, Hyannis, and Revere, Mass.; *Long Island City, *Troy, *Alder Creek, *Syracuse, *Peterboro, *Geneva, and *Lockport, N. Y.; *Erie and Philadelphia, Pa.; Washington, D. C.; Arlington, Va.; Raleigh and Weaverville, N. C.; Circleville, O.; Indianapolis, Ind.; *Mt. Carmel, *Richland Co., Adams Co., Mason Co., *Sugar Creek Prairie, *Waukegan, *Calumet, *Riverdale, *W. Northfield, and *Evanston, Ill.; Ann Arbor and *Cadillac, Mich.; Racine and *Dane Co., Wis.; *Toronto, *Peel Co., and Rat Portage, Ontario; *Carberry, Manitoba; *Pembina, N. Dak.; Ft. Snelling, Tintah, and Zumbrota, Minn.; *Lake Mills and *Grinnell, Ia.; London and Papillion, Neb.; *Turkey Creek, *Leavenworth, *Topeka, Manhattan, and *Big Blue River, Kan.; *Missouri; Gainesville, Dallas, and Giddings, Tex.; *Carson and *Franktown, Nev.

4. *Otocoris alpestris giraudi* Hensh. TEXAN HORNE LARK.

Habitat. — Coast region of southern Texas.

Small size and the peculiar light gray of the back distinguish this form at all seasons. There is a yellowish green tinge above in autumn, and at all seasons the yellow of the head is very deep, extending on the breast below the black crescent in a large majority of the males. Without being pallid like *arenicola*, it is strikingly pale, and does not resemble any other race so closely as *leucolæma*. Its peculiarities of coloration, its size, and its isolated breeding range, which seems to be several hundred miles from the nearest forms (towards which it shows no variation), give it strong claims for specific rank, but while material from the intermediate area is lacking, such a course might be premature.

Average measurements of 15 breeding males: wing, 97.3 mm. (3.83 in.); tail, 65.0 mm. (2.56 in.); tarsus, 21.6 mm. (.85 in.); bill from nostril, 9.1 mm. (.36 in.).

Specimens examined: ♂, 31; ♀, 19; young in first plumage, 5. Localities represented: *Brazoria Co., *Wharton Co., *Aransas, Bee Co., *Corpus Christi, and Pt. Isabel Texas.

5. *Otocoris alpestris arenicola* Hensh. DESERT HORNED LARK.

Habitat.—Region of the Great Plains, Rocky Mts., and the Great Basin of the United States, from the northern boundary to about Lat. 34°.

General paleness combined with whiteness below mark this race, distinguishing it from *praticola*; size and yellow chin separate it from *leucolema*; the back is pale, and the nape vinaceous-pink. The yellow is, however, as in the other races, exceedingly variable, independent, I have already said, of age, sex, or season, and may vary from almost white to bright lemon. Still on an average it is brighter in autumn than in summer, and palest in northern breeding birds. Colorado breeding birds differ very little from those of the plains of Montana at lower altitude, but Dakota and Kansas specimens approach *praticola*. Those of the mountains of western Montana approach close to *merrilli*, are darker on the back, and in autumn more suffused with yellow. Specimens of this sort are found at Carson in winter. Birds from the desert region of Utah, near Great Salt Lake, are paler with a reddish cast of plumage similar to specimens from northern New Mexico, Arizona and Western Texas, which are still redder and a little smaller, with yellower throats. Most of these last are the intermediates between *arenicola* and *adusta*, and referable to the latter. Material at hand, particularly young birds, indicates that the birds of the higher portions of Arizona and New Mexico, notably San Francisco Mt., Ft. Verde, Lone Mt. and Albuquerque, are better referable to *arenicola*. Where mountains, forest, and desert are so mixed together that in a few miles one may find all these modifying causes it is not surprising that the birds should prove puzzling.

I have referred the mountain bird of Carson to *praticola*. Probably *arenicola* is the form of the arid region at the foot of the mountains, but there is no material from the Great Basin between Carson and Great Salt Lake to prove this. Winter birds from the Mojave Desert, though small, are referable to this

race, and a Ft. Tejon, Cal., specimen seems to be a connecting link between *chrysolæma* and *arenicola*. The young of this race and the young of *praticola* differ much more than do the adults, *praticola* being very dark brown and *arenicola* very light.

In winter *arenicola* ranges south into Texas and Mexico, though it is probable that many of the birds merely descend from the mountains to the neighboring plains. How far north *arenicola* extends is uncertain. It may be called the form of the Rocky Mountains and adjacent plains, and while it embraces birds of mountain, plain, and desert, the differences between them are so unimportant, as shown by the immense series before me, that I am convinced, unless we go into veritable 'hair-splitting,' one name should stand for all. Local causes, such as latitude, rainfall, and altitude, modify somewhat the average characters of this race, birds breeding on the mountains being slightly larger and paler than those of the lower plains, and the same thing holds true of northern breeding birds as compared with those from its southern limit, but considering the great diversity of the large area over which it is found, the differences are surprisingly small and do not appear to be much greater than the individual differences observable in large series from single localities.

Average measurements of 20 breeding males: wing, 104.4 mm. (4.11 in.); tail, 72.1 mm. (2.84 in.); tarsus, 21.3 mm. (.84 in.); bill from nostril, 9.7 mm. (.38 in.).

Specimens examined: ♂, 395; ♀, 206; young, first plumage, 73. Localities represented: *Heart River, *Fort Union, Ft. Rice, and Dickinson, N. Dak.; *Buffalo Gap, Ft. Tyndall, and Ft. Randall, S. Dak.; *Ft. Keogh, Ft. Custer, Frenchman's River, Porcupine River, Two Forks of Milk River, Sunday Creek, Three Buttes, Dry Horse Creek, *Helena, *Moreland, *Pass Creek, Dry Creek, *Willow Creek, Madison River, Gallatin River, *Hillsdale, and *Rainbow Falls, Mont.; *Ft. Fetterman, Bridger, Laramie and Cheyenne, Wyo.; *Denver, Ft. Massachusetts, Clear Creek. *Colorado Springs, Pueblo, *Fair Play, Central City and *South Platte, Col.; Washoe Lake and Carson, Nev.; Salt Lake City, Santa Clara, Ogden, Beaver, Fairfield, and Kelton, U.; Mojave Desert, Cal.; Wilcox, Ft. Verde and San Francisco Mountain, Ariz.; Zuñi, Santa Fé, Chico Springs, Silver City, Lone Mountain, Mimbres to Rio Grande, Las Vegas, Deming, Ft. Thorn, and Ft. Bayard, N. M.; Chihuahua, Mexico; San Angelo, Concho Co., Comanche, Cook Co., Kendall Co., Giddings, *Pecos City, Ft. Davis, Sierra Blanca, Marfa, Del Rio, and Laredo, Tex.; Beaver River, Tepee Creek and Ft. Reno, I. T.; Garden City and *Ft. Hays, Kan.; and *Valentine, Neb.

6. *Otocoris alpestris adusta*, subsp. nov. SCORCHED HORNED LARK.

Habitat.—Southern Arizona and New Mexico, Western Texas, and southward into Mexico.

SUBSP. CHAR:—Similar to *chrysolæma*, but of a uniform scorched pink or vinaceous-cinnamon above.

Adult male in breeding plumage (No. 23,575, Coll. Wm. Brewster, Feb. 21, 1887, Camp Huachuca, Arizona): Above uniform vinaceous-cinnamon, in no contrast to slightly pinker nape, and extending on sides and flanks; fore part of head, 'horns,' loreal stripe, and jugular crescent, uniform black; chin canary-yellow; forehead, superciliary stripe, and posterior ear-coverts white, tinged with canary; rest of lower parts creamy white, reddish-tinged; wings reddish brown, quills whitish-edged. Feet black; bill plumbeous black, lower mandible bluish towards base. Wing, 101.6 mm. (4.00 in.); tail, 71.9 mm. (2.83 in.); tarsus, 20.3 mm. (.80 in.); bill from nostril, 9.1 mm. (.36 in.).

Adult male in autumn plumage (No 23,555, Coll. Wm. Brewster, Sept. 28, 1888, Chihuahua, Mexico.): Above darker and more scorched or rusty than in spring; black areas clouded, and plumage generally softer, otherwise as in spring.

Adult female in breeding plumage (No. 23,588, Coll. Wm. Brewster, March 2, 1887, Camp Huachuca, Arizona): Above reddish cinnamon, streaked continuously from bill to rump-band with darker reddish brown; no crown patch; loreal stripe faintly indicated with dusky; jugular patch restricted; otherwise like the male. Wing, 94.7 mm. (3.73 in.); tail, 63.0 mm. (2.48 in.); tarsus, 19.8 mm. (.78 in.); bill from nostril, 8.6 mm. (.34 in.).

Young, first plumage (No. 116,918, U. S. Nat. Mus., Sulphur Spring, Arizona, Aug. 18, 1874). Above pale reddish cinnamon, dotted on head, neck, and back with small buffy spots, tipping feathers that are dark brown subterminally; wings similar, quills edged with reddish cinnamon; underparts white, spotted lightly across the throat with dusky upon a buffy band. Tail deep brown, outer feathers tipped and edged with reddish cinnamon. This bird is very young, the tail not one third grown. As compared with the young of other races, it is almost identical in appearance with *chrysolæma* from Nicasio, California, but the prevailing reddish tints render it easily separable from all the other forms except *chrysolæma* and *rubea* of which the series of young is a meagre one, and the constant characters open to some doubt.

The uniform pale vinaceous-cinnamon above, which tinges the creamy white of the lower parts, renders this bird almost unmis-takable. It presents a scorched appearance, the brown more pronounced in autumn.

It may seem questionable to describe a race that is intermediate in characters and habitat between others already known, but, as I have said before, several of the existing races grade into two or three others, and if we admit them we must also recognize others quite as well marked. *Adusta*, I venture to say, is as conspicuous as any, and shows the extreme effect of sun and desert in paling and reddening a bird that otherwise would be a small *arenicola*.

It extends but a short distance north of our Mexican boundary, and is found in winter at Chihuahua, but from lack of material we can only surmise that it will be found in the desert plateau region of Mexico south of our border line, passing into true *chrysolæma* in the fertile valleys to the south. The most characteristic birds come from Camp Huachuca, Arizona, in the spring, but I have others from Ft. Yuma, the Santa Rita Mountains, and Ft. Verde, that are nearer to this form than to *arenicola*. Western Texas birds seem to be larger and much like Great Salt Lake specimens, but all birds from desert regions in Nevada, Utah, Arizona, New Mexico and western Texas, are paler and redder-tinged than those that are found in the mountains, so that the length of wing and intensity of yellow on the chin must also be factors in determining whether they should be referred to this race or to *arenicola*.

Average measurements of 20 breeding males: wing, 102.9 mm. (4.05 in.); tail, 71.4 mm. (2.81 in.); tarsus, 20.8 mm. (.82 in.); bill from nostril, 9.4 mm. (.37 in.).

Specimens examined: ♂, 51; ♀, 30; young in first plumage, 11. Localities represented: Chihuahua, Mexico; *Camp Huachuca, *Santa Rita Mts., *Ft. Verde, *San Francisco Mt., *Oracle, *Willow Spring, *Sulphur Spring, and *Rio Perro, Ariz.; *Ft. Wingate, Zuñi, *Santa Fé, *Albuquerque, and *Lone Mt., N. M.; and *Ft. Davis, *Pecos City, Laredo, and Giddings, Tex.

7. *Otocoris alpestris chrysolæma* (Wagl.). MEXICAN
HORNED LARK.

Habitat.—Mexico, northward along the coast of California to about Lat. 38°.

In this race the contrast between the color of the nape and that of the back is sharp even in autumn, and typically it is a pink cinnamon-rufous contrasting with a sepia-brown back. Autumn specimens are darker, often quite yellowish, and the yellow of the throat is a variable quantity, usually bright. The white below is

clear and rather creamy at all seasons. This race also often has the feathers of the 'knee' yellow.

Although the Mexican material is limited to a few specimens, it suffices to show that while birds from Vera Cruz and the Valley of Mexico average a little larger and perhaps yellower-throated than those from San Francisco, all may be included in the same race. Breeding birds from southern California are often indistinguishable even in size from Mexican examples, and although San Francisco birds are redder and sometimes identical with true *rubea*, the majority are more like Mexican specimens than they are like *rubea*.

The habitat assigned admits *chrysolæma* to California in a narrow belt west of the Coast Range Mountains. Although *adusta* and *pallida* practically cut the habitat of *chrysolæma* in two, material at hand does not show that the Mexican bird is separable. Mr. Henshaw thought the California birds were all *rubea*, and referred Audubon's supposed type of *Alauda rufa* to this form. I have examined it, and refer it to *chrysolæma*, restricting *rubea* to the Sacramento Valley. What may occur in the San Joaquin Valley remains to be proved. A Ft. Tejon specimen is very faded and approaches *arenicola*, as already noted. A winter specimen from Bogotá (described by Sclater as a new species, *peregrina*) is very small, but does not differ appreciably otherwise.

Average measurements of 30 breeding males: wing, 99.3 mm. (3.91); tail, 68.3 mm. (2.69); tarsus, 20.8 mm. (.82); bill from nostril, 9.4 mm. (.37 in.).

Specimens examined: ♂, 90; ♀, 36; young in first plumage, 3. Localities represented: [Bogotá, U. S. of Columbia] ?; *Valley of Mexico and *Mirador (near Vera Cruz), Mexico; *San Quentin, Lower Cala.; San Diego, Elsinore, San Geronio Pass, Riverside, *Los Angeles, Pasadena, *Alhambra, Ventura Co., *Santa Barbara, San Simeon, Los Gatos, San José, San Francisco, *Oakland, *Haywards, *Altamont, Stockton, *Nicasio, and *Sonoma Co., California.

8. *Otocoris alpestris rubea* Hensh. RUDDY HORNED LARK.

Habitat.—Sacramento Valley, California.

Bright rufous suffusing the whole plumage and merging into the ruddy brown of the back without abrupt change, distinguishes this race from *chrysolæma*. It averages a very little smaller, and as it is restricted to a small area the geographical variation is slight. Cut off by high mountains from adjacent races north and

east, it does not seem to partake of their characters, and 'intergrades' are few. Though the material at hand only proves that it inhabits the Sacramento Valley between the Sierras and the Coast Range, it is probable that it will be found in the San Joaquin Valley along the western slope of the Sierras as far south as the same conditions of rainfall and similarity of country prevail. It seems to be largely resident. Mr. Henshaw described as his female type of this race (Auk, 1884, p. 267) the female from Santa Rosalia Bay (No. 82,413, U. S. Nat. Mus.) that Mr. Townsend has now referred to *pallida*. It certainly is not *rubra*, and strange to say bears no type label, while No. 83,968 from Placer Co., Cala., is labelled as a type and is a typical female. For the sake of accuracy I call attention to this hitherto unexplained changing of labels.

Average measurements of 13 breeding males: wing, 99.6 mm. (3.92 in.); tail, 69.1 mm. (2.72 in.); tarsus, 21.1 mm. (.83 in.); bill from nostril, 8.6 mm. (.34 in.).

Specimens examined: ♂, 22; ♀, 11; young in first plumage, 1. Localities represented: *Stockton, *Placer Co., *Yuba Co., Gridley, *Red Bluff, and *Mt. Lassen, Cala.

9. *Otocoris alpestris strigata* Hensh. STREAKED HORNED LARK.

Habitat.—Coast region of Oregon, Washington [and British Columbia?], west of the Cascade Mountains, and Santa Cruz group of islands, California.

This race has credit for more streaking and more yellow than it deserves. By rumpling the feathers of the back of almost any of the other forms a heavily streaked effect may be obtained, and the extreme yellowness below of the type specimens is not supported by the small series I have before me. It is darker than any of the other races except *merrilli*, and, compared with it, is not so broadly streaked, and is browner and more yellowish tinged at all seasons. The nape is of a deep vinaceous-cinnamon while in *merrilli* it is much paler. The yellow on the throat is a little deeper and often tinges the breast, sometimes extending over the whole of the lower parts, but the amount of yellow is a most misleading and variable quantity, as we see in the other races, and I cannot but conclude that the types are birds abnormally yellow. Analogous specimens may be selected from *merrilli*, *giraudi*,

and even *arenicola*. Five spring males from Oregon show very little yellow on the breast, and one of them none. Females are but slightly tinged on the chin.

It appears to be resident in a narrow belt, of heavy rainfall, west of the Cascade Mountains. The line of 44 inches annual rainfall almost coincides with the meridian of 123° down to about Lat. 40° , while east of the mountains the rainfall is only 20 inches. It is also much warmer along the coast, so that it is natural to find the coast birds resident and those east of the mountains migratory. The great number of *merrilli* found in winter in California, as compared with *strigata*, seems to support this idea.

It is to be noted here that, starting in Mexico, the size of the Horned Larks decreases as we go north along the coast, reaching its minimum in *strigata*, while inland it increases reaching its maximum in *leucolama*. *Merrilli* is intermediate in size between *arenicola* and *strigata*, as might be expected. I have not seen young of *strigata*.

Mr. C. H. Townsend has kindly loaned me a series of ten male Horned Larks from the Santa Cruz group of Islands, California, including the type of the race he calls *insularis*. I am much surprised to find his birds practically indistinguishable from Oregon specimens of *strigata*. They are the same size and though averaging a little darker, the nape approaching brick red, some of them can be matched by the few specimens of *strigata*, I have for comparison. I know that as a rule island birds make not only good races, but often good species, and that Oregon is hundreds of miles from these particular islands, but the fact remains that these two forms differ far less from one another than do any two of the other forms that are of the same size. The case seems parallel to that of the Carson *praticola*, and may well raise the question of what constitutes a race. The study of the Horned Larks convinces me that identical races may occur in isolated spots very much like oases in a desert, but it may be that future material will cause me to change my opinion.

Average measurements of 17 breeding males: wing, 98.8 mm. (3.89 in.); tail, 67.8 mm. (2.67 in.); tarsus, 21.1 mm. (.83 in.); bill from nostril, 9.1 mm. (.36 in.).

Specimens examined: ♂, 18, ♀, 19. Localities represented: *Ft. Steilacoom and *Shoalwater Bay, Wash.; *Salem and Albany, Ore.; Red Bluff, Gridley, Yuba Co., Summit, San Francisco, and *Santa Cruz Islands, Cala.

10. *Otocoris alpestris merrilli*, subsp. nov. DUSKY HORNED LARK.

Habitat.—Eastern Oregon, Washington, and British Columbia, between the Cascade and Rocky Mountains; southward in winter into Nevada and California.

SUBSP. CHAR.—Larger, more broadly streaked above, and blacker than *strigata*, with less yellow about the head and throat, the nape pinker.

Adult male in breeding plumage (No. 19,516, Coll. Wm. Brewster, Ft. Klamath, Oregon, July 1, 1887):—Back dark sepia brown, the feathers edged with pinkish gray; back of head, nape, shoulders, and rump-band vinaceous-cinnamon, the color extending to the sides of the neck and into the white of the breast below the black jugular patch, and faintly along the sides and flanks, which are streaked with dusky; loreal stripe from bill to middle of ear coverts (where it is widest and curves downward). fore part of crown, 'horns', and large jugular patch, uniform black; posterior portion of ear coverts dusky; band on forehead, stripe over eye and rest of lower parts white; eyebrow tinged with yellow; chin bright primrose yellow; wings dark like the back, the quills edged with grayish, the outer web of the first primary white-edged; tail black, two outer feathers white-edged externally and two central feathers brown, darkest at tip, and passing into the color of the rump at their base. Bill, plumbeous black, lower mandible pale buffy at base. Feet black. Wing, 103.4 mm. (4.07 in.); tail, 71.1 mm. (2.80 in.); tarsus, 21.6 mm. (.85 in.); bill from nostril, 8.9 mm. (.35 in.).

Adult female in breeding plumage (No. 19,538, Coll. Wm. Brewster, Ft. Klamath, Oregon, May 23, 1887):—Above broadly streaked with deep sepia brown, the feathers edged with pinkish gray, head more narrowly, and nape but slightly, streaked; nape, etc., paler than in male, the shoulders largely dusky; black jugular patch small and ill-defined; no black cap back of forehead, and loreal stripe only indicated by dusky; chin tinged with primrose yellow; eyebrows and lower parts white. Wing, 94.5 mm. (3.72 in.); tail, 63.5 mm. (2.50 in.); tarsus, 19.1 mm. (.75 in.); bill from nostril, 8.6 mm. (.34 in.).

Male in autumn plumage (No. 18,857, Coll. Wm. Brewster, Ft. Klamath, Oregon, Sept., 13, 1887):—Similar to breeding plumage, but softer, grayer, and pinker, pinkish gray edging of the feathers obscuring the dark color along the shafts as well as the white forehead and black cap; buffy tips cloud the other black areas, and the breast is clouded with dusky spotting below the jugular patch.

Female in autumn plumage (No. 18,852, Coll. Wm. Brewster, Ft. Klamath, Oregon, Oct. 26, 1887):—Similar to breeding plumage, but softer, grayer, and pinker; grayish wash across breast obscurely streaked.

Young in first plumage (♂, No. 19,524, Coll. Wm. Brewster, Ft. Klamath, Oregon, July 1, 1887):—[Described as *strigata*, Auk, Vol. V, 1888, p. 260.] Above brownish black * * * conspicuously varie-

gated with white or soiled white markings * * * ; underparts soiled white, the cheeks and jugulum flecked with dusky, the breast and sides, obscurely spotted with dull black [quoted in part].

This is the blackest-backed of all the races, the dark brown of *strigata* having a decidedly yellowish shade, particularly in autumn specimens, whereas *merrilli* is black-brown in spring and strikingly grayish and streaked in autumn. Sometimes it shows as much yellow as *strigata*, chiefly in autumn specimens, but it is a larger bird, so that size and color combined generally suffice to determine doubtful specimens. Certain pale birds of large size indicate an approach to *leucolama*, and probably come from an intermediate breeding area. The breeding range of *merrilli* includes the eastern portions of Oregon and Washington and the plains of the Fraser River. How far eastward it extends remains to be proved. Birds from western Montana approach this form, having yellow on the breast and darker streaked backs than average *arenicola*, to which form, however, it is perhaps best to refer such specimens. In winter it ranges as far south as Carson and San Francisco. *Merrilli* is certainly intermediate, but so are other races, and as this one is constant over a considerable area, it seems advisable to name it. This, it is only fair to say, Mr. Wm. Brewster proposed to do some years ago, and at his suggestion I name it after Dr. J. C. Merrill, U. S. A., to whose efforts a fine series of specimens is due. (Cf. Auk, Vol. V, 1888, p. 259.)

Average measurements of 20 breeding males: wing, 101.6 mm. (4.00 in.); tail, 69.6 mm. (2.74 in.); tarsus, 21.1 mm. (.83 in.); bill from nostril, 9.4 mm. (.37 in.).

Specimens examined: ♂, 62; ♀, 35; young, first plumage, 11. Localities represented: *Ashcroft, *Kamloops, and Chilliwask, B. C.; Walla Walla, Wash.; *Umatilla Agency, Camp Harney, *Ft. Klamath, Ore.; Carson and Steamboat Valley, Nev.; *Mt. Shasta, Ft. Crook, Gridley, Marysville, and Stockton, Cal.

11. *Otocoris alpestris pallida* Townsend, ms.

Habitat.—Lower California and Sonora. Mr. C. H. Townsend has recently described a race from Lower California and kindly permitted me to examine his type. Mr. W. E. Bryant has also sent me a pair of this race, and informs me that they are typical of others from the same locality. It is the smallest and

most pallid of any yet described, and resembles most a miniature *arenicola*. The white edging of the feathers of the back, particularly the secondaries, is very marked. While material is so meagre it is hardly safe to assign a definite habitat, but this probably represents a desert seashore race. A female, worn and faded, from Tehuantepec is perhaps referable to this race, but I imagine Mexico has still some curious facts to disclose regarding its resident Horned Larks.

Average measurements of 2 breeding males: wing, 95.0 mm. (3.74 in.); tail, 64.0 mm. (2.52 in.); tarsus, 19.6 mm. (.77 in.); bill from nostril, 9.1 mm. (.36 in.).

Specimens examined: ♂, 2; ♀, 2. Localities represented: *Santa Rosalia Bay and *Magdalena Bay, Lower Cala.; *Mouth of Rio Colorado, Mexico.

I conclude this paper with a description of the seasonal differences of plumage applicable to any of the races, a key to the races based on breeding birds, a table of measurements, and a map of North America showing the localities from which I have examined specimens.

COMMON CHARACTERS.

Males in breeding plumage. — Back various shades of brown, the feathers darkest along the shafts and edged with pinkish, reddish, or grayish, corresponding to the tints of the nape, and producing a mottled or broadly streaked appearance; back of head, sides of neck and nape (generally in marked contrast to the back) pinkish, vinaceous, or reddish, extending to the black of the jugulum and along the sides and flanks; shoulders and a band on rump, usually redder than the nape; fore part of crown, erectile 'horns,' a broad loreal stripe, extending wider below the eye into the middle ear-coverts, and a crescentic patch on the jugulum, curving below from shoulder to shoulder, uniform black; frontal band, a broad superciliary stripe, the middle of the ear-coverts (often interrupted with dusky), chin, throat, and remaining lower parts white, usually tinged about the head with yellow which is brightest on the chin and sometimes washes the breast; flanks obscurely streaked with dusky; tibiae like sides or duller, sometimes pale yellow; wings similar in color to the back, rather darker, the quills whitish-edged; tail black, outer web of exterior feathers chiefly white, and color of rump-band shading off into the pale brown of the two central feathers. Bill plumbeous black, lower mandible paling from tip to base. Feet black.

As but one moult takes place in the year (at the end of the breeding season), the breeding plumage is the direct result of the wearing and

fading of the autumn plumage, each individual feather wearing away at the points of least resistance, chiefly the tip. As the feathers of the back are darker at the base they fade least, the yellow ones fade most, while the vinaceous tints of the neck are often deeper in summer than in spring when the grayish tips are longer, consequently :

Adult males in autumn plumage differ from breeding birds only in softer plumage and more blended colors; grayish, yellowish, or brownish tips obscure the whole of the upper parts, producing a grayer or darker, more broadly and indistinctly streaked appearance; yellowish tips obscure more or less the black areas; and dusky tips just below the black crescent produce a clouding or indistinct spotting across the breast. The yellows are much brighter.

Young of the year are usually more conspicuously spotted, washed with buffy across the breast, and browner and darker above, with smaller bills.

Females in breeding plumage.—Smaller than males; black areas more restricted and less clearly defined; streaked continuously above from frontal band to rump-band, lines narrowest on the head and fewest on the nape, sometimes forming a black patch (rarely as distinct as in the most indistinct male) on the fore part of the crown; frontal band often narrow and obscure; shoulders and ear-coverts frequently obscured with dusky; otherwise similar to the male.

Adult females in autumn plumage.—Plumage softer and colors more suffused than in breeding dress, grayish, brownish or yellowish tips obscuring the various areas of color. Brownish wash and dusky spotting on the breast more or less distinct.

Young of the year usually darker and browner above, the breast below the crescent more conspicuously washed with buffy and more heavily spotted with dusky brown.

Young in first plumage.—Above dusky, brownish or buffy, conspicuously dotted from bill to tail with white; wing-quills and coverts edged with buffy; below white, spotted (more or less) across the breast with dusky, often on a buffy wash. This plumage is completely moulted in acquiring the autumn dress which varies but little from that of the adult. The feathers of the back are first replaced, those of the shoulders next, then the wing-quills, beginning with those nearest the body, and when the spotted plumage has nearly all disappeared, the head changing last, the black about the head and then that of the jugular crescent begins to show, and the tail feathers appear last of all. Bill and feet pale yellowish.

KEY TO MALES, BASED ON BREEDING PLUMAGE.

A. Backs grayish or brownish.

a. Colors pale, nape, shoulders and rump-band pinkish; colors generally grayer in autumn.

a'. No yellow anywhere; wing, 111.8 mm. (4.40 in.). *leucolama*.

b'. Yellow on throat.

- a''*. Back dark, eyebrows always white; colors darker in autumn; wing, 104.1 mm. (4.10 in.). *praticola*.
- b''*. Back pale; yellow usually brighter in autumn; wing, 104.1 mm. (4.10 in.). *arenicola*.
- c''*. Back very pallid; wing, 95.0 mm. (3.74 in.). *pallida*.
- d''*. Back light gray; wing, 97.8 mm. (3.85 in.). *giraudi*.
- b*. Colors dark, nape, etc., reddish; colors generally darker in autumn.
 - a'*. Browner, less streaked, eyebrows and throat always yellow; wing, 109.2 mm. (4.30 in.). *alpestris*.
 - b'*. Darker, more streaked, eyebrows and throat sometimes white.
 - a''*. Back blacker, nape paler; grayer in autumn; wing, 101.6 mm. (4.00 in.). *merrilli*.
 - b''*. Back yellower, greenish tinged, nape darker; grayer in autumn; wing, 99.1 mm. (3.90 in.). *strigata*.
- B*. Back reddish; usually darker in autumn.
 - a*. Colors of nape in marked contrast to the back; wing, 99.1 mm. (3.90 in.). *chrysolæma*.
 - b*. Colors of nape merging into those of the back.
 - a'*. General appearance rich rufous; wing, 99.1 mm. (3.90 in.). *rubea*.
 - b'*. General appearance pallid and scorched; wing, 102.9 mm. (4.05 in.). *adusta*.

KEY TO FEMALES, BASED ON BREEDING PLUMAGE.

- A*. Back grayish or brownish; usually darker in autumn.
 - a*. Eyebrow and chin always yellow; dark colors; wing, 101.6 mm. (4.00 in.). *alpestris*.
 - b*. No yellow anywhere; wing, 104.1 mm. (4.10 in.). *leucolæma*.
 - c*. Eyebrow and chin usually yellow, often white.
 - a'*. Back pale gray; wing, 88.9 mm. (3.50 in.). *giraudi*.
 - b'*. Back pallid; wing, 96.5 mm. (3.80 in.). *arenicola*.
 - c'*. Back very pallid; wing, 88.9 mm. (3.50 in.). *pallida*.
 - d'*. Back dark.
 - a''*. Blackish brown, darker in autumn; eyebrow always white; wing, 96.5 mm. (3.80 in.). *praticola*.
 - b''*. Blackish brown, more broadly streaked; grayer in autumn; wing, 95.3 mm. (3.75 in.). *merrilli*.
 - c''*. Yellowish brown; yellower in autumn; wing, 91.4 mm. (3.60 in.). *strigata*.
- B*. Back reddish, usually darker in autumn.
 - a*. Ruddy-tinged; wing, 91.4 mm. (3.60 in.). *rubea*.
 - b*. Yellowish-tinged; wing, 92.7 mm. (3.65 in.). *chrysolæma*.
 - c*. Pallid; wing, 95.3 in. (3.75 in.). *adusta*.

KEY TO YOUNG IN FIRST PLUMAGE.

- A. Black and white above.
 a. Spotting whiter. *merrilli.*
 b. Spotting more buffy. *leucolæma.*
- B. Dark brown above.
 a. White below, heavily spotted on breast. *praticola.*
 b. Yellow-tinged throughout, less spotted. *alpestris.*
 c. [Probably similar to *alpestris*]. *strigata.*
- C. Pale brown above.
 a. Darker and grayer. *giraudi.*
 b. Paler and browner. *arenicola.*
 c. [Probably similar to *arenicola*]. *pallida.*
- D. Reddish brown above.
 a. Dark. *chrysolæma.*
 b. Ruddy. *rubea.*
 c. Pale. *adusta.*

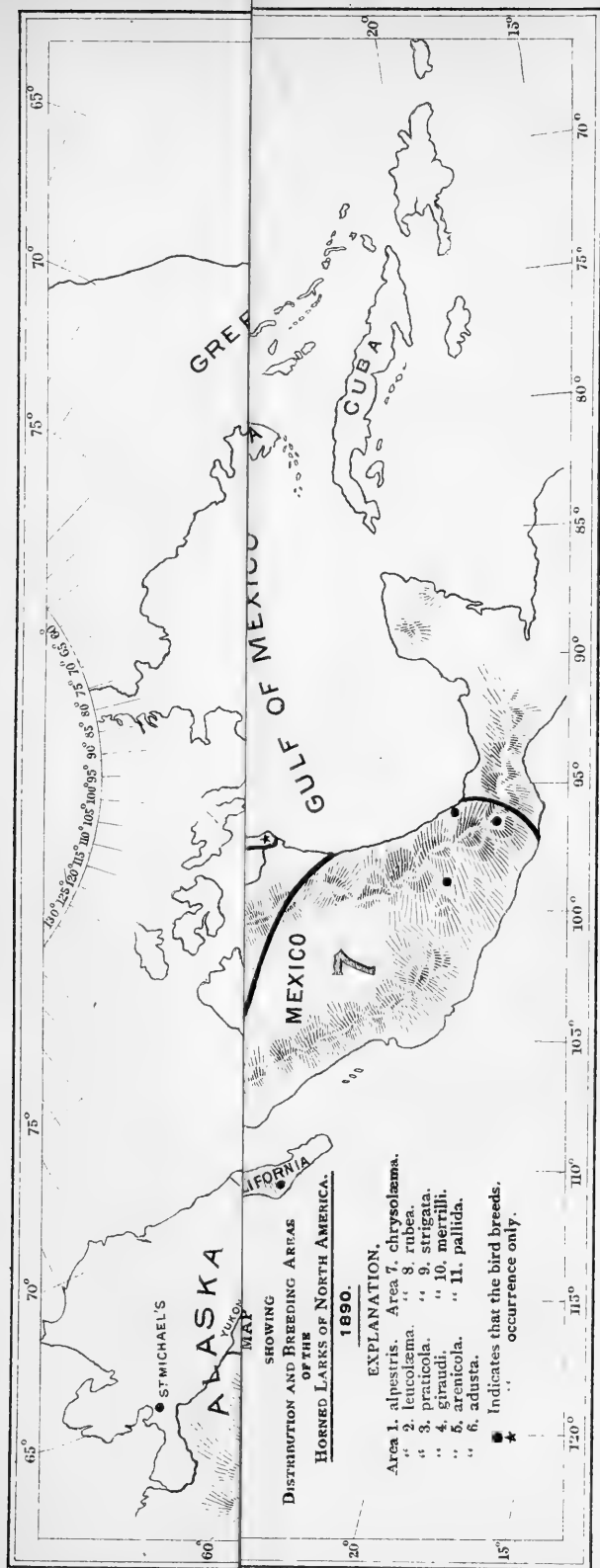
TABLE OF MEASUREMENTS (IN MILLIMETERS).

No. of specimens.		WING.			TAIL.			TARSUS.			*BILL (from nostril).		
		Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.
MALES.													
25	leucolæma	111.5	115.8	108.0	74.7	78.7	69.3	22.4	23.4	21.1	9.7	10.4	8.4
30	alpestris	109.7	114.8	106.2	74.2	80.3	67.6	23.4	25.4	21.6	10.2	11.2	8.9
30	arenicola	104.9	107.7	101.1	71.9	76.7	64.0	21.3	22.6	19.6	9.7	10.2	8.9
30	praticola	103.9	107.4	99.6	72.9	76.2	68.6	21.1	22.1	19.6	9.4	10.2	8.4
30	adusta	102.9	108.7	99.6	71.1	74.9	68.1	20.6	22.1	19.1	9.4	10.7	8.4
30	merrilli	101.9	104.9	98.6	70.4	73.7	66.0	21.1	22.9	19.8	9.4	10.2	8.4
30	chrysolæma . . .	99.3	104.6	93.5	68.3	72.4	63.5	20.8	22.4	19.1	9.4	10.7	8.4
17	rubea	99.1	104.6	96.0	67.1	71.1	66.0	21.1	22.1	20.1	9.1	9.9	8.1
19	strigata	98.6	101.6	92.5	67.6	71.9	63.5	20.8	22.6	19.3	9.1	10.2	8.1
25	giraudi	96.3	102.6	92.5	65.0	68.6	61.0	21.3	22.4	20.3	9.1	9.9	8.1
2	pallida	95.0	95.3	94.7	64.0	64.3	63.5	19.6	19.6	19.6	9.1	9.1	9.1
FEMALES.													
10	leucolæma	104.6	106.2	102.1	68.3	71.4	62.2	21.6	22.9	20.8	9.1	10.4	8.4
30	alpestris	101.6	104.6	97.5	66.0	70.6	59.7	22.4	23.6	20.8	9.1	10.9	8.4
30	arenicola	97.0	101.6	92.0	64.5	68.6	60.5	20.3	21.6	19.1	8.9	9.7	8.1
30	praticola	97.3	101.1	92.7	65.0	71.9	61.0	20.8	22.1	19.6	8.9	9.9	8.1
20	adusta	95.8	98.6	94.0	63.2	66.6	58.4	20.3	21.1	18.5	8.6	9.7	8.1
30	merrilli	95.5	99.8	92.0	63.5	70.6	59.7	20.3	21.8	19.1	8.6	9.9	7.9
25	chrysolæma . . .	92.5	96.0	89.7	61.2	66.0	57.9	20.1	20.8	18.8	8.6	9.1	8.1
9	rubea	91.4	94.0	89.7	61.7	64.0	58.4	20.3	20.8	19.6	8.6	9.4	7.9
17	strigata	91.7	96.8	89.4	61.0	65.5	57.2	20.1	21.3	19.3	8.6	9.1	8.1
18	giraudi	88.6	92.0	85.1	56.9	60.5	53.9	20.6	21.6	17.8	8.6	9.7	8.1
2	pallida	89.7	90.2	88.9	56.9	57.9	55.9	20.0	20.1	19.8	8.6	8.9	8.1

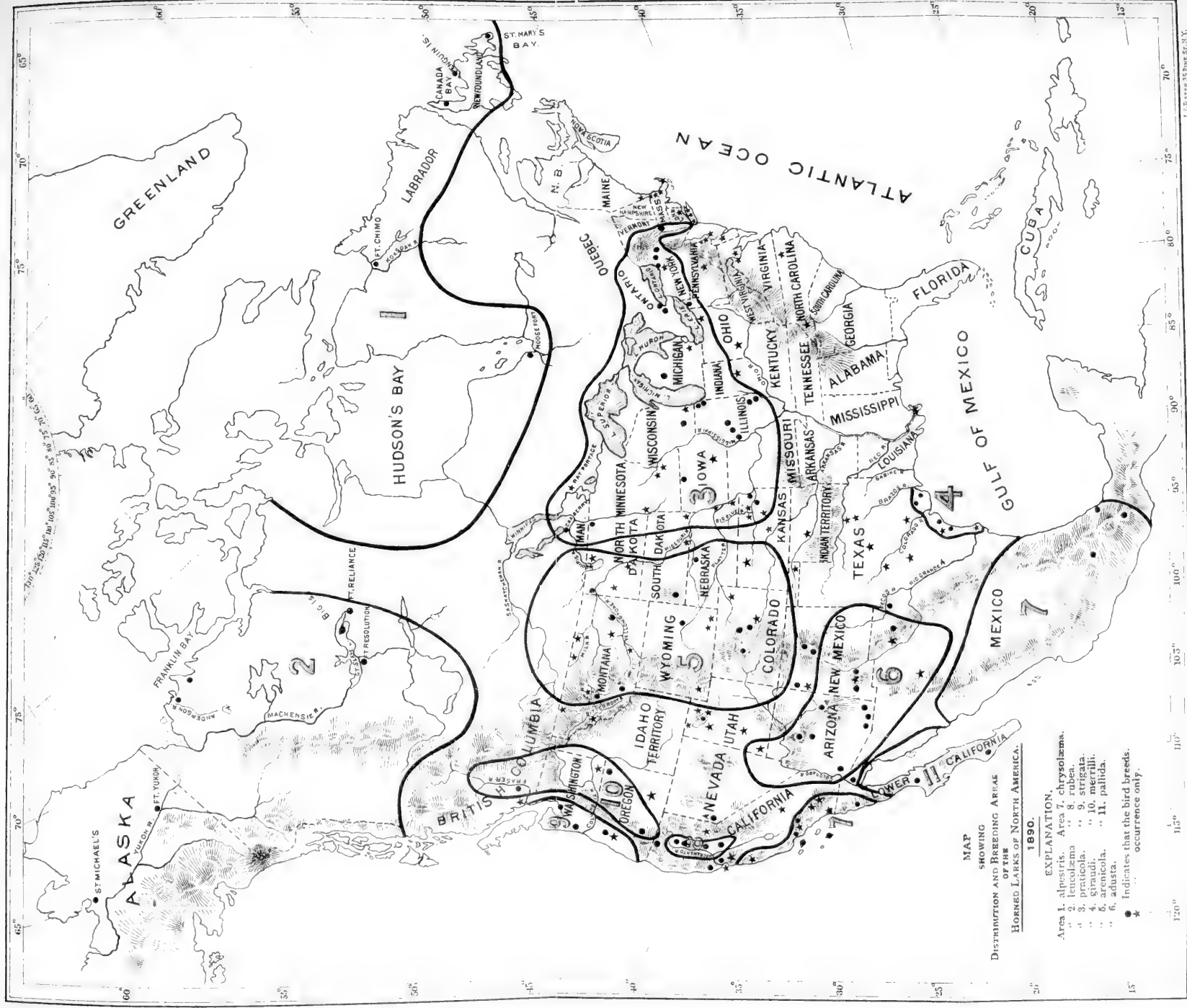
*Culmen averages about one fifth larger.

Wing measurement is chord from carpal joint to end of first primary.

Tail measurements is from insertion of two central rectrices to end of longest.



J. S. RESTON, 35 FINE ST. N. Y.





A NEW VIREO FROM CALIFORNIA.

BY F. STEPHENS.

***Vireo vicinior californicus*, subsp. nov.**

CALIFORNIA GRAY VIREO.

Darker than *Vireo vicinior* Coues. Above grayish-plumbeous, middle and greater wing-coverts, secondaries, tertials, and outer web of outer tail-feathers more or less edged with grayish white. Wing and tail of equal length. Nest not pensile, and not built in thorny bushes.

For many years I have thought the California Gray Vireo varietally distinct from the form that breeds east of the Colorado River, and I now venture to describe it as such. The difference in climate of the breeding habitats of the two forms is sufficient to account for their differentiation. I feel inclined to give the new form specific rank, as I am unacquainted with any intermediate specimens, and from the nature of the country intervening between the breeding range of the two forms I should not expect to find such, since that region is so barren that the species does not occur at all.

The most prominent difference between the two forms is the darker color above, combined with the greater amount of whitish edging on wing and tail, in the California form.

A comparison of a nest and set of four eggs taken ten miles east of Riverside, California, on April 26, 1889, and now before me, with the description given by W. E. D. Scott in 'The Auk' (Vol. II, Oct., 1885, pp. 321-326) of nests and eggs obtained by him in Arizona, indicate that my nest is smaller, especially in inside diameter, and that my eggs are longer in proportion. This nest was about four feet from the ground, and is composed of dry outside parts or fibres of a flax-like plant, gray in color, and is lined with the fine, dry, yellowish-colored stems of 'six weeks grass.' Width of nest outside, 3 inches; inside, 1 3-4 inches; depth outside, 2 3-4 inches; inside, 1 3-4 inches. The eggs measure .73 × .57, .74 × .55, .74 × .55, and .77 × .53 inch. Their colors are similar to those of *V. vicinior* described by Scott.

Each of the three nests that I have found was similarly situated in the middle of thick bushes, growing thickly among others of their kind on the slopes of mountains, forming the hundreds of thousands of acres of brush land, known locally as 'chaparral' or 'chemise,' which is the sole habitat of *Virco vicinior californicus*. I find this variety only between the altitudes of 2000 and 4000 feet, principally from 3000 to 3500. They appear early in April, and are gone by September. Probably two broods are raised.

A STUDY OF THE GENUS *DENDROORNIS* AND ITS SPECIES.

BY D. G. ELLIOT.

Among the difficult groups in ornithology, the Dendrocolaptidæ occupy a prominent position, and the species of the genus *Dendroornis* are not the least puzzling of its members. These bear, as a rule, so close a resemblance to each other, that at times, from descriptions alone, it is impossible to determine exactly which species may be under consideration, and ornithologists have frequently been obliged to transmit their material to those who have access to the types, in order that their examples might be correctly named. Fully aware of the difficulties that other naturalists have had to contend with in their work on this genus, I should never have attempted its revision, had I not been able to obtain a large number of the type specimens described from time to time, and so to have a tangible, indisputable starting point, from which to base my conclusions. Of the thirty-one forms, that have been named as belonging to this genus, I have procured no less than fourteen types, and among the other examples in my possession are some that have been compared and identified with the types of other species by ornithologists who have paid especial attention to these perplexing birds.

My material consists of one hundred and seventy-seven specimens, obtained from the following sources: the Boston

Society of Natural History,—a large series with Lafresnaye's types; the National Museum at Washington,—another large series with the types of Mr. Ridgway's lately described forms; the material in the collections of the American Museum of Natural History in New York, with Mr. Lawrence's types; the specimens contained in the Museum of Comparative Zoölogy of Cambridge; those of the Academy of Natural Sciences of Philadelphia, and some specimens from the collection of my friend, Mr. G. B. Sennett. Many of the specimens in Mr. Lawrence's collections and also in the National Museum have been identified by Mr. Scater, Mr. Salvin, Herr von Berlepsch and others, and in some instances examples from the private collections of these gentlemen were present in one or other of the series committed to my charge, showing what they considered a certain species to be, at all events at the time they identified that particular example. A change of opinion regarding the proper name to be applied to any specimen of this genus, judging from the labels borne by a number of them, seems to have been admissible, even if of very frequent occurrence.

The types in my possession while preparing this paper, are the following: *D. weddelli* Lafres., *D. nana* Lawr., *D. multiguttata* Lafres., *D. lacrymosa* Lawr., *D. guttatoides* Lafres., *D. triangularis* Lafres., *D. mentalis* Lawr., *D. fraterculus* Ridgw., *D. lawrencei* Ridgw., *D. lawrencei costaricensis* Ridgw., *D. punctigula* Ridgw., *D. albisquama* Lafres., *D. peruana* Lafres. MS., and *D. albirostris* Lafres. MS. Beside these I have a typical specimen of *D. chunchotambo* Tschudi, procured by the describer of the species during his journey in Peru, and typical specimens of *D. rostri pallens* Lafres. Of many of the species I have a considerable number of examples, sometimes large series, as in *D. flavigaster* Swain., represented by no less than sixty specimens, so that altogether I think I may consider that my material is as ample as any that may have been at the command of anyone who has paid especial attention to this genus, and far greater and more complete than has been at the service of the majority of ornithologists.

In my conclusions, in so far as the species were represented before me, I have been guided solely by my material, and although I am well aware that in this age, when the 'pendulum' has swung almost to the verge of the 'splitters' limit, to some many of my determinations may not be acceptable, yet I am satisfied that an

examination of my material by any unbiased naturalist, would permit no other conclusions to be arrived at than those expressed in these pages. It is not pleasant to disagree with those working in the same field, and wherever a shadow of a doubt existed, I have preferred to give the benefit of that 'shadow,' if any could be derived from it, to a fellow ornithologist, but when my material caused me to believe that an error had been committed, I have not hesitated to say so, with my reasons for such belief.

I have found that measurements, taken as a basis of scientific value in this group, are of little worth, as examples of the same species vary in their dimensions even from the same locality, and when such differences were considerable I have given the extreme measurements of the specimens before me, beside those of the example described. The length of the bill given is always that of the exposed culmen.

Knowing by experience how extremely difficult it is to distinguish closely allied species of this genus by descriptions only, and not hoping to be more successful in this respect than any of those who have written upon this group, I have constructed a key, containing distinctive characters, or the salient character of each species, by the aid of which, I trust, little difficulty will be met with by any one in deciding what particular species he may have before him. Of course, to those who consider that this genus should contain races, sub-races, etc., not recognized in this paper, and not apparent to the author, the key will only be useful up to a certain point, beyond which they must provide their own conveyance for farther travel. I have not attempted to quote what might be considered a full synonymy for each species, as in many cases where the name only was given, no description having been added, it was impossible to determine with any degree of accuracy what was the species intended. That errors were made, was shown in certain instances, where an author in a subsequent paper had altered the name previously given to his specimen, to that representing quite a different species. It therefore seemed best, when no description was given, and access to the specimen mentioned was not available, that in the great majority of cases no notice of its occurrence should be taken, and that I should confine myself to such references, regarding which there was no reasonable doubt as to what species was mentioned. To cite an instance of the difficulty of

knowing what species was intended by a name only, I would mention the three species, *susurrans*, *pardalotus* and *nana*, which have been confounded together by most writers, but which my material shows are quite separable. To quote any of these, especially the last (which seems not to have been distinguished at all by many authors), where a name only was given, with perhaps no authentic locality, would possibly only serve to perpetuate an existing error. I have therefore given only such synonymy as I was able to verify with some considerable degree of certainty. Seven described species I have not seen, and they are not represented, so far as I am aware, by any specimen in the United States. They are *kieneri*, *ocellata*, *elegans*, *spixi*, *palliata*, *polysticta*, and *obsoletus*.* I have therefore given the original descriptions without any comments, as it is impossible to definitely fix their specific status without seeing the types.

It only remains for me to express my thanks to those gentlemen who have aided me by the loan of specimens, and kindly given such other assistance as was in their power, among whom I would especially mention Mr. C. B. Cory for the large series of specimens and types from the Lafresnaye collection, without which no conclusive or satisfactory paper could be written on this genus; Mr. R. Ridgway of the National Museum, Washington; Mr. W. Brewster of the Museum of Comparative Zoölogy, Cambridge, Mass.; Mr. W. Stone of the Academy of Natural Sciences, Philadelphia; Prof. J. A. Allen and Mr. F. M. Chapman of the American Museum of Natural History, New York; and Mr. Geo. B. Sennett.

LITERATURE OF THE GENUS.

In reviewing the literature of *Dendrornis*, I confine myself mainly to those authors and works by which new species have been introduced to ornithologists; or to those where certain forms are described that our present knowledge hardly permits us to accept as entirely worthy of occupying distinct positions among the

* Of the above desiderata, specimens of *ocellata*, *elegans*, and *spixi*, collected by Natterer, have been forwarded to the American Museum of Natural History from the Vienna Museum, but have not been received in time for me to remark upon them in this paper. [See p. 207 of this number of 'The Auk.'—ED.]

species of the group. As the earliest writer on the birds of this genus does not date back of 1818 I am fortunately not required to decide which is the proper edition of Linnæus's 'Systema Naturæ' for ornithologists to consider as the true and only starting point.

1818. LICHTENSTEIN, *Abhand. Königl. Akad. Wissens.*—Two species are here described as *Dendrocolaptes guttatus*, and *D. obsoletus*. Species 2.

1818. VIEILLIOT, *Nouveau Dictionnaire d'Histoire Naturelle*.—*Dendroornis pardalotus* described as *Dendrocopus pardalotus*. Species 3.

1824. SPIX, *Avium species novæ quas in itinere per Brasiliam*.—*D. ocellata* described as *Dendrocolaptes ocellatus*; and *D. tenuirostris* (nec Licht.) described under the genus *Dendrocolaptes*. Species 5.

1827. SWAINSON, *Philosophical Magazine*.—*D. flavigaster* described as *Xiphorhynchus flavigaster*. Species 6.

1831. LESSON, *Traité Ornithologie*.—*Dendrocolaptes tenuirostris* Spix, re-named *Picolaptes spixi*, which specific name stands, as *tenuirostris* had already been employed by Lichtenstein.

1842. LAFRESNAYE, *Revue et Magasin de Zoologie*.—*Dendroornis triangularis* described as *Nasica triangularis*. Species 7.

1843. LESSON, *Echo du Monde Savant*.—*D. flavigaster* Swain. re described as *Dryocopus eburneirostris*.

1844-46. TSCHUDI, *Untersuchungen über die Fauna Peruana*.—*Dendroornis chunchotambo* described. Species 8.

1847. JARDINE, *Annals and Magazine of Natural History*.—*D. susurrans* described as *Dendrocolaptes susurrans*. Species 9.

1850. LAFRESNAYE, *Revue et Magasin de Zoologie*.—*D. d'orbignyannus*, *D. multiguttata*, and *D. guttatoides* described under the genus *Nasica*. Species 12.

1852. LAFRESNAYE, *Revue et Magasin de Zoologie*.—*D. susurrans* re-described as *Nasica beauperthuyssii* and *N. albiquama*.

1852. EYTON, *Jardine's Contributions to Ornithology*.—*D. multiguttata* re-described as *Picolaptes notatus*.

1853. SCLATER, *Proceedings of the Zoölogical Society of London*.—*D. eytoni* described as *Dendrocolaptes eytoni*.

Species 13.

1856. LAFRESNAYE, *Castelnau Voyage de l'Amérique du Sud*.—*D. weddelli* and *D. rostripallens* described. Species 15.

1856. DES MURS, *Castelnau Voyage de l'Amérique du Sud*.—*D. kieneri* and *D. palliata* described. . . . Species 17.

1856. SCLATER, *Proceedings of the Zoölogical Society of London*.—*D. erythropygia* described. . . . Species 18.

1862. LAWRENCE, *Annals of the New York Lyceum of Natural History*.—*D. lacrymosa* described. . . . Species 19.

1863. LAWRENCE, *Ibis*.—*D. nana* described. . . . Species 20.

1867. LAWRENCE, *Annals of the New York Lyceum of Natural History*.—*D. flavigaster* Swain. re-described as *D. mentalis*.

1868. PELZELN, *Ornithologie Brasiliens*.—*D. elegans* described. Species 21.

1883. SALVIN and GODMAN, *Ibis*.—*D. polysticta* described.

Species 22.

1883. BERLEPSCH and TACZANOWSKI, *Journal für Ornithologie*.—*D. erythropygia* Sclat. re-described as *D. erythropygia æquatorialis*.

1884. RIDGWAY, *Proceedings of the United States National Museum*.—*D. nana* Lawr. re-described as *D. lawrencei*.

1887. RIDGWAY, *Proceedings of the United States National Museum*.—*D. susurrans* Jardine re-described as *D. fraterculus*.

1888. RIDGWAY, *Proceedings of the United States National Museum*.—*D. punctigula* described. Species 23.

1889. RIDGWAY, *Proceedings of the United States National Museum*.—*D. nana* Lawr. re-described as *D. lawrencei costaricensis*.

GENERA.

The birds enumerated in this paper had been assigned by different writers to various genera of the family Dendrocolaptidae until 1851, when Eyton, in 'Jardine's Contributions to Ornithology,' proposed for them the term *Dendroornis* with the following characters: "Bill nearly straight, of moderate length, the upper mandible hooked at the tip, fourth quill longest." These characters are comparative rather than positive; with the exception of the last, and yet perhaps they are the best that can be given, as

the bill, which is the main distinction, varies considerably among the different species, some being much more slender and comparatively longer than others, almost in some instances verging upon *Picolaptes*. The third and fourth quills are equal and longest (rather than fourth quill longest as given by Eyton), and in this respect resemble the species of other genera of the family. I do not think it is possible to define any characters that will serve to absolutely distinguish the members of *Dendrornis* from their relatives, and yet when the general stoutness of the bill together with the usual pattern of markings are considered together, the birds form a tolerably recognizable group. Reichenbach in his 'Handb. Spec. Ornith.,' p. 186, proposed for *D. guttata* the generic term *Premnocopus*. This however had already been employed by Cabanis for another group of birds.

GEOGRAPHICAL DISTRIBUTION.

The members of the genus *Dendrornis* are dwellers of the Neotropical Region, their most northern habitat being the Mexican Sub-region. Here, in the vicinity of Mazatlan on the west and Tampico on the east, we find the *D. flavigaster*, which extends its range into Central America as far as the confines of Costa Rica, and *D. erythropygia* ranging from Jalapa through Central America, and as far south as Ecuador. *D. lacrymosa* goes from Costa Rica through the Isthmus of Panama into Colombia. *D. punctigula* is, so far as known, restricted to Costa Rica and Colombia, not being a native of Panama, but represented there by *D. erythropygia*, a singular distribution, and not easily accounted for. *D. nana* ranges from Honduras into Colombia. Colombia (Colombian Sub-region), beside the species already given, contains *D. rostripallens*, which extends into Ecuador and is also found at Matto Grosso, Brazil, on the borders of Bolivia, possibly being a native also of that country; and *D. guttatoides*, also stated to be a native of British Guiana and Cayenne (Amazonian Sub-region), but not as yet found in Venezuela. Tobago and Trinidad contain *D. susurrans*, also met with in Venezuela and at Santarem, Brazil, in the Amazonian Sub-region. Guiana also contains *D. polysticta*, *D. pardalotus*, not found elsewhere, and, according to Sclater, also *D. multiguttata*. Brazil possesses a large number of these birds. In the Amazonian Sub-region we

have from Para, *D. spixi*, *D. palliata*, *D. obsoletus*; and *D. cytoni*; the last is also found at Santarem, where *D. multiguttata* is met with. *D. ocellata* comes from Piahy, and *D. guttata* appears to be confined to Bahia. *D. elegans* was procured at Engenho do Gama, and is also a native of Peru; while *D. d'orbignyanus* is found at Matto Grosso in the west of Brazil and also in Bolivia. *D. triangularis* is met with in Ecuador, Peru, and Bolivia of the Colombian Sub-region, while *D. chunchotambo* is apparently confined to Peru.

KEY TO THE SPECIES.

- A. Back uniform.
- a. Throat buff. Bill strong, longer than head.....1. *D. weddelli*.
 - b. Throat pure white. Bill small, long as head.....2. *D. kieneri*.
 - c. Throat buff, feathers margined with dark brown....3. *D. ocellata*.
- B. Back striated, under parts not dark olive, markings linear.
- a. Throat white, feathers margined with dark brown.
 - 4. *D. susurrans*.
 - b. Throat deep rusty buff, feathers margined with black.
 - 5. *D. pardalotus*.
 - c. Throat uniform buff. Under parts yellow olivaceous brown.
 - a'. Back with lanceolate dark buff stripes, margined with black; breast striped with deep buff, margined with black.....6. *D. nana*.
 - b'. Back with broad pale buff stripes margined with black; breast and abdomen with broad buffy-white stripes margined with black.....7. *D. multiguttata*.
 - d. Throat pale or whitish-buff, feathers with dark margins.
 - a'. Back with narrow buff lines.....8. *D. chunchotambo*.
 - b'. Back with pear-shaped buff lines.....9. *D. elegans*.
 - e. Throat uniform buffy-white.
 - a'. Bill: maxilla brown, mandible yellow. Under parts with narrow oblong fulvous spots.....10. *D. spixi*.
 - b'. Bill entirely yellow.
 - a''. Underparts with large whitish-buff spots, margined with black, spots growing smaller on abdomen11. *D. palliata*.
 - b''. Underparts rather broadly striated with pale buff, margined with black.....12. *D. flavigaster*
 - c'. Bill blackish, base of mandible yellowish.
 - a''. Large buff spots on back and breast; abdomen striped conspicuously with pale buff margined with blackish-brown.....13. *D. lacrymosa*.
 - b''. Small buff spots on back and breast; abdomen nearly uniform brown.....14. *D. polysticta*.

- f.* Lower part of breast and abdomen fulvous striped with buff.
- a'*. Buff stripes on lower part of breast and abdomen without dark margins.
- a''*. Bill black; throat white; upper part of breast with large buffy-white spots, margined with black.....15. *D. eytoni*.
- b''*. Bill yellowish-white. Buff spots on upper and lower part of body without black margins.....16. *D. d'orbignyianus*.
- c''*. Bill pale horn-color; buff stripes on upper part of breast margined with black.....17. *D. rostrispallens*.
- b'*. Buff stripes on breast and abdomen margined with black.
- a''*. Bill half as long again as head. Throat and stripes on breast deep rusty-buff.....18. *D. guttata*.
- b''*. Bill short, stout, long as head. Throat and stripes on breast whitish-buff.....19. *D. guttatoides*.
- C.* Back striated. Entire underparts dark olive covered with triangular yellowish-white spots.
- a.* Lower back bright olive. Back with few narrow buffy-white lines on upper part.....20. *D. triangularis*.
- b.* Lower back cinnamon-red.
- a'*. Back olive brown, with numerous lengthened buffy-white spots.....21. *D. erythropygia*.
- b'*. Back olive brown with narrow whitish-yellow stripes on upper part.....22. *D. punctigula*.

The description of *D. obsoletus* Licht, is so meagre and unsatisfactory, that it is impossible to assign to it any place in the above key.

Dendrornis weddelli.

Dendrornis weddelli LAFRES. DES MURS, Voy. Castel. Amer. Sud. Ois. p. 46, Tab. xiv, fig 2. (1856).

Habitat.—?

Crown and nape reddish-brown, with pear-shaped spots of buff, minute on forehead, more elongated on nape. Back uniform reddish-brown, the shafts of feathers buff. Rump and upper tail-coverts cinnamon-red. Throat buff, each feather margined with a narrow blackish-brown line; this becoming broader and more conspicuous on the buff markings on the lower part of the neck. Under parts olive brown, each feather with a lengthened pear-shaped pale buff spot without any dark margin, these spots becoming obsolete on the abdomen. Under tail-coverts olive brown with a reddish tinge. Wings cinnamon. Tail cinnamon-red, much darker than the wings. Bill very long, slender and pointed; horn-brown on maxilla, pale yellow on mandible. Feet pale brown. Length $8\frac{1}{2}$ in. Wing $3\frac{1}{2}$ in. Tail $3\frac{3}{10}$ in. Bill $1\frac{1}{2}$ in. Description taken from type, No. 2267, Coll. Boston Soc. Nat. Hist.

The types of this species are before me from the Lafresnaye collection, and they appear quite distinct from all others of this genus. The figure in Des Murs's work (l. c.) gives no idea of the bird, and is, like all the other figures of *Dendroornis* in the volume, apt to mislead, as they are quite unlike the specimens, both in color and in shape and distribution of the spots. *D. weddelli* is remarkable for its long and slender bill, which is quite straight with the gonys very long and ascending. The maxilla is slightly hooked at the point. Des Murs gives no habitat for the species, nor is any mentioned on the labels. Mr. Sclater states in P. Z. S., 1871, p. 86, that he had compared his specimens, designated by him heretofore as *D. palliata*, with the marked types of *D. weddelli* in the Paris Museum and "found them identical with it and not with *D. palliatus*." A doubt arises here in my mind whether after all specimens marked *D. weddelli* were really that species. Des Murs gives the name of *D. weddelli* as a MS. one conferred by Lafresnaye, and the author of the birds of Castelnau's 'Voyage' does not say that the type or any specimens of *weddelli* are in the Paris Museum; while Lafresnaye's collection contains two specimens marked as the types of the species, while they are also enumerated as such in the catalogue, made by Jules Verreaux, of the collection in Paris, before it was sold to Dr. Bryant and brought to Boston. On the other hand, *D. palliatus* Dev. and Des Murs is not contained in the Lafresnaye collection and would naturally be supposed to be among Castelnau's birds in the Paris Museum. I do not mean to argue that *D. weddelli* is not represented in the Paris Museum collection, but I doubt very much if any specimen there is rightly labelled as a type of the species. The two are apparently very distinct, the form and length of the bill of *D. weddelli* being quite different from that of the other species of *Dendroornis*, and neither agrees with the typical specimen of *D. chunchotambo* Tsch. before me, which has been considered as a synonym of *D. ocellata* Spix by some writers.

Dendroornis kieneri.

Dendroornis kieneri DES MURS, Voy. Amer. Sud. Ois. p. 45, pl. 14, fig. 1. (1856).

Habitat.—Ega, Brazil.

"D. supra cinnamomeo-rufus; secundariis reatricibus fuscioribus; tergo dilutiore; capite, genis, colloque postico ferè nigris, fulvoalbidie stricto

flammulatis; remigum primariis apice nigricantibus; rectricibus apice elongato-acuminatis. Subtus fulvo-rufus; gutture albescente; pectore albido flammato, maculis nigro circumcinctis; abdomine fulvo-albido striato. Rostro minore corneo. Pedibus brunneis."

"Dessus de la tête et derrière du cou d'un noirâtre beaucoup plus prononcé que dans le *D. rostripallens*; chaque plume striée de raies d'un fauve blanchâtre s'épanouissant en forme de larmes par le bas, où la bordure noire qui les encadre les fait ressortir avec plus d'éclat; dos d'un brun roussâtre, uniforme; ailes et queue d'un brun rouge-cannelle très foncé; les remiges primaires teintées d'un brun fuligineux ou noirâtre à leur pointe; menton d'un blanc presque pur. Tout le reste du dessous du corps d'un fauve roussâtre; la poitrine largement écaillée de plaques d'un blancé légèrement teinté de fauve, occupant presque toute la surface de chaque plume, et encadrée d'une fin liséré noir; le ventre strié de raies longitudinales d'un fauve blanchâtre. Bec couleur de corne, brunâtre à sa base. Pieds d'un brun noirâtre. Longueur totale 22 centimètres environ;—du bec, $2\frac{1}{2}$; du tarse, 2; de la queue près de 9; le rachis de chacune des rectrices dépassant les barbes de 1 centimètre."

The above is Des Murs's description. I have not seen this species.

Dendroornis ocellata.

Dendrocolaptes ocellatus SPIX, Av. Bras. Vol. I, p. 88. Text (1824).

Dendrocolaptes guttatus SPIX, Av. Bras. Vol. I, Tab. xci., fig. 1. (1824).

Picolaptes ocellatus LAFRES., Rev. Mag. Zool. 1850, p. 371.

Habitat.—Piauhy, Brazil (Spix).

"Sub-minor, olivaceo-castaneus, rostro fere recto, non adunco, parum compresso; gula ochracea; jugulo maculis ochraceis ocellato fuscoque fimbriato; capite nucha pectoreque fulvo strigilatis; macula auriculari crispa, fulvo-strigilata; collo antico ochraceo-guttato."

"Descriptio. Corpus Dendrocolaptes guttato ac Pico minus; dorsum immaculatum corpusque subtus olivaceo-ferruginea; alæ subtus fulvæ; remiges candaque castaneæ, rectricibus intermediis ad apicem acutis; rostrum olivaceo-fuscum, subarcuatum; pedes fusco-albidi. Longitudo cor-7', cauda $3\frac{1}{3}$ ', c. alis. l. 2', rostri $1\frac{1}{3}$ '."

The above is Spix's description of the species, and judging from this and his figures (I have not seen the type), I cannot consider that it is the same as *D. chunchotambo* Tschudi from Peru. Most of the later writers on these birds, have Tschudi's name as a synonym of *ocellatus* Spix, and while some state that they have compared their specimens with Tschudi's type, none say that they have also compared them with the type of Spix's spe-

cies. As will be noticed in my Key, the two great groups into which the known species can be divided are characterized by having the back uniform in color, or striated, and so few are the former that out of the 23 species acknowledged in this paper, but three can be placed in the first division. Now, as will be noticed, Spix says of his bird, "dorsum immaculatum," and his figure shows the back without the spots or lines. Tschudi's species has the back covered with narrow buff lines. The distinction here is important, and would alone seem to be sufficient to prevent these birds from being considered as the same species. The measurements given by Spix do not at all agree with the typical specimen of Tschudi's bird before me, being much less in all of them, except the bill, which is longer. There are other differences in color of the plumage, but not sufficiently definite for me to found an opinion, not having Spix's bird before me; but those I have given, seem to me quite enough to prevent me from considering *D. chunchotambo* as a synonym of *D. ocellata*. It remains for some one who may have an opportunity of comparing both of the types together to decide their specific standing.

Dendroornis susurrans.

Dendrocolaptes susurrans JARD. Ann. Mag. Nat. Hist. 1847, p. 81, ex Tobago.

Nasica albisquama LAFRES. Rev. Mag. Zool. 1852, p. 465.

Nasica susurrans LAFRES. Rev. Mag. Zool. 1850, p. 425.

Nasica beauperthuyii LAFRES. Rev. Mag. Zool. 1850, p. 419; 1852, p. 469.

Dendroornis fraterculus RIDGW. Proc. U. S. Nat. Mus. Vol. X, 1887, p. 526, ex Brazil.

Habitat.—Tobago, Trinidad, Venezuela, Brazil, Santarem (Riker).

Bill curved at the tip, maxilla blackish brown; mandible paler; in some specimens dark brown, others yellowish. Crown, nape and cheeks dark brown, each feather with an apical, ochraceous, oval spot. Back yellowish brown, the feathers on upper portion having central, lengthened pale yellow-spots, becoming gradually narrower on the middle of the back, and disappearing altogether on the lower part. Each of these yellowish spots or lines is surrounded by a narrow dark brown border. Rump, wings, and tail, reddish brown. Throat white, the feathers edged with dark brown; rest of underparts pale yellowish brown, each feather having a central oval yellowish white spot, surrounded with a border of darke

hue. These spots become gradually less and less distinct, and disappear altogether on the lower part of the breast. Feet, pale brown. Entire length, $8\frac{7}{8}$ in.; bill, $1\frac{1}{2}$ in.; wing, $4\frac{1}{2}$ in.; tail, $3\frac{1}{2}$ in. Description taken from a Tobago specimen, collected by Ober in May, in collection American Museum Natural History. Dimensions of a specimen from Venezuela collected by Coale, No. 106,047, U. S. Nat. Mus.: Length, $7\frac{1}{2}$ in.; wing: $3\frac{9}{10}$ in.; tail, $3\frac{1}{10}$ in.; bill, $1\frac{5}{12}$ in. Dimensions of type of *D. fraterculus*, wing, $3\frac{1}{10}$ in.; tail, $3\frac{7}{12}$ in.; exposed culmen, bill broken, .83.

The above description differs in some particulars from that of the type given by Jardine (l. c.) also from Tobago. He says the *mandible* is umber-brown, *maxilla* paler. This is evidently a transposition of terms, as the mandible is never darker than the maxilla, the opposite being almost always the fact. In two specimens before me, one from Venezuela collected by Coale, the other being one of the types of *N. albiquama* Lafres., the mandible is quite as dark as the maxilla, the entire bill being, in fact, nearly black. This variance of color seems, however, to be an individual characteristic, as nearly all specimens have the bill colored as described above. Jardine also states that the *nape* is yellowish brown like the back. In all my specimens the nape and crown are of the same color, and very much darker than the back. With the above discrepancies, the description of the type agrees with the specimens before me from Tobago and elsewhere. The depth of color differs in specimens, some being generally darker than others, and the spots brighter and more clearly defined, and their borders more sharply marked. This difference of hue does not occur in specimens from one locality more than from another, and evidently has no specific value whatever. One specimen from Tobago, collected by Ober in April, a month earlier than the one described above, has the throat pale buff, more like those of Central American birds, and the spots above and below are brighter, of a deeper color, and more distinct.

I have placed among the synonyms of this species *D. fraterculus* Ridgw., from Santarem, Brazil, the type of which is before me. The measurements in a series of these birds vary very considerably, and I have before me a specimen from Venezuela (measurements given above) that varies but slightly from the type of *fraterculus*. The length of bill in the latter I am unable to ascertain as only about half of it remains, the apical portion having disappeared. Mr. Ridgway gives the "exposed culmen 1.15,"

but the bill of the type specimen as received by me has the portion remaining of the exposed culmen only .83. The chestnut color of the shafts of the rectrices does not appear to be a reliable character, as these vary in a series from black to bright chestnut, and some specimens have both hues, the shafts of the median pair being black while those of the lateral feathers are chestnut. The pale buff of the throat is matched in the Tobago specimen mentioned above, and is evidently the result of individual variation, the specimens being more richly colored than is seen in the usual typical style. The rest of the plumage is, however, no brighter in either example than can be seen in the ordinary run of individual *susurrans*.

N. beauperthuysii Lafresnaye, is stated by its describer to be the same as *D. susurrans* (vide Rev. Mag. Zool. 1852, p. 469).

Dendroornis pardalotus.

Le Grimpar Flambé LEVAILL. Hist. Nat. des Promer. et des Guép. pl. 30, ex Guiana.

Dendrocopus pardalotus VIEILL. Nouv. Dict. Hist. Nat. Vol. 26, p. 117 (1818).

Dendroornis pardalotus PELZ. Ornith. Bras. p. 45 (1868).—SALV. Ibis, 1885, p. 422.

Habitat.—Guiana. Bartica Grove, Camacusa, Merumé Mountains, Roraima (3,500 feet) (Whiteley). Demarara (Ridgway).

Crown of head and nape blackish brown, each feather with a minute dark buff spot, these becoming slightly larger on the nape. Back dark yellowish brown, each feather having a pear-shaped, apical spot, surrounded by a narrow line of brownish black. Secondaries, rump and tail bright chestnut. Shoulders of wings yellowish brown. Primaries chestnut, with a considerable length of the apical portion of the inner webs, purplish brown. Throat deep rusty buff, the feathers edged with black. Underparts dark yellowish brown, with rather broad, deep buff lines in the centre of each feather, less distinct on flanks and abdomen. Tips of feathers of under tail-coverts chestnut. Bill: maxilla blackish brown, mandible yellowish, varying in degree among individuals. Feet, black. Length, $8\frac{1}{2}$ in.; bill, $1\frac{3}{4}$ in.; wing, 4 in.; tail, $3\frac{1}{2}$ in.

Specimen described from Demarara, Brit. Guiana, in U. S., Nat. Mus., No. 84,105.

The general hue of this species beneath is rufous, occasioned by the deep buff of its throat, and stripes and spots on head, back, and lower parts. It is apparently confined to Guiana and is readily distinguished from its allies, *D. susurrans* and *D. nana*.

Dendroornis nana.

Dendroornis nana LAWR. Ibis, 1863, p. 181, ex Panama.—SALV. Proc. Zool. Soc. 1870, p. 193.

Dendroornis lawrencei RIDGW. Proc. U. S. Nat. Mus. Vol. X, p. 509 (1887), ex Panama.—SCLAT. Ibis, 1889, p. 353.

Dendroornis lawrencei costaricensis RIDGW. Proc. U. S. Nat. Mus. Vol. X, p. 510 (1887).—SCLAT. Ibis, 1889, p. 353.

Habitat.—Honduras, Nicaragua, Costa Rica, Panama, Colombia.

Head and nape blackish brown, each feather with an apical pear-shaped ochraceous spot, smallest on the forehead, becoming more elongated on the nape. Back brownish olive, the upper part with narrow, lanceolate dark buff stripes bordered with black; lower part of back, rump, tail and wings cinnamon-red, the wings of a rather lighter color than the tail. Throat pale buff, unspotted; cheeks pale buff, feathers edged with dark brown; underparts pale yellow-olivaceous-brown, marked conspicuously on the breast and lower part of neck with rather broad, deep buff stripes, edged with black; these stripes becoming narrower on lower breast, and nearly obsolete on flanks and abdomen. Under tail-coverts washed with rufous, more strongly defined in some specimens than in others. Maxilla dark brown, mandible yellowish, brownish at the tip. Feet blackish brown. Length, $8\frac{3}{4}$ in.; wing, $4\frac{1}{2}$ in.; tail, $4\frac{1}{2}$ in.: bill, $1\frac{3}{4}$ in.

Specimen described from Lawrence collection, No. 43,274, Am. Mus. Cat., from Panama, obtained by McLelland in 1862.

The type of this species is before me, but being in moult with the tail and wings not fully developed, I have taken another example obtained in Panama at the same time, as the type of my description. A number of specimens are before me, seventeen in all, from all the localities of which it is stated to be an inhabitant, among which are the types of *D. lawrencei* Ridgway and *D. l. costaricensis* Ridgw. From an investigation of the labels, I find the various specimens of *D. nana* have been referred to *pardalotus* Vieill. and *susurrans* Jard., sometimes to both of these species, and sometimes left undetermined. The throat entirely unspotted, easily distinguishes this species from all its near allies, and on comparison with a series of these, the different coloring of the underparts with the shape and arrangement of the spots make it readily recognizable.

I regret to place as synonyms Mr. Ridgway's species and subspecies from Panama and Costa Rica, as I can find no characters to separate them from typical *nana*. Mr. Ridgway in his descrip-

tion of *D. lawrencei* (l.c.) compares it with *D. ocellata* Spix, or, speaking more correctly, with a type specimen of *D. chunchotambo* Tschudi, which has been determined by both Sclater and Taczanowski to be identical with *D. ocellata* Spix.* It is quite true that Mr. Ridgway's specimens are separable from the species from Peru, but that is not their nearest ally, and if the type of *nana* had been in his possession at the time he wrote his descriptions I believe he would have perceived that his birds were identically the same. The slight difference in size mentioned as distinguishing *D. lawrencei* from *D. l. costaricensis* is also to be noticed in a series of any species of this genus, and is evidently of no specific value.

Dendroornis multiguttata.

Nasica multiguttatus LAFRES. Rev. and Mag. Zool. 1850, p. 417.

Picolaptes notatus EYTON, Contr. Orn. p. 26 (1852).

Dendroornis multiguttatus LAFR. DES MURS. Cast. Voy. Amer. Sud. Ois. p. 44, Tab. xii, fig. 1 (1856).

Dendroornis multiguttata SCLAT. Cat. Am. B. p. 164, sp. 1010 (1862). SCLAT. & SALV. Proc. Zool. Soc. 1873, p. 271.—TACZ. Ornith. Per. Tom. II, p. 180 (1884).

Habitat.—Brazil, Fontiboa, Upper Amazon (Lafres.), Santarem (Williams). Lower Ucayali (Bartlett). Cayenne (Sclater).

Top of head, neck and back olive brown, darkest on the head, which has the central portion of the feathers striped with buffy white, becoming broader and more lengthened on the back, and of a reddish shade, and all margined with black. Rump, upper tail-coverts, wings and tail cinnamon-red. Throat buff, in one specimen the feathers indistinctly margined with brown. Entire underparts grayish olive, broadly striped with buffy-white, margined with black, the stripes becoming narrower and less distinct as they proceed towards the vent. Bill yellowish white. Feet pale brown. Total length, $7\frac{1}{8}$ in.; wing, $3\frac{3}{4}$ in.; tail, $3\frac{3}{8}$ in.; bill, 1 in.

Type specimen described, No. 2269, Coll. Bost. Soc. Nat. Hist.

Several specimens are before me, among which is Lafresnaye's type. It is one of the smallest species of the genus and cannot be confounded with any other of those that I have seen. Sclater (l.c.) gives it as from Cayenne, but all the specimens I have met with are from Brazil. Of three specimens obtained at Santarem on the Amazon, one agrees in all respects with the types and was procured on July 30. The other two were shot in June,

* See my remarks on *D. ocellata*.

and instead of being grayish olive beneath, are of a decided reddish shade, and are also reddish brown on the back. In size, shape and distribution of markings, and in general dimensions, however, they agree with the July specimen, and probably merely represent a reddish phase of plumage, which I have noticed occurs sometimes with other species of the genus.

I place *Picolaptes notatus* Eyton (l.c.) as a synonym of this species, as Sclater says (P. Z. S., 1873, p. 372) he has compared the type with *D. multiguttata* Lafres. and decided it to be the same.

Dendroornis chunchotambo.

Dendrocolaptes chunchotambo TSCHUD. Faun. Peruv. p. 241, Tab. xxii, fig. 1 (1844-46). LAFRES. Rev. Mag. Zool. 1850, p. 281.—SCLAT. Proc. Zool. Soc. 1871, p. 86.

Dendroornis peruviana LAFRES. MS.

Nasica chunchotambo LAFRES. Rev. Mag. Zool. 1850, p. 421.

Dendroornis ocellata PELZ. Ornith. Bras. p. 45 (1868).—TACZ. Ornith. Per. Tom. II, p. 179 (1884).—SCLAT. & SALV. Proc. Zool. Soc. 1867, pp. 575, 751, 1873, p. 271.

Dendroornis palliata SCLAT. Cat. Am. B. p. 164 (1868).—SCLAT. & SALV. Proc. Zool. Soc. 1873, p. 271.

Dendroornis weddelli SCLAT. Proc. Zool. Soc. 1871, p. 86. (nec LAFRES).

Habitat.—Peru (Tschudi) Xeberos. Eastern Peru (Bartlett).

Crown of head and nape brownish black, with small, apical, pear-shaped buff spots on each feather, slightly larger on the nape than on the forehead. Back yellowish brown, each feather having a narrow, central buff line. Cheeks dark brown, striated with narrow yellowish white lines. Chin whitish, uniform. Throat pale buff, each feather bordered with blackish brown. Under parts yellowish brown but lighter than the back. Upper part of breast covered with elongated buff spots, broadest at their apical portion, and bordered with blackish brown. The spots on lower breast, abdomen and flanks are also buff, but narrower and much longer, and become almost obsolete on the vent and lower tail-coverts. Wings, rump and tail, chestnut; apical portion of inner webs of primaries purplish brown. Bill yellowish brown. Feet blackish brown. Length, $7\frac{5}{8}$ in.; wing, 4 in.; tail, $3\frac{1}{10}$ in.; bill, $1\frac{1}{10}$ in.

Described from a specimen obtained by Tschudi in Peru (now in U. S. Nat. Mus., No. 41,918), and identified by Sclater in his own handwriting as the same as *D. ocellata* Spix.

There are three specimens in Lafresnaye's collection, bearing the MS. name of *D. peruviana*, but without any locality given

on the labels. I consider them to be the same as Tschudi's specimens from Peru; the only difference I can see between them is that the throat of Tschudi's bird is somewhat paler. As the various species of this genus exhibit examples that vary from the typical style both in coloration of plumage, and in general measurements, it does not appear to me wise to consider these specimens of Lafresnaye, on account of the slight difference shown, as specifically distinct from the species described by Tschudi.

I have included among the synonyms, *D. weddelli*, mentioned by Sclater (l.c.), as I gather from his remarks that he considers it the same as *D. ocellata* Spix. Judging from the type of *D. weddelli*, and the typical example of *D. chunchotambo* Tsch. referred to by Sclater as belonging to the Smithsonian Institution, both of which are before me; the two represent entirely distinct species.

Dendroornis elegans.

Dendroornis elegans PELZ. Orn. Bras. pp. 45, 63 (1868).—Tacz. Ornith. Peru, Tom. II, p. 178 (1884).

Habitat. — Engenho do Gama, Manaqueri, Brazil (Natterer). Peru, Chamicuro (Bartlett), Yurimaguas (Stolzmann).

"D. pileo nuchaque nigrescentibus, maculis guttæformibus parvisochra-ceis, dorso fusco olivaceo maculis ochraceis conformibus sed multo majoribus postice nigro limbatis, uropygio caudaque cinnamomeo rufis, tectricibus alarum minoribus, mediis et majorum pogonio externo, marginibusque primariarum fusco olivaceis, plumis humeralibus, remigibus primariis excepto apice nigricante, reliquis totis cinnamomeo rufis, plumis auricularibus nigriscentibus ochraceo striatis, gula flavo albida, plumarum marginibus obscuris plus minusve conspicuis, juguli et pectoris plumis basi griseo olivaceis, scapo et macula terminali triangulari obscure marginata ochraceis, his maculis in jugulo contiguas et squamæformibus, in pectore rarioribus haud contiguas, abdomine fere unicolore ochraceo olivaceo maculis vix conspicuis, rostro compresso subrecto, culmine parum deflexo, gonyde fere recta, maxilla et apice mandibulæ obscure cor-neis, mandibula reliqua cærulescente cinerea. Longit. (specim. exsicc.) 8-8½", alæ 3" 7-11", caudæ 3"-3" 5", rostri 11"-1", a rectu 16-17.""

The above is Pelzel's description of the type. I have not seen any specimen of this species.

Dendroornis spixi.

Dendrocolaptes tenuirostris SPIX. Av. Bras. p. 88, Tab. 91, fig. 2 (1824) (nec LICHT.).

Picolaptes spixi LESS. Trait. Ornith. p. 314 (1831).

Dendroornis psixi PELZ. Orn. Bras. p. 45 (1868).

Habitat.—Para. Brazil (Pelzeln).

"Minor, castaneus; rostro cylindrico, arcuato; gula brevipenni im-maculate fulva; capite fulvo-ocellato; occipite albido-maculato; nucha, collo, pectore abdomineque oblonge et latissime fulvo-maculatis; macula auriculari periopthalmiisque fulvis, nigro-variegatis; canda læte rufa."

"Descriptio. Corpus præcedente (*D. ocellatus*) nonnihil minus; caput fuscum, ocellatum; dorsum corpusque subtus olivaceo-rufescentia. albo large strigilata; tectrices alarum olivaceo-castanea; remiges castaneæ, vexillo interno nigricante; rostrum supra fuscum, subtus flavidum; pedes cærulescentes. Longitudo corporis $6\frac{1}{4}$ ', cauda 2 1-2', c. alis 1. $1\frac{1}{2}$ ', rostri 1'."

The above are Spix's descriptions from the type. I have not seen any specimens of this species.

Dendroornis palliata.

Dendroornis palliatus DES MURS, Voy. Amer. Sud. Ois. p. 46, pl. 15 fig. 1 (1856).

Dendroornis palliata SCLAT. & SALV. Proc. Zool. Soc. 1866, p. 184.

Habitat.—Lower Ucayali (Bartlett).

"D. supra cinnamomeo brunneiis; subtus brunneo-olivaceus; capite brunneo-nigrescente, fulvo-albido flammato; collo postico tergoque concoloribus, singulis flammulis nigro circumdati; uropygio, alis caudæque cinnamomeo rubris; primariis apice nigrescentibus; mento gulæque fulvo-albidis; pectore abdomineque fulvo-albido squammatis, singulis maculis nigro lateraliter marginatis. Rostro corneo. Pedibus brunneis."

"Dessus du corps d'un brun olivâtre; tête d'un brun noirâtre piqué de flammèches de fauve blanchâtre; chaque flammèche encadrée de noir. Croupion, ailes et queue, d'un brun rouge cannelle foncé; les primaires terminées de brun noirâtre; menton et gorge d'un blanc teinté de fauve; l'estomac largement maculé de blanc fauve; chaque plume de cette couleur encadrée de noir. Ventre flamméché de taches de même teinte beaucoup moins apparentes. Bec couleur de corne jaunâtre. Pieds brun. Longueur totale 19 centimètres—du bec, $2\frac{1}{2}$;—du tarse, 2;—de la queue, $7\frac{1}{2}$."

The above is Des Murs's description of the type. I do not know the species.

Dendroornis flavigaster.

Xiphorhynchus flavigaster SWAIN. Phil. Mag. Vol. I, p. 440 (1827).

Dryocopus eburneirostris LESS. Echo. Mond. Sav. (1843).—DES MURS, Icon. Ornith. pl. 52 (1849).

Dryocopus flavigaster DES MURS, Icon. Ornith. Text. (1849):

Dendrornis eburneirostris SCLAT. Cat. Am. B. p. 164, sp. 1011 (1862).—
BOUC. Proc. Zool. Soc. 1883, p. 450.

Nasica flavigaster LAFR. Rev. Mag. Zool. 1850, p. 283.

Dendrornis mentalis LAWR. Ann. Lyc. N. Y. Vol. VIII, 1867, p. 481.

Habitat.—Mexico, Yucatan, Guatemala, Honduras, Nicaragua, Costa Rica.

Top of head and nape black; the centre of each feather with a pale buff stripe, widest at the tip, very small on the forehead, where it is merely an apical spot, larger and broader on the nape. Back light rufous, with broad pale buff or buffy white stripes margined with black. Rump and upper tail-coverts cinnamon, darkest on tail-coverts. Wings cinnamon, tail cinnamon-red, considerably darker than the wings. Throat buffy white without spots in adults; in some specimens the feathers of lower part of throat are edged with dark brown. Underparts grayish olive with conspicuous broad, pale buff stripes margined with black, largest and most numerous on upper part of breast, becoming narrower on flanks and lower part of breast and indistinct on abdomen and vent. On either side of throat is a more or less distinct black line sometimes extending from base of mandible to lower part of the throat, in other examples again only seen on a portion of the lateral part of the throat. Bill white, dark brown in some specimens on the basal portion. Feet brownish black.

Description taken from an example from Orizaba, No. 31,737, Museum Comparative Zoology, Cambridge, Mass. Total length, 10 $\frac{5}{8}$ in.; wing, 4 $\frac{5}{8}$ in.; tail, 4 $\frac{3}{4}$ in.; bill, 1 $\frac{5}{8}$ in.

Other specimens vary as follows: Wing, 4 $\frac{1}{2}$ —4 in.; tail, 4 $\frac{5}{8}$ —3 $\frac{7}{8}$ in.; bill, 1 $\frac{1}{2}$ —1 $\frac{1}{8}$ in.

Sixty specimens of this species are before me from nearly all the localities in which it is stated to dwell, among them being the types of Lafresnaye's *D. albirostris*, a MS. name, and Lawrence's *D. mentalis* from Mazatlan. The latter is a light colored specimen, that is possibly seasonal, as other specimens from Mazatlan* are as dark colored as those from various other localities, and it is impossible to separate them from specimens obtained at Orizaba, and Tampico in Mexico, and other places in Guatemala, Honduras, etc. The stripes on the back vary in width in different specimens, even from the same locality, and this has no specific value, and I can perceive nothing in the large series at my command to indicate that there is more than one species of this form.

* Specimen 58,237, National Museum, from Mazatlan. Back olivaceous brown. Stripes rusty buff.

In order to exhibit more clearly the variation that exists in the extreme length of the wing, I give here a list of forty-four specimens from various localities, with the measurements of the wing taken from the carpal joint to extreme point of primaries. It will be seen that the longest wing measures $4\frac{3}{4}$ inches and the shortest $3\frac{7}{8}$, a difference of $\frac{7}{8}$ of an inch. The specimens with the longest wings come from Tehuantepec, and those with the smallest from Mazatlan and Guatemala. But there are examples from Tehuantepec with a wing measurement of $4\frac{3}{8}$ inches, showing a difference from its larger relative of $\frac{3}{8}$ inch, and from Mazatlan there are specimens with wings $4\frac{1}{2}$ inches in length, or a difference in birds from that locality of $\frac{5}{8}$ inch. In Mazatlan and Tehuantepec these extremes are exhibited in different sexes, the female being the smaller, but examples from Orizaba show the male to have a wing of $4\frac{1}{4}$ inches and the female of $4\frac{5}{8}$ inches. Honduras also shows a male with a wing $4\frac{3}{8}$ inches long, and a female with one $4\frac{1}{2}$ inches, so it cannot be said that the difference of measurement is sexual; nor is it of any value, as already stated, for a specific character.

			Wing.
♀ 663,	Sennett Coll.	Tampico.	$4\frac{1}{2}$ in.
♀ 583,	" "	"	$4\frac{3}{4}$ in.
♀ 584,	" "	"	$4\frac{2}{3}$ in.
♀ 568,	" "	"	$4\frac{1}{2}$ in.
— 28859,	National Museum.	Mazatlan.	$4\frac{3}{8}$ in.
♀ 50788,	" "	"	$3\frac{7}{8}$ in.
♂ 50787,	" "	"	$4\frac{1}{2}$ in.
♂ 3450,	" "	"	$4\frac{1}{2}$ in.
— 58238,	" "	"	$4\frac{1}{4}$ in.
— 51479,	" "	"	$4\frac{1}{2}$ in.
— 58237,	" "	"	$4\frac{5}{8}$ in.
♂ 30134,	" "	"	4 in.
♂ 43272,	Amer. Mus. Nat. Hist., N. Y.	"	$4\frac{2}{3}$ in.
— 43258,	" " " " "	Jalapa.	$4\frac{5}{8}$ in.
♂ —,	Sennett Coll.	Vera Cruz.	$4\frac{5}{8}$ in.
— 38187,	National Museum.	Orizaba.	$4\frac{1}{2}$ in.
♂ 31738,	Mus. Comp. Zool. Cambridge.	"	$4\frac{1}{4}$ in.
♀ 31737,	" " " " "	"	$4\frac{5}{8}$ in.
♂ 41626,	National Museum.	Cordova.	$4\frac{3}{8}$ in.
♂ —,	Sennett Coll.	Manzanillo.	$4\frac{3}{8}$ in.
— 57608,	National Museum.	Tehuantepec.	$4\frac{3}{4}$ in.
♂ 58901,	" "	"	$4\frac{3}{4}$ in.
♂ 57615,	" "	"	$4\frac{2}{3}$ in.

♂ 57614,	National Museum	Tehuantepec.	4 $\frac{3}{4}$ in.
♀ 57613,	" "	"	4 $\frac{5}{8}$ in.
♀ 59598,	" "	"	4 $\frac{3}{8}$ in.
♀ 51609,	" "	"	4 $\frac{3}{8}$ in.
— 106293,	" "	Yucatan.	4 $\frac{5}{8}$ in.
♂ 106292,	" "	Temax.	4 $\frac{5}{8}$ in.
♂ 39241,	" "	Merida.	4 in.
— 50533,	" "	Guatemala.	4 $\frac{3}{8}$ in.
— 603278,	" "	"	4 $\frac{1}{4}$ in.
— 30765,	" "	"	4 $\frac{1}{2}$ in.
— 42700,	" "	"	4 $\frac{1}{8}$ in.
— 30766,	" "	"	4 in.
— 28028,	Amer. Mus. Nat. Hist., N. Y.	"	3 $\frac{7}{8}$ in.
— 43260,	" " " " "	"	4 $\frac{1}{4}$ in.
— 43257,	" " " " "	"	3 $\frac{7}{8}$ in.
— 43259,	" " " " "	"	4 $\frac{3}{8}$ in.
— 28127,	" " " " "	"	3 $\frac{7}{8}$ in.
— 28128,	" " " " "	"	4 in.
♂ 112554,	National Museum.	Truxillo, Honduras.	4 $\frac{3}{8}$ in.
♂ 112583,	" "	" "	4 $\frac{3}{8}$ in.
♀ 90921,	" "	Sucuya, Nicaragua.	4 $\frac{1}{2}$ in.
♂ 90922,	" "	" "	4 $\frac{1}{4}$ in.

Dendroornis lacrymosa.

Dendroornis lacrymosa LAWR. Ann. Lyc. Nat. Hist. Vol. VII, p. 467 (1862).—SALV. Proc. Zool. Soc. 1870, p. 193.—SCLAT. & SALV. Proc. Zool. Soc. 1879, p. 523.

Habitat.—Costa Rica, Panama, Colombia (Truando, Schott). Antioquia (Salmon).

Top of head, back, small and middle wing-coverts black, centre of each feather covered by a pale fulvous spot, pear-shaped and quite small on the head, increasing in size from the forehead, and becoming quite large and broadly elongated on the back. Larger wing-coverts bright rufous, with a broad black stripe on the edge of the outer web. Lower part of back, rump, and upper tail-coverts, wings and tail, dark cinnamon-red. Throat, buffy white. Sides of head pale buff streaked with blackish brown. Neck in front, and breast pale buff, each feather margined with black. Flanks, abdomen and lower tail-coverts dark grayish-brown striped with pale buff, margined with blackish brown. Maxilla blackish brown, base of mandible pale yellow. Feet dark brown. Total length, 9 $\frac{1}{2}$ in; wing, 4 $\frac{3}{4}$ in.; tail, 4 $\frac{5}{8}$ in.; bill, 1 $\frac{3}{8}$ in. Ex Type, Coll. Am. Mus. Nat. Hist., N. Y.

In some specimens the throat is deep buff with a tinge of rufous on the abdomen and lower tail-coverts. Apparently younger birds have the underparts white tinged with buff, the feathers margined with dark brown.

Dendroornis polysticta.

Dendroornis polysticta SALV. & GOD. Ibis, 1883, p. 210.—SALV. Ibis, 1885, p. 422.—REICH. & SCHOL. Jour. für. Ornith. 1885, p. 91.

Habitat.—Bartica Grove, British Guiana (Whiteley).

"Supra brunnea, capite summo nigricante, uropygio, alis et cauda ferrugineis; capite summo, cervice et interscapulio cervino guttatis, guttis singulis nigro marginatis; subtus gutture cervino, pectore et abdomine toto brunnescentibus, illo guttis cervinis nigro marginatis notato; rostri maxilla nigricante, mandibula interdum nigricante interdum ad basin flavicante, pedibus corylinis; long tota 8.5, alæ 4.0, rostrum rictu 1.5, tarsi 0.9."

"Obs. *D. lacrymosæ* affinis, sed guttis supra et subtus minoribus, abdomine imo fere immaculato et tectricibus alarum brunneis diversa."

The above are Salvini and Godman's description and observations. I have not seen the species.

Dendroornis eytoni.

Dendrocolaptes eytoni SCLAT. Proc. Zool. Soc. 1853, p. 69.

Dendroornis eytoni SCLAT. Cat. Am. B. p. 165, sp. 1013 (1862).—SCLAT. & SALV. Proc. Zool. Soc. 1867, p. 575.

Dendroornis eytonii PELZ. Ornith. Bras. p. 45 (1868).

Habitat.—Brazil, Capin River, Lower Amazon, Para (Wallace), Santarem (Riker).

Head and nape black with central pale buff spots. Lower part of neck and back dark olive brown, centre of feathers with broad buff stripes margined with black, the stripes becoming narrower towards the middle of the back. Lower part of back, wings, rump, upper tail-coverts and tail cinnamon, the tail darker than the wings, and ends of primaries dark brown. Throat white, upper part of breast and sides dark brown with broad, large, buffy white spots margined with black. Abdomen and under tail-coverts fulvous, obscurely striped with pale buff. Bill black. Feet black. Total length, $9\frac{3}{8}$ in.; wing, $4\frac{3}{8}$ in.; tail, $4\frac{5}{8}$ in.; bill, $1\frac{3}{8}$ in. Description from an example from Santarem, Brazil, Coll. C. B. Riker.

Dendroornis d'orbignyianus.

Nasica d'orbignyianus PUCH. & LAFRES. Rev. Mag. Zool. 1850, p. 420, ex Peru.

Habitat.—Bolivia, Guarayos, Chiquitos, a Dom. d'orbigny altatus (Puch. & Lafres.). Peru? (Lafres.). Brazil, Matto Grosso (Smith).

Crown black, centre of feathers with lengthened pear-shaped pale buff spots. Back of neck and upper part of back olivaceous brown with a reddish tinge, and with a central buff stripe on each feather. Lower part of back and upper tail-coverts cinnamon-red. Wings and tail cinnamon-red, the tail being a darker shade. Throat pale buff. Underparts olivaceous brown with a reddish tinge, and striped with pale buff; these stripes broadest on upper part of breast, growing narrower as they descend and becoming nearly (in some specimens, quite) obsolete on the abdomen. Bill yellowish white. Feet black. Total length, about $9\frac{3}{4}$ in.; wing, 5 in.; tail, $4\frac{1}{4}$ in.; bill, $1\frac{1}{2}$ in.

Description taken from a specimen in the collection of the Academy of Natural Sciences of Philadelphia from Chiquitos, the locality of Lafresnaye's type.

This species is apparently distinct from the other members of *Dendrornis* from the fact, that the buff stripes on neck, upper part of back, and underparts are not margined with black. No other species is known so far as I am aware, that has not these spots or stripes margined with black, upon some one or other portion of the back or underparts. This character is especially emphasized by its describer, who states that "*ses flammettes ne sont nullement circonscrites de noir ou de noirâtre sur les parties antérieures et sur le dos.*"—Five specimens are before me, which I assign to this species, three of them are from the collection of the Philadelphia Academy of Sciences, and two from Matto Grosso in the collection of the American Museum of Natural History in New York. One of these last, No. 33,650, has on two of the feathers of the neck, a narrow black margin to the central buff stripe, but the other, No. 33,649, is entirely without black margins. The underparts on all the examples are more olivaceous than those of specimens of either *D. rostrispallens* or *D. guttata*, which have a very decided reddish tinge. In a large series of specimens it would not be unlikely, I think, to find some with more or less black margins to the buff stripes on the back, but the fact that these stripes on the entire underparts are without these black margins readily distinguishes *d'orbignyanus* from *rostrispallens*, which has the breast stripes margined with black, and from *guttata*, which has all the stripes on the underparts margined in the same manner.

The authors of this species, after their description, give its habitat as "Guarayos, Chiquitos," and at the end of the remarks, it is said "Le d'orbignyanus est du Pérou." As Chiquitos lies to the east of the Andes in Bolivia, it is evident that there is some confusion here. I have seen no Peruvian specimens.

Dendroornis rostripallens.

Dendroornis rostripallens LAFRES. MS. DES MURS, Voy. Castel. Amer. Sud Ois. p. 45, pl. 12, fig. 2 (1856), ex Upper Amazon.—PELZ. Ornith. Bras. p. 45 (1868);—*ibid.*, Proc. Zool. Soc. 1882, p. 27.—TACZ. Ornith. Per. Tom. II, p. 176 (1884).

Dendroornis pardalotus SCLAT. Cat. Am. B. p. 164, No. 1007 (1862), nec. VIEILL.

Dendroornis guttata TACZ. Proc. Zool. Soc. 1874, p. 529 (nec LICHT.).—SCLAT. & SALV. Proc. Zool. Soc. 1879, p. 622 (nec. LICHT.).

Habitat.—Colombia, Ecuador, Sarayacu (Buckley). Brazil, Matto Grosso (Smith).

Crown and nape blackish brown, spotted with buffy white, the spots on the crown pear-shaped, on the nape elongated. Back yellowish brown, central portion of feathers pale buff, this color disappearing on centre of back. Rump and upper tail-coverts cinnamon-red. Chin white, throat deep buff, unspotted. Lower parts pale yellowish brown, inclined to reddish buff on the abdomen, conspicuously striped with deep buff, the stripes, on upper part of breast only, margined with black. These buff stripes usually become obsolete on lower abdomen and vent, although in some specimens they are faintly visible. Wings cinnamon. Tail very dark chestnut. Bill, pale horn-color; in some examples, however, the lateral basal portion of the maxilla is blackish brown. Feet black. Length, $10\frac{1}{2}$ in. to 9 in.; wing, $4\frac{1}{2}$ to $4\frac{1}{2}$ in.; tail, $4\frac{1}{2}$ to 4 in.; bill, $1\frac{7}{12}$ to $1\frac{3}{12}$ in.

The above measurements are taken from a series of nine specimens and show the extremes.

In his description of the type of this species, Lafresnaye makes no mention of any black margins to the buff stripes upon the breast, and if the type does not possess these it is questionable if the birds generally assigned to *rostripallens* do not really represent some other form, as all writers describe them as having these stripes margined with black. The figure given by Des Murs does not satisfactorily indicate whether these black margins exist or not. However, I am led to believe that this was an oversight on the part of the describer of the species, since all the examples of

'*rostri-pallens*' from Lafresnaye's collection have the buff stripes on the upper part of the breast margined with black. An examination of the type, which is probably in the Paris Museum, is necessary to decide this point. I include among the synonyms, *D. pardalotus* given by Sclater in his 'Catalogue of American Birds', as one of the specimens contained in the Lawrence Collection is labelled in Sclater's handwriting, "*Dendrornis pardalotus*, Vieill. of my Cat. P. L. S."

The bills of the various specimens before me vary considerably, not only in color, as already noticed, but also in size, and this occurs in examples from the same locality.

Dendrornis guttata.

Dendrocolaptes guttatus LICHT. Abhandl. Königl. Akad. Wissens. Berl. 1818, p. 201; *ibid.* Verz. Doubl. Zool. Mus. Berl. p. 16, no. 149 (1823).

Dendrornis guttata PELZ. Ornith. Bras. p. 45 (1868).

Habitat.—Brazil, Bahia.

Upper part of head blackish brown, each feather with a small, pear-shaped dark buff spot tipped with black. Back olive brown with reddish tinge, with elongated dark buff stripes bordered with black, these stripes becoming narrower towards the lower part of the back. Lower part of back and upper tail-coverts cinnamon-red. Throat deep rusty buff. Underparts rusty buff, conspicuously striped with reddish buff, all the stripes margined with black. On the abdomen these stripes have a reddish tinge. Wings dark cinnamon; exposed portions of primary coverts olivaceous. Tail dark chestnut. Under tail-coverts in some specimens have a rufous tinge. Bill has the maxilla dark brown, paler on the culmen; mandible yellowish. Feet brownish black. Length, $9\frac{3}{4}$ in.; wing, $4\frac{3}{4}$ in.; tail, $4\frac{3}{8}$ in.; bill, $1\frac{3}{8}$ in. Specimen described, No. 43,270, Am. Mus. Nat. Hist., Lawr. Coll.

This species is very nearly allied to *D. rostri-pallens* Lafr., and a question arises in my mind if they should really be regarded as distinct. The chief difference seems to be that the buff stripes on the underpart of the body in *guttata* are margined with black even upon the abdomen, while such margins in *rostri-pallens* are restricted to the upper part of the breast. It appears to be a rather fine distinction, and can only be ascertained to be reliable from the examination of a large series of specimens. Unfortunately I have not been able to procure many examples from

Bahia, the locality from which the type came, but I doubt, with ample material to enable an opinion to be formed, whether the two forms could be kept apart. Of course if they should be proved to be but one species, *rostri-pallens* with its synonymy would have to be included under the much older name of *guttata*.

Dendroornis guttatoides.

Nasica guttatoides LAFRES. Rev. Mag. Zool. 1850, p. 387, ex Colombia.
Dendroornis guttatoides DES MURS. Voy. Castel. Ois. p. 43, pl. xiii, fig. 2 (1856).—SCLAT. Cat. Am. B. p. 164, sp. 1008 (1862).—SALV. Ibis. 1885, p. 422.

Habitat. Colombia (Lafres.), Cayenne (Sclater), Bartica Grove, British Guiana (Whiteley).

Top of head and back of neck, black, with central pale buff spot on each feather, more elongated on the neck. Back reddish brown with rather broad central deep buff stripes, bordered with black; these stripes becoming narrower on lower part of the back. Rump and upper tail-coverts dark cinnamon-red. Cheeks pale buff streaked with dark brown. Throat whitish buff, uniform. Underparts dark olive brown, reddish on the centre of abdomen, vent and under tail-coverts, each feather with a broad central streak bordered with black, these streaks whitish buff on the breast, becoming brighter and reddish on the abdomen, and indistinct, towards the vent. Wings and tail dark cinnamon. Bill short, dark brown, paler on basal half of mandible. Feet, horn brown. Total length $9\frac{1}{4}$ in.; wing, $4\frac{1}{2}$ in.; tail, $4\frac{3}{8}$ in.; bill, $1\frac{1}{2}$ in. Type described, No. 2258, Coll. Bost. Soc. Nat. Hist.

The above description is taken from Lafresnaye's type, which he states in the 'Revue et Magasin' (l. c.), as having been bought from a dealer with some other birds from Colombia. It was also obtained by Castelnau at Lorette. The type represents a very strongly marked and well defined species, not in any way resembling the *D. guttata* with which its describer compared it. The entire underparts are conspicuously covered with broad buff stripes, and the bill, which perhaps is the strongest character, is very short and stout for the size of the bird. Oudart's figure in Des Murs's work gives no idea whatever of its appearance. The type is a fine specimen, and in perfect preservation.

Dendrornis triangularis.

Nasica triangularis LAFRES. Rev. Zool. 1842, p. 134; *ibid.*, Mag. Zool. Ois. pl. 32 (1843); *ibid.*, Rev. et Mag. Zool. 1850, p. 418.

Dendrornis triangularis SCLAT. Cat. Am. B. p. 165, sp. 1014, (1862).—SCLAT. & SALV. Proc. Zoöl. Soc. 1879, p. 622.—TACZ. Ornith. Pèr. Tom. II, p. 177 (1884).

Habitat. Colombia, Ecuador, Peru, Ray-Urmana (Stolzmann), Bolivia, Simacu, Prov. Yungas (Buckley).

Top of head and nape blackish, each feather with a lengthened central buffy white spot. Back bright olive, with a few narrow buffy white lines on the upper part. Upper tail-coverts cinnamon. Throat yellowish white, varying in depth of shade, each feather with an apical blackish brown margin. Entire underparts dark olive thickly covered with yellowish white triangular spots placed at the end of each feather. In some specimens these spots are rounded at the end instead of being of a triangular shape. Wings pale cinnamon, with the edges of the outer webs of all the feathers bright olive. Tail dark cinnamon brown. Bill blackish at the base, yellowish white for the remaining part. Feet, olive brown. Total length, $8\frac{1}{2}$ inches.; wing, $4\frac{1}{2}$ in.; tail, $4\frac{1}{2}$ in.; bill, $1\frac{1}{2}$ in. This description is from the type specimen, No. 2276, Coll. Bost. Soc. Nat. Hist. Other specimens vary in their measurements as follows: Wing, $4\frac{3}{8}$ to $4\frac{5}{8}$ in.; tail, $4\frac{3}{8}$ to $4\frac{5}{8}$ in.; bill, $1\frac{1}{4}$ to $1\frac{1}{2}$ in.

There are three types of this species from the Lafresnaye collection before me, two of which are *D. triangularis*, and the third is *D. erythropygia* Sclat. Whether this last came from Colombia with the others, I have no means of ascertaining, as no locality was given upon any of Lafresnaye's types. That author evidently did not perceive that he had two allied species in his possession. There is no doubt, however, which of the three specimens Lafresnaye considered as *triangularis*, as his description and figure, poor as the latter is, point conclusively to the bird without the cinnamon rump, and with the throat feathers margined with a dark line and not spotted.

Dendrornis erythropygia.

Dendrornis triangularis SCLAT. Proc. Zoöl. Soc. 1856, p. 289 (nec LAFRES.).

Dendrornis erythropygia SCLAT. Proc. Zoöl. Soc. 1859, p. 366.—SALV. Proc. Zoöl. Soc. 1870, p. 193.

Dendrornis erythropygia æquatorialis BERLEP. & TACZ. Proc. Zoöl. Soc. 1883, p. 563.—REICH. & SCHAL. Jour. für. Ornith. 1886, p. 91.

Habitat.—Mexico, Jalapa (De Oca), Guatemala, Costa Rica, Veragua (Salv.), Panama (Lion Hill, near Aspinwall, McLeannen), Chimbo, Ecuador (Stolzmann).

Top of head and nape olive brown, each feather with a small apical light buff spot and a terminal blackish brown margin. Back olive brown each feather with a conspicuous, rather elongated, buffy white spot near the tip. Lower back and upper tail-coverts cinnamon-red. Throat ochraceous, with a small dark olive spot at the tip of each feather, these spots becoming terminal bars on the lower part of the throat. Entire underparts dark olive, with a large pale yellow ovate spot at the tip of each feather. Wings and tail cinnamon, the tail slightly the darker in coloring. Bill: maxilla dark brown; mandible yellowish white. Feet black. Total length, $9\frac{5}{8}$ in.; wing, $4\frac{3}{4}$ in.; tail, $4\frac{7}{8}$ in.; bill, $1\frac{1}{4}$ in. Ex Jalapa, Sp. Other examples vary as follows: wing, $4\frac{5}{8}$ to 4 in.; bill, $1\frac{1}{4}$ to 1 in.

The range of this species, as defined by some writers, seems peculiar. It goes from Mexico on the north (the type and the bird above described both having been procured at Jalapa) through Guatemala, possibly Honduras and Nicaragua, although I have not seen specimens from those countries, and the Isthmus of Panama, whence thoroughly typical specimens were obtained by McLeannen. The typical form does not seem to be found in Costa Rica. It is apparently very distinct from *D. triangularis*, and it is somewhat surprising that so keen an ornithologist as Lafresnaye should not have perceived that he had two species before him.

Dendrornis punctigula.

Dendrornis punctigula RIDGW. Proc. U. S. Nat. Mus. Vol. XI, p. 544 (1888).—SCLAT. Ibis, 1889, p. 352.

Habitat.—Costa Rica, Colombia, Truando (Schott).

The only difference I can see between specimens from Costa Rica and those of *D. erythropygia* from all localities, is that the back is nearly uniform in its coloration with narrow whitish yellow stripes on the upper portion instead of the conspicuous spots seen on Sclater's species. My material is not sufficient (I have only eleven specimens from Costa Rica), to enable me to determine the value of the claim that this bird represents a distinct species. The fact that it is apparently surrounded by *D. erythropygia* on the north and south, and that it also appears in Colombia, as I have a specimen of the Costa Rican form from Truando collected by Schott, would seem to indicate that it

would be extremely difficult to arrange in any satisfactory manner the geographical distribution of the two forms, and I think it not unlikely that with a good series of examples the two would run into each other without leaving any definable line of separation. Mr. Ridgway refers this bird from Truando in his article on *D. punctigula* (l.c.), to *D. erythropygia* Sclat., but as it has no spots on the back, merely a few pale yellow lines, it is undoubtedly the same as the Cost Rica bird. Mr. Ridgway's identification may, however, eventually prove to be correct. At all events the bird from Costa Rica separated by Mr. Ridgway is not restricted to that country, as is shown by the Truando specimen. It remains therefore for some one with better material at hand than I at present possess, to fix the status of the form called *D. punctigula*.

Dendroornis obsoletus.

Dendrocolaptes obsoletus ILLIG. LICHT. Abhand. Königl. Akad. Wissens. 1818, p. 205, No. 10.—LICHT. Berlin, Abhand. 1819, p. 203, 1821, p. 265.

Picolaptes obsoletus LAFRES. Rev. Mag. Zool. 1850, p. 371.

Nasica obsoletus LAFRES. Rev. Mag. Zool. 1850, p. 423.

Habitat.—Para, Brazil.

“Rostro recto, valde compresso, cultrato, albicante, gulâ maculisque guttata capitis, colli, dorsi et pectoris sordide albo-flavescentibus; digitis pro mole tenerrimis; gonyde porrecta, culminis apice sensim deflexo. Longit. tota, 8 pollices.”

I do not know this bird.

RECENT LITERATURE.

Salvin and Godman's *Biologia Centrali-Americana—Aves.**—Volume I of this great work, the first signature of which bears date of September,

* [Temporary Titlepage.] | *Biologia* | *Centrali-Americana*. | — | *Aves*. | Vol. I. | By | Osbert Salvin, M. A., F. R. S., &c., | and | Frederick DuCane Godman, F. R. S., &c. | == | 1879-1887.

For a previous notice of this work (Parts I-X) see Bulletin Nuttall Ornithological Club, Vol. VI, No. 3, July, 1881, pp. 174-176.

1879, and the last that of April, 1887, has been issued. It is a large quarto of 512 pages of text, illustrated by 35 beautiful hand-colored plates* by Keulemans, the well-known ornithological artist and illustrator of Dresser's 'Birds of Europe' and others of the more recent high-class European bird books. The classification adopted is that of Sclater and Salvin's 'Nomenclator Avium Neotropicalium' (1873), and the geographical field that embraced between the United States-Mexican boundary on the one hand and the Isthmus of Panama on the other, or the continental part of that portion of the western hemisphere designated by Professor Baird, in his 'Review of American Birds' (1864-66), 'Middle America.'

Volume I of the 'Biologia' includes the whole of the Oscines, and is the only single and approximately complete work in existence on the special subject to which it pertains. The high reputation of the authors is of itself a sufficient guarantee that their task has been intelligently and thoroughly performed, and has resulted in a grand work which is absolutely indispensable to students of New World ornithology, highly useful to those who labor in other geographical fields, and must long remain the standard authority on the birds of Central America.

As was to be expected from the character of their previous writings on the same subject, the authors of the 'Biologia' treat their subject from the conservative standpoint to which English naturalists, for the most part, still adhere; and it is the natural sequence of this method, but more especially the unfortunate adoption of the purely binomial system of nomenclature, which affords most of the grounds for criticism; the very great importance of the work rendering such defects highly conspicuous. It would have been better had the authors followed, to some extent at least, the rulings of the 'Committee on Species and Subspecies' of the American Ornithologists' Union regarding the status of certain 'Nearctic' forms which have been so carefully investigated with the aid of large series of specimens on this side of the Atlantic, instead of depending on their own limited, and often misleading, material. In all probability, however, the remaining portion of the work will be less marred by errors of this kind, since Mr. Henshaw's fine collection has been transferred to the British Museum, where it can readily be compared with that belonging to the authors of the 'Biologia,' also, we understand, to be deposited there as each group is worked up.

We have already remarked that the comparatively few defects of the work are chiefly the direct result of adherence to the binomial system, "pure and simple," of nomenclature. When this is strictly followed, the finest discrimination and soundest judgment can hardly prevent inconsistent rulings as to rank of forms, some subspecies being elevated to specific rank, and others degraded to mere synonyms. Instances of this sort in Vol. I of the 'Biologia' are not numerous, but there are enough to be regretted; and since most of them affect forms belonging to the North American

* While these illustrations are eminently satisfactory from an artistic point of view, they might have been more accurate ornithologically.

fauna we may as well give a list of them: *Turdus auduboni* and *T. swainsonii* are ranked as species, distinct from *T. pallasii* and *T. ustulatus* (both of which are also given), as are also *Vireo cassini* and *V. plumbeus*; *Pyrrhula cooperi* is recognized as specifically distinct from *P. æstiva*; *Melospiza montana* and *M. heermanni* are also regarded as species, the latter, by the way, being not *M. heermanni* but *M. fasciata mexicana*, one of the most strongly marked of the many geographical forms into which *M. fasciata* has become differentiated. The same rank is accorded *Cardinalis igneus*, though the equally distinct form belonging to southeastern Mexico (*C. cardinalis coccineus*) is referred to *C. virginianus*,* and to *Chondestes strigatus*, although the latter is no more different from *C. grammacus* than *Spizella socialis arizonæ*, *Passerculus sandwichensis alaudinus*, and *Coturniculus passerinus perpallidus* are from *S. socialis*, *P. sandwichensis* and *C. passerinus*, respectively, these three trinomials being given as mere synonyms of the binomials which follow. The differences between the two forms of *Chondestes* are, in fact, of exactly the same character as those which exist between the forms of *Spizella*, *Passerculus*, and *Coturniculus*, above mentioned; and if *Chondestes strigatus* is recognized as a species, so also should be *Spizella arizonæ*, *Passerculus alaudinus*, and *Coturniculus perpallidus*. But to accord these specific rank would be a violation of our knowledge of their relationships, for every ornithologist who has compared large series of specimens knows that they intergrade completely with their eastern or western representatives along the line where their habitats merge together, just as does *Chondestes grammacus strigatus* with the true *C. grammacus*.

Icterus cucullatus nelsoni is given as a distinct species (*I. nelsoni*), while an equally marked variation, in the opposite direction, from the typical form, *I. c. igneus*,† is considered the same as *I. cucullatus*.

These instances show clearly how useful, if not indispensable, is the modified form of the binomial system of nomenclature, which has been adopted and, as consistently as possible, followed by the Committee of the American Ornithologists' Union, and not a few of the working ornithologists of Europe as well.

In other cases, we regret to see forms which, in the light of material contained in collections on this side of the Atlantic, appear to be distinct enough to merit at least subspecific recognition, utterly ignored, except that their names are given in the synonymy. Such as these are the Mexican and Guatemalan Bluebirds (*Sialia sialis azurea* and *S. s. guatemalæ*), which are called simply *S. sialis*; *Icteria longicauda* (*I. virens longicauda* of American authors), which is considered a synonym of *I. virens*, yet is quite as different from the latter as is *Pyrrhula cooperi* from *P. æstiva*; and the following additional but no less conspicuous cases: The several South American forms of *Progne* which have uniform blue-black males

* On this subject see 'Proceedings of the United States National Museum,' Vol. VIII, 1885, pp. 569-570.

† See 'Proceedings of the United States National Museum,' Vol. VIII, p. 19.

are referred to *P. subis*; all the Central American Mockingbirds except the northern *M. polyglottos*, which occurs also in Mexico, are referred to the South American *M. gilvus*, a species which apparently extends no farther north than Guatemala, if, indeed, it occurs beyond Costa Rica, the Mexican forms which have been referred to it being at least sub-specifically distinct.* The bird called *Molothrus æneus* includes two very distinct species, *M. æneus* (Wagl.) and *M. robustus* Cab., but up to the time the 'Biologia' was published the differences between them had not been pointed out.† The Meadowlarks are 'lumped' into one species, *Sturnella magna*, notwithstanding two very distinct forms (probably species), *S. magna mexicana* and *S. neglecta*, occur in Mexico, besides a third (*S. hippocreptis*) in Cuba. Under the name *Aphelocoma californica*, which belongs to a form whose range certainly does not extend into Mexico, except as a well-marked subspecies‡ in the peninsula of Lower California, are included the *A. sumichrasti*§ and *A. cyanotis*||, purely Mexican forms, whose respective ranges are separated from that of *A. californica* by the intrusion of *A. woodhousei*, in Arizona. The name *Aphelocoma ultramarina*, even if belonging to either of the forms which are referred to it, also covers, according to the synonymy, three well-marked forms, one of which is undoubtedly specifically distinct from the others. This is the *A. couchi*, a smaller and much shorter-tailed species than *A. sieberii*, with whiter under parts, the sides of the head much lighter and brighter blue, and the tail less graduated, found in the Mexican States of Tamaulipas and Nuevo Leon; *A. sieberii* of southern Mexico and its much paler and grayer northern race *A. s. arizonæ* being larger every way, with the tail proportionally longer as well as much more rounded, besides differing in the darker under parts and darker and less bluish color of the sides of the head. The two strongly marked forms of *Xanthoura* are likewise considered identical; yet no one having a series of specimens from the Rio Grande Valley and an equal number from Yucatan or Guatemala, *without specimens from intermediate localities*, would think of uniting them under one name. It is true that they intergrade; but if they did not, we should be justified in considering them distinct species (*X. luxuosa* and *X. guatemalensis*); recognizing, however, the fact of one extreme grading into the other, through specimens from intermediate localities, we should *not* be justified in thus naming them, a trinomial designation for the more recently named form (*X. luxuosa guatemalensis*) expressing their relationship much better.

* See 'Proceedings of the United States National Museum,' Vol. V, pp. 10-12; Vol. VIII, p. 562, and Vol. X, p. 506.

† They were first formally separated, as *Calliothrus æneus* and *C. robustus*, in the writer's 'Manual of North American Birds' (p. 589), in 1887.

‡ *A. c. hypoleuca*, 'Manual of North American Birds,' p. 356.

§ History of North American Birds, Vol. II, p. 283; Cat. B. Brit. Mus. Vol. III, p. 14; Man. N. Am. B., p. 356.

|| Man. N. Am. B., p. 357.

We cannot agree with the authors of the 'Biologia' in referring *Zonotrichia vulcani* Boucard to the genus *Zonotrichia*, and *Fringilla chlorura* Aud. to the genus *Embernagra*, although the reasons given for such reference have been carefully considered. Regarding the former, these reasons are as follows: "This somewhat abnormal *Zonotrichia* was removed from this genus and placed in *Junco* by Mr. Ridgway chiefly on account of the color of the irides, which are yellow as in *J. cinereus* and its allies. No *Junco* has a spotted back in the adult nor a tail of uniform color." This statement however does not fairly represent the reasons given for considering the bird more a *Junco* than a *Zonotrichia*, for, while we said that "it agrees perfectly in its generic characters with the former, except that the back is streaked, while there is no white on the lateral tail-feathers," the color of the iris was mentioned only incidentally, as was also its alpine habitat. It is true that no other species of *Junco* has, when adult, a streaked back or lateral tail-feathers without a considerable white patch, and most of the species of *Junco* also have a dark brown iris. But it is equally true that no species of *Zonotrichia* * is without white wing-bands and very conspicuous black stripes on the head (or else with the head wholly black). Not one of them has the bill so slender as in '*Z. vulcani*', the tarsi so lengthened, or the tail so short, compared with the wing. In all these structural characters it agrees closely with *Junco alticola*, as it does also, very closely too, in the uniform dull grayish head with distinctly blackish lores, the general coloration of the under parts, and the absence of wing markings; while a close inspection will discover distinct remains of the white tail-patches. In fact, were it not for the broad black streaks on the back, we doubt whether its reference to *Junco* would ever have been questioned. We admit that it is not a typical member of that genus; but if it is to be referred to one or the other, reasons for its reference to *Junco* appear to very greatly preponderate.†

No special reasons are assigned for placing the bird which we have been accustomed to call *Pipilo chlorurus* in the genus *Embernagra*, but this is apparently done on account of some resemblance in coloration, the bird in question and the typical *Embernagræ* having the wings and tail uniform olive green. The numerous and considerable differences of form, however, appear to have been overlooked, as well as the fact that other species of *Pipilo* approach *P. chlorurus* in one point or another of its aberrant coloration. All the true *Embernagræ* have the tail either decidedly shorter than the wing or else not any longer; *P. chlorurus*, on

* We consider the genus *Zonotrichia* a true Nearctic type, including only those species which belong to the North American fauna. They are all of boreal or alpine distribution, breeding chiefly north of the United States except at high elevations.

† If the streaked back of '*Junco vulcani*' is sufficient to exclude it from the genus *Junco*, why should not the streaked back (and plain or finely streaked head) of '*Embernagra platensis*' exclude that species from the genus *Embernagra*, all the other species of which have plain backs and conspicuously striped heads?

the other hand, has the tail much longer than the wing as do also the other species of *Pipilo*. No true *Embernagra* has a rufous pileum, but some true *Pipilos* have; no *Embernagra* has a white throat-patch and malar stripe, but such markings occur in *Pipilo rutilus*. Further, the olive green wings and tail of *P. chlorurus* are reproduced in *P. macronyx* and *P. chlorosoma*, large species of the black-headed and -chested and rufous-sided group, while *P. complexus** combines with the general plumage of the *P. maculatus* group the white throat-patch and rufous pileum of *P. chlorurus*, although these markings are less developed.

Notwithstanding the strong conservatism of the authors of the 'Biologia,' genera have fared well by them, and we observe with pleasure that such familiar and well-marked groups or types as those which until recently were familiar to us as *Lophophanes*, *Peucedramus*, *Oporornis*, *Passerculus*, and *Coturniculus*, degraded to the rank of subgenera by the A. O. U. committee, are recognized as genera. It matters little whether these are true genera or not; they are well-defined groups except *Peucedramus*, and that is an isolated or monotypic form, with characters as well defined as those of many so-called genera which have never or seldom been challenged. The species of *Merula*, however, are all ranged under *Turdus*; and, with this single exception, we have no particular fault to find with the treatment of genera, although from the A. O. U. standpoint some of the generic names should be different, or differently spelled, (e. g. *Myadestes* instead of *Myiadectes*, *Helmitherus* instead of *Helminthotherus*, *Helminthophila* instead of *Helminthophaga*, *Compsothlypis* instead of *Parula*, etc.).

There are a few forms given under names which belong to allied species or races, but they were either separated subsequent to the printing of the pages on which they occur or so soon before that the authors probably had not become aware of such separation. The bird called *Rhodinocichla rosea* is a case of this kind; the Mexican bird was named *R. rosea schistacea* in December, 1878,† and should probably be ranked as a species, not only on account of its marked differences of coloration and proportions from *R. rosea* but also because of the wide separation of its habitat.

We have already‡ criticised the change of name in the 'Cliff Swallow' from *Petrochelidon lunifrons* (Say) to *P. pyrrhonota* (Vieill.) and the reasons given for objecting to this change we still believe to be valid.

We have endeavored to point out as fully as possible the defects — from our standpoint — of this work, both as resulting from the insufficient material examined and the adoption of rules of nomenclature different from those which have been in vogue among American ornithologists, as well as the different views entertained by the authors regarding the question of species and subspecies. The small number of these defects in a work of such magnitude shows how well the authors of the 'Biologia' have performed their task.

* See Proc. M. S. Nat. Mus., Vol. IX, pp. 147-148.

† Proc. U. S. Nat. Mus., Vol. I, p. 247.

‡ Proc. U. S. Nat. Mus., Vol. IX, p. 139, foot-note.

In conclusion we would say that by far the most unsatisfactory feature of the work is its slow progress. The first volume covers only about one third of the entire field, yet seven and a half years are comprised between the dates of publication of the first and last signatures. At this rate, we may look for the completion of the work not sooner than the close of the present century! It is to be hoped, however, that the authors may manage to hasten its completion, for, until the remaining families shall have been treated, any work done by others in the same field will be, necessarily, premature. — ROBERT RIDGWAY.

Saunders's Manual of British Birds.*—"The purpose of the present volume is "to convey as much information *up to date* as may be practicable in *one volume*." The plan of the work, as the author says, "may justly be called Procrustean," just two pages being allowed to each species, the matter consisting of a full-length figure and a page and three quarters of text. Very few of the wood-cuts are new, nearly all being from "the blocks from which the illustrations were struck for the four editions of Yarrell's 'British Birds'," to which, however, have been added figures of many of the recent wanderers to Great Britain, and a few fresh figures of other species, including the Great Auk. In this small space the author has compressed a fair statement of the habitat and migrations of each species treated, of course, with special reference to its status as a British bird; a summary of its life-history, and a description of its external characters, including seasonal, sexual and other phases of plumage.

There is neither synonymy nor any bibliographical references, and the generic diagnoses are given in the 'Introduction', under their respective orders and families, arranged mainly in accordance with the B. O. U. 'List of British Birds.' The work is thus in a true sense a 'Manual',—an epitome of what is most interesting and most useful to the general reader. The addition of analytical keys and tables would perhaps have made the book more useful to the young student without greatly increasing the cost or size of the 'Manual'.

The number of species considered as unquestionably entitled to be reckoned as British is 367; a few others are incidentally mentioned, respecting the status of which there are conflicting opinions. "The species which have been ascertained to breed within the United Kingdom during the present century may be taken as 200; about 70 non-breeding wanderers have occurred fewer than six times, and 59 others are more or less infrequent visitors; while 38 species annually make their appearance on migration or during the colder months, in some portion of our long, narrow group of islands or the surrounding waters" (p. v).

* An Illustrated Manual of British Birds. | By | Howard Saunders, F. L. S., F. Z. S., &c. | Editor of the Third and fourth Volumes of "Yarrell's History of British Birds," Fourth Edition. | With Illustrations of nearly every Species. | [Monogram:] London: Gurney and Jackson, &c., Paternoster Row. | (Successors to Mr. Van Voorst.) | 1889.—8vo, pp. xl + 754, with 3 maps, and "367 illustrations."

The author displays much conservatism, both in respect to the admission of alleged stragglers, and in the matter of subspecies. Thus a number of North American species often entered in British lists are ruled out on the ground that the specimens taken were in all probability escaped cage-birds, or "assisted" wanderers, or as "not likely to be genuine visitors." His position on the question of races is shown by his treatment of the British Tits, in several of which he admits the existence of "climatic races," but declines to give them recognition in nomenclature.

Three maps accompany this excellent work. The first is a 'Bathy-oro-graphical map of the British Isles and surrounding seas'; the second is a map of Europe, also bathy-oro-graphical, and the third is a 'North Polar Chart,' useful as showing the range of birds breeding in the Arctic regions.—J. A. A.

Notes on Sport and Ornithology.*—His Imperial and Royal Highness, the late Crown Prince Rudolf, of Austria, was well known for his enthusiastic interest in ornithology. His 'Notes on Sport and Ornithology' is a series of pleasantly written sketches of ornithological expeditions, followed by a number of more formal ornithological papers. The first of these sketches is entitled, 'Fifteen Days on the Danube,' and occupies the first 227 pages of the book. Accompanying the Prince on this journey were, among others, the late Dr. Eugen von Homeyer, the younger Brehm, Hodek, father and son, and other more or less well-known naturalists and sportsmen, besides a retinue of hunters, guides and valets. The trip was made in the steamer 'Vienna,' which left Pesth with the party on the 22d of April, 1878. The special object of the journey was the solution of the question of whether the 'Stein' and Golden Eagles were or were not distinct species. The narrative here given recounts in a delightful way the experiences and successes of each day's hunt, giving incidentally a graphic picture of the low, somewhat marshy forests of the lower Danube, and their feathered inhabitants. Eagles and Vultures, and the larger birds of prey generally, together with Cormorants, Storks, and Herons, were the chief objects of quest, the smaller birds coming in for only a small share of attention. Among the ornithological results of the expedition were 9 Vultures, 29 Eagles, 24 Hawks, 8 Cormorants, 12 Storks, 15 Herons, and various smaller birds, the total numbering over 200 specimens and about 70 species. Much interesting information is given respecting the habits of many of the species mentioned, particularly of the Vultures and Eagles.

Next follow 'Extracts from a Journey in the East' (pp. 229-390), describing an ornithological trip in Lower Egypt and in Palestine, made in February, March, and April, 1881. The narrative is replete with interest-

*Notes | on | Sport and Ornithology | by | His Imperial and Royal Highness the late Crown Prince | Rudolf of Austria. | Translated, with the Author's permission, by C. G. Danforth. | [Monogram.] London: | Gurney and Jackson, | Paternoster Row. | (Successors to Mr. Van Voorst.) | 1889 — 8vo. pp. viii + 648.

ing notes of travel and sport, largely ornithological. Over 1000 specimens were taken, representing about 125 species of birds and 15 species of mammals.

About 50 pages are devoted to 'Ornithological Sketches from Spain,' and relate mainly to Vultures and Eagles, of which eight or nine species are more or less formally treated. 'Ornithological Sketches from the East' seems to be a systematic, annotated list of the birds observed during the 'Journey in the East' mentioned above.

The numerous minor papers give notes on birds observed in the vicinity of Vienna, during January 1 to June 1, 1882, November, 1883, February, 1884, and December, 1885, and include two papers on 'Hybrid Grouse,' and an annotated list of birds observed on the coast of Dalmatia and Istria. An excellent index concludes this very entertaining book of nearly 650 pages.—J. A. A.

Doan's Birds of West Virginia.*—The writer of this list spent the time from August 1 until November, 1888, travelling through the State stopping for a few days each at some fifteen different places. He says:—"During the last five weeks in the field the inclemency of the weather was such that it was impossible for me to do any collecting whatever; and as the season was far advanced and the remaining time short, my explorations were necessarily hurried. Much valuable time was lost in travelling in order to reach all the different districts, many of which are widely separated and remote from railroads. By far the most productive and satisfactory work was done at Buckhannon and vicinity during the month of August. The following list [of 200 species] contains all species that I personally identified, together with a few additions from Mr. William Brewster's paper on the 'Birds of Ritchie County,' and W. E. D. Scott's 'Birds of Kanawha County.'" He also acknowledges his "indebtedness to Dr. J. R. Mathers and Mrs. E. L. Day, of Buckhannon, for valuable notes on several species with which I did not meet." In spite of the fact that his field work was all done later than August 1, the author does not hesitate to enter many species as summer residents, and in the same bold spirit he gives others as winter residents, either at a guess, or upon some authority which he does not quote. Among all these unreliable statements are one or two records that would be valuable, if we dared believe them. There are others that are quite easy to believe, as the assertion that the Woodcock is "a lover of low damp places," or that "Turkey Buzzards feed upon carrion and are very useful birds."

Cynical readers may be amused to notice that, according to the author's observations, "in eastern Pennsylvania" various of the insect-eating species still adhere with surprising fidelity to the diet prescribed for them some years ago by Mr. T. G. Gentry.

* Bulletin No. 3, of the West Virginia Agricultural Experiment Station at Morgantown, W. Va., December, 1888, — Prepared under the Auspices of the West Virginia Agricultural Experiment Station. By Wm. D. Doan. — John A. Myers, Director. Birds of West Virginia. 8vo pp. 41-88.

What object there can have been in publishing such a worthless production as this (10,000 copies were distributed), it is hard to imagine. We notice it chiefly to call attention to the folly and uselessness of issuing local lists that are based on few and imperfect observations. Every beginner in ornithology seems beset by a desire to print a list of the birds of his own neighborhood, and thinks himself quite competent for the task. The fact is there are few things that require such long training and exceptional talents to make the results of real value. Even then a list should not be published unless based on years of constant field-work or unless the region treated is practically unknown ground. It is, nevertheless, an excellent thing for the beginner to prepare his local list,—but for his own use. It gives him some valuable practice; its incompleteness may stimulate him to further discoveries; and it will doubtless afford him that most invaluable lesson,—how easy it is to make mistakes, and many of them.—C. F. B.

The Quadrate Bone in Birds.*—A paper by Miss Mary L. Walker treats of the quadrate bone of birds, describing one or more specimens from typical examples of each of the various groups proposed by Huxley. The quadrate is shown to have a characteristic shape in the different species examined, and from hastily running over a considerable number of crania it is apparent that the quadrate possesses much taxonomic importance. Its value, however, will doubtless prove to be comparative rather than positive, and will be found in the fact that it furnishes an additional point in summing up the evidence in any given case. Some of the facts brought forward in the paper show very clearly that, like most characters of birds, the form of the quadrate will need to be checked by others, and that, as has so often been said, it is not by any one character, but by the resultant of many, that birds must be classified. None of the *Machrochires* were examined by Miss Walker, and it may be said that the quadrate of Hummingbirds, Swifts, and Goatsuckers are built on the same general plan, the resemblance between Swifts and Goatsuckers in this particular being especially noticeable. The paper is confessedly "a short, and indeed, preliminary study," and it is to be hoped that we may soon see it extended, for we cannot have too many aids in the classification of birds, and each additional taxonomic character is to be welcomed.—F. A. L.

Minor Ornithological Publications.—There has not been much of ornithological interest in the literary monthlies since they were last noticed in this department. *Harper's Monthly* since Vol. LXXI (see Auk, II, 372) has contained nothing in Vols. LXXII-LXXIX worth noticing here. *Scribner's Magazine* has so far (Vol. I-VI) contained no ornithological matter. *The Century Magazine* was last noticed (Vol. XXVI, 1883) in the

*Studies from the Museum of Zoölogy in University College, Dundee. Edited by D'Arcy W. Thompson, Professor. I. On the Form of the Quadrate Bone in Birds. By Mary L. Walker.

'Bulletin of the Nuttall Ornithological Club,' Vol. VIII, 1883, p. 238; since then it has contained, in Vols. XXVII-XXXIX (Nov., 1883-April, 1890) the following (Nos. 1636-1644).

1636. *Bird Enemies*. By John Burroughs. 'The Century Illustrated Monthly Magazine,' Vol. XXXI, No. 2, Dec., 1885, pp. 270-274.

1637. *Feathered Forms of Other Days*. By R. W. Shufeldt. *Ibid.*, No. 3, Jan., 1886, pp. 352-365.—Illustrated with figures of *Camptolaimus labradorius*, *Plautus impennis*, and several fossil birds.

1638. *Birds' Eggs*. By John Burroughs. *Ibid.*, Vol. XXXII, No. 2, June, 1886, pp. 273-278.

1639. *Sea Birds at the Farne Islands*. By Bryan Hook. *Ibid.*, No. 4, Aug., 1886, pp. 557-564.—A popular sketch, illustrated.

1640. *Notes from the Prairie*. By John Burroughs. *Ibid.*, No. 5, Sept. 1886, pp. 784-790.—Contains a few notes on the Sand-hill Crane.

1641. *The Sportsman's Music*. By W. J. Henderson. *Ibid.*, Vol. XXXIV, No. 3, July, 1887, pp. 413-417.—With cuts, and musical notation of songs, of several birds.

1642. *Bird Music*. By Simeon Pease Cheney. *Ibid.*, Vol. XXXV, No. 6, April, 1888, pp. 845-848 (*Sialia sialis* and *Merula migratoria*); *ibid.*, Vol. XXXVI, No. 1, May, 1888, pp. 147-149 (Partridge and Owls); *ibid.*, No. 2, June, 1888, pp. 254-256 (*Icterus galbula*, *Turdus mustelinus*, *T. a. pallasi*, *T. fuscescens*); *ibid.*, No. 3, July, 1888, pp. 416-417 (*Melospiza fasciata*, *Spizella pusilla*); *ibid.*, No. 5, Sept., 1888, pp. 718-719 (*Icteria virens*, *Dolichonyx oryzivorus*, *Antrostomus vociferus*); *ibid.*, Vol. XXXVII, No. 1, Nov., 1888, p. 97 (*Urinator imber*); *ibid.*, Vol. XXXVIII, No. 2, June, 1889, pp. 234-235 (*Sturnella magna*, *Pipilo erythrophthalmus*, *Piranga erythromelas*, *Spinus tristis*).—With musical notation of songs.

1643. *Doves*. By E. S. Starr. *Ibid.*, pp. 698-703.—Contains some account of a nesting of *Ectopistes migratorius*.

1644. *Bird Music: Songs of the Western Meadow-Lark*. By Charles W. Allen. *Ibid.*, No. 6, Oct., 1888, pp. 908-911.—With musical notation.

The *Atlantic Monthly*, last noticed (Vol. LIII, No. 318, April, 1884) in Vol. II, p. 373, of 'The Auk', has since contained in Vols. LIII-LXIV (1884-1889) the following (Nos. 1645-1669).

1645. *The Bird of Solitude*. By Olive Thorne Miller. 'The Atlantic Monthly,' Vol. LIII, No. 320, June, 1884, pp. 753-758.—A popular account of the characteristics of *Turdus mustelinus* and *T. a. pallasi*. Reprinted in 'Bird Ways,' Boston, 1885, pp. 13-29.

1646. *Bird Gazing in the White Mountains*. By Bradford Torrey. *Ibid.*, Vol. LIV, No. 321, July, 1884, pp. 51-59.—Reprinted in 'Birds in the Bush,' Boston, 1885, pp. 75-102, entitled 'In the White Mountains'.

1647. *In the Haunts of the Mockingbird*. By Maurice Thompson. *Ibid.*, No. 325, Nov., 1884, pp. 620-627.—Reprinted in 'By Ways and Bird Notes,' New York, 1885, pp. 5-22.

1648. *Winter Birds about Boston*. By Bradford Torrey. *Ibid.*, Vol.,

LV, No. 328, Feb., 1885, pp. 160-168. — Reprinted in 'Birds in the Bush,' Boston, 1885, pp. 185-210.

1649. *A Ruffian in Feathers*. By Olive Thorne Miller. *Ibid.*, No. 330, April, 1885, pp. 490-495. — *Passer domesticus*. Reprinted in 'Bird Ways,' Boston, 1885, pp. 151-159.

1650. *A Bird Lover's April*. By Bradford Torrey. *Ibid.*, No. 331, May, 1885, pp. 692-701. — Reprinted in 'Birds in the Bush,' Boston, 1885, pp. 211-241.

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1653. *A Trickster's Spirit*. By Olive Thorne Miller. *Ibid.*, No. 337, Nov., 1885, pp. 676-685. — *Mimus polyglottos* in captivity.

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1657. *The Mockingbird's Nest*. By Olive Thorne Miller. *Ibid.*, No. 354, April, 1887, pp. 514-524.

1658. *Flutterbudget*. By Olive Thorne Miller. *Ibid.*, No. 355, May, 1887, pp. 678-682. — *Harporhynchus rufus* in captivity.

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1662. *Virginia's Wooing*. By Olive Thorne Miller. *Ibid.*, No. 365, March, 1888, pp. 362-366. — *Cardinalis cardinalis* in captivity.

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1669. *December Out-of-doors.* By Bradford Torrey. *Ibid.*, No. 386, Dec., 1889, pp. 752-761.—Various birds noted in eastern Massachusetts in December, 1888.

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1670. *Beach Birds.* By Nathan Clifford Brown. '*Lippincott's Monthly Magazine*,' Vol. XXIII, May, 1879, pp. 620-626.—An illustrated sketch of various species found on the beaches [near Scarborough, Maine?].

1671. *Notes on the Intelligence of Birds.* By Mary Treat. *Ibid.*, Vol. XXIV, Sept., 1879, pp. 359-364. — On habits of various species in New Jersey.

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1672. *Notes on a Few of Our Birds.* By Harry Merrill. '*The Popular Science Monthly*,' Vol. XVII, No. 3, July, 1880, pp. 386-392.—Interesting notes, especially on breeding habits, of various birds in Maine.

1673. *Land Birds in Mid-ocean.* By George W. Grim. *Ibid.*, Vol. XXIV, No. 2, Dec., 1883, pp. 207-209.—A few interesting facts and suggestions.

1674. *The Social Life of Arctic Birds.* By Dr. Alfred E. Brehm. *Ibid.*, Vol. XXVIII, No. 2, Dec., 1885, pp. 209-216.—A popular sketch of the habits of several species.

1675. *Bird Migration.* By Barton W. Evermann. *Ibid.*, Vol. XXX, No. 6, April, 1887, pp. 803-810.—A popular review of the subject and its study in America.

1676. *The Home of the Great Auk.* By Frederic A. Lucas. *Ibid.*, Vol. XXXIII, No. 4, Aug., 1888, pp. 456-464.—An account of the writer's visit to Funk Island.

1677. *Birds with Teeth.* By Otto Meyer, Ph. D. *Ibid.*, Vol. XXXVI, No. 3, Jan., 1890, pp. 382-389.—A short illustrated sketch of several fossil species.—C. F. B.

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GENERAL NOTES.

The Appearance of the Razor-billed Auk (*Alca torda*) on the Coast of North Carolina.—Not long since Lieut. D. F. Foley, U. S. N., sent to the Department of Agriculture a head, wing, and foot of the Razor-billed Auk for identification. He stated that the bird was shot on February 15, 1890, in Lookout Cove, North Carolina, and that others were observed at the same place.

As far as known to the writer, this locality is the most southern point from which the species has been obtained. In a previous number of 'The Auk' (IV, 1887, 158) Mr. Frederick S. Webster records a specimen from Norfolk, Virginia.—A. K. FISHER, M.D., *Washington, D. C.*

The Great Auk in the U. S. National Museum.—The Great Auk in the collection of the U. S. National Museum has recently been remounted by Mr. N. R. Wood, and is thereby greatly improved in appearance. Although the specimen is more than fifty years old, the skin proved to be in fair condition, although naturally so venerable a bird needed careful manipulation.

Like nearly all mounted specimens of the Great Auk this was far too long, and even now that it has been shortened between two and three inches still remains at least so much longer than in life.

Measured along the curve the length of the stuffed specimen is a little more than twenty-nine inches from tip of beak to root of tail, while a

large skeleton, similarly measured, is but a trifle more than twenty-five inches in length.

A life-sized, colored photograph of the bird as it appeared before remounting is preserved in the collection. — F. A. LUCAS, *Washington, D. C.*

Eggs of the Florida Dusky Duck. A set of the eggs of the Florida Dusky Duck (*Anas fulvigula*) were taken by Mr. O. A. Quartermain on the Banana River, Florida, May 22, 1889. The set contained ten eggs, which are almost white in color, showing a very faint tinge of green when held in the light. An average specimen measured 2.15×1.60 inches. — CHARLES B. CORY, *Boston, Mass.*

Another Capture of the Widgeon (*Anas penelope*) on the Atlantic Coast.—On January 11, 1890, I saw a very fine adult male hanging in a marketman's stall in New York City, near Washington Market. On inquiry, I learned that it had been shipped from Baltimore to New York, and doubtless was shot on Chesapeake Bay. It was hanging amongst a lot of Dusky Ducks (*Anas obscura*) with which it was said to have been received. It has been mounted and placed in the collection of the American Museum of Natural History, New York. Its fresh measurements were as follows: length, 495 mm.; alar expanse, 850 mm.; wing, 260 mm.; tail, 116 mm.; culmen, 34 mm.; tarsus, 40 mm.—EDGAR A. MEARNS, M.D., *Fort Snelling, Minn.*

Capture of a Specimen of *Somateria dresseri* in the vicinity of Ottawa, Canada.—On November 7, 1889, after a strong easterly storm the writer shot a young male of this species, in the plumage of the female, while flying up the River Ottawa a short distance below the City. This is, I believe, the first specimen obtained in this locality.—GEO. R. WHITE, *Ottawa, Canada.*

The Red Phalarope on Lake Erie.—I take pleasure in making the following record of the occurrence of the Red Phalarope (*Cry mophilus fulicarius*) on Lake Erie at the mouth of the River Raisin, Monroe, Michigan. On October 24, 1888, Mr. Ralph Brandreth noticed the bird sitting in the water and shot it. It was in summer plumage. It was mounted, and is now temporarily in my possession.—ROBT. B. LAWRENCE, *New York City.*

Recent Occurrence of the Turkey Vulture in Eastern Massachusetts.—Messrs. Goodale and Frazar, the Boston taxidermists, have lately mounted a Turkey Vulture which was shot at Essex, Massachusetts, Nov. 16, 1889. The species has been bought for the Essex County collection of the Peabody Museum of Salem. There are records of four previous occurrences in the State, one by Samuels (*Agr. Mass., Secy's Rep.* 1863, App., p. xviii) of two specimens taken in 1863, another by Maynard (*Nat. Guide,*

1870, 137) of a bird seen in Waltham, August, 1867, and a third by Mason (Auk, VI, Jan., 1889, p. 71) of an example shot in West Falmouth, Sept. 9, 1888. Two supposed "Massachusetts instances," referred to by Dr. Coues in New England Bird Life (II, 1883, 137), have been since shown by Mr. Allen (Bull. Am. Mus. Nat. Hist., No 7, 1886, 242 (foot-note), to really relate to Maine instead of Massachusetts.—WILLIAM BREWSTER, Cambridge, Mass.

Harlan's Hawk a Race of the Red-tail, and not a Distinct Species.—

An adult specimen belonging to the Iowa College Museum, Grinnell, Iowa, which Dr. Merriam has kindly submitted to me for examination, is so clearly intermediate between *B. harlani* and *B. borealis* that I have no longer any doubt that the former is simply a peculiar variation of the latter, in which the coloration of the tail is chiefly affected. In this Iowa specimen the plumage is in every respect, except the tail, that of typical *B. borealis*, while the tail has the curious mixed coloration so characteristic of the so-called *B. harlani*. The ground color of the tail is chiefly white, but this is much broken by numerous *longitudinal* mottlings and spots or other markings of dusky in longitudinal series, both webs of the feathers being thus marked. Most of the rectrices have a greater or less amount of rufous suffusion along the edge of the outer web, while the inner web of the middle feather on the right side is almost entirely rufous, though this color is broken by the usual dusky blotches; all the rectrices have a suffusion of rufous near their tips, which are narrowly white, the subterminal dusky bar of typical *B. borealis* being slightly indicated by dusky blotches and rather extensive dark brownish gray shading. In addition to the distinct dusky markings and rufous washes, many of the rectrices are washed with brownish gray on portions of their outer webs, this gray wash being also more or less mottled or blotched with darker. The specimen is probably a female, the measurements being as follows: Wing, 16.75 inches; tail, 9.35; culmen, 1.10; tarsus, 3.20 (unfeathered portion in front, to tips of feathers, 1.16); middle toe, 1.75; the outer toe about .15 longer than the inner.

The technical name of Harlan's Hawk should therefore be changed to *Buteo borealis harlani* (Aud.).—ROBERT RIDGWAY, Washington, D. C.

Capture of a Third Specimen of the Barn Owl in Massachusetts.—

Through the kind offices of Mr. J. A. Farley I have just obtained a Barn Owl (*Strix pratincola*) which was taken by Mr. C. T. Wood at South Westport, Massachusetts, Dec. 30, 1888. It is a male in fine plumage and was mounted by Mr. H. P. Babcock of New Bedford. Mr. Wood writes that he shot the bird in a bushy pasture on 'Horse Neck', within a few rods of a salt creek. The specimen is, I believe, only the third that is known to have been taken in Massachusetts.—WILLIAM BREWSTER, Cambridge, Mass.

The Great Gray Owl in Lewis County, New York. — I take pleasure in recording the capture of the Great Gray Owl (*Scotiaptex cinerea*) in this locality. It is, I believe, the first authentic instance of its capture in this County (Lewis). It was shot by a farmer in the town of Watson, Dec. 17, 1889, and is now in my collection. The farmer said that he was slaughtering swine, and the Owl flew from an adjoining piece of woods, alighting in a tree in the yard (doubtless attracted by the fresh meat). The bird, which was an adult female, was in very poor condition and the stomach was empty.—JAMES H. MILLER, *Lowville, N. Y.*

Picoides arcticus in Central New York.—The Arctic Three-toed Woodpecker is undoubtedly one of the rarest winter visitants in central New York, and its occurrence in Onondaga County in the vicinity of Syracuse has, I believe, never been made public. It is with pleasure therefore that I record two instances of its capture that have come under my notice.

On December 25, 1883, Mr. E. F. Northrup took a specimen in a swamp a few miles north of the city, but through ignorance of its value delayed skinning it until too late. I saw the bird on several occasions doing duty as copy for a water-color sketch, and tried to secure possession of it, but without success, and to my disgust it was finally thrown into an ash barrel as unfit to skin. A mention of this capture was made in Bulletin No. 1 of the Biological Laboratory of Syracuse University, published in February, 1886, by Morgan K. Barnum, entitled 'List of the birds of Onondaga County.' This Bulletin, however, was not a success, and beyond a few copies given to applicants and friends the entire issue was stored away in the College archives.

The second specimen, an immature female, was taken at Tully, New York, on February 22, 1889, by my friend Mr. J. A. Dakin who kindly consented that it should form a part of my own collection. He informs me that it was exceedingly shy and difficult of approach, and that it was only after a long pursuit and some sharp manœuvring that it was finally secured.—E. M. HASBROUCK, *Washington, D. C.*

The Red-bellied Woodpecker in Northwestern New Jersey. — I shot a female Red-bellied Woodpecker (*Melanerpes carolinus*) at Newton, New Jersey, on the 16th of November, 1889. I have only found this species in northern New Jersey on one or two occasions, but it is of more frequent occurrence in the southern part of the State.—STEWART LEWIS, *American Museum of Natural History, New York City.*

Food of Young Hummingbirds.—July 2, 1887, Mr. E. S. Hoar of Concord, Mass, found a Ruby-throated Hummingbird's nest in his garden. It was saddled on the drooping branch of an apple tree about eight feet above the ground, and contained two eggs which were hatched July 4. On the 7th Mr. Hoar kindly allowed me to inspect the nest and its contents. The young were then nearly as large* as their mother, and were

*It is remarkable that they should have attained so large a size in so short a time. They did not, however, leave the nest until July 18.

covered with pin-feathers of a dark brown color. Their bills were perhaps a quarter of an inch long, wide at the base, and in general shape not unlike the bill of a *Dendroica*, but more depressed.

Taking a station near the tree I watched the nest for two hours (from 11 A.M. to 1 P.M.). During this period the female visited it three times. At her first coming she fed the young, and after brooding them for forty-five minutes, buzzed about in the tree (not once leaving it) for about a minute. She then returned to the nest and fed the young again, one of them twice in succession. Immediately afterward she flew off out of sight and was absent sixteen minutes. At the end of this time she came directly to the nest, fed each young bird once, brooded both for six minutes, and then again flew away not reappearing during the remaining twenty minutes of my stay.

Her manner of feeding her offspring was as follows: Alighting on the edge of the nest, her tail pressed firmly against its outer side in the manner of a Woodpecker, her body erect, she would first look nervously around, then thrust at least three quarters of the total length of her bill down between the upraised open mandibles of the young bird. Next she would shake her head violently as if disgorging something; then, with their bills glued tightly together, both birds would remain, for the space of several seconds, perfectly immovable save for a slight, rapid, pulsating or quivering motion of the mother's throat. The actual contact of the bills lasted once four seconds, once six seconds, and twice eleven seconds, the time being taken with a stop watch. The male did not appear at all. The young were perfectly silent. The mother in brooding them kept moving restlessly about as if she were trampling on them.

The close and prolonged contact of bills, the shaking of the mother's head, the subsequent quivering motion of her throat, and, above all, the fact that after sitting on the nest nearly an hour she fed the young a second time without once leaving the tree in the interim, convinced me that the method of feeding was by regurgitation.

The character of the food thus supplied I could not, of course, ascertain without killing and dissecting one of the young, a proceeding which my kind-hearted host would certainly not have sanctioned.

The observations above detailed were made at a distance of about ten yards from a point only a few feet below the level of the nest, and with the aid of a powerful field glass. As the day was clear and the light strong I could see the birds nearly as well as if I held the nest in my hand.—

WILLIAM BREWSTER, *Cambridge, Mass.*

Remarks on certain species of *Dendroornis*.—Since my paper on *Dendroornis* has been printed, the American Museum of Natural History has received from the Vienna Museum the three species mentioned in a footnote to page 163, viz.: *D. ocellata* Spix, *D. spixi* Less., and *D. elegans* Pelz., and I am therefore able to publish my conclusions in this number of 'The Auk.'

The specimens of *D. ocellata*, so determined by von Pelzel, before me are marked male and female, and differ from each other in the general smaller dimensions and shorter bill of the female. These examples cannot be separated from *D. weddelli* Lafres., with the types of which I have compared them.

If therefore these specimens from von Pelzel have been compared with Spix's type and found identical, then Lafresnaye's species must become a synonym of *D. ocellata*, but if not, then I am still in doubt as to what *D. ocellata* really is. If Spix's type is still in existence, this point could be easily settled by the Continental ornithologists.

A single example of *D. spixi*, and which agrees fairly well with Spix's description and figure, shows that this species is very nearly related to *D. guttatoides* Lafres., but differs in much more slender bill, generally smaller dimensions, and different coloration on the back and under parts, with, however, the same character of spots. It may be described as follows: Top of head and back of neck brownish black, each feather with a central, pale buff, tear-shaped spot, more elongated on the neck. Back, yellow-olivaceous-brown with broad, central, buff stripes bordered with black. Rump and upper tail-coverts dark cinnamon. Throat pale buff, each feather indistinctly margined with pale brown. Entire under parts grayish-olive-brown, each feather with a broad, central, buff streak, margined with black, some of these streaks on upper part of breast being a bright buff. Wings and tail dark cinnamon. Bill long and slender, dark brown, paler at the tip. Feet horn brown. Length, $8\frac{3}{4}$ in.; wing, $3\frac{3}{4}$ in.; tail, $3\frac{5}{8}$ in.; bill, $1\frac{1}{4}$ in. Specimen described No. 48,149, collection American Museum of Natural History ex Para (Natterer).

In my key of the species *D. spixi* will have to be removed from the position given it and placed after *D. guttatoides* as "C. Bill long, slender, longer than head. Throat and stripes on breast buff."

D. elegans Pelz. is a very distinct species, and well characterized by the description quoted from the Orn. Bras. Its position in the key is quite correct.—D. G. ELLIOT, *Am. Mus. Nat. Hist., New York City*.

The Purple Grackle at Charleston, South Carolina.—Mr. Wayne has at length taken true *Q. quiscula* near Charleston. The specimen, which he sends me for examination, is a female in high plumage. I cannot see that it differs at all from several of the females in my collection from the Middle States. It was shot by Mr. Wayne, Nov. 30, 1889, at Pinopolis, a few miles from the City proper.—WILLIAM BREWSTER, *Cambridge, Mass.*

Quiscalus quiscula æneus Killing and Catching Goldfish.—During the past summer, while noting the condition of my goldfish pond I frequently found many bodies of these fishes floating, bearing evidence of some sharp instrument having been used to effect their death: deep incisions, holes, and grooves in their heads and backs, etc. Carefully killing every Kingfisher and all the Herons, Bitterns being wholly absent, I became very much puzzled at the constant loss of life among these pretty fish of which

I have, I presume, some 3000 individuals in the pond. I first observed this evidence of destruction early in May last, and it was not until late in July that I detected the cause of it.

Large flocks of *Quiscalus q. æneus* make their home annually from early spring till late every fall, in the pine, spruce and hemlock groves which belong to my grounds; as I do not raise cereals, and devote my land to fruit culture, I regard these birds as the most valuable of their kind to me, and never have permitted them to be shot at or disturbed on my premises. Going down to my pond, as usual, in quest of Kingfishers, I happened to take notice of a Crow Blackbird in the act of striking quickly with its bill into the water at the edge of the bank. Wondering what it found there for food, I cautiously approached, sneaking behind the shelter of an evergreen and bed of flowering shrubs. This bird had struck a small goldfish as it came up to the water's edge—struck it in the centre of its head with the sharp point of its bill. This blow only stunned the fish, but rendered it unable to dart away, although it could still squirm and wriggle; the Blackbird was earnestly trying to land its prey by repeatedly striking the fish so as to get a beak hold, which it finally did after many failures. Catching sight of me, it at once flew away, leaving the writhing and mortally wounded victim upon the earth. The mystery of that peculiar destruction of my goldfish was thus solved.

The habit of goldfish whereby they suck and bore at and into the grassy and mossy edges of a pond as they feed, renders them a comparatively shining mark for *Quiscalus*.—HENRY W. ELLIOTT, near Cleveland, Ohio.

The Evening Grosbeak at Montreal.—Mr. William Brewster in a note to 'Forest and Stream,' Feb. 6, 1890, records the occurrence of the Evening Grosbeak (*Coccothraustes vespertina*) in eastern New Hampshire and Massachusetts, and Dr. A. K. Fisher of Washington, D. C., also Mr. J. Alden Loring of Oswego, N. Y., and Mr. J. L. Davison of Lockport, N. Y., records its occurrence in New York State, between the dates of Dec. 14, 1889, and Feb. 1, 1890. My attention was drawn to its occurrence here by Mr. Caulfield, taxidermist, one having been shot in this city by Mr. John H. R. Molson's gardener in the last week in January, 1890, and four at Laprairie, on the south side of the St. Lawrence River about nine miles above Montreal, on Feb. 5. I saw two of these birds after they were stuffed. I believe this is the first record of their occurrence in this district.—ERNEST D. WINTLE, *Montreal, Canada*.

Coccothraustes vespertina in Erie County, N. Y.—On the 15th of April, 1887, Mr. B. W. Fenton of Buffalo shot a pair (male and female) of Evening Grosbeaks at Brant, Erie County, N. Y., and brought the male's head to the late Charles Linden for identification. This observation was published by Prof. Linden in the 'Forest and Stream,' Vol. XXVIII, 1887, p. 367. This is, I believe, the first record from New York State which is backed by a specimen: the above-mentioned head is now in the collection of Mr. A. H. Alberger of Buffalo, and places the record beyond cavil.

On Jan. 10, 1890, Mr. D. W. Fenton observed a flock of nine Evening Grosbeaks in our City Park, and on the following day with his assistance I was able to secure three specimens, two females and one immature male. The birds were very tame, and were feeding on the seeds of the maple.

On the 18th of January, 1890, Mr. Geo. Harris of West Seneca, Erie County, received a fine male of this species, which had been shot at West Seneca. He was informed that the bird was in full song on a low bush when shot, and that no more were seen at the time.

These facts, excepting the Harris record, are also embodied in a report to 'Forest and Stream' (Vol. XXXIV, 1890, pp. 64, 65,) by Dr. A. K. Fisher.—W. H. BERGTOLD, M. D., *Buffalo, N. Y.*

Evening Grosbeaks in Vermont.—During the last few weeks, there has been around my house here, a flock of Evening Grosbeaks (*Coccothraustes vespertina*), consisting of about a dozen individuals, more than half males in the most brilliant plumage. They seem especially fond of the seeds still hanging on a box elder tree.—W. W. COOKE, *Burlington, Vermont, Feb. 20, 1890.*

Coccothraustes vespertina at Amherst, Massachusetts.—On January 8, 1890, I was visited by a farmer from the southern part of Amherst, who had with him a bird he desired me to name for him. I recognized it at once as a male *Coccothraustes vespertina* in fine adult plumage. The man said his boy had shot it a day or two before as it was perched on the top of a cherry tree near his house. There were two together but the other escaped. The one that he shot he said was singing finely at the time, and seemed much brighter colored than the other. We have had very mild weather this year and no snow at all.

I had no difficulty in obtaining a good skin, and soon it will grace the collection of Amherst birds in the Amherst College cabinet.—HUBERT L. CLARK, *Amherst, Mass.*

Evening Grosbeaks in Hampden County, Massachusetts.—A few days since Mr. Rufus E. Bond brought into the Museum of the Worcester Natural History Society an Evening Grosbeak which was killed by Mr. Louis James in East Brimfield, Mass., on February 1. Neither of these gentlemen knew the bird, but thinking it might be something of interest to the Museum Mr. Bond, who is a member of the school board of Fishdale, at once brought it to us. A small flock of the birds, perhaps a dozen in all, had been seen about the house for several days. The bird is an adult male in fine plumage. I have preserved it for our collection.

Some of the cyclonic storms of the past month have been followed by strong west winds. This may account for the presence of the birds so far to the east of their usual habitat.—E. H. FORBUSH, *Worcester, Mass.*

The Evening Grosbeak in Connecticut.—A female Evening Grosbeak (*Coccothraustes vespertina*) was shot at Gaylordsville, Conn., March 10, 1890, by Mr. E. H. Austin of that place, who kindly forwarded it to me. Mr. Austin writes that it was one of four or five that came near his house, and that one of them was very yellow, probably an adult male. Gaylordsville—a district of the town of New Milford—is on the Housatonic River, but a few miles from the New York State line.—C. K. AVERILL, JR., *Bridgeport, Conn.*

Evening and Pine Grosbeaks in Ontario.*—Large and numerous flocks of these two species (*Coccothraustes vespertina* and *Pinicola enucleator*) have appeared this year in the Province of Ontario. They are reported from Kingston, Toronto, southern Peel Co., and Hamilton; no doubt more extended observation would show a universal distribution at least along the northern shore of Lake Ontario. The first comers of this migration were observed about New Year's Day, and since then large numbers of both species have been reported from all points under observation. Sometimes the species are in separate flocks, and sometimes together. When not associated with the Pine Grosbeaks, the Evening Grosbeaks have usually been observed on the ground, where their actions are much like those of the *Pipilo erythrophthalmus*; the food that they find there is seeds of maple (*Acer saccharinum*?), stones of choke cherry, and common ed haws; these latter are found in their stomachs all crushed, no doubt, by the powerful mandibles of the birds.

The Pine Grosbeaks are usually seen feeding on the berries of the mountain-ash, and the crops and gizzards of many that have been shot have been found crammed with the seeds of the black ash, divested of the outer covering in most cases.

This migration is so great and so unusual that all the papers have had notices of it, and every one about here who makes any pretention to being a naturalist has added numerous examples of both species to his collection.

It is interesting to note that last winter there were no records here for the Evening and but one or two for the Pine Grosbeaks; the winter was a severe one, while this is unusually mild so far (Jan. 27), so it seems as if the abundant food supply, rather than any climatic conditions directly, might have had to do with the migration.—ERNEST E. THOMPSON, *Toronto, Ont.*

The Ipswich Sparrow in Georgia.—I took on Jan. 8, 1890, a fine male specimen of the Ipswich Sparrow (*Ammodramus princeps*) on 'Jack's Bank,' a bleak, grassy coast island, just south of the Altamaha River, in Glynn County, Georgia. On Jan. 15 I secured another specimen, a

*For further records of the eastward movement of Evening Grosbeaks during the past winter see the following: 'Forest and Stream', Vol. XXIV, Feb. 6, 1890, pp. 44, 45; Feb. 13, pp. 64, 65; Feb. 27, pp. 103, 104; March 6, p. 123; March 13, p. 143; March 20, p. 167; March 27, p. 187.—'Ornithologist and Oölogist', Vol. XV, No. 2, Feb., 1890, pp. 27-28; No. 3, March, 1890, p. 46.

female, within a hundred yards of where the first was shot, and on Jan. 27 I saw another in the same place, but failed to secure it. This evidence leads me to believe that this bird may be found, in *suitable places*, all along the coast, at least as far south as this. The place resembles, in everything except climate, their favorite haunts on the south shore of Long Island, N. Y.

I believe this record extends its range considerably south, at least on the Atlantic coast.—W. W. WORTHINGTON, *Shelter Island, N. Y.*

The Acadian Sharp-tailed Sparrow and Scott's Seaside Sparrow on the Coast of South Carolina.—Among a large number of Sharp-tailed Sparrows which have been collected for me on the coast of South Carolina, I find no less than five typical examples of *Ammodramus caudacutus subvirgatus*. Three of these were taken at Frogmore by Mr. Hoxie in the spring of 1886 (♀ March 19, ♂ April 19, ♂ April 20), the remaining two near Charleston by Mr. Wayne in the autumn of 1889 (♀ Oct. 25, ♂ Oct. 30). My South Carolina series, as a whole, indicates that typical *caudacutus* is the prevailing form, *nelsoni* next in numbers, and *subvirgatus* the least common. It furnishes no evidence that any one of these forms breeds in the State. There is, I think, no previous record—at least no specific record—of the occurrence of *subvirgatus* in South Carolina.

I have also a Seaside Sparrow (a female) killed near Charleston by Mr. Wayne, Oct. 29, 1889, which Mr. Allen considers "quite far on the way towards *peninsulæ* and * * * perhaps nearer this form than it is to *maritimus*," and which Mr. Wayne assures me is very much darker than any specimen that he has hitherto taken. All the autumn and winter examples which he has sent me, except the one just mentioned, are typical *maritimus*. I have seen no breeding Seaside Sparrows from any locality on the coast of South Carolina, but the form which I found breeding in the salt marshes at St. Mary's, Georgia, in 1877, was unmistakably *maritimus*, not one of the dozen or more birds that I preserved (several of them were taken with nests and sets of eggs) showing the slightest approach to *peninsulæ*. In view of these facts it is hard to explain the occurrence of *peninsulæ* in autumn or early winter* at points north of St. Mary's, unless it may be assumed that a few individuals of this subspecies occasionally wander northward in autumn, from their breeding grounds on the Gulf Coast.—WILLIAM BREWSTER, *Cambridge, Mass.*

Passer domesticus in Cape Breton.—It seems noteworthy that the House Sparrow made its first appearance in Cape Breton coincidentally with the completion of the Cape Breton Railroad, during the month of November last. It is probable that the Sparrow followed up the line of the road under construction, attracted by the grain and other supplies transported.—W. P. COUES, *Cambridge, Mass.*

* Mr. Allen has recorded (*Auk*, V, Oct., 1888, p. 426) a "typical *A. m. peninsulæ*" shot at Sapelo Island, Dec. 14, 1887. I have also two specimens from the same locality (♀, Dec. 1, ♀, Dec. 3, 1887) which although not quite typical, must be referred to *peninsulæ*.

Shrikes of Minnesota.—Not exactly knowing the true position held by the Shrikes of Minnesota, I submitted a small series of four to Mr. Ridgway for identification, two from Minneapolis, which were dark colored specimens, and two, which were much lighter, from Lanesboro in the southern part of the State.

The following was the result of the examination. He says: "None of your Shrikes are typical of either *ludovicianus* or *excubitorides*, all being intermediate between the two forms. The specimen I have marked 'A' [one of those from Minneapolis] comes nearest the former, but is not dark enough in the coloration of the upper parts; the others come decidedly nearer *excubitorides* than *ludovicianus*, but are not pale enough to be typical."—GEO. G. CANTWELL, *Lake Mills, Wis.*

Notes on some Minnesota Birds.—It is thought that sufficient interest attaches to the occurrence in Minnesota of the five species of birds mentioned below to justify the publication at this time of the following notes in regard to them. Two of the five—the Burrowing Owl and Henslow's Sparrow—are here reported from the State for the first time, so far as the writer can discover. The published statements in regard to the others have been in such general terms as to give no very definite idea of the real manner of their occurrence.

Colymbus holboëlii. HOLBØLL'S GREBE.—This bird is found in limited numbers during the summer season in the west-central part of the State. It may, and doubtless does, occur in other portions of the prairie region of the State, but as yet no positive evidence of its presence has been obtained. Birds supposed to be of this species were seen in Elbow Lake, Grant Co., in June, 1879, by Mr. Franklin Benner and the writer, but no positive identification could be then made. Its eggs, taken in the vicinity, were seen at that time in the collection of Mr. Jasper N. Sanford of the town of Elbow Lake. Subsequently, in the fall of 1881, in response to numerous inquiries, Mr. Sanford kindly sent to me the skin of a male of this species together with several eggs taken early in the preceding summer near Elbow Lake. These specimens are now in my collection. This affords satisfactory assurance of the breeding of this Grebe in Minnesota.

Speotyto cunicularia hypogæa. BURROWING OWL.—On July 19, 1881, while passing through the southwestern part of Swift County, which lies in the western part of Minnesota, I came upon a small colony of these Owls living in fox or badger dens in a prairie hillside. There were apparently not more than two pairs of old birds with the young of the year. One of the young birds was shot, and the skin preserved. Many weeks spent in travelling through the prairie portions of the State failed to disclose the presence of this bird in any other locality.

Ammodramus henslowii. HENSLOW'S SPARROW.—A male bird in full song was taken by the writer on June 16, 1880, near Minneapolis, and the species was evidently breeding in the wet marsh where it was shot. In February, 1881, I was shown a specimen by Mr. W. W. Eager which he

had shot June 25, 1880, in Grant County in the west-central part of Minnesota. Mr. Eager regarded the bird as not uncommon in that locality, but Mr. Benner and myself failed to find it during two weeks collecting in the same County in 1879. Dr. Wm. L. Abbott includes this species without comment in a list of birds ('Forest and Stream,' Jan. 15, 1880) taken in July, 1879, at Pembina, N. D., which is in the Red River Valley close to the extreme northwestern corner of Minnesota.

Spizella pusilla. FIELD SPARROW.—Though long familiar with the characteristic song and habits of this bird through an acquaintance formed in the East, I have, in an experience of fifteen years in many parts of the State lying north of the latitude of Minneapolis, been enabled to detect it with certainty in only one locality—northern Ramsey County. Here I obtained the first specimen June 24, 1884. On visiting in June, 1889, the same locality, which is an extensive tract of uncultivated sandy country covered with a scattered growth of 'black' and bur oaks of small size, I found the birds fairly common, and shot six of the many heard and seen. Of these seven specimens, one, the bird taken June 24, 1884, is a large light-colored male which Dr. C. Hart Merriam, who kindly examined the series for me, states is nearer *arenacea* than *pusilla*. While the other six specimens are somewhat lighter in general coloration than are typical eastern *pusilla*, and in three or four instances show conspicuous gray feathers on the crown, still on the whole they are much nearer the eastern form. Dr. Merriam remarks upon the singular fact of the occurrence of these two forms in the same locality. The Field Sparrow is reported from Lanesboro, Fillmore County, in the southeastern part of the State, in the springs of 1884 and 1885 ('Report on Bird Migration in the Mississippi Valley in the years 1884 and 1885,' p. 202) and in a manuscript list of the birds of that locality, prepared by Dr. Hvoslef and temporarily in the hands of the writer through the courtesy of Dr. Merriam, it is noted as an "abundant summer resident." E. E. Thompson reports it as breeding in western Manitoba ('The Auk,' Vol. III, p. 324). There must be vast areas of intervening country where the species is sparingly distributed or does not occur at all.

Helminthophila pinus. BLUE-WINGED YELLOW WARBLER.—May 17, 1880, I shot a male bird at Minnehaha Falls near Minneapolis. The skin is now in my collection. This Warbler is undoubtedly rare here, and this is probably very near the limit of its northward migration. Dr. Hvoslef speaks of it as a rare migrant at Lanesboro, Fillmore Co., and records its occurrence in August. "Aug. 28, '87, shot 2."—Hvoslef.—THOS. L. ROBERTS, *Minneapolis, Minn.*

Note on Pacific Coast Birds.—I wish to call the attention of all ornithologists, to a circumstance that has never been sufficiently explained and may therefore cause misunderstanding in reference to my statement given in the 'Ornithology of California.' In 'The Auk' for Jan., 1890, I am quoted on p. 24 as saying that the eggs of *Pipilo fuscus mesoleucus* resemble those of *P. fuscus*. The facts are that I never saw the bird

mentioned alive, nor its eggs. I only collected in Arizona at Fort Mojave, about a mile from the California side of the River Colorado, and therefore considered the birds collected as without doubt belonging to the Californian avifauna. My MS. report was intended to relate only to birds belonging to California, as determined on good authority, though I included a few of the species found at Fort Mojave, which I had not actually obtained west of the river. But among them was *not* the *P. f. mesoleucus*, as I found none. In the preface to the 'Ornithology of California' it is stated that the plan was afterwards changed so as to include all land birds of the west slope of the United States, and Prof. Baird, who advised this, in editing the volume added all then known in the region, besides a few more, 'on a venture' or suspicion that they *might* at some future time be found there. His name was generally added, but not always, and thus I am quoted for what I did not write, and had no opportunity to prevent or correct (see Proc. Cal. Acad. Sc., VI., 189, 1875). As Prof. Baird had no eggs of the species mentioned he must have judged from those of *P. aberti*. Besides the 36 species which have "(Baird)" as authority at the end, all of which were then unknown as Californian, the following are included by him as editor, though for some unknown reason he did not add his name:

1. Harporhynchus cinereus, Lower California.
2. Campylorhynchus affinis, " "
3. Helminthophaga virginæ.
4. Dendræca chrysopareia.
5. Vireo atricapillus.
6. Vireo belli. Given by me in 1862 as found in California, for var. *pusillus*.
7. Vireo vicinior.
8. Pyranga hepatica.
9. Plectrophanes nivalis.
10. Passerculus guttatus, Lower California.
11. Ammodramus samuelis. Now known as a variety of *Melospiza fasciata*.
12. Peucaea cassini.
13. Calamospiza bicolor.
14. Cyanospiza versicolor Lower California.
15. Pyrrhuloxia sinuata " "
16. Cardinalis igneus " "
17. Pipilo mesoleucus.
18. Pipilo albicula. Lower California.
19. Cyanura macrolopha.
20. Contopus pertinax. Lower California.
21. Atthis heloisæ " "
22. Centurus aurifrons.
23. Melanerpes formicivorus angustifrons. Lower California.
24. Nyctea nivea.
25. Surnia ulula.

26. *Falco femoralis*.
 27. *Ectopistes migratoria*. Not found by me on western slope, except in Montana.
 28. *Melopelia leucoptera*.
 29. *Meleagris mexicana*.
 30. *Callipepla squamata*.
- Total 66.

Those from Lower California he supposed must soon be found north of the boundary, but so far but few have been obtained, chiefly in Arizona. As to the rest I ought not to be quoted for their occurrence either in California or anywhere on the Pacific slope, as my part of the work relates only to California birds.—J. G. COOPER, M. D., *Haywards, Cal.*

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

Recording the Numbers of Birds Observed.

TO THE EDITORS OF THE AUK:—

Dear Sirs:—In an interesting article in 'The Auk' a year ago Mr. Witmer Stone speaks of the difficulty of estimating the number of birds in a given locality, and declares it "wellnigh impossible." Although this difficulty is, perhaps, not so great as it seems, yet it has been so generally recognized that almost all field observers seem to have accepted the case as hopeless, and to have contented themselves with entering a bird in their note-books, as well as in published lists, as 'abundant,' 'rare,' or 'rather common,' words of such pleasing indefiniteness that they seldom mean the same thing to two different observers, or to the same person in regard to different species. The result is that we have but the vaguest idea of the relative abundance of different birds or of the fluctuations of any one species in different years or from day to day through its period of migration.

To take a complete census—except perhaps during the breeding season—may be out of the question, but there is no reason why an observer should not make his work exact as far as his opportunities and abilities permit,—*i. e.*, why he should not keep a record of the exact number of birds of each species met with each day. This of course would not represent the actual number present in any locality, for varying circumstances of length of time spent in the field, extent and nature of the country covered during the day, weather, etc., would considerably modify the results, but, by entering all these facts in the day's journal, and giving them due consideration in making subsequent comparisons of the figures obtained, results can be reached that, if not exact, are at least an approach toward it, and of vastly more value than the record of a vague

generalization based perhaps as much on some mere accident that has strongly impressed the imagination, as on any serious consideration of the facts observed.

This practice of keeping a careful count has been in use for the last few years among several ornithologists of my acquaintance, and it would seem worth while to urge its general adoption among field naturalists, if it were only to infuse a spirit of more scientific exactness into their field-work. Our way is to jot down in the field with pencil and paper—perhaps on the back of an old letter—every individual bird seen or heard. If birds are few, and one's memory good, it may be possible to do this all at the end of the day, but for most people, and in the height of the season, the best way is to stop every little while—in the inevitable pauses of waiting for some bird to show himself or to sing again—enter the species not already on the list, and mark against each name the number seen or heard since the last entry. Care must be taken to make due allowance for individuals already previously observed during the same day, in order not to unduly swell the record by entering them over again. At the end of each day the results can be transferred to the permanent record. To some the work may seem an irksome slavery, hopelessly interfering with their enjoyment of the beauties of nature. But with a very little practice they will be surprised to see how easy it becomes, and how much more thoroughly they observe when they have an increased incentive to identify every bird and count the number in each flock.

To illustrate the system, I give a brief extract from the notes taken near Cambridge last season by Mr. Jonathan Dwight, Jr., and myself.

May	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
<i>Ampelis cedrorum</i> . . .					2				3	4		11		10	7		2	4
<i>Vireo olivaceus</i> . . .		3		5	5	1	1		10	9		2		3	21	1	2	9
<i>V. gilvus</i>	10	9	2	12	8	2	1	2	15	14		4		8	10	1		6
<i>V. flavifrons</i>	1	2	1	4	1	1	1	1	2					1	1		2	4
<i>V. noveboracensis</i> . . .					2	1			1								1	
<i>Mniotilta varia</i>	4	10		6	6				5	2		1		1	3			
<i>Helminth. chrysoptera</i>	6			1											1		1	
<i>H. ruficapilla</i>	1				5				1	1				1			1	
<i>Compoth. americana</i> . .		3	1											1				
<i>Dendroica æstiva</i>	12	15	2	35	28	1	3	1	39	13	1	5	1	12	37	2	5	26
<i>D. cærulescens</i>		4																
<i>D. maculosa</i>	1	1																
<i>D. pensylvanica</i>	8	12		4	4				8	9		2		2	7			1
<i>D. striata</i>	2		1	1	2				4	1		2	2	4	5	1		
<i>D. virens</i>		7		1					1	3				1				2
<i>D. vigorsii</i>	1	1		1					1			2		1	1			1
<i>D. discolor</i>	1	8		10	5				5	3		2		1	4			1

As a matter of convenience we use for a permanent record pages on which the species likely to be met with are printed in systematic order down the left hand margin. These pages are ruled both horizontally and vertically, and the vertical columns headed with the days of the month, so that a space is given for the entry of each species under each day. This greatly facilitates the making of the original entry, and upon subsequent reference to it the history of the occurrence and abundance of any species during the period of observation may be read at a glance.

When it happens to be impossible to make an exact count—as is sometimes the case with a large flock of birds—the fact of the number recorded being only an estimate can be indicated by attaching to the figures any arbitrary sign to suit the fancy of the observer. Similarly, signs and abbreviations can be used to indicate that a species was in flocks, was apparently migrating, was singing, etc. As a rule, however, such facts can be more profitably treated at greater length in the note-book proper.

Hoping that others may be induced to follow this plan, and so with but little trouble greatly increase the scientific value of their field-work,

I am,

Respectfully yours,

C. F. BATCHELDER.

Cambridge, Mass.,

March 14, 1890.

NOTES AND NEWS.

DR. LADISLAS TACKZANOWSKI, an Honorary Member of the American Ornithologists' Union, died at Warsaw, Russia, on January 17, 1890, at the age of seventy years. For many years he was director of the Zoölogical Museum of Warsaw. His numerous important publications on the ornithology of Siberia, Northern Africa, and South America, made him one of the leading ornithologists of the world. His principal special work, his '*Ornithologie du Pérou*,' in three octavo volumes, was published in 1884-86, and forms a most useful handbook of the ornithology of the region treated.

SINCE the publication of the By-Laws of the American Ornithologists Union in 1887, the following Articles and Sections have been amended to read as follows:

Article I, Section 3. Associate Members shall be residents of North America, and shall not be limited in number.

Article II, Section 4. The Treasurer shall collect all dues from members, attend to all receipts and, after approval of bills by the President, make all disbursements, and shall have charge of the property of the Union, and make a report of the same to the Union at each Stated Meeting.

Article IV, Section 9. Every Honorary and Corresponding Member-elect shall notify the Secretary of his acceptance of membership within one year from the date of his election; in default of which notification, his name shall not be entered on the roll of members.

Article V, Section 2. The annual assessment for the ensuing year shall fall due on the first day of each Stated Meeting.

Article V, Section 3. No Active Member in arrears for dues shall be entitled to vote or take part in the business of any meeting.

Article V, Section 4. The name of any member one year in arrears for dues shall be removed from the roll of membership, provided that two notices of indebtedness shall have been given him by the Treasurer, at intervals of three months; and no such person shall be restored to membership until all arrearages have been paid, or the person has been re-elected.

MR. JONATHAN DWIGHT, JR., proposes to make a critical study of the entire group of Juncos, and solicits for this purpose the loan of material from those having specimens in their collections. It is especially desirable to secure large series of specimens of all of the different forms taken in the breeding season. As the material is not desired for use before next November, it is hoped, in the interest of science, that collectors will give special attention to this group during the coming season and be willing to promptly transmit their material to Mr. Dwight early in the autumn. The specimens should be sent to Mr. Dwight, care J. A. Allen, American Museum of Natural History, 77th St. and 8th Ave., New York, N. Y. They will be returned to the owners with reasonable promptness on the completion of the proposed investigation.

IN ORDER TO make the 'Minor Ornithological Publications' as complete as possible, the Associate Editor earnestly begs the readers of 'The Auk' to send him copies of newspapers, or other publications of but local circulation, in which they may happen to notice any ornithological articles or items of scientific value. Such assistance will add greatly to the thoroughness, and hence the usefulness, of these records.

He also especially desires to obtain, for use in this same connection, Nos. 1, 3, 4, 9, 10, 11, of 'The Young Ornithologist' (published by Arthur A. Child at Boston in 1885-86), and Nos. 1 and 6 of Vol. I; also any numbers later than No. 1 of Vol. II, of 'The Florida Naturalist' published at St. Augustine in 1884-85 (the name changed in the second volume to 'The Naturalist'), and will be greatly obliged to any one who can inform him where copies of these issues can be purchased.

SOME READERS may be glad to know that record sheets such as are described by Mr. Batchelder in this number of 'The Auk' (antea p. 218), can be obtained at a small price from Mr. F. B. Webster, 409 Washington St., Boston. Each set is arranged for 200 species, and will hold a month's observations. They can be had printed with a selected list of 174 of the land birds that are most likely to come under observation in the region from Virginia to the St. Lawrence, east of the Mississippi, the rest of the space being left blank for insertion of any other species that may be noted. If preferred—as might be the case if used beyond these limits—they can be obtained with the spaces for the names of the species left blank, to be filled by the observer to suit the fauna of his own region.

A FOURTH EDITION of Dr. Coues's 'Key to North American Birds,' will be brought out immediately by Messrs. Estes and Lauriat of Boston. It will be printed from the same plates as the third, of 1887, and so will be identical in the main body of the text; but will contain an additional 'Second Appendix,' in which will be noted all changes which the A. O. U. Committee on Nomenclature have acted upon in the Committee's 'Supplements' of 1889 and 1890, thus bringing the subject down to date. A short second preface will appear with this edition.

THE 'ORNITHOLOGISCHES JAHRBUCH: Organ für das palæarktische Faunengebiet,' is a new ornithological journal, devoted especially, as its name implies, to Palæarctic ornithology, edited by Victor Ritter von Tschusi zu Schmidhoffen, President of the Committee for Ornithological Observation Stations in Austria-Hungary, and published at Hallein. It is a 24-page, large octavo monthly, the first number bearing date January, 1890. It is intended later to increase the number of pages and add illustrations. It is intended to fill the long-felt need of a special medium of publication for the now widely scattered material relating to the Palæarctic ornithology. The first two numbers are devoted to records of rare captures in various parts of northern Europe.

THE OBSERVER, published monthly, by E. F. Bigelow, at No. 5 Waverly Avenue, Portland, Conn., is an eight-page newspaper, devoted to natural history and popular science, with a department of 'Ornithology' under the editorship of Mr. John H. Sage, containing original and selected articles. The first number is dated January, 1890. 'The Observer' is well edited and attractively printed, and as a popular journal of natural history well deserves many readers.

MR. W. E. D. SCOTT, with an ornithological assistant, has started on an exploring trip to the Dry Tortugas, Key West, and the whole chain of keys up to Key Biscayne. The trip will occupy several months. Some account of it may be expected in the July issue of 'The Auk.'

WILL the person who, in January last, sent a section of a spruce tree with excavation of the Pileated Woodpecker, to R. Ridgway, Smithsonian Institution, please send him his address?

THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. VII.

JULY, 1890.

No. 3.

AN ACCOUNT OF FLAMINGOES (*PHÆNICOP-
TERUS RUBER*) OBSERVED IN THE
VICINITY OF CAPE SABLE, FLORIDA.

BY W. E. D. SCOTT.

IT WAS my good fortune, during February of the present year, to have an opportunity of observing for several days the only large flock of Flamingoes that still frequents the shores of the extreme southern portion of Florida. Here, owing to the environment, these birds have remained comparatively undisturbed, the region being very inaccessible, because of the absence of fresh water and the great expanses of very shoal salt water, that can only be navigated by the lightest draught skiffs on favorable tides; hence very few hunters, and only those who have declared the war of extermination on the Snowy Heron (*Ardea candidissima*) and the White Egret (*A. egretta*), ever visit the locality in question. The 'plume hunter' is in greater numbers and more active than ever in South Florida, and there are absolutely *no Heron rookeries* on the salt water bayous or on the outlying keys of the Gulf coast of Florida, from Anclote Keys to Cape Sable. I have recently spent some three weeks in carefully examining this coast, making in my small schooner from twenty-five to sixty miles a day, and the only rookeries that I saw were two on keys in Charlotte Harbor and three to the south of that

point, five in all. These rookeries were inhabited by comparatively small numbers of Brown Pelicans, Florida Cormorants, and White Ibises,—nothing else.

Eighteen miles east of Cape Sable are three bays making into the mainland. The water in these bays and for miles outside of them is extremely shallow, being rarely more than eighteen inches in depth, while the average depth on ordinary tides probably does not exceed six inches. The bottom is soft and muddy, and the mud is very deep, making wading, for a man, impossible. The shores are wooded with black mangrove, 'button wood,' and some cabbage palmettoes, and there is much undergrowth of smaller shrubs. The land is so low as to be flooded at any extra high tide. The country is necessarily very damp, and is the home of the mosquito in all its varieties. Even in February, when I visited the region, though a stiff easterly breeze was blowing all the time, going ashore was something to be dreaded, and once on the land the conditions were wellnigh unbearable. It was a most desolate and forbidding region either on sea, if sea it may be called, or on the land.

I had heard much of this flock of Flamingoes, and taking a supply of fresh water, enough to last for a week, the schooner, or more properly 'sharpie,' was turned in the direction of the locality I had been led to believe the birds frequented. After rounding Cape Sable we were able to cruise in the sharpie, which only draws about eighteen inches of water, to a point some seven or eight miles east of the Cape and about two miles from the mainland. Here all semblance of a navigable channel ceased, and here I was obliged to make my headquarters. In the vicinity were a few scattered keys wooded with mangrove, all of them affording breeding places and homes for *Ardea occidentalis*. This beautiful and conspicuous species was not at all uncommon, but seemed there to be of a solitary disposition, in no way resembling its allies, all of which seem more or less gregarious, especially in the breeding season. An examination of the keys rarely showed the existence of more than two nests on an island, and the birds were so wary as to be almost impossible to approach, even when nesting. The breeding season, I should say, was fairly begun, if not at its height, and in one nest I found two downy young, one of which was apparently a day or two old, and the other just hatched from the egg and not yet dry. There

were also in this nest two unhatched eggs that contained large embryos. So it seems probable that incubation begins with the laying of the first egg, and is continuous till all are hatched. Of other birds there were few on these keys; but Brown Pelicans and Cormorants were frequent, and among the smaller land birds *Thryothorus ludovicianus miamensis* and *Geothlypis trichas ignota* were quite common, and a few representatives of each of the following species were observed at different times during my stay here: *Dendroica blackburnia*, *Dendroica virens*, *Dendroica palmarum*, *Dendroica palmarum hypochrysea*, *Dendroica coronata*, *Galeoscoptes carolinensis*, *Seiurus aurocapillus*, *Seiurus noveboracensis*, *Melanerpes carolinus*, *Colaptes auratus*, *Falco sparverius*, *Ceryle alcyon*, *Cathartes aura*, *Haliaeetus leucocephalus*, *Corvus ossifragus*.

To return to the Flamingoes. It was some nine or ten miles from our anchorage to the mouth of the first of the three bays I have mentioned,—a long way to go in a skiff. But both of our boats were soon manned and we began the details of the exploration. Rounding the point opening the first or more westerly of the bays, we found that it was about a mile and a half in width and some three miles deep into the land, with a decided bend to the west. No birds were to be seen till this bend was in turn opened, and there, still a mile or more away, was presented a truly wonderful sight. Stretched out for fully three quarters of a mile, and about three hundred yards from the mainland shore, was a band of rosy, fire-like color. This band was unbroken, and seemed to be very even, though curving with the contour of the shore. Now and again a flame or series of flames seemed to shoot up above the level of the line. This proved when examined through the glass to be caused by one or more birds raising their heads to look about or to rest themselves, for when first noticed all were feeding, with their heads most of the time buried in the shallow water, searching the mud for the small shell fish which appear to be the favorite food at this point.

Presently some of the birds saw the boats, and the alarm was given. Slowly the line began to contract toward the centre, and the birds were soon in a compact body, appearing now like a large field of red upon the water, and the resemblance to flames was much increased by the constant movements of the heads and necks of the different individuals. In a few moments they began

to rise and soon they were all in full flight, passing out of the bay and over the point of land to the east in long lines and in V-shaped parties, recalling to mind the flight of Wild Geese. If the color on the water was novel, that of the flock while in the air was truly surprising, a cloud of flame-colored pink, like the hues of a brilliant sunset. As far as we could descry the birds, the color was the great conspicuous feature. Looked at through the glass, while in flight, the individuals composing the flock were seen to be mostly adults. I saw only a small division of the lighter colored immature birds. These seemed to have their own particular position in the flock, and on this and subsequent occasions, when seen, these younger individuals were always alone. As nearly as could be estimated there were at least one thousand birds in this flock, and of these all but about fifty appeared to be adults.

After the flock had disappeared and had seemingly settled in the second of the bays, we allowed an hour or more to elapse before trying to approach them again. Then I took a stand on the end of the point that separated the first two bays, hoping to get a nearer look at the flock, should they return, when disturbed, to their first feeding place. One of my aids was also posted at what appeared to be another point of crossing for the birds, and the boat started toward the point where we believed the flock to have alighted. This time it was getting late in the afternoon, the birds were much tamer, and Mr. Henry W. Cook, who went after them in the boat, said that they were very loth to leave, and that the flock alighted twice after taking wing, before they finally flew, and this time again to the eastward and presumably into the third of the bays alluded to. Even then a considerable contingent, a hundred or more, did not forsake the second bay, but alighted in very shoal water where it was not possible to approach in the boat. So we left them after the first day, not having fired a shot, but having had a very good look at them, and having gained some idea of their habits when feeding and when alarmed.

The next morning on reaching the first bay, as soon as I was sure that the large flock was again feeding, the boats were concealed in the bushes, and for three hours I watched the flock with the glass, first having crawled along the shore as near as I could without creating alarm, so that I had a very good opportunity of watching them.

While feeding they were stretched out in the long line already described, sometimes in a single, but quite as often in a double rank. This line varied in length at different times, sometimes being fully a mile long and again contracting to some six hundred feet. When most stretched out it was broken in places, an interval of a hundred feet being the largest open space observed.

All the time the birds were feeding there were three small parties, varying from two to five individuals, that were apparently doing a sort of picket duty. At each end of the line and about one hundred yards from it was posted one of these parties, and off shore and at the centre of the line and some hundred yards away the third party was stationed. About every half hour the individuals composing these picket squads would take wing, fly to the flock in line and alight, and presently, that is in less than a minute, another or part of the same picket squad would leave the flock and fly to the point left but a few minutes before. I am not sure that the entire squad was changed at such times, but the pickets taking the place that had been left only a few minutes before were generally one or two more or less in number than the party they apparently relieved. I never saw more than five individuals in a party, and now and then there was only a single sentinel, but generally from three to five. The birds at these outposts did not appear to be feeding, but were apparently guarding against any attempt to surprise the main body.

After watching them for rather more than three hours, I again posted two men at points which I thought would give them opportunities to secure some of the birds, and taking one of the boats to windward with Capt. Cook to paddle, I attempted to drift down on to the flock. As we approached, the pickets flew and joined the line which gradually contracted into a solid body. Looking through the glass I saw they were all facing us. Presently they flew as we came within five hundred feet of them. But they seemed very loth to leave their feeding ground, and soon all of them alighted again. This was repeated three times, when the flock seemed to lose its organization somewhat and became broken into smaller parties. One of these parties, composed of five adult birds, came within very long buckshot range, and I was so fortunate as to wound and finally secure a single one. The whole flock left as soon as I fired, and we did not find it again that day. The bird secured was in full, unworn,

adult plumage, and proved on dissection to be a female, and from the condition of the ovaries laying would have begun, I think, in from four to five weeks.

The next day two more adult female birds were secured by members of the party, but though we tried afterward, and always saw the birds, they had become so wary that our efforts were futile. The ovaries of these two females were in about the same condition as in the one already described.

From information gathered from a man who has known of this flock of birds for several years, I am led to believe that they breed somewhere in this vicinity. He tells me that from July to January Flamingoes are to be found on the outlying islands and reefs of Barnes Sound and Biscayne Bay, but that in January they begin to congregate at the point I have indicated, where there are always at least a hundred of the birds the year round. From these facts and the approach to the breeding season indicated by the females we obtained, it seems altogether probable that this large flock of Flamingoes breeds at some point not far from where I found it.

My thanks are due to Capt. Cook and to Mr. W. E. Treat of my party for aid in securing and observing these remarkable birds.

CAPE COD BIRD NOTES.

BY G. S. MILLER, JR.

THE FOLLOWING notes were made during the years 1888 and 1889 in the vicinity of Highland Light, North Truro, Mass.

At this point Cape Cod is but little more than two miles wide. On the ocean side banks of clay and sand rise to a height of about one hundred and fifty feet above the water. From here the land slopes gradually westward, the general level broken only by an occasional valley or 'sink hole,' to the Bay where the sand 'cliffs,' as the natives call them, although much less high and commanding than those on the ocean side, are nevertheless quite

abrupt. The soil is almost entirely sandy, supporting a scant vegetation among which such species as *Ammophila arundinacea*, *Andropogon virginicus*, *Arctostephalos uva-ursi*, *Corema conradii* and *Hudsonia erecoides* are noticeable. The only abundant trees are the scrub oaks and pines. The former seldom attain a greater height than ten feet; while the pines are but little taller, excepting where, as in some deep 'sink hole' or valley, they are sheltered from the force of the wind. Here they sometimes grow to a height of nearly thirty feet. These pines for the most part have been planted within the past twenty years, and seem to have about completed their growth, as most of the larger ones already show signs of decay. The 'sink holes' form a characteristic feature of the place. They occur in great abundance, varying from slight depressions in the ground to deep, irregularly circular basins several acres in extent and probably seventy-five to one hundred feet deep. At the bottom of them there is apt to be a richer soil than that of the surrounding country, and it is also very common to find a pool of water.

Most of the captures here recorded were made near the little group of farmhouses known as the 'High Land' settlement, which stands about half a mile back from the ocean, and almost due west of Highland Light.

Xema sabinii.—I secured a fine adult female of this species in fresh autumnal plumage on August 21, 1889. The bird was shot from a fishing boat about three miles west of North Truro, in Cape Cod Bay. When first seen it was feeding among a flock of *Larus* and *Stercorarius* upon the dog-fish livers which had been thrown overboard to attract the sea-birds.

The only other Massachusetts records of this species are, so far as I am aware, a young bird taken in Boston Harbor on September 27, 1874 (see "Brewster, Am. Sportsman, V, 1875, 370," Allen, Bull. N. O. C., III, 1878, 195, which see also for other New England records) and another specimen killed on "Cape Cod" during 1888 (Ornithologist and Oölogist, XIV, June, 1889, p. 95).

Ereunetes occidentalis.—Although I searched carefully for this species during the autumn of 1888 and summer of 1889, I failed to detect it until September 2, 1889, when I obtained a fine adult male from a gunner who had killed the bird on the beach, about two miles north of Highland Light, on the ocean side of the Cape. This is the only specimen that I have met with on Cape Cod, and the species must be rare, or at least irregular, at North Truro, as I have examined large numbers of *Ereunetes* in search of the western bird.

Sayornis saya.—On September 30, 1889, I killed an adult male of this western species, near one of the High Land farmhouses. It was after sunset when the bird was first seen, and several times during the rather long chase that he gave me I nearly lost him in the darkness. Late though it was, he was busily engaged in catching insects, which he invariably did by flying directly upward. The only way in which I can explain this peculiar action is by supposing that in the fast failing light, insects were most easily seen when outlined against the sky. His flight, and in fact all of his motions, seemed strong and active, and did not in the least suggest fatigue. So far as I could tell he was perfectly silent; but as there was a high south wind blowing at the time, some slight note might easily have passed unnoticed. Upon dissection the bird proved to be in good condition, fat, and apparently uninjured in any way, excepting that the right scapula had, at some previous time, been fractured near its distal end. This injury was, however, so perfectly recovered from, that it could have caused the bird no inconvenience whatever. The testes were as well, if not better, developed than is usual in autumnal birds. The stomach was well filled, chiefly with *Diptera*, but the heads of a few ants were noticed among the other contents.

It is unnecessary to say that this is the first record of the capture of this species in New England.

Loxia curvirostra minor.—On April 24, 1889, while hunting in a deep sink hole known locally as Hell's Bottom, about a mile and a half north of Highland Light, in the midst of a tract of pines covering about one hundred acres, I secured four specimens of this species. Two days later another was taken at the same place. Besides the specimens taken, perhaps half a dozen others were seen. The birds were all found among the pines which in this sheltering 'sink hole' had attained a height of from twenty to thirty feet. For Crossbills they seemed remarkably quiet, and showed none of that restlessness which generally seems so characteristic of these birds. They were quietly flying about among the pines and now and then alighting by the pool at the bottom of the sink hole to drink and bathe. They all seemed to be perfectly silent.

Of the five taken three were females, and upon dissection all showed unmistakable evidence that they were breeding. The testes of the two males were much enlarged. Of the females, the one taken on April 26 had just deposited her set of eggs. The oviduct of this specimen showed that it had very recently been active; while in the ovary were three ruptured capsules. Of the two females taken on April 24, one had several much enlarged ova in the ovary, and in the oviduct an egg upon which the shell had not yet begun to form; while the ovary of the other contained several much enlarged ova.

Unfortunately, after skinning the birds, I was unable to visit Hell's Bottom again in search of nests; but there is little room for doubt that the birds were breeding very near to the place where they were found.

Spiza americana.—A single immature male shot from a mixed flock of small Sparrows feeding in an asparagus bed, on September 30, 1889, is my only Cape Cod record of this species.

Thoreau in speaking of this part of the Cape ('Cape Cod,' p. 120) says: "Of birds not found in the interior of the State—at least in my neighborhood—I heard, in Summer, the Black-throated Bunting (*Fringilla Americana*) amid the shrubbery." This was in 1855 (l. c., p. 1) and it is very possible that the bird was more common there then than now. If the species breeds at all near Highland Light at present, it must be a very rare occurrence, as I utterly failed to detect it during the breeding season, although, having read Thoreau's note, I was constantly on the lookout for it.

Dendroica palmarum.—Two specimens taken on September 23, 1889, and another on the 24th of the same month, are the only specimens of the Western form of the Palm Warbler that I have met with at Highland Light. *Dendroica palmarum hypochrysea* was quite common from October 2 to 12 in 1888, and in 1889 arrived on October 6 and remained fairly common until the time of my departure from High Land on October 15. These individuals of *palmarum* were much less shy than the average *hypochrysea*, but otherwise I noticed nothing peculiar in their habits.

Polioptila cærulea.—An adult female was secured on October 9, 1889. The bird was feeding among some small pines not over four feet high, in company with a small flock of *Dendroica coronata*, *Sitta canadensis* and *Spinus tristis*, and is the only one that I have met with on Cape Cod.

ADDITIONAL NOTES ON THE BIRDS OF ONEIDA COUNTY, NEW YORK.

BY WILLIAM L. RALPH AND EGBERT BAGG.

SINCE the publication of our local list* in 1886, we have devoted a much larger portion of our attention to the western part of the County, the eastern end of Oneida Lake. We have also had during the past four years the benefit of the observations of Mr. W. P. Shepard of Utica and Mr. R. J. Hughes of Remsen, both students at Hamilton College at Clinton. The results of the time since 1886 will be found in the following notes.

*Transactions of the Oneida Historical Society, Vol. III, 1886, pp. 101-147.

Of new records we have the following:

Urinator lumme.—A young bird of this species was killed at Clinton, in October, 1889, by a young man of that place, who has had it mounted and preserved.

Crymophilus fulicarius.—A young bird, probably a female, was killed at Sylvan Beach on the east end of Oneida Lake, Oct. 4, 1889, by Messrs. Shepard and Hughes.

Icterus spurius.—A male of the third year was seen near Bear Pond, Herkimer Co., May 15, 1887. Unfortunately, as it was on Sunday and no gun was at hand, the bird was not secured, but there is no doubt of the identification, as he was watched for some time, both with a field glass and with the naked eye, and every mark was plainly seen.

Coccothraustes vespertina.—The unusual migration of this species during the past winter, brought a record to us as it did to many other localities in the State. On Feb. 9, 1890, Mr. James R. Benton of Clinton, N. Y., saw a flock of four singing on a tree before his house, and had the good fortune to secure three of them, a male and two females, all of which have been preserved.

Seiurus motacilla.—In a little ravine in the town of Kirkland we secured our first specimen May 9, 1887, and in the same ravine it has been found by Mr. Shepard in May, 1888, and 1889, and it undoubtedly breeds there, though no nest has been found.

These five additions, together with *Tringa bairdii*, recorded by Mr. Henshaw in 'The Auk,' Vol. II, p. 384, from Locust Grove, N. Y., but overlooked in making the List, raise the total number of recorded species for Oneida Co., and its immediate vicinity to 230.

The following are some observations upon species given in the List, which seem to us worth a record.

Olor columbianus.—A fine specimen of this bird was killed on the river flats in the town of Deerfield, March 13, 1890, and is now in the collection of W. L. Ralph. This bird was given in the List on the authority of De Kay, with the further statement that several Swans, undoubtedly of this species, had been killed on Oneida Lake. This is, therefore, the first positive record for the County.

Ardea egretta.—A specimen killed in Marcy, about Nov. 10, 1889, was mounted by Messrs. J. P. and F. J. Davis, taxidermists, of this city. This is our third record.

Phalaropus lobatus.—A specimen killed at Sylvan Beach, east end of Oneida Lake, Sept. 21, 1889, is our second record.

Tringa minutilla.—One taken at Sylvan Beach, Oneida Lake, Sept. 18, 1888.

Charadrius squatarola.—A specimen was taken at Sylvan Beach, Oct. 8, 1888. Another was taken at the same place Sept. 24, 1889. These are the first records for the County, though the species was given in the List as taken on the Lake by Mr. A. A. Howlett of Syracuse.

Zenaidura macroura.—We find the species rather common on the pine barrens at the east end of Oneida Lake, undoubtedly breeding, though we

have failed to find a nest. A female killed April 13, 1889, contained a fully formed egg. A single bird was also observed at Utica, May 7, 1889. This species was given in the List on the strength of a single specimen taken in Herkimer Co., and its occurrence in such numbers as we have found it, was a great surprise.

Accipiter velox.—Two nests were taken near Holland Patent, May 18, 1887, and June 7, 1887.

Accipiter atricapillus.—A specimen was taken at Remsen in January, 1888, a second somewhat later in the same winter, a third at Trenton Falls during the next summer, and a fourth at Remsen in October of the same year. The first and last are in the collection of Mr. Hughes. We had but one previous record.

Falco columbarius.—A specimen was taken at Sylvan Beach, Sept. 12, 1889, by Messrs. Shepard and James R. Benton.

Syrnium nebulosum.—Breeds. A nest containing two eggs was taken at Holland Patent April 18, 1889.

Nyctala acadica.—Our fifth nest of this species was taken near Holland Patent April 30, 1889, from a hollow 65 feet from the ground in the dead limb of a living tree. The clutch (which was probably not completed) consisted of four fresh eggs.

Melanerpes erythrocephalus.—Messrs. Shepard and Hughes found these birds at Remsen, Dec. 20 to 22, 1888.

Antrostomus vociferus.—This species is common along the shore of Oneida Lake in June. Undoubtedly breeding, though we have not found it. It was given in the List on the strength of a single specimen taken in Herkimer Co.

Spinus tristis.—Messrs. Shepard and Hughes found these birds at Remsen, Dec. 20 to 22, 1888.

Spinus pinus.—Messrs. Shepard and Hughes found these birds in large numbers near Remsen April 4 to 9, 1889, apparently mated and preparing to nest, but a careful search a week or two later failed to find them.

Pipilo erythrophthalmus.—A fine male killed in New Hartford, May 12, 1889, is our second record.

Vireo solitarius.—Mr. Shepard states that this bird is a summer resident about Joc's Lake, in Herkimer Co., where he found a nest containing young July 25, 1888.

Dendroica cærulescens.—Our fifth nest of this species was found June 22, 1888. It contained two addled eggs, one young Warbler, and two young Cow Birds able to fly.

Dendroica blackburniæ.—Breeds. Mr. Hughes found a nest containing young in July, 1887, near Remsen. July 16, 1888, we took a nest about four miles north of Holland Patent, which contained four eggs on the point of hatching. The nest was well concealed in a bunch of small branches, about fifteen feet above the ground, in a spruce tree. It was composed of hemlock and spruce twigs outside, then pine needles and dry grass, and lined with horsehair. The eggs (which we were unable to save, they were so near hatching), were large for the size of the bird, and darker colored than is usual with Warblers' eggs.

***Dendroica vigorsii*.**—June 11, 1889, at Sylvan Beach, we saw at least two pairs building in high pines. We watched them, with a glass and the naked eye, collecting spiders' nests from under the veranda of a cottage and carrying these and other materials into two places in the pines. A day or so afterwards a gang of men moved a neighboring cottage a few feet, cutting two trees near those in which the birds were building, and the birds disappeared. About two weeks later a single bird was seen at the same place. This species was given in the List on the strength of the single specimen given by Dr. Merriam, in his 'Preliminary List of the Birds of the Adirondack Region,' as taken at Lyon's Falls. It must now be given as a rare summer resident, breeding.

***Dendroica palmarum*.**—Given in the List on the authority of Dr. Merriam. Mr. Shepard has taken three specimens, two near Clinton, May 3 and 9, 1888, and one at Sylvan Beach, Oct. 5, 1889.

***Troglodytes ædon*.**—Perhaps the strangest observation we have to record is the entire disappearance of this species which was ten or fifteen years ago one of our most abundant species, nesting in dozens of bird houses in the city and in every empty shed and wooden bridge in the country. In the List it is given as "a summer resident, not nearly so common as formerly, breeds." Since that was written four years have passed during which, of the four workers whose observations are here recorded, only one has seen a single specimen of this bird. Since 1887 not a single one has been observed. We are unable even to suggest an explanation of this mystery.

***Troglodytes hiemalis*.**—We have taken two more nests of this species, June 28 and 29, 1887, at Holland Patent and Trenton Falls. They were placed and constructed almost exactly as the one described in the List, and contained four and six fresh eggs respectively.

***Certhia familiaris americana*.**—Since the nest described in the List, we have taken three more, all near Holland Patent, and each placed under a loose piece of bark beside the trunk of a dead tree. The first was taken June 15, 1888, and contained four young birds ready to fly and two addled eggs. The second was taken June 21, 1888, and contained five nearly fresh eggs. The third, taken June 30, 1888, contained six fresh eggs.

***Sitta canadensis*.**—A common migrant; summer resident in the northern part of the County. Breeds. A second nest, taken May 30, 1887, in Wilmurt, Herkimer Co., contained six fresh eggs.

***Parus hudsonicus*.**—A specimen was killed by Mr. Hughes at Remsen, Dec. 25, 1886. This species was given in the List on the authority of Dr. Merriam.

***Regulus satrapa*.**—Given in the List as "a common migrant." To this must be added:—An occasional resident, both winter and summer; breeds.—A specimen was taken by Messrs. Hughes and Shepard at the same time and place as the preceding, and they also report that they have found them other winters. During the latter part of June, 1888, near Holland Patent we observed a pair of these birds followed by seven or eight young which they were feeding.

NOTES ON THE NESTING HABITS OF SEVERAL
BIRDS AT SAN JOSÉ, COSTA RICA.

BY GEORGE K. CHERIE.

Todirostrum cinereum (LINN.).

AT SAN JOSÉ I first met with this active and curious little Fly-catcher early in April, 1889, when I secured two fine specimens, after having watched them as they searched diligently among the leaves and smaller branches for their insect food, all the time uttering a sharp, jerky, and to me unmusical, note. Arriving at the end of the branch they would pause for a moment, and then perhaps dart off, taking their prey on the wing. Flying from tree to tree, they kept close by the river, and indeed thus far in my observations I have not seen one go twenty feet from its bank.

On April 26 I found the first nest, evidently just completed. But, unfortunately, before I could prevent it, the boy who was with me had torn it down. At that time I was ignorant who the owner might be, and not a little vexed at the proprietors for not claiming their property. The peculiar construction and location interested me—hanging at the extreme end of a long, delicate, leafless branch that swung out over the river about five feet above the water, apparently a handful of dried grass that had been entangled there during high water. On closer examination it is seen to be constructed of very fine plant fibers and dried grass, the whole neatly covered with the downy plumed seeds of some plant. In shape it can best be described by supposing the two poles of a hollow sphere to be drawn in opposite directions until we have a figure something like two cones base to base. The hollow of the nest is exactly in the centre. The entrance is on one side and from below, formed by a covered passage, so that looking from above or at the sides no means of entrance can be seen.

From April 26 until May 12 I occasionally saw one or two birds busily hunting after insects in the low trees along the river bank. On the latter date I found a second nest, apparently completed on the outside. I saw the bird with a mouthful of soft material fly to the shrub in which the nest was situated; but, see-

ing me, the material was immediately dropped and a vigilant search for insects commenced. Not wishing to intrude any farther at that time, I took my departure, and returned on the 17th for the nest. I found it completed and containing one egg. Unfortunately, after cutting the branch which held the nest, my footing slipped, and in the endeavor to avoid falling the egg was thrown out and broken. The half shell that I brought away is pure white. The nest was situated about eight feet above the water at the extreme end of the long, overhanging branch of a rose bush, with no green leaves within three feet of it, and not concealed in any way save by its resemblance to a bit of drift grass. From the point on the branch at the apex of the upper cone to the extreme lowest point is fifteen inches. The diameter at the centre is two and a half by three and a half inches, the greater diameter being caused by the entrance passage which is round and one inch in diameter. In taking this nest I was severely bitten and stung by the vicious little black ants that had the hollow stem of the rose for a nest. Mr. Anastasio Alfaro informs me that he has noted nests in the vicinity of Alajuela protected in the same manner. During the time I was taking the nest I did not see or hear anything of the owners. On going away I saw the female quietly hopping about in search of insects in a tree near by, seemingly taking no concern in what I was doing. A short distance down the river the male was to be seen darting here and there, a noisy and most pugnacious little fellow.

I saw no more of the birds until May 26, when I found a nest just completed, but not containing eggs. I visited the spot again on the 30th of the month and secured the nest and two fresh eggs. As with the others the nest hung at the extreme end of a small, delicate branch about four feet above the water and was not concealed in any way by leaves or by surrounding branches. It measures as follows: extreme length, fourteen inches; diameter at centre, three and a half by two and a half inches; entrance, one inch. The two eggs measure each .62 X .45 inch. One is a pure, delicate white; the other has a few very pale, scarcely visible ochrous buff spots about the larger end. While I was taking the nest the bird was nowhere to be seen, and not a sound came from her. But on going away I noticed her acting precisely as in the case before described. It seems to me probable that the three nests were built by the same birds. After my taking this last nest

the birds seem to have deserted the locality. I saw no more of the species until July 12, when I took a fine male, but a very quiet, different bird from the pugnacious, restless, noisy fellow of six weeks before.

***Myiozetetes texensis* (GIRAUD).**

I have been able to make but very few notes on the habits of Giraud's Flycatcher, as the bird cannot be said to be common in the vicinity of San José, yet, as I believe the eggs are unknown, I will give a description of a nest and three eggs which I took on May 1, 1889. The nest was found on April 26. It would never have been observed had not the bird manifested great concern, flying repeatedly back and forth to the nest while I remained watching. As at that time it did not appear completed, I did not tarry long, but returned on May 1 for the prize.

The nest was situated near the end of a slender branch growing out over the water from a small shrub on the river bank. As there were no leaves, it was in plain view from any quarter, yet from its bulky, ragged appearance it would hardly have drawn attention as being more than a handful of dry grass and weed stems. It was about six feet above the water. Placed at the fork of the branch, it neither rests on the forks nor can it properly be said to hang between them. It is a hollow sphere, divided and supported at the middle by the horizontal branches of the fork. The entrance, in the upper half, is arched over forming a dormer-window-like doorway; it measures two and three quarters inches wide by two deep. The nest proper measures seven inches vertically by six horizontally.

The eggs, three in number, perfectly fresh, are white speckled with walnut and seal brown, very thickly at the larger end. They measure $.86 \times .65$, $.90 \times .67$ and $.90 \times .68$ inch.

***Elænea pagana* SCL.**

Within six feet of the nest of *Myiozetetes texensis*, just described, was a nest of *Elænea pagana*. The two birds were evidently living on the best of terms. The nest, a beautifully delicate, lichen-covered affair very closely resembling the nest of *Contopus*

virens, was about four feet above the water in the thick bushes on the river bank, and was completely concealed by leaves. It rested on a small horizontal branch, and was held in place by three ascending twigs. It is rather small and compact, covered on the outside with gray lichens and some few spider-webs, the latter binding the lichens. A green leaf is bound to the upper edge on one side. The inside is carefully lined with soft feathers. Inside its diameter is two inches (in the direction of the branch) by one and three quarters, by one inch deep. Outside it is three and three eighths by three and one eighth, by two inches deep. The eggs, two in number, were slightly incubated. They are cream white, speckled, chiefly about the larger end, with spots varying in color from a dark chestnut or livid brown to orange rufous. The eggs measure $.82 \times .64$ and $.82 \times .62$ inch. While I was engaged in taking the nest the parent bird flew restlessly from branch to branch of the trees near by. When resting she sat bolt upright with crest erected, calling out her discontent in short, sharp, quickly repeated chirps. She seemed much more annoyed than the *M. texensis*. I did not see the male at all. This was the first nest I found.

On the 5th of the month I found another nest about two thirds completed. Almost all the outside was covered with lichen, but it had not yet any lining. The birds were quite solicitous while I was there. It was but nine feet from the ground, situated at the horizontal forks of a very small limb and not in any way concealed, save by its lichen-covered sides resembling a part of the limb. On May 12 I found the nest completed and containing two young birds at least a day and a half old.

On June 2 I found a third nest, containing two fresh eggs, in a small tree close by the river bank. It was situated about ten feet from the ground, far out on a limb at a point where it divided into four ascending shoots which gave excellent support. It was well shaded by leaves from above, and owing to its covering of lichens was not conspicuous from below. The nest is compact and well built, and is almost round. It is lined with half a dozen feathers, a few long horse-hairs, and several pieces of lichen. The rim is slightly contracted. Outside it measures three and a quarter inches in diameter by one and a half in depth. Inside its diameter is two and a quarter inches, its depth one inch. The two

eggs measure respectively $.87 \times .62$, and $.90 \times .63$ inch. They are creamy-white, thickly speckled, chiefly about the larger end, with irregular spots varying in color from liver brown to orange rufous. On finding the nest I waited a few minutes. The female flew quickly to a tree near by, but gave no note to indicate her presence.

On this same date I took the first fully fledged young. It differed from the adult only in the absence of the concealed crown patch and in much softer plumage.

I took a fourth nest June 11. It was placed about twelve feet from the ground in the upright forks of a small tree that stood alone in a large field. It is a little unusual in shape, being oval in form, while ordinarily they are almost round. The measurements inside are 2.38 by 1.38, by 1.12 inches deep; outside 3.50 by 3.00, by 1.75 inches deep. It is beautifully covered with lichens, and is lined first with a few horse-hairs, and then completely with white chicken feathers. The eggs measure $.87 \times .65$ and $.88 \times .66$ inch, and in color are like those already described.

The last nest I took was on June 14. With this the birds were as unexpectedly slow in the use of their nest as the owners of the nest of May 5 were quick. I found it just completed, but without eggs, on June 7. On June 9 it was still empty. On June 14 it contained two fresh eggs. The nest was about seven feet from the ground in a tree that grew at an angle of about 45° with the ground; at the first branches there was formed a broad, flat space, and there the nest was placed. None of the materials of construction went around the branch to bind it there, but it was attached quite firmly with lichens and spider webs. It measures inside 2.25 inches in diameter by 1.38 inches deep; outside 3.50×3.00 inches by 1.50 deep. It is lined first with horse-hairs and then with soft light-colored feathers. The eggs measure $.84 \times .65$ and $.85 \times .66$ inch, and are marked like the preceding. While I was at the nest both birds remained close at hand, flying restlessly back and forth. Whenever they alighted they stood very erect with the crest fully expanded. They seldom uttered a note.

NOTES ON THE FRINGILLIDÆ OF WESTERN ILLINOIS.

BY OTHO C. POLING.

IN PRESENTING a paper on the family Fringillidæ it had been my intention to include only those species of rare occurrence which had come under my observation, but as my notes have increased considerably within the past three seasons I shall, for the sake of completeness, cover the entire family, and consider in particular the rarer Sparrows and Finches. Adams County, where the material for these notes was gathered almost entirely, is situated on the the Mississippi River, west of the centre of the State, the 40th parallel running through its centre. The bottom lands extending north and south through its western portion vary in width from two to six miles, except in the immediate vicinity of Quincy where the bluffs closely approach the river. A large part of these lowlands are free from cultivation, being frequently overflowed. Numerous lakes and sloughs and large tracts of swamp land are interspersed through this territory, and while there are vast tracts of heavy timber, much of it is grown up with reeds and rushes or covered with rank grass and weeds. Willows are everywhere found in abundance, often tracts of many miles being covered by them. Among the bluffs, and to the east, the country is somewhat hilly or undulating, and is drained by numerous large and rapid creeks. Here also is found a great variety of timber. Lima Lake, which will be referred to occasionally, is in the northwest part of the County. It covers a dozen or fifteen square miles, and is usually very shallow.

1. *Coccothraustes vespertina*. EVENING GROSBEAK.—Irregular in its appearance but frequently seen in Illinois. Specimens were observed in the winter of 1887. (See 'Ornithologist and Oölogist', March, 1889.) A small flock of six or seven individuals were seen on April 1, 1889. They were at rest in the top of a soft maple, and had evidently been feeding on the buds during the morning as numbers of them were scattered upon the fresh snow beneath the trees. While at Champaign, Ill., I met with a flock of seven or eight males of this species on Nov. 12, 1889. They were well concealed among the branches of some willows still green with foliage, and I was only attracted by their loud, sharp notes. I secured but

one specimen, a male, and failed to discover the flock again. During a collecting trip in the spring of 1889, Mr. Charles F. Adams secured one fine male of this species near Champaign, Ill., which he found feeding among some sugar maples. The trees were in leaf, and neighboring trees in blossom, and although the exact date was not recorded, it is believed that it was near the first of May, as at that time the Warbler migration was well advanced, and many species were present. From these records it would seem that the Evening Grosbeak is not only a winter straggler, but a spring and fall visitor as well, which may be due to the better condition of its favorite food at such times in more southerly localities.

2. *Carpodacus purpureus*. PURPLE FINCH.—A common winter visitor, appearing late in the fall and remaining until May. Its abundance depends very much on the food supply which is chiefly buttonwood or sycamore balls and the seeds of various weeds. During the winter of 1888-89, the supply of hempseed and sycamore balls was unusual, and in consequence the Purple Finch was one of the most common winter birds. Flocks of many hundreds remained, and their songs could be heard almost any sunny day in winter.

3. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Very erratic in its visits here. This may be owing to the small amount of pine to be found, but more likely to some other cause, as while here it does not seem to seek the pines so much as some other resorts. I have frequently found them feeding in apple and pear trees where the fruit had remained on and had been frozen. I also noticed one flock feeding on buds of the common cottonwood, and I remained beneath the tree some time watching them while parts of the buds dropped about me.

4. *Loxia leucoptera*. WHITE-WINGED CROSSBILL.—As irregular as the last, and much more rare of late years. Single specimens are sometimes found along with a flock of the red species.

5. *Acanthis linaria*. REDPOLL.—A rare winter visitant. Only seen in February.

6. *Spinus tristis*. AMERICAN GOLDFINCH.—Resident. Found in large flocks in winter when it frequents patches of weeds and hemp and the borders of timber. Commonly seen about the houses in town in May and again in July and August, coming to breed.

7. *Spinus pinus*. PINE SISKIN.—Found plentifully in winter and at the approach of spring. A very unsuspicious bird often allowing one to advance within two or three feet of it while feeding. I have usually found them in small flocks of a dozen or more about pines and evergreens.

8. *Calcarius lapponicus*. LAPLAND LONGSPUR.—Casual winter visitor. Sometimes appearing late in the fall before the first snow. It is found associated with the Horned Larks. Often when a flock of Larks is flying overhead, I have heard the twittering notes of this Longspur coming from among them. In February when the river is usually frozen over, I have seen them on the ice where sand had been scattered by passing wagons.

9. *Calcarius pictus*. SMITH'S LONGSPUR. — The Painted Longspur is a regular spring and fall migrant through Illinois. It seems more plentiful in the fall than in the spring, and its sojourn is usually more protracted. I have found them on many occasions in the fall, from early October until the middle of November. At such times they frequent stubble fields of oats or wheat, which have been well grown up with short grass and weeds. I have also found large flocks of them among the lowlands about Lima Lake, where they lie closely in the short grass. This species is seldom found associated with other birds. They often congregate in large flocks of several hundreds, and when such a flock has settled in good cover one may approach fairly into the midst of them without becoming aware of their presence, until with one impulse all will arise and, uttering their rapid, twittering notes, circle about high in the air for some time, and perhaps fly far away, unless the intruder remain concealed and quiet, when they will drop in again all about him. During the migration one who is perfectly familiar with their note may often observe flocks of them flying rapidly over at a great height, often scarcely perceptible, and constantly uttering the notes, but unless he should find their particular feeding ground, it would be useless to search for them. This is particularly the case in the spring, when many flocks pass over, and should one alight and be disturbed, they seldom return, but seem restless and anxious to complete their long journey.

10. *Poocætes gramineus*. VESPER SPARROW. — Very common during migrations, not often remaining to breed, though occasionally its pleasing notes may be heard during the summer months.

11. *Ammodramus sandwichensis savanna*. SAVANNA SPARROW. — One of our most common Sparrows in spring and fall, often associated with other species of its genus as well as with the Song and Swamp Sparrows. It frequents the uplands where it may usually be found in stubble fields and patches of swamp grass or weeds.

12. *Ammodramus savannarum passerinus*. GRASSHOPPER SPARROW. — A common summer resident arriving by the middle of April, and frequenting the clover fields, where its familiar subdued notes may be heard throughout the spring and summer, as the bird sways in the breeze from a weed top, or crouches upon a fence post.

13. *Ammodramus henslowii*. HENSLOW'S SPARROW. — Abundant spring migrant, and not uncommon during the summer and fall, although then less conspicuous from its quietness and more restricted haunts. The migration takes place in April, and is at its height from the 15th until the 25th of that month. At this time the birds are in their best plumage, and their habits may be most successfully studied. From dawn until two or three hours after sunrise, while the dew still sparkles on the grass, they will be found most active and full of life. In this locality they not only frequent the marshes and bottom lands but are also found in upland clover fields and fields of timothy, and in fact I have discovered them in a great variety of places, though their favorite haunts seem to be among the dense growth of swamp grass of our bottom lands. I have known

several pairs to breed in a clover field of some ten acres or more, through which extends a swampy brook well lined with weeds and a few patches of tall grass. During the spring migration large numbers of this species, as well as Leconte's and the Yellow-winged Sparrow frequent this field, and often in an hour's walk I have flushed several dozen of them which on taking flight would usually seek the tall grass and weeds about the brook.

15. *Ammodramus leconteii*. LECONTE'S SPARROW.—Fully as abundant as the last species, and perhaps more evenly distributed locally. The habits of Leconte's Sparrow are similar to those of Henslow's, and its migration takes place at about the same time. My earliest record for the spring migration was on March 14, 1889, when I shot a single male bird which was flushed from among short blue-grass, in a large open field. This Sparrow like the last two is often found in wheat or oat stubble grown up with grass and smartweed, where the hollows usually contain thick shelter to which they resort when disturbed. The young Leconte's and Henslow's Sparrows are sometimes found in August in immature plumage, but as yet I have failed to find any positive proof of the former species breeding here.

16. *Ammodramus caudacutus nelsoni*. NELSON'S SPARROW.—Apparently of very rare occurrence here, as all my searches have revealed but a single specimen, a male shot on April 26, 1889, in a reedy marsh.

17. *Chondestes grammacus*. LARK SPARROW.—Common summer resident, reaching here from the south about May 1. Old pasture fields and fields of corn are most frequented by them, where they often sing for hours from the top of some dead tree. The nest is placed on or near the ground, often among crab sprouts in grassy places.

18. *Zonotrichia querula*. HARRIS'S SPARROW.—I have shot and preserved two specimens, a male and a female, of this species. They were found along a brush fence in a small clump of bushes where others were observed. The species is probably a regular, but rare, migrant as far east as the Mississippi bottoms.

19. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—A common migrant, more often seen in spring than fall when they migrate in small bands of half a dozen or more, sometimes in with flocks of the White-throated Sparrows. They seem to prefer bushy pastures and fences of osage hedge.

20. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Found here in greater numbers than the last; both arrive from the south in some numbers by the middle of April and remain until about May 10. The song is very pleasant, though not loud.

21. *Spizella monticola*. TREE SPARROW.—Very common in winter. This and the Junco are found in about equal numbers in winter, both species remaining late in spring, sometimes until the first of May.

22. *Spizella socialis*. CHIPPING SPARROW.—Abundant summer resident, arriving sometimes by March 20. Two or three broods are raised here. The nests are built in shrubs and cedars in the city suburbs.

23. *Spizella pallida*. CLAY-COLORED SPARROW.—I have occasionally met with this species during the migrations. Early in May, 1887, I collected a number of specimens, and found them quite common in pasture and stubble fields near the city.

24. *Spizella pusilla*. FIELD SPARROW.—The Field Sparrow arrives from the south by the first of April, and is soon dispersed over the fields and pastures in considerable numbers. The song may be heard at any time in the spring or summer. Two broods at least are raised, and I have found the full set of fresh eggs by May 1. Nests are built in brush and bushes, among dead grass, or on the ground. I have found nests with eggs in cedar bushes five or six feet high.

25. *Junco hyemalis*. SLATE-COLORED JUNCO.—During the winter months this bird is common about the houses at the approach of or during storms. When the weather is pleasant they seek the fields and orchards or borders of woods where brush piles are found. I have records of the occurrence of this species as early as September 1, and on one occasion I met with a male bird on May 24, which was apparently in a sound state.

26. *Peucæa æstivalis bachmanii*. BACHMAN'S SPARROW.—Early in May, 1887, I shot three specimens of this bird and saw two others. They were in an old orchard of apple trees which were at that time in full blossom. In the spring of 1889, while searching the wooded bottom lands of Missouri just across the river from Quincy, I saw two others which, from the note and appearance, must have been of this species, though I was unable to obtain them. They were among scrub oaks and brush in a clearing. This was between the 1st and 5th of May; the exact date was not kept.

27. *Melospiza fasciata*. SONG SPARROW.—Common during migrations, and a very few remain throughout the year.

28. *Melospiza lincolni*. LINCOLN'S SPARROW.—Found in considerable numbers during the spring migrations about the first week in May. Less abundant in fall, and more irregular in its occurrence here.

29. *Melospiza georgiana*. SWAMP SPARROW.—In the spring and fall migrations this Sparrow is a common inhabitant of the bottom lands, or wherever rank grass, weeds, and brush are found. They are most abundant about the last of April, when all the marshes are full of them.

30. *Passerella iliaca*. FOX SPARROW.—Common in spring and fall. They arrive from the south by the middle of March, and often associate with the Towhee, seeking the deepest thickets and brush heaps, particularly in clearings where oak brush abounds. The song, which I have but rarely heard, is truly beautiful.

31. *Pipilo erythrophthalmus*. TOWHEE.—Abundant summer resident. It arrives from the south early in March, and nesting begins by April 1. I have found dozens of nests of this bird, from the middle of April until the last of August, with fresh eggs, and at least two thirds of those examined contained Cowbirds' eggs. They are built on the ground or in bushes near the ground. I have found them occasionally in roots or grass hanging along creek banks, and in the tops of fallen trees.

32. *Cardinalis cardinalis*. CARDINAL.—Abundant resident, particularly in the heavily wooded bottom lands of the Mississippi on both sides of the river. Nesting begins early in April or even by the last of March. I have found good-sized young by the middle of April. Nests are placed in bushes and thorn trees, near the ground, or in roots of fallen trees. The eggs are two, three, or four in number.

33. *Habia ludoviciana*. ROSE-BREADED GROSBEAK.—Common summer resident. This is a well-known song bird, and is found in many parts of the city as well as in the deepest woods. The nests, of which I have examined a large number, are placed in the tops of trees and saplings. The eggs can be seen from below in most cases. They are from four to six in number.

34. *Passerina cyanea*. INDIGO BUNTING.—A well known bird in this locality, coming from the south in late April or by the first of May. By the last of May nesting has begun. Three or four eggs are deposited, and the Cowbird usually adds one or more. The nest is built in grass, weeds, or briars, or in the sprouts at the foot of a tree.

35. *Spiza americana*. DICKCISSEL.—Abundant summer resident, breeding in clover fields, where many nests can be found in a limited area. These are placed in the tops of clumps of clover or in shorter growth. I have found them sunk in the ground. The eggs are two, three, or four, in number.

DESCRIPTIONS OF A NEW SPECIES AND THREE NEW SUBSPECIES OF BIRDS FROM ARIZONA.

BY DR. EDGAR A. MEARNS, U. S. A.

Junco ridgwayi, sp. nov.

SP. CHAR. — Above similar to *J. caniceps*; below indistinguishable from *J. annectens*.

Adult Male (Type, No. 2770, Coll. E. A. Mearns, Whipple Barracks, Arizona, April 22, 1884): — Upper parts of head and neck, with rump, throat and jugulum, ash-gray. Lores grayish black. Scapulars and interscapular region bright rufous; outer webs of inner tertiarics tinged with the same. Abdomen and crissum white. Sides pinkish. Wings and tail dark grayish ash, the latter with the outer rectrix wholly white, the second white except a dusky line along each edge, and the third with a long white terminal stripe nearly confined to the inner web. Bill flesh color, slightly tipped with black. Feet and claws light brown. Length, 163; alar ex-

panse, 257; wing, 80; tail, 77; culmen, 12; tarsus, 20.5; middle toe and claw, 20; middle claw, 6 mm.

Adult Female (No. 11,187, U. S. Nat. Mus., Coll. C. Drexler, Fort Bridger, Utah, May 28, 1858): — Similar to the male, but duller, with an olive wash to the gray of head, and the plumage generally faded to a browner color, which is probably the result of exposure, the bird being in worn breeding dress. Size smaller.

I take pleasure in naming this handsome Junco after Mr. Robert Ridgway, of Washington, D. C. It was abundant at Whipple Barracks and in the vicinity of the neighboring town of Prescott, Arizona, during the latter part of April, 1884, at which season all of the four species of this genus found by Dr. Coues during his long residence in this locality had departed, with the exception of a few individuals of *Junco oregonus shufeldti* that still lingered in the mixed woods of oaks and pines, in company with the present species. I preserved but a single specimen of each, and cannot now refrain from smiling at the recollection of my misdirected zeal in garnering series of specimens of Flickers, Long-crested Jays, Black-headed Grosbeaks and other conspicuous but well-known birds, while these two Juncos, both of which were new to science, were almost ignored. I inferred that *Junco ridgwayi* was then on its breeding ground, the migrants having nearly all departed, a supposition that I was unable to verify, however, never having visited the locality since then during the breeding season.

An example of this species was taken in New Mexico, as I am informed by Mr. Ridgway, to whom I am indebted for the loan of two breeding birds of this species — male and female, taken at Fort Bridger, Utah, by C. Drexler on May 28, 1858 — and for many other specimens, needed for comparison, from the National Museum collection. Its habitat will probably be found to include the lower evergreen-forested areas of the Great Basin region from Utah southward.

***Spinus tristis pallidus* subsp. nov.**

Mr. J. A. Allen has called attention to this well-marked geographical race of the American Goldfinch, in his annotations to Mr. W. E. D. Scott's paper on Arizona birds, published in the *Auk*, Vol. IV, p. 198. His remarks are as follows: —

"Six specimens in winter plumage are strikingly different from the Eastern bird in corresponding plumage. The white edging of the feathers of the wing and tail in the Arizona bird is much broader; the dorsal surface is much lighter, the yellow of the throat is much purer, lacking almost wholly the greenish shade seen in the Eastern bird; the white of the belly is purer, with a faint fulvous instead of grayish shade; the sides are washed with a paler shade of fulvous brown, in quite strong contrast, however, with the almost pure, solid white of the abdomen and lower tail-coverts. If summer specimens should show correspondingly paler tints in comparison with Eastern examples, as they are almost sure to do, the Arizona form is quite as well entitled to recognition as a subspecies as are several of the pallid forms of Sparrows which have been accorded this rank."

With commendable and characteristic conservatism, Mr. Allen abstained from imposing a name upon this race until summer specimens should reveal more clearly its true status. My task, therefore, is reduced to describing the breeding dress, and naming the new subspecies.

Adult Male in Breeding Plumage (Type, No. 6311, Coll. E. A. Mearns, Fort Verde, Yavapai County, in central Arizona, May 3, 1888): — Similar to the corresponding plumage of Eastern *S. tristis*, but with the black cap larger and extending farther back on the head, the general color decidedly paler, and all of the white markings increased in area. The wing bands, formed by the white tips of the greater and lesser coverts, are considerably broader. The secondaries and tips of primaries are more broadly edged with white, as are the tail-feathers, the inner webs of which are more largely occupied by white. Irides hazel. Bill brownish yellow at base, shading to dusky olive at tip. Feet pale yellow, claws brown. Length, 138; alar expanse, 240; wing, 80; tail, 57; culmen, 10.5; bill, measured from nostril, 8.7; gape, 12; from tip of bill to centre of pupil, 16; from tip of bill to occiput, 26; from base of bill to occiput, 18; length of tibia, 23; tarsus, 13.5; middle toe and claw, 15.5; middle claw, 5.3; hallux with its claw, 13; claw of hallux, 6 mm.

A quite large series of winter specimens of both sexes in my collection, from Fort Verde, Arizona, fully confirms Mr. Allen's description and conclusions based on six specimens in Mr. Scott's collection. The winter plumage is much paler than that of the Eastern bird, with much extension of the white, some specimens having tails that are nearly all white, in which condition they differ in appearance from Eastern *tristis* about as *Acanthis hornemanni* does from *A. linaria*. This pale race will doubtless

prove to be an inhabitant of the whole area of the Great Basin. It is considerably larger than the Eastern bird, as shown in the following

MEASUREMENTS.*

	<i>Spinus tristis.</i>						<i>Spinus tristis pallidus.</i>					
	26 MALES (from New York).			7 FEMALES (from New York).			10 MALES (from Arizona).			11 FEMALES (from Arizona).		
	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum
Length . . .	131.6	139.7	125.2	125.0	130.0	120.7	135.0	140.0	130.0	132.0	136.0	127.0
Expanse . . .	227.6	231.9	222.3	218.0	221.2	211.1	238.0	243.0	230.0	229.0	233.0	225.0
Wing . . .	72.4	76.2	67.6	70.4	72.4	67.1	78.0	80.0	77.0	75.0	76.0	74.0
Tail . . .	50.8	53.1	47.8	49.5	55.6	47.8	56.0	58.0	55.0	54.0	58.0	51.0
Culmen . . .	10.2	10.9	9.4	10.2	10.4	9.4	10.9	11.8	10.5	10.7	11.5	10.0
Bill from nostril . . .	8.1	8.6	7.6	8.6	8.6	8.6	8.7	8.7	8.7	8.5	8.5	8.4
Gape . . .	10.7	10.9	10.2	11.7	12.4	10.7	11.5	12.0	10.5	11.4	12.0	10.5
Tarsus . . .	13.7	14.2	13.2	14.0	14.2	13.5	13.8	15.0	13.0	14.0	15.0	13.0
Middle toe and claw . .	15.5	16.3	14.1	15.2	15.5	15.0	16.0	17.0	15.0	16.0	17.0	15.0
Middle toe . .	10.9	11.2	10.7	10.2	10.4	9.9	12.0	12.0	12.0	10.0	10.0	10.0
Middle claw .	5.6	5.8	5.1	5.1	5.1	5.1	5.3	6.0	5.0	5.3	6.0	4.5

Coccothraustes vespertina montana Ridgway.

On comparing thirteen Evening Grosbeaks from Arizona with seventy-two specimens from Fort Snelling, Minnesota, all collected by the writer, the Arizona form appeared to be separable from the Eastern, as a subspecies. Through the kindness of Messrs. Robert Ridgway, J. A. Allen, and George B. Sennett, I was enabled to add to this material all of these Grosbeaks in the United States National Museum at Washington, in the American Museum of Natural History of New York, and in the private collection of Mr. Sennett, thus bringing together about 150 specimens. From the study of this quite extensive material, it became apparent that the Western bird, *in general*, is very different from that inhabiting the region of the Great Lakes and north-central portion of North America. The distinction rests entirely on the female, such apparent characters as may seem to exist in the male, when individual examples are compared, being completely overlapped and extinguished when large series are

*In millimetres; taken from specimens in the flesh, by the author.

brought together. Western females have the parts which are of an ashen color in the Eastern bird of a yellowish brown; and this striking difference pertains to all Western birds, as well as to those from Mexico. I am unable to detect any marked difference between specimens from British Columbia and the northwestern United States, and those from the Valley of Mexico and the highlands of Vera Cruz. Specimens before me from British Columbia, Washington, Oregon, California, Utah, Arizona, New Mexico, Valley of Mexico, and Mirador (near Vera Cruz), are all examples of the western subspecies, which must be called *montana*, that name having been applied by Mr. Ridgway to the Evening Grosbeak inhabiting the southern Rocky Mountains of the United States and thence southward through the highlands of Mexico into Central America, although none of the characters assigned by him are adequate to separate the Western bird from that of the Great Lake region, the diagnosis having been based on the characters of the male, and the describer's intention having been to separate from the northern bird at large that inhabiting Mexico and the southern Rocky Mountain region, as shown by his assignment of habitats to the two forms: "HAB. (Var. *vespertina*): Pacific coast to Rocky Mountains; northern America east to Lake Superior. (Var. *montana*): Southern Rocky Mountains of United States into Mexico; Orizaba! (SCLATER, 1860, 251); Vera Cruz (alpine regions, breeding) SUMICHRIST, Pr. Bost. Soc., I, 550; Guatemala, SALVIN." As the subspecies *montana* has been dropped, not appearing in the A. O. U. Check-List nor in Mr. Ridgway's Manual of North American Birds, the characters on which it was based having been shown to be inconstant, I have enumerated it in the present article as new, since here first described, retaining Mr. Ridgway's name, his type, from Cantonment Burgwin, New Mexico, being an example of the new subspecies.

Adult Male (Type, No. 11,960, U. S. National Museum, collected by W. W. Anderson, at Cantonment Burgwin, New Mexico, June 3, 1859):—Indistinguishable from northeastern specimens of true *C. vespertina*.

Adult Female (Type, No. 4163, Coll. E. A. Mearns, Oak Creek, near Fort Verde, Yavapai County, Arizona, August 14, 1885):—Pattern of markings as in *C. vespertina*, but the color of most of the body is brown, mixed with olive yellow, and tinged with gray, instead of being wholly grayish as in *vespertina*. The black stripe at each side of the throat and

the dark markings of the wings and tail, are less restricted. The irides are hazel, the entire bill light yellowish green, the tarsi and toes pale yellowish brown, and the claws dark brown. The general color is yellowish brown instead of grayish.

Young Male in First Plumage (No. 4165, Coll. E. A. Mearns, Oak Creek, thirty miles north of Fort Verde, Arizona, August 14, 1885):—In general appearance it resembles the female more than the male, although traces of the male dress are present, as indications of the frontal crescent, black patch on crown, dark mantle, white tertials, and wholly black primaries and tail-feathers. The grayish tinge is entirely wanting. The body is olivaceous buff, more greenish above and brownish below; frontal crescent buff; crown patch with a brownish black spot occupying the centre of each feather; stripe on each side of throat dusky olive; interscapular region darker olivaceous; rump with blackish edging to the feathers; upper tail-coverts black, broadly edged with greenish buff, the longest of them black throughout; inner greater wing-coverts sulphur-yellow; tertials smoky white, with a slight amount of dusky on their inner edge; feathers of crissum white, edged with a pale buff; bill greenish olive, yellowish green only at extreme base; tarsus, toes and claws brown. Another specimen (No. 4164, ♂, juv.), presumably belonging to the same brood, of which the female above described was the parent, differs in having the crown patch indicated by a slightly darker olivaceous coloring instead of having blackish centres to the feathers, in having the longest upper tail-coverts tipped with buff, and more black on the inner edge of the tertials, though much less in amount than in adult females. There is also a small white spot at the tip of the inner web of the outer tail-feather. The bill, tarsus, toes, and claws are a little less dark than in the preceding specimen, although both have these parts darker than in either parent.

Remarks.—In fully adult males, of both subspecies, the tertials lose the smoke-brown tint and the black inner edging, becoming pure white; and the tail-feathers lose the white on their inner webs, becoming black throughout. There is considerable variation in respect to the breadth of the yellow frontal crescent of both forms. In most specimens a very narrow edging of black is interposed between the maxilla and the yellow front, which occasionally appears as a broad black band encroaching on the yellow, but is quite frequently absent. The broadest front in the series is in an immature bird from Hudson's Bay Territory, specimens from Minnesota, Arizona, and Washington Territory, respectively, coming next to it, in this respect; and the narrowest front is seen in an immature male from the city of Mexico, specimens from Minnesota, New Mexico, Washington, California, and Arizona following in order after it. The original type of *mon-*

tana, from New Mexico, has the frontal stripe quite as broad as in average Minnesota specimens. In Western and Southern birds there is a slight average increase in the intensity of the yellow in males. Season appears to exert but little influence upon the plumage, though the yellowest males were taken in spring, and Western females average browner in winter, with an increase of the olive yellow in autumn. The brownest females of *C. vespertina montana* come from the extreme localities of Walla Walla and Mirador, and were taken in January and June, respectively. The variation in size in the subspecies *montana*, throughout its range, is almost inappreciable, measurements of specimens from the northwestern United States averaging almost exactly the same as those from southern Mexico, while those from intervening localities show only slight individual variations.

MEASUREMENTS.*

	<i>Coccothraustes vespertina</i> (from Minnesota).						<i>Coccothraustes vespertina montana</i> (from Arizona).					
	13 MALES			13 FEMALES			3 MALES			8 FEMALES		
	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum
Length . . .	203	210	199	201	205	190	202	204	200	200	204	195
Expanse . . .	348	361	338	342	353	329	349	357	340	343	348	339
Wing	115	122	110	113	118	110	116	120	113	112	115	110
Tail	72	76	66	69	73	65	72	77	70	70	72	68
Culmen (chord) . . .	19.5	20.6	18.3	19.5	20.5	18.7	21	21	21	20.6	21.5	19.5
Bill from nostril . . .	15.4	16.4	15	15.6	16.3	15	16.2	16.5	16	15.7	16.5	15
Gape	21.0	22.5	21	21.7	22.5	21	21.7	22	21	20	23	21
Height of bill at base .	15.5	16.2	14.8	15.5	16	15	15.7	17	15	15	15.5	14.5
Width of bill at base .	14.7	15.2	14	14.6	15.2	14	14.7	15	14.5	14.5	15.2	14
Tarsus . . .	21.9	23	21	22	23.5	21	20.8	21	20.5	21.3	22	20
Middle toe and claw . .	24.2	25	23	24.1	26	23	24.5	26	23	24.2	26	23.5
Middle claw .	7.3	8.2	6.3	7.5	8	7	7	8	6	7.3	8.5	7
Hallux with its claws . .	17.8	19	16.5	17.5	18.5	16.5	16	16	16	16	16.1	15.9

Melanerpes formicivorus aculeatus subsp. nov.

A comparison of more than fifty Arizona specimens of this species with the series of *Melanerpes formicivorus bairdi* from

* In millimetres; taken from specimens in the flesh, by the author.

the Pacific coast of the United States, *M. formicivorus* from southeastern Mexico and Central America, and *M. formicivorus angustifrons* from Lower California, in the American Museum of Natural History, New York, the U. S. National Museum at Washington, and the cabinet of Mr. George B. Sennett, shows that it is subspecifically separable from either of the above forms. It differs from all of them in the small size and peculiar shape of the bill, but is in most respects intermediate between *M. formicivorus bairdi* and *M. formicivorus*.

Adult (Type, No. 6345, Coll. E. A. Mearns, Squaw Peak, central Arizona, May 9, 1888):—General size and coloring intermediate between *M. formicivorus* and *M. formicivorus bairdi*; throat less yellow than in either of them; bill shorter, more slender, and less arcuate than in either of the other forms of *M. formicivorus*; white striping of chest more than in the Pacific coast form, less than in *formicivorus*.

Young in First Plumage (No. 5556, ♀, juv., Coll. E. A. Mearns, Baker's Butte, Mogollon Mountains, central Arizona, July 18, 1887):—Similar to adults, but lacking the black band across the fore part of crown, the whole top of the head being red, *in both sexes*; colors duller, with the quill-feathers, neck and breast slightly brownish; pectoral band broader, with less of the white striping; black streaks of sides less sharply defined, having a blurred appearance.

Habitat.—Southwestern United States, southward through the mountainous portions of western Mexico.

MEASUREMENTS* OF *Melanerpes formicivorus aculeatus* FROM ARIZONA.

	17 MALES.			17 FEMALES.			BOTH SEXES (34 specimens).		
	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum
Length	242	250	232	237	248	231	240	250	231
Alar expanse	457	472	442	450	475	437	454	475	437
Wing	144	151	137	144	150	140	144	151	137
Tail	89	97	82	90	95	83	89	97	82
Culmen (chord)	26.3	29	24	25.5	28	23	25.9	29	23
Tarsus	22	24	21	21.5	24	19	21.7	24	19
Middle toe and claw .	25.2	27	24	24.6	26	22.5	24.9	27	22.5

*In millimetres; taken in the flesh by the author.

MEASUREMENTS OF 12 SPECIMENS OF *Melanerpes formicivorus bairdi*
FROM CALIFORNIA.

				Wing	Tail	Culmen
1,028	♂ ad.	San Fernando Valley, Cala. . .	E. C. Thurber	150	96	31.5
884	♂ ad.	San Gabriel, California	"	145	96	30
44,121	♂ ad.	California (F. Gruber). . . .	Am. Mus. Nat. Hist.	147	97	30.5
44,118	♂ ad.	California (J. Krider)	"	153	93	31
25,661	♂ ad.	Cosumnes River	"	150	92	30.5
929	♂ ad.	Newcastle, California.	George B. Sennett	145	86	33.5
....	♂ ad.	Sebastopol, California	"	150	88	31.5
675	♂ ad.	Alhambra, California	E. C. Thurber	145	87	27.5
884	♂ ad.	San Gabriel, California	"	145	90	28.5
25,662	♂ ad.	California.	Am. Mus. Nat. Hist.	145	84	29.5
930	♂ ad.	Newcastle, California	George B. Sennett	140	81	28
...	♀ ad.	Sebastopol, California	"	148	82	28

COMPARATIVE MEASUREMENTS OF THE FOUR SUBSPECIES OF
Melanerpes formicivorus.

Average of <i>M. f. bairdi</i> from California (7 males and 5 females)	147	89	30
Maximum " " " " " " " "	153	97	33.5
Minimum " " " " " " " "	140	81	27.5
Average of <i>M. formicivorus</i> from S. E. Mexico and Central America*	141	89	29.5
Maximum " " " " " " " "	150	91	31
Minimum " " " " " " " "	135	79	28.9
Average of 34 specimens of <i>M. f. aculeatus</i> from Arizona	144	89	25.9
Maximum " " " " " " " "	151	97	29
Minimum " " " " " " " "	137	82	23
Average of <i>M. f. angustifrons</i> from Lower California*	137	86	30.5
Maximum " " " " " " " "	141	89	31.8
Minimum " " " " " " " "	132	84	29.2

OBSERVATIONS ON THE AVIFAUNA OF PORTIONS
OF ARIZONA.

BY EDGAR A. MEARNS, M. D.

(Concluded from Vol. VII, p. 55.)

Dryobates villosus hylscopus. CABANIS'S WOODPECKER. — Breeds commonly throughout the pine belt, often ascending higher in summer, then preferring aspens to the fir and spruce woods of high altitudes. It very rarely descends to the cottonwoods of the Verde Valley to fraternize with its smaller relative, Baird's Woodpecker, and only when the moun-

*Taken from Ridgway's Manual of North American Birds.

tain timber is icy or the weather uncommonly fierce; then it is usually accompanied by flocks of Cassin's Purple Finches, Red-backed Juncos, and its boon companions, the Slender-billed Nuthatches. About the middle of June the young leave their nests, and soon after make a partial migration downward towards the lower border of the pine belt, in common with many other birds that breed at high levels.

Dryobates pubescens oreæcus. BATCHELDER'S WOODPECKER. — This bird breeds sparingly through the *Pinus ponderosa* belt, ascending into the spruce zone on the San Francisco cone. It is the rarest of the Woodpeckers here enumerated. A male selected a sounding dry aspen, and drummed regularly above my camp, high up on San Francisco Mountain during the early part of June, 1887, at which season the nights were still intensely cold and this species was probably not yet breeding.

Picoides americanus dorsalis. ALPINE THREE-TOED WOODPECKER. — Breeds commonly throughout the pine belt, seldom ascending far into the spruce woods of the highest peaks. On the northwestern slope of San Francisco Mountain I discovered a nest of this species on June 8, 1887. The female was seen alone, pecking at a large yellow pine which, although dead, still retained its bark and was quite solid. While feeding, she uttered a peculiar, harsh, nasal cry. I shot her, and then noticed a small, neatly bored hole in the south side of the pine trunk, about thirty feet from the ground and away from branches. With the aid of a rope, and taking a start from the saddle, I was scarcely able to climb to the nest, which the male did not quit until I was well up; then he came out and uttered a sudden, sharp *whip-whip-whip* in a menacing tone, remaining hard by while I worked with saw and chisel. It took me nearly half an hour to make an opening sufficiently large to admit the hand, as the burrow was situated so extraordinarily deep. Two young, male and female, with feathers just sprouting, were found on a bed of small chips at the bottom of a burrow, not more than eight inches lower than the entrance, but in the very heart of the tree, the cavity being oblique and pear-shaped, and having the strong odor characteristic of Woodpeckers' nests in general. Both parents and their progeny were preserved, and are now in the American Museum collection. The irides of the adults were dark cherry-red; their feet, claws and basal half of mandible plumbeous, the rest of the bill being plumbeous black.

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER. — Breeds very commonly at the highest altitudes, frequenting the spruce and fir woods. It seldom descends far into the pine belt during the breeding season, although it is found in the pines in winter, occasionally descending even to the cedars in severe weather; and after the nesting season it frequently roves down to the pine woods with its young. When shot, it usually fastened its claws into the balsam bark and remained hanging there after life was extinct.

The specimens of this bird procured during the breeding season exhibit certain peculiarities of plumage, as compared with Pacific coast examples and winter migrants to Arizona, which, if constant, would warrant

the separation of the resident Arizona bird as a subspecies. It is somewhat smaller than northwestern specimens, and much blacker, the white being more restricted throughout. In some males no white spots are visible on the outside of the primaries or secondaries, even when the wing is spread; the white bars on the axillars, lining of wings, and sides are much more restricted; the under tail-coverts are black, very narrowly edged with white; the white head stripes are narrower; and there is no concealed white in the interscapular region. One male (No. 5574, Baker's Butte, Arizona, July 23, 1887) has the belly sap-green, instead of the usual citron-yellow. The adult female is likewise darker, the dark areas being broader, and the white proportionately reduced. In Californian specimens the light bands on the back, wings, and sides are brownish, similar to the head, while they are nearly white in breeding females from Arizona. The pectoral patch is also more solidly black in the Arizona bird. A young female (No. 5559) in first plumage taken in the Mogollon Mountains, Arizona, July 18, 1887, has strong indications of the yellow belly. Its plumage is duller than in the adult of the same sex, lacks the black chest patch, and has the white bars replaced by brown similar in color to the head. A much younger specimen (No. 5552), sex undetermined, has a narrow band of brownish white, slightly tinged with greenish yellow, down the middle of the belly, in other respects agreeing with the preceding. Some winter specimens from Arizona are indistinguishable from others from Fort Crook, California. These might be regarded as northern migrants; but one male from the last-named locality lacks the white spots on the wing quills, as in Arizona specimens; and one Arizona resident has as much white spotting as the average from California. In making the comparison of these birds, I have examined all the material in the National Museum at Washington, in the American Museum of Natural History of New York, and in several private collections. I am also under obligations to Dr. C. Hart Merriam for the opportunity of examining the series of specimens of this Sapsucker collected by him in Arizona, and belonging to the biological collections of the U. S. Department of Agriculture. As the result, it may be stated that the differences described appear to be largely individual, to some extent geographical, and possibly dependent somewhat on season; but the material available for study is insufficient to enable me to decide how much is due to each of these influences. The series of Arizona summer specimens averages darker, with the pale tints whiter. The difference cannot be wholly due to season, unless several of the specimens examined from other localities have erroneous labels.

Melanerpes formicivorus aculeatus.—A very common resident through the pine belt, breeding plentifully. I have found it as high as the spruce forests, but never in them. It is essentially a bird of the pines, only occasionally descending to the cottonwoods of the low valleys. The oaks which are scattered through the lower pine zone supply a large share of its food. Its habit of industriously hoarding food in the bark of pines, and in all sorts of chinks and hollows, is well known. These

stores are the source of unending quarrels between this Woodpecker and its numerous pilfering enemies; and I have laid its supplies under contribution myself, when short of provisions and lost from the command with which I had been travelling, by filling my saddlebags with half-dried acorns from under the loose bark of a dead pine.

Melanerpes torquatus. LEWIS'S WOODPECKER.—It may be said that the pine forests are the favorite home of this beautiful species, although its habits are so erratic that one must take counsel before making any positive assertion concerning it. I have never had proof of its breeding anywhere in Arizona, although I have found it at all seasons and places. It is a wandering bird, travelling about, usually in large flocks, and visiting all likely places for food and frolic. In midwinter it is often very abundant in the highest pine forests of the Mogollons and about Fort Whipple; but I have spent a whole summer in these mountains without seeing any of them; again, it was noted among the cottonwoods of the Santa Cruz and Rillitto in the vicinity of Tucson and Fort Lowell during the blazing weather of April. Sometimes it would come in great numbers in March and April to the oak woods bordering the streams near Fort Verde; or a pair or two would take up their abode in a grove of cottonwoods, and spend April and May, in the hot valley of the Rio Verde. Its movements, like those of the Eastern Red-headed Woodpecker, are probably largely governed by the food supply; and it doubtless breeds wherever it chances to be at the season, provided that food be plenty.

Colaptes cafer. RED-SHAFTED FLICKER.—Breeds commonly throughout the pine belt, ascending still higher.

Phalænoptilus nuttalli. POOR-WILL.—This interesting bird breeds abundantly throughout the pine belt. A set of perfectly fresh eggs was taken on the Mogollon Mountains, on July 3, 1886. Another set, taken near Flagstaff, contained large embryos on May 27, 1888; and a couple of young were found the same day.

Chordeiles virginianus henryi. WESTERN NIGHTHAWK.—I have never known this species to infringe on the territory of the Texan Nighthawk during the breeding season; each keeps to its own ground, the latter being confined to the region below the pines, and the former residing in the pines and spruces, breeding in great numbers in these limited areas. A single migrant was taken at Fort Verde, on May 9, 1885. Two fresh eggs were taken at Flagstaff on June 18, 1887, in a level place, bestrewn with volcanic scoria, beneath the pines. In our summer camp, near the summit of the Mogollon Mountains, a small beetle was annoyingly abundant, flying into our tents in great numbers during the day, and at night swarming around our log fires. As the twilight gathered, hundreds of these Nighthawks appeared upon the scene, preying upon the troublesome insects. Careless of our presence at the fires and of the noisy hilarity of camp, they flitted through the smoke with astonishing freedom from diffidence, capturing myriads of the hated beetles, as they passed and repassed above, between, and around us, until their flickering forms

were as familiar as the stirring of the pine boughs overhead, and the fanning of their wings almost as little heeded. A couple of young, recently hatched, were found near the camp, on July 27, 1887, showing that two broods are reared the same year or that its season of reproduction is quite protracted. The voice of this species is quite unlike that of *Chordeiles texensis*.

Micropus melanoleucus. WHITE-THROATED SWIFT. — In Arizona this large and handsome Swift is very abundant in the vicinity of cañons and cliffs, in which it breeds from the altitude of Fort Verde (about 3400 feet) up to the highest peaks in the Territory. I saw them wheeling around the highest points of the San Francisco Mountains, and darting in and out of the jagged rocks, in June.

Trochilus alexandri. BLACK-CHINNED HUMMINGBIRD. — A summer resident in the zone of *Pinus ponderosa*; not seen higher.

Trochilus platycercus. BROAD-TAILED HUMMINGBIRD. — This beautiful Hummingbird is an inhabitant of the highest land of Arizona, being rarely encountered until one is well within the spruce belt, when it suddenly becomes extremely plentiful. About springs and willow-edged water-courses swarms of these gay birds congregate. Its boldness is without a parallel; it knows no fear. A member of our party on San Francisco Mountain wore a scarlet cap, but he found these audacious birds so troublesome from their constant attacks upon it that he was glad to pocket it in order to be rid of the irate little furies. A shrub grows on the mountain bearing purplish red flowers of which this species is extravagantly fond; and numbers of them may be closely watched by seating oneself amongst these plants. Its flight is accompanied by a metallic, screeching sound unlike that made by any other Hummer with which I am familiar, and I heard them continually, when riding through the forest, though they were invisible. It ranges to the very summit of San Francisco Mountain, being abundant in the highest timber.

Tyrannus vociferans. CASSIN'S KINGBIRD. — Breeds commonly throughout the pine forests. I found it in the uppermost timber on San Francisco Mountain in June, the altitude being nearly 12,000 feet. This conspicuous species likewise breeds in the low valleys of Arizona together with the Arkansas Kingbird (*T. verticalis*), nests of both species having been found at the same time in one cottonwood tree in the Verde Valley. On the Mogollon Mountains I saw them attack Crows and Western Red-tailed Hawks and drive them from the neighborhood of their nests after the spirited fashion of the Eastern Kingbird.

Contopus borealis. OLIVE-SIDED FLYCATCHER. — Breeds throughout the area under consideration, but is especially common in the higher belt of evergreen forest, in which it ranges almost to the timber line. It builds its nest near the tops of the tallest firs and balsams. Its characteristic cry of *whip-me-to*, given with such vigor and clearness of enunciation as to be almost startling, was continually heard when we were encamped at Smith's Big Spring, in the cañon or crater enfolded by the San Francisco peaks, opening to the east; and it was equally abundant in

the White Mountains and the higher spurs of the Mogollon range. Like many other mountain species it ranges down hill with its young after the breeding season. On Oak Creek, in the cypress belt below the pines, it appears in families during the first half of August.

Contopus pertinax. COUES'S FLYCATCHER.—This bird was seen feeding its young on Baker's Butte, one of the higher spurs of the northern part of the Mogollon range, during the months of July and August. Its habits resemble those of the smaller species of this genus, rather than of the Olive-sided Flycatcher.

Contopus richardsonii. WESTERN WOOD PEWEE.—Breeds commonly throughout these mountains.

Empidonax difficilis. WESTERN FLYCATCHER.—Breeds commonly in the upper pines and through the spruce forest, almost reaching the timber line on San Francisco Mountain. It has a song and a very sweet call, besides a sharp chirp uttered when angry or frightened.

Empidonax pusillus. LITTLE FLYCATCHER.—This interesting bird, so abundant in the cottonwood and willow thickets along the lower streams of Arizona, was also occasionally seen, during the summer months, in the dwarf willows (*Salix rostrata*) that border the tiny streams and swampy hollows sometimes met with in traversing these mountains. It was noted at the altitude of 9000 feet at the foot of the San Francisco peaks.

Otocoris alpestris adusta. SCORCHED HORNED LARK.—The Horned Larks which were found breeding in the park-like openings in these mountain forests up to an altitude of 10,000 feet, have recently been referred to this race by Mr. Jonathan Dwight, Jr., in his monograph of this species, published in 'The Auk' for April, 1890. The form breeding in the neighboring valleys and low desert regions is also *adusta*, but not typical, tending considerably toward the more northern race *arenicola*; there would have been good grounds for the presumption that the bird breeding in these high mountain districts would prove to be typical *arenicola*; but such is not the fact.

Cyanocitta stelleri macrolopha. LONG-CRESTED JAY.—Resident to the altitude of 10,000 feet, ascending still further. On the San Franciscos, I found its nest with fresh eggs at the upper limit of the pines in the second week of June, 1887, while the nests found in the lower Mogollons during the last third of May of the same year all contained young.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.—A quite common resident in the White Mountains of eastern Arizona; not seen in the northern Mogollons or the San Franciscos.

Corvus corax sinuatus. AMERICAN RAVEN.—Most of the Ravens of Arizona are the White-necked species, but the northern Raven is common in the mountain districts, nesting as low as 3000 feet, usually, if not invariably, upon ledges of cliffs.

Corvus americanus. AMERICAN CROW.—Breeds commonly in the pines and spruces throughout this area. It ascends to the timber line, breeding in the higher firs as well as in the pines.

Picicorvus columbianus. CLARKE'S NUTCRACKER.—Breeds abundant-

ly in the fir and spruce belt on the San Francisco cone; but on the crest of the more southern Mogollons, near Fort Apache, I have found it only in October. It breeds quite early, when the mountains are still covered with snow. I started for the San Franciscos on the 20th of May, 1887, but found them so deeply covered with snow that I was obliged to wait a fortnight for the snow to melt. When I reached the mountain the young birds were travelling with their parents. They often descended well into the pines, or ascended to the timber line, according as their fancy suggested. They were tame, noisy, and frolicsome, reminding me, as they played boisterously in the top of some dead tree, of a flock of Red-headed Woodpeckers.

Cyanocephalus cyanocephalus. PINON JAY.—Resident in the pine belt in summer, breeding as high as the upper limit of *Pinus ponderosa*, but descending to the cedars and piñons of the low country in autumn. They are wandering, erratic birds, occurring in immense numbers one season, and as conspicuous by their absence the next. They are highly gregarious; and flocks travelling over a more or less open country have the appearance of rolling along, the hindmost continually passing to the front, the whole flock screaming with cat-like voices. It was common around the base of San Francisco Mountain in June, 1887, the flocks having dispersed in pairs for the purpose of breeding. In July and August they again appeared in flocks composed of from several to many families, frequenting the juniper groves, having performed a downward migration in common with *Coccothraustes vespertina montana*, *Spinus pinus*, *Setophaga picta*, and many other mountain birds. With the approach of autumn, when the young are strong on the wing, they begin their gregarious wanderings over country high and low, sometimes assembling in flocks of thousands.

Molothrus ater obscurus. DWARF COWBIRD.—A common summer resident. Frequently seen accompanying the range cattle that graze on the mountains. Possibly some of the mountain Cowbirds are true *M. ater*, but of this I am uncertain, having shot but few specimens.

Xanthocephalus xanthocephalus. YELLOW-HEADED BLACKBIRD.—This handsome bird is a summer resident in such spots, in this high region, as are suited to its needs. It breeds in vast numbers at Mormon Lake, in the Mogollon Mountains; many of the nests examined by us there contained fresh eggs at the time of our visit—during the last week of May.

Sturnella magna neglecta. WESTERN MEADOWLARK.—Breeds in open, grassy places at any elevation. I have seen it as high as 10,000 feet. These mountain birds are the typical *neglecta* of the north; but, as might have been predicted, the resident Meadowlark of the low parts of Arizona exhibits the effects of its environment in certain peculiarities of plumage, having the pallid, scorched appearance common to most birds of desert regions.

Scolecophagus cyanocephalus. BREWER'S BLACKBIRD.—Breeds abundantly in dwarf willows (*Salix rostrata*) through the pine belt, where-

ever there is water. It was sometimes found nesting in aspens, pines, or spruces along streams, but its preference is for wet openings where there are willows. At Woods' stock ranch, on the road from the Verde Valley to Flagstaff, near the lower edge of the pine forest, most of the young were on wing by the 20th of June, 1886, many of them having tufts of down still adhering to the feathers, which gave them a comical aspect. A single nest contained eggs, four in number, nearly fresh; it was placed six feet above the ground in a young aspen (*Populus tremuloides*), and was coarsely fashioned of small twigs and stems of plants, with a lining of rootlets. At Mormon Lake, a more elevated locality than the above, all of many nests examined contained fresh eggs the last of May, 1887. At the base of San Francisco Mountain several pairs were found that were just building nests in the early part of June. On the mountains, as elsewhere, this bird likes the company of cattle.

Coccothraustes vespertina montana. WESTERN EVENING GROSBEAK.—This beautiful Grosbeak is partial to cañons, shady ravines and the vicinity of water during the breeding season, afterwards descending to the oak-wooded foot-hills with its young. At Fort Verde it sometimes appeared, in spring or fall, in the cottonwoods bordering the Verde River, feeding at times upon the berries of a species of mistletoe (*Phoradendron flavescens*), when it became exceedingly fat; but it was much more common in the neighboring foot-hills. In winter it feeds extensively on hackberries, seeds of the box-elder (*Negundo aceroides*), and the berries of several species of juniper.

Carpodacus cassini. CASSIN'S PURPLE FINCH.—A resident of the pines; sometimes driven into the low valleys in great numbers, in winter, by severe weather.

A young fledgling supposed to be *Leucosticte australis*, proves to be another species, and the name should be expunged from page 49 of this paper.

Loxia curvirostra stricklandi. MEXICAN CROSSBILL.—One of the commonest birds in the pine forest, ascending into the spruces. I found it in June at the extreme lower edge of the pine belt. It is notably fond of drinking and bathing, and can generally be found about watering places at all times of the day. I noted the presence of this bird in all parts of the pine belt that I visited, whatever the season. Great numbers were occasionally found congregated around springs, in regions where water is very scarce.

Spinus psaltria. ARKANSAS GOLDFINCH.—A summer resident in the pine belt. Mountain specimens are typical *psaltria*; but those of the surrounding low regions manifest a tendency toward the subspecies *arizonæ*, varying in degree with the locality. Several birds taken in the Verde Valley are referable to *arizonæ*, though the majority are nearer to *psaltria*.

Spinus pinus. PINE SISKIN.—A resident species, frequently descending to the warm valleys in autumn, winter and spring. Although breeding in high places, many flocks may be found to have wandered down to the lower edge of the pines by the first week of July.

Pooecætes gramineus confinis. WESTERN VESPER SPARROW.—A common summer resident in the upper pines. On San Francisco Mountain it was found breeding, in June, up to the altitude of about 10,000 feet, occupying grassy openings where there were a good many rocks.

Chondestes grammacus strigatus. WESTERN LARK SPARROW. — A very common summer resident through the pines. It ranged up to the true base of the San Francisco cone, the country above that point being obviously unsuited to it. It nests indifferently in bushes or upon the ground, and sings sweetly until midsummer.

Zonotrichia leucophrys. WHITE-CROWNED SPARROW. — I found it at the base of San Francisco Mountain, apparently breeding, in June. I also shot a bird which I supposed to be *Z. intermedia*, but could not find the specimen. The Intermediate Sparrow is believed to breed wholly north of the United States; but from this circumstance and its late occurrence at Fort Verde (May 11, 1887) it seems not improbable that some breed within our borders, in the higher portions of the Rocky Mountains.

Spizella socialis arizonæ. WESTERN CHIPPING SPARROW. — Breeds abundantly from the lower pines to near the tops of the highest peaks. In June it was found at the elevation of 10,000 feet on San Francisco Mountain; and it likewise resides during summer on the highest crests of the Mogollon range.

Junco cinereus dorsalis. RED-BACKED JUNCO.—Typical *dorsalis* breeds very plentifully through the northern Mogollon and San Francisco Mountains, but does not appear until one has ascended a considerable distance into the pine belt. It is the most characteristic bird of this higher region. Sets of fresh eggs were found from May 22 to July 22, 1887, the nesting season varying considerably with the altitude, but the clutch seen on the last date probably belonged to a second brood. A typical nest was found on May 30, 1887, in pine woods near the bottom of a ravine on Mormon Mountain. At a short distance was a deep snow-bank. The male parent flew from the nest, beneath my horse's feet, where I found it concealed in a thick bunch of wire-grass. It was composed of fine roots, stems of plants, grasses, and an occasional feather, loosely put together in the manner of most ground nests. It contained four eggs, of an elongated oval shape, measuring (in millimetres) 15×21 , 15×20.5 , 14.7×21.5 , 15.4×21 . Three of them are marked with lilac and reddish brown on a greenish white ground, the spots forming a circle around the great end; the remaining one differs from the others in having the wreath of spots about the small end.

I found its nest close to the upper edge of timber on San Francisco Mountain about the middle of June, and another nest on the very top of Baker's Butte, containing eggs, on the 22d of July.

Pipilo chlorurus. GREEN-TAILED TOWHEE.—It was not found breeding, but was common through the mountains in May and June. In the latter month I saw it on Mount Humphreys, of the San Francisco group, above 11,000 feet, timber line being at 11,468 feet, and the highest land in Arizona (the summit of Humphreys Peak) 12,568 feet.

Habia melanocephala. BLACK-HEADED GROSBEAK.—Breeds through the pine belt, ranging both higher and lower. It evinces an attachment to oak groves and wooded cañons, but is generally dispersed.

Piranga ludoviciana. LOUISIANA TANAGER.—Breeds throughout the pine zone, ascending higher on the peaks, where it was seen in the highest aspens but a short distance from the line where timber ceases to grow. Owing to its gorgeous plumage and sweet song it figures conspicuously in the alpine avifauna.

Piranga hepatica. HEPATIC TANAGER.—This sweet singer is a common resident of the pine belt, never having been noted by me higher than this. It is best suited, as to residence, with such rocky ravines, hills, and ridges in the pine district as are wooded with oaks, for which trees it has a marked predilection.

Progne subis. PURPLE MARTIN.—An abundant summer resident throughout this high region, especially near water. It usually builds its nest in holes in the largest dead pines, several pairs living in the same tree. The Martin of this region, while differing somewhat from the Eastern bird, is not the subspecies *hesperia* recently described by Mr. Brewster, to whom I am indebted for the means of making the comparison.

Tachycineta thalassina. VIOLET-GREEN SWALLOW.—This exquisite bird is highly characteristic of the wooded mountain regions of Arizona, where it breeds, not only in the hollows of trees, but very frequently in cavities in cliffs. While for the most part retiring to the higher land during the breeding season, a good many pass the summer and breed in the wooded cañons in which there are streams, in the lower country. None were found breeding in the immediate valley of the Verde, in the vicinity of Fort Verde, but they were sure to be found after ascending, for a short distance, any of the tributary streams that flow through cañons from the high plateau. There they usually nest in the limestone cliffs, which form the walls of the cañons. I have since seen them breeding in similar situations in the mineral formation about the hot springs and geysers of the Yellowstone National Park and in the bluff banks of the Big Horn River, in Montana.

Vireo gilvus swainsoni. WESTERN WARBLING VIREO.—A summer resident, breeding in the highest aspen timber on San Francisco Mountain, where it sang incessantly and sweetly. Immediately after the breeding season many of them descend to the lower valleys with their young. In autumn, it commonly resorts to the rank growth of annuals usually found beside streams in the valleys at that season, and is especially abundant in the beds of yellow *Cleome*, in the company of terrestrial Warblers of the genera *Helminthophila*, *Geothlypis*, and *Sylvania*.

Vireo solitarius plumbeus. PLUMBEOUS VIREO.—By its loud song this species is known to be a common denizen of the pine forests of this region; but it keeps so near the pine-tops as to be seldom seen, save by tracing to their source the sweet notes one almost constantly hears when riding through these grand forests, it being one of the most persistent

singers that I have met with. It often visits the spruce woods of the higher zone, a few perhaps breeding there.

Dendroica olivacea. OLIVE WARBLER.—I did not see this Warbler in the San Francisco Mountains, save one that was doubtfully identified on Mt. Kendrick, though it is a common summer resident in the adjacent portion of the Mogollon range, becoming still more abundant to the southward. It rises to the level of the firs, but is most numerous in the upper pines. At Baker's Butte it sang sweetly in July.

Dendroica auduboni. AUDUBON'S WARBLER.—A common summer resident throughout this region, ranging upward to the highest timber. It is never found, in summer, below the level of the pines. It is an excellent singer.

Dendroica graciae. GRACE'S WARBLER.—This beautiful Warbler is preëminently a bird of the pines. It is found as soon as the pine belt is entered, and continues almost to its upper limit; but I did not meet with any in the aspens, firs, or spruces above the pines. In Clark's Valley, between Flagstaff and Mormon Lake, it was seen engaged in nest building on the last of May; it gathered materials for the purpose on the ground, in which situation its nest, when discovered, will perhaps be found. Its song is a sweet warble, frequently uttered from the lower pine boughs. It is very gentle and unsuspicious.

Setophaga picta. PAINTED REDSTART.—This brilliant Warbler inhabits the pine-forested portion of the Mogollon Mountains, descending, after the breeding season, to the streams of lower regions. In Tonto Basin, during August, it was found in considerable numbers in the dark cañon of Weber Creek, among the gigantic alders (*Alnus oblongifolia*) bordering that stream. It seemed fond of watching and conversing with its own bright reflection in the inky pools.

Cardellina rubrifrons. RED-FACED WARBLER.—A summer resident from near the lower border of the pine belt to the summit of the Mogollon Mountains. It was not seen on the San Francisco Mountains, but was found breeding about thirty miles south of them.

In 'Birds of the Colorado Valley,' Dr. Coues thus concludes his remarks on this species: "The birds thus introduced by Mr. Henshaw with some particularity to American ornithologists as one of the newest acquisitions, is left, as found, to my readers,—some one of whom, perhaps, may hereafter have his own story to tell of its nest, its eggs, and its nuptial song." Though this story has since been told (see this journal, Vol. V, p. 385), I will narrate my experience in finding the first nest of the Red-faced Warbler that ever fell into the hands of any naturalist.

On the 19th of June, 1886, I was encamped on a southern slope of the Mogollon Mountains, about five miles within the pine belt, in what has been designated the Great San Francisco Forest. Following a small stream into a little cañon between whose rocky walls stood groups of towering spruces and of aspens, the ground beneath thickly sprinkled with violets, strawberries, honeysuckles, and columbines, I entered a side ravine and had stooped to gather some flowering honeysuckles when a

little bird was flushed from its nest upon the side of the bank, close to the trunk of a large spruce. Alighting in a young spruce tree, it uttered a sharp, hard *chip*. It was the first Red-faced Warbler I had ever seen; and its red face, black cap, gray back, and white rump suggested to my mind a miniature of the European Bulfinch. The bird was so fearless, and the place so confined, that I had some difficulty in securing the specimen in good condition. The male was not seen. After a close search an old nest was discovered on the ground; and I was about to conclude that it belonged to my bird and was as yet unfinished, when I descried a small opening close beside it among the stones and pine needles; on parting some blooming honeysuckles (*Lonicera ciliosa*) and moss, I discovered the nest,—most artfully concealed. In it were four eggs, containing small embryos which were easily extracted, the shells being thick and hard. The nest rested on a mass of dry leaves and spruce needles, and was entirely covered up and concealed by the honeysuckles. It is well built, being composed of a neatly felted mass of plant-stems and strips of fine bark, lined with soft vegetable fibres and cow-hairs. Its outside diameter is 130 mm.; depth outside, 55 mm.; inside diameter, 45 mm.; depth inside, 30 mm. The eggs are spotted with reddish brown upon a white ground, the spots being aggregated and heavier about the larger extremity, and those markings underlying the shell having a purplish color. They measure, 16×13 , 15.5×13 , 16×13 , 16×13.5 mm.

Salpinctes obsoletus. ROCK WREN. —A permanent resident from the lower pine region downwards. In summer it ranges to the highest peaks. It was one of the birds noted on the summit of Mount Humphreys in June, 1887, at which time the hollows thereabouts were filled with enormous masses of ice and snow, and fierce storms and high winds were prevalent.

Troglodytes aëdon aztecus. WESTERN HOUSE WREN. —A summer resident throughout the forested areas, ranging almost to timber line. It appeared to be fond of woods of mingled spruces, firs, and aspens on the mountain slopes. In the pine-forested tablelands almost every pile of rocks or fallen tree was inhabited by a pair of these Wrens. In the lumbering region about Flagstaff the finest pines had been felled and left on the ground, in preparation for the saw-mill. Among their branches these little Wrens were skipping merrily about; they were abundant and full of song.

Certhia familiaris montana. ROCKY MOUNTAIN CREEPER. —An abundant summer resident of the spruce, fir and aspen woods of high altitude, ranging to the timber line; much less common in the pines, to which it descends, however, in winter, when it is also occasionally seen in the cedars and piñons of the foot-hills, or in the deciduous timber along the streams in the valleys. In summer I have seen it no lower than 6500 feet, at which altitude it was only observed after the breeding season.

Sitta carolinensis aculeata. SLENDER-BILLED NUTHATCH. —A common summer resident in the pine and spruce belts throughout this region. It

very rarely appeared in the deciduous trees along the Verde River, and only in hard winters. To the cedars, junipers and piñons of the foot-hills it is a more frequent winter visitant.

***Sitta canadensis*.** RED-BREASTED NUTHATCH.—A summer resident in the pine and spruce zones of the highest peaks of the Mogollon and San Francisco Mountains. It was not seen as low as the pine belt, though it doubtless descends from its high abode during the winter.

***Sitta pygmæa*.** PYGMY NUTHATCH.—A summer resident through the pine belt. It is abundant, gregarious, noisy, and curious. It is sure to be an early spectator of any exciting scenes occurring in the feathered community.

***Parus gambeli*.** MOUNTAIN CHICKADEE. — A common summer resident of the pines, ranging well up towards the highest forest growth on the peaks. The only nest examined was found in a cavity in a small aspen, about ten feet from the ground, near a spring, at the height of from 10,000 to 11,000 feet on San Francisco Mountain. It contained half-grown young on the 15th of June. The nest resembled that of the Eastern Black-capped Chickadee, being apparently felted in purse shape of cow and squirrel hair; but I was unable to examine it as thoroughly as I wished without danger of injury to the little ones, for whose welfare the mother showed the greatest solicitude. She was so fearless that I twice caught her in my hand when enlarging the hole to see into the cavity in which the nest was built. This species rarely visited the Verde Valley in winter, though it was more frequently seen in the bordering foot-hills.

***Regulus calendula*.** RUBY-CROWNED KINGLET. — A very abundant summer resident throughout this area, except in the lowest pines where it is rare if occurring at all in summer. I saw it close to the timber line in June. A nest and clutch of fresh eggs were taken in a spruce-tree beneath which my tent had been pitched, at Mehrens' stock ranch in Quaking Asp Settlement, in a notch at the summit of the Mogollon Mountains, on May 26, 1887. It was attached to the end of a horizontal branch upwards of a hundred feet above the ground, where attention was attracted to it by the actions of the parents. Our chief packer, a strong and intrepid climber, secured the nest and eggs, with the parent, having to climb the tree twice and saw off the limb, before the hazardous feat was accomplished. The parents were extremely fearless.

***Turdus aonalaschkæ auduboni*.** AUDUBON'S HERMIT THRUSH.—This, the sweetest mountain songster, is an abundant summer resident in fir and spruce forests, breeding late in May and in June. At Quaking Asp Settlement, near the end of May, a pair was engaged in building a nest in my camp. The nest was saddled on to the middle of the lowest limb of a large spruce, and the birds gathered material for its construction close about my tent with perfect freedom from shyness, accepting proffered bits of cotton for its completion. Like the Wood Thrush, its song is most frequent in the early morning hours, and after showers. The form wintering in the Verde Valley is the Dwarf Hermit Thrush (*Turdus aonalaschkæ*).

Merula migratoria propinqua. WESTERN ROBIN.—An abundant summer resident from the beginning of the pine belt upwards, but never occurring below the pines in summer. It ranges high at times, but is not common above the pine zone. Nests, at the upper edge of pine timber, contained young on the first of June, 1887. Its fine song continues until July.

Sialia mexicana. WESTERN BLUEBIRD.—A very abundant summer resident from the lower pines upward into the spruce belt, but not ascending as high on the peaks as the following species.

Sialia arctica. MOUNTAIN BLUEBIRD.—This lovely bird, though less abundant than the preceding, is a common summer resident throughout the area under discussion, breeding even below the summer range of the Western Bluebird. May 21, 1887, I took a set of five eggs, with the female parent, from a cavity in a rough-barked juniper (*Juniperus pachyphloea*), just below the pines, on the Mogollon Mountains, near Stoneman's Lake. It was commonly seen on San Francisco Mountain during June, ranging up to the highest erect timber; the uppermost has a prostrate habit, due to the pressure of masses of snow and ice upon it during the greater part of the year.

TWO SPECIES OF SWALLOW NEW TO NORTH AMERICA.

BY W. E. D. SCOTT.

DURING a short visit to the Dry Tortugas, Florida, in the latter part of March and early April of the present year, 1890, it was the writer's good fortune to secure two species of Swallow, which up to the present time have not been recorded as occurring in North America.

The records are as follows:

Petrochelidon fulva (Vieill.). CUBAN CLIFF SWALLOW.*

Coll. of W. E. D. S., No. 8401, ♂ ad., Garden Key, Dry Tortugas, Florida, March 22, 1890. No. 8492, ♂ ad., same locality, March 25, 1890.

*For description of species see Cory, Auk, Vol. III, p. 57.

Calichelidon cyaneoviridis (*Bryant*). BAHAMAN SWALLOW.*

No. 8677, ♂ ad., Coll. of W. E. D. S., Garden Key, Dry Tortugas, Florida, April 7, 1890.

As the known habitat of the Cuban Cliff Swallow is Central America, from northern Yucatan to Panama, Cuba, San Domingo, Jamaica and Porto Rico, it is not surprising that it should occur at the Tortugas, especially in the spring. It seems probable that this species will be found to occur more or less regularly at this point during March and early April. The Bahaman Swallow must, however, be regarded, in the light of present evidence, as an accidental visitor, its known habitat being the Bahamas where it has been regarded by collectors as a rare species.

A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL.

BY CLARENCE B. RIKER.

With Annotations by Frank M. Chapman.

[Continued from p. 137.]

[6. *Thryophilus* sp.—? There is a single specimen of a Wren of the *T. leucotis* type in Mr. Riker's collection, collected by Williams and labelled by him, "Corresponding to nest, ♂." The date and locality, farther than "Amazon," have been omitted, but there is little doubt that the bird came from Santarem, as the skin is evidently of Mr. Williams's make. With the material at my command I cannot satisfactorily identify this bird with any of the described forms, but rather than add to the confusion which already exists in this puzzling group I prefer to leave it unnamed. In general coloration it agrees exactly with a specimen of *superciliaris* (Lawr.) from Puna Island, but has the bill shorter, the superciliaries much more restricted, and the ear-coverts and cheeks distinctly margined with the color of the back.

True *T. leucotis* (Laf.) I have never seen; this bird may possibly be that species; it does not, however, agree with descriptions, and is quite

*For description of species see Cory, Auk, Vol. III, p. 59.

different from *galbraithi* (Lawr.), by some authors synonymized with *leucotis*.—F. M. C.]

7. *Thryophilus tænioptera* Ridgw.

Thryophilus tænioptera RIDGW., Proc. U. S. Nat. Mus., X, 1887, p. 518.

A male taken June 29, 1887, on the 'mountain' in a dense forest amongst the tangled roots of climbing vines. There were several together, and when disturbed by the report of my gun, they darted off with a sudden outcry of shrill calls.

[This bird bears a close relationship to a specimen from Guiana, which I take to be *Thryophilus albipectus* (Cab.), a species which is generally synonymized with *leucotis* (Lafr.). Apparently we have then at Santarem two quite different birds, but both, by different lines of divergence, bearing relationships to the same species.—F. M. C.]

8. *Thryothorus herberti* Riker.

Thryothorus herberti RIKER MS., RIDGW., Proc. U. S. Nat. Mus., X, 1887, p. 516.

Two males taken June 13 and 29, 1887, on the 'mountain' in palm thickets.

[Having no material with which to compare this species, I can add nothing to the remarks contained in the original description.—F. M. C.]

9. *Anthus rufus* (Gm.).—Two specimens taken on the meadow, June and July, 1887.

10. *Vireo chivi agilis* (Licht.).—Common in lowlands. A busy little bird, having a song very much resembling that of our *V. olivaceus*.

11. *Cyclorhis guianensis* (Gm.).—Two specimens, male and female, taken July 9 and 13, 1887, from the treetops in the lowlands.

[For remarks on this species, see Allen, Bull. Am. Mus. Nat. Hist., II, 1889, p. 133.—F. M. C.]

[12. *Chelidon erythrogaster* (Bodd.).—A single specimen taken by Smith, March 1, 1889.—F. M. C.]

13. *Tachycineta albiventris* (Bodd.).—Common about water, June to August, 1887.

14. *Dacnis cayana* (Linn.).—Two males, one adult, one immature, taken June 1, 1887.

[15. *Dacnis plumbea* (Lath.).—A male taken by Smith January 21, 1889. Not before recorded from the Amazon, although it is necessarily to be expected from that region.—F. M. C.]

16. *Arbelorhina cærulea* (Linn.).—A male taken June 6, 1887.

17. *Cereba chloropyga* (Cab.).—A female taken July 15, 1884.

[Smith's collection contains moulting, immature, and adult birds taken March 29 to April 1, 1889.—F. M. C.]

18. *Euphonia violacea* (Linn.).—Two males taken July 18 and 24, 1884, and two females taken August 4, 1884, and June 29, 1887.

[Three males (one taken by Smith, February 5, 1889) average as follows: Wing, 2.21; tail, 1.15; culmen, .32 in. Two females average: Wing, 2.15; tail, 1.18; culmen, .32 in.—F. M. C.]

19. *Euphonia chlorotica* (Linn.).—A male and female taken June 19, 1887.

[The male has the purplish reflections confined to the occiput, hind neck and throat, and measures: wing, 2.15; tail, 1.24; culmen .30 in. The female measures: wing, 2.08; tail, 1.15; culmen, .30 in.—F. M. C.]

20. *Calliste cayana* (Linn.).—A male and female shot on the campos July 14, 1884.

21. *Calliste boliviana* (Bp.).—One male and two females, taken respectively July 22 and 30, 1884, and June 6, 1887.

[The male has the abdomen of the same shade of yellow as in specimens from Bolivia and Ecuador, the lesser wing-coverts, however, are turquoise blue, mixed with the blue of the greater coverts, in some cases both colors appearing on the same feather. The specimen thus shows an approach to *Calliste mexicana* (Linn.).—F. M. C.]

22. *Tanagra episcopus* (Linn.).—Common, particularly on the campos.

[Two of three specimens, are, on comparison with a Guianan skin, evidently referable to this form, but the third, a male taken June 1, 1887, shows a decided approach to *Tanagra episcopus leucoptera* (Gray), the greater wing-coverts having a distinct margin of bluish white.—F. M. C.]

23. *Tanagra palmarum melanoptera* Hartl. — Very common.

[Comparison of the 21 specimens in the Riker and Smith collections with a series of forty odd examples of true *palmarum* from Matto Grosso, which agree with Maximilian's type, show that *melanoptera* is distinguished from *palmarum*, not alone by the greenish edgings to the wing and tail feathers, but more especially by the darker centres of the feathers of the back, and the peculiar purplish suffusion which in *melanoptera* is uniformly stronger and darker than in *palmarum*.—F. M. C.]

24. *Rhamphocœlus jacapa* (Linn.).—Very common.

25. *Phenicotheraupis rhodinolæma* Salv. & Godm. — [A female taken July 15, 1887, is referred by Mr. Ridgway to this species, thus extending its range from the Upper to the Lower Amazon.—F. M. C.]

[26. *Lanio atricapillus* (Gm.). — "Santarem, May 27; not common."*—F. M. C.]

27. *Tachyphonus cristatus* (Gm.).—A female taken July 15, 1887, on the 'mountain.'

28. *Tachyphonus luctuosus* Lafr. & d'Orb.—A male taken July 5, 1887, on the 'mountain.'

[Not before recorded from the Lower Amazon.—F. M. C.]

[29. *Tachyphonus melaleucus* (Sparrrm.).—A male taken by Williams, June, 1883.—F. M. C.]

30. *Lamprospiza melanoleuca* (Vieill.).—Two males taken July 15, 1887, on the 'mountain,' feeding in the tops of tall trees.

31. *Saltator magnus* (Gm.).—Common in the lowlands. Its song resembles that of our Rose-breasted Grosbeak (*Habia ludoviciana*).

32. *Pitylus grossus* (Linn.).—A female taken in some underbrush on the lowlands, August 5, 1884.

*Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 78.

[33. *Guiraca cyanea* (Linn.).—A female taken by Smith March 14, 1889.—F. M. C.]

34. *Sporophila minuta* (Linn.).—Common about meadows.

[A male taken July 1, 1887, apparently represents the fully adult plumage of this species and differs from Panama, Venezuela, and Cayenne specimens in having the head and upper back ashy gray, without olivaceous or brownish wash.—F. M. C.]

35. *Sporophila castaneiventris* (Cab.).—Common about meadows. Gregarious.

36. *Sporophila lineata* (Gm.).—Common in flocks, feeding on wild rice.

37. *Paroaria gularis* (Linn.).—Common along water courses.

38. *Sycalis columbiana* (Cab.).—Common; gregarious; song resembles that of a Canary. Observed building nests in half submerged bushes about the meadow, during June and July.

[The female, before unknown, may be described as follows: ("♀, July 16, 1884; shot on an island in the Tapajos; male shot at the same time;" coll. C. B. R.). Differing from the male, and not resembling the female of *Sycalis flaveola*. Above olivaceous ashy, forehead with an indistinct frontal band of orange yellow, feathers of the crown and back with obscure darker centres; quills blackish brown, margined externally with greenish yellow, the borders of the coverts and tertiaries having more of an ashy color; inner web of the quills whitish with slight yellowish reflections; under wing-coverts with a more evident trace of yellow; tail of the same color as the wings, the feathers externally margined with yellowish green, the under surface having slight greenish reflections; below soiled whitish, the breast with a band of pale buffy, the flanks slightly washed with yellowish, the crissum pale sulphur. Wing, 2.22; tail, 1.53; tarsus, .71; culmen, .42 in.—F. M. C.]

39. *Sycalis minor* (Cab.).—Common in large flocks about the meadows and river.

[Three specimens collected by Mr. Riker in June, July, and August, and a single one in the Smith collection taken March 1, present a large amount of variation but are evidently the same, and with some hesitation I refer them to *minor* of Cabanis. Of this form I have no examples, but should the identification be correct there can be little doubt that this bird should rank as a species, so widely does the most extreme of these four specimens differ from a series of over fifty true *arvensis* with which I have compared it. The Smith specimen more closely approaches typical *arvensis*, and agrees well with the description of *minor*, but from it we pass, through the remaining examples, by three nicely graduated steps to a specimen which below is clear, pure yellow, as are the others, but this color largely predominates above, the brownish of *arvensis* being here restricted generally to a narrow median line or shaft streak; the rump and upper tail-coverts are clear, bright yellow of the same shade as the under surface; the lesser wing-coverts are entirely greenish yellow, the median coverts widely margined with the same color.

Taken alone it is evident this bird differs too greatly from descriptions of *minor* to be identified with that species, but considering it in connection with the three remaining specimens, obviously representing different stages of the same bird, it is probable that we have here the fully adult, and before undescribed, plumage of *Sycalis minor*. The specimen described is labeled "♀ July 1, 1887;" if it be rightly sexed there can be little difference in the adult plumage of both sexes.—F. M. C.]

[40. *Gymnostinops yuracarium* (Lafr. & d'Orb.).—"Santarem."*—F. M. C.]

41. *Ostinops decumanus* (Pall.).—Common; while feeding, associates with *Cassicus persicus* in immense flocks.

42. *Cassicus persicus* (Linn.).—Common everywhere, and called by the natives 'Japim.' Hundreds of their pendulous nests are sometimes placed on one tree.

43. *Icterus croconotus* (Wagl.).—Common about meadows where it builds a pendulous nest. On account of its pleasing song it is frequently kept in captivity by the natives, who call it 'Rochinal.'

[44. *Molothrus bonariensis* (Gm.).—A male taken by Williams, May, 1883.—F. M. C.]

45. *Xanthosomus icterocephalus* (Linn.).—Common in large flocks, feeding on wild rice.

[46. *Amblycercus solitarius* (Vieill.).—There is a single specimen of this species in Mr. Riker's collection, bearing Mr. Williams's label and evidently of his make. The label, however, is without data, but the species is included here with little doubt that the specimen was taken at Santarem.—F. M. C.]

47. *Gymnomystax melanicterus* (Vieill.).—Common about the river in pairs, and known by the native name of 'Rochinal grande.' Builds a pendulous nest about three feet in length.

48. *Leistes guianensis* (Linn.).—Common about lowlands.

[49. *Cassidix oryzivora* (Gm.).—A female, taken by Williams, October 11, 1883.—F. M. C.]

[50. *Tænioptera nengeta* (Linn.).—One example without indication of sex, taken by Smith, March 13, 1889.—F. M. C.]

51. *Arundinicola leucocephala* (Linn.).—Common about meadows, building a covered nest in a partially submerged bush. A nest taken June 20, 1887, contained two eggs. I saw scores of these nests and they were invariably placed within a few inches of the nest of a large species of wasp. Owing to this peculiar association the natives call the bird 'Mother of the Wasp.'

[52. *Fluvicola albiventris* (Spix).—Two males, one taken by Williams, June, 1883, the other by Smith, March 9, 1889.—F. M. C.]

53. *Todirostrum cinereum* (Linn.).—A male taken July 14, 1884.

[54. *Todirostrum maculatum* (Desm.).—One example, without indication of sex, taken by Smith, March 16, 1889.—F. M. C.]

* Allen, Bull. Essex Inst., VIII, 8, 1876, p. 79.

[55. *Euscarthmus striaticollis* (Laf.).—One example, without indication of sex, taken by Smith, March 2, 1889. Apparently not before recorded from the Amazons.—F. M. C.]

56. *Calopteryx ornatus* Ridgw.

Calopteryx ornatus RIDGW., Proc. U. S. Nat. Mus., X, 1887, p. 519.

One example, a female, taken in the second growth on the lowlands, June 16, 1887.

57. *Mionectes oleagineus* (Cab.).—One specimen taken July 22, 1884.

58. *Ornithion napæum* Ridgw.

Ornithion napæum RIDGW., Proc. U.S. Nat. Mus., X, 1887, p. 520.

Three specimens, June and July, 1887.

59. *Tyrannulus reguloides* Ridgw.

Tyrannulus reguloides RIDGW., Proc. U. S. Nat. Mus., X, 1887, p. 521.

A single specimen taken June 30, 1887, feeding on the trees about the house, its movements resembling those of a Kinglet.

[I am unable to separate this bird from *T. elatus* (Lath.) except by its smaller size.—F. M. C.]

[60. *Elænea pagana* (Licht.).—"Santarem, June; very common."*]

[61. *Legatus albicollis* (Vieill.).—One specimen taken by Smith, February 8, 1889.—F. M. C.]

62. *Myiozetetes cayennensis* (Linn.).—One specimen taken in a clearing, August 4, 1884.

63. *Myiozetetes sulphureus* (Spix).—A female taken June 16, 1887.

[Not before recorded from the Lower Amazon. Agrees in coloration with a Guianan specimen.—F. M. C.]

64. *Rhynchocyclus ruficauda* (Spix).—A male taken June 15, 1887.

[65. *Pitangus lictor* (Licht.).—One specimen taken by Smith, February 1, 1889.—F. M. C.]

66. *Pitangus sulphuratus* (Linn.).—A male taken June 30, 1887.

[Darker and much more olivaceous than a specimen from Cayenne.—F. M. C.]

67. *Myiodynastes solitarius* (Vieill.).—Common in the lowlands, feeding on seeds and insects.

68. *Megarhynchus pitangua* (Linn.).—Common in the lowlands.

69. *Muscivora regia* (Gm.).—A male taken June 14, 1887, sitting within a few feet of the ground in a dense forest in the lowlands.

[70. *Myiarchus tyrannulus* (Müll.).

Myiarchus nigriceps ALLEN, Bull. Essex Inst. VIII, 1879, p. 79.

One example taken by Smith, March 21, 1889. On examination Mr. Linden's Santarem specimen, recorded as *nigriceps* Scl., proves to be this species.—F. M. C.]

71. *Myiarchus ferox* (Gm.).—A specimen taken June 20, 1887, on the 'mountain.'

72. *Empidonomus varius* (Vieill.).—A female taken June 30, 1887.

73. *Tyrannus melancholicus* (Vieill.).—A male taken June 6, 1887.

*Allen, Bull. Essex Inst., VIII, 8, 1876, p. 79.

[74. *Tyrannus albogularis* *Burm.*

Tyrannus niveigularis ALLEN, Bull. Essex Inst., VIII, 1876, p. 79.

A typical male of this species was taken by Mr. Williams, July 25, 1883. This capture considerably extends the range of this species, which has before been known only from the interior of Brazil. Through the kindness of Mr. William Brewster, I have been enabled to examine at the Museum of Comparative Zoölogy, a number of the Linden specimens on which Mr Allen's paper was based, and find the bird there recorded (l. c.) as *Tyrannus niveigularis* Scl. to be *Tyrannus albogularis* *Burm.*

In addition to the first example mentioned there are two other specimens collected by Mr. Williams; one mounted in Brown University, without indication of sex or date of capture, the other a skin of a male in Mr. Riker's collection, taken in June, 1883. These birds agree very closely with each other and differ so decidedly from *albogularis*, as represented by a series of 18 specimens, that for a time I had little doubt of their distinctness. Certain peculiarities in coloration, however, have led me to believe that these specimens may have been preserved in alcohol, and I therefore simply append a comparison with its nearest ally, leaving it to be decided by the acquisition of further material whether the bird is deserving of recognition. The male, taken in June, is in fresh, unworn plumage. It may be distinguished from *albogularis* at any season, by (1) the greenish olive-brown instead of olive-green back, (2) a brownish suffusion in the ashy color of the head (the crown patch remaining unchanged), (3) the hair-brown (not black or blackish) auriculars, (4) the brown in place of black wings. It is the coloration of the wings, however, which has aroused my suspicion, and while, as has been stated, the general color is brown, there is a peculiar blackish and lighter brownish mottling on some of the quills which suggests a chemical change having occurred in the coloration. This apparent abnormality is even more marked in the wings, and also the tail, of the mounted Brown University specimen. In both specimens the yellow of the underparts has evidently not been affected and agrees in color with that of *albogularis*.—F. M. C.]

75. *Milvulus tyrannus* (*Linn.*).—Common in lowlands and flooded tracts.

(*To be continued.*)

RECENT LITERATURE.

Ridgway on the Genus *Xiphocolaptes*.—Mr. Ridgway's 'Review'* of this difficult genus is based upon the material of the National Museum, supplemented by that of the American Museum of Natural History, the Boston Society of Natural History, and the Museum of Comparative

* A Review of the Genus *Xiphocolaptes* of Lesson. By Robert Ridgway. Proc. U. S. Nat. Mus., Vol. XII, 1889, pp. 1-20.

Zoölogy, and thus practically upon all of the material in this country available for study. "Somewhat to my surprise," says Mr. Ridgway, "the existence of a much greater number of clearly-defined forms than have been recognized by leading authorities soon became apparent; and a strict regard for the principles of geographical distribution and variation has left me no other resource than to describe a considerable number as new to science, even though by doing so the number of the latter exactly equals that of those which have hitherto been recognized as valid."

While he believes that more extensive collections, representing large areas in South America now practically unknown as regards this group, will considerably further increase the number of forms, it seems to him also probable "that more material will show that several of the forms now ranked as distinct species actually intergrade, thus being entitled only to trinomial instead of binomial appellations."

The range of the genus extends from southern Mexico southward to Bolivia, the Argentine Republic, and Paraguay. Of the 11 forms recognized by Mr. Ridgway the following are described as new: *Xiphocolaptes sclateri*, from southeastern Mexico; *X. emigrans costaricensis*, from Costa Rica; *X. virgatus*, habitat unknown; *X. ignotus*, from Ecuador; *X. cinnamomeus*, from Eastern Brazil; *X. major castaneus*, from Bolivia. Four additional species are included as "not seen" by the author, the exact status of which seems more or less in doubt. Several of the new forms are based on single specimens, in one case without locality, and in others on examples obviously immature. In view of our ignorance, through the absence of adequate material, of the variations dependent on age, sex, and season among Dendrocolaptine birds, Mr. Ridgway appears to have taken a rather bold position in reference to the present group.—J. A. A.

Ridgway on the Genus *Sclerurus*.—The equally difficult genus *Sclerurus* has also recently passed under Mr. Ridgway's critical notice.* This genus has about the same geographical distribution as *Xiphocolaptes* and about the same number of forms, as determined by Mr. Ridgway, who recognizes, in the present paper, ten species of *Sclerurus*. Of these one (*S. lawrencei*, from "Bahia") is described as new, and a Maximilian name is revived for another, Wied's *Tinactor fuscus* being considered as in part (the female) referable to *S. umbretta* (Licht.), and in part (the male) to a new form, for which Wied's name is retained. Heretofore Wied's *Tinactor fuscus* has been synonymized with *S. umbretta* (Licht.). Mr. Ridgway gives the habitat of *S. fuscus* as "Upper Amazons," but there is apparently no good reason for supposing the locality of either of Wied's specimens to have been other than southeastern Brazil. In his MS. Catalogue the locality and source of both these specimens are given as "Brasilien, M. R." (= meine Reise).† The remarks made

* A Review of the Genus *Sclerurus* of Swainson. By Robert Ridgway. Proc. U. S. Nat. Mus., Vol. XII, 1889, pp. 21-31.

† Cf. Bull. Am. Mus. Nat. Hist., Vol. 11, p. 242.

above respecting the meagreness of our knowledge of the variations in *Xiphocolaptes* depending upon age, sex, and season, apply with even greater emphasis to the present group, specimens of which are so hard to procure that no very large series of any form is as yet available for study.—J. A. A.

Ridgway on Birds from the Galapagos Islands, the Abrolhos, the Island of Santa Lucia, and from the Straits of Magellan.—Mr. Ridgway has published two papers on the birds collected during the recent cruise of U. S. Fish Commission Steamer 'Albatross,' from New York around Cape Horn to San Francisco, California, the first* treating of the birds obtained at the Galapagos Islands. This collection is of special interest, as containing birds from two islands of this peculiarly interesting group from which no birds had previously been collected. Specimens of 47 species were obtained, including ten species not previously reported from the Galapagos Archipelago, eight of which are described as new. An annotated list of the species is given, followed by a tabular list of all the 69 species thus far found among these islands, showing their distribution among the different islands, with also special lists for each island, and the authorities on which their occurrence rests. The paper is thus an epitome of our present knowledge of the ornithology of this "classic ground."

A new genus, *Nesomimus* (type *Mimus melanotis* Gould), is provided for the peculiar Mimine birds of the Galapagos Islands, and the following new species are characterized: (1) *Nesomimus macdonaldi*, Hood Island; (2) *N. personatus*, Abingdon Island; (3) *Certhidea cinerascens*, Hood Island; (4) *Geospiza conirostris*, Hood Island; (5) *G. media*, Hood Island; (6) *Cactornis brevirostris*, Chatham Island; (7) *Camarhynchus townsendi*, Charles Island; (8) *C. pauper*, Charles Island; (9) *Poecilonetta galapagensis*, Charles Island. Two specimens of the rare *Creagrus furcatus* were obtained at Chatham Island, showing *Creagrus* to be, in Mr. Ridgway's opinion, one of the best characterized genera of the Larinæ. A single specimen of *Sula gossi* was collected at Chatham Island, and a specimen of *Hæmatopus galapagensis* from James Island.

From the above showing, says Mr. Ridgway, it is evident "that the avifauna of the Galapagos Archipelago is by no means exhausted as a field of promising research in the problem of the 'derivative origin of species.' Future exploration will no doubt add new species and extend the range of those already known. The largest island of the group, Albemarle, is still almost untouched; . . . two islands (Wenman and Culpepper) have not been explored at all, while it can be safely said that on none of the islands has anything like a thorough investigation of the bird-fauna been made."

* Scientific Results of Explorations by the U. S. Fish Commission Steamer Albatross. No. I. Birds collected on the Galapagos Islands in 1888. By Robert Ridgway. Proc. U. S. Nat. Mus., Vol. XII, 1889, pp. 101-128.

The collection made at the Island of Santa Lucia, West Indies,* numbers 15 species. Of seven specimens of *Cœreba martinicana*, Mr. Ridgway says four have the superciliary stripe wholly white, and three bright yellow passing into white anteriorly, thus showing that his *Certhiola finschi* is untenable.

The collection from Abrolhos Islands numbers only five species, all water birds. The Straits of Magellan collection numbers 66 species, and includes a number of specimens of special interest. A species of *Geositta* is provisionally described as new (*G. longipennis*), its nearest ally being *G. antarctica* Landb. A specimen of *Upucerthia* forms the basis of a new species (*U. propinqua*), allied to *U. dumetoria*. Two examples of *Nycticorax* lead to the recognition of *N. obscurus* Bon. as a good species, it having before been merged by Mr. Ridgway with *N. nycticorax naevius* under the erroneous supposition that alleged specimens of *N. obscurus* he had examined were the true *N. obscurus*, which now proves not to have been the case.

For the bird usually called *Phalacrocorax brasilianus* (Gm.), Mr. Ridgway adopts the name *P. vigua* (Vieill.), he considering Gmelin's bird unidentifiable. He finds *P. vigua* to be closely allied to *P. mexicanus*, the latter seeming to be "simply a smaller intertropical race of *P. vigua*, in which case it should be called *P. vigua mexicanus*."

The 'Albatross' collection was made by Prof. Leslie A. Lee, naturalist of the expedition, assisted by Mr. Charles H. Townsend and Mr. Thomas Lee.—J. A. A.

Chapman on the Genus *Xiphorhynchus*.—In a paper of nine pages, recently published in the 'Bulletin' of the American Museum of Natural History, † Mr. Chapman reviews the Dendrocolaptine genus *Xiphorhynchus*, his work being based on the combined material representing this group contained in the museums of Cambridge, Boston, New York, and Washington, including the types of Lafresnaye's species in the Museum of the Boston Society of Natural History. Nine species are recognized, of which two are described as new, namely, *X. dorsoimmaculatus* (habitat "Cayenne?"), and *X. rufodorsalis* (ex Corumba, Brazil). *X. venezuelensis* Lafr. MS. is also for the first time described; *X. falcularius* (Vieill.) is disentangled from *X. procurvus* auct. (nec Temminck), with which it has been confounded, and various manuscript names of Lafresnaye's are duly allocated by an examination of Lafresnaye's types.—J. A. A.

* Scientific Results of Explorations by the U. S. Fish Commission Steamer Albatross, No. 11. Birds collected on the Island of Santa Lucia, West Indies, the Abrolhos Islands, Brazil, and the Straits of Magellan, in 1887-88. By Robert Ridgway. Proc. U. S. Nat. Mus. Vol. VII, 1889, pp. 129-139.

† A Review of the Genus *Xiphorhynchus* Swainson, with Descriptions of two new species. By Frank M. Chapman. Bull. Am. Mus. Nat. Hist., Vol. II, pp. 153-162. (Published July 5, 1889.)

Berlepsch on some Neotropical Birds in the U. S. National Museum.—In a paper in the 'Proceedings' of the U. S. National Museum * Count von Berlepsch publishes his determinations of various specimens submitted to him for examination. They represent 28 species of Hummingbirds; and 6 species of Passerine birds, the specimens of the latter being types of species described by Mr. George N. Lawrence. The paper comprises much interesting comment on questions of nomenclature and the status of alleged species. *Uranomitra quadricolor* Elliot (*nec* Vieillot) is named *U. ellioti*.—J. A. A.

Stejneger on European Titmice.—Dr. Stejneger, in a paper on the European Marsh-tits, † finds three forms of Marsh-tits in the Scandinavian Peninsula, one of which, *Parus colletti*, he describes as new. The relationship of the three forms is considered at length. In a paper on the European Crested Titmice, ‡ he finds the Scandinavian form separable from that of central Europe. To the former he restricts the name *Parus cristatus* Linn., and adopts *Parus mitratus* Brehm for the form of central Europe, which may, he says, prove to be only a geographical race of *P. cristatus*.—J. A. A.

Stejneger on Hawaiian Birds.—Two additional § collections received at the U. S. National Museum from Mr. Valdemar Knudsen form the basis of two recent papers by Dr. Stejneger. The first || contains extended comment on 10 species of water birds, one of which, *Puffinus knudseni*, is described as new. *Anas wyvilliana* is described at length, and its relationships defined, its nearest affine proving to be *A. aberti* Ridgw. of northwestern Mexico, as previously pointed out by Mr. Ridgway.

The collection treated in the second paper ¶ was made wholly in the island of Kauai, and numbers about 20 species, of which about one-half are land birds. *Oreomyza wilsoni* is described as new. Further material shows that *Puffinus knudseni* is not separable from Mr. Salvin's *P. cuneatus*, described only a few months before *P. knudseni* was published.—J. A. A.

* Notes on some Neotropical Birds belonging to the United States National Museum. By Hans von Berlepsch. Proc. U. S. Nat. Mus., 1888, pp. 559-566. (Published Sept. 20-25, 1889.)

† Notes on European Marsh-tits with Description of a new Subspecies from Norway. By Leonhard Stejneger. Proc. U. S. Nat. Mus., 1888, pp. 71-76. (Published Mar. 8, 1888.)

‡ Notes on the European Crested Titmice. By Leonhard Stejneger. *Ibid.*, pp. 113-114.

§ See Auk, Vol. V, p. 196.

|| Further Contributions to the Hawaiian Avifauna. By Leonhard Stejneger. Proc. U. S. Nat. Mus. 1888, pp. 93-103. (Published Nov. 8, 1888.)

¶ Notes on a Third Collection of Birds made in Kauai Hawaiian Islands, by Valdemar Knudsen. By Leonhard Stejneger. *Ibid.* Vol. XII, pp. 377-386. (Published March 8, 1890.)

Stejneger's 'Review of Japanese Birds.'—Parts VIII * and IX † of Stejneger's 'Review of Japanese Birds' treats of the Nutcracker and the Wrens. In the first the synonymy, number, and relationships of the forms of the Nutcracker are considered at length. Two forms, a slender-billed eastern (*Nucifraga caryocatactes*), and a thick-billed western (*N. macrorhynchos*), are recognized, in accordance with the published conclusions of Dr. Blasius and V. von Tschusi-Schmidhoffen, as opposed to those of Mr. Seebohm. In the second paper two forms of Japanese Wrens are distinguished, namely, *Troglodytes* (*Anorthura*) *fumigatus*, inhabiting Japan proper, and *T. f. kurilensis* (subsp. nov.) from the Kurile Islands. —J. A. A.

Stejneger and Lucas on Pallas's Cormorant. ‡—While the extinct Great Auk of the North Atlantic has formed the subject of numerous papers, including several voluminous monographs, and is represented in museums by about 80 skins, 70 eggs, and "countless bones," the great extinct Pallas's Cormorant (*Phalacrocorax perspicillatus* Pall.) of the North Pacific is comparatively little known, a good detailed description of it being first printed in the present paper, from the original manuscript of the late Professor Brandt of St. Petersburg. So far as known, according to Dr. Stejneger, the only remains of the bird extant are two excellent fully adult specimens in the Museum of the Imperial Academy of Sciences of St. Petersburg, another in the British Museum, a fourth in the Leyden Museum, and a few bones (including the principal parts of the skeleton) in the United States National Museum, the latter collected by Dr. Stejneger on Bering Island. The only locality where Pallas's Cormorant has been seen within historic times was at Bering Island, where Steller found it, in 1741, in great numbers; but it appears to have been wholly exterminated during the following century, mainly by man's agency. Though not flightless, like the Great Auk, it was of heavy build and of slow locomotion, in the air as well as on land, and thus fell an easy prey to the natives of the island, who used it for food during the long winters.

A large colored plate of the British Museum specimen, by Wolf, is given by Elliot in his 'Birds of North America,' and the same specimen is figured by Gould in the Zoölogy of the Voyage of the Sulphur. These, with a few wood-cuts, comprise the published illustrations of the species.

As already intimated, the only bones of this species extant in museums are those collected by Dr. Stejneger, in 1882, at Bering Island. These comprise the rostral portion of a cranium, a lower mandible and the right ramus of another, two nearly complete sterna, three nearly perfect pelves, various limb bones, and a few vertebræ. Detailed descriptions of them,

* Review of Japanese Birds. VII.—The Nutcracker (*Nucifraga caryocatactes macrorhynchos*). By Leonhard Stejneger. Proc. U. S. Nat. Mus., 1888, pp. 425-432.

† IX. The Wrens., *Ibid.*, pp. 547-548.

‡ Contributions to the Natural History of the Commander Islands. X.—Contributions to the History of Pallas' Cormorant. By Leonhard Stejneger and Frederic A. Lucas. Proc. U. S. Nat. Mus., Vol. XII, pp. 83-94, pls. ii-iv. (Published Feb. 5, 1890.)

with figures, are given by Mr. Lucas, who compares them with the corresponding parts of *Phalacrocorax carbo*, *P. urile*, and *P. dilophus*. Mr. Lucas finds *P. perspicillatus* "to have been a much heavier bird than *P. carbo*, and a bird of weaker flight; with more robust and muscular legs, and a more slender and more feeble head and neck."—J. A. A.

Lucas on the Osteology of the Thrushes and Wrens.*—Mr. Lucas concludes "that the Miminæ hold a somewhat intermediate position between the Wrens and Thrushes, and if the characters described are of sufficient value to be considered *family* characters (which is extremely doubtful) each of the groups under consideration seems to have equal right in that respect.

"The Wrens, as represented by the species in hand, form a harmonious group, agreeing very closely with one another in their osteology, and presenting some well-marked distinctive characters.

"The Thrushes also, when compared with the Wrens, present well-defined characters, and while differing among themselves more than do the Wrens, these differences are nevertheless very slight.

"Aside from *Galeoscoptes*, the Miminæ are fairly well marked, having a very characteristic shape to the maxillo-palatine process. This maxillo-palatine is so entirely different from that of the Wrens that from what little experience I have had I should hesitate to unite two groups so dissimilar in this respect. On the other hand, *Galeoscoptes* has such decided leanings toward the Thrushes, not only in its skull, but in other portions of the skeleton, that it would seem to connect them with the Miminæ. Be this as it may, *Galeoscoptes* is certainly nearer to the Thrushes than any other member of its group, while *Harporhynchus* seems to be the farthest removed."

It would thus seem that the position of the Miminæ as a subfamily of the Turdidæ was more in accordance with the osteological characters of the Miminæ than is its present position among the Troglodytidæ. "In fact," says Mr. Lucas, "it seems more and more clear that the Miminæ should not be included in the very sharply defined family Troglodytidæ." On the other hand, he believes that the true affinities of both *Chamaea* and *Certhia* are with the Wrens.

Mr. Lucas's important paper is illustrated with figures of the skull, sternum, and pelvis in *Merula*, *Campylorhynchus*, and *Harporhynchus*.—J. A. A.

Shufeldt on the Osteology of the Ardeinæ.†—This paper contains a detailed description of the osteology of *Ardea herodias* and *Nycticorax violaceus*, with excellent figures of the principal parts of the skeleton in

* Notes on the Osteology of the Thrushes, Miminæ, and Wrens. By Frederic A. Lucas. Proc. U.S. Nat. Mus., 1888, pp. 173-180.

† Osteological Studies of the Subfamily Ardeinæ. By R. W. Shufeldt, M. D., C. M. Z. S. Journ. Comp. Med. and Surg., July and October, 1889. (Separates repaged.)

these two forms, as well as of some bones of *Ardea candidissima*. The paper concludes with a 'Synoptical and Comparative Review of the chief Osteological Characters of certain species of North American Ardeinæ. —J. A. A.

Shufeldt on the Relationships of the Genus *Chamæa*. *—Upon a careful comparison of the structure, external and internal, of *Chamæa* with a variety of more or less closely allied forms, Dr. Shufeldt finds its closest agreement to be with the genus *Psaltiriparus*, and that it thus has distinctly Parine rather than Troglodytine affinities. The principal forms with which comparisons were made are, among Wrens, the genera *Thryothorus*, *Salpinctes*, *Campylorhynchus*, and *Cinnicerthia*; among Tits, the genera *Parus*, *Lophophanes*, *Psaltiriparus*, *Ægithaliscus*, and *Auriparus*; among other birds, the genera *Certhia*, *Regulus*, *Poliophtila*, *Accentor*, etc. He first compares in detail their pterylography and topographical anatomy, and then their osteology and more or less their visceral anatomy. Figures of the skulls are given of eight species, including of course *Chamæa*. In the totality of its characters *Chamæa* is found to be much more closely related to the Bush-Tits than to any of the Wrens, unless it be the South American genus *Cinnicerthia*, which, however, is known to Dr. Shufeldt only from an examination of skins and plates representing its external characters. The last-named genus he conjectures, we fear without just grounds, may have, like *Chamæa*, Parine affinities. His passing remarks on *Perisoreus* are of interest, as showing that while in its external characters it so strongly recalls the Tits, it is essentially a Garruline bird, a comparison of the skeleton of *Perisoreus* with that of *Parus* at once dispelling the resemblance suggested by the external characters.—J. A. A.

Shufeldt's 'Studies of the Macrochires'.—Under this title† the author treats at some length several forms not belonging to the group of Macrochires, as *Ampelis cedrorum* (pp. 306-318), *Trogon mexicanus* and *T. puella* (pp. 318-338), and the North American Hirundinidæ (pp. 352-355) the latter with special reference to their relationship to the Swifts. *Ampelis*, as shown by Garrod, may be regarded as "an average Oscinine bird," with, says Dr. Shufeldt, "here and there in its economy traces of a Clamatorial type, such as is shown by its free lachrymal bone and a few other minor points." It apparently has no close morphological relationship with the Hirundinidæ. In the present memoir it was chosen on account of its average Passerine character for comparison with the other forms treated.

* On the position of *Chamæa* in the System. By R. W. Shufeldt. Journ. of Morph., Vol. III, No. 3, pp. 475-502.

† Studies of the Macrochires, Morphological and otherwise, with the view of indicating their Relationships and defining their several Positions in the System. By R. W. Shufeldt, M. D., C. M. Z. S., Captain, Medical Corps, U. S. Army (communicated by W. K. Parker, F. R. S., F. L. S.). Journ. Linn. Soc., Zoölogy, Vol. XX, pp. 299-394 pl. xvii-xxiv. (Published Oct., 1889.)

The Trogons are found, as would be expected, to be widely separated from the Caprimulguine forms and the Hummingbirds, and to have no very close relationship with either the Cuckoos or the Kingfishers.

The Swallows are considered as a specialized group of Passeres, considerably modified through "physiological adaptations of structure."

As regards the general conclusions reached respecting the Macrochires, Dr. Shufeldt contends that the Caprimulguine birds are so far removed in structure from all other birds that they should rank as a separate order, the Caprimulgi, with the Owls as their nearest kin, and as having "no special affinity with the Cypseli, much less with the Trochili." He proposes also to give the Swifts the rank of an order, Cypseli. "This order, were it represented by a circle, would be found just outside the enormous Passerine circle, but tangent to a point in its periphery opposite the Swallows." He still contends strongly for the ordinal rank of the Trochili. In comparing the two groups, Swifts and Hummingbirds, he claims that they "have been associated together upon an entirely false system of classification, which assumed first, that they are alike in their wing-structure—a resemblance which I have shown to be purely *superficial*; secondly, that they both have an unnotched sternum, although physiological law demands it, and when associated with an entire organization that widely differs from that of another form which may happen to possess an unnotched sternum, it means nothing so far as affinity is concerned. This becomes the more evident when the sterna themselves are fashioned upon essentially different plans, as is the case in the Cypseli and Trochili."

The seven lithographic plates illustrating the present memoir give the pterylosis, skull, and other parts of the anatomy of *Ampelis cedrorum*, *Antrostomus vociferus*, and *Trochilus calliope*, and the skull and skeleton of *Trogon mexicanus*, the skulls of *Phalacroptilus nuttalli*, *Micropus melanoleucus*, several species of *Trochilus*, *Progne subis*, *Chelidon erythrogaster*, *Tachycineta thalassina*, *Tyrannus verticalis*, etc., and side views of the plucked bodies of *Micropus melanoleucus*, *Chætura pelagica*, and *Trochilus platycercus*.—J. A. A.

Shufeldt on the Osteology of the North American Passeres.*—In this paper the osteology of the leading types of the North American Passeres is reviewed, followed by a re-arrangement of the families in accordance with the author's conclusions. The skeletal characters of *Myadestes* prove to be eminently Turdine. Good cranial characters are found for the constitution of *Lophophanes* as a full genus. The families recognized are the same as those of the A. O. U. Check-List, with their limits the same, but the order of succession is radically changed, without, we fear, in some instances at least, very obvious improvement, even granting that

* Contributions to the Comparative Osteology of Families of the North American Passeres. By R. W. Shufeldt, M. D., C. M. Z. S. Journ. of Morph., Vol. III, No. 1, June, 1889, pp. 81-112, pll. v, vi.

the Corvidæ and the 'conirostral' series of families generally are better placed at the upper than at the lower end of the Oscinine series.

It is, indeed, doubtful whether any very final conclusions can be based on a consideration confined almost wholly to forms represented in North America, or without a pretty intimate knowledge of exotic types. Although such intimately related and practically inosculating groups as the Tanagridæ and Mniotiltidæ are separated in the new arrangement by the interpolation of such diverse forms as the Cinclidæ, Troglodytidæ, etc., we do not see that any new light is thrown upon their complex relationships. Such inferences as may be drawn from the color of the eggs, the similarity of the plumage, or otherwise, between young birds and their parents, the presence or absence of a rudimentary tenth primary, have of course more or less significance within narrow limits, but obviously fail as a test of affinity in any general sense. While the new classification is based mainly upon osteological characters, much stress is properly laid upon the size of the brain; and perhaps too much, here and there, on rather trivial characters.

The two plates accompanying the paper contain 26 figures, illustrating the cranial characters of 23 species.

Other recent papers on avian anatomy by Dr. Shufeldt are 'Notes on the Anatomy of *Speotyto cunicularia hypogæa*,'* and a paper entitled 'Progress in Avian Anatomy for the years 1888-1889,'† the latter read at the last meeting of the American Ornithologists' Union (see Auk, VII, p. 68). —J. A. A.

Maynard's 'Eggs of North American Birds.'‡—Mr. Maynard's work was issued in nine parts, mostly during the year 1889. As about 1000 species and subspecies are treated in less than 160 pages of rather open text, the descriptions are necessarily brief and general. The ten plates contain about eighty figures, intended to represent "type eggs, not of groups of birds, but of types of the forms and patterns of coloration of North American eggs." The text is generally good so far as it goes, being limited to a statement of the number of eggs, their color (in general terms) and size, the breeding range and season of breeding, the whole usually condensed into about four to six lines of long primer type, on a rather narrow page. The arrangement, numeration, and nomenclature are, with slight exceptions, the same as in the A. O. U. Check-List; a few species being included which are not recognized by the A. O. U. Committee in making up the Supplements to the Check-List.

The work is fairly free from typographical errors, though not a few grievous ones occur, which the author laments, and partly corrects, in

* Journ. of Morphology. Vol. III, 1889, pp. 115-125, pl. vii. •

† Journ. Comp. Med. and Vetern. Arch., Jan. 1890.

‡ Eggs | of | North American Birds | by | Chas. J. Maynard. | Illustrated | with ten hand-colored Plates. | — | Boston: | De Wolfe, Fiske & Co. | 1890.—8vo., pp. iv + 159.

his Appendix. Whether the grouping of the Orioles and Blackbirds under the family "Sturnidæ," or the uniform substitution of *Chordeiles* for *Chordeiles* are to be regarded as typographical accidents, or an expression of the author's preferences, is not evident.—J. A. A.

Bryant's 'Catalogue of the Birds of Lower California.'*—This paper is based primarily on the author's experience during two visits of several months each in 1888 and 1889 to Lower California, where he spent his time on the western coast near Magdalena Bay, and in travelling on horseback through the interior. His own observations are supplemented by notes furnished by Messrs. L. Belding and A. W. Anthony, and he has also availed himself of the literature bearing on the subject in order "to embrace the known avifauna of the entire peninsula and adjacent islands." Mr. Bryant begins his paper with an introduction of a dozen pages chiefly a narrative of his own and others' explorations, but including, too, a bibliographical list of twenty-four previous publications relating to the region. He then gives an annotated list of 320 species and subspecies of which 215 are land birds. The annotations usually are brief, and relate chiefly to the distribution and times of occurrence of each species. Occasionally there are extended biographical notices of much interest, as in the cases of *Phalacrocorax dilophus albociliatus*, *Pelecanus californicus*, and *Fregata aquila*. The paper is accompanied by a sketch map of Lower California, showing the places visited by Mr. Bryant. This map, however, does not appear with the author's extras. Mr. Bryant deserves thanks for having brought together so much valuable information about the ornithology of a region of which we have long had but a shadowy knowledge.—C. F. B.

Anthony on New Birds from Lower California.†—The birds here described were collected by Mr. Anthony and Mr. C. H. Townsend, in April and May, 1889, in the San Pedro Mountains in Lower California, situated about one hundred and fifty miles south of the United States, and about midway between the Pacific Ocean and the Gulf of California. The mountains form a series of small ranges having an altitude of 8000 to about 12,000 feet. The birds described as new are the following: (1) *Oreortyx picta confinis*, (2) *Aphelocoma californica obscura*, (3) *Junco townsendi*, (4) *Sitta pygmaea leuconucha*, (5) *Sialia mexicana anabelæ*. The first four, so far as known, are restricted to the region in question; the habitat of the last (*Sialia m. anabelæ*) includes also Mt. Lassen, in Northern California, Genoa, Utah, and Puget Sound. While the first four have

* A Catalogue of the Birds of Lower California, Mexico. By Walter E. Bryant. Proc. Cal. Acad. Sci., Ser. 2, Vol. II, pp. 237-320. With map.

† New Birds from Lower California, Mexico. By Alfred W. Anthony, Proc. California Acad., 2d. Ser., Vol. II, 1889, pp. 73-82.

been admitted to the A. O. U. Check-List (see Auk, VII, pp. 60-66), the *Sialia* has been considered by the A. O. U. Committee as an inconstant phase of *S. mexicana*, which latter Mr. Anthony also found in the San Pedro Mountains, but which he believed was represented merely by migrants on their way to more northern breeding grounds.—J. A. A.

Sennett on Bird Legislation.—An address on 'Bird Legislation,' by Mr. George B. Sennett, read before the State Board of Agriculture of Pennsylvania at the Annual Meeting of the Board for the year 1889, has been recently published.* In reviewing the general subject, the importance of knowing our birds thoroughly in respect to their food habits is duly set forth; a succinct history of the work thus far accomplished is given, and the present methods of investigating this important subject are fully explained. This is followed by a discussion of what sort of legal protection is necessary, and the submission of a draft of 'An act for the Protection of Birds, their Nests, and Eggs,' modeled after the New York law devised by the A. O. U. Committee on Bird Protection, of which Mr. Sennett is Chairman. It is a pleasure to know that a statute in substantial agreement with the one here submitted was later enacted by the Pennsylvania Legislature. The various methods of placing a check upon the increase of the European House Sparrow are discussed at length, and important suggestions are given. A State bounty for the destruction of these birds is shown to be impracticable. The appointment of a State ornithologist is urged, a part of whose duties shall be a systematic effort, under an appropriation of money by the State, to exterminate the Sparrow pest.—J. A. A.

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* Bird Legislation. By Hon. George B. Sennett, Erie, Pa. Report of the Board of Agriculture of Pennsylvania, for 1889. Pp. 12 (separates repaged).

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GENERAL NOTES.

Black Guillemot in Connecticut.—Through the kindness of Mr. Gurdon Trumbull, I received in the flesh a male *Cepphus grylle* taken at Stony Creek, Conn., in December, 1887. So far as I know there is no previous record of this species for the State.—JOHN H. SAGE, *Portland, Conn.*

The Widgeon (*Anas penelope*) near Baltimore, Md.—February 25, 1890, on the property of The Carroll's Island Club, Baltimore County, Md., Mr. Wm. Carpenter killed one of this species from a bunch of Baldpates. This bird has been mounted and is for the present in my care.—L. S. FOSTER, *New York City.*

The King Eider (*Somateria spectabilis*) at Brunswick, Ga.—I have been so fortunate as to secure two fine specimens of the King Eider, both of which I shot at the mouth of the Altamaha River. The first, a male, was taken April 25, 1890, and was alone. The other, also a male, was shot from a flock of seven, four males and three females, on May 5. All were rather tame and unsuspicious until shot at once, but I was unable to get near them again. The flesh of the two captured was found to be tender and delicious, with no fishy taste. The stomachs contained a few small shell-fish and some vegetable matter.—W. W. WORTHINGTON, *Shelter Island, N. Y.*

The Snow Goose (*Chen hyperborea nivalis*) on the Coast of Maine.—About the middle of last April I received a Snow Goose in the flesh that had been shot April 7 on Heron Island, at the mouth of the Kennebec River, by Mr. E. A. Morse, of Phippsburg, Maine. The bird was a female in good condition but not fat. Mr. Morse writes me that it had been seen about there for three days before it was shot. It never went outside on the open ocean, but stayed on the marsh or in some pond. It alighted one day with a flock of Wild Geese, but they appeared afraid of it, and it did not stay with them. Except in this instance it was always alone. It was very shy and wild, but would not leave the neighborhood.

There are some half-dozen published records of the capture of Snow Geese in New England, but unfortunately they are by no means explicit as to whether the specimens were of this form or of the smaller Western race, *C. hyperborea* proper. A point of interest is that they were all taken in the autumn or early winter.—C. F. BATCHELDER, *Cambridge, Mass.*

Former Abundance of the Wild Pigeon in Central and Eastern New York—During the early years of my boyhood Wild Pigeons abounded in great numbers in central New York. One case in particular I well remember in the spring of, I think, 1835. The southeastern part of the township of New Hartford, Oneida Co., N. Y., became for several days their feeding grounds. This region abounded in beech forests, upon the nuts of which trees they delighted to feed. For several days, beginning with the early dawn and extending to near the middle of the forenoon, the flight of these birds was almost incessant, and in the afternoon and evening their return was equally as phenomenal; their roost was reported as being in the town of Norwich, Chenango Co., a distance of about fifty miles. The flocks were so large and numerous that they appeared almost more like clouds, and during the most active part of the time many flocks would be in sight from any one point of observation. Their flight was also very low, probably owing to the close proximity of their feeding grounds, and caused the noise from their passage over our heads to be very perceptible, resembling the rushing sound of a heavy wind. Many of the smaller flocks would fly so low, that it induced the workmen from a neighboring machine-shop to try to kill them by striking among them with long poles; this failed, however, for some time, as the flocks simply parted and al-

lowed the pole to pass through without hitting any or the birds. After a time my father suggested that they strike in the direction of the flight, when, the birds being unable to see the pole, many of them were destroyed in this manner. I well remember my brother and myself standing in the garden, watching them as they passed over our heads, and throwing our caps at them, which would pass through the parting ranks without hitting a bird, the gap being closed again almost instantly, and not seeming to check their rapid passage in the least.

Many of the people in the vicinity employed nets to catch them. Going into the woods where they alighted in the quest of food, a spot of ground was prepared, the net set so as to be thrown over the spot by the rebound of a young sapling placed so as to be strongly bent under tension which when relieved would instantly carry the net over the prepared area. A living Pigeon, having been caught and a cord fastened to it, was allowed to fly into the air on the approach of a flock, when, on being drawn back to the ground, its cry would attract them, and they would follow and settle on the prepared ground where food had been scattered. Then the net was thrown across, and large numbers entrapped. A farmer, Mr. Oxford, whose farm was within their feeding ground and whose newly sown fields they were injuring, obtained my father's net in the morning, and by night, with the aid of his two sons, had a pile of dead pigeons which would have made more than one wagon load. The Indians from a distance came and camped in the vicinity, procured vast numbers of them, salted and packed them in barrels, and carried them away in quantities.

At a still later period, in the early sixties, on the mornings of two or three consecutive days, large numbers of Wild Pigeons passed up the Hudson Valley crossing over the City of Albany. One of these mornings the flocks were uncommonly large. Three in particular which passed northward in quick succession, so that all were in sight at the same time, were so large and dense that the shadow cast on the ground as they passed was like the shadow of a passing cloud, being easily perceptible. The Hudson Valley at this point from the level of the plateau on the west to Cantonment Hill on the east, must be two and a half miles or more in width. Standing on the crest of the hill to the south of the city, the east and west extremities of each of these three flocks were invisible, although they were at a great height; the ends dwindled away in the distance, appearing only as a faint shadow. I noticed a few days after in the newspapers a statement that there was an unusually large 'pigeon roost' near Fort Edward, N. Y.—R. P. WHITFIELD, *New York City*.

Harlan's Hawk.—I am pleased to notice that Mr. Ridgway has concluded (*Auk*, Vol. VII, p. 205) that *Buteo harlani* is only a variety of *B. borealis*. Thus far so good, but I think that in the near future the species '*harlani*' will be entirely disposed of and no attention whatever be paid to the singular coloration spoken of, which, at least in the specimens I have secured here, particularly in the fall, have shown its strong melanistic character. I have not the opportunity now to refer to specimens or notes but write from memory only.—D. H. TALBOT, *Sioux City, Iowa*.

Habits of the Barred Owl.—The first paragraph of the interesting article by Mr. Bolles in the April number of 'The Auk,' would leave the general reader under the impression that the Barred Owl (*Syrnium nebulosum*) defends its nest and young by attacking the intruder. My own experience would lead me to conclude that it is a very timid bird. I have collected many sets of their eggs, and have frequently climbed to the nests to examine their young, and in no case have I ever been attacked by the parent birds. They usually fly away at the approach of the collector, and remain away until he leaves the vicinity. If the nest contains young, they make demonstrations of cries and snapping of bills from the safe shelter of a neighboring tree. I have known them to fly toward me snapping their beaks, until within a few yards, but they were careful not to come very near. I have never been attacked or seen other persons attacked by any species of Owl in defense of its nest, except when the Owls were in confinement. I once experienced great difficulty in getting a set of eggs from a cage containing three Great Horned Owls.—D. E. LANTZ, *Manhattan, Kansas.*

Phalænoptilus nuttalli nitidus Breeding in Kansas. Is it a Valid Race or a Color Phase of *P. nuttalli*?—Since the publication of the A. O. U. Check-List, two varieties of the Poor-will have been added to the list, the Frosted and Dusky. Of the latter I have no personal knowledge. Its habitat—as given by the describer—is different from that of the Frosted, and if constant in the coloration of its plumage, it is doubtless a valid race. The home of the Frosted Poor-will, however, as far as known, is about the same as that of the Poor-will, and the few specimens of each that I have examined do not differ materially in size, and I am impressed with the thought that it is possible the Frosted may prove to be a dichromatic phase, similar to the case of the Screech Owl (*Megascops asio*), and not a bleached race, as it is now regarded. I therefore call attention to the matter. But, be that as it may, it now stands as a distinct race, and so anything relating to its nesting habits will be of interest. I therefore take pleasure in saying that Mr. Eben M. Blachly, of Leonardville, Riley County, Kansas, kindly loaned me for identification a set of eggs, together with the skin of one of the parent birds (I regret that he did not capture its mate), which proved to be of this variety. The bird and eggs were collected in the vicinity of Leonardville, June 26, 1889. The eggs two in number, were laid upon the bare ground, under a bunch of grass, upon the prairie, near the edge of a cornfield. In color they are white. In form they are oval or rounded elliptical, the small end nearly as obtuse as the larger. They measure 1.05 X .79, and 1.03 X .78. They do not differ from the eggs of the Poor-will; this, however, would be expected, for even if the former is a valid race, the eggs might be expected to be alike.—N. S. Goss, *Topeka, Kansas.*

Food and Habits of the Ruby-throated Hummingbird.—On June 5, 1888, I secured a nest, containing one young bird and an egg on the point of hatching, of the Ruby-throated Hummingbird. The nest is a

very peculiar one, being constructed upon one of the preceding year, and in a very conspicuous situation upon a branch of sycamore, which inclined at an angle of 45° . It was about twelve feet from the ground, on the lowest branch (a dead one), with no foliage whatever to afford concealment, and could be readily seen from a distance of sixty to seventy-five feet in any direction.

The old nest is much the worse for wear, having passed through at least one winter; the new one was built partly on one edge of this and partly on the adjoining branch, leaving fully one-half of the distorted cavity at the base exposed. The entire external surface of both is covered in the usual way with lichens, although not in any way resembling the smooth, mottled surfaces adjoining. It would seem that the scenes of bygone associations have some permanent attractions, even though comparatively barren to our eyes.

Perhaps the most interesting facts were brought to light when the young one, about two days old, was examined. Its throat being much distended, I sought the cause by lightly pressing with a dull instrument from the thorax toward the bill, and succeeded in bringing to light, *sixteen* young spiders of uniform size. These measured about .11 of an inch in length, and with outspread legs covered a circle of .26 of an inch in diameter. Dissection revealed a pulaceous mass of the same in the stomach, but no more liquid than would result during digestion of insects of this gelatinous character. They were all of the same species, and may have been young found about certain plants in the immediate vicinity. It is surprising that young Hummingbirds of this age could thrive, as it would seem, entirely upon insects, although the quality be of the finest.

Although I spent several hours watching this nest, on different occasions, no food was brought at such times, but the actions of the female, as seen through a strong field glass at short range, were decidedly interesting. The approach to the nest was as usually described in about one third of the records—*i. e.*, directly to a point over and close to the nest, then dropping lightly into it. The general method, however, was by a dashing flight to within twelve or fifteen feet, a sudden pause while poised in the air, anxiously looking about her, then one or two feet further, another pause with the same manœuvres, to be repeated until at last, she dropped into the nest as ordinarily. This entire procedure occupied less than ten seconds. A few times she seemed to fly directly *into* the nest without any preliminaries.

Just after settling in the nest, she had a habit of occasionally completely turning around in it, one or more times. This was a hitching motion, as if by the use of her feet, meanwhile appearing to re-arrange the material on the outside and as if shaping the interior to her better satisfaction by this treading motion. At other times, spreading her wings over the nest in a seeming ecstasy of delight, she rather flutteringly turned around in it, apparently without regard for its precious contents.

There seemed to be one never varying position when at rest, that facing the more open part of the grove, the usual direction of approach be-

ing from behind, whereas the flight from the nest was toward the clearer space in front. The sitting posture was not one of absolute rest at any time, as the head was constantly in motion, so that no approach could be made without her knowledge. The flight from the nest seemed to be directly out of it, without any preliminaries. The weather was warm, yet she would remain on the nest from fifteen to twenty minutes, and in no instance was away more than two minutes, while I had her under observation. The male frequently appeared in the vicinity, but neither offered food or even deigned to alight on the same tree, yet birds which had a good claim in the neighborhood dared not approach very close, as the combined attack of these active birds always proved so distasteful that they invariably beat a hasty retreat.—EDWIN H. EAMES, *Bridgeport, Conn.*

Snake Skins in the Nests of *Myiarchus crinitus*.—The habit of the Great Crested Flycatcher of putting scraps of discarded snake skin in its nest is—so far as the nests which I have found—invariable. Nevertheless, in one instance, at Tamworth, New Hampshire, I found a nest with one egg in it but with no snake skin visible. I found it about 7 A.M. one beautiful day in early July, 1888. I touched the egg and handled the nest slightly. Shortly before sunset I looked a second time into the hollow limb where the nest was placed, and was much surprised, in fact somewhat startled, by what I saw. Forming a complete circle about the egg, resting, in fact, like a wreath upon the circumference of the nest cavity, was a piece of snake skin six or seven inches long. The part which had encased the head of the snake was at the front of the nest and was slightly raised. It may not be wise to found a theory upon a single fact, but from the moment I saw that newly acquired snake skin, placed as it was, I made up my mind that the Great Crested Flycatcher uses the skin to scare away intruders. When the full set of eggs was laid, I took them and the nest. Only remnants of snake skin remained in the rubbish of the nest. The large skin had been removed or torn to bits.

The following year the same hollow was again occupied by Great Crested Flycatchers. I found the nest on July 7. It contained four eggs, and some scraps of snake skin were in sight. All the eggs hatched on the morning of the 12th. On the intermediate days my visits to the nest were regular. During those days a number of larger scraps of skin were placed on the outer edge of the nest. Their position was changed almost daily. Once some were set up like a fence, and so was a hen's feather. The birds knew of my visits, and scolded me while I remained in sight. These facts tended to confirm my theory in my own mind.—FRANK BOLLES, *Cambridge, Mass.*

Wintering of the Red-winged Blackbird near Cambridge, Mass.—On the 29th of December, 1889, while passing along the edge of a small swamp grown up with cat-tails, low bushes, birches, and maples, not far from Fresh Pond, I heard repeatedly the note of a Blackbird. I was un-

able to follow up the sound owing to the thinness of the ice with which the swamp was coated, and failed to see the bird, although it answered my 'squeaking' several times. January 12, 1890, I visited the same swamp in company with Mr. Frank Bolles, and, finding the ice strong enough to bear, went towards some low bushes where I had heard the bird upon the previous date, and soon started a male Red-winged Blackbird in clear bright plumage. After alighting for a few moments in a small birch not forty yards away, the bird flew off across the swamp.

My friend Mr. Walter Faxon informs me that he found a Red-winged Blackbird in the same swamp on January 6, and 27, and on February 1, and 23, 1890, which was doubtless the same bird. The presence of this bird through January, a month which may be regarded as a test month for birds which are spending the winter with us, and on into February until within a few days of the arrival of the spring migrants, is thus established, and affords, I believe, the first record of the wintering of the Red-winged Blackbird in Massachusetts.—HENRY M. SPELMAN, *Cambridge, Mass.*

Coccothraustes vespertina in Taunton, Massachusetts.—On March 8, 1890, as I was walking out of my door I heard the notes of a bird strange to me but which at first I took to be those of the Pine Grosbeak. Getting my gun and coming out into the yard I found three Evening Grosbeaks feeding on the buds of a maple tree. In the course of a few minutes I had two fine males and a female laid out on my skinning table. This is I think the first record for Bristol County.—A. C. BENT, *Taunton, Mass.*

The Evening Grosbeak (*Coccothraustes vespertina*) near Springfield, Mass. — Mr. Edwin U. Leonard captured at Agawam a bird of this species from a flock of about twenty, March 21, 1890. A week or two later a bird of the the same kind was seen near there by Mr. Leonard.—ROBERT O. MORRIS, *Springfield, Mass.*

Junco hyemalis shufeldti in Maryland.—On the 28th of April, 1890, my son, A. W. Ridgway, shot a female of this subspecies near Laurel, Md. The specimen is a very typical one, having the distinctly cinnamon-pinkish sides abruptly contrasted anteriorly against the gray of the chest; in fact, so sharply defined and distinct is this pinkish color that it was supposed to be a *J. annectens*, until careful comparison with specimens showed otherwise. It was shot out of a small flock, in which my son thinks were others of the same kind, but he may have been mistaken.—ROBERT RIDGWAY, *Washington, D. C.*

Seaside Sparrows at Monomoy Island, Cape Cod.—Although I have kept a sharp lookout for the Seaside Sparrow (*Ammodramus maritimus*) at Monomoy every season, the first to my knowledge was taken by Dr. L. B. Bishop on the salt marshes, April 14, 1890. This bird, which was

an adult female, was moulting about the head and lower neck. Dr. Bishop saw several others but not thinking that they were rare shot only the above specimen. I visited the marshes several days after and hunted it carefully without seeing a bird, although I saw several Sharp-tailed Sparrows. From my own observation I am inclined to believe that this bird is rare in Massachusetts, at least on the Cape coast.—JOHN C. CAHOON, *Taunton, Mass.*

Young Cedarbirds and Great Crested Flycatchers in Captivity.—While in Tamworth, N. H., last July, I imprisoned two broods of young birds when just ready to fly, with a view to seeing what their parents would do about it. One brood consisted of five Cedarbirds and the other of four Great Crested Flycatchers. I imprisoned the Cedarbirds on July 10, placing them in an ordinary wire canary cage. Their cries, when being caged, brought the mother, who first flew in my face and then perched on the outer edge of the cage as it rested on my knees. I put the cage very near the house, and it was only a short time before the parent birds began consoling the young with cherries (*Prunus pennsylvanica*). During the twelve days of their captivity the young were supplied with 8400 cherries, or one cherry a bird every six minutes. I ascertained the number by counting and weighing the stones left by them in the bottom of their cage. On an average the old bird or birds made 140 visits a day, bringing five cherries, each time. One was carried in the beak, and the others were jerked up from the throat one by one until all of the five young were fed. At their release the young were so tame that they returned to take cherries, from my fingers, but the old birds soon enticed them away.

The young Great Crested Flycatchers were taken from their cavern in an apple tree on July 21, and placed in a wire cage which I hung in the next tree. I could see it from my barn door. The old birds would never go near the young if I was in sight. Concealed, I watched them with a glass and occasionally saw the young fed. They were given harvest flies, dragon flies, and various beetles, and also smaller insects of which they left no fragments. I kept them caged until early in August. They were as wild on the last day as on the first, and if the parents changed their feelings towards me, it was only by intensifying their hatred.—FRANK BOLLES, *Cambridge, Mass.*

Song of the Female Butcher Bird.—On the morning of April 8, 1890, when walking through the Fresh Pond Swamps at Cambridge, I heard a Butcher Bird (*Lanius borealis*) in full song. The bird was an unusually fine singer, and quite a mimic, its medley of notes suggesting a combination of the Brown Thrasher and as the Blue Jay, with an occasional 'mewing' sound much like the common Catbird. It was shot, and on sexing proved a female, the ovary being considerably enlarged. —ARTHUR CHADBOURNE, M. D., *Cambridge, Mass.*

Helminthophila celata at Montreal.—On May 21, 1890, I shot an Orange-crowned Warbler at Montreal. This is, I believe, the first record of its occurrence here.—ERNEST D. WINTLE, *Montreal, Canada.*

The Song of *Helminthophila leucobronchialis*.—At Englewood, New Jersey, on May 11, 1890, I saw and positively identified an apparently typical individual of *Helminthophila leucobronchialis*. Being fortunately without a gun I was spared the temptation of shooting, and during the ten or fifteen minutes which the bird was under my observation I had the pleasure of hearing it sing many times, even seeing it open its bill in the act of song. This song exactly resembled the rising and falling *tse* notes of *H. pinus* but was slightly weaker than the average song of that species.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City*.

***Dendroica cærulea* again in the District of Columbia.**—On May 5, 1888, I had the pleasure of capturing the first Cerulean Warbler taken in the vicinity of Washington (see 'The Auk' Vol. V, No. 3, p. 323). I took a second specimen, a female, on May 11, 1890, on the Virginia side of the Potomac. The bird was in the thick woods on top of a high ridge, and was shot without the least idea as to its true identity, it being taken for a Parula Warbler.—E. M. HASBROUCK, *Washington, D. C.*

***Cistothorus stellaris* at Washington, D. C.**—Up to the present date five species of the Troglodytidae have been taken at Washington. These are: *Troglodytes aëdon*, *T. hiemalis*, *Thryothorus ludovicianus*, *T. bewickii*, and *Cistothorus palustris*, all of which are common with the exception of Bewick's Wren, of which species three, I believe, have been taken. To this list I would add a sixth species, a single female Short-billed Marsh Wren having been taken on May 9, 1890. The species has been expected to occur here for years, there being no apparent reason why it should not be found, but thus far all attempts to secure it have been unsuccessful. The bird was evidently a thoroughly tired migrant that had stopped to rest, as it was found in the very place where one would least expect it,—a swampy little ravine thickly grown with young trees and skunk cabbage, and some little distance removed from any suitable locality. The bird was entirely alone, as I searched carefully for any other stragglers, and it was so exhausted that I had little difficulty in capturing it.—E. M. HASBROUCK, *Washington, D. C.*

Capture of the Hudsonian Chickadee in Worcester County, Mass.—A specimen of this species (*Parus hudsonicus*) was taken in a low swampy tract in North Ashburnham, Mass., during a blinding snowstorm, March 17, 1890. While wading through the snow along an old cart-path in the above-mentioned swamp I thought I detected an unfamiliar chirp in the bushes near by, and presently three dark colored birds appeared in sight. I immediately fired at the nearest one, but must have missed it, as, with the aid of my setter, I could not find it. In the mean time the other two had disappeared, but following carefully along in the direction they had taken I soon found them again, and secured one with the right barrel, but the other shell missed fire, but a friend with me, from whom the other

bird was hidden by thick bushes, handed me his gun and I secured it. They proved to be a young male and a female, the first examples of this species, I believe, ever taken in Worcester County.—R. E. KIMBALL, *Fitchburg, Mass.*

A Yellow-crowned *Regulus calendula*.—April 27, 1890, I shot near Laurel, Md.; an adult male 'Ruby-crowned' Kinglet which has the crown-patch pure orange-yellow instead of vermillion, the plumage being otherwise quite normal. The crown-patch is very well developed, being more extensive than in the average of specimens. —ROBERT RIDGWAY, *Washington, D. C.*

The Breeding Ranges and Songs of Three Thrushes in Montana.—In June, 1889, while collecting in the Belt River Cañon I found the summer home of three of the smaller Thrushes more or less overlapping, and the following notes and comparisons, made at the time, may be of interest. The birds referred to are *Turdus fuscescens salicicolus*, *T. ustulatus swainsoni* and *T. aonalaschkæ auduboni*, the Willow, Olive-backed and Audubon's Thrushes.

First, I will speak of the Willow Thrush, the commonest and most widely distributed of the Thrushes in Montana. It finds favorite nesting sites all along the valley streams in thickets of willow, rose, box-elder, etc., that, as the summer advances, become almost impenetrable with a rank growth of weeds. From such localities its song is often heard on its first arrival, but later little else than its loud, plaintive call-note greets the listener's ear and one may spend many a fruitless moment in trying to obtain a fair glimpse of the wary little inhabitant of the secluded covert. From the lower valleys this species ranges up to the mountain foot-hills and cañons, but I have never seen it far from water or more than a few yards above the earth, and never in heavy, evergreen timber. The Willow Thrush's song, identical with that of the Eastern form, although so difficult to describe, is probably familiar to most lovers of birds in the regions where either variety breeds. It is not surpassed, in my estimation, either in beauty or length by the song of the Olive-backed or of Audubon's Thrush. The song of the latter may about equal it, while in any case, I should put the Olive-back last on the list of vocalists, although its notes are the most varied, and quite odd as well. Willow Thrushes are rare here in spring and fall migration, from which it may be inferred that no great numbers go much farther north. They arrive with considerable regularity about May 15. The latest date I have for their departure is September 7.

Next in order of abundance during the breeding season, is the Olive-backed Thrush. In migration it is the only common bird of the three, appearing in considerable numbers about the middle of May, and again the second or third week in September, along all the lower valley streams. The earliest I have noted their arrival in spring is May 10, and at this season they do not tarry long away from their breeding grounds. In the fall they appear from the higher elevations about September 1, and

remain till October 10 at least. Throughout the summer the Olive-back is only found in the mountains and, like the Willow Thrush, but very short distances from water, but unlike that species, the male is not satisfied with an elevation of only a few feet, when towards evening he pours forth his curious lay to his shy mate below. At such times the most prominent limb of some tall cottonwood is none too lofty a perch.

About the first of July I camped for several days in a grove that seemed a chosen resort for Olive-backs. Regularly, an hour or so before dark, a bird would be heard from some topmost branch, and scarcely would he be through, before another would answer from a few rods away, only to be followed by still another, till half a dozen or more could be heard from different localities. Nor would they cease until the last rays of daylight were rapidly disappearing from the western sky. In early morning they were not nearly so active. In regard to the song itself, the birds almost always begin with several call-notes, interspersed with various odd chucks, then the ringing melody, characteristic of the Willow Thrush's song is produced, winding up rather abruptly with some fine, weaker notes. Occasionally they would utter the first call-notes and chucks without anything following, but I never heard the latter and more pleasing part of the song without the prelude. They were so excessively shy that it was some time before I actually identified the song as belonging to this bird. Usually, long before getting within anything like shooting distance, the notes would cease, and while vainly endeavoring to catch a glimpse of the shy performer through the dense foliage above, suddenly his mocking call-note would come from some impenetrable thicket near by.

Audubon's Thrush, according to my observations, is much the rarest, in Montana, of the birds under consideration. It reaches a somewhat higher elevation than the other two, and I have seen it at least half a mile from streams in dense evergreen timber. The first specimen noted was in the top of a pine sixty or seventy feet high, standing on a projecting knoll of the mountainside some eight hundred or a thousand feet above Belt River. I was first attracted by the song, at that time quite new to me, and shortly discovered and obtained the bird. Their song begins with two (sometimes only one) clear, whistle-like notes of slightly different pitch, followed by the ringing melody peculiar to the songs of the other species, and the whole, though rather too brief, produces a fine effect as it comes floating, clear and distinct, from the silent dark-timbered mountainsides. They sing at irregular intervals throughout the day, and never seem to collect together in any numbers, certainly manifesting some very hermit-like traits.

Following are about the altitudes at which I have found the three species during the breeding season. The Willow Thrush inhabits from the lowest valleys up to about 4200 ft., the Olive-back from 4200 to 5000 ft., and Audubon's Thrush from 4200 ft. up to probably 6000 ft.—R. S. WILLIAMS, *Great Falls, Montana*.

Additional Notes on the Probable Breeding of *Saxicola œnanthe* near Godbout, Province of Quebec, Canada.—In 'The Auk' for July, 1885, Dr. C. Hart Merriam recorded several specimens of the Wheatear taken by me on the north shore of the St. Lawrence during May and June of 1884 and 1885. Since then I have secured several additional specimens which throw more light on the occurrence of the species near Godbout. I shot a young male September 19, 1885, and another specimen November 9, 1886. None were observed in 1887 or 1888. September 30, 1889, while visiting the Caribou Islands, I saw five of these birds together, but having no gun was unable to secure specimens. The next morning I saw one hopping around the house where I was staying, and upon calling the attention of my host, Mr. Chas. Jordan, to the bird he informed me that he had noticed a pair of them several times but was not certain of the date when he had first seen them—probably about the end of August. I have since heard that his son shot two or three. October 17, 1889, I shot a pair of Wheatears at Godbout, both exceedingly fat; one of these was sent to Dr. Merriam. Two days later (October 19) I saw a single bird but was unable to secure it.

Caribou Islands being only twenty miles east of Godbout it is quite possible that some if not all of the birds observed here during October were the same I noticed there. It can hardly be expected that I have seen all that have passed this point, and several may have occurred along the north shore both east and west without being recorded, but I think *Saxicola œnanthe* has been observed here often enough, and at dates close enough to its breeding season, to entitle it to a place in the list of birds breeding in this vicinity.—NAP. A. COMEAU, *Godbout, Quebec.*

Notes on Several Species of Water Birds at Muskeget Island, Massachusetts.—*Anas crecca*.—On March 16, 1890, I had the good fortune to shoot a European Teal at Muskeget. It was an adult male in full spring plumage, and was the only Teal seen there. The day before there had been a very severe northeasterly snowstorm. The bird's stomach contained nothing but a few seeds. These have been identified by Mr. Sereno Watson as no doubt belonging to some species of *Ranunculus*, most probably *R. septentrionalis*, which is common in swamps and ditches from New England to Florida and Texas. Little clue is afforded therefore as to the bird's last feeding ground. The skin is now in the collection of Mr. William Brewster.

Tringa canutus.—Two Red-breasted Sandpipers were shot by myself on Muskeget March 19, 1890, but only one was saved; this was a male. There had been three in all, and they were all in the gray autumnal plumage. The one skinned was very fat. According to two local accounts these three birds had been living there a considerable part of the winter, none having been seen before at this season. They were first noticed about the middle of January. They were also seen by Mr. Marcus Dunham on Feb. 15.

Calidris arenaria.—On March 19, 1890, I saw a flock of about thirty-five Sanderlings and shot one from it. I saw them again March 22. I learn

from Mr. Marcus Dunham, a local sportsman, that a few winter here every year, the number varying from a dozen to fifty or sixty.

Ægialitis vocifera.—One Killdeer was shot on Muskeget, Feb. 28, 1890, the only one seen. I have preserved the skin.—GEORGE H. MACKAY, *Boston, Mass.*

Notes on Several Birds in the Catskill Mountains.—In the summer of 1889 I spent a few days among the Catskill Mountains, and though I was unfortunately prevented from giving much time to ornithology, I noted one or two things that are worth mentioning because they differ from the experience of Mr. E. P. Bicknell as recorded in his well-known paper on the birds of that region.* Mr. Bicknell's work, which was done almost entirely in the Big Indian Valley and on Slide Mountain, covered but a small portion of the whole Catskill Mountain region, and a rich field still awaits the ornithological surveyor who will undertake a thorough, detailed exploration of all its mountains and valleys.

Zonotrichia albicollis.—Mr. Bicknell did not meet with the White-throated Sparrow at all in the Catskills, and it is very likely nowhere abundant in the region. I found one singing, however, on the afternoon of July 18, on the Plaaterkill Turnpike between the foot of Overlook Mountain and Tannersville. It was in low, rather wet ground, a half-wooded pasture on the head waters of Schoharie Creek, and at an elevation probably of about 1800 feet. Along the same road, and at similar altitudes, I saw *Galeoscoptes carolinensis* and *Harporhynchus rufus*.

Pipilo erythrophthalmus.—What I saw of the Towhee was very different from Mr. Bicknell's experience with it. He says: "Except on my latest trip to the Catskills, when it was twice noted in the Big Indian Valley, this bird was not observed." During my stay at Overlook Mountain (July 14-18) I found Towhees plenty all over the top of the mountain (altitude 3150 ft.), perhaps most so in a tract, burnt over some time ago, where a second growth of scrub oak five or six feet high had grown up among the dead oaks most of which were still standing. I heard them singing every day of my stay. July 15 I shot a full-grown young in first plumage, attended by both its parents.

Geothlypis philadelphia.—At Overlook Mountain I found Mourning Warblers, adults and young, near the top of the steep upper slopes of the mountain, in woods consisting mainly of scrub-oaks twenty or thirty feet high, with a good deal of underbrush of oaks and other shrubs, and with here and there a fallen tree. I mention this, as it seems contrary to the usual habits of the species which is apt to frequent such places as Mr. Bicknell found it in,—burnt land grown up with willow herb, wild red cherry, etc.

Turdus aonalaschkæ pallasii.—The Hermit Thrush does not seem to have been found by Mr. Bicknell except on the higher parts of Slide Mountain. It was common in the hard woods on the upper slopes of Overlook Mountain and also on the hills (altitude 2300-2600 ft.) near the Catskill Mountain House.—C. F. BATCHELDER, *Cambridge, Mass.*

* Transactions of the Linnæan Society of New York, Vol. I, pp. 113-168, 1882.

Notes on Birds Observed in the Colorado Desert in Winter.—We arrived at Boregas Spring Dec. 20, 1889. This spring lies about 25 miles northeast of Warner's Pass, in a western arm of the desert, and about 10 miles from the foot of the mountains on either side. It is a barren part of the desert. A few small mesquit trees are scattered around in the least arid part of the valley, and stunted *larrea* bushes grow a few yards apart over the entire region. Cactuses are scarce, the soil being too poor for their growth. Below the spring is a considerable patch of arrow-weed. A stay of a week proved that birds were scarce, thirteen species only being noted. I found several species of the smaller mammals tolerably well represented, principally pocket rats and allied species. The birds noted were:—

Circus hudsonius. One seen.

Sayornis saya. One seen.

Corvus corax sinuatus. One seen occasionally, perhaps different individuals.

Carpodacus mexicanus frontalis. Rather common.

Chondestes grammacus strigatus. Several seen.

Zonotrichia leucophrys intermedia. Common.

Amphispiza belli nevadensis. Several seen.

Phainopepla nitens. Several seen.

Harporhynchus lecontei. Two shot, another seen.

Catherpes mexicanus punctulatus. Two seen in clay cliffs.

Auriparus flaviceps. Several seen. One caught in its nest about sunrise. This species sleeps in its nest most of the year.

Polioptila plumbea. Six shot, others seen. In winter plumage.

Sialia mexicana. Several seen.

From Boregas Spring our course was east 20 miles to turn a spur of the mountains, then northwest 15 miles to a spring known by the Indians as La Carisita de Laguna Salada. A heavy rain had fallen two weeks previously and we found water in pools in three places. Usually there is no water to be found in this 35 miles of barren desert, which is nearly impassable with a wagon. No road exists, and much deep sand and many bad washes occur, so that with our light spring wagon we were nearly three days going from one spring to the other, our principal trouble being to find places to cross the washes.

Over this 35 miles of desert the only birds I saw were a pair of *Harporhynchus lecontei*, and a small flock of *Zonotrichia leucophrys intermedia* at a rain-water pool off the point of the mountain. As the water of the Carisita spring was too alkaline to be palatable we went on the next morning six miles to the first of a series of springs called by the Indians Agua Dulce (sweet water). Here was an old Indian village, deserted except by one family. This proved a good collecting ground. From there to Indio, a station on the Southern Pacific Railroad, the soil was good in places, with plenty of good-sized mesquit trees, and a few species of birds were moderately abundant. Birds of the Sonoran Province mingled with northern birds driven down by the snow from the adjacent mountains. The birds noted from this part of the desert were:—

- Anas carolinensis*. Four seen at the Carisita Spring.
Callipepla gambeli. Several coveys seen. Six shot.
Zenaidura macroura. Rare.
Circus hudsonius. Occasional.
Buteo borealis calurus. Occasional.
Falco sparverius. Two seen.
Speotyto cunicularia hypogæa. One seen.
Dryobates scalaris bairdii. Three shot.
Colaptes cafer. Several seen.
Micropus melanoleucus. Common.
Sayornis saya. Occasional.
Corvus corax sinuatus. Rather common.
Agelaius phœniceus? One female seen.
Carpodacus mexicanus frontalis. Common.
Spinus psaltria. Several seen.
Zonotrichia leucophrys intermedia. Abundant.
Junco hyemalis oregonus. One seen.
Amphispiza belli nevadensis. Several seen.
Ampelis cedrorum. Small flock seen.
Pipilo aberti. Three taken, others seen. Shy as usual.
Phainopepla nitens. Common.
Lanius ludovicianus gambeli. Several seen; one shot.
Dendroica auduboni. Several seen.
Oroscoptes montanus. One shot January 7, 1890.
Mimus polyglottos. Two seen.
Harporhynchus lecontei. Several seen.
Harporhynchus crissalis. One shot, others seen. In full song.
Campylorhynchus brunneicapillus. Occasional.
Troglodytes ædon aztecus. Several seen.
Cistothorus palustris paludicola. Several seen at the springs.
Auriparus flaviceps. Occasional.
Polioptila plumbea. Rather common.
Merula migratoria propinqua. Several seen.
Sialia mexicana. Common.

From Indio we went north to the palm groves in the cañons opening on the desert from the foot-hills on the north side. In these palm groves were a few birds of common species. The only bird of any interest that I saw was a female *Myadestes townsendi*, shot January 10.

Soon after leaving the palm groves I saw a small flock of *Otocoris* and shot a female, which appears to be *O. a. chrysolæma*. We left the desert by way of the San Geronio Pass, January 17.

The principal results of the trip, as far as birds were concerned, were the extension of the known range of *Harporhynchus crissalis* west to Indio, and the finding that this species, *Pipilo aberti*, *Auriparus flaviceps*, *Polioptila plumbea*, *Oroscoptes montanus*, and *Myadestes townsendi* all winter in the desert. The last two should probably be considered as stragglers.—F. STEPHENS, Santa Ysabel, Cal.

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

The Delaware Valley Ornithological Club.

TO THE EDITORS OF THE AUK:—

Dear Sirs:—The majority of the readers of 'The Auk' have no doubt spent a good deal of time in the study of bird migration and in the systematic arrangement of their field notes with a view to reaching general facts in regard to the subject. While a single observer making careful notes for a number of years can determine many interesting facts, such as the average time of arrival and departure of the various birds at his station, and the relation of the 'migration waves' to meteorological variations; still there are many other points bearing on the subject of migration which it will be impossible to study without the assistance of other workers in the same field.

Recognizing the advantages to be gained by combined work, a number of ornithologists residing in the vicinity of Philadelphia have organized the Delaware Valley Ornithological Club, for the study of the birds of southeastern Pennsylvania and southern New Jersey, with especial reference to their migration in the valley of the Delaware River. The active membership of the club is limited and consists only of those who have had considerable experience in field work and are known to be thoroughly reliable. An associate membership has been added to include beginners in the study who can furnish data subject to the approval of the active members, and in return can receive the benefit of their experience.

The following is a brief outline of the methods, of work of the Club. Daily field notes are taken by the members, and recorded systematically on monthly charts containing vertical columns for the days and horizontal ones for the birds in the order of their occurrence during the month. The spaces are sufficiently large for recording the number of birds seen (as recommended by Mr. Batchelder, in the April number of 'The Auk'), and short abbreviated notes as to singing, mating, nesting, etc. Across the top of the chart are blanks for recording the curve of temperature variation, the direction and force of the wind, and other correlative notes. In addition to these individual charts there are "combined monthly charts," on which the notes of all the observers are recorded followed by private marks indicating their various stations. These charts are passed from one member to another and when all the data have been recorded are reproduced by a copying process and copies furnished to each observer. In the same way it is proposed to have yearly charts on which will be recorded the first and last occurrence, arrival and departure of bulk, and other general facts relating to each species.

The Club meets in Philadelphia twice a month, when all matters of importance are discussed and specimens exhibited.

Another aim of the Club is to keep a complete record of all the birds which occur in southeastern Pennsylvania and southern New Jersey, and

of the breeding habits of those species which remain in this district during the summer. These observations will cover a wider field than those on migration, the latter being confined to the immediate vicinity of the Delaware River south of Trenton, as it is thought that better results can be obtained by restricting the country covered by the observations to one river rather than by including other river or coast districts.

During the present year the Club has seven regular observers, — Wm. L. Baily at Wynnewood, Pa.; Samuel N. Rhoades at Haddonfield, N. J.; J. Harris Reed at Tinicum Island, Pa.; Geo. Morris at Olney, Pa.; Dr. Spencer Trotter at Swarthmore, Pa.; Chas. A. Voelker at Chester, Pa., and Witmer Stone at Germantown, Pa.

The results so far have been highly satisfactory and have far surpassed our expectations. We therefore thought that by stating our methods of work other observers similarly situated might be led to "join their forces" and gain the benefit of each others' work as we have done.

This work need not interfere in any way with that being conducted by the Department of Agriculture, as the correspondents of the Department can fill out their schedules as heretofore, or they can substitute the combined report of the Club, as may be desired. In any case the results obtained by the combined efforts of a number of observers in a small district cannot fail to be of service to the Department when it undertakes to work out the migration through the country at large.

At the close of the year we hope to present to 'The Auk' an abstract of the migration of 1890 as it occurred in the valley of the Delaware, with a map showing the district covered by each observer.

WITMER STONE.

Academy of Natural Sciences, Philadelphia, Pa..

June 5, 1890.

NOTES AND NEWS.

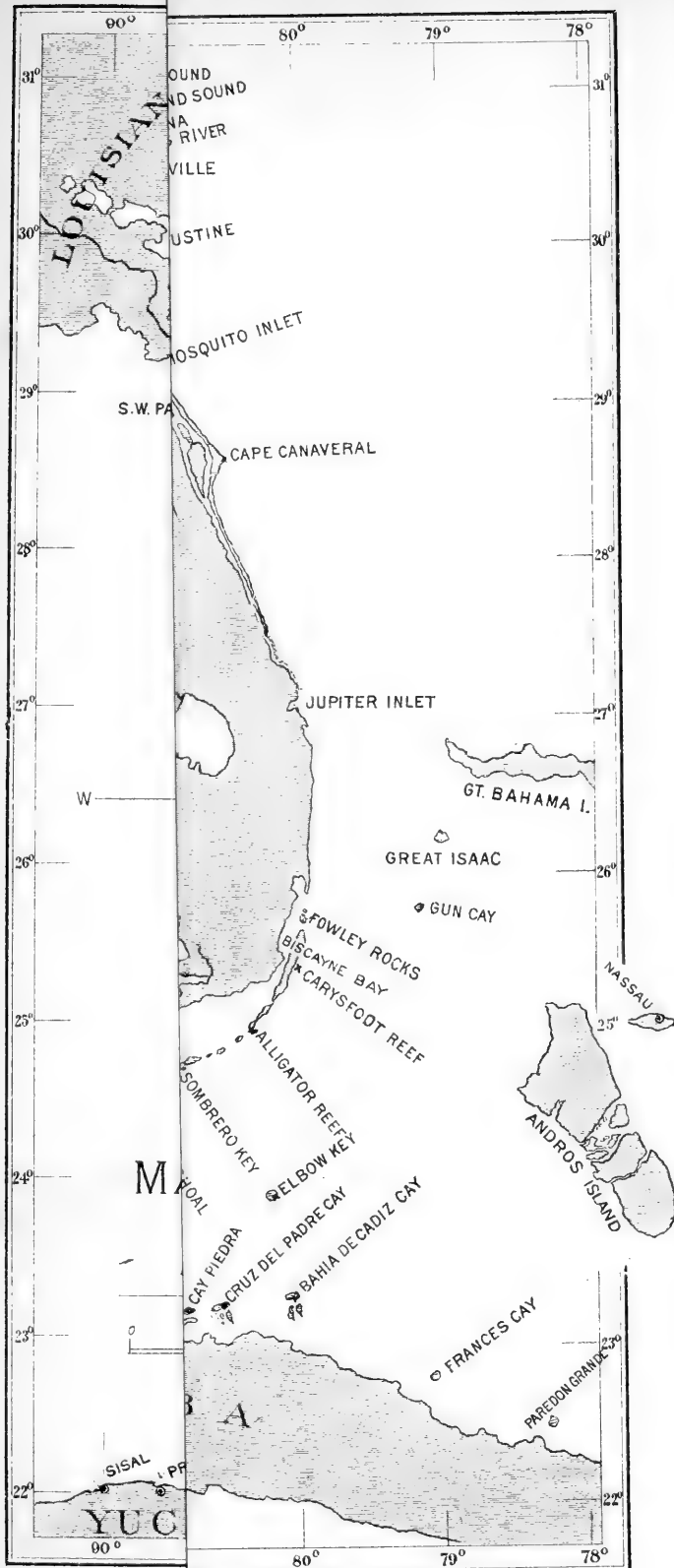
JOHN HENRY GURNEY, an Honorary Member of the A. O. U., of Northrepps, near Norwich, England, died April 20, 1890, at the age of seventy-one years. He was "the son of the world-wide famous Joseph Henry Gurney, of Earlham, whose name men hold dear for his philanthropy, and for his writings in defence of civil and religious liberty. From his boyhood's days John Henry Gurney took a lively practical interest in bird-life and common objects of the country. He began his connection with the Norfolk and Norwich Museum by a gift to that institution when he was only ten years old. In the year 1849 he was chosen President of the Museum, which office he filled to the day of his death." For many years he has been a recognized authority on the Raptorial Birds of the world, and the magnificent collection of these birds — one of the finest extant — in the Norfolk and Norwich Museum was brought together mainly by his efforts, and is almost wholly his gift. He prepared and

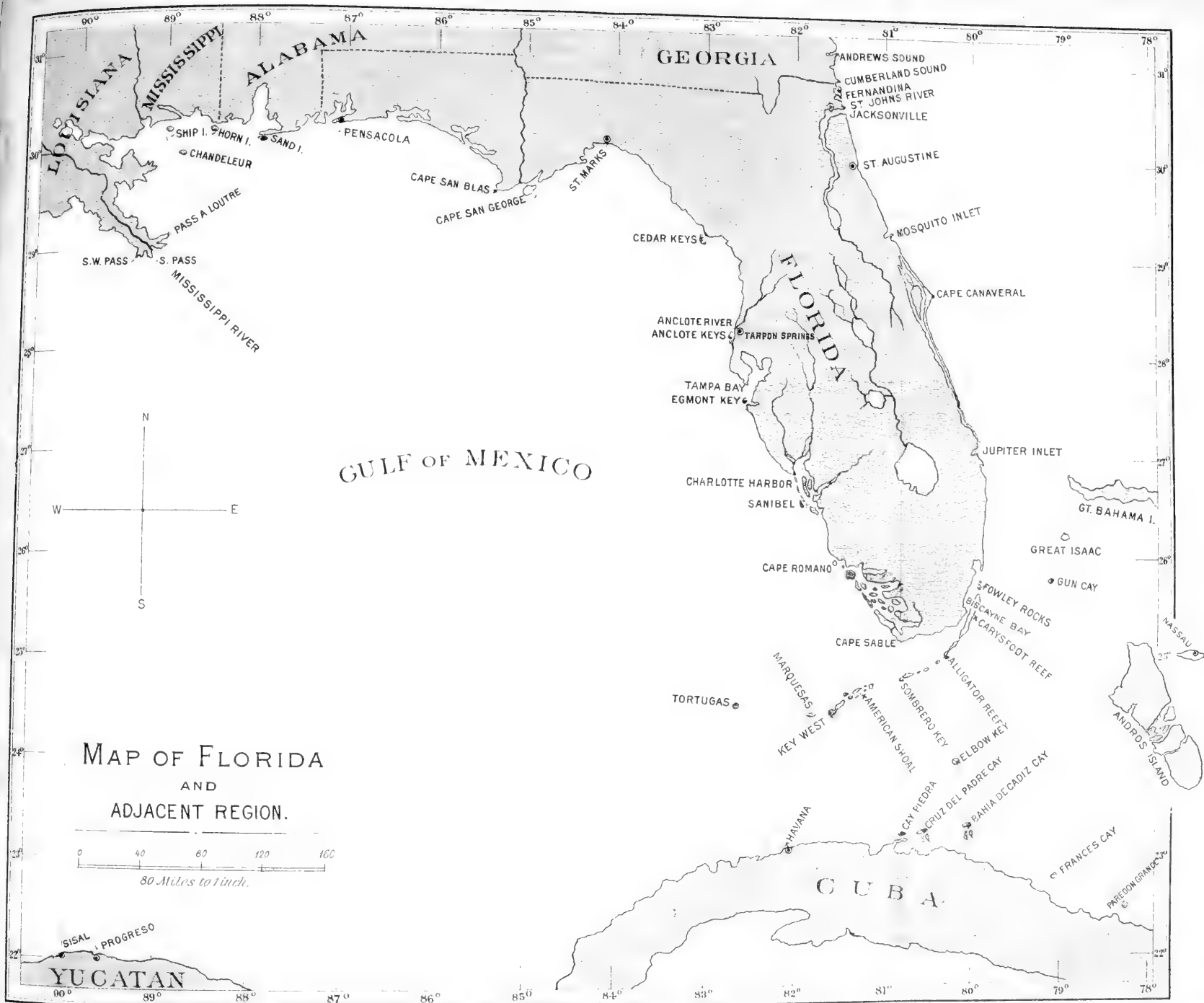
edited the late C. J. Andersson's 'Birds of Damara Land and the adjacent countries of Southwest Africa,' published in 1872. His contributions to 'The Ibis,' 'The Zoölogist,' and the 'Proceedings' of the Zoölogical Society are very numerous, running back for nearly fifty years. They relate largely to Raptorial birds, but include papers on South African ornithology, and especially upon British birds. In 1884 he published his very important and well known 'List of the Diurnal Birds of Prey, with References and Annotations.' He was one of the Founders of the British Ornithologists' Union. His business life was that of a banker, he being a partner of the banking firm of Gurneys, Birkbecks, and Co. He was a Member of Parliament from 1854 to 1862, and for many years a magistrate for the County of Norfolk and city of Norwich. His many good works had "endeared him to his neighbors in every rank of life." He leaves two sons, one of whom, John Henry, is a well-known ornithologist.

'ZOE, A BIOLOGICAL JOURNAL,' is published at San Francisco, California, on the last day of each month, by the Zoe Publishing Company, Volume I, No. 1, bearing date March, 1890. It is an octavo of 32 pages, filled with original matter of excellent quality. The opening article, by Dr. H. W. Harkness, President of the California Academy of Sciences, on the 'Nomenclature of Organic Life,' is a terse statement of the fundamental principles of sound nomenclature. Interspersed with articles on botany and ichthyology are several papers on birds. Mr. A. W. Anthony describes the nests and eggs of Townsend's Junco and the San Pedro Partridge, and Mr. W. E. Bryant gives some interesting observations on birds during the total solar eclipse of January, 1889. There is a department of 'Recent Literature,' and another of 'Proceedings of Societies.' The prospectus states that 'Zoe' is designed to "furnish a medium for the dissemination of the results of scientific thought and investigation, and for the review of contemporaneous scientific literature, especially that relating to the west coast of America." The merits of the new journal entitle it to a cordial welcome and we heartily wish it a success.

CAPTAIN CHARLES E. BENDIRE is preparing for publication an elaborate treatise upon the oölogy and breeding habits of North American birds. It will be based upon the author's own wide experience, supplemented by occasional extracts from previous writers, and by matter contributed by his correspondents, and will cover the subject with as great thoroughness as existing knowledge will permit. Much new information will be given, helping to define exactly the breeding range of each species. The descriptions of the eggs will be taken in most cases from the now unrivalled collection of North American eggs in the United States National Museum. The work will probably fill five large quarto volumes, and be illustrated with colored plates of the eggs of each species. In both accuracy and artistic merit these plates are likely to be of an unusually high order.

Captain Bendire would be glad to correspond with any one who is disposed to aid him with any new information about the breeding habits of our birds. All such contributions that may appear in the book will be duly acknowledged.





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THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. VII.

OCTOBER, 1890.

No. 4.

ON BIRDS OBSERVED AT THE DRY TORTUGAS,
FLORIDA, DURING PARTS OF MARCH
AND APRIL, 1890.

BY W. E. D. SCOTT.

THROUGH the kind permission of Dr. John B. Hamilton, Surgeon General of the Marine Hospital Service of the United States, I was allowed to make my headquarters for ornithological work at the Key West Quarantine Station on Garden Key, Dry Tortugas, Florida, during the past spring. I had planned an ornithological exploration along the Gulf coast of Florida, from Tarpon Springs south to Cape Sable and through the more important keys lying off the south coast of the peninsula from Bahia Honda westward. The field is a large one to cover even in a superficial manner, and after some work in the region about Cape Sable and adjacent keys, I proceeded to Bahia Honda and thence through the group of keys westward to Key West, where some three weeks were spent. Here I found that through the kindness of Capt. Bendire and Prof. G. Brown Goode, of the Smithsonian Institution, the Secretary of the Treasury of the United States had placed at my disposal the U. S. Revenue Cutter 'McLane,' Captain Munger in command, to convey myself and assistants to such points as I might desire to investigate.

I wish in this connection to express my thanks publicly to these gentlemen as well as to Professor Langley of the Smithsonian Institution, and to Dr. Murray, Surgeon in charge U. S.

Marine Hospital at Key West, and to Dr. Geddings, Surgeon in charge Key West Quarantine Station, Garden Key, Dry Tortugas, Florida, for their many kindnesses in facilitating the scientific work I had undertaken. To Capt. Smyth who succeeded to the command of the revenue cutter during the period of my work, I am under special obligations for the many courtesies shown me, and for very substantial aid rendered to the work I had in view.

The use of the revenue cutter saved much time in getting from Key West to the Tortugas, and as my entire party and collections were returned directly to the Anclote Keys by this vessel, much time was devoted to observing and collecting that would otherwise have been employed in sailing between these points. So on March 19 I sent the 'sharpie,' on which I had cruised from Tarpon Springs to Key West, back to the former point and embarked with two assistants on board the cutter which landed us at Garden Key, Dry Tortugas, the same afternoon.

The Dry Tortugas consist of a group of irregular, low, sand and coral islands, six in number, which are some sixty miles west of Key West, in north latitude $24^{\circ} 35'$ and west longitude $82^{\circ} 50'$, approximately. The only land between Key West and the Tortugas is the group of keys known as the Marquesas, and these keys are a little less than twenty miles west of Key West. So the nearest land to the Tortugas is rather more than forty miles away. The nearest mainland is Cape Romano, Florida, about 140 miles distant; and the Island of Cuba is, at its nearest point, about 90 miles distant. The coast of Yucatan is some 350 miles southwest, and directly to the westward in a straight line is the Mexican coast, about 750 miles away. So that this small group of little islands is very much isolated from any adjacent land, and all birds visiting it must pass over considerable distances of open sea.

The first island of the group to the eastward is known as East Key. It is a low, sandy, coral island, covered in parts with stunted bushes, and contains an area of perhaps eighteen acres. The two keys succeeding it are known as Middle Key and Hospital Key. They are both very small and are little more than sand banks protruding from the water, sparsely growing coarse grass and some low, stunted bushes being the only relief from total barren-

ness. Middle Key is rather more than a mile west of East Key, and in the same direction Hospital Key is about a mile from Middle Key. Southwest of Hospital Key and a mile from it is Garden Key, the centre of the group, and the most important of the islands, though by no means the largest. It is nearly circular, and the walls of Fort Jefferson originally extended to the water's edge entirely round the island. Now a considerable point of land has been formed to the south, and a like point to the north, outside of the walls by the action of the tide currents. There are perhaps altogether outside the walls three acres of land built up in this way in the past thirty years, and coarse grass, beach ivy, and some low bushes, make these areas quite green and agreeable to look at. The walls, which are about sixty feet high, inclose an area of some thirteen acres, at least three of which are occupied by buildings of a substantial character, and there is a harbor light on the east wall. So that nearly ten acres inside the fort are open space. Most of this is grown up with grass and beach ivy, but in one corner of the enclosure is a little grove of button-wood trees of perhaps half an acre in extent, and scattered over the rest of the area are about forty cocoanut palms and a few other button-wood trees. The trees in the grove and the others scattered about are all of fairly good size, but none are more than fifty feet high. There is no natural spring of fresh water at present on this or any other island of the group, but on this key are enormous cisterns of great capacity, which are replenished from the roofs of buildings and the tops of the walls of the fort. None of the water in these cisterns, however, is accessible to birds, as all are carefully covered or are under ground. This enclosure which I have thus briefly sketched was, I found, by far the most attractive point for land birds and the list that will presently be presented was practically made here.

About three quarters of a mile to the westward and a little south of Garden Key, is a small key, oval in shape and of perhaps eight acres in area. It is known as Bird Key. Here the different Gulls and Terns breed in myriads, those which are ground nesters finding room between and *under* the bushes in which the Noddies (*Anous stolidus*) build countless nests. But of this more presently.

Loggerhead Key, the extreme westerly island of the group, is a long island similar in character to those already described, but

larger. Near one end of it is a light-house of the first order and near it are the keeper's quarters and buildings, surrounded by some cocoanut palms, and a few scrubby button-wood trees. The usual low bushes are abundant, but, so far as I am aware or could learn, no birds breed at this point, though the superficial area of the island must be at least twenty acres and it seems admirably adapted to the breeding wants of Terns and the like.

After a careful study of all of these islands, supplemented by close questioning of the lighthouse-keepers and the sergeant who has been in charge of the government property at Garden Key for the past five years, I have arrived at the general conclusions: (1) That no land birds breed on any of the keys of the group. (2) That the stay of any land birds is of very short duration save on exceptional occasions which I shall have reason to allude to in more detail presently.

The migrations of the land species which I observed during my stay always coincided with the approach or occurrence of some pronounced aerial disturbance, and the advent of a strong north or northwest breeze always meant a very perceptible, and generally a marked, accession of the bird visitors. This applies to land birds in the main, and was not remarked regarding water birds, except in the case of the Herons, which will be noticed in detail further on. It seems probable that the flight of land birds was at this time of year quite constant and that the northwest winds arrested this flight and so increased the number of birds on the keys.

My stay at Garden Key was limited, and I left there on April 10. The following list includes all the birds that were observed up to that date and the records of several others, and notes regarding their occurrence, made by Dr. F. S. Goodman, of the U. S. Marine Hospital Service, stationed at the Quarantine Station on Garden Key. This gentleman kindly consented to carry on some work for me after my departure. In all cases he has forwarded to me the birds secured, together with the date of capture, etc. My thanks are due to him for this aid and in all instances I include his name in connection with information which he has furnished.

The list of birds observed at the Tortugas includes eighty species and though it will undoubtedly be greatly added to, yet enough land birds are present, fifty-seven species in all, to point apparently to the following conclusions.

That the birds of the Florida peninsula that have become specialized so as to present tangible characteristics of appearance, etc., are not migratory in a large sense, but are restricted to comparatively limited areas. Examples may be cited, such as *Vireo noveboracensis maynardi* and *Geothlypis trichas ignota*, which are represented on these keys during the times of migration by their closely allied representatives, which I take it are migratory species in a broad sense. There are many species of Woodpeckers on the peninsula, but none are to be considered as migratory save *Sphyrapicus varius*, which occurs, as has been shown, quite commonly on these keys and was the only species of Woodpecker observed. No Wrens were observed, yet as near as the Cape Sable region *Thryothorus ludovicianus miamensis* is common. On the adjacent mainland of the Florida peninsula *Cardinalis cardinalis*, *Pipilo erythrophthalmus alleni* and *Cyanocitta cristata florincola* are more or less abundant and are all of them common species that are not migratory and are not represented in the fauna that has been considered. All of the species of land birds observed at the Tortugas are migratory in the fullest sense, and the only specialized form noticed that is a breeding bird on the mainland, *Chordeiles virginianus chapmani*, is the only specialized race of Florida bird that seems the exception to the conclusion that the breeding birds of the Florida peninsula cannot be regarded as migratory species. Negative evidence in support of this conclusion seems to be furnished by the fact that almost every land species well known as a migrant on the mainland was observed during the time, about two months in all, that observations were carried on at the Dry Tortugas.

Further, it will be noticed that the tendency to representation of western races is marked. This is well illustrated in the case of *Dendroica dominica albilora* and *Dendroica palmarum*. The first bird is almost unknown on the mainland, but out of a series of eight Yellow-throated Warblers obtained, six are well-marked representatives of *D. d. albilora*, and though upward of twenty Palm Warblers are included in the birds taken at the Tortugas, only two are referable to the eastern race *hypochrysea* which is not at all rare in the region about Tarpon Springs.

1. *Larus argentatus smithsonianus*. HERRING GULL.—Rather common, especially during the earlier part of my stay.

2. *Larus atricilla*. LAUGHING GULL.—Rather common resident, and some birds undoubtedly breed at this point.

3. *Sterna maxima*. ROYAL TERN.—The commonest representative of the family. All of the individuals examined were moulting, or had almost completed the spring moult. The majority had assumed, or were assuming, the black cap of the adult; but at least twenty per cent, though their moult had taken place, remained in a phase similar to that of winter adult birds. About April 5 the moult was completed and, though the birds were still in flocks, mating in at least some cases had begun. The birds are known at this point as 'Redshanks,' and I am told that many breed here. The moult was in all cases complete, including the primary quills and tail-feathers.

4. *Sterna antillarum*. LEAST TERN.—These birds were not observed during my stay, but Dr. Goodman obtained them commonly in late April and early May, and they breed, I should judge, rather commonly. They are known by the egg hunters who resort to this point as 'Sandpeters.'

5. *Sterna fuliginosa*. SOOTY TERN.—This is another species that had not arrived at the Tortugas up to the time of my departure. Dr. Goodman, however, found that they arrived about the same time as the Noddies, but were, though plentiful, not so abundant as that species. They breed here in numbers, laying soon after their arrival, and are known to the egg hunters as the 'Egg Bird,' their eggs being more esteemed for food than those of the other Terns breeding here. Their breeding ground, as near as I could ascertain, is restricted to East Key and to Bird Key.

6. *Anous stolidus*. NODDY.—An abundant breeding species at the Tortugas, being mainly confined to Bird Key as a breeding place, and nesting in the low bushes. So far as I could learn, the birds are not residents at this point and I only observed three during my stay. This was one day late in March. They, with the Sooty Terns, appeared on April 20 in large numbers, but only remained two days, when, after inspecting their breeding grounds, all departed, to return about a week later in greatly increased numbers, when breeding was almost at once commenced. They leave, I am told by the people familiar with the region, early in the fall and are not seen, except an occasional one, till the following spring.

All of the Gulls and Terns that breed at the Dry Tortugas have been much diminished in numbers in the past ten years. It has always been the custom for some of the boats engaged in fishing and sponging about Key West to resort to these islands during the breeding season, and lately their depredations have really made a very appreciable difference in the birds that resort to this breeding ground. I am told that the eggs have a commercial value as an article of food in the markets of Key West, where barrels of birds' eggs from the Tortugas are brought every season of late years.

7. *Rynchops nigra*. BLACK SKIMMER.—The sergeant in charge of the government property on Garden Key showed me the head of one of

these birds. He had secured it a year or two ago, and it was the only one of the kind he had seen during a stay of five years at Garden Key.

8. *Sula sula* BOOBY.—A few Boobies were observed during my stay, but none secured. I believe them to have been this species. Later, on April 19, Dr. Goodman procured one which he sent to me. I am told by all the old sailors and sponge fishermen who have been familiar with this region for years, that formerly the Boobies were abundant, and bred and roosted in great numbers on East Key. They were very tame, and could be readily killed with sticks, and being much liked for the pot, have been gradually diminishing in numbers, till now it is unusual to see these birds, except out at sea or perched on some buoy that marks the passages through the outer reef. Mr. Atkins, while repairing the Key West and Cuban cable, in March and April, 1890, saw Boobies not at all uncommonly, and told me that, whenever they were obliged to mark any part of their work with buoys, on returning to such a point Boobies were almost always to be seen taking advantage of these roosting places. The birds were very tame and could be easily approached; but none were secured, as time did not permit.

9. *Phalacrocorax dilophus floridanus*. FLORIDA CORMORANT.—This species is apparently rare at the Tortugas. I learned from good authority that they were occasionally seen. None were observed by myself or party during our stay.

10. *Pelecanus fuscus*. BROWN PELICAN.—A few were observed every day during my stay, and their numbers were occasionally increased so that the birds were noticeably common. They were for the most part in the gray phase, and but few birds in breeding plumage were noticed. They do not breed at this point, but from reliable men I learn that there is a large breeding rookery of both these birds and Florida Cormorants on one of the keys of the Marquesas group.

11. *Fregata aquila*. MAN-O'-WAR-BIRD.—Noticed every day during my stay. They did not seem to come to this point for food, as they were rarely seen fishing for themselves or chasing the Terns for food. But almost every day about noon a party of from four to twenty of these birds came to Garden Key and, attaining a point just above the Harbor Light Tower on the northeast wall of the fort, they would begin to soar in what seemed a sort of way of resting. The circles were of about one hundred feet diameter; the flight very regular, slow and monotonous, with no apparent motion of the wings for hours. It tired one to look at them. They would keep this up till after dark at night; at least they were to be seen as long as there was light to distinguish them, and on one moonlight night, not long before I left the Tortugas, at eleven o'clock I saw five of these wonderful flyers still soaring high above the light tower. It must not be thought that one of these birds came and that another went away and that so the appearance of tireless soaring was carried on. They came and went away in parties, and solitary individuals were exceptional. They are said to greatly increase in numbers about the time the young Terns and Noddies are hatched, and to persecute the old birds bringing

food to their young. This I can readily believe, as such is their habit about Brown Pelican and Cormorant rookeries at like seasons. At the time referred to, I am told, they roost in great numbers on East Key.

12. *Ardea wardi*. WARD'S HERON.—A large Blue Heron, which was presumably this species, was observed on a single occasion, feeding on the beach of Bird Key.

13. *Ardea cœrulea*. LITTLE BLUE HERON.—A number of representatives of this species was observed on Garden Key. Individuals in both phases of plumage were taken. It was novel to see the birds adapt themselves to new conditions. I frequently saw this species and *Ardea virescens* alight in the embrasures of the fort, and to escape pursuit they would, instead of flying over the walls of the fort, dodge into one cannon port and out of another, with great success, easily avoiding any one, and becoming quickly lost to the hunter in the mazes and corridors at different levels.

14. *Ardea virescens*. GREEN HERON.—Plentiful on Garden Key during my stay, and Dr. Goodman collected some ten or fifteen individuals in the three weeks succeeding my departure. I have never seen Green Herons in the same abundance that I found them here. There were always several fishing in the moat outside of the walls of the fort, and I rarely passed through the little buttonwood grove inside of the fort without disturbing one or two roosting in these trees. I do not think that this or any other kind of Heron breeds in this group of islands, and regard all representatives of the family found here as nomadic. Their numbers generally increased just before the beginning of strong northerly winds.

15. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.—Dr. Goodman sent me a single representative of this species which he procured late in April.

16. *Nycticorax violaceus*. YELLOW-CROWNED NIGHT HERON.—During the time spent at the Tortugas five representatives of this Heron were obtained. All were adult, and in fine, unworn plumage. In the vicinity of Key West the low mangrove keys seem to be particularly adapted to the wants of the Yellow-crowned Night Heron, and the birds are abundant. I found them breeding, and with young just hatched, as early as March 5.

17. *Gallinula galeata*. FLORIDA GALLINULE.—I found on Middle Key a mummied specimen of this bird. No others were met with.

18. *Tringa minutilla*. LEAST SANDPIPER.—A single one taken, and no others observed. Dr. Goodman took one on April 25.

19. *Calidris arenaria*. SANDERLING.—Two small flocks were seen frequently during my stay and some seven or eight secured. These were the commonest shore birds.

20. *Actitis macularia*. SPOTTED SANDPIPER.—I obtained a single individual during the last day or two of my stay. Dr. Goodman found them to be a quite common bird late in April and early in May, and he sent me a large series which he had collected at that time.

21. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—A single one was taken on April 22 by Dr. Goodman.

22. *Ægialitis meloda circumcincta*. BELTED PIPING PLOVER. — A single individual of this subspecies was secured on March 27. It is a male.

23. *Arenaria interpres*. TURNSTONE.—A small flock of perhaps ten or twelve of these birds was frequently seen during my stay, and a few representatives were secured.

I had expected to find at the Dry Tortugas many water birds,—that is, great flocks of Gulls and Terns and Plover and Sandpipers; and it would seem an ideal place for all these kinds of birds. The falling tide exposes much reef that seems fairly to swarm with minute marine animal life, and the sand beaches reach down to such shoal water that in many places it is almost impossible to land a boat save on extreme high tide. Small fish could be seen in great schools in the areas of shoal water and it appeared to be altogether just the place for myriads of Gulls. But the kinds of Gulls and Terns that were noticed during my stay were not represented by large numbers of individuals, and the beach birds were insignificant. The list of water birds that I have presented only includes twenty-three species; and of these seven were added to the list by Dr. Goodman after my departure, so that *sixteen* species of water birds, represented by but comparatively small numbers of individuals, were all that were seen at the Dry Tortugas between March 20 and April 10, — a period of three weeks.

But if water birds were not where I had hoped to find them, land birds were present in numbers; and it was with increasing surprise that each day of my stay discovered some unlooked-for species that, in planning my trip to these islands for Noddies and rare Terns, for Boobies and perhaps some water wanderers among the Petrels, were not even thought of. The result of the collections and observations produces a little over fifty land birds, two of which were before unrecorded from North America. (See Auk, Vol. VII, No. 3, pp. 264–265.) This is perhaps the more remarkable when I reiterate that so far as my own observation goes and from all that I could gather from other sources not a single land species breeds on any of these keys.

24. *Accipiter velox*. SHARP-SHINNED HAWK.—Dr. Goodman sent me an adult female bird which he procured on May 1. This is the only record I have.

25. *Buteo lineatus alleni*. FLORIDA RED-SHOULDERED HAWK. — A single representative of this species visited Garden Key during my stay. I was unable to procure the bird, but had good opportunities to examine it with a glass.

26. *Falco peregrinus anatum*. DUCK HAWK. — A single bird was observed on one occasion on Bird Key and a pair soared round above the fort for an hour or more one afternoon about April 1.

27. *Falco columbarius*. PIGEON HAWK. — I secured one and saw several pass over the fort during the last few days of my stay. Later in April Dr. Goodman procured me a series of six of these birds, among which are two individuals that are moulting and one in a phase between the immature and adult plumage.

28. *Falco sparverius*. AMERICAN SPARROW HAWK. — Some dozen or more individuals were observed during my stay, and several were taken. They are said to be resident at Garden Key, *i.e.*, there are always some representatives present, but I could find no signs of their having nested on the island or on the others of the group, and so believe that while they may be always represented in the bird fauna of the island, yet it is by different individuals passing some little time at this point.

29. *Pandion haliaëtus carolinensis*. AMERICAN OSPREY. — A single one was noted.

30. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. — This species was not common, but I obtained one on the 7th and another on the 9th of April. Dr. Goodman collected four individuals, April 28–30.

31. *Ceryle alcyon*. BELTED KINGFISHER. — There were one or two representatives of this species present on Garden Key during my stay, but the birds were never noticed as being at all common. But their numbers were greatly augmented during the later part of April, for Dr. Goodman sent me a large series which he secured at that time.

32. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER. — This was the only Woodpecker observed at the Tortugas, where it was not uncommon during my stay. In all I secured six representatives, the first on March 25 and the last on April 8; five of these are females. The only male noticed was taken on March 25 and approaches the subspecies *nuchalis*, having a few red feathers faintly representing the nuchal band. The bird is also of a decidedly deeper and brighter yellow below than average specimens of typical *varius*.

33. *Antrostomus carolinensis*. CHUCK-WILL'S-WIDOW. — A single bird (a male) was secured on April 8, and Dr. Goodman sent me three, two of which were taken April 19, and one May 1.

34. *Chordeiles virginianus chapmani*. FLORIDA NIGHTHAWK. — I obtained a Nighthawk on April 5, and Dr. Goodman took two others on April 13 and 14 respectively, all of which I refer to this subspecies.

35. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD. — On the 24th of March I noticed several male birds, which were the first I had seen at this point. Two of these were seen half a mile from the shore, as they passed by the open boat in which I went from one key to the other. From this time they were more or less common till the 29th, when the migration seemed to be at its height and I took seven adult males. After about April 2 I did not see any. Only one female was noted during my stay. The adult males were, however, as abundant, if not more so, than I ever noted them at any point on the mainland in the spring migration. It was very curious to meet these birds, when at considerable distance from land. Frequently while fishing and collecting

water birds I noticed Hummingbirds that were always identified, when close enough to be seen plainly, as this species. One morning I counted six pass by the boat in this way. At such times their flight was direct and very rapid, and all were going in a northerly direction. They flew about twenty-five feet above the water and did not appear in any way fatigued, nor show any desire to alight on the boat, as small birds crossing the water so frequently do. The individuals taken on Garden Key, a dozen or more in all, were in superb plumage and good condition. They fed on cultivated flowers, that had been planted near some of the houses, and seemed as much at home as in our northern flower beds.

36. *Tyrannus tyrannus*. KINGBIRD.—This was by far the commonest land bird met with at the Tortugas. I should think that the first individuals of the migration arrived about the time that we came to Garden Key. For a day or two not many were seen. But one evening just about sundown I noticed at least fifty coming into the enclosure of the fort over the walls. From this time, about March 25, until we left they were very abundant. Generally on any dead limb or on the tops of the trees at least four or five, and not infrequently a dozen, were to be seen. Once I counted twenty-three individuals in one tree at the same time. The birds remained common during our stay and Dr. Goodman took them in numbers all through April, and secured examples as late as May 2.

37. *Tyrannus dominicensis*. GRAY KINGBIRD.—On March 23 I secured two individuals on Garden Key, but one was very badly mutilated and was not preserved. These were all the Gray Kingbirds that I met with during my stay. In the latter part of April they came to the Tortugas in numbers, and Dr. Goodman sent me many individuals taken during the first week in May.

38. *Corvus americanus floridanus*. FLORIDA CROW.—No Crows were secured by me at the Tortugas, but two birds that I saw and heard one day near East Key I refer to this subspecies.

39. *Dolichonyx oryzivorus*. BOBOLINK.—Not met with during my stay, but Dr. Goodman secured two on April 30 and another on May 1, all adult males.

40. *Icterus spurius*. ORCHARD ORIOLE.—Dr. Goodman sent me one, an adult male in full plumage, which he took on April 11.

41. *Ammodramus sandwichensis savanna*. SAVANNA SPARROW.—A few of these birds were found on Bird Key during the first ten days of my stay, but later none were taken and presumably all had gone north.

42. *Ammodramus savannarum passerinus*. GRASSHOPPER SPARROW.—A single bird was secured on April 7.

43. *Piranga rubra*. SUMMER TANAGER.—Dr. Goodman sent me an adult male which he procured late in April.

44. *Piranga erythromelas*. SCARLET TANAGER.—I saw one on Garden Key, at two different times during the 29th of March. The bird was very shy, and I was unable to secure it. The next day it was gone.

45. *Petrochelidon fulva*. CUBAN CLIFF SWALLOW.—For records of the occurrence of this species at Garden Key, see Auk, Vol. VII, No. 3, p.

264. Among a flock of Tree Swallows (*Tachycineta bicolor*) that visited Garden Key on March 29 I saw an individual of this species which I was unable to obtain. This was after the capture of the two individuals already recorded.

46. *Chelidon erythrogaster*. BARN SWALLOW. — A single bird was observed, but not procured, on April 8. This was the only note during my stay, but Dr. Goodman took two on April 20, which he sent to me.

47. *Tachycineta bicolor*. TREE SWALLOW. — Not common at the Tortugas during my stay. A small flock made its appearance on March 29 and remained near by all that day and part of the next. There were in all about a dozen birds, two of which were taken. This is the entire record for the species, and is given in detail as it bears strongly, by a process of exclusion, on other Swallows observed.

48. *Calichelidon cyaneoviridis*. BAHAMAN SWALLOW. — For a note on the capture of this species, see Auk, Vol. VII, No. 3, p. 265. Another individual of the same species was seen the same day flying about over the enclosure of the Fort, but was not secured. The bird is so easily recognized when on the wing, as not to be readily confounded with any other species.

49. *Vireo altiloquus barbatulus*. BLACK-WHISKERED VIREO. — Dr. Goodman took a single representative on April 29. I did not meet with the species.

50. *Vireo olivaceus*. RED-EYED VIREO. — During my stay on the Tortugas I secured a single bird on March 23 and two others on the 29th of that month. These are all the records.

51. *Vireo flavifrons*. YELLOW-THROATED VIREO. — A single one was taken at Garden Key on March 24.

52. *Vireo noveboracensis*. WHITE-EYED VIREO. — At Garden Key I secured three Vireos that are undoubtedly to be referred to this species. It would seem natural to expect to find the representatives of the White-eyed Vireo at the Tortugas the same as at Key West. I had just come from that island and had there collected a large series of birds—upwards of fifty—that were all unquestionably *Vireo noveboracensis maynardi*, so that the material that I have has enabled me to substantiate conclusions already advanced in this journal. (See Auk, Vol. VII, No. 1, pp. 15-16.) I am now inclined to believe further, that the White-eyed Vireos breeding on the west coast of Florida, from at least Tarpon Springs south, are not migratory birds and change their location but little at any season. This being the case it would not be natural to expect to find the subspecies *maynardi* at the Tortugas, if, as I believe fully, no land birds breed at that point. The White-eyed Vireos that are the resident breeding birds at Tarpon Springs are not as extreme examples in the direction of *crassirostris*, structurally, as those collected at Key West; but they have as a whole so far diverged from true *noveboracensis*, that they appear to me referable to *maynardi* rather than to the former, and are in much the same category as the Carolina Wrens of the Tarpon region, which, while not as extreme as *miamensis*, yet diverge so far from true *ludovicianus* in the direction of *miamensis* as to be referable only to that form.

53. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—This was one of the commonest birds at the Tortugas during my stay, and was found there by Dr. Goodman as late as April 28. On March 23 the birds were particularly abundant at Garden Key.

54. *Protonotaria citrea*. PROTHONOTARY WARBLER.—This species was met with but once on Garden Key. An adult male flew into an open window on April 6.

55. *Helinaia swainsonii*. SWAINSON'S WARBLER.—Three individuals were obtained on Garden Key during my stay. A male was procured on March 25, and another flew in at an open window the next day. A female was taken on April 5 concluding all records of the species at this point.

56. *Helmitherus vermivorus*. WORM-EATING WARBLER.—Two males taken on April 5 are all that were recorded during my stay. Dr. Goodman obtained a single bird on April 13.

57. *Helminthophila bachmani*. BACHMAN'S WARBLER.—A male taken on March 26 and a female taken on April 9 comprise all the records that were made of this species on the Dry Tortugas.

58. *Helminthophila pinus*. BLUE-WINGED WARBLER.—Three were taken on March 23, and one each on March 24 and 25,—five individuals in all.

59. *Compsothlypis americana*. PARULA WARBLER.—A few were noted and taken on the different keys during my stay. The birds were most abundant March 24 and 25 on Garden Key.

60. *Dendroica tigrina*. CAPE MAY WARBLER.—I took a single bird on April 8, and Dr. Goodman obtained one on the 27th of that month.

61. *Dendroica caerulescens*. BLACK-THROATED BLUE WARBLER.—Dr. Goodman obtained one on April 24. I did not meet with the species.

62. *Dendroica coronata*. MYRTLE WARBLER.—The only one observed, a female, was taken on Garden Key March 31.

63. *Dendroica caerulea*. CERULEAN WARBLER.—The only one recorded, an adult male, was taken in the low bushes on Bird Key, March 23.

64. *Dendroica striata*. BLACKPOLL WARBLER.—Dr. Goodman took two of these birds, one on the 26th and the other on the 28th of April. I did not meet with them.

65. *Dendroica dominica*. YELLOW-THROATED WARBLER.—Three Warblers of this kind were taken on the different keys of the group. The records are a male, March 23; a male, March 29; and a female, April 8. These birds are all well marked and typical specimens.

67. *Dendroica dominica albilora*. SYCAMORE WARBLER.—Six examples of this subspecies were obtained on the keys of the group during my stay. All are very strongly marked and are to be easily selected at a glance from the true *dominica*. The records of this subspecies for Florida are, so far as I know, confined to the single bird taken by Mr. J. W. Atkins at Key West (see Auk, Vol. VII, No. 1, p. 20). There are no records that I am aware of for the mainland of the peninsula. It is not a little remarkable that the western form of a bird should be so well represented in the migratory season on the extreme western land off the Florida coast.

68. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Dr. Goodman obtained a single specimen on April 26.

69. *Dendroica palmarum*. PALM WARBLER.—This was the commonest Warbler at the Tortugas during the time I spent there, and the twenty or more individuals taken form an interesting series, being in the moult and showing the change from the winter to the breeding plumage. Dr. Goodman took two of these birds on Garden Key on April 24 and 26.

70. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER.—Two males taken March 22 and March 31, I refer to this subspecies. These are all the records I have obtained.

71. *Dendroica discolor*. PRAIRIE WARBLER.—During my stay these birds were not uncommon, being noted almost daily, and sometimes as many as half a dozen were seen at the same time.

72. *Seiurus aurocapillus*. OVENBIRD.—This bird was not common at the Tortugas, but two or three being secured or observed. Dr. Goodman obtained a single bird as late as April 21.

73. *Seiurus noveboracensis*. WATER-THRUSH. — Dr. Goodman obtained single representatives of this species on April 25 and May 2.

74. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER-THRUSH.—Two Water-thrushes, a female March 26, and a male March 28, I refer to this well-marked subspecies. These were all the Water-thrushes I obtained at the Tortugas.

75. *Geothlypis formosa*. KENTUCKY WARBLER.—On March 29 I took an adult male, which is, so far as I am aware, the second record of the species in Florida.

76. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—A female was taken on March 21 and a male, on April 7. These are all the records from this group save a single bird taken by Dr. Goodman on April 26.

77. *Sylvania mitrata*. HOODED WARBLER.—This species was more or less common during my stay. On March 23 I took four and saw three others, and almost every day a single bird was seen or taken. Dr. Goodman obtained them as late as April 14.

78. *Setophaga ruticilla*. AMERICAN REDSTART.—Two males were taken during my stay, one on March 30 and one on April 5. Dr. Goodman found them to be quite common during the last week in April and up to May 2.

79. *Galeoscoptes carolinensis*. CATBIRD.—This species was not common during my stay, and only two were secured and no others noted. But Dr. Goodman found them rather abundant during the last week in April and the early part of May.

80. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Never very common, but met with several times, generally in pairs. Perhaps ten in all were seen.

A SUPPOSED NEW SPECIES OF HUMMINGBIRD IN
THE ROYAL ZOOLOGICAL MUSEUM OF
DRESDEN.

BY A. B. MEYER.

Eriocnemis aurea sp. nov.

E. cupreiventris (Fras.) similis, sed minor, corpore toto, gula et pectore exceptis, aureo-æneo, caudæ tectricibus longis prasinis, subcaudalibus cobaltinis plus minusve viridi marginatis, tibiarum pappis minoribus, diversus.

Long. al. 58; caud. 40; rostri 20 mm.

HAB. — Colombia.

E. cupreiventris measures: wing, 62 mm.; tail, 45 mm., bill of equal length. The coloration of the specimen above described differs so considerably from *cupreiventris* that it cannot be taken for an individual variation. While *cupreiventris* is only slightly tinted with bronze, *aurea* is covered with golden bronze all over, and in part of a most lively tint, even on the shorter tail and wing coverts. The throat and upper breast are lighter green than in *cupreiventris*, and in certain lights washed with bronze too, and each feather has a concealed white cross band as in *E. dybowskii* Tacz. Further, the long upper tail-coverts are not greenish blue, but green, and the under tail-coverts are not violet, but cobalt blue, only in certain lights they are hyacinth-blue, some margined with green. The color of the wings as well as of the tail is not as lively as in *cupreiventris*; and, finally, the white plumes on the thighs are much shorter and not as abundant. The specimen cannot be taken for a young *cupreiventris*, being much more brightly colored on the whole body, than the adult of this species.

SOMATERIA DRESSERI, THE AMERICAN EIDER.

BY GEORGE H. MACKAY.

THIS bird is found, as far as I have been able to learn, only on the Atlantic coast from Labrador to Delaware, collecting in large

numbers in the shoal waters adjacent to the Islands of Nantucket, Muskeget and Martha's Vineyard, where they pass the winter months, and it is the only one of the Eider group which has come under my immediate notice. Resembling somewhat the Pacific Eider, and also *S. mollissima*, they are easily distinguishable from the former by their size, being much smaller, and by their having the forehead much more prominent; it is elongated and depressed in the other two varieties. *S. dresseri* also has the frontal fleshy portion of the bill much wider and more prominent than in *mollissima*.

Their favorite ground on this coast is about those low-lying, partially submerged rocks which abound with their favorite food, mussels (*Modiola modiolus*), which are from one to four miles from the mainland. Here they find the black mussel which adheres to the sunken rocks, as also sea urchins. When living near some favorite rock, they always fly out to sea after their evening meal to roost, and on their return the following morning, if we take the rock as a centre, they come from points covering some sixty-five degrees, thus showing a remarkable dispersion during the night, for they leave the rock at night in one body; and it is curious that no matter from what point they start at daybreak, or before it, they are always pointed undeviatingly for the rock. In flying they have a habit of carrying the head very low, on which account it is easy to under-shoot them. They are most observing, and notice the least thing unusual on or about the rocks or with the decoys, which must be set so as to ride very steadily, and too much care cannot be exercised if a successful issue is to be expected.

They are expert divers, and if wounded are most difficult to capture; in fact I know of no birds more so, unless it may be the Loons. They swim deeply and steadily when at ease, and are rather slow and heavy in their movements, but withal graceful; but if frightened they are very agile, and if under water at such a time will always come out flying separately, no two being together. They dive for the mussels outside of the breaker which usually lies just outside the main rock, swimming underneath the surf and pulling off the mussel, returning to the surface again outside the breaker, but never coming up in it; and when a flock has been feeding an examination of the ledge, or rocks, reveals the white threads, like the mycelium of the mushroom, adhering

where the mussels have been torn off. When coming to feed in the morning, the earliest birds arrive before daybreak, and they continue coming until all have arrived. They invariably alight outside, some distance from the rock, and swim in always in a compact body, frequently almost on top of each other, carrying a wave before them. Some days they have what I call a diving morning, when it seems impossible to shoot them. I have known a flock of seventy-five to swim up in a body to within forty-five yards, when on shooting at them, they would all get under water before the shot could reach them. Such mornings were always the precursor of few if any Ducks.

The young drakes seem to keep together, one instance of which I may mention, when my friends Messrs. Nickerson and Phillips, with only one barrel each, shot eighteen young drakes dead out of a flock of twenty-three on the Salvages off Cape Ann, in the winter of 1860. These same gentlemen also shot eighty-seven one day in December, 1859, on the same rock. The feathers of the females are more easily detached than those of the drakes.

These Ducks will not come to the rocks or decoys if a dead bird is floating in the vicinity, just the opposite, in my experience, of the effect it has on other Ducks. I have known a large flock sitting some two miles to leeward to be disturbed, and take flight, by a dead Duck drifting down past them. This, however, does not appear to affect them in Muskeget waters, for they do not mind the dead birds around, and it is a common occurrence for them to alight to dead birds drifting. When they have not been disturbed the previous day and they leave at night for the open sea to roost, it is certain they will return the following morning, but if so disturbed it is problematical if they return at all.

It is only in those waters bounded by the islands of Nantucket, Muskeget and Martha's Vineyard that the American Eider may be said to congregate, in our vicinity, as is also the case with most of the other water fowl found on our coast. Here in immense numbers they live undisturbed during the winter months, with an abundance of sea-clams and scallops, black mussels (*Modiola modiolus*) and sweetmeats (*Crepidula fornicata*). Of these last they do not swallow the shells, but shuffle the meat out, discarding the shell, empty ones of which I found in great quantities on the shoals. All these are obtained by diving. On

March 18, 1875, on a return trip from the island of Muskeget where I had been after these Ducks, I saw and started from the water adjacent to Eel Point on Nantucket Island a body of these Ducks which I computed contained twelve thousand, and near them was a flock of Scoters and Velvet Ducks which I estimated contained twenty-five thousand. The first portion of the flock—and they all followed each other in their flight—extended as far as the eye could discern towards Great Point on the same island, the distance being eleven miles from where I was. It was the largest body of wild fowl I ever saw.

The American Eiders remain in these waters until the latter part of April, when they depart for the North. Before starting they frequent the sand bars and shoals which are out of water, on which they like to crawl up and sit, and where also they obtain gravel,—to serve as ballast, according to the local gunners. At this time they are more easily decoyed than at any other, coming to bunches of seaweed rolled up and placed on the beach near the water, which seem to answer very well the purpose of decoys, also to the dead birds placed on the shore as soon as they are shot. They can also be waved in from quite a distance when flying along the shore outside, by shaking a black cloth or gun case at intervals, by which means they are frequently brought within shooting range. When flying along the shore they seem to avoid passing over sand spits where the sea is breaking sufficiently to make white water, preferring to go to either side of them. Neither will they come on shore to crawl up where there is ice or snow, that is when the shore has been bare previous to a snowstorm.

It frequently happens that the scallops in these waters change their location by swimming to other places, and oftentimes the beds of sea-clams become covered up with a layer of sand through the agency of storms, but the Eiders discover the new place, or other beds, with surprising intelligence, so quickly as to cause them apparently little inconvenience.

In these waters the American Eider is known by the name of 'Shoal Duck.' In Rhode Island and Shelter Island waters they are called 'Wamps.' To the north of Cape Cod they are known by the name of 'Sea Ducks.'

In closing I would mention as one instance of how alive they are to the presence of their favorite food, the black mussel, that

the United States Government has built out from the north shore of Nantucket, close to the harbor entrance where boats are continually passing, a rough stone jetty nearly a mile long, at the extremity of which is an iron rod with a moveable red lantern for the use of the daily steamboat. Last year the man who tends the light told me that as the mussels were growing there in considerable quantity they were attracting the Shoal Ducks, or Eiders, which were coming daily in increasing numbers to feed on them, frequently crawling out of the water onto the rocks. They continued to arrive in greater numbers until some eight hundred had collected, when they commenced to shoot them. The keeper told me that they were observing, so much so that they perceived a difference if the lantern was not in place at the top of the iron rod, and if he did not desire to have any shooting there, all he had to do was to leave the lantern half way down the rod instead of in place at the top, and no Ducks could be induced to come near the jetty to feed, although sitting off on the water in detached groups, where they could observe everything that took place. I should estimate the number of Eiders living around this jetty at present (March 27, 1890) to be about fifteen hundred.

ON A COLLECTION OF BIRDS FROM FORT CHURCHILL, HUDSON'S BAY.

BY W. EAGLE CLARKE.

IN the year 1845, Dr. Gillespie, Junior, presented to the Edinburgh Museum a series of bird skins collected by himself during his residence at Fort Churchill as an officer of the Hudson's Bay Company. This collection has hitherto remained unrecorded, but an account of it may, perhaps, be deemed worthy of a place in 'The Auk' since it is thought that little or nothing has been contributed to the avifauna of the district around this station — the most northerly outpost of civilized man's residence on the western shores of this great inland sea.

Fort Churchill was,* doubtless, an interesting and singularly favorably situated station for ornithological work, for it combined several important advantages. It lay at the mouth of the great river after which it took its name, and in proximity to the sea, and must thus have been an exceptionally good locality for observing and obtaining migratory species. But it had further advantages, for in its vicinity lies the northern limit of forest growth, and hence the boundary to the range of woodland species; while just beyond this natural barrier are those desolate arctic wilds, not inappropriately alluded to by Sir John Richardson in the 'Fauna Boreali-Americana' as the "Barren Grounds," a region, however, affording a congenial summer haunt for Waders, Ducks, and other birds for which the far north offers peculiar attractions.

It is a matter for regret that no data accompany the specimens, which represent seventy-seven species, but it should be remarked however, that each bears a label upon which is written "Churchill Fort, Hudson's Bay, Dr. Gillespie, Junr." The classification and nomenclature adopted are those of the A. O. U. Check-List, while the species have been determined in accordance with the same authority, as set forth by Mr. Robert Ridgway in his excellent and useful 'Manual of North American Birds.' The writer alone is responsible for the naming of the specimens.

Colymbus auritus.—An adult in summer plumage.

Urinator imber.—An adult in summer plumage.

Urinator arcticus.—An adult in summer plumage.

Urinator lumme.—An adult in summer plumage.

Stercorarius pomarinus.—An adult.

Stercorarius parasiticus.—An adult of the melanistic form.

Larus philadelphia.—A young bird in first plumage.

Sterna paradisæa.—*a, b*, adults in summer plumage.

Merganser serrator.—An adult male.

Anas boschas.—An adult male.

Anas carolinensis.—*a, b*, adult females.

Anas americana.—An adult male.

Charitonetta albeola.—*a, b*, adult males.

Clangula hyemalis.—*a*, adult male in summer plumage; *b*, adult female in summer plumage; *c*, adult female in transition plumage.

Oidemia americana.—An adult male.

Botaurus lentiginosus.—An adult.

* The word *was* is used advisedly, for it seems doubtful if the station is now maintained.

Porzana carolina.—*a, b*, adults.

Crymophilus fulicarius.—*a*, adult male in summer plumage; *b*, adult female in summer plumage.

Phalaropus lobatus.—*a, b, c*, adults in summer plumage.

Gallinago delicata.—*a, b*, adults.

Macrorhamphus griseus.—*a, b*, adults in summer plumage.

Micropalama himantopus.—An adult in summer plumage.

Tringa alpina pacifica.—*a, b*, adults in summer plumage. These specimens seem to agree perfectly with Scotch specimens of *Tringa alpina*, with which they have been compared. After an examination of the few American specimens of this bird at my disposal I have come to the conclusion that even the eastern American Dunlins are liable to considerable variation. An adult specimen from New Jersey in full summer plumage is much brighter, though paler, in color than any European specimen I have seen; and the breast is whiter and much less streaked with dusky; the bill, however, is only 1.30 inches in length. An adult in full winter plumage, and also from New Jersey, is a deep brown on the upper surface and quite different from the European bird at the same season, and the bill is no less than 1.70 inches in length. The various dimensions of these four specimens are as follows:

	<i>Wing</i>	<i>Culmen</i>	<i>Tarsus</i>
Fort Churchill <i>a</i>	4.57 in.	1.43 in.	.97 in.
Fort Churchill <i>b</i>	4.65 "	1.52 "	1.02 "
New Jersey (summer)	4.65 "	1.30 "	.96 "
New Jersey (winter)	4.85 "	1.70 "	1.06 "

Ereunetes pusillus.—*a*, adult male in summer plumage; *b*, adult female in summer plumage.

Calidris arenaria.—An adult in summer plumage.

Limosa hæmastica.—*a*, adult in summer plumage; *b*, adult in spring plumage—*i.e.*, with traces of summer plumage, but its winter dress predominating.

Totanus melanoleucus.—An adult in summer plumage.

Totanus flavipes.—Adult in summer plumage.

Actitis macularia.—An adult in summer plumage.

Numenius hudsonicus.—An adult.

Charadrius squatarola.—*a, b*, adults in summer plumage.

Charadrius dominicus.—An adult in summer plumage.

Ægialitis semipalmata.—*a, b*, adults in summer plumage.

Arenaria interpres.—*a, b, c*, adults in summer plumage; *d*, a bird of the year in first plumage.

Dendragapus canadensis.—An adult male.

Lagopus lagopus.—*a, b*, adults in winter dress. In specimen *a*, the wing, from the carpal joint to the end of the longest primary, measures no less than 8.45 inches.

Lagopus rupestris.—*a*, male in winter plumage; *b*, female in winter plumage.

Ectopistes migratorius.—*a*, adult male; *b*, adult female.

Circus hudsonius.—An immature specimen.

Accipiter atricapillus.—An adult female.

Archibuteo lagopus sancti-johannis.—A light colored specimen practically indistinguishable from Scotch examples of *Archibuteo lagopus*, in immature plumage, in the Edinburgh Museum collection.

Falco rusticolus gyrfalco.—*a*, adult female; *b*, young male in first plumage.

Falco peregrinus anatum.—An adult male.

Falco columbarius.—An adult female.

Asio accipitrinus.—An adult.

Bubo virginianus.—An adult.

Surnia ulula caparoch.—An adult.

Ceryle alcyon.—An adult male.

Dryobates villosus leucomelas.—*a*, adult male; *b*, female.

Picoides americanus.—*a*, *b*, *c*, adult males; *d*, *e*, adult females.

Spyrapicus varius.—An adult female.

Colaptes auratus.—An adult female.

Chordeiles virginianus.—An adult female.

Otocoris alpestris.—*a*, *b*, *c*, *d*; adults in summer plumage; *e*, young bird in first plumage.

Perisoreus canadensis.—An adult.

Scolecophagus carolinus.—*a*, adult male in summer plumage; *b*, an immature bird.

Quiscalus quiscula æneus.—An adult male.

Pinicola enucleator.—*a*, *b*, adult males; *c*, male in orange-red plumage; *d*, adult female.

Loxia leucoptera.—*a*, *b*, *c*, adult males; *d*, *e*, adult females.

Acanthis hornemannii.—*a*, *b*, adults.

Plectrophenax nivalis.—Adult female in spring dress.

Calcarius lapponicus.—*a*, *b*, *c*, adult males in summer plumage; *d*, *e*, adult females in summer plumage; *f*, young bird in first plumage.

Zonotrichia leucophrys.—An adult.

Zonotrichia albicollis.—*a*, adult male; *b*, adult female.

Spizella monticola.—*a*, *b*, *c*, *d*, *e*, adults.

Junco hyemalis.—*a*, *b*, adults.

Tachycineta bicolor.—An adult male.

Lanius borealis.—*a*, *b*, adults in summer plumage.

Dendroica æstiva.—*a*, *b*, adult males.

Dendroica coronata.—*a*, *b*, adult males.

Dendroica striata.—*a*, an adult male; *b*, a young bird in first plumage.

Dendroica palmarum.—An adult.

Sitta carolinensis.—An adult female.

Parus hudsonicus.—*a*, *b*, *c*, *d*, adults.

Regulus calendula.—An adult.

Turdus aliciae.—An adult.

Merula migratoria.—*a*, *b*, adults in summer plumage; *c*, adult with traces of winter plumage.

THE NESTING OF THE YELLOW-THROATED WARBLER AT RALEIGH, N. C.

BY C. S. BRIMLEY.

THE YELLOW-THROATED WARBLER (*Dendroica dominica*) is a regular summer visitor at Raleigh, arriving in the spring from the middle to the end of March and leaving in September. While it is more or less numerous in all large tracts of pines and in all mixed woods containing large pines, it cannot be called plentiful anywhere; a fifty-acre tract of pines about half a mile from my house contains just five pairs this year, and they are more numerous there than in any other place I know of.

This Warbler commences nesting early in April, selecting as a site for its nest a horizontal limb usually, but not always, of a tall thin pine. Sometimes it builds its nest where the limb forks, but more often right on the limb, attached only to the limb itself or else laced to small twigs as well; one nest was built among and attached to small twigs only, but this nest was also essentially different in construction from any other we have ever taken and resembled the others only in the rough and unfinished character of the rim. The nest is usually much like a Pine Warbler's in general character, but lacks the black grape-vine bark which gives the latter such a dark appearance, and is also usually less compact, especially about the rim. The materials of which it is composed are weed stems, strips of trumpet-vine bark, fine grass, and caterpillar silk; the lining is of horsehair or feathers or both. The nest varies a good deal in size. The height of the nest varies from twenty to ninety feet or more, and the distance from the trunk from about three to twelve feet. While the female is building, she usually keeps silent, but sometimes chirps; the male is apt to be singing somewhere near by, but apparently does not care to go near the nest as he does not accompany the female when she goes to the nest to build. At such times the female often takes a roundabout route to get there, and her flight is usually more desultory and less suggestive than the straight business-like flight of the female Pine Warbler when approaching her nest.

The female apparently does all the incubating, as we have never

taken a nest yet when the male was not singing near by, though we have on three occasions observed the female come to the nest early in the morning just before we took it and so presume she has to feed herself as well as do all the work. This Warbler is the closest sitter I am acquainted with, never leaving the nest till the limb it is built on is jarred, and in a large majority of cases, not till the nest itself is touched. When she does conclude to quit she slips out of the nest and flutters vertically downward some six feet or more, but makes no pretense of a broken wing or any other affliction. The set is usually four, occasionally three. When one set is taken, the female goes to work, builds another nest, and lays another set.

The nest is very hard to find, in fact the only way to find one is to watch a pair of birds day after day until at last the female is detected building, and the nest located. As seems to be the case generally here with Pine Warblers and Gnatcatchers, it is easier to detect the Yellow-throated Warbler building when it first commences than later on when it is putting in the finishing touches.

The following list of all the nests we have found here will give a better idea of several details than any amount of general description.

1. Nest found April 25, 1888, about one third built in a large old field pine, the female only building. This was in a narrow strip of good-sized pines adjoining a large tract of woods. The nest was taken on May 11, and contained only one fresh egg. The nest was 65 feet high, and 12 feet from the trunk, and was larger and deeper than a Pine Warbler's, but the rim was thinner and more ragged, the nest was composed of grape-vine bark, horsehair, and a great quantity of white chicken feathers. The nest was not built on a limb, but attached by the sides and bottom to a number of small twigs, thus differing in situation, as well as in construction, from any other taken so far.

2. Nest found April 25, 1889, apparently just finished, but with no eggs. Took set of four from this nest on May 4, flushing the female from the nest on jarring the limb, eggs fresh. The nest was 20 feet high, 7 feet from the trunk, on a horizontal limb of the pine, and also laced to small twigs. The nest was much like a Pine Warbler's, but smaller and grayer, lacking the grape-vine bark of the latter. The nest was in a fifty-acre tract of pines where most of this year's nests were found.

3. Nest found just commenced on April 5, 1890, 42 feet, built on fork of pine limb some eight feet from the trunk. The set of four fresh eggs was taken April 25. The bird came to the nest while my brother was putting his climbers on. The nest was much like a Pine Warbler's, but with

no grapevine bark, but instead some bark of the trumpet-vine, and heavily lined with feathers; the rim was quite thin and loose, otherwise the nest was solid enough.

4. April 29, I found the same pair re-building, this time on a pine limb some 47 feet high and four or five feet from the trunk. On May 12 we took our second set of four from this pair, the eggs containing small embryos. The pine was tall and slim, and we had to stay it with ropes while taking the nest. The female stayed on the nest till it was touched. Nest similar to the preceding two.

5. May 15, I found this pair again re-building in a pine near where their first nest was (the second nest having been some 200 yards east of the first one), the pine being even taller and thinner than before. The nest was 58 feet high and 6 feet from the trunk, and the pine swayed frightfully, although stayed with ropes, when we took our third set of four on May 26. This nest was quite small, otherwise like the others.

6. On May 28 I started for the fourth time to look up this pair and duly found them, in no way discouraged, again building, this time near the second nest and in a respectable sort of pine, 44 feet high and four or five from the trunk. On June 7 we took our fourth set of four from this pair, and I think we were satisfied.

7. Found a second pair of birds building a well-built nest on a good-sized limb of a large pine, 42 feet high and about seven from the trunk. On April 22, 1890, we took a set of four fresh eggs from this nest. The nest was composed of weed stems, grass stems, and caterpillar silk, and heavily lined with horsehair.

8. On May 8, 1890, we found and again took a set of four from this pair. The nest was 38 feet high and some ten feet from the trunk, and was built and almost hidden in the lateral fork of a large limb. We found the nest by watching the bird go to it after feeding. This nest was made of the stems and leaves of a gray weed known as rabbit tobacco, pieces of cotton, cocoon silk, fine grass and horsehair, and weed stems, and was heavily lined with horsehair. The eggs contained small embryos.

9. April 24, I found a third pair of birds building a well-built nest in a medium-sized pine, 43 feet high and four feet from trunk. Took four eggs, slightly incubated, from it on May 3. The bird went to the nest while we were preparing to take it. This nest was very large, with very thick, strong walls made very largely of rabbit tobacco, the outside almost entirely of it, and was lined with feathers and horsehair. The nest, superficially, reminded one more of that of the Prairie Warbler, a bird which uses rabbit tobacco a great deal, but was much larger and thicker.

10. May 2, I found a nest just started by a fourth pair on a pine limb 44 feet high, some five or six from the trunk. The female was building in a desultory sort of way. We took a set of four fresh eggs on May 8. This nest was very small and only scantily lined with feathers, the lining being so thin that the eggs would have fallen through in one place if there had been nothing underneath.

11. I found this last pair re-building May 19, 43 feet from ground and

five or six from the trunk. We took a set of three on May 30. This nest was small, but better made than the previous one. The eggs contained small embryos.

All of the foregoing were found in a fifty-acre tract of pine woods. The following nests were found in mixed woods.

12. April 14, I found a nest just started in a tall, very thin pine some 50 feet high; a heavy rain came next day and the nest was deserted.

13. April 24, I found this pair re-building in a huge pine not far from the first, the nest some 90 feet high and 15 from the trunk. I did not trouble that pair any more.

BIRDS FOUND BREEDING ON SEVEN MILE BEACH, NEW JERSEY.

BY CHARLES S. SHICK.

ABOUT five years ago one of the richest ornithological fields open to collectors was Seven Mile Beach in Cape May County, New Jersey, a beautiful island, over seven miles long and from a quarter of a mile to a mile wide, densely covered with cedar, oak, pine, holly, sassafras and birch trees, nearly every one of them covered with long, rich pendants of *usnea* moss. The natural advantages offered here for nest building are unsurpassed.

I have watched the encroachments of man year after year, until now, to cap the climax, a seashore resort has been started and the axe of the woodman is clearing away many of the fine old trees on which the Fish Hawks formerly built their homes. In a few years more this island, which five years ago was the collector's paradise, will no longer be frequented by many birds that now summer there. I give a list of birds breeding there at the present time.

Larus atricilla. LAUGHING GULL.—During my eight years residence in South Jersey I have found this bird breeding abundantly each summer. On Gull Island, near Hereford Inlet, at the southern point of Seven Mile Beach, a vast colony congregates every year. Early in May and again about June 2 full sets of eggs can be found. The nests are built of sedge

grass, generally along the border of a salt pond. They are also known by the name of Black-headed Gull.

Gelochelidon nilotica. GULL-BILLED TERN.—A rather common visitor. Breeds on the meadows and sand flats at the southern point of the island. I have found it breeding in company with *Larus atricilla*. Mr. Harry G. Parker has also taken eggs in the same locality.

Sterna forsteri. FORSTER'S TERN.—Not as common as either of the above. It was formerly very abundant. It associates with *Sterna hirundo*.

Sterna hirundo. COMMON TERN.—Very common, breeding on sand flats and along the beach, out of reach of the tide. I have taken many sets of eggs each year. 'Sea Swallow' and 'Summer Gull' are two of the local names.

Sterna dougalli. ROSEATE TERN.—Breeds in company with the Common Tern, from which its eggs cannot with certainty be distinguished. They are not nearly as plentiful as they were five years ago, when it was an easy task to go out and gather several bushels of eggs in a few hours.

Sterna antillarum. LEAST TERN.—A very common breeder. I have taken eggs every year since 1882. I must state, however, that all of the Terns are gradually forsaking their former breeding grounds on account of the new seaside resorts that are being started on all the islands. Formerly many hundred pairs occupied a small sand flat near Sea Isle City, but they are now all gone, not one pair breeding where a few years ago hundreds raised their young.

Rynchops nigra. BLACK SKIMMER.—Breeds, but not very commonly. Several years ago I could go out during the breeding season and take all the sets I desired; they are very scarce now. Residents throughout Cape May County call this bird 'Shearwater,' 'Razorbill,' and 'Broadbill.'

Ardea cœrulea. LITTLE BLUE HERON.—A few pairs still hold out in a thick grove of cedar trees on the lower part of the island. Capt. William Sutton, an old resident in this locality, informs me that in former years, there was a large heronry on this beach, which the residents of the mainland would visit every spring, when they would secure hundreds of their eggs. He stated that even after taking large basketfuls, one could not notice a diminishing of nests. He was confident that several thousand pairs occupied the lower end of Seven Mile Beach. 'Booby' is its most common name in this locality.

Ardea virescens. GREEN HERON; 'SQUAWK'; 'FLY-UP-THE-CREEK'; 'BOOBY.'—It is very abundant and at any time after May 10 can be found in the deep woods, along the edge of the meadows, and even on the beach in search of food. It nests in low bushes, within a foot of the ground, and in trees fifty feet from terra firma. Its nest is built in a very slovenly fashion, and in many cases I have counted the three or four pale green eggs from the foot of the tree. This season I took many fine sets of three and four eggs each.

Nycticorax nycticorax nœvius. BLACK-CROWNED NIGHT HERON.—Not common. Breeds in small colonies among the cedar trees near swamps.

Rallus longirostris crepitans. CLAPPER RAIL.—This is one of the

most common birds to be found here. Every small creek has its dozen or more Clapper's nests along its banks in the high sedge grass. It is quite easy to secure several hundred eggs in a day. The largest set I ever took, was found here on Seven Mile Beach and contained thirteen eggs. I know certainly that the Clapper Rail remains here through the winter, for several times in January and February of this year I flushed the birds while walking the meadows in search of Ducks. My dog also flushed several on different occasions. They bear the local name of 'Mud Hen.'

Symphemia semipalmata. WILLET.—Rather common. Found breeding late in May and early in June on the salt marshes adjacent to the main island. Last year I found two sets of four eggs each, among a colony of Laughing Gulls on Gull Island. They are not as numerous as they were formerly.

Actitis macularia. SPOTTED SANDPIPER.—This beautiful wader is found abundantly all over the island. Its *peet, peet, peet-weet* can be heard from every quarter. It breeds in the higher parts of the island, generally on a sandy knoll in the high, rank sedge grass.

Ægialitis meloda. PIPING PLOVER.—The dull, mournful, single note of this bird can be heard at any hour of the day along the beach. It has a habit, if you approach its nest, of leaving it before you come within several hundred feet. Running along the ground in front of you, it will not readily take wing. I have walked several miles along the beach with a Piping Plover in front of me all the way. On this island it breeds in very moderate numbers. Mr. Harry G. Parker took a number of sets last season along the beach shingle, out of the reach of the tide.

Pandion haliaëtus carolinensis. AMERICAN OSPREY.—Very common. Since 1884 it has been gradually becoming scarcer each year. I know that in 1884 fully one hundred pairs occupied nests in every part of the island, while this year not more than one fourth of that number remain. Their usual complement of eggs is three, while sets of two and four are not uncommon.

Syrnium nebulosum. BARRED OWL.—Probably breeding. On May 10 I flushed a pair from a clump of cedar trees and they flew away to another clump some distance off. I searched for the nest in vain. Mr. Harry G. Parker found these birds in the same place a few days later.

Ceryle alcyon. BELTED KINGFISHER.—I found a nest in a hollow stump in the summer of 1886, and from the appearance of the cavity am sure it was occupied by a pair of Belted Kingfishers that were in the vicinity all summer.

Tyrannus tyrannus. KINGBIRD.—This bird is comparatively common, and in June can be found breeding in every clump of cedar trees on the island. It raises two broods every year.

Contopus virens. WOOD PEWEE.—This is one of the rare birds here, but a few pairs rear their young on the island. On the mainland they are common.

Corvus americanus. AMERICAN CROW.—Quite common, breeding abundantly on the outer edge or strip of cedars near the meadows.

Corvus ossifragus. FISH CROW.—Though not as numerous as *Corvus americanus*, this Crow is not to be classed as rare. It breeds abundantly in May in the clumps of cedar trees near the beach. On May 16 Mr. Harry G. Parker found a number of sets of eggs in a grove of cedars near the Seven Mile Beach Life-saving Station. Incubation was but slightly advanced. My notes on the Fish Crow in the 'Bay State Oölogist' for March, 1889, were wrong, as the Crow I found breeding on Peck's Beach in April was not the Fish Crow, but *Corvus americanus*. The breeding time of the Fish Crow is from the 5th to the 25th of May. Fresh eggs can be found early in May.

Molothrus ater. COWBIRD.—I have taken a number of sets of Chipping Sparrow's nests containing single eggs of this bird, and I have also found their eggs in the nests of Song Sparrows.

(To be continued.)

NOTES ON HABITS AND NESTING OF *VIREO FLAVOVIRIDIS* (CASS.).

BY GEORGE K. CHERRIE.

AT SAN JOSE, Costa Rica, the Yellow-green Vireo (*Vireo flavoviridis*) is not a permanent resident, disappearing at the beginning of the dry season together with the Red-eyed Vireo (*Vireo olivaceus*), which latter bird is seen only for a very short time and is very rare as it passes on its journey south. The last record I have of *V. flavoviridis* for 1889 is that of the night of September 28, when, in company with seven other species of North American birds—none of which are found within the limits of Costa Rica during the breeding season,—they rushed, in terrified groups, to death, bewildered by the electric lights. The bodies of those picked up the following morning, and for some three weeks previous, were noted as being extremely fat, a thing that had not in any way attracted my attention previous to the migration.

By April 10 they are quite common, and on April 24, 1889, I saw one carrying nesting material. At this season they are almost always seen in pairs, and apparently have a pent up supply of song that is liable to burst forth at almost any moment, wherein they differ from their near relatives, *V. olivaceus*, which at this

time are only seen as single individuals and apparently are not in a singing mood.

Although I first saw the birds carrying nesting material on April 24, and frequently thereafter, — for they breed abundantly here, — I did not succeed in finding a nest until May 12, when I collected one containing two fresh eggs. The nest in all essential features is like those of *V. olivaceus*. It was situated about four feet from the ground in a shrub (*Dracco volanais*), suspended between small forks, and overhung by a bunch of leaves which completely concealed it. Outside the diameter is 2.50 inches; inside, at top, 1.75; lower down it is somewhat greater, for the rim is a trifle contracted. Depth outside, 2.25; inside, 1.75. The lining of the nest is very fine dry grass. The outside is covered with soft dry leaves and a kind of papery bark such as peels from a birch tree, all bound and held in place by spider webs. The eggs, measuring $.81 \times .57$ and $.81 \times .58$ inch, are white, speckled, chiefly at the larger end, with spots varying in color from a dark chestnut to an orange rufous, the chestnut predominating.

A second nest containing three fresh eggs was taken May 21. In this instance the nest was at the extreme end of a large limb of a tree on the river bank, about ten feet above the water. In form and materials it was similar to the last. The eggs measure $.76 \times .58$, $.75 \times .57$ and $.79 \times .60$ inch. In color and markings they are exactly like the last. When discovered, the female was on the nest and refused to move until the limb was shaken.

A third nest and three much incubated eggs were secured May 26. The eggs measure $.83 \times .56$, $.84 \times .55$, and $.84 \times .56$ inch. In color and markings they are like those described above. The nest was about seven feet from the ground, hanging between the twigs of a small tree on the river bank. It was admirably concealed by leaves from above and the sides. It is typical in construction and location. Depth outside from the supporting twigs 2.75, inside 2.00 inches. The rim, bounded on two sides by the supporting twigs and on the other by the free edge of the nest, forms an equilateral triangle having sides two inches long. Outside diameter 2.50 inches. The female was shot as she left the nest.

Both male and female are always to be found very near the nest, the male warbling joyously, but stopping to take an insect

between whiles. When disturbed the birds remain quite near, but are not demonstrative in their uneasiness, usually keeping well concealed from view and uttering very few notes, few, if any, indicative of alarm.

From the latter part of May until the middle of July the birds I observed were exceedingly shy and very quiet. June 30 I secured the first young bird from the nest. By July 20 family parties were very common and made noisy crowds. To approach one of these parties, was to be at once taken for an evil character. The parent birds would immediately grow excited trying to hurry their charges along. The family parties were common until about August 20, when they were more frequently seen in pairs or singly until all had departed.

The present year I have seen, compared with last year, very few birds. Also the breeding commenced very much later and I did not take a specimen showing signs of breeding by the swollen condition of the ovaries until May 8. Not only with *V. flavo-viridis* have I noticed the late date of breeding, but with all the birds breeding in the vicinity of San José. This is probably owing to the commencement of the rainy season being a month later than last year, that is the middle of May this year, whereas last year it had begun by the middle of April. Before the beginning of the wet season vegetation is parched and dry, and insects of all kinds are much less abundant.

NORTH AMERICAN BIRDS FOUND AT SAN JOSÉ, COSTA RICA, WITH NOTES ON THEIR MIGRATION.

BY GEORGE K. CHERRIE.

According to Zeledon's list of the birds of Costa Rica, published in Vol. I, *Annales del Museo Nacional de Costa Rica*, there are found here 190 of the birds recognized by the A. O. U. as North American. Of this number 81 are found at San José, as represented in my own collection or that of the Museo Nacional. While the time I have been in Costa Rica is short, I yet feel that

the notes I present may be of some value as they represent the observations made in the field on an average of four mornings each week.

On the night of Sept. 28, 1889, great numbers of birds were killed by flying against the electric light wires. The night was very dark, and the birds, which were evidently migrating, became bewildered by the electric lights. Their frightened cries were heard all night, and in the morning many dead birds were picked up in the streets. The occurrence was so novel and marked as to attract general attention. I made thirty-five skins from birds found dead in the streets, but generally they were too much mutilated to be available for specimens. I noticed among them eight species, seven of them being migrants.

1. *Anas discors*.—Oct. 27, 1889, I saw a Blue-winged Teal on the river just south of the city. It is the only Duck I have seen in the vicinity of San José.

2. *Ardea herodias*.—About the first of December one was shot just east of the city and brought to the museum.

3. *Ardea egretta*.—During December and January several were shot.

4. *Ardea cœrulea*.—During December several were brought to the museum.

5. *Ardea virescens*.—They are resident and breed, but are only rarely seen.

6. *Nycticorax violaceus*.—From Aug. 25, 1889, until Oct. 15, I occasionally saw them. All seen were young birds.

7. *Porzana carolina*.—The museum possesses a single specimen labelled, "San José, 1881, J. C. Zeledon."

8. *Gallinago delicata*.—First noted Oct. 9, 1889; for a time they were not uncommon, but then seemed to disappear, and none were noted again until Feb. 1, 1890. I saw the last Feb. 16.

9. *Tringa maculata*.—This species appeared and disappeared with the Bartramian Sandpiper.

10. *Totanus solitarius*.—I took a female April 27, 1889. In the fall I saw the first Sept. 16. They were common from that time until Dec. 1, 1889. I have not noted any since.

11. *Bartramia longicauda*.—From Sept. 25, 1889, until Nov. 15, they were common.

12. *Tryngites subruficollis*.—They appeared and disappeared with *Bartramia longicauda* and *Tringa maculata*. Their early disappearance was probably due to the dry season commencing and consequently destroying their feeding grounds.

13. *Actitis macularia*.—I saw the first in the fall Oct. 4, 1889. They were common until Feb. 16, 1890, when I saw the last.

14. *Charadrius dominicus*.—Sr. Don Manuel Caranza brought one to the museum Dec. 2, 1889. Dec. 3 I saw three others. Not noted again.

15. *Ægialitis vocifera*.—From Nov. 20, 1889, they were abundant until March 12, 1890.

16. *Zenaidura macroura*.—During December and January three or four were taken.

17. *Columbigallina passerina*.—Very common resident. Breeds.

18. *Cathartes aura*.—Occasionally seen.

19. *Catharista atrata*.—Exceedingly abundant and ever present.

20. *Circus hudsonius*.—One was taken Oct. 1, 1889, after that they were frequently seen until Feb. 2, 1890.

21. *Parabuteo unicinctus harrisi*.—I have not seen any, but there is one in the museum collection labelled San José.

22. *Buteo swainsoni*.—One was taken Nov. 25, 1889.

23. *Buteo latissimus*.—Noted during December and January, and one seen April 20, 1890.

24. *Falco sparverius*.—Were common from Oct. 27, 1889, until Feb. 16, 1890.

25. *Polyborus cheriway*.—Are not common about San José, but are resident and breed near the city.

26. *Glaucidium phalænoides*.—A tolerably common resident.

27. *Crotophaga sulcirostris*.—Abundant resident.

28. *Coccyzus americanus*.—Have taken one.

29. *Coccyzus erythrophthalmus*.—I am assured by Señor Zeledon that it is taken in San José.

30. *Ceryle cabanisi*.—Common resident. Breeds.

31. *Chordeiles texensis*.—Two specimens in the museum collection, male and female, both labelled, "San José, Nov. 6, 1888, A. Alfaro."

32. *Cypseloides niger*.—There is a single specimen in the museum collection labelled, "San José."

33. *Trochilus colubris*.—I have not noted any, and there are none in the museum collection, but I am assured by Sr. Don José C. Zeledon that they are found here.

34. *Amazilia fuscicaudata*.—Common resident. Breeding, I believe, every month in the year.

35. *Milvulus tyrannus*.—I noted the first at San José, June 7, 1889, a male in worn plumage. The second was noted June 14, when they were common in the large open fields. They remained common until the middle of July, then were absent until Sept. 18, when I saw quite a number. By the first of November they had again disappeared, and they have not yet (June 19) appeared this year. They breed quite commonly at a little lower altitude.

36. *Pitangus derbianus*.—Have taken it once or twice.

37. *Myiozetetes texensis*.—In the spring of 1889 they were not uncommon in the vicinity of the city, and one nest and set of eggs were taken. But they were rarely seen from June 20 until Oct. 13, 1889, when I recorded them as "quite common by the river." None were noted again until Feb. 9, 1890, then some were seen in company with several *Megarhynchus pitangua*. None have been noted since that time, and I do not believe any have bred here this year.

38. *Myiarchus crinitus*.—I have only one record, that of a male taken Nov. 24, 1889.

39. *Contopus borealis*.—I have notes for only five dates, and but a single individual was seen each time. The first was Oct. 4; second, Oct. 17; third and last in 1889, Oct. 27. None were seen until April 27, 1890, when I took a fine female; it was very fat. A male was taken May 7.

40. *Contopus virens*.—In the spring of 1889 the last one, a female, was seen April 11. The first to return was a male on August 21. This year I took the last April 29. They are never common.

41. *Contopus richardsonii*.—I find such difficulty in separating *C. virens* and *C. richardsonii* that it is only typical examples that I can refer to either with any certainty that I am correct. I took the first typical *richardsonii* Oct. 27, 1889. From that time until the middle of November they were much more frequently met with than *C. virens*. None were noted after Dec. 1.

42. *Empidonax flaviventris*.—Have taken only one, a male, Oct. 27, 1889.

43. *Empidonax acadicus*.—Took two in the fall of 1889, one Sept. 17, the other Oct. 4. In the spring of 1890, in the early part of May, they were very common, frequenting the fringe of woods along the river bank. May 11, I took six and saw others. All were very fat.

44. *Callothrux robustus*.—Common and permanent resident at San José. Seems to have a preference for the nest of *Buarremon gutturalis*.

45. *Sturnella magna mexicana*.—A common bird, breeding in the vicinity. During the worst of the rainy season in 1889, from the last of July until the middle of November, they disappeared, but were found in other localities. Several were noted Nov. 24, but they were not again common until the first of March, 1890.

46. *Icterus spurius*.—I have no spring notes for 1889. I took the first fall migrant, a female, July 31. The second noted was a male Aug. 13. By August 25 they were tolerably common, but they disappeared immediately after that, being rarely seen. The last were seen March 2, 1890.

47. *Icterus galbula*.—Quite rare. The first seen in the fall of 1889 was on Oct. 27; the last in the spring, March 2, 1890.

48. *Habia ludoviciana*.—Oct. 23, 1889, I noted the first arrival, a young male. They were then seen occasionally until Feb. 3, 1890, when I took the last, a female.

49. *Passerina cyanea*.—There are two skins in the museum collection labelled respectively "San José, Nov. 5, 1887," and "San José, Nov. 17, 1887. A. Alfaro." I have not noted the bird myself.

50. *Spiza americana*.—My only record is for Sept. 29, 1889, many having perished the night before. Almost all were young birds, with a slight preponderance of males. Mr. J. C. Zeledon reported them a month before from Pozo Azul.

51. *Euphonia elegantissima*.—There are two specimens in the museum collection, both males, one without date, the other labelled "Dec. 20, 1884, Anastasio Alfaro."

52. *Piranga rubra*.—Not an uncommon bird for a little time after they first arrive in the fall. My first note is for Oct. 26, 1889, when I saw several. I saw none in the spring, but there is a female in the museum collection labelled "San José, Jan 10, 1885. A. Alfaro."

53. *Chelidon erythrogaster*.—First noted Sept. 8, 1889, when they were quite abundant. They were common until early in February.

54. *Stelgidopteryx serripennis*.—Very common throughout the rainy season, but seldom seen in the dry season, from early in December until the latter part of April.

55. *Vireo olivaceus*.—But seldom seen. I took a female Oct. 9, 1889. Noted the last this spring April 20.

56. *Vireo flavoviridis*.—Breeds abundantly, disappearing from San José only during the dry season. In the fall of 1889 the last were seen Sept. 29, several having been killed the night before. They return about the middle of April. For fuller notes on *V. flavoviridis* see the present number of 'The Auk' pp. 329-331.

57. *Vireo philadelphicus*.—I have only once noted the Philadelphia Vireo. April 23, 1889, I took a female.

58. *Vireo flavifrons*.—Seldom met with here. The first arrival in 1889 was a female Oct. 25. Feb. 9, 1890, I saw two; they were the last.

59. *Mniotilta varia*.—Arriving in San José the middle of February, 1889, I made no notes on the Black-and-white Creeper that spring, and the first noted in the fall was Aug. 20, when I saw one industriously searching the branches for food. The next were noted Aug. 23, when two females were taken, both birds of the year. They are never at any time even tolerably common, and from Sept. 15, they are exceedingly rare. One was noted Nov. 10, and the last seen, a fine male, was on Feb. 28, 1890.

60. *Protonotaria citrea*.—The first were noted Oct. 13, 1889, on which date they were not uncommon. They were seen again Oct. 21. A skin in the museum collection is labelled "San José, Oct. 29, 1887." None were seen in the spring.

61. *Helminthus vermivorus*.—I find a single skin in the Museo Nacional, labelled "San José."

62. *Helminthophila chrysoptera*.—Took a fine female Sept. 15, 1889. They were quite abundant on that date. This is the only note I have made regarding this species.

63. *Helminthophila peregrina*.—I have no notes for the spring of 1889. In the fall the first were noted Sept. 17; several were seen. None were met again until Oct. 14, when I took a female. From that time on they were common until Oct. 27, when they were very abundant, the most so of all the Warblers. Then they seemed to decrease in numbers until Dec. 5, when I again found them abundant. Through January and February they were tolerably common. The last were seen March 6.

64. *Dendroica æstiva*.—This is one of the most common of the Warblers. The last was seen in the spring of 1889 on May 9. The present year I saw the last May 11. They made their first appearance in the

fall of 1889 Aug. 25, on which date a number were seen. Those taken were very fat. From this date they were common, and by Sept. 17 abundant, then the numbers seem to have diminished, until during October, November, December and January they were only tolerably common. During the latter part of January and the first of February they were the most common Warbler in the vicinity of San José. From this time they were common until the first of May. None of those taken last showed any signs of breeding.

65. *Dendroica coronata*.—They were not noted in the fall, and only twice in the spring: a female in good plumage was taken Jan. 19, and a male and a female were seen Feb. 15.

66. *Dendroica pensylvanica*.—In the spring of 1889 the last individual seen was a male, April 24. The first arrival noted in the fall was one of the unfortunates of the night of Sept. 28, also a male. By Oct. 13 they were abundant, but this was their last appearance. There is one skin in the museum collection labelled "San José, Nov. 1887." None were noted in the spring of 1890.

67. *Dendroica Blackburniae*.—The first Blackburnian Warbler was noted Sept. 8. They were not seen again until the 24th, and then again not until the 29th, when a specimen was picked up in the street, a victim of the panic of the night before. They were common from that time until Oct. 13, when I recorded them as abundant, but within three or four days all had disappeared and none were met with again until their last appearance Feb. 9, 1890, when several were seen.

68. *Dendroica virens*.—The museum possesses a single skin labelled, "San José, Nov., 1887. Alfaro."

69. *Seiurus aurocapillus*.—I have only once noted the Ovenbird at San José, on Oct 27, 1889.

70. *Seiurus noveboracensis*.—Last year (1889) I had frequent notes until May 21, when I took a female, the last seen. This spring my last note is April 20. In the fall of 1889, I saw the first Sept. 14. A number were victims in the disaster of the night of Sept. 28. They are never common.

71. *Seiurus motacilla*.—I have one in my collection, taken in San José, March 9, 1890.

72. *Geothlypis formosa*.—There is a skin in the museum, without date.

73. *Geothlypis philadelphia*.—Rare in this vicinity. The last seen in the spring of 1889 was on April 24; the last in 1890, April 27. The first to return last year was noted Sept. 1. Quite a number perished on the night of Sept. 28, 1889; with one exception they were all females.

74. *Geothlypis macgillivrayi*.—A very good example of Macgillivray's Warbler was one of the victims of Sept. 28.

75. *Geothlypis trichas*.—Very rarely seen at San José. This year I took a female in good plumage April 29. The last seen in 1889 was a female, March 29. I have no records for the fall and there are no fall specimens in the museum collection.

76. *Icteria virens*.—In the fall of 1889 the first appeared Oct. 26. For two weeks they were not uncommon and then disappeared entirely, not being seen again until March 1, 1890. They were tolerably common until the 5th, when I took the last, a female. For the spring of 1889 I have only one note, that of a female taken Feb. 15.

77. *Sylvania pusilla pileolata*.—First seen Oct. 27 (1889), by Nov. 20 they are quite common, and throughout December are the most abundant Warbler. Saw the last March 6.

78. *Sylvania canadensis*.—The first I saw at San José was a female picked up in the street on the morning of Sept. 29, 1889. They were not uncommon from that date until Oct. 6 when I found them abundant along the river banks. None appeared in the spring.

79. *Setophaga ruticilla*.—I have no notes for the spring of 1889. The first for the fall is that of a female Aug. 13; the second, also a female, was seen on the 20th; the first male was noted on the 23d; on the 27th I saw the second and last male noted, although the females were tolerably common until March 6 when the last was seen.

80. *Turdus fuscescens*.—I have seen only a single example, brought in the flesh to the museum Oct. 14, 1889, by Señor Manuel Caranza.

81. *Turdus ustulatus swainsonii*.—There is one specimen in the museum collection, labelled "San José, Nov. 7, 1887. A. Alfaro."

NOTES ON HABITS OF A FEW BIRDS OF ORANGE COUNTY, FLORIDA.

BY D. MORTIMER.

Ardea herodias. GREAT BLUE HERON.

THE Great Blue Heron is commonly rather wary, but I have noticed one or two singular exceptions to this rule. On June 23, 1888, my brother and I were fishing in a small creek that drains from the great prairie on the west shore of Lake Jessup. We had shifted our position to a certain point when we noticed that some creature was splashing about just around the nearest bend. Watching for a moment, we soon saw a Great Blue Heron busily engaged in catching a lunch. It was wading in water that reached above the joints of its legs, and its mode of proceeding was to lift one foot after the other slowly and deliberately clear of the surface, thus moving steadily and silently. Frequently it struck

to the right or left, first pausing and apparently taking careful aim. Occasionally it wished to reach some object at a distance out in the stream, when it plunged bodily forward and stretched its neck to the utmost, though it could no longer touch bottom with its feet. At these times it always spread its wings, and with their aid floundered backward to its former position in shallow water. The manœuvre was decidedly awkward, though apparently always successful, as the bird could be observed swallowing what it had secured. We watched it for some time as it waded up and down the shore, and were surprised that it was not disturbed by our presence and conversation. Finally, to test its unconcern, my brother sculled the boat past it, keeping to the opposite shore, which, however, was less than twenty yards distant from the bird. After he had passed the Heron, we talked back and forth past it, but the only notice it took of us was to stand motionless once or twice and look at us. It displayed the greatest proof of confidence as my brother was returning, for, as he was about opposite to its station, it made one of its comical plunges into deep water. We finally left it still pursuing its nourishment.

Himantopus mexicanus. BLACK-NECKED STILT.

It is interesting to note the ability of this extraordinary Wader to swim when pressed by necessity, though it probably never exercises itself in this way under ordinary circumstances. While on the St. John's River in April, 1888, in company with my brother, we wounded a Black-necked Stilt that was yet able to use its legs and ran some distance along the shore; but being pressed by our pursuit, it took to the river and swam for the opposite bank. One returned to the place where we had stepped ashore, to get the boat, while the other remained to watch the bird and direct the continuation of the pursuit. Before the boat could be brought up to the scene of action, the Stilt had crossed the river, but there it lost strength and lay helpless under the bank. In swimming, the Stilt had proceeded in a sort of sidling manner, and rising in the water with each stroke of the feet, and continually turning its head from side to side, it presented a foolish aspect, but, its progress was remarkable when its ill adaptation to swimming is considered.

Buteo lineatus alleni. FLORIDA RED-SHOULDERED HAWK.

This is the most troublesome of the Hawks among young chickens in Orange County. The numerous bay tree swamps are its favorite residence, as they serve as a safe stronghold, and also harbor myriads of cotton rats which are a favorite prey with it. It would appear that this Hawk is not in the habit of molesting the common small birds, as I have observed numbers of Blackbirds fly into the same tree with one, neither party paying any attention to the other. The bold little Sparrow Hawk has no difficulty in driving this larger species, and I have seen a pair of Quail rout a Red-shoulder that had made a sally upon their brood.

Ceophlœus pileatus. PILEATED WOODPECKER.

The Pileated Woodpecker is among the birds most limited in the variety of their notes, and indeed its only cry seems to be the wild clatter that has been so often described. On one occasion I discovered a pair of birds of this species apparently at play amongst the trees of a dense hummock. Wishing to secure them, I shot the female as she clung to a broken limb on a large oak. The male, who had been making a great noise, was silent a minute upon the report of the gun, but directly began again, and at the same time flew about rapidly as if trying to discover his mate. Presently he alighted on the very limb from which the other had fallen, and then I fired at him in the midst of one of his outbursts. Although he fell, he did not pause in his clatter for an instant, but came tumbling down until he caught in some moss at a distance from the ground, where he continued to vociferate without apparently allowing himself to draw a breath. Very soon he fell to the earth, but became quiet only when I pressed my hand upon his lungs. It would seem that this bird must have felt pleasure, fear, and pain during the time I observed him, all of which he expressed by the same sounds.

Melanerpes carolinus. RED-BELLIED WOODPECKER.

Possessing very full testimony regarding this bird's habit of eating oranges, as noticed with interest by Dr. Warren and Mr. Brewster, I offer my observations made near Sanford. During

February and March, 1889, while gathering fruit or pruning orange trees, I frequently found oranges that had been riddled by this Woodpecker, and repeatedly saw the bird at work. I never observed it feeding upon fallen oranges. It helped itself freely to sound fruit that still hung on the trees, and in some instances I have found ten or twelve oranges on one tree that had been tapped by it. Where an orange accidentally rested on a branch in such a way as to make the flower end accessible from above or from a horizontal direction the Woodpecker chose that spot, as through it he could reach into all the sections of the fruit, and when this was the case there was but one hole in the orange. But usually there were many holes around it. It appeared that after having once commenced on an orange, the Woodpecker returned to the same one repeatedly until he had completely consumed the pulp, and then he usually attacked another very near to it. Thus I have found certain clusters in which every orange had been bored, while all the others on the tree were untouched. An old orange grower told me that the 'sapsuckers,' as he called them, never touch any but very ripe oranges and are troublesome only to such growers as reserved their crops for the late market. He also said that it is only within a very few years that they have shown a taste for the fruit; and I myself observed that, although Red-bellies were very common in the neighborhood, only an individual, or perhaps a pair, visited any one grove. In one case a pair took up their station in a dead pine near a grove and made excursions after the fruit at all hours of the day, being easily located by the noise they kept up.

Tyrannus tyrannus. KINGBIRD.

Flocks of Kingbirds wintering in Orange County are very fond of frequenting the lakes that abound there. About Lake Ada, a large, clear-water pond, it is common to find Kingbirds in great numbers, reaching even into the hundreds. They always seem in high spirits and full of play. Continually uttering their note, they pursue one another, and frequently dip in the water like Swallows. Whenever an opportunity offers they indulge in their favorite trick of abusing any Crow that comes along.

Corvus americanus floridanus. FLORIDA CROW.

This variety of the American Crow seems to be more familiar with man and sociable among its feathered neighbors than its Northern relative. It is common to see it feeding about the streets and vacant lots of Sanford, especially when the palmetto fruit is ripe enough to eat. It associates freely with the Boat-tailed and Florida Grackles, and also with the Red-winged Blackbird and the Rice-bird, and I have seen flocks including all these species enjoying themselves about the town. It always retreats before any small bird that undertakes to chase it, though it does so apparently because it is too indolent to drive off its assailant, and not on account of timidity. Omnivorous in the fullest sense, it is always on the lookout for any edible morsel. I have seen Florida Crows attach themselves to the Osprey as soon as the latter captured a fish, and tag it about as if to secure any scraps that might fall during the meal. The Osprey is disturbed by this intrusion and tries to strike the Crows with its wings if they come too close.

For several weeks I kept in confinement a Florida Crow that had been injured by a shot. It became quite tame, almost at the first and ate every kind of food. It was particularly fond of the larvæ and spiders contained in the nests of the mud wasp and would peck the cells open in order to obtain them. It was very fond of bathing in a pan of water. When it recovered from its injuries I set it at liberty, but was surprised to see that it stayed about for a few days. It entered the house and explored every room up stairs and down, and finding a pail of refuse scraps in the kitchen, returned to feed from it several times after we supposed it had left for good.

The Florida Crow has a peculiar note that I never heard uttered by any Crow at the North. It is a loud, rattling sound something like the cry of the Cuckoo, and puzzled me much as to its source until I detected the bird in the act of producing it.

Quiscalus major. BOAT-TAILED GRACKLE.

Boat-tailed Grackles are great insect eaters. Besides being fond of palmetto fruit and other vegetable substances, they frequent the beds of 'bonnets' or lily pads for the worms, etc., that are to be found there, and I have also observed them pursuing and capturing moths and other winged insects.

Passer domesticus. HOUSE SPARROW.

On account of the extreme rarity of this interesting bird in Orange County, I mention the single instance of its occurrence that came under my notice during a residence of two years and four months. Throughout the latter half of March, 1887, a female House Sparrow frequented the stable on our premises, a mile north of the town of Sanford.

Lanius ludovicianus. LOGGERHEAD SHRIKE.

In March, 1889, two instances of the Loggerhead Shrike killing small birds came under my notice. In both cases the victim was a Grasshopper Sparrow, although birds of this species were few and scattered at that time, while the Savanna Sparrow was very abundant. The Sparrows were impaled by the neck upon orange thorns, and there were no wounds on any other part of the body. The 'Florida Dispatch' cites an instance of the Loggerhead killing a little chicken. This bird impales its prey not only when it wishes to preserve it, but also when it intends to devour it immediately, and the long slivers on fresh pine stumps are commonly selected for the purpose wherever they can be found. The bird flies to a stump with its victim, usually a large beetle, and forces it upon a sliver, just behind the thorax; thus having a convenient place to stand, and a convenient fork to hold the morsel, while he breaks open the hard shell and eats the softer parts. The same stump is resorted to many times by the same bird, so that it is common to find quantities of the legs and wing-cases of beetles about these curious dining tables.

Dendroica coronata. YELLOW-RUMPED WARBLER.

I have seen Yellow-rumped Warblers eating oranges as mentioned by Mr. Brewster in 'The Auk' (July, 1889). When observed in the act they were feeding on fallen fruit that had been broken open, but, as they also frequented the trees, possibly they extracted pulp through holes made by the Red-bellied Woodpecker. From January 12 to February 8, 1888, this species was extremely abundant all over the region about Sanford. Hummock, bay, pine land, and flat woods swarmed with them, and they also frequented the town, and even entered houses.

Mimus polyglottos. MOCKINGBIRD.

The power of song in this bird is a subject that never ceases to be interesting. My observations on the subject lead me to conclude that the great majority are not very gifted singers, and that the wonderful variety of notes so often described is possessed by a small percentage only.

Surrounded by orange groves, which are a favorite haunt of the Mocker, our home was amongst dozens of Mockingbirds, but only two seemed to be great singers. Later we moved to a new place, two miles further from Sanford, and there there was but one great singer among the Mockingbirds of that neighborhood. The cries of the Sparrow Hawk and the Loggerhead Shrike seem to be possessed by all, but whenever I heard one utter any other note it seemed striking. A Mockingbird that frequented our place imitated the Blue Jay, Bob-white, Sparrow Hawk, Red-shouldered Hawk, Cardinal and Bluebird, besides having its own individual song. The same bird imitated a chicken in distress so perfectly that I several times believed a Hawk had visited the hen-yard.

**DESCRIPTION OF A NEW SPECIES OF *ICTERUS*
FROM ANDROS ISLAND, BAHAMAS.**

BY J. A. ALLEN.

THROUGH the kindness of Mr. John I. Northrop, of the School of Mines, Columbia College, New York, I have the pleasure of making known a new species of *Icterus* from Andros Island, one of the larger islands of the Bahaman group. During four months spent recently on Andros Island, Mr. and Mrs. Northrop devoted much attention to birds, collecting about seventy species, among them several new to the Bahamas, as well as the novelty about to be described, which adds not only a new genus to the Bahaman fauna, but a new species to science. The species is represented by nine specimens, three of which are adult males,

one immature male, one adult female, three immature females, and another immature specimen of which the sex could not be determined. As shown by Mr. Northrop's notes given below, he found the species not uncommon. It is known to the residents of the island as the 'Cocoanut Bird,' and is said to be resident throughout the year.

Icterus northropi, sp. nov.

Adult Male.—Whole anterior half of the body, as far as the middle of the breast below, and including the interscapulum above, together with the wings (except the lesser and median coverts), and tail, deep black; rest of the body, the thighs, lesser and median wing-coverts, edge of the wing, lower wing-coverts and axillars, rich lemon-yellow; greater wing-coverts and primaries very narrowly edged, and the outer tail-feathers very narrowly tipped with white. Bill and feet black; lower mandible with the basal third bluish. In one specimen the longest two lower tail-coverts are mixed yellow and black; in the other specimens they are all wholly yellow.

Adult female.—Similar to the male, except slightly smaller, and with the black a little less lustrous.

Young.—Immature birds of probably the second year are olivaceous gray above, brighter and more yellowish on the front of the head; lesser wing-coverts, lower back, rump, upper tail-coverts, and whole lower surface greenish yellow, brightest on the rump and middle of the abdomen; median wing-coverts pale sulphur yellow; greater coverts brown, edged with whitish; chin, throat, and cheeks much mixed with black, which here prevails over the yellow; there are scattered black feathers over the breast and head, and in one specimen blackish patches on the outer edge of the scapulars and sides of the breast; wings and tail brown, the remiges edged with whitish, and the rectrices with olive.

Other specimens in a less advanced stage are similar, except that there are fewer black feathers intermixed with the yellow, the chin and the front edge of the cheeks alone being decidedly blackish, and the back is less olivaceous.

Measurements.—Length (from skins), 205 mm. (195–215 mm.); wing, 94 mm. (90–99 mm.); tail, 94 mm. (90–97 mm.); culmen, 22 mm. (21–22 mm.); tarsus, 25 mm. (24–27 mm.).

Types. No. 49,911, Am. Mus. Nat. Hist., ♂ ad., Andros Island, Bahamas, June, 1890; Mr. and Mrs. John I. Northrup. No. 49,912, Am. Mus. Nat. Hist., ♀ ad., Andros Island, Bahamas, April 16, 1890.

The extent and distribution of the black and yellow in the adults are the same as in *P. wagleri* except that the tail-coverts are yellow instead of black; the tint of the yellow is nearly as in

I. dominicensis, from which it differs in having the whole lower parts yellow from the middle of the breast posteriorly, instead of the yellow being confined to the sides of the abdomen and crissum. The two species agree in general size, but in *I. northropi* the bill is much stouter than in *I. dominicensis*.

It is surprising that a bird so conspicuous, and apparently so common, as this should hitherto have escaped observation, Andros Island having been several times previously visited by ornithologists.

Mr. Northrop has kindly presented the types of this species to the American Museum of Natural History, and contributes the following notes on its habits and distribution.

"The above species of *Icterus* was first collected by us at Nicol's Town, near the northern end of Andros, on April 8, 1890. We had been there nearly a month when one morning a new note called us out of the house, and we saw three or four of these birds flying about the shrubs near by. They were so tame and unsuspicious, that when one was shot, the others kept their positions undisturbed until they met a similar fate. Of the three we got then, one was a male, one a female, and one we could not determine, but they were all in immature plumage. Two weeks or so later, while on a trip to the west side, we saw a number of these birds near Red Bays, and this time were fortunate enough to get a male and female in full plumage. They were flying about the palmettoes, or the flower stalk of an Agave which was a mass of golden blossoms and a great attraction to all the birds in the neighborhood, as the flowers contained a large amount of nectar. While here one day, we heard a great commotion near by, and approaching the scene found two of these young birds fighting so violently that we almost got near enough to take them up in our hands. The only sound we heard them utter here was a rather plaintive call of two notes; but a month later, on May 22, we heard their song. It was a sort of whistle of eight or nine notes, very sweet and pleasing, and almost always given with the same intervals, and the same arrangement of notes. The bird was observed in two other localities, the last time, June 18, near Wide Opening on the west side. It seems to inhabit the more open portions of the island, near the coast, as we never saw any inland.

"The natives say that it builds its nest in the cocoanut trees, and is always about them, hence its local name of 'Cocoanut Bird.' They also told us that it remained throughout the year; that the eggs were pure white; and that the young birds differed from the old in plumage. From the condition of the organs of generation, it seems that the bird breeds during the month of June.

"The stomachs of those examined contained the remains of a grasshopper, beetles, and seeds; hence it may be inferred that its food consists of fruits and insects."

A LIST OF BIRDS FROM NORTHEAST BORNEO, WITH FIELD NOTES BY MR. C. F. ADAMS.

BY D. G. ELLIOT.

THE greater portion of the species enumerated in this paper were obtained by Mr. Adams in the vicinity of Sandakan. The extent and character of the region explored in making this collection is very fully described by Mr. Adams in the following paragraphs, which, with the field notes relating to the species, he has kindly furnished. Mr. Adams sent his collection of birds to the American Museum of Natural History for identification, and specimens of all the species given below (except three, Nos. 43, 58 and 83, included on Mr. Adams's own authority) have passed through my hands. The types of *Copsychus adamsi* (sp. nov.), and a set of duplicates from the collection, have been kindly presented by Mr. Adams to the American Museum.

[The following notes refer to birds collected in a narrow east and west tract lying in that particular part of British North Borneo between 5° 30' and 5° 40' N. Lat., and crossed by the meridian of 118° E., during the time from May, 1887, until Feb., 1888, while making a specialty of collecting the mammals of that region. The list includes a fair representation of what one may expect to find in that locality, although in a number of cases but one specimen of a species was observed. As is usual with the coast region of Borneo, this region is for the most part low, with occasionally

a hill or knoll to break the monotony of swamp and tide-affected rivers. The latter are numerous, and the most of them short, being brackish near or quite to their sources at high tide. Sandakan Harbor receives about a dozen of these short streams, which flow from the low lands lying to the south and west. The north side of the harbor is bounded by bluffs, or rather a range of hills, which run parallel with that side. At a point about ten miles southeast of the mouth of Sandakan Harbor the Kinabatangan, which is one of the largest rivers of the country, flows into the sea. Near its mouth, as is also the case with the other rivers, a growth of mangrove borders its channel, which at high tide it over-flows for an indefinite distance. Next in ascending order come the Nipa palms which extend for a few miles, being succeeded, as the country becomes a little higher, by the tropical forest made up of a variety of trees, many of which bear fruit.

In consequence of the seasons not being well marked, fruits are ripening in every month of the year.

The view one gets from a boat in ascending the Kinabatangan River gives an impression that the forest stands on high ground, and extends back indefinitely, but usually it is found that at a distance of a few hundred yards it gives place to boggy swamps containing scattering, stunted trees, vines, and various kinds of thorny growths. This is especially the case with the lower portion of the river.

The birds in this collection were taken among the range of hills just back of Sandakan Harbor, on Bahala Island, at the mouth of the harbor, and up the Kinabatangan, Suanlamba, and Sapagaya Rivers.

In these regions bird life may be said to be abundant, except in the mangrove districts where it might be expected that Herons or other water birds would have been found breeding, but not a single rookery was observed, an occasional Heron, Darter, or Kingfisher being the only birds noticed.

Early in the day mammals and birds are very active, but from eleven until three in the afternoon the heat induces them to retire to some dense shade where the hottest part of the day is passed.

As another consequence of the seasons not being well marked, the moulting of birds is very irregular, and of one species of Hornbill (*Buceros galeatus*) not a single specimen was taken during the seven or eight months of collecting that was in good plumage.—C. F. A.]

ORDER PASSERES.

FAMILY TURDIDÆ.

1. *Geocichla interpres*.

Turdus interpres TEMM. Plan. Color. pl. 458. — LESS. Trait. Ornith. p. 410 (1831).

Geocichla interpres SHARPE, Cat. B. V, p. 166.

Suanlamba River. A single specimen differs somewhat from *G. interpres*, by not having any ochraceous on the flanks.

[Found in damp situations. Shy. — C. F. A.]

2. *Copsychus adamsi*, sp. nov.

Adult Male. — Entire plumage glossy purplish black, shading to a slaty gray on lower part of abdomen. A large, white patch on wing including least, median and greater coverts, with a black inner web to the innermost greater coverts. The edge of outer web on the sixth secondary of the right wing is white for two thirds its length from the base. This does not exist on the left wing and is possibly abnormal. Tail, feet, and bill black. "Iris dark brown." Total length (skin), 8½ in. Wing 4½. Bill, ⅞. Tail, 4. Tarsus 1½ in.

Female. — Above glossy black, like the male, but with the outer web of the sixth secondary broadly edged with white. Below ashy gray, the throat and breast with a strong bluish cast. Otherwise like the male, except slightly smaller.

A nearly mature male differs from the male above described in having the lower abdomen and flanks ashy.

Types, No. 49,677, ♂, No. 49,678, ♀, Am. Mus. Nat. Hist., Sandakan, May 11 and 12, 1887; C. F. Adams.

This bird resembles closely *C. sechellarum* A. Newton (Ibis, 1865, p. 332, pl. 8.) from the Seychelles, but is smaller in all its measurements, those given of Newton's type being as follows: tot. length 10.5 in.; culmen 1; wing 4.9; tail 4.7; tarsus 1.55. It is rather singular to find so near a representative of a Seychelles species in Borneo.

[Rather common along clear brooks in shady situations. — C. F. A.]

3. *Cittocincla stricklandi*.

Copsychus stricklandi MORTL. & DILL, Nat. Hist. Lab. p. 20, pl. iv [1855].

Kittocincla stricklandi SALV. Ucc. Born. p. 253 (1874).

Cittocincla stricklandi SHARPE, Cat. B. VII, p. 88 (1883); *id.* Ibis, 1889, p. 270.

[Sandakan. Iris dark brown. Found along clear brooks in company with the last species. Although probably seldom seeing man, it is exceedingly wild, uttering sharp, chirping notes and quickly flying away at the first appearance of an intruder. — C. F. A.]

FAMILY PYCNOTIDÆ.

4. *Chloropsis zosterops*.

♀ *Chloropsis gamphorhynchus* JARD. & SELB. Ill. Ornith. pl. 7 (1826).
Chloropsis zosterops VIG. App. Mem. Life Raffl. p. 674. — SHARPE, Cat.
 B. VI, p. 24 (1880).

Phyllornis sonneratii (nec JARD. & SELB.) BLYTH, Journ. Asiat. Soc.
 Beng. XI, p. 109 (1842). — JERD. B. Ind. II, p. 100 (1863). — SALV.
 Ucc. Born. p. 193 (1874).

Phyllornis javensis (nec HORSE.) GOULD, B. Asia, Pt. XII. — WALDEN,
 Ibis, 1871, p. 168.

Phyllornis viridis TWEED. Ibis, 1877, p. 305.

[Sandakan. Iris dark brown. Common among low bushes in cleared districts. — C. F. A.]

5. *Criniger phæocephalus*.

Ixos phæocephalus HARTL. Rev. Zool. 1844, p. 401.

Trichophorus caniceps LAFRES. Rev. Zool. 1845, p. 367.

Criniger phæocephalus SALV. Uccell. Born. p. 207 (1874). — SHARPE,
 Cat. B. VI, p. 74 (1881); *id.* Ibis, 1889, p. 274.

[Sapagaya River. Iris brown. — C. F. A.]

6. *Irena crinigera*.

Irena turcosa (nec WALD.) SHARPE, Ibis, 1876, p. 44.

Irena crinigera SHARPE, Ibis, 1879, p. 257; *id.* Cat. B. VI, p. 176 (1881);
id. Ibis, 1889, p. 277.

[Sandakan. Iris reddish orange. Common. Found high up in the largest fruit trees, with the Hornbills, Pigeons, etc. — C. F. A.]

The specimens before me have the under tail coverts extending quite to the tips of the rectrices, and small blue spots on the innermost greater wing-coverts. I follow Sharpe in the name of this species, as, not having any specimen from Java to compare with, I am unable to determine the specific value of the Bornean birds.

FAMILY TIMELIIDÆ.

7. *Orthotomus cinerascens*.

Orthotomus sepium LAFRES. Mag. Zool. 1836, pl. 51 (*nec* HORSF.).

Orthotomus cinerascens BLYTH, Jour. As. Soc. Beng. XIV, p. 489 (1845).

—SALV. Ucc. Born. p. 248 (1874). —SHARPE, Cat. B. VII, p. 225, (1883); *id.* Ibis, 1889, p. 279.

Orthotomus borneonensis SHARPE, Ibis, 1876, p. 41, pl. 11, fig. 1.

[Suanlamba River. Iris light hazel. —C. F. A.]

8. *Stachyris nigricollis*.

Timalia nigricollis TEMM. Plan. Col. pl. 594, fig. 2.

Timelia nigricollis SALV. Ucc. Bor. p. 212 (1874).

Stachyris nigricollis SHARPE, Cat. B. VII, p. 535 (1883).

[Suanlamba River. Iris red. A fine songster. —C. F. A.]

9. *Turdinus atrigularis*.

Cacopitta atrigularis BON. Consp. Av. I, p. 257 (1850).

Turdinus atrigularis SALV. Ucc. Born. p. 217 (1874). —SHARPE, Cat. B. VII, p. 549 (1883).

[Sapagaya River. Iris hazel. Legs light brown. Bare skin behind eye blue. Frequents the ground much after the manner of the Pittas. —C. F. A.]

10. *Drymocapthus capistratoides*.

Myiothera capistratoides TEMM. Mus. Lugd.?

Goldana capistratoides STRICKL. Contr. Ornith. 1849, p. 128, pl. 36.

Drymocapthus capistratoides STRICKL. Contr. Ornith. 1857, p. 16.

SALV. Ucc. Born. p. 218 (1874). —SHARPE, Cat. B. VII (1883);

id. Ibis, 1877, p. 11; 1879, p. 258; 1889, p. 415.

[Kinabatangan River. Iris brown. This little bird frequents the same situations as the Pittas, running along through dense brush, taking short flights only to re-alight on the ground. —C. F. A.]

I am somewhat in doubt whether to designate the single specimen obtained as *D. nigricapitata* or the present species, since the ear-coverts are much more ashy than black, and the mandible is decidedly yellow and not lead-color. Are the two forms really specifically distinct?

FAMILY ORIOLIDÆ.

11. *Oriolus xanthonotus*.

Oriolus xanthonotus HORSF. Trans. Linn. Soc. XIII, p. 153 (1821).—SALV.

Ucc. Born. p. 277 (1874).—SHARPE, Cat. B. III, p. 213 (1874);

id. Ibis, 1879, p. 251; 1889, p. 185.

[Sandakan. Iris red.—C. F. A.]

FAMILY CERTHIIDÆ.

12. *Dendrophila corallipes*.

Dendrophila corallipes SHARPE, Ibis, 1888, p. 479; 1889, p. 420.

[Sandakan. Iris yellow. Bill, eyelids and legs red. Runs over the tree trunks in the same manner as our Nuthatches.—C. F. A.]

FAMILY LANIIDÆ.

13. *Hyloterpe grisola*.

Tephrodornis grisola BLYTH, Jour. Asiat. Soc. Beng. XI, p. 799 (1842).

Hyloterpe grisola SALV. Ucc. Bor. p. 157 (1874).—SHARPE, Proc. Zool. Soc. 1879, p. 341.

Pachycephala grisola SHARPE, Cat. B. VIII, p. 220.

Hyloterpe grisola SHARPE, Ibis, 1889, p. 419.

Sandakan.

FAMILY DICRURIDÆ.

14. *Chaptia malayensis*.

Chaptia malayensis BLYTH, Jour. Asiat. Soc. Beng. XV, p. 294 (1846).

—SALV. Ucc. Born. p. 153 (1874).—SHARPE, Cat. B. III, p. 244 (1877).

[Sapagaya River. Iris brown. Shot among trees in an old clearing. Seems very restless.—C. F. A.]

15. *Dissemurus brachyphorus*.

Eolius brachyphorus BON. Consp. I, p. 351 (1850).

Dissemurus brachyphorus CAB. Mus. Hein. I, p. 112 (1850).—SALV. Ucc.

Born. p. 154 (1874).—SHARPE, Ibis, 1876, p. 45; 1879, p. 251; 1889, p. 45.

Dissemurus paradiseus SHARPE, Cat. B. III, 258 (1877), in part.

[Kinabatangan River, December, 1887. Iris dark red. Found in wooded places near rivers. Seems to prefer spots where there is little undergrowth to interfere with short cross flights. It is rather restless, twisting from side to side on its perch, causing the spatulate ends of the long outer tail feathers to appear as objects hovering behind the bird, since the shaft between the broad tip and the basal part of the feather is so narrow as to be invisible at a short distance.—C. F. A.]

FAMILY PRIONOPIDÆ.

16. *Hemipus obscurus*.

Muscicapa obscura HORSF. Trans. Linn. Soc. XIII, p. 146 (1822).

Tephrodornis hirundinaceus SCL. Proc. Zool. Soc. 1863, p. 217.

Hemipus obscurus SHARPE, Cat. B. III, p. 305 (1877); *id.* Ibis, 1889, p. 189. Suankumba River.

17. *Platylophus coronatus*.

Lanius coronatus RAFF. Trans. Linn. Soc. XIII, p. 306 (1822).

Lophocitta coronata CAB. Mus. Hein. I, p. 219.

Platylophus coronatus SALV. Ucc. Born. p. 280 (1874).—SHARPE, Cat. B. III, p. 318 (1877); *id.* Ibis, 1889, p. 190.

[Kinabatangan River. Iris brown; legs leaden blue. Apparently of an inquisitive disposition, hopping about overhead with its fine crest turned far forward, peering down on the intruder below.—C. F. A.]

FAMILY CAMPOPHAGIDÆ.

18. *Pericrocotus igneus*.

Pericrocotus igneus BLYTH, Jour. Asiat. Soc. Beng. XV, p. 309 (1846).

—SALV. Ucc. Born. p. 144 (1874).—SHARPE, Cat. B. IV, p. 78 (1879); *id.* Ibis, 1889, p. 192.

[Sandakan. Iris red. Common.—C. F. A.]

19. *Lalage culminata*.

Ceblepyris culminata HAY, Madr. Journ. XIII, p. 157.

Volvocivora schierbrandii SALV. Ucc. Born. p. 148 (1874).

Lalage culminata SHARPE, Cat. B. IV, p. 104 (1879); *id.* Ibis, 1889, p. 194.

[Sandakan. Iris black.—C. F. A.]

FAMILY MUSCICAPIDÆ.

20. *Hypothymis occipitalis*.

Muscicapa occipitalis VIGORS, Proc. Zool. Soc. 1831, p. 97.

Hypothymis azurea SALV. Ucc. Born. p. 133 (1874).—SHARPE, Ibis, 1877, p. 18.

Hypothymis occipitalis SHARPE, Cat. B. IV, p. 275 (1879); *id.* Ibis, 1889, p. 197.

[Suanlamba River. Iris black.—C. F. A.]

21. *Rhipidura perlata*.

Rhipidura perlata MÜLL. Natuurl. Gesch. Land-en Volkenk. p. 185 (1839, 44).—SHARPE, Cat. B. IV, p. 328 (1889); *id.* Ibis, 1889, p. 199.

Leucocerca perlata SALV. Ucc. Born. p. 136 (1874).

[Sandakan. Iris brown. Very common. In movements resembles our Redstarts.—C. F. A.]

22. *Philentoma pyrrhopterum*.

Muscicapa pyrrhopterum TEMM. Plan. Col. 596, fig. 2.

Philentoma pyrrhopterum SHARPE, Cat. B. IV, p. 366 (1879); *id.* Ibis, 1889, p. 200.—SALV. Ucc. Born. p. 138 (1874).

[Sandakan. Iris brown. Very common.—C. F. A.]

23. *Stoparola thalassinoides*.

Glaucomyias thalassoides CAB. Mus. Hein. I, p. 53, note (1850).

Stoparola thalassinoides SALV. Ucc. Born. p. 132 (1874). — SHARPE, Cat. IV, p. 439 (1879); *id.* Ibis, 1889, p. 205.

[Suanlamba River. Iris dark brown.—C. F. A.]

24. *Siphia beccariana*.

Siphia beccariana SALV. Atti. R. Acad. Sc. Tor. III, p. 533 (1868)

—SHARPE, Cat. B. IV, p. 452 (1876).

[Suanlamba River. Iris brown.—C. F. A.]

25. *Terpsiphone affinis*.

Muscipeta paradisæa EYTON, P. Z. S, 1830, p. 102 (*nec* LINN.)

Tchitrea affinis BLYTH, Journ. As. Soc. Beng. XV, p. 292.

Terpsiphone affinis SALV. Ucc. Bor. p. 137 (1874). — SHARPE, Cat. B. IV, p. 349 (1879); *id.* Ibis, 1877, p. 19; 1889, p. 200.

[Sandakan, May 23, 1887. Iris dark brown; bill and eyelids deep purplish blue. Rather uncommon in the regions visited. While dashing about after insects it is very conspicuous (the male) on account of its light colors against the dark background of tropical foliage. As it describes graceful curves during its flight, the long feathers of the tail make it appear as an animated pennant.—C. F. A.]

FAMILY HIRUNDINIDÆ.

26. *Hirundo javanica*.

Hirundo javanica SPARR. Mus. Carl. pl. 100 (1789). — TEMM. Pl. Col. 83, fig. 2.—SALV. Ucc. Born. p. 126 (1874). — SHARPE, Cat. B. X, (1885); *id.* Ibis, 1889, p. 430.

Sandakan. Iris brown.

FAMILY DICÆIDÆ.

27. *Dicæum trigonostigma*.

Certhia trigonostigma SCOP. Flor. et Faun. Insub. p. 91 (1786).

Dicæum trigonostigma SALV. Ucc. Born. p. 166 (1874). — SHARPE, Cat. B. X, p. 38 (1885); *id.* Ibis, 1889, p. 429.

Suanlamba River. Iris brown.

FAMILY NECTARINIDÆ.

28. *Cinnyris jugularis*.

Certhia jugularis LINN. Syst. Nat. I, p. 185 (1766).

Cinnyris jugularis SHELLEY, Mon. Nec. I, pl. 93 (1876-1880).

[Sandakan. Iris brown. Common.—C. F. A.]

29. *Anthothreptes phœnicotis*.

Nectarinia phœnicotis TEMM. Pl. Col. 108, fig. 1, 388, fig. 2.

Anthreptes phœnicotis SHELLEY, Mon. Nec. p. 325, pl. 105.

Anthothreptes phœnicotis SHARPE, Ibis, 1889, p. 425.

Chalcoparia singalensis SALV. Ucc. Born. p. 180 (1874).

[Suanlamba River. Iris red. Rather common among bushes in old clearings.—C. F. A.]

30. *Arachnothera chrysogenys*.

Arachnothera chrysogenys TEMM. Pl. Col. 388, fig. 1.—SALV. Ucc. Born. p. 181 (1874).—SHELLEY, Mon. Nec. p. 365, pl. 117.—SHARPE, Ibis, 1889, p. 426.

[Sandakan. Iris dark brown.—C. F. A.]

31. *Arachnothera flavigastra*.

Anthreptes flavigaster EYTON, P. Z. S. 1839, p. 105.

Arachnothera flavigastra BLYTH, Journ. As. Soc. Beng. XIV, p. 557 (1845).

Arachnorhaphis flavigastra SHELLEY, Mon. Nect. p. 373, pl. 120.

Arachnothera flaviventris GADOW, Br. Mus. Cat. B. IX, p. 109 (1884).

[Suanlamba, Jan. 21, 1888. Iris brown.—C. F. A.]

FAMILY PLOCEIDÆ.

32. *Munia fuscans*.

Spermestes fuscans CASS. Proc. Acad. Sc. Phil. VI, p. 185 (1852); *id.* Journ. Ac. N. Sc. Phil. III, p. 69, pl. 3, fig. 3, (1855).

Munia fuscans SALV. Ucc. Born. p. 268 (1879).—SHARPE, Proc. Zoöl. Soc. 1879, p. 344; *id.* Ibis, 1889, p. 434.

[Sandakan. Iris dark brown. Frequents coarse grass in open situations.—C. F. A.]

FAMILY STURNIDÆ.

33. *Gracula javanensis*.

Corvus javanensis OSBECK, Iter. p. 102 (1757).

Gracula javanensis SALV. Ucc. Born. p. 274 (1874).—SHARPE, Ibis, 1889, p. 432.

[Sandakan. Iris brown. Legs and wattles chrome yellow, brightening to orange in middle of patch on side of head; basal part of beak reddish, graduating into yellow toward the tip. Rather common. Its note is a strong mellow whistle. Feeds on berries and small fruits. Near a camping place in an old clearing a pair used to come each evening just before dark and alight on the dead stub of a tree, where they kept up a whistling until it was rather dark and then crawled into a hollow to pass the night.—C. F. A.]

FAMILY CORVIDÆ.

34. *Platysmurus aterrimus*.

Glaucopis aterrimus TEM. Pl. Col. Liv. 57 (1825.)

Platysmurus aterrimus SALV. Ucc. Bor. p. 279 (1874). — SHARPE, Cat. B. III, p. 91 (1877); *id.* Ibis, 1889, p. 85.

[Suanlamba River. Iris red. Goes in small flocks. Its note very much resembles that of our common Crow. — C. F. A.]

FAMILY PITTIDÆ.

35. *Pitta cœrulea*.

Miyothera cœrulea RAFF. Trans. Linn. Soc. XIII, p. 301 (1822).

Brachyurus cœruleus ELLIOT, Mon. Pitt. pl. i (1863); *id.* Ibis, 1870, p. 412.

[Suanlamba River. Iris brown. But one specimen, a female, was seen. — C. F. A.]

36. *Pitta venusta*.

Pitta venusta TEMM. Pl. Col. 500. — SALV. Ucc. Born. p. 244, (1874).

Brachyurus venustus ELLIOT, Mon. Pitt. pl. xiv, (1863), *id.* Ibis, 1870, p. 416.

[Suanlamba River. Iris brown. Legs dusky blue. Generally observed on the ground but sometimes perched on the twig of a fallen branch or hopping lightly along a log. The flight, as of the other species, is usually quite short, consisting merely of passing near the ground from one slightly elevated position across pools of water to another. On dry ground they may disappear by hopping away through the dense brush. This beautiful species was sometimes found sitting on a log with point of beak elevated, softly whistling a very mellow and musical strain. — C. F. A.]

37. *Pitta baudi*.

Pitta baudi MÜLL. & SCHLEG. Verh. Nat. Gesch. Ned. Ind. pl. 2 (1839-44). — SALV. Ucc. Born. p. 243. (1874). — SHARPE, Ibis, 1889, p. 441.

Brachyurus baudi ELLIOT, Mon. Pitt. pl. xxii (1863); *id.* Ibis, 1870, p. 419.

[Sapagaya River. Iris brown. Legs and feet pale flesh color. Found in nearly the same situations as the preceding species, but seems to prefer drier and more open places. — C. F. A.]

38. *Pitta sordida*.

Turdus sordidus P. L. S. MÜLL. Natur. Anh. p. 143 (1776).

Pitta mülleri SALV. Ucc. Born. p. 240 (1874).—SHARPE, Ibis, 1889, p. 443.

Brachyurus mülleri ELLIOT, Mon. Pitt. pl. xxvi (1863).

Brachyurus atricapillus ELLIOT, Mon. Pitt. pl. xxv (1863).

Brachyurus sordidus ELLIOT, Ibis, 1870, p. 419.

[Kinabatangan River. Iris brown; legs flesh color with a faint wash of blue. Not common. Exceedingly shy, and difficult to shoot, as it flies to such a distance as seldom to be started a second time. — C. F. A.]

FAMILY EURYLAIMIDÆ.

39. *Eurylaimus javanicus*.

Eurylaimus javanicus HORSEF. Trans. Linn. Soc. XIII, p. 170 (1821). — SALV. Ucc. Born. p. 107 (1874).—SCLAT. Cat. B. XIV, p. 463 (1888). — SHARPE, Ibis, 1889, p. 439.

[Kinabatangan River. Iris dark brown; bill cobalt-blue above with black cutting edges. — C. F. A.]

40. *Eurylaimus ochromelas*.

Eurylaimus ochromelas RAFFLES, Trans. Linn. Soc. XIII, p. 297 (1822). — SALV. Ucc. Born. p. 108 (1874). — SCLAT. Cat. B. p. 465 (1888). SHARPE, Ibis, 1889, p. 439.

[Kinabatangan River. Iris yellow; bill cobalt above with black cutting edges; below yellow. — C. F. A.]

41. *Cymborhynchus macrorhynchus*.

Todus macrorhynchus GMEL. Syst. Nat. I, p. 446 (1788).

Cymbirhynchus nasutus VIG. App. Mem. Raff. p. 654 (1831).

Cymborhynchus macrorhynchus SALV. Ucc. Born. p. 109 (1874).—SCLAT. Cat. B. p. 468 (1888).

Cymbirhynchus macrorhynchus SHARPE, Ibis, 1880, p. 440.

[Kinabatangan River. Iris bronzy green; bill above, and edges of mandible, bright blue. Rest of mandible yellow. The most common of the Broad-mouths taken. Easily shot; it seems stupid. — C. F. A.]

42. *Corydon sumatranus*.

Coracias sumatranus RAFF. Trans. Linn. Soc. XIII, p. 303 (1822).

Corydon sumatranus STRICKL. Ann. Mag. Nat. Hist. VI, p. 418 (1844). —
SALV. Ucc. Born. p. 111 (1874). — SCLAT. Cat. B. XIV, p. 466
(1888). — SHARPE, Ibis, 1889, p. 440.

[Sandakan. Iris dark brown. Bare skin on head pale reddish carmine.
— C. F. A.]

ORDER PICARIÆ.

FAMILY CYPSELIDÆ.

43. [*Callocalia fuciphaga*.

Iris black. This species breeds in caves and crevices of rocks where the nest is sheltered.

The British North Borneo Company receives annually a considerable sum as export duty on the nests of this species which are sent to China to be used in soups.

The salivary glands which secrete the mucus of which the nests are composed are very large for so small a bird.—C. F. A.]

44. *Callocalia linchii*.

Hirundo fuciphaga HORSF. (nec THUNB.) Trans. Linn. Soc. XIII, p. 143 (1821.)

Callocalia linchii HORSF. & MOORE, Cat. B. Mus. E. Ind. Comp. I, p. 100 (1854). — SALV. Ucc. Born. p. 121 (1874). — SHARPE, Ibis, 1890, p. 23.

[Suanlamba River. Iris black. Shot while flying about in a clearing.
— C. F. A.]

45. *Dendrochelidon comata*.

Cypselus comatus TEMM. Plan. Col. p. 268 (1824).

Dendrochelidon comata SALV. Ucc. Born. p. 123 (1874). — SHARPE, Ibis, 1890, p. 23.

[Iris brown. Found in clearings back of Sandakan, perched on branches of dead trees.—C. F. A.]

46. *Dendrochelidon longipennis*.

Hirundo longipennis RAFF. Bull. Sc. Soc. Phil. III, p. 153 (1804).

Dendrochelidon longipennis SALV. Ucc. Born. p. 122 (1874).—SHARPE, Ibis, 1890, p. 24.

[Sandakan. Iris brown. Taken in the same situations as the former.—C. F. A.]

FAMILY TROGONIDÆ.

47. *Harpactes kasumba*.

Trogon kasumba RAFF. Trans. Linn. Soc. XIII, p. 28 (1822).

Pyrotrogon kasumba SALV. Ucc. Born. p. 29 (1874).

Harpactes kasumba SHARPE, Ibis, 1890, p. 3.

[Sandakan. Iris very dark. Tip of bill and line over culmen deep blue, rest black.—C. F. A.]

48. *Harpactes diardi*.

Trogon diardi TEMM. Plan. Col. pl. 541.—GOULD. Mon. Trog. pl. 30.

Pyrotrogon diardi SALV. Ucc. Born. p. 28 (1874).

Harpactes diardi SHARPE, Ibis, 1890, p. 3.

[Sandakan. Iris dark brown. Top of bill and fore part of cutting edge and line on culmen black; other parts blue. Skin around eye purple. Not common. Found in shady places where there is a scarcity of undergrowth. Active towards the middle of the day.—C. F. A.]

49. *Harpactes duvauceli*.

Trogon duvauceli TEMM. Plan. Col. 291.—GOULD, Mon. Trog. pl. 32.

Harpactes duvauceli SHARPE, Ibis, 1890, p. 3.

Pyrotrogon duvauceli SALV. Ucc. Born. p. 29 (1874).

[Sandakan. Iris brown; bare skin over eye and gape dark blue; bill blue and black as in *H. kasumba*.

This specimen furnishes a striking example of how feebly a dried skin conveys an idea of what the natural life appearance really is. In life some of the fading parts of these tropical birds are vividly rich in color which, combined with the freshness of the plumage, excites the admiration of the most indifferent. — C. F. A.]

(To be continued.)

SUMMER ROBIN ROOSTS.

BY WILLIAM BREWSTER.

PERHAPS the greatest charm of ornithology is that its pursuit yields surprises when they are least expected. Especially true is this of the study of birds' habits, for a close watch kept on even the commoner species is sure, sooner or later, to reveal facts not in the books. Nor is this strange, for a lifetime is not long enough for fathoming all the secrets of the woods and fields immediately about one's home, while the general subject is inexhaustible. Moreover, a discovery which comes early and easily to one may long elude others equally vigilant. Yet who would suspect that at this late day, there could be an unwritten page in the life history of our Robin (*Merula migratoria*), a species of unusually general distribution, abundant nearly everywhere, and probably familiar to a larger number of people than any other bird on this continent? Nevertheless no author whom I have consulted so much as mentions the fact that Robins, while still in their summer haunts, form roosts* which are resorted to regularly night after night and season after season by hundreds or even thousands. Such gatherings, however, are by no means uncommon in Massachusetts, and they doubtless occur throughout the entire North, wherever Robins abound.

Possibly they have been neglected rather than overlooked. In either case I hope to show that they are not without interest and importance. What I have to say of them proceeds chiefly from personal experience, but I have also drawn freely from the notes of Messrs. Faxon, Batchelder and Torrey†, to all of whom I am indebted for much valuable aid in the preparation of this paper.

Our Massachusetts Robin roosts are invariably in low-lying woods which are usually swampy and are composed of such de-

*It has been known for some time of course, that Robins form large roosts while in their winter quarters in the South, but no very exact or precise information concerning these roosts seems to have been thus far recorded.

†Mr. Torrey has written an article on this subject for the October issue of the 'Atlantic Monthly.' It will relate, I understand, chiefly to a roost at Melrose Highlands which he has studied closely.

ciduous trees as maples, oaks, chestnuts, and birches, sometimes mixed with white pines. I have never known Robins actually to spend the night, however, in the latter, or indeed in any species of evergreen, except at Falmouth, Mass., where there has been a small gathering, these past two seasons, in a white cedar swamp. The trees in the roost may be tall and old with spreading tops, or crowded saplings only twenty to thirty feet in height, but it is essential that they furnish a dense canopy of foliage of sufficient extent to accomodate the birds which assemble there. As a rule, the woods are remote from buildings, and surrounded by open fields or meadows, but the latter may be hemmed in closely by houses, as is the case with a roost which at present exists in the very heart of Cambridge. A roost once established is resorted to nightly, not only during an entire season, but for many successive seasons. Nevertheless it is sometimes abandoned either with or without obvious cause, as the following account of the movements of the Cambridge Robins during the past twenty odd years will show.

I first found them roosting in the summer of 1867 in a tract of some ten or twelve acres of swampy woods situated about two hundred yards to the north and east of Fresh Pond and known to Cambridge collectors as the 'Maple Swamp.' The birds which came to this swamp approached it chiefly from the direction of Cambridge, the main body of the flight entering on the south and east sides. Probably it accommodated *all* the Robins which at the time bred in or very near Cambridge, for from every part of that city the flights led straight towards it. It also received some contributions from the country to the north and west, but these were comparatively trifling.

Either in 1873 or 1874 the Cambridge Robins deserted the Maple Swamp and found another roost in a similar piece of swampy woods on the opposite (northern) side of the Fresh Pond marshes, near the north bank of Little River not far from Spy Pond, and just within the borders of Arlington. The cause of this desertion was somewhat obscure, for the place which they left had undergone no sudden or marked alteration, nor had they been molested there to any considerable extent, while the change added nearly a mile to the length of their morning and evening flights, the course of which lay directly over the former roost where the passing birds would sometimes alight for

a moment as if to renew old associations. The new roost was many times more populous than the old, for it drew, in addition to the whole Cambridge contingent, a great number of birds from neighboring portions of Arlington and Belmont. In short, Robins poured into it nightly by thousands, and about equally on all sides. It was resorted to regularly until 1876 when the woods were cut down.

Neither note-book nor memory throws any light on where the Cambridge Robins roosted during the next five seasons. I was away from home much of the time, and lost all track of their movements until the summer of 1881 when I observed them passing over my house in nearly the opposite direction to that which they had taken in former years. Their roost proved to be within a few hundred yards of the Cambridge Museum, in Norton's Woods where it has continued ever since. I have no doubt it was founded by the same Robins—or their descendants—which in earlier days frequented first the Maple Swamp and later the woods on Little River.

There are equally good reasons for believing that a roost in the valley of Beaver Brook on the dividing line between Belmont and Waltham was also formed by some of the scattered legions of the Little River roost from which it is a little less than three miles distant. I discovered this Beaver Brook roost Aug. 25, 1884, when it contained an imposing body of birds—"thousands," according to the notes I made at the time. It has been occupied regularly since 1884, and is at present the largest colony known to exist anywhere near Cambridge.

South of the Charles River, in Longwood, about two and one half miles from the Norton roost, I found a considerable colony on the evening of Aug. 26, 1884. Their rendezvous was of the usual character—dense, swampy woods of oak and red maple. I did not again visit this place until Aug. 22, 1890, when I found that all the trees in the swamp had been killed by inundation. Nevertheless the Robins had not deserted the woods, but in fully their former numbers were roosting in a cluster of tall red maples, white oaks and chestnuts which, standing on a knoll above the reach of the water, had escaped the fate of their fellows. The entire area covered by the living trees was not over one quarter of an acre.

To go somewhat outside of the immediate neighborhood of

Cambridge, there is—or was in 1886—a roost in birch and maple woods on the banks of the Assabet River at Concord, remarkable for the small number of birds—only about fifty—which assembled there nightly, and a large colony at Melrose Highlands, discovered by Mr. Torrey in the summer of 1889. There are doubtless still others of which I have no knowledge scattered through this region.

Thus far I have spoken in only general terms of the number of Robins which sometimes congregate at these summer roosts. Several of my friends have attempted to count them, taking the best available stations outside the roosts and noting each bird as it flew in. This appears to be the only practicable method, for nothing whatever can be done inside the wood; but under the most favorable conditions it falls far short of absolute accuracy, especially at the larger roosts into which, at the height of the flight, the birds pour in such swarms that eye, brain and pencil are alike unequal to the task of noting all that pass in open view, to say nothing of the many that steal by close to the ground, under cover of bushes or the gathering darkness. Nevertheless any count carefully and conscientiously made, has this obvious value—it is sure to be well within the truth.

At the Beaver Brook roost Mr. Faxon with the help of an assistant counted 1883 incoming birds on the evening of Sept. 2, 1889. His next largest count, made without help Aug. 28 of the same year, was 1180. At Melrose Highlands Mr. Torrey, unaided, counted 1267, July 29, 1889, and 1517 on the same date in 1890. On July 28, 1890, with an assistant, he counted 2314. In both cases the assistant stood near his principal and was employed merely to divide the labor, no more ground being covered than on the other occasions.

On their face these figures indicate of course that the roost at Melrose Highlands is larger than that on Beaver Brook. But Mr. Torrey tells me that practically all his birds approach the woods from the same side, whereas, as Mr. Faxon and I have both observed, the Beaver Brook birds enter their roost in about equal numbers from every side. Before the two colonies can be fairly compared, therefore, it is evident that Mr. Faxon's count must be multiplied by four at least, if not, as he himself believes, by five. Any additions which should be made for birds that passed the observers uncounted would probably be so nearly equal in both

cases as not to affect the comparison, although doubtless they would swell both totals materially. The figures as they stand, however, are sufficiently impressive.

I made no counts at the Maple Swamp roost, but as I remember it, it never contained more than about 2000 birds. Its successor at Little River was not only very much larger, but if my notes and memory can be trusted, was by far the largest gathering that has ever fallen under my observation. Thus I find that on the evening of Aug. 4, 1875, I estimated the Robins which came in on two sides only at 25,000. This estimate was not mere guess work but was based on a count of the birds which passed during an average minute, multiplied by the number of minutes occupied by the passage of the bulk of the flight. Such a method, of course, is far from exact, and it very probably gave exaggerated results, but a deduction of fifty per cent would surely eliminate all possible exaggeration. As the birds were coming in quite as numerously on the two sides opposite to those where my estimate was made, it follows that the total, after making the above deduction, was still 25,000, and this I feel sure was far below the actual number.

The Norton roost is comparatively small, although, according to some careful counts made this season by Mr. Batchelder, it occasionally reaches an aggregate of about 1500 birds. The Longwood roost at the time of my last visit contained certainly 1000 and probably 1500 Robins.

During the past season Mr. Faxon saw a few Robins going to the Beaver Brook roost as early as June 11, but I have never observed any well-marked flights at Cambridge before the 20th of that month. The time probably depends somewhat on the date at which the first broods of young are strong enough to make the necessary effort, for the earlier gatherings are composed chiefly of young birds still in spotted plumage. Perhaps not all of those able to undertake the journey actually perform it at this period, for the movement, at its inception, is slight, and it gains momentum slowly. After July 1 it increases more rapidly, and by the middle of July becomes widespread and general, although it does not usually reach its height until the latter part of that month or early in August. By this time the old birds have brought out their second broods, and old and young of both sexes and all ages and conditions join the general throng. In fact it is

nearly certain that during August practically *all* our Robins visit some roost nightly.

It is by no means equally clear that individual birds or flocks go always to the *same* roost. If this were so the number at any given roost should remain uniform for a time after it has reached its maximum and before the migration begins. But it not only varies from week to week, but from night to night. Thus at the Norton roost, where, owing to the small size of the colony and to the fact that most of its members enter at one side over a wide opening, it is possible to count the birds with close approach to accuracy, Mr. Batchelder noted 861 on July 23, and on the next evening 1062, an increase of about 23 per cent! On the evening of Aug. 15 following, standing at precisely the same point, I counted only 518; on that of Sept. 4, 1251. Mr. Faxon's counts at Belmont and Mr. Torrey's at Melrose Highlands show similar variations. As already stated, Mr. Faxon's largest count was made Sept. 2, 1889, the next largest Aug. 28 of the same year. The Melrose roost, during the last two seasons, was apparently most populous in the latter part of July. More observations are perhaps necessary before the cause of these fluctuations can be definitely ascertained; but as Robins, when not tied down by family cares, are addicted to wandering more or less widely in pursuit of food or recreation, it seems more than likely that during August and early September they sometimes pass outside the limits of the region—often, be it remembered, only a few miles in extent—tributary to their chosen roosts. If this is true;—and it can scarcely be doubted—what more natural than that they should join at nightfall the general exodus from the surrounding fields and woods, even though it leads in a direction contrary to that which they have been accustomed to take? In support of this assumption is the fact that, as far as I have seen, the evening flights over any given place are invariably in one direction, that is there are never two sets of Robins passing in different directions at the same time, as would be the case were such rovers to return at evening straight to their own roosts. This theory, it will be observed, is only necessary to account for the acquisition of the habit by the young, for after it has become established a knowledge of the existence and position of several roosts would certainly be taken advantage of more or less frequently. Another factor which possibly has some influence on

the fluctuations under consideration is the Robin population of the country along the boundaries between two contiguous roosting areas. Why may not this constitute a neutral ground, its inhabitants sometimes visiting one roost, sometimes the other, as fancy or the conditions of wind and weather dictate? This suggestion, however, is pure speculation unsupported by any data.*

After the middle of September the roosting flights diminish rapidly, and by the end of the first week in October the roosts are practically deserted. The latest date in my possession at which any Robins have been actually found in a roost is Oct. 20, 1889, when Mr. Faxon noticed a few still lingering at Beaver Brook, but my notes record that on Nov. 6, 1888, I saw a succession of flocks flying, at sunset, into these Beaver Brook woods which, at the time, were "leafless"! About 200 Robins were seen on this occasion. They were in unusually large flocks, one, which passed me closely, containing fully 100 birds. If, as seems probable, they were migrants from further north it is interesting that they should have found their way to this roost; but perhaps enough local birds were with or near them to serve as guides. Mr. Faxon believes that our roosts receive some accessions from the north as early as September.

I had supposed that the old birds which accompany the young in the earlier flights to the roosts are individuals of both sexes that for one reason or another have not attempted to rear second broods. But Mr. Faxon informs me that as far as he has seen they are invariably males, and in disproof of the rest of my assumption furnishes the following interesting bit of evidence. The observations quoted were made in July, 1890, a little over a mile from the Beaver Brook roost.

* Since the above was written, I have definitely ascertained that over a belt of country a mile or more in width lying about midway between the Beaver Brook and Norton roosts the flight is directed sometimes to the former, sometimes to the latter roost. On the evening of Sept. 6, 1890, the Beaver Brook roost drew not only the entire Robin population from this neutral ground but also all the birds of an adjoining area which extended to within half a mile of, and had been before tributary to, the Norton roost. A profusion of ripe rum cherries had attracted to this area an unusual number of Robins. Probably the greater part of these belonged to the Beaver Brook colony and the less numerous local birds followed their lead on the return flight that evening. At least I can think of no other explanation of the phenomenon — which was repeated on the evening of Sept. 11. These observations throw much light on the questions above raised and in the main appear to support the theories which I have just advanced.

“The numbers of adult males *in song*, and the lack of females shown whenever I scrutinized the individual birds on their way to the roost—together with the fact that the Robins hereabouts seemed to be generally engaged at that time in rearing new broods—led me to doubt your theory and to attempt observations that would throw some light on the subject. It happened that on the 22d of July there were two Robin's nests on the place, one with three young, well advanced, and one with three eggs (female sitting). I had noticed several times that the male belonging to nest No. 1 carried food to his young late in the afternoon, while the flight to the roost was going on. On the day above-named, therefore, I began watching him closely toward evening, and saw him—after feeding the young—fly straight off for the roost, $1\frac{1}{4}$ miles away, at 7.30 P.M. You remember I have an unobstructed view from the house to the north and northwest, so the bird's course could be readily followed till he disappeared over the ‘Granite Ledge.’ On his departure the female came and took possession of the nest for the night. I saw her brooding the young until it became so dark that I could distinguish nothing, even at near range with opera-glasses. On the following evening the male again fed the young at about the same hour, then flew to the top of a spruce tree, and, after singing a good-night to his wife and babies, took a direct flight for the roost. The female then fed the young and settled in the nest. This was all repeated again on the 24th. While this was going on female No. 2 was sitting closely and I saw nothing of her mate, although the young hatched out on or before the 30th. The young in nest No. 1 left it on the 26th. This male has been on the place all summer, and by long familiarity we have come to distinguish him readily by a peculiar high note in his song. On the morning of the 24th I was awake from three to four o'clock, and our model husband and father returned to his family at 3.40 (sunrise 4.29), his arrival being announced by his glad call and morning song. On the morning of the 26th (which was cloudy) his salute was not heard from the favorite tree till four o'clock. He was singing pretty freely, even through the day, up to the time the young left the nest. Since then, although the whole family has remained about the nest up to this time, he has been almost silent (at least so far as singing is concerned), like the rest of his tribe at the present time.

"Now, although these observations were all made on one family of Robins, I have no doubt that they show, when taken in connection with the other facts, that the early flights to the roost are composed of the first brood young *together with the old males*. The later augmentation of the roost will come from the younger broods plus the females. What possibilities are suggested—if this be so—through the persistence of mutual relations between the old males and their offspring! The old birds must guide the young birds to the old roosting ground, and who shall say that this hegemony of the roost may not continue in a greater or less degree throughout the season? I do not mean to imply that each parent takes his own offspring in tow—but the nightly re-union of old and young *en masse* cannot but be an education for the youngsters. It was a revelation to me to find the male Robins taking care of their younger broods and wives by day, and going off nightly to sleep with their elder children!"

Most of the roosts which I have visited are resorted to by other birds besides Robins. The Little River colony always included some Bronzed Grackles and Cow Buntings, the former, to the number of a thousand or more, coming in all together in a single flock, or in two or three flocks closely following one another, the latter, perhaps half as numerous, arriving in a succession of flocks containing from twenty to thirty birds each. There were Swallows, also, in varying numbers. All these species alighted with the Robins and, as nearly as I could ascertain, passed the night among them. At the Falmouth roost there are quite as many Grackles as Robins (about two hundred of each), and the two species certainly roost together in the densest part of the cedars, although the Grackles arrive in one great flock, whereas the Robins drop in singly or in small parties after their usual fashion. There are also a good many Cowbirds besides a fair number of Red-winged Blackbirds and a few Kingbirds. The Cowbirds come in small flocks, and at first alight in the cedars, but soon fly down to, and doubtless pass the night in, some dense thickets of pepper-bush (*Clethra alnifolia*) which form a fringe around the edges of the swamp. The Norton roost accommodates a few Grackles and some Orioles (*I. galbula*). On one occasion I saw fully fifty of the latter settling themselves for the night in the undergrowth nearly beneath the oaks where the Robins congregate. At the Longwood roost there are Orioles,

but no Blackbirds of any species. A few Cedarbirds are also found in or near most of the roosts, and at Beaver Brook Mr. Faxon has seen Brown Thrashers.

Having dealt with what may be termed the statistics of my subject, it remains to give some description of these flights and the behavior of the birds at the roost. There is nothing about the start which would attract particular attention, but a close observer will notice that, as evening draws near, such Robins as may have been scattered about on the lawns or in the orchards near his position begin to show marked restlessness, ascending to the tops of the taller trees, calling a good deal — an old male perhaps singing. At length they take wing, one after another in quick succession, each, as it flies, uttering a loud note, and in straggling order disappear over the trees. The approach of another flock seems to excite them and hasten their departure, and they often follow it at once, all dashing off together as if struck by a panic, but I have never seen two flocks unite, although single birds occasionally join a larger number. Their course towards the roost is usually straight, but they sometimes turn aside to avoid a hill or follow the valley of a brook or river. As 'all roads lead to Rome,' so the various Robin paths traced across the sky at sunset converge more or less regularly from every side to their common centre, the roost. At roosts where for one or another reason most of the birds enter on a single side only and are drawn to something like a focus, they form, during the height of the rush, an apparently continuous stream. But close examination will show that the flight is always more or less intermittent and composed of single Robins and loose, straggling parties of from three or four to eighteen or twenty birds, each single bird or flock moving quite independently of all the rest.

Some—probably birds from the greatest distances—are a thousand feet or more above the earth, flying slowly apparently, with whirring, often intermittent, wing-beats, until almost over the roost when, perhaps after circling once or twice, they half close their wings and drop like meteors, or descend in graceful curves or spirals. Others, at lower elevations, seem to advance more rapidly and steadily, and upon nearing the roost glide down on gentler inclines. While still others skim close over the turf with arrowy swiftness, swerving now to this side, now to that, to avoid bushes or other obstacles, and turning sharply upward into

the treetops just as they gain the woods. The average height of flight is a little above the trees, but it varies at different periods of the same evening as well as on different evenings. As a rule the birds come lower and lower as the twilight deepens. They seem to fly lowest—as might be expected—on cloudy and especially rainy nights, but highest—as certainly would not be supposed—on cloudless nights *when the air is filled with dense haze*. On a particularly hazy evening (Aug. 31, 1889) the flights passing over Mr. Faxon's house were so high that "many birds were just discernible." As only 450 were counted against 835 of the preceding evening, Mr. Faxon concludes "that one half of them were beyond my ken." The presence or absence of wind may have more to do with this matter than the conditions just mentioned, for all the especially high flights that I have witnessed have occurred during nearly or perfectly still weather.

A good many birds approach the roost by short, interrupted flights, lingering on the way in isolated trees or groves where they often sing for a minute or two. At the Longwood roost more than two thirds of the entire colony arrive in this manner, probably because the swamp is in the bottom of a deep hollow surrounded by hills crowned with woods or orchards which afford convenient places for alighting.

The first comers reach the roost an hour or more before sunset, but for the next thirty or forty minutes the arrivals are few in number and at wide intervals although they gradually increase. There is rarely anything like a continuous or heavy flight until within fifteen or twenty minutes of sunset, but rather more than half the total number usually pass in before the sun has dipped below the horizon.

For about fifteen minutes after sunset the rush continues unabated. It then begins to slacken, always diminishing more rapidly than it grew, and often ending with somewhat marked abruptness. Stragglers, however, continue to arrive until it is too dark to see them distinctly except against the light in the western sky.

The earlier comers usually alight on the topmost twigs of the taller trees and sometimes, after a brief rest, fly back to the fields to feed, as if conscious that they were ahead of time. If there is a brook or spring near at hand many birds visit it to drink or bathe. They are also fond of collecting in the upper branches of

dead trees to bask in the last rays of the sinking sun, and a rum cherry tree loaded with ripe fruit is an irresistible attraction. But when the rush is at its height, there is rarely any loitering. Each bird, as it gains the woods, plunges into them at once, and with such directness and decision that one feels sure it has gone straight to its own particular perch. This, however, is evidently not the case, for during the entire period covered by the bulk of the flight, indeed for some time after the last belated straggler has stolen in, there is incessant and general agitation of the foliage as if a strong wind were blowing through the trees. This is caused by the movements of innumerable birds who, in the attempt to secure positions nearer the centre of the roost, or in thicker foliage, are continually darting from place to place, often plunging headlong into the branches or dropping through the leaves with much awkward and noisy fluttering. Either because of inability to see distinctly in the dim light, or with deliberate design to dispossess their fellows, such restless spirits often try to appropriate perches already occupied, and the squabbles which ensue, although quickly ended by one or the other giving way, are accompanied by outcries which rise above the general din of shrill, varied voices. If it is early in the season there is also more or less singing.

But the most characteristic and peculiar sound to be heard in a roost is that produced by the myriad wings constantly striking the leaves. This closely resembles the patter of hail or large rain drops on dry foliage at the beginning of a shower. There is also an equally steady and similar but slighter sound of falling excrement with which the ground and bushes beneath the roost are so thickly covered at times as to look as if sprinkled with snow flakes.* As the darkness deepens the tumult gradually subsides. One by one the shrill voices are hushed and the nervous flutterings cease, until, when the light has quite gone from the west and the stars are all out in the great dome overhead, a person might pause under the trees and listen intently for minutes without hearing anything save the occasional drowsy chirp or faint rustle of some half-awakened bird — sole tokens of the feathered host bivouacking in the leafy canopy above.

* Early in the season when the food of the Robin consists chiefly of earth worms and insects its excrement is of chalky whiteness. Later, when berries are eaten freely, the color becomes so dark that the deposits beneath the roost are no longer noticeable.

Mr. Batchelder visited the Norton colony before daybreak on the morning of July 8, 1890, to see the birds go out. His notes describe this experience in the following words:

"It was a warm morning, with a few thin clouds, and a moon at the third quarter in the meridian, at three A. M. when I reached the ground. There was hardly a trace of dawn in the east, but one or two Robins had begun singing. At 3.06 there was a chorus singing, so many birds that it was hard to distinguish any individual's song; it did not seem as if they sang with full power. At 3.16 I heard Robins singing in the trees on Divinity Avenue and probably, too, beyond the Museum. At 3.29 three birds left the roost. By this time there was so much daylight that the moon hardly cast any shadow. At 3.34 one more bird left; by 3.39, twenty had left; 3.41, thirty; 3.44, sixty; 3.46, ninety; 3.47, one hundred; 3.49 $\frac{1}{2}$, one hundred and fifty; 3.51 $\frac{1}{2}$, two hundred; 3.54, two hundred and fifty; 3.56 $\frac{1}{2}$, three hundred; 4.00, three hundred and forty; 4.02, three hundred and fifty; 4.05, three hundred and sixty; 4.14, three hundred and seventy-five; 4.16 three hundred and eighty; 4.19, three hundred and eighty-five. At 4.20 it was bright daylight. By this time light fleecy clouds covered thinly most of the sky, and a cool west wind had risen. The Robins, most of them, scattered gradually among the trees adjoining the roost before they finally flew off, and this together with the fact that when they left they usually flew low, diving down nearly to the ground at the beginning of the flight, made it difficult to count the departures; probably many got away without my seeing them in the dim twilight. A considerable portion of them stopped to feed in the ball-field before going away; sometimes one of these would fly up into the trees again before leaving. At 4.20 the roost was pretty nearly deserted, but for perhaps a hundred yards around Robins were to be seen in the woods, mostly feeding on the ground; I should think there must have been a hundred of them."

There is much about the flight to the roost which will remind the reader of migration. The preliminary restlessness and gathering of the scattered birds; the excitement caused by the passage of other flocks; the wide spread of the infection; and the brief time in which a considerable area is practically drained of its entire Robin population;—all these are familiar features to one who has studied the phenomena of migration. As with the

latter, the roosting flights are doubtless started by a few experienced birds who, with a definite purpose in view, lead the way over familiar ground to an old haunt. Others follow and the rout becomes general, although many of the birds which it includes are probably at first as ignorant as they are careless of whither they are going and to what end. A further resemblance to migration may be found in the manner in which the different sets of birds perform their journey—not all together nor yet quite independently of one another, but in what is virtually a straggling army where the new recruits are always more or less directly under the guidance of veteran leaders. In short, so closely do these evening flights resemble those of migration that I can trace only two marked distinctions: (1) They are comparatively local affairs extending at most over only a few square miles; (2) they are undertaken, not because of the necessity of escaping from a region where food will soon fail or the climate become unbearable, but seemingly from a mere impulse to assemble nightly in one place for mutual companionship and protection. Neither of these differences is really fundamental, nor can either affect the obvious significance of the fact, established by Mr. Faxon, that the young are at first led to the roost by their parents. If the guidance of old birds is necessary along the short and simple paths to the roosts, can it be doubted that it is even more essential on the long and difficult journey southward?

ON A COLLECTION OF BIRDS MADE DURING THE
WINTER OF 1889-90, BY CYRUS S. WINCH, IN
THE ISLANDS OF ST. THOMAS, TORTOLA,
ANEGADA, AND VIRGIN GORDA,
WEST INDIES.

BY CHARLES B. CORY.

ST. THOMAS.

Dafila bahamensis (Linn.).

Aythya affinis (Eytou).

Tyrannus dominicensis (Gmel.).

Euetheia bicolor (Linn.).

Compothlypis americana (Linn.).

Cæreba portoricensis (Bryant).

The St. Thomas Creeper does not appear to differ sufficiently from the Porto Rico species to warrant its separation. In fact, specimens from St. Thomas, Tortola, Anegada, Virgin Gorda, and Calebra are apparently the same form. Eighty-five specimens were examined from the above-mentioned islands.

Margarops fuscatus (Vieill.).

ANEGADA.

Sterna maxima Bodd.

Ardea virescens Linn.

Macrorhamphus scolopaceus (Say).

Ereunetes pusillus (Linn.).

Calidris arenaria (Linn.).

Totanus flavipes (Gmel.).

Symphemia semipalmata (Gmel.).

Numenius hudsonicus Lath.

Ægialitis vocifera (Linn.).

Ægialitis semipalmata Bonap.

Ægialitis wilsonia (Ord.).

Columbigallina passerina (Linn.).

Falco dominicensis Gmel.

Falco caribbæarum Gmel.

Crotophaga ani (Linn.).

Bellona exilis (Gmel.).

Eulampis holosericeus (Linn.).

Lampornis ellioti, sp. nov.

Lampornis ellioti, sp. nov.

Similar to *Lampornis dominicus*, but differs from it in being smaller, in having the wings and tail shorter, and in having the belly, crissum, and under tail-coverts much paler. The white feathers on the thighs are more extended. Two central tail-feathers golden bronze. Length (skin) 4.20; wing, 2.45; tail, 1.50; bill, .87 inch.

Habitat, Anegada.

Elænea martineca (Linn.).

Euetheia bicolor (Linn.).

Cæreba dominicensis (Bryant).

Dendroica ruficapilla (Gmel.).

TORTOLA.

Ardea virescens Linn.

Ardea cærulea Linn.

Actitis macularia (*Linn.*).
Zenaida zenaida (*Bonap.*).
Columbigallina passerina (*Linn.*).
Falco dominicensis (*Gmel.*).
Coccyzus minor (*Gmel.*).
Crotophaga ani (*Linn.*).
Eulampis holosericeus (*Linn.*).
Tyrannus dominicensis (*Gmel.*).
Cæreba portoricensis (*Bryant*).
Dendroica discolor (*Vieill.*).
Compsothlypis americana (*Linn.*).
Setophaga ruticilla (*Linn.*).
Margarops fuscatus (*Vieill.*).

VIRGIN GORDA.

Podilymbus podiceps (*Linn.*).
Ardea virescens *Linn.*
Nycticorax violaceus (*Linn.*).
Ægialitis vocifera (*Linn.*).
Ægialitis wilsonia (*Ord.*).
Columba leucocephala *Linn.*
Zenaida zenaida (*Bonap.*).
Columbigallina passerina (*Linn.*).
Falco columbarius *Linn.*
Falco dominicensis *Gmel.*
Falco peregrinus anatum (*Bonap.*).
Coccyzus minor (*Gmel.*).
Crotophaga ani (*Linn.*).
Bellona exilis (*Gmel.*).
Eulampis holosericeus (*Linn.*).
Tyrannus dominicensis (*Gmel.*).
Elænea martinica (*Linn.*).
Euetheia bicolor (*Linn.*).
Cæreba portoricensis (*Bryant*).
Compsothlypis americana (*Linn.*).
Dendroica discolor (*Vieill.*).
Dendroica ruficapilla (*Gmel.*).
Setophaga ruticilla (*Linn.*).
Margarops fuscatus (*Vieill.*).

DESCRIPTION OF A NEW SUBSPECIES OF WILD TURKEY.

BY W. E. D. SCOTT.

A COMPARISON of many specimens of Wild Turkey from the region about Tarpon Springs, Florida, with birds from Virginia and northward shows such constant characteristics dividing the two, that for the Florida bird I propose the name

***Meleagris gallopavo osceola*, subsp. nov. FLORIDA WILD TURKEY.**

Description. — Similar to *Meleagris gallopavo* but perceptibly darker in general tone. *Coloring* of tail and upper tail-coverts similar in both forms. The white on the primary and outer secondary quills restricted, and the dark color (brownish black) predominating, the white being present only as detached, narrow, broken bars *not reaching* the shaft of the feather. The inner secondaries of a generally dirty grayish brown *without* apparent bars, but with brownish vermiculations on the inner web.

Type, ♂, No. 7079, collection of American Museum of Natural History, New York. Loaned to the Museum by W. E. D. Scott. Taken at Tarpon Springs, Florida, by the author, March 16, 1887.

The new subspecies is named after Osceola, a celebrated and remarkable chief of the Seminole tribe of Indians.

For convenience, and to make the relationship of the three forms of American Wild Turkey apparent, the salient characteristics of both *M. gallopavo*, and *M. g. mexicana* are subjoined. The principal and conspicuous feature of true *M. gallopavo*, the northern representative of the eastern *wild bird*, is the clear, well-defined black or dark brown and white barring of the primary quills on both inner and outer webs, the bars of the *two colors* being of equal width and the white bars reaching to and touching the shaft of the feather. The barring of the outer secondaries is similar, but while the white bars are as pure in color as those of the primaries, the darker bars are of decidedly lighter brown and not at all *black*, as is the ground color of the outer secondaries in *osceola*. The barring on the inner secondaries while still distinct *on both webs*, has the darker color, brownish with greenish iridescence, predominating. The color of the tail feathers and upper tail-coverts is similar in this form and in *osceola*.

Meleagris g. mexicana is related to the southern or Florida form and is similar to it in the coloration of the primary and secondary quills, but is widely separated from both forms (*M. gallopavo* and *M. g. osceola*) in the lighter coloration of the tips of the tail-feathers and the color of the tips of the tail-coverts, which in this form is buffy whitish.

A NEW SUBSPECIES OF THE SOLITARY SAND-PIPER.

BY WILLIAM BREWSTER.

Totanus solitarius cinnamomeus, subsp. nov. CINNAMON SOLITARY SANDPIPER.

SUBSPECIFIC CHARACTERS (*young in autumn plumage*): Similar to *T. solitarius*, but larger, the wings grayer, the light spots on the back, scapulars, and wing-coverts brownish cinnamon instead of white or buffy whitish; the sides of the head with more whitish, especially on the lores. No well-defined loreal stripe.

Male juv., autumnal plumage (No. 17,735, San José del Cabo, Aug. 30, 1887). Above grayish brown, the back, scapulars, and wing-coverts tinged with olive and coarsely spotted with brownish cinnamon, the nape with fine, obscure streaks of grayish; sides of neck rather more broadly and plainly striped; sides of head, including most of the lores, white, finely spotted with dusky; an immaculate white space extending from above the eye forward nearly to the forehead; a short dusky space at the base of the bill; under parts white, the breast, jugulum and sides of neck and body, but not the flanks, distinctly streaked with grayish brown; the under tail-coverts with conspicuous bars of dark slate; under wing-coverts and axillars white, thickly and coarsely barred with dark slate; under primary-coverts and primaries dark pearl-gray; the outer primary finely mottled with ashy white along the border of its inner web for a distance of about an inch beyond the tips of the under primary-coverts. Rump, upper tail-coverts and middle pair of tail-feathers colored like the back, but with the outer tail-coverts white with dark slaty bars, the middle tail-feathers notched along the edges of both webs with rusty white. All the other tail-feathers white, more or less tinged with rusty near their tips, and with wide bars of dark slate, most numerous on the outer webs.

In respect to the characters mentioned in the above diagnosis, seven specimens collected by Mr. Frazar in Lower California differ very constantly from twelve examples in corresponding

plumage from various parts of the eastern United States. In the latter the spots on the back, scapulars and wing-coverts are usually smaller and invariably much lighter, varying from ashy white to very pale buffy. The Eastern birds also have the shoulders and outer edges of the wings above blacker, and the dusky on the sides of the head usually in excess of the white ground color. They also have a well-marked dark loreal stripe which is either wholly wanting or but imperfectly indicated in the Lower California bird. The mottling on the breast of the latter seems to be also darker, the streaks more distinct. While not constantly diagnostic, the mottling on the inner web of the first primary, mentioned in the description of the type, is an excellent *average* character. I have seen it exhibited in only one example of true *solitarius* while in *cinnamomeus* it is generally present.

The difference in size is shown by the following table of measurements (in inches).

Catd. No.	Sex.	Locality	Date	Wing	Tail	Tarsus	Culmen from feathers	
3,840	♂	Maine	Sept. 6, 1874	5.19	2.18	1.10	1.06	Coll. W. Brewster.
11,978	♂	"	Oct. 22, 1886	4.92	2.10	1.15	1.03	" " "
10,170	♂	Mass.	Aug. 29, 1888	5.07	2.06	1.18	1.17	" " "
12,728	♂	New York	Sept. 22, 1886	4.90	2.05	1.09	1.14	" " "
12,731	♂	"	Sept. 28, 1886	5.04	2.23	1.15	1.15	" " "
10,856	♂	New Brunswick	Sept. 15, 1885	5.07	2.14	1.15	1.13	" " "
10,935	♂	Maine	Oct. 12, 1885	5.10	2.28	1.16	1.15	" " "
3,843	♂	Mass.	Aug. 30, 1875	5.07	2.18	1.18	1.18	" " "
12,729	♂	New York	Sept. 22, 1886	5.13	2.16	1.15	1.08	" " "
6,427	♂	Ft. Snelling, Minn.	Aug. 24, 1888	4.83	2.14	1.30	1.17	*Dr. E. A. Mearns.
6,590	♂	"	May 6, 1889	5.00	2.18	1.20	1.20	" " "
6,591	♂	"	"	5.06	2.22	1.17	1.20	" " "
6,426	♂	"	Aug. 24, 1888	5.04	2.20	1.25	1.20	" " "
17,734	♂	Lower Cala.	Aug. 25, 1887	5.36	2.25	1.26	1.30	Coll. W. Brewster.
17,735	♂	"	" 30, "	5.37	2.37	1.23	1.19	" " "
17,736	♂	"	" 31, "	5.25	2.18	1.25	1.15	" " "
17,737	♂	"	" " "	5.18	2.22	1.22	1.22	" " "
17,738	♂	"	Sept. 2, "	5.10	2.09	1.23	1.16	" " "
17,740	♂	"	Aug. 30, "	5.40	2.28	1.24	1.26	" " "
17,741	♂	"	Sept. 2, "	5.49	2.23	1.30	1.25	" " "
4,180	♀	Ft. Verde, Arizona	"	5.09	2.15	1.14	1.17	*Dr. E. A. Mearns.
	♀	"	Aug. 28, 1885	4.90	2.05	1.17	1.08	" " "

*American Museum, N. Y. City.

All the Lower California specimens just mentioned are young birds, but the collection contains a single adult male in autumn plumage (No. 17,739, San José del Cabo, Oct. 28, 1887) which, in every respect, is identical with autumnal adults in my collection from the Eastern States. I see no reason why it may not be regarded as an example of true *solitarius*.

Two specimens from Fort Verde, Arizona, in the collection of Dr. Mearns agree closely with the Lower California birds in the color of the wings and the character of the dorsal spotting, but in other respects they are intermediate between the Lower California and Eastern birds.

RECENT LITERATURE.

Slater's Catalogue of the Tracheophonæ.*—The Tracheophone passeres, as is well-known, are restricted to the warmer parts of the two American continents, being for the most part tropical in their distribution. They comprise the four families Dendrocolaptidæ, Formicariidæ, Conopophagidæ, and Pteroptochidæ, and differ from other Passeres in the peculiar modification of the lower end of the trachea for the production of vocal sounds. They are birds of mostly small size, the largest not much exceeding the stature of a Jay, the average size being that of a small Thrush. They vary greatly in form and habits, and are mostly denizens of the thicket or the forest. Many of the Dendrocolaptidæ resemble the Tree-creepers in form and habits, having stiffened spiny tails and the same manner of life. Other forms of the same family are terrestrial, and are remarkable for the large domed clay nests they construct, from which they derive the name of Oven-birds. The Formicariidæ are likewise very variable in form, some of them being decidedly Shrike-like, while others are more like Thrushes and Warblers, and still others, as regards external form, recall the Pittas of the Old World. The Pteroptochidæ may be compared to gigantic Wrens.

In the present volume 559 species are recognized, of which 271 belong to the Dendrocolaptidæ, 256 to the Formicariidæ, 11 to the Conopophagidæ, and 21 to the Pteroptochidæ. Of these 531 are represented in the British Museum collection, the number of specimens aggregating 4482. Many other species are referred to in foot-notes, which, says the author, "may ultimately turn out to be perfectly valid," only such species as the author has *seen* being, as a rule, admitted!

The style of treatment is the same as in the same author's previous volumes of the series, noticed in former numbers of this journal. The

*Catalogue of the | Passeriformes, | or | Perching Birds | in the | Collection | of the | British Museum. | — | Tracheophonæ, | or the Families | Dendrocolaptidæ, | Formicariidæ, | Conopophagidæ, and Pteroptochidæ. | By | Philip Lutley Slater. | London: | Printed by order of the Trustees. | 1890.—8vo, pp. xviii X 372, pll. xx. (Volume XV of the 'Catalogue of the Birds in the British Museum.')

author states that "his work has no claims to be called a monograph, but is simply a catalogue of species and specimens, which it is hoped, however, may tend towards the elucidation of a very difficult subject by future laborers." Its utility will certainly prove almost beyond estimate, even to those who may not be prepared to agree fully to all of the conclusions presented. In such obscure and difficult groups as are here treated, opinion must vary on many points, being influenced by the amount of material in hand and the standpoint from which it is viewed.

In comparing the present volume with the 'Nomenclator Avium Neotropicalium' of Sclater and Salvin, published in 1874, it is of interest to note that the number of species now recognized for the Tracheophonæ has increased about twenty-five per cent in sixteen years, there being about 120 species added in the present volume that were not included in the 'Nomenclator.' Of these about 75 have been described since the publication of the 'Nomenclator', while nearly 50 then ignored are now given place as probably valid species. The number of genera has proportionately increased, and about in the same ratio as regards the recognition of generic groups formerly ignored. Of the nearly 90 species referred to only in foot-notes, probably one half to two thirds will prove to be recognizable forms, while many of those now registered as species will doubtless take rank eventually as merely local races or subspecies.

Species described as new or re-named are the following: (1) *Thamnophilus puncticeps*, p. 212; (2) *Myrmotherula inornata* (Berlepsch, MS.), p. 243; (3) *Cercomacra hypoleuca*, p. 268; (4) *Myrmeciza pelzelni*, p. 283; (5) *Grallaria nigro-lineata* (Berlepsch, MS.), p. 321; (6) *Liosceles erithacus*, p. 345. A new genus is *Thamnocharis* (p. 310).

As regards matters of nomenclature, we regret to see that the law of priority is not always respected, as when, in several cases, an earlier name, based on the female sex, is rejected for a later one based on the male; or when, as in the case of *Formicarius cayennensis* Bodd. (p. 302), a much used early name is rejected, because indicating "a wrong locality," for an uncurrent later name.

In conclusion we cannot do less than tender hearty thanks, in behalf of ornithologists at large, to the accomplished author of the volume under notice for the great service he has rendered in marshalling one of the most difficult sub-orders among birds into an orderly array.—J. A. A.

Allen on Birds from Quito.—The collection upon which this paper* is based was "made in the immediate vicinity of Quito by M. L. Söderström," and "numbers 210 specimens, representing 79 species, one of which proved to be new." A list is given of all the species contained in the collection, many of them accompanied by critical remarks having reference to questions of synonymy or relationship, those thus discussed being as follows:—

* Notes on a Collection of Birds from Quito, Ecuador. By J. A. Allen. Bull. American Museum Nat. Hist., Vol. II, No. 2, March, 1889, Art. VI, pp. 69-76.

Diglossa sittoides (Lafr. & D'Orb.), differing in certain respects from a Bogota example.

Dacnis egregia æquatoriæ Berl., confirming the differences on which the separation of the Ecuadorian from the Colombian bird was based.

Chlorophanes spiza cærulescens (Cass.), of which *C. s. exsul* Berl. is said to be a synonym.

Chlorophanes spiza guatemalensis (Cass.), the skins so identified being "evidently of a different make from the others, and are no doubt from a different locality."

Cæreba cærulea (Linn.), said to "agree perfectly with Bogota examples."

Procnias viridis Ill., usually called *P. tersa* (Linn.), apparently good reasons being given for changing the specific name, while Mr. Allen states his inability, "with a large series of specimens" before him, to distinguish a "smaller subspecies *occidentalis*."

Habia ludoviciana (Linn.), from the "foot of Pichincha, alt. 10,000 ft.," the date unfortunately not given.

Pipra auricapilla Licht., which differs in several particulars from the typical bird of eastern Brazil, Cayenne, and Trinidad.

Tityra personata Jard. and Selby, reference being made to 'The Auk,' Vol. V, 1888, p. 287.

Tityra nigriceps Allen, first described in 'The Auk,' Vol. V, 1888, p. 287.

Pithys peruvianus (Tacz.), which is easily separable from *P. albifrons* of Cayenne and Brazil.

Galbula albirostris chalconecephala (Dewille), "which name may be employed to designate this fairly marked Andean and West Brazilian race" of *G. albirostris*.

In addition to these notes on particular species, two genera are specially considered: *Chiromachæris* Cabanis (*et. auct.*), which must be changed to *Manacus* Brisson; and *Tityra*, of which an excellent and very convenient key to the species and subspecies is given on page 73. — R.R.

Allen on Birds collected in Bolivia. — With possibly the exception of Messrs. Sclater and Salvin's report on Mr. C. Buckley's collection of Bolivian birds,* Mr. Allen's "List of the Birds collected in Bolivia by Dr. H. H. Rusby,"† is by far the most important publication which has appeared on the birds of that country.

* On new Species of Bolivian Birds. By P. L. Sclater, M. A., Ph. D., F. R. S., and Osbert Salvin, M. A., F. R. S. Proc. Zool. Soc. Lond. 1876, pp. 352-358, pls. xxx-xxxiii. (Based on a collection of "between 400 and 500 skins of about 194 species," 15 of which, and 1 new genus, are described as new.)

† List of the Birds collected in Bolivia by Dr. H. H. Rusby, with Field Notes by the Collector. By J. A. Allen, Bull. Am. Mus. Nat. Hist., Vol. II, No. 2, March, 1889, pp. 77-112.

The collection was made during the years 1885 and 1886 by Dr. H. H. Rusby, "the well-known botanist," who "made a journey diagonally across northern Bolivia, starting at Arica in Chili and proceeding thence north-eastward to the head waters of the Rio Madeira, and thence down this river to the northern border of Bolivia." The number of specimens was about 400, representing 267 species, about 125 of which are added to the list of previously known Bolivian birds, while no less than 13 are apparently new to science. A complete list of the species is given, with critical annotations when they seem called for, while Dr. Rusby's very interesting field-notes are given in brackets and are followed by the initial 'R'.

The new species and subspecies described are the following:—*Empidonax bolivianus*, *Chiroxiphia pureola boliviana*, *Enicornis striata*, *Leptasthenura fuscescens*, *Leptasthenura fuliginiceps boliviana*, *Synallaxis griseiventris*, *Anabazenops immaculatus*, *Picolaptes obtectus*,* *Myrmochanes* (gen. nov.) *hypoleucus*, *Conopophaga rusbyi*, *Phlogopsis notata*, and *Scytalopus bolivianus*.

The annotated species are the following: *Atticora cyanoleuca montana* Baird, the subspecific characters originally ascribed to which are distinctly seen in the Bolivian bird; *Cæreba cærulea* (Linn.), Bolivian specimens of which "have the bill very short and slender, shorter and smaller even than Bogota specimens . . . labelled *Cæreba cærulea microrhyncha* by Berlepsch"; *Euphonia lanirostris* Lafr. & D'Orb., which differs "from Bogota specimens (*E. crassirostris* Scl.) in having the bill much smaller, the yellow of the cap much deeper (orange-yellow)," and in other particulars; *Paroaria gularis cervicalis* (Scl.), *P. cervicalis* Scl. being "doubtless only a local form of *P. gularis*," to which Mr. Allen thinks *P. capitata* (D'Orb. & Lafr.) also probably referable in the same manner; *Pachyrhamphus niger* Spix, a specimen of which "is much blacker below, with less white on the scapulars, wings, and tail than in Brazilian and Cayenne birds"; *Lathria plumbea* (Licht.), if not *L. cinerea* (Vieill.), which Mr. Allen regards as doubtfully separable; *Cinclodes rivularis* (Cab.), the complicated synonymy of which is disentangled; *Formicarius analis* (Lafr. & D'Orb.), a specimen of which agrees essentially with the type; *Pteroptochos albifrons* Landb., which Mr. Allen regards, and we believe correctly, as a "good species," or at least as not referable to *S. magellanicus*; *Hylactes castaneus* Phil. & Landb., the young of which is described; *Trogon collaris* Vieill., a male of which is described; *Galbalcyrrhynchus leucotis* Des Murs, the single specimen having the bill "about 7 mm. longer than the maximum given by Sclater in his monograph of the family."—R.R.

Allen on the Genus *Cyclorhis*.—Three times within the space of five years had this genus been 'monographed': by Hans Gadow in 1885,† by

* This, however, from an unknown locality, the type belonging to the Lafresnaye collection in the Museum of the Boston Society of Natural History.

† In 'Catalogue of the Birds in the British Museum,' Vol. VIII, pp. 316-321.

Dr. Sclater in 1887,* and Count von Berlepsch in 1888,† but in each case with only partially satisfactory results, owing in large part to lack of a sufficient number of specimens to show what limit of variation in any one form should be allowed for individual variation. Happily this deficiency, in the case of one species at least (*C. viridis*), was supplied by material which came into Mr. Allen's hands while the subject was fresh, thus enabling him to supplement the efforts of his predecessors by a much more elaborate paper‡. The additional material which enabled Mr. Allen to obtain the clue to individual variation in species of this genus formed part of the "Smith collection of Brazilian birds, recently purchased by the American Museum of Natural History," and embraced no less than 46 specimens of *C. viridis*. "These specimens, while presenting great variations in respect to coloration, size, and particularly in the size and color of the bill, are obviously referable to a single species, the two extremes of the series being completely connected by intermediate phases." Mr. Allen further observes that "while there is evidently a wide range of individual variation, in coloration as in the size of the bill, much of the very great variation in plumage is unquestionably due to season and age"; but he says "there is no apparent difference in the sexes, except that the females are found on measurement to average slightly smaller than the males." By the aid of this material and specimens from other sources Mr. Allen was enabled to satisfactorily separate and define *C. viridis* (Vieill.) from *C. ochrocephala* Tsch. and properly allocate their synonymy, and give satisfactory reasons for considering *C. cearensis* Baird, *C. wiedii* Pelz., *C. albiventris* Scl. & Salv., and *C. alirostris* Salv. as mere synonyms of *C. viridis* (Vieill.). Mr. Allen's critical remarks are not, however, confined to *C. viridis* and *C. ochrocephala*, but having in hand "much other authentic material . . . making, with the large series of the American Museum of Natural History, 123 specimens, and representing all the species of the genus except *C. atrirostris* Scl.," a few observations on other species of the genus are added. These are (1) *C. flavipectus* Scl., which name is restricted to specimens from Colombia; (2) *C. flavipectus subflavescens* (Cab.), from Central America; (3) *C. flavipectus trinitatis* subsp. nov., from Trinidad; (4) *C. flaviventris* Lafr., from southern Mexico, southern Yucatan, and Guatemala; (5) *C. flaviventris yucatanensis* Ridgw., from northern Yucatan; (6) *C. insularis* Ridgw., from Cozumel Island; (7) *C. guianensis* (Gm.), from Guiana and Amazonia. The forms of this genus are thus for the first time treated from the standpoint of modern nomenclature, trinomial designations being applied to those which are found to intergrade with others. The extent to which this reduction of

* Remarks on the Species of the Genus *Cyclorhis*. Ibis, fifth series, Vol. V, July 1887, pp. 320-324, pl. x.

† On the Genus *Cyclorhis*, Swains. Ibis, fifth series, Vol. VI, Jan. 1888, pp. 83-92.

‡ On *Cyclorhis viridis* (Vieill.) and its Allies, with Remarks on other species of the Genus *Cyclorhis*. Bull. Am. Mus. Nat. Hist. Vol. II, No. 3, June, 1889, pp. 123-135, figs. 1-7.

supposed species to the rank of geographical races or subspecies may be further carried is not yet known, but the material examined by Mr. Allen foreshadows still further reduction. For example, "the Cayenne form known as *C. guianensis*," says Mr. Allen, "probably will be found to grade into *C. viridis* through a paler race representing the species in northeastern Brazil, . . . for which Baird's name *cearensis* (= *albiventris*) would be available. In short, it seems probable that the whole group centring about *C. flavipectus*, including not only its several recognized subspecies but *C. guianensis* and *C. viridis*, and possibly also *C. flaviventris* through its southern forms,* will be found, when ample material for the study of the genus has been gathered, to imperceptibly blend."

The article is supplemented by Mr. Allen's "present impressions of the status, relationships, and distribution of the various forms of *Cyclorhis*," concluding with an excellent key to the species. — R. R.

Allen's Descriptions of New South American Birds.—Eight new species and subspecies, belonging to various families, are described in this paper,† as follows: (1) *Thryothorus macrurus*, Bogota; (2) *T. longipes*, Ambato, Ecuador; (3) *Platyrhynchus bifasciatus*, Chapada, Matto Grosso, Brazil; (4) *P. insularis*, Tobago; (5) *Euscarthmus ochropterus*, Chapada, Matto Grosso; (6) *Sublegatus virescens*, Chapada; (7) *Empidonax lawrencei* (= *Otheca flaviventris* Lawr.); (8) *Thamnophilus doliatus mexicanus* (= *T. affinis*, Cab. & Heine, pre-occupied). The "remarks" on other species refer to the following: (1) *Thryothorus "mysticalis"*, of the Rusby Collection, which proves to be "probably a large, very strongly colored example of *T. genibarbis*, or else an undescribed form" somewhat intermediate between the latter and *T. mysticalis*; (2) *Porphyrospiza caerulescens* (Max.), this being the correct name for the bird usually called *P. cyanella* (Sparrrn.); (3) *Mecocerculus uropygialis* Lawr., a specimen of which, "said to have been collected at a point thirty miles north of Bogota" is in the collection of the American Museum of Natural History, "thus greatly extending the range of the species to the northward"; (4) *Euscarthmus pelzelni* Scl., a second specimen of which is in the collection, from Cuyaba, Matto Grosso; (5) *Habrura superciliaris* (Wied), being the species usually called *H. pectoralis* (Cab. & Heine); (6) *Habrura minima* (Gould), very generally synonymized with *H. pectoralis*, but restored to specific rank‡; (7) *Phyllomyias incanescens* (Wied), which is now first referred to its proper genus, being the *Muscipeta incanescens* of Wied, of which *Phyllomyias berlepschi* Scl. is a synonym; (8) *Ornithion cinerascens* (Wied), being the bird usually called *O. obsoletum* (*Muscicapa obsoleta*

* Unfortunately we are not informed what these "southern forms" of *C. flaviventris* are!

† Descriptions of New Species of South American Birds, with Remarks on various other little known species. Bull. Am. Mus. Nat. Hist. Vol. II, No. 3, June, 1889, pp. 137-151.

‡ In a "Note on the Type of the Genus *Habrura* Cab. & Heine," on p. 147, this species is shown to be the type, instead of *H. pectoralis*, as given by Sclater.

Temm.); (9) *Formicivora griseigula* Lawr., which proves to be "an immature *Thryothorus coraya* (Gm.)"; (10) *Peristera mondetoura* Bon., from Bogota.—R. R.

Allen on Individual and Seasonal Variation in the Genus *Elainea*.*—

While the family Tyrannidae has been generally recognized as perhaps the most difficult to study of all the large distinctively American bird groups, the genus *Elainea* is admitted to be its most perplexing genus. In working up the very extensive 'Smith Collection' of birds from Chapada, Matto Grosso, Brazil, Mr. Allen found himself confronted by the not very pleasant or promising task of naming a series of 129 specimens "from an area of about five miles radius," representing several species, but how many only the most patient investigation could determine. The chief difficulty lay with specimens belonging to the *pagana-albiceps* group, of which, fortunately, no less than 116 specimens were present; but this richness of material for a while proved rather an embarrassment than an aid, a large proportion of the specimens being "referable to the true *E. pagana* of authors, and a still larger number to what is commonly recognized as *E. albiceps*, while the great bulk of the series" was "made up of specimens variously intermediate between these two forms." Mr. Allen found it desirable, "in order to satisfactorily determine the relationships of the puzzling birds represented in the Chapada series," to bring together as much material as possible; consequently, the *Elaineas* of the National Museum collection (numbering about 200 specimens), the Boston Society of Natural History, and the Museum of Comparative Zoölogy in Cambridge, were borrowed for the purpose. After patient study of this material Mr. Allen was enabled to reach definite conclusions, some of which were probably no less surprising to himself than to others who have read his excellent paper. "The Chapada series of *Elainea* referable to the *E. pagana-albiceps* group," says Mr. Allen "presents a wide range of variation, not only in size and coloration, but especially in the size and form of the bill. Were there fewer specimens, representing the same range of variation, but with most of the 'intermediates' left out, it would be quite easy to divide the series into several apparently well-marked species, and not hard to find names for them among the so-called species already described. Especially would this be the case were the specimens gathered from a wider geographical area, with the leading forms more or less localized. As the case stands, however, the specimens are all from a single very limited locality, and the gaps between the extreme forms are completely filled by specimens presenting every intermediate phase of variation. Besides, the variations in any other feature,—as in the form of the bill, in general size, the relative length of the outer primaries, or the relative length of wing to tail,—are found not to be correlated with varia-

* Remarks on Individual and Seasonal Variation in a large series of *Elainea* from Chapada, Matto Grosso, Brazil, with a Revision of the species of the restricted Genus *Elainea*. Bull. Am. Mus. Nat. Hist. Vol. II, No. 3, Article XVIII, Oct. 1889, pp. 183-208.

tions in other features; so that while the specimens may be somewhat arbitrarily divided into series on general size, or on the form of the bill, the important variations in other features are not correlated with them but present all sorts of combinations of characters. Indeed, division on either size alone or color alone, or exclusively on the form of the bill, cannot be made satisfactorily, since there is no point at which a separation can be made."

Part I of Mr. Allen's paper is devoted to a general discussion of individual variation, with special reference, of course, to the genus *Elainea* and the Chapada specimens in particular. Part II consists of a review of the species and subspecies, based on the material examined, the "*E. pagana-albiceps* group" receiving most attention. Of *E. pagana* several subspecies are recognized: *E. pagana* (Licht.) proper from Eastern South America, north to Trinidad; *E. pagana subpagana* from Central America and Mexico; *E. pagana martinica* (Linn.) from the Antilles and Cozumel, to which Mr. Allen refers *E. cinerascens* Ridgw. from Old Providence; and *E. pagana albiceps* (D'Orb. & Lafr.) from "the Andean region, from Colombia and Ecuador southward, including Peru, Bolivia, Paraguay, the extreme southern part of Brazil, and the region thence southward to the straits of Magellan." Regarding the Antillean form, Mr. Allen notes that "birds from different islands present much variation," and that "it is probable that large series from different islands, when compared, will be found to present slight average differences, as in case of other birds of similar distribution"; but he adds that at present lack of material renders an attempt to discriminate such forms impracticable. We trust the necessary material may soon be placed in Mr. Allen's hands, in order that he may be able to complete the work which he has so ably begun.—R. R.

Allen on the Maximilian Types of South American Birds.—In a paper of 68 pages, Mr. Allen has given a complete list of the Maximilian types of South American birds in the Museum of Natural History, New York City,* the names of Maximilian's new (actual or supposed) species being cited under their equivalent current names, the order of arrangement being that of Sclater and Salvin's 'Nomenclator Avium Neotropicalium.' The catalogue has to do with "only the South American birds, and more especially with the types of the species described as new by the Prince in his 'Reise nach Brasilien' and 'Beiträge zur Naturgeschichte von Brasilien,'" in which works "about 160 species were described as new, of which about three fourths are still represented in the Maximilian Collection by the original or 'type' specimens." Altogether about 183 Maximilian names are discussed, the list including others beside the species which he described as new. The whole number are arranged, at the end of the paper (pp. 273-276), in a most convenient and useful 'Con-

* On the Maximilian Types of South American Birds in the American Museum of Natural History. Bull. Am. Mus. Nat. Hist., Vol. II, No. 3, Article XIX, December, 1889, pp. 209-267.

cordance and Index,' "in the order in which they stand in his 'Beiträge,' with a reference to the volume and page of the 'Reise' or 'Beiträge' where they were first described," while "in the second column is given the equivalent name under which they are treated in the present paper, the figures at the extreme right referring to the page where the species is considered."

The paper is an extremely important one, and in its preparation the author has performed a good work, for which students of South American ornithology will be grateful.—R. R.

Dionne's Catalogue of the Birds of Quebec.*—The writer modestly expresses a hope that his work will be of some use as a guide to the young ornithologists of Quebec. This is evidently its chief purpose, and is one that cannot fail to be amply fulfilled. The Catalogue follows the classification and nomenclature of the A. O. U. Check-List, and gives also—as an aid in reference to earlier writers—the names and numbers borne by each species in the check-lists of Baird, Coues, and Ridgway. Following this comes a generalized statement of the bird's distribution, adapted from the A. O. U. Check-List, together with information as to its occurrence, abundance, times of appearance, etc., in the Province of Quebec. Of the 273 species and subspecies recorded, the following seem noteworthy: *Megalestris skua*, *Larus brachyrhynchus*, *Puffinus cinereus*, *Anas strepera*, *Ardea cœrulea*, *Otocoris alpestris praticola*, *Pica pica hudsonica*, *Ammodramus caudacutus subvirgatus*, *Pipilo erythrophthalmus*, *Piranga rubra*. It is to be regretted that in recording rarities Mr. Dionne does not always give full particulars and, in some of these cases, that the specimens were not identified by some ornithologist of unquestionable authority.

The author justly regrets the scantiness of the data at his command, and, doubtless, more field work in his own neighborhood would have led him to change some statements, especially as to the abundance of certain species. Nevertheless he gives us much valuable information, and a book that promises to serve so well the purpose for which it was written may well be spared too searching criticism.—C. F. B.

Proceedings of the Linnæan Society.†—The Linnæan Society has recently issued a brief 'abstract' of its Proceedings for the year ending March 7, 1890. "A large proportion of the papers read before the Society have been published in 'The Auk,' 'Forest and Stream,' and the 'Bulletin of the American Museum of Natural History,'" and are only mentioned here. The bulk of the abstract is made up of brief items, chiefly ornithological, and many of them of much importance. The only paper of any

* Catalogue | des | Oiseaux | de la Province de Québec | avec des Notes sur leur Distribution Géographique | par | C. E. Dionne | [cut] | Québec | des Presses à Vapeur de J. Dussault, | Port Dauphin | 1889. 8vo. pp. 119.

† Abstract | of the Proceedings of the | Linnæan Society | of | New York | for the Year ending March 7, 1890. 8vo. pp. 10.

length is by Mr. F. M. Chapman, 'Notes on the Carolina Paroquet (*Conurus carolinensis*) in Florida' (pp. 4-6), in which he gives interesting details of his experience with this bird on the Sebastian River in March, 1889. The publication unfortunately lacks an index.—C. F. B.

Minor Ornithological Publications.—'Forest and Stream,' last noticed here in Vol. VI, pp. 174-180 (April, 1889), continues to have much valuable ornithological matter. It is greatly to be regretted that some of the best contributors to its natural history columns hide their identity under pseudonyms, and thus lessen the scientific value of their communications. Vols. XXX-XXXIV, Jan. 26, 1888-July 17, 1890, contain the following (Nos. 1678-1932):—

1678. *Kingfisher in New York in Winter.* By Robert B. Lawrence. 'Forest and Stream,' Vol. XXX, Jan. 26, 1888, p. 6.

1679. *Ice-bound Rail.* By Robert B. Lawrence. *Ibid.*—*Porzana carolina* at Flushing, L. I., Dec. 23.

1680. *The Hardy Snipe.* By W. D. Pickett. *Ibid.*, Feb. 2, p. 24.—*Gallinago delicata* wintering in Wyoming.

1681. *Winter Bird Notes.* By X. Y. Z., J. L. K., and C. L. S. *Ibid.* p. 25.

1682. *Food of the European Sparrow.* By Hoosier. *Ibid.*

1683. *Kingfisher in Winter in Massachusetts.* By C. B. *Ibid.*, Feb. 9, p. 44.

1684. *Powder-down Feathers in Herons.* By C. E. B. *Ibid.*, p. 46.

1685. *Canadian Birds.* *Ibid.* Feb. 16, p. 64.—A review of Montague Chamberlain's 'Catalogue of Canadian Birds.'

1686. *Winter Kingfishers.* By A. B. George. *Ibid.*—In Michigan.

1687. *The Food of Rapacious Birds.* By Edward Swift. *Ibid.*, March 1, p. 104.—With tabulated report of contents of stomachs of fourteen species.

1688. *Kingfishers in Winter.* By George H. Shelton. *Ibid.*—In Connecticut.

1689. *The Food of Rapacious Birds.* By M. G. Ellzey, M.D. *Ibid.*, March 15, p. 144.—Especially *Accipiter velox*.

1690. *The Willet (Symphemia semipalmata) Alighting on Trees.* By John C. Cahoon. *Ibid.*, March 22, p. 165.

1691. *Ridgway's North American Birds.* *Ibid.*, March 29, p. 184.—Review of 'A Manual of North American Birds' by Robert Ridgway.

1692. *A Little Girl on Sparrows.* By Susie J. Allen. *Ibid.*—*Passer domesticus*.

1693. *The American Skylark.* By R. I. B. *Ibid.*, p. 185.—*Alauda arvensis* on Long Island.

1694. *A Blue Heron on Mid-ocean.* By Mac. *Ibid.*

1695. *Notes on the English Sparrow.* By Ernest E. Thompson. *Ibid.*, April 5, pp. 204-205.—With tabulated report of contents of stomachs examined.

1696. *An Early Yellow Rail*. By E. H. Austin. *Ibid.*, p. 205. — At Gaylordsville. Conn., March 24.
1697. *Aquatic Turkeys*. By Dupont. *Ibid.*, April 12, p. 223.
1698. *Birds at a Government Post*. By Edward Clark. *Ibid.* — In winter and early spring at David's Island, New York Harbor.
1699. *The Song Sparrow*. By Ernest E. Thompson. *Ibid.*, April 19, p. 244. — Plan for investigating its life history.
1700. *The "Cranesback"*. *Ibid.*, April 26, pp. 268-269. — Chiefly a quotation from a letter by J. E. Harting in the 'London Field,' giving evidence of small birds being carried in migration on the backs of Cranes, Geese, etc.
1701. *Post-nuptial Migration*. By Roxey Newton. *Ibid.*, p. 269. — The males of certain species leaving their mates at the beginning of incubation.
1702. *Bird Notes from Canada*. By J. L. [=M.] Lemoine. *Ibid.* — Migrants at Quebec.
1703. *Col. Pickett's English Snipe*. *Ibid.* — *Gallinago delicata* wintering in Wyoming. See also *antea*, No. 1680.
1704. *Are Hawks Destructive of Game*. By M. G. Ellzey, M. D. *Ibid.*, May 3, pp. 288-289. — Some notes on *Archibuteo lagopus sancti-johannis*.
1705. *Spring Bird Notes*. By Eben P. Dorr. *Ibid.*, p. 289. — At Buffalo, N. Y.
1706. *The Bird Hosts*. Editorial. *Ibid.*, May 24, p. 345. — Spring migrants about New York City.
1707. *Some Autumn Birds of the St. Mary's Lake Region*. By Geo. Bird Grinnell. *Ibid.*, May 24, pp. 348-349; May 31, pp. 368-369. — An annotated list of 74 species noted during October and November in northern Montana.
1708. *Familiarity of the Gray Jay*. By W. B. Mershon. *Ibid.*, June 21, p. 432. — *Perisoreus canadensis*.
1709. *Jay, Pigeon, Camera*. By Ebeemee. *Ibid.*, June 28, p. 452. — *Perisoreus canadensis* and *Ectopistes migratorius*.
1710. *Grouse in Captivity*. By Jay Beebe. *Ibid.*, p. 453. — *Bonasa umbellus*.
1711. *Plumage of the Mallard*. By J. L. Rooney. *Ibid.*
1712. *The Loon in Captivity*. By Edward Jack. *Ibid.*, July 12, p. 491.
1713. *The Names of Game Birds*. *Ibid.*, Vol. XXXI, Aug. 2, 1888, p. 24; Aug. 16, p. 65. — Review of Trumbull's 'Names and Portraits of Birds which Interest Gunners.'
1714. *Interesting Bird Notes*. By J. L. Davison. *Ibid.*, p. 63.
1715. *The Domestication of Wild Fowl*. By Fred. Mather. *Ibid.*, Aug. 23, p. 83.
1716. *Shore Birds*. By X. Y. Z. *Ibid.*, p. 85. — At Ipswich, Mass., in August.
1717. *The Pileated Woodpecker*. By Coahoma [=F. G. Dabney]. *Ibid.*, Sept. 6, p. 122.
1718. *Golden Plover*. By F. *Ibid.*, Sept. 13, p. 145. — Large flights on Long Island.

1719. *The Foot of the Wood Duck*. By Fred. Mather. *Ibid.*, Oct. 4, p. 205. — Climbing powers of the young.
1720. *A Captive Grouse*. By J. B. Battelle. *Ibid.*, Oct. 25, p. 264. — *Bonasa umbellus*.
1721. *Economic Ornithology*. *Ibid.*, Nov. 1, p. 284. — Review of 'Report of the Ornithologist and Mammalogist [of the Department of Agriculture] for 1887.'
1722. *A Ruffed Grouse in Town*. By Henry J. Thayer. *Ibid.*, p. 285. — In Cambridge, Mass.
1723. *Failure of the Woodcock Flight*. By E. H. Lathrop. *Ibid.*, p. 286. — See also Nos. 1725 and 1727.
1724. *Game in Town*. By von W., J. G. L., J. L. Davison, Blue Ridge, E. T. Johnson and Hub. *Ibid.*, Nov. 15, p. 323; Dec. 13, p. 408; Dec. 20, p. 435. — *Bonasa umbellus*, *Colinus virginianus* and *Philohela minor*.
1725. *The Woodcock Flight*. By E. H. Lathrop. *Ibid.*, p. 326.
1726. *Notes from Missouri*. By J. B. *Ibid.*, Nov. 22, p. 343.
1727. *The Woodcock Supply*. By N. A. Plummer, Notliks, A. B. C., Alfred A. Fraser, Whitt., Sandpiper, H. B. N., C. B., *et al.* *Ibid.*, p. 345; Nov. 29, p. 367; Dec. 13, p. 411; Dec. 27, p. 458.
1728. *The Annual Meeting of the A. O. U.* *Ibid.*, Nov. 29, p. 363.
1729. *Destruction in Migration*. By Ruthven Deane. *Ibid.*, Dec. 6, p. 385. — Near Chicago and Racine in May, 1888.
1730. *Turkey Buzzards and Cowbirds*. By Coahoma [=F. G. Dabney]. *Ibid.*, Dec. 13, p. 407.
1731. *Range of the Wild Turkey*. By Charles F. Batchelder. *Ibid.*
1732. *Notes on New Mexican Shrikes*. By R. W. Shufeldt. *Ibid.* *Lanius borealis* and *L. l. excubitorides*.
1733. *Chestnut Ruffed Grouse*. By F. W. *Ibid.*, p. 408. — Individual variation in *Bonasa umbellus*.
1734. *Owl and Man*. By C. H. Ames. *Ibid.*, Dec. 20, p. 435. — A man attacked by a large Owl.
1735. *Nesting of Leach's Petrel*. By F. H. Carpenter. *Ibid.*, p. 436.
1736. *Massachusetts Killdeer Plover*. By Hub. *Ibid.*, p. 437.
1737. *An Interesting Hybrid*. *Ibid.*, Dec. 27, p. 455. — From the 'Evening Mercury,' St. Johns, N. F. A supposed hybrid between the Black-cock and the Ptarmigan.
1738. *Grasshoppers and Hawks*. By Dr. C. Hart Merriam. *Ibid.*, pp. 455-456. — Great numbers of grasshoppers caught by Hawks, especially *Buteo swainsoni*.
1739. *Mississippi Valley Bird Migration*. *Ibid.*, Jan. 3, 1889, p. 475. — Review of Bulletin No. 2 of the Division of Economic Ornithology, Department of Agriculture.
1740. *Facksnipe in January*. By G. C. P. *Ibid.*, Jan. 17, p. 515. — *Gallinago delicata* (?) at Granville, Ohio.
1741. *Shore Birds of Central New York*. By Morris M. Green. *Ibid.*, Vol. XXXII, Jan. 31, 1889, p. 22. — 34 species recorded.

1742. *Pennsylvania Birds*. *Ibid.*, p. 22. — Review of B. H. Warren's 'Report on the Birds of Pennsylvania.'
1743. *Want of Foresight*. By A. H. G. *Ibid.* — On the absence of various winter birds at Scarborough, N. Y.
1744. *Golden-winged Woodpecker in Massachusetts*. By Hermit. *Ibid.*, Feb. 14, p. 63. — Food in winter.
1745. *Winter Woodpeckers of Michigan*. By E. L. Moseley. *Ibid.*
1746. *Habits of the Flicker*. By C. W. Chamberlain. *Ibid.*, Feb. 28, p. 107.
1747. *The Jekyl Island Pheasants*. Editorial. *Ibid.*, March 7, p. 129. — Propagation of Pheasants at Jekyl Island, Georgia. See also pp. 169 and 355, and Vol. XXXIII, Aug. 22, 1889, p. 81.
1748. *Midwinter Bird Notes*. By Shoshone. *Ibid.*, March 7, p. 131. — Notes on migration at Kearney, Neb.
1749. *Hummingbird on the Ground*. By Chas H. Eldon. *Ibid.* — *Trochilus colubris* alighting on the ground.
1750. *Crows and Poison Ivy*. By W. B. Barrows. *Ibid.*, March 14, p. 151. — Scattering the seed.
1751. *Ways of the Woodpecker*. By Fannie Heatherington. *Ibid.*
1752. *Woodcock Breeding in North Carolina*. *Ibid.* — From the 'Wilmington (N. C.) Daily Star.'
1753. *Five Days a Savage*. By Edward Howe Forbush. *Ibid.*, March 21, p. 171; March 28, p. 191; April 4, p. 211; May 2, pp. 294-295; May 9, pp. 314-315. — Notes on various birds in the Gulf of Georgia, B. C.
1754. *A Grouse Trajectory*. By Jay Beebe. *Ibid.*, April 4, p. 212. — Flight of a Ruffed Grouse.
1755. *Bird Notes from Maryland*. By M. G. Ellzey, M. D. *Ibid.* — In winter and early spring.
1756. *Honkings from the Platte*. By Shoshone. *Ibid.* — On migration of Geese and a few other birds in Nebraska.
1757. *The Migration of the Ducks*. By Shoshone. *Ibid.*, April 18, p. 256. — Interesting notes on Ducks and Geese in Nebraska.
1758. *Questions about Chimney Swifts*. By W. E. Saunders. *Ibid.*, May 2, p. 295. — Migration.
1759. *Migrations on the Plains*. By Shoshone. *Ibid.* — Chiefly water birds about Kearney, Neb.
1760. *Range of the Wild Turkey*. By Sullivan Cook. *Ibid.*
1761. *Whistling Swan in Niagara County, N. Y.* By J. L. Davison. *Ibid.*
1762. *Nests of the Great Horned Owl*. By O. B. H. *Ibid.*, May 9, p. 315.
1763. *Domesticated Wild Geese*. By J. L. Davison. *Ibid.* — *Branta canadensis*.
1764. *A Captive Robin*. By Robt. B. Lawrence. *Ibid.*, p. 316.
1765. *Florida Birds of Plume*. Editorial. *Ibid.*
1766. *Brant in Michigan*. By Robert B. Lawrence. *Ibid.* — *Branta bernicla*.

1767. *Spring in New Brunswick*. By Edward Jack. *Ibid.*, p. 317.—*Branta canadensis*.
1768. *British Columbia Notes*. By Stanstead. *Ibid.*, May 23, p. 355.—*Dendragapus obscurus fuliginosus*.
1769. *Massachusetts Bird Notes*. By F. C. Browne. *Ibid.*—Species noted near Framingham, May 12.
1770. *Brant Shooting at Cape Cod*. By W. Hapgood. *Ibid.*, May 30, p. 377.—*Branta bernicla*.
1771. *Nesting Habits of Hawks*. By Walter C. Wood. *Ibid.*, June 13, p. 420.—Especially *Buteo lineatus*.
1772. *Spring Notes on Migratory Birds*. By Robert Ridgway. *Ibid.*—At Laurel, Md.
1773. *Chimney Swallows*. By J. S. C. *Ibid.*—Migrations.
1774. *Ruffed Grouse's Nest with Fifteen Eggs*. *Ibid.*, p. 421.—From the 'Worcester [Mass.] Spy.'
1775. *Long Island Birds*. By Wm. Dutcher. *Ibid.*, June 20, p. 444.—A request for information.
1776. *To Pennsylvania Ornithologists*. By B. H. Warren. *Ibid.*, p. 445.—A request for information.
1777. *The Contradictory Crow*. Editorial. *Ibid.*, June 27, p. 465.—Notice of investigations by the Department of Agriculture as to the Crow's beneficial and injurious qualities.
1778. *Economic Ornithology*. Editorial. *Ibid.*, July 4, p. 489.—Notice of the annual report of the Department of Agriculture.
1779. *North American Birds*. Editorial. *Ibid.*—Notice of H. Nehrling's 'North American Birds.'
1780. *Range of the Turkey Buzzard*. By J. A. Loring. *Ibid.*, p. 490.—At Owego, N. Y.
1781. *The Woodcock's Whistle*. By H. B. N. *Ibid.*, July 11, p. 510.
1782. *Outdoor Notes from Louisiana*. By H. P. U[fford]. *Ibid.*, July 18, p. 528.—*Ardea cærulea*.
1783. *The Sparrow Pest*. By Jacobstaff. *Ibid.*—*Passer domesticus*.
1784. *Ruffed Grouse Eggs*. By John Williams. *Ibid.*—Notes on number of eggs and period of incubation of *Bonasa umbellus* and *Colinus virginianus*.
1785. *A Study of Woodcock*. By Paul Pastnor. *Ibid.*, pp. 528-529.
1786. *Can the Nuisance be Abated?* Editorial. *Ibid.*, Vol. XXXIII, July 25, 1889, p. 1.—*Passer domesticus*.
1787. *Ways of the Woodcock*. Editorial. *Ibid.*, Aug. 1, p. 21.—Interesting observations about feeding habits and notes.
1788. *The Woodcock and the Worm*. By E. B. and William Brewster. *Ibid.*, p. 24.—Mr. Brewster's article is an important contribution to our knowledge of the Woodcock's habits.
1789. *A Hard Time of It*. By A. H. G. *Ibid.*, Aug. 8, p. 43.—An item about *Turdus mustelinus*.
1790. *Notes on the Woodcock*. By Canonicus. *Ibid.*, pp. 44-45.
1791. *The Woodcock's Whistle*. By Robert T. Morris. *Ibid.*, Aug. 15, p. 65.

1792. *The Loon's Flight*. By Caryl D. Haskins. *Ibid.*
 1793. [*The Woodcock and the worm*.] Editorial. *Ibid.*, Aug. 22, p. 81.
 1794. *The Woodcock's Whistle*. By William Brewster and W. *Ibid.*, p. 83.
 1795. *Bird Notes from Missouri*. By Jasper Blines. *Ibid.*—Mention of *Mimus polyglottos*, *Harporhynchus rufus* and *Galeoscoptes carolinensis*.
 1796. *The Plumed Quail of Arizona*. By T. W. B. *Ibid.*, pp. 84-85.—*Callipepla gambeli* (?).
 1797. *Grouse Reared in Confinement*. Editorial. *Ibid.*, p. 85.—*Bonasa umbellus togata*.
 1798. *The Woodcock's Whistle*. By H. B. N. *Ibid.*, Aug. 29, p. 104.
 1799. *The Grouse of Utah*. By Geo. H. Wyman. *Ibid.*
 1800. *The Woodcock's Whistle*. By H. B. Soule and F. W. *Ibid.*, Sept. 5, p. 123.
 1801. *Quail in Dixie*. By Geo. H. Wyman. *Ibid.*—In Utah.
 1802. *Range of the Wild Turkey*. By Chas. Hallock. *Ibid.*, p. 124.
 1803. *Wild Pigeons*. By Geo. A. Boardman. *Ibid.*—Near Calais, Maine.
 1804. *The Whistle of the Woodcock*. By C[harles] H[inkle] and Canonicus. *Ibid.*, Sept. 12, p. 143.
 1805. *Birds of Niagara County, N. Y.* By J. L. Davison. *Ibid.*, Sept. 19, p. 164; Sept. 26, p. 183; Nov. 7, p. 303.—190 species are given, with brief annotations.
 1806. *Massachusetts Wild Turkeys*. By A. C. Sikes. *Ibid.*, Sept. 19, p. 167.
 1807. *Mockingbirds in Massachusetts*. By E. H. Lathrop. *Ibid.*, Oct. 3, p. 202.
 1808. *Michigan Wild Turkeys*. By S. C. *Ibid.*, p. 205.
 1809. *Birds of Plume*. *Ibid.*, Oct. 10, p. 224.—From the 'Mobile Register.' "10,000 Terns and other birds of plume" shipped to New York.
 1810. *Hawk Migration*. By R. G. M. *Ibid.*, p. 225.
 1811. *Wild Pigeon in Massachusetts*. By C. E. I. *Ibid.*, Oct. 17, p. 243.
 1812. *The Woodcock's Whistle*. By Marstrand. *Ibid.*—*Scolopax rusticola*.
 1813. *The Wild Pigeon*. Editorial. *Ibid.*, Oct. 24, p. 261.—Notes the occurrence of "many" in Prince George's County, Md.
 1814. "*In a Garden*." By Coahoma [=F. G. Dabney]. *Ibid.*, p. 265.—A fight between two *Trochilus colubris*.
 1815. *The Wiles of a Mother Teal*. By Rex. *Ibid.*—*Anas discors*.
 1816. *Waders in Sandusky Bay*. By Dr. E. Sterling. *Ibid.*—*Limosa fedoa*, *Macrorhamphus griseus*, *Micropalama himantopus*.
 1817. *New England Grouse*. By Special. *Ibid.*, p. 267.—*Bonasa umbellus* and *B. u. togata*.
 1818. *Out-of-door Papers. From My Window*. By Fannie Pearson Hardy. *Ibid.*, Oct. 31, p. 283.—Notes on several species in [Northampton (?)] Mass.

1819. *Food of California Birds*. By Walter E. Bryant, Charles A. Keeler, Harry R. Taylor. *Ibid.*—A request for material and observations bearing on the subject.
1820. *Wild Pigeon in Massachusetts*. By H. J. Thayer. *Ibid.*, p. 288.
—A pair said to have nested in Plymouth, Mass., in 1889
1821. *Woodcock in Town*. By S. E., Duplex, and H. J. G. *Ibid.*, Nov. 7, p. 302; Nov. 14, p. 324.
1822. *A Tame Wild Duck*. By H. C. Newell. *Ibid.*, Nov. 7, p. 303.
—*Anas obscura*.
1823. *Migration of Ducks*. By J. W. C. *Ibid.*—*Oidemia deglandi* in Buzzard's Bay and Vineyard Sound.
1824. *Out-of-door Papers. A Question of Taste*. By Fannie Pearson Hardy. *Ibid.*, Nov. 14, p. 323. — On food habits of *Sphyrapicus varius*, *Merula migratoria*, *Carpodacus purpureus* and *Pinicola enucleator*. 188
1825. *Wild Turkeys in New England*. By C. H. Ames. *Ibid.*, p. 325.
1826. *Annual Congress of the A. O. U.* *Ibid.*, Nov. 21, pp. 343-344.
—A detailed narrative of the seventh congress of the Union.
1827. *A Tamed Ruffed Grouse*. By E. M. Stillwell. *Ibid.*, p. 344.
1828. *Wild Turkeys in New England*. By Milton P. Peirce. *Ibid.*, p. 346. — Reports of their occurrence about Mt. Tom and Mt. Holyoke in Massachusetts thirty years ago.
1829. *Bears, Birds and Fishes*. By T. H. B[ean?]. *Ibid.*, p. 348.
1830. *Gunning down by the Sea*. By James M. Scovel. *Ibid.*, Nov. 28, pp. 362-363. — Contains some notes on nesting of *Pandion haliaëtus carolinensis*.
1831. *Out-of-door Papers. Winter Fishing*. By Fannie Pearson Hardy. *Ibid.*, p. 363. — Notes on a few winter birds in Maine, especially *Parus atricapillus*.
1832. *Game in Town*. By C. G., Milton P. Peirce and Medicus. *Ibid.*, p. 364. — Notes on *Bonasa umbellus*, *Colinus virginianus*, and *Melanerpes erythrocephalus*.
1833. *Rare Birds in Rhode Island*. By Newton Dexter. *Ibid.* — *Grus canadensis* and *Ionornis martinica*.
1834. *Ruffed Grouse Plumage*. By G. W. Z. *Ibid.*
1835. *The Snowy Owl in New Jersey in November, 1889*. By L. S. Foster. *Ibid.*
1836. *Snowy Owl in Pennsylvania*. By W. K. P. *Ibid.*
1837. *Notes on the Snowy Owl*. By Osceola. *Ibid.*, Dec. 5, p. 384.
1838. *Snowy Owls in Maine*. By W. D. U. *Ibid.*
1839. *Weight of Grouse*. By Rudolph von Ohl. *Ibid.*, Dec. 12, p. 402.
— *Bonasa umbellus* and *Colinus virginianus*.
1840. *Snowy Owl in Massachusetts*. By C. W. C[hamberlain?]. *Ibid.*, p. 405.
1841. *Snowy Owl in Connecticut*. By John H. Sage. *Ibid.*
1842. *Grouse Notes*. By Jay Beebe. *Ibid.*, Dec. 19, p. 422. — *Bonasa umbellus*.
1843. *A December Robin's Nest*. By A. C. Kirkpatrick. *Ibid.*
1844. *Weight of Grouse*. By Robert T. Morris, M. D. *Ibid.*, p. 433.
— *Bonasa umbellus*.

1845. *A Tame Snipe*. By Wm. Schott. *Ibid.*, Dec. 26, p. 449. — *Arenaria interpres*.
1846. *The Snowy Owl*. By L. S. Foster, C. P. Hubbard, and H. *Ibid.*
1847. *Great Gray Owl in New York*. By O. Stewart Bamber, M. D. *Ibid.*
1848. *Weight of Grouse*. By Noltiks. *Ibid.*, Jan. 2, 1890, p. 467. — *Bonasa umbellus*.
1849. *A Wild Pigeon Flight*. By Keouk. *Ibid.*
1850. *The Ways of the Woodcock*. By T. M. Aldrich. *Ibid.*, pp. 468-469. — An article of great interest.
1851. *The Chinese Pheasants*. By J. F. L. *Ibid.*, p. 471.
1852. *Hawks that Kill Hens*. By M. G. Ellzey, M.D. *Ibid.*, Jan. 9, p. 497. — Contains notes on *Buteo latissimus*, *B. borealis*, *Archibuteo lagopus sancti-johannis*, *Circus hudsonius*, and *Colinus virginianus*.
1853. *Snowy Heron on Lake Ontario*. By E. E. Chapman. *Ibid.* *
1854. *Cape Cod Quail*. By J. C. C[ahoon]. *Ibid.*, p. 498.
1855. *The Snowy Owl*. By Shoshone and S. C. Clarke. *Ibid.*, Jan. 16, p. 511.
1856. *El Carpintero*. By Arefar. *Ibid.*, p. 512. — *Melanerpes formicivorus bairdi*.
1857. *An Albino Hairy Woodpecker*. *Ibid.*
1858. *Game Birds of the Plains*. By Shoshone. *Ibid.*, pp. 513-514. — Includes a list of 'game birds' near Kearney, Nebraska, chiefly Waders and Ducks.
1859. *Weight of Grouse*. By Sus. Q. Hannah. *Ibid.*, p. 515.
1860. *Out-of-door Papers*. IX.—*Largely Personal*. By Fannie Pearson Hardy. *Ibid.*, Vol. XXXIV, Jan. 23, 1890, p. 4. — Contains notes on *Bubo virginianus* and *Nyctalu acadica*.
1861. *Grouse in Confinement*. By G. Jaye and W. D. L. *Ibid.*
1862. *Snowy Owls*. By T. F. C. and J. Y. C. *Ibid.*, Jan. 30, p. 23.
1863. *Food of Quail*. By C. T. *Ibid.*, p. 27. — Seeds of skunk cabbage.
1864. *Wingless Birds of New Zealand*. By Edward Wakefield. *Ibid.*, Feb. 6, p. 44.
1865. *Evening Grosbeak in New England*. By William Brewster. *Ibid.*, pp. 44-45.
1866. *Evening Grosbeak in Central Ontario*. By John Ewart. *Ibid.*, p. 45.
1867. *The Snowy Owl*. By A. H. P. *Ibid.*
1868. *Notes on Pennsylvania Birds*. By B. H. Warren. *Ibid.*, Feb. 13, p. 64. — *Pinicola enucleator*, *Plectrophenax nivalis*, *Calcarius lapponicus*.
1869. *Evening Grosbeak in New York*. By A. K. Fisher and J. Alden Loring. *Ibid.*, pp. 64-65.
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GENERAL NOTES.

The Little Black Rail (*Porzana jamaicensis*) at Key West, Florida. — Mr. John W. Atkins secured on March 11, 1890, an adult male of this species which he kindly gave to me. The bird in question was caught on one of the principal and most frequented wharves of the water front of the city. It was evidently migrating, and had but just arrived at the point in question in a very fatigued condition, and was observed by a passer by, trying to hide among some loosely piled brick. This person secured it easily and brought it to Mr. Atkins alive. So far as I am aware this is the first absolute record of the occurrence of this species on the Island of Key West.—W. E. D. SCOTT, *New York City*.

The Dowitcher at Ottawa.—On May 9, 1890, I shot a female *Macrorhamphus griseus* feeding in a moist meadow within a mile of this city. It is now in my collection.—GEO. R. WHITE, *Ottawa, Ontario*.

The American Barn Owl near Troy, New York. — In my collection is a specimen of *Strix pratincola* in rather dark plumage, lately received from Mr. A. E. Weinbender of West Troy, who informed me that he shot the Owl November 19, 1888, in a clump of poplar trees, where it had just been mobbed by Crows, on Weinbender's Hill, about one mile west of the Hudson River at Troy, N. Y.—AUSTIN F. PARK, *Troy, N. Y.*

Strix pratincola in Western New York. — On July 5, 1890, a live Barn Owl was captured in Buffalo in the warehouse of a large tannery close to the New York Central R. R. Station. The bird had probably entered the building during the preceding night through an open window, and failing to find the same means of exit was captured in the morning. It was a fine full-plumed male. It was kept by its captor for a number of days before it came into my possession. It is interesting to note that the few days preceding the bird's capture were very hot, and that the nights were also warm. I know of only one previous record of the capture of this Owl in Erie County, and of but few elsewhere in this region.—W. H. BERGTOLD, M. D., *Buffalo*.

A Correction.—In the current volume of 'The Auk,' page 91, Dr. R. W. Shufeldt records the capture of the Hawk Owl near Washington, D. C. The undersigned called at the studio of Mr. F. S. Webster to see the specimen, and found it to be a Short-eared Owl (*Asio accipitrinus*) instead of the above named species.—A. K. FISHER, *Washington, D. C.*

Breeding of the Pileated Woodpecker in Worcester County, Massachusetts:—In a recent paper* I noticed the fact that a few Pileated Wood-

* Notes on the Birds of Winchendon, Worcester Co., Mass. 'The Auk,' Vol. V No. 4, Oct. 1888, pp. 386-393.

peckers still linger in the northern part of Worcester County, Mass., and that a brood of young was seen there in the summer of 1887. Any doubt that may have existed as to whether these birds really breed in this region is now dispelled, for Mr. C. E. Bailey has sent me a set of four eggs which he took at Winchendon, May 17, 1890. The nest was about forty feet above the ground in a dead hemlock fully three feet through at the base and over seventy feet in height. Some photographs taken for me under Mr. Bailey's direction show that the tree stood in an opening surrounded by a dense forest of spruces. One of the Woodpeckers, sufficiently large and distinct to be easily identified with the aid of a magnifying glass, appears clinging to the trunk a few feet from the entrance to its nest. This opening, according to Mr. Bailey's description, was of sufficient size to admit the hand and arm, so that no preliminary cutting was necessary in order to reach the eggs.

When the nest was first discovered both birds were in it together, but on the following day when the eggs were taken the male was away, and did not appear until his home was invaded. He watched the movements of the enemy from a safe distance, relieving his mind, meanwhile, by "talking a good deal." The female parent, on the contrary, showed marked devotion to her eggs. After being again and again driven from the nest by violent pounding at the base of the tree, she would quickly return; and even after the eggs were removed she entered the nest and remained within for some time, peeping out every now and then as if seeking some trace of her lost treasures.

After the nest was robbed, the pair disappeared for a few days, but returned about July 1, and a week or so later (I have been unable to obtain the exact date and particulars) Mr. Bailey took a second set of four eggs from the same hole.

In the eggs of the first set incubation had progressed several days, showing that probably the full number had been laid. They measured respectively: 1.34×1.00 , 1.28×1.00 , 1.27×1.00 , and $1.22 \times .97$ inch. In shape they are full, somewhat elliptical ovate. Save that they are larger and have an even higher polish, they closely resemble the eggs of *Colaptes*, showing the same conspicuous pits or pores.—WILLIAM BREWSTER, Cambridge, Mass.

Melanerpes aurifrons in Young Co., Texas, in 1878.—In 'The Auk' for July, 1889 (Vol. VI, p. 238) Mr. E. M. Hasbrouck notes the northern limit of range of *Melanerpes aurifrons*. It would appear from the following extract from 'Science News' of Sept. 13, 1879, that the range of the species was considerably farther north than Eastland County in 1878.

"I have had an opportunity of noting the eastern and northern limit of the Yellow-faced Woodpecker of Texas and have found it to range considerably further north than I expected. This species first attracted my attention between Austin and San Antonio, in Comal County, and about two hundred miles from the Rio Grande. West of San Antonio it became more plentiful and seemed to be inspecting the cedar telegraph poles, with

a view to nest-building. Those poles being longer and larger than the mesquite timber, which abounds along the road from San Antonio to Castroville in Medina County, seem to offer better facilities for nesting than the small short trunks of the mesquite. From Medina County we traced the species northeasterly to the Colorado River, in San Daba County, about one hundred and fifty miles. From this point to Gainesville, Texas, some two hundred miles northeast, we did not encounter the species, and there seems to be a narrow belt of neutral land between the eastern range of the Yellow-faced Woodpecker and the western limit of its near relative, the Red-bellied Woodpecker.

"During the fall of the same year (1878) I started from Gainesville, Texas, and traveled a little south of west, and was surprised to find the species on the Brazos River, so far north. Traveling westward, we seemed to pass beyond the bird, as we did not see it in Taylor and Nolan Counties at all.

"On our return we noted the species again in the vicinity of the Brazos River still above where we crossed that river going out and near Fort Belknap. At this point it is only about forty miles from Red River; and the bird may be looked for on that stream, although Lieutenant McCauley does not mention it in his notes on the birds of the upper Red River.—*G. H. Ragsdale, Gainesville, Texas, Aug. 1, '79.*"

Eastland County lies south of $32^{\circ} 30'$ while Belknap is north of 33° .—*G. H. RAGSDALE, Gainesville, Texas.*

Notes on *Eugenes fulgens*.—This Hummingbird is a summer resident in the Huachuca Mts., Arizona. It arrives in May, but is nowhere plentiful until the mesquite shrubs begin to blossom, about the middle of June. From this time on during the entire summer one may observe on almost any hillside below the pine belt large clusters of bright red or yellow flowers spreading out from stalks ten or fifteen feet high. There are many varieties of this plant and all are favorite feeding resorts of the Rivoli Hummer. I have shot as many as a dozen in a day simply by sitting down and watching for them to come and feed. It is necessary to select a well-matured plant, and at the proper elevation, as well as in good surroundings of spruce pines. While feeding, these birds range from 4,500 to 8,000 feet altitude or up to the pine belt, their favorite grounds being where the pines end on the downward slope. Their flight is exceedingly rapid at times but they often fly slowly so that the wings can be easily seen during the beats. The noise made by this bird's wings during a rapid flight is not like the buzzing of the small Hummer's wings, the beats being more slow and distinct, without any buzzing noise.

Their note is a twittering sound, louder, not so shrill, and uttered more slowly than those of the small Hummers.

From July 5 to 9 I examined nine females; one had already laid and the others contained eggs that would probably have been laid within from one to four days. On July 10 my search for the nest was at last rewarded. The country I had explored was from 7,500 to 10,000 feet elevation,

where a dense growth of tall spruce pines covers the hillsides. These pines are all more or less covered with bunches of moss and lichens. I was resting on a rock in the cool shade beneath one of these trees when I was suddenly attracted by the noise of a Hummer's wings close to my head. Looking up, I saw a female Rivoli making perpendicular dives at me. After repeating this until I had moved off a sufficient distance, she alighted upon a small dead twig and there sat watching me for some moments. As all remained quiet, she now flew about the tree slowly, and when about fifty feet up made a rapid dart to the crotch of a mossy limb about ten feet from the trunk, where the nest was built, nearly hidden from the ground. I now came up, and by throwing things at her flushed her off the nest, but she at once returned to it. After much trouble the nest and the two eggs it contained were secured in safety.

The nest was firmly attached to the limb just beyond a crotch, the limb at the nest being about an inch in diameter. It is of a uniform oval shape, its diameter outside being from 2.03 to 2.62 inches; inside from 1.20 to 1.45. The depth outside is 1.55 inches; inside it is .62. It is composed outwardly of bits of fine moss and lichens, and is indistinguishable from the limbs about it. It is well lined on the inside with many star-shaped downy seeds of a delicate cream color, similar to those of the common thistle of the East, but smaller and softer. The two eggs are pure white, shaped alike at both ends, and measure .53 \times .37 and .52 \times .37 inch.—OTHO C. POLING, *Ft. Huachuca, Arizona*.

The Philadelphia Vireo in Vermont.—Although the distribution of the Philadelphia Vireo (*Vireo philadelphicus*) leads one to expect its regular occurrence in Vermont, I find no record of its capture in that State. It may therefore be of interest to mention that on September 11, 1889, I took a female of this species at Pittsford, Rutland County, Vermont. I found the bird among some low alders which overhung a meadow brook.—FRANK H. HITCHCOCK, *Somerville, Mass.*

Spotted Eggs of Swainson's Warbler.—On May 13 of this year I found a nest of Swainson's Warbler in Coosawhatchie Swamp,—which is a very large river-swamp about five miles from Yemassee. Upon looking into the nest I found a single egg, and was very much surprised to see that it was distinctly marked over the whole of the egg. I left the nest with the egg to get the full set, and returned on the 15th and found the bird sitting. The nest contained three eggs which were all spotted. As these are the first eggs of Swainson's Warbler which are distinctly spotted, a description will doubtless be of interest.

I sent these eggs with the nest to Capt. Bendire, and at my request Mr. Ridgway has kindly described the eggs and I herewith give his description.

"The two eggs measure, respectively, as follows:—.83 \times .59, .85 \times .60 inch. One of them, being broken, cannot be measured. The ground color of the eggs is yellowish or buffy white; one of them is very faintly and rather sparsely flecked, chiefly on and near the larger end, with pale

buffy brown; the other two are distinctly flecked with reddish brown or cinnamon-color, these markings most numerous, and in one egg most distinct, on the larger end."

The nest was built in canes, six and a half feet from the ground, and over running water, and is typical of a Swainson's nest.

After taking the nest and eggs I would not shoot the birds as I hoped I could get another set of eggs from them. I accordingly visited the same swamp again on May 26, and after an hour's careful search I found the nest, with the bird sitting. I actually had my hand on her before she left the nest. The eggs—three, as in the first nest—are all spotted, much more so than the first set. They are all marked with reddish brown, upon a buffy white ground, though in one egg the ground color seems to be a little lighter than in the others, and it is not as heavily marked. The nest was built in canes, but was placed only three feet from the ground and in a comparatively dry situation.

Mr. Brewster has described a set of three eggs of this Warbler which were taken by me. (See Auk, Vol. II, No. 4, 1885.) He says: "One is perfectly plain; another, like the larger egg of the first set, has two or three minute specks which may be genuine shell markings; while the third is unmistakably spotted and blotched with pale lilac."—ARTHUR T. WAYNE, *Yemassee, S. C.*

Helminthophila chrysoptera in Manitoba.—By the kindness of Mr. William Hine of Winnipeg, Manitoba, I am enabled to record the capture of a Golden-winged Warbler taken by him near Winnipeg on or about May 24, 1887. Two years ago in Winnipeg Mr. Hine showed me the specimen, which he had mounted. It was an adult male in full plumage. This capture is an interesting one, for although the Golden-winged Warbler is well known to breed in some parts of Wisconsin and Minnesota, Winnipeg is some three or four hundred miles beyond its known range.—C. F. BATCHELDER, *Cambridge, Mass.*

Was He a Philanthropist?—On the fourth of July, when in the woods looking for the nest of a Black-throated Blue Warbler, my attention was diverted by a Chestnut-sided Warbler. He came hunting over the bushes near me, once flying so low that I caught his image among the waving reflections of the sunlit saplings in the pool at my feet. I traced him to a nest, and was rejoicing over the discovery when, on walking nearer, I was thrown into perplexity by seeing a female Redstart come to feed the young. What could it mean? I dared not believe my eyes. Perhaps, in moving to a better position, I had lost my Chestnut's nest and come upon a Redstart's. Or—could such strange things be? Before I had time to get over my bewilderment, back flew the Chestnut again, feeding the babies as calmly as if to assure me that such things were, whether from precedent or the premises of ornithologists they could be or could not be.

I signalled excitedly to Mrs. Olive Thorne Miller, who was watching

for the Blue Warbler a few rods away, and we seated ourselves about fifteen feet from the tree, determined to see everything that happened. The nest was in a small beech, about thirty feet from the ground, in a crotch made by a short, dead branch with the trunk. It seemed to be a compact, typical Redstart nest, though placed higher than usual—it certainly had nothing to suggest a Chestnut-sided Warbler's nest. It was in such plain view from where we sat that, through our glasses, we could see the fuzz on the heads of the little ones, and see the larger of the two scratch his bill, stroke his feathers, stand up in the nest, and stretch his wing over the edge. When the sun lit up the leaves and the nest in their midst, we could see into the throats of the hungry babies. When the old birds fed them, I saw the yellow patches on the tail of the Redstart as she darted around the nest, and the white breast and yellow crown of the Chestnut-sided Warbler. And in hunting, the Chestnut came within six feet of us, so that we could see the deep chestnut of his sides and the heavy black markings of his cheeks. We watched the birds closely for an hour or more in the morning, two hours in the afternoon, and for a short time just before dark; and each time saw the same singular performance.

The birds fed the young at dangerously short intervals—we feared they would leave the nest dyspeptics for life! And they would have been crammed still more, if it had not been for the time it took the Redstart to drive off the Chestnut, and the delay her attacks caused him; for she had no wish for his kind offices and, as Mrs. Miller remarked, like some other philanthropists that made no difference to him! When she saw him coming with food, before he was anywhere near the tree, she dashed at him with spread tail and resentment in every feather. His long-suffering meekness was philosophical. He flew before her, waited till she had spent her anger and gone off or down in the bushes for an insect, when he slipped up to the nest and fed his charges. It seemed as if she could not bear the sight of him. Again and again she drove him out of the tree, and sometimes she almost tumbled her babies out of the nest, flouncing at him over their heads when he was in the act of feeding them. Once or twice he came to a twig behind the nest, leaned over, and stretched the food across to the birds, as if to make sure of getting off before she caught him. But he was no coward, and took a good claw-to-claw tumble with her when she had snapped her bill at him once too often. Except for this, he seemed calm and self-possessed through all her persecution, hopping from twig to twig, running along the branches, clambering up the stalks of the bushes, and occasionally giving a thin low call; while she flashed around madly, under leaves and over branches, flying up against one tree-trunk only to dart off to another. At first she made no noise, except when she snapped her bill, but later on she sang a few notes now and then while at her work.

On the morning of the fifth, we found that one of the young had flown, and the other one was out on a branch by the side of the nest. Mrs. Miller watched the family while I went to look up some noisy Ovenbirds,

and she thought the Chestnut lost track of the bird when it flew to another branch, for he watched where the Redstart went and tried to follow her. After he had been driven back a number of times, he apparently gave up, and disappeared. I came back in time to see the little one go to the ground and caught it and held it, though its poor mother trailed pitifully, while Mrs. Miller took notes on its plumage. She found that it was ashy on the back and darker on the head; that its throat and breast were ashy, turning to white below. The sides of its breast were slightly washed with yellow, and there were two yellow wing-bars. The beak was light colored, a little darker above than below. The tail was too short to show any color.

Whether the Chestnut succeeded in following the family after they left the nest, or gave up, discouraged in well doing, we did not determine. We saw the Redstart hunting about in the vicinity of the dead treetop where she took her young, the day after it left the nest, but saw no more of the Chestnut with her. A thousand theories suggest themselves in explanation of this domestic comedy, but of course it is too late to prove any of them. The only thing we felt justified in concluding from the position and character of the nest and the actions of the birds, is that the Redstart rather than the Chestnut-sided Warbler was the original owner of the nest.

On July 23 Mrs. Miller and I were near the dead treetop watching the family of Black-throated Blue Warblers whose nest we had been looking for when we came on the scene of coöperative housekeeping nearly three weeks before. As we were going on, I caught sight of a Chestnut-sided Warbler, and, as it was the first time I had seen one there since the nest had been left, I stopped involuntarily, half conscious of a hope that I might see more strange sights. The Chestnut went to the ground and following him with my glass, under the jewel weed, I saw a big grayish bird looking for food. In a moment it fluttered its wings and opened its bill and — was fed by the Chestnut! I was dumbfounded. Surely, wonders never cease!

It flew up into the trees after him and chirped as peremptorily as if the Chestnut had always got its meals for it. It was an odd sight to see the little Warbler chasing round for the big baby! He seemed very hard-worked, for besides having a larger capacity than the poor Chestnut was used to, the young bird had full use of its wings and was rarely found twice on the same branch, so that the little old gentleman had to whisk round for flies and for his adopted son too.

The young bird kept so high and clambered over the branches so nimbly, that we had much ado to make out its markings, but found enough to show that it was neither Chestnut-sided Warbler nor Redstart. When on the ground under the weeds its gray back seemed to have an olivaceous tinge; and when it flew up we could see that its light breast was somewhat streaked, the lines extending back to the flanks, where they were stronger. Its chin was white, and there was a dark line on its cheek. It had a finch bill, two wing-bars, and a long emarginate tail.

Who were the pair, and what did it all mean? Was this the same kind-hearted Chestnut Warbler that we had watched before, or is there a peculiar strain of human kindness in the blood of the Chestnut family? If he was the same bird, he certainly deserves a position at the head of an orphanage, for perhaps his combination with 'fresh air' work is a bit of Warbler wisdom that might be imitated.—FLORENCE A. MERRIAM, *Locust Grove, Lewis County, New York.*

Capture of a Second Specimen of the Hooded Warbler in Massachusetts.—Some time ago my friend, Mr. Wilnot W. Brown, Jr., of this city, showed me, among other interesting birds in his collection, a specimen of the Hooded Warbler (*Sylvania mitrata*) taken at Provincetown, Mass., by Mr. Harry C. Whorf of Winthrop. I have since obtained full particulars of the capture from Mr. Whorf, who kindly permits me to write this note. The bird was an adult male in high plumage, and was shot June 25, 1888, while busily catching insects in a thicket of scrub oaks and bushes. From the date of capture it would seem probable that the Warbler was breeding in the vicinity; but Mr. Whorf, who watched it for some time before shooting, saw nothing in its behavior to indicate that such was the case, the bird showing no signs of anxiety at his presence, nor any of the actions characteristic of a bird having a nest or young near by. There is, I believe, but one previous record of the occurrence of *Sylvania mitrata* in Massachusetts, that of a specimen taken in Brookline, June 25, 1879, as noted by Mr. Ruthven Deane (Bull. Nutt. Orn. Club, Vol. V, 1880, p. 117).—FRANK H. HITCHCOCK, *Somerville, Mass.*

Interesting Nesting Site of a Winter Wren (*Troglodytes hiemalis*)—Instead of being in "thick, coniferous woods," I found this nest in an upturned beech root in an open part of our deciduous woods. The tree had lodged after falling to an angle of about forty-five degrees, and the nest was stowed away in the earth among the rootlets. The beech was just off from an unused wood road that had grown up to jewel-weed (*Impatiens pallida*); and ferns filled the space up to the very edge of the gap from which the tree turned back, and formed a pretty fringe on top of the root. The May rains had turned the cavity beneath into a clear pool of water, and filled the swampy land back of the tree with similar pools where Red-eyed Vireos and Scarlet Tanagers came to bathe.—FLORENCE A. MERRIAM, *Locust Grove, Lewis County, New York.*

The Hudsonian Chickadee (*Parus hudsonicus*) in Vermont and Massachusetts.—While passing through a large larch swamp in Sutton, Vt., Aug. 16, 1889, I saw three or four Hudsonian Chickadees in company with a number of common Chickadees. A specimen shot proved to be a bird of the year. I do not remember to have seen any previous record of this species in the State of Vermont. From the date and from the nature of the locality it is probable that the birds bred there.

On October 18, 1889, I found two individuals of this species in a white

pine grove in Arlington, Mass. These also were among a flock of common Chickadees. The following day I shot one of them. The survivor remained in the same grove as late as the 22d. On the 17th of November of the same year I discovered another in a small grove composed of white pines, pitch pines and red cedars in Waverly, Mass. This bird remained in the same wood throughout the following winter. I saw it at frequent intervals up to April 5, 1890, when it disappeared together with a large flock of the common species—its associates throughout the winter. Very likely the Hudsonian came from the north with the Blackcaps in the autumn and returned with them in the spring (*cf.* Allen, Bull. Mus. Comp. Zoöl., II, 262). During its sojourn with us it was much less active and noisy than its Black-capped cousins and stuck more closely to the *evergreen* trees. While the Blackcaps made daily foraging excursions extending a quarter of a mile or more beyond the limits of the grove, the Hudsonian remained behind, silently awaiting their return. The peculiar tone of its voice affected even its simple *chip*, so that, after long acquaintance, I could trace the bird merely by this simple clue.

During a short trip with Mr. William Brewster to Mt. Graylock, Berkshire Co., Mass., Dec. 14-20, 1889, we found the Hudsonian Titmouse on four several days—three or four specimens in second-growth pasture spruces in the Notch (alt. 1600 ft.), and a flock, estimated at six to ten, in the 'Mountain Pasture' (alt. 2200 ft.).

Assuming that the Waverly bird was not the survivor of the pair seen in Arlington (the two localities are three and a half miles asunder), it makes the ninth, I believe, recorded from eastern Massachusetts. At least two unrecorded specimens have been killed in this neighborhood—one by Mr. S. F. Denton in Wellesley, Oct. 30, 1880, and one by Mr. Brewster in Belmont, Dec. 31, 1884. It has also been taken in Rhode Island and Connecticut. Instead of regarding this species as *accidental* in Massachusetts, as Mr. Allen does in his list of the birds of the State, I believe it to be a rare (perhaps irregular) bird of passage in the eastern part of the State, while probably considerable numbers descend in autumn along the spruce belt of the Green Mountains into northern Berkshire. That it *breeds* on Mt. Graylock I think improbable, as it was not found there in the summer by either Mr. Brewster or myself during several weeks spent in exploring the mountains in the years 1883, 1888, and 1889.—WALTER FAXON, *Museum of Comparative Zoology, Cambridge, Mass.*

Myadestes townsendii in Nebraska.—In looking over a small collection of mounted birds today (the property of Mr. L. Sessions, of Norfolk, Nebraska) I found a specimen of *Myadestes townsendii* which Mr. Sessions assures me he took in that vicinity in winter some years ago. Unless I am mistaken, this is rather out of its usual habitat and is worthy of record.—GEO. L. TOPPAN, *Chicago, Ill.*

The Long-billed Marsh Wren, Maryland Yellow-throat, Nashville Warbler and Great Blue Heron in Eastern Massachusetts in Winter.—On November 1, 1889, I found two Long-billed Marsh Wrens (*Cistothorus*

palustris), in the Fresh Pond Marshes, Cambridge, several weeks after the migration of this species was supposed to be over. One of them was in full song. I again came upon one of them, Nov. 8, near the same place, and, on examining the close cover formed by the dried and matted cat-tail flags, I began to suspect that a few of these birds might winter there. I again met with one on three successive days in December (Dec. 8, 9 and 10) in another part of the same marshes. These days were warm for the season, although the marshes had been frozen over, and the brave little bird was still singing with almost as much ardor as in spring. I next saw the Wren on January 2 and 3, 1890. Wondering whether its presence here in midwinter was an accident or no, I bethought myself of another similar cat-tail swamp in Arlington, near the Medford line, and a visit to this place on January 7 was rewarded by the finding of a Long-billed Marsh Wren there also. This bird I shot on the 13th of January. It proved to be a male—fat and in fine plumage. Its stomach was still filled with the remains of coleopterous larvæ. The bird was again seen in the Fresh Pond marshes on the morning of March 4, when my thermometer registered 4° F. and about a foot of snow lay on the ground.

I believe that the Long-billed Marsh Wren has not hitherto been found wintering in the East further north than the Carolinas, but the western race (*C. p. paludicola*) is said by Cooper (Geol. Surv. Cala. Orn., I, 75) to winter on the Pacific coast as far north as the Columbia River, in marshes overgrown with *tulé* (*Scirpus palustris*). Dr. Merrill (Auk, V, 362) also observed that a few passed the winter at Fort Klamath, Oregon, where the winters must be very severe. The rôle of the *tulé* is played in the East by the cat-tail flags (*Typha latifolia* and *T. angustifolia*).

On January 31, 1890, I shot a young male Maryland Yellowthroat (*Geothlypis trichas*), in the Fresh Pond swamps, Cambridge. When found he was in the company of White-throated, Swamp, Song, and Tree Sparrows, sticking closely to the tall weeds and dense shrubbery, under which he would run about on the ice, leaving the imprint of his delicate little feet on the thin coat of snow. He was in beautiful plumage, and plump, although the mercury within a week had fallen to 5° F. (probably lower in the swamp). Cf. Auk, I, 389.

On the same day (Jan. 31) I found a dead Nashville Warbler (*Helminthophila ruficapilla*), in Swampscott, Mass., with its neck broken and wedged between two twigs of a barberry bush—clearly the work of a Shrike. Mr. Brewster, who now has the bird's skin, was sure that it could not have been dead over two weeks. In the stomach were many land snail shells, 1.5 mm. long, belonging to the genus *Pupa*.

The Great Blue Heron (*Ardea herodias*) is a bird that rarely favors us with his presence in the winter months. It may be worth while, then, to chronicle the capture of one in the Arnold Arboretum, West Roxbury, Mass., either December 31, 1889, or January 1, 1890. A tub of water stocked with minnows served to keep him alive for five or six days, when he suddenly died either from cold or the enervating effects of imprisonment. His body afterwards came into my possession. A previous record

of this species in Massachusetts in winter will be found in Bull. Nuttall Orn. Club, VIII, 149.

The winter of 1889-90 was on the whole a very mild one, with but little snow, yet marked by great and sudden changes of temperature. The mercury stood at 5° F. or thereabouts on several nights, and on the 22d of February it fell to -7°. It is worthy of note that the Yellowthroat, Nashville Warbler and Blue Heron above-mentioned were all birds born during the preceding summer. It seems reasonable to suppose that many young birds annually get left behind when the autumnal migration occurs. In such an event they might survive the following winter if it should prove to be a mild one, while the stoutest heart among them would probably succumb to the rigors of a genuine 'old-fashioned' New England winter.—WALTER FAXON, *Museum of Comparative Zoölogy, Cambridge, Mass.*

Two Notes from South Carolina.—I shot a male *Dendroica cærulescens* on December 6, 1889, at Pinopolis, a few miles from Charleston. The weather was very cold at the time, and was the coldest of the winter of 1889-90, up to March. This species ordinarily passes through here as late as the middle of October.

On May 9, 1890, Mr. W. F. Colcock brought me an adult male Rose-breasted Grosbeak. It was shot in Saltkehatchie Swamp which is only a few miles from tide-water. A few days later another male was seen. This is the first record for lower South Carolina. It is only found in the mountainous portions of the State.—ARTHUR T. WAYNE, *Yemassee, S. C.*

CORRESPONDENCE.

A Query in regard to the Least Tern.

TO THE EDITORS OF THE AUK:—

Dear Sirs:—I wish to inquire about a peculiarity in the nesting habits of the Least Terns or, as they are commonly known here, the 'Little Sea Gulls.' They generally arrive here about May 6 (this year, May 13) to breed on the sand bars of the Mississippi River. If the water is off the bars they begin laying about the middle of June, and they continue to lay until August, for I have found their eggs as late as the middle of the latter month. I have generally found three or four, and often five, eggs in a nest. The nest is only a little hollow scooped out in the sand. In July, when most of them are laying and have eggs, if you walk over the bars they fly close to you and almost strike you with their wings, making a loud noise as if they were terribly annoyed by your presence and wished to drive you away.

Upon examining the eggs you will find perhaps half of them have a spot of water on them. How did it get there? Is it put there by the parent bird, and if so, for what purpose? I have questioned persons who were,

I thought, ornithologists of some authority, but got no satisfactory answers. One even wrote to me that perhaps it was dew formed on the eggs. Just think of dew, at midday, on the sand blazing under a semi-tropical sun, with not a particle of shade except when the sky is overcast! Cannot any of your readers throw some light on the subject?

The young are just the color of the sand. I have followed their trails through the sand for fifty or a hundred yards and found the little downy fellows with not a feather on them. How they escape the foxes, raccoons, and opossums, besides the numerous Hawks, is more than I can tell.

Yours respectfully,

GIDEON MABBETT.

Rodney, Mississippi.

NOTES AND NEWS.

WILLIAM KITCHEN PARKER, F. R. S., an Honorary Member of the American Ornithologists' Union died suddenly July 3, 1890, at Cardiff, Wales, at the age of 67 years. He was born at Dogsthorpe, near Peterborough. While still a youth he was apprenticed to a chemist. Later he studied medicine, settling at Pimlico in 1849. In natural history he was at first deeply interested in botany, and later on in the study of the Foraminifera, to which his earlier papers relate. In 1865 he began the publication of a series of valuable papers on the morphology of the skull in Vertebrates, beginning with the Ostrich, and including the Parrot, the Common Fowl, and representatives of the principal types of Vertebrates, from mammals to fishes. In 1868 he brought out his well-known wonderful, 'Monograph on the Structure and Development of the Shoulder-girdle and Sternum in the Vertebrata.' He was also the author of the article on the Anatomy of Birds in the last edition of the 'Encyclopædia Britannica.' His contributions to ornithology are mainly anatomical, and include among others the following: 'On the Osteology of *Balaniceps rex*,' 1860-62; 'On the Osteology of the Genera *Pterocles*, *Syrhaptes*, *Hemipodius*, and *Tinamus*,' 1862; 'On the Systematic Position of the Crested Screamer (*Palamedea chavaria*),' 1863-64; 'On the Skeleton of the *Archæopteryx* and on the relation of the Bird to the Reptile,' 1864; 'On the Osteology of the Kagu (*Rhinocetus jubatus*),' 1864; 'On the Structure and Development of the Skull in the Ostrich Tribe,' 1866; 'On the Osteology of Gallinaceous Birds and Tinamous,' 1866; 'On Ægithognathous Birds,' 1873-76; 'On the Development of the Wing in the Common Fowl,' 1888; 'On the Systematic Position of the Swifts,' 1889. In 1877 he summarized the results of his previous studies in a volume on 'The Morphology of the Skull.' He also left unpublished memoirs on the Morphology of the Anatidæ and the Alcidæ. In 1874 he was appointed Hunterian Professor of Comparative Anatomy at the Royal College of Surgeons. He was elected a Fellow of the Royal Society in 1865, and for a time was Pres-

ident of the Royal Microscopical Society. His skill as a draughtsman gave him great advantage in the illustration of his papers, which have contributed so eminently to the embryology and the morphological relations of the Vertebrata. He is said to have been an enthusiastic and entertaining lecturer; as a man, large-hearted, liberal-minded and modest; as a naturalist, philosophic to a high degree, and a devoted searcher after truth for its own sake. "Deprived of the advantages of a University education, and without any of those aids to learning which are afforded by the Science Schools of the present day, he owed all the knowledge which he acquired to an intense love of Nature prompting and developing a taste for original research, which, in spite of many obstacles, he assiduously cultivated to the last. Few men probably have commenced a scientific career under greater difficulties than he must have experienced; but his indomitable energy and perseverance, combined with natural talent, eventually placed him in the foremost rank of modern scientists."

THE EIGHTH CONGRESS of the American Ornithologists' Union will be held in Washington, D.C., beginning Tuesday, November 18, 1890. A large attendance of both Active and Associate Members is anticipated. Aside from the reports of Standing Committees and the usual business routine, important amendments to the By Laws will come up for consideration, and reports from Special Committees, including the Report of the Committee to devise and recommend a uniform system for measurements of birds. A good display of photographs of birds in life, including stereopticon illustrations, may be expected, if members will cordially co-operate with the Committee having the matter specially in charge. (See *Auk*, VII, p. 100.) Members, both Active and Associate, are requested to send the titles of papers they propose to present at the meeting to the Secretary, Mr. John H. Sage, Portland, Conn., some days in advance of the meeting, so that a programme of papers may be prepared. The utility of such a programme was well demonstrated at the last Congress, but its preparation will depend upon the necessary co-operation of members in promptly forwarding the titles of their papers.

THE SECOND INTERNATIONAL ORNITHOLOGICAL CONGRESS will be held at Budapest in May, 1891, the session beginning at Whitsuntide. The Hungarian Committee of the Congress has already issued a circular of information, inviting each Ornithological Society throughout the world to send a representative delegate, and each specialist in ornithology to be present personally. The Hungarian Committee, with their headquarters at the Hungarian National Museum, has already begun preparations for the reception of the Congress, under the direction of four Sub-Committees, as follows: I. Scientific Committee: President, Mr. Otto Herman, M. P.; Secretary, Dr. Julius Madarász. II. Economic and Financial Committee: President, Mr. Fridor Máday. III. Committee of Correspondence: President, Mr. John Xántus. IV. Exhibitions' Committee: (a) for the exhibition of mounted skins, President, Mr. John Frivaldszky, Curator of the Zoölogical Section of the Hungarian National Museum; (b) for the exhibition of living birds, President, Mr. Charles Serák, Director of the Zoölogical Gardens.

The exhibition will embrace the full Hungarian Ornis as far as known up to the day of opening. Abnormalities and interesting aberrations

will be grouped separately, as a special part of the exhibition. The results of the combined observations on bird migration made during the spring of 1890 will be graphically represented, and illustrated with specimens of the birds to which they relate. The observations made fall into two groups: (1) Those made along a diagonal line between the mouth of the River Drau and Lake Ferto, from the middle of February to the middle of May. (2) The combined observations of fifteen ornithologists, made at their respective places of residence during the same period. During the sitting of the Congress several excursions will be made to such parts of the country as present features of special ornithological interest. Count Béla Széchényi proposes a general fowl and bird shooting excursion on Lake Ferto, and another for Bustard shooting in the same vicinity.

The President of the Hungarian Committee is his Excellency the Minister of Agriculture, Count Andrew Bethlen. The Vice-Presidents are Mr. Em. Szalay, Counsellor of the Ministry of Public Instruction; Prof. Géza Entz, of the Polytechnic High School; and Mr. Charles Kammermeyer, the Mayor of Budapest. The Secretary is Mr. Stephen Chernel.

A detailed programme of the proceedings at the Congress will soon be arranged, giving further information.

THE REAL character of the European House Sparrow is at last attracting, at least in some quarters, the attention of legislators. While the bird has for some time been made an outlaw by legislative action in several of the States, and the offering of bounties for their wholesale destruction has been agitated in others, the Massachusetts Legislature, after an extended discussion of the matter, has passed an act entitled 'An act providing for the extermination of the English Sparrow in the Commonwealth.' The act provides as follows:

"*Section 1.* In all cities of the Commonwealth the officers having charge of the public buildings, and in all towns thereof such officers as the selectmen shall designate and appoint, shall take and enforce such reasonable means and use such appliances as in their judgment may be effective for the extermination of the English Sparrow therein; but in so doing poisons shall not be used.

"*Sect. 2.* Any person who shall wilfully resist the persons in any city or town charged with the execution of the provisions of this act, while engaged therein, or who shall knowingly interfere with the means used by them for said purpose, to render the same less effective, shall be punished by fine not exceeding twenty-five dollars for each such offense.

"*Sect. 3.* Nothing in this act shall be so construed as to allow an officer to enter on private property without consent of the owner or occupant thereof."

While extermination may not be effected, it seems possible to greatly lessen the numbers of the pest wherever systematic effort is made for their destruction. Even persistent removal of their nests is found not only to check their increase but to lead them to forsake favorite haunts.

AMONG the more important ornithological works in progress or projected may be mentioned the following as of special interest. As noticed in the present number of 'The Auk' (p. 379), the fifteenth volume of the British Museum Catalogue of Birds, by Dr. Sclater, devoted to the Tra-

cheophonine Passeres, has recently appeared. Volume XIII, by Mr. R. B. Sharpe, which includes the Ploceidæ, Sturnidæ, and the Pseudoscines, and completes the series of volumes on the Passeres (fifteen in number), has also just been issued. The Picariæ, it is expected, will occupy five volumes (Vol. XVI—XX), several of which are already in course of preparation. Mr. Salvin will treat the Hummingbirds, Swifts, and Goatsuckers; Mr. Hargitt will prepare the volume on the Woodpeckers; Mr. Sharpe will take the Anisodactylæ and Heterodactylæ, and Capt. Shelley the Zygodactylæ. Count Salvadori will prepare the volume on the Parrots.

Of monographs in course of publication mention may be made of Sharpe and Wyatt's Monograph of the Hirundinidæ, now approaching completion; Bartlett's Monograph of the Weaver-birds and Finches; Pelzeln and Madará-z's monograph of the Pipridæ or Manakins. Mr. Sharpe has in preparation a monograph of the Birds of Paradise, to be published by Sotheman & Co. of London. Mr. Seebohm has in press 'The Birds of the Japanese Empire,' to be issued in one royal octavo volume, and is preparing a monograph of the Thrushes, with colored illustrations of all the species. Mr. Dresser, it is announced, is preparing a supplementary volume to his 'Birds of Europe.'

THE READERS of 'The Auk' will be pleased to learn that Congress has appropriated \$25,000 for carrying on the work of the Division of Economic Ornithology and Mammalogy for the year beginning July 1, 1890, the appropriation being made specifically "for investigating the geographical distribution of animals and plants." In other words, the indefatigable Chief of the Division, Dr. C. Hart Merriam, may be congratulated on having at last realized his hope of establishing in effect a 'Biological Survey' of the United States. He has already five trained collectors in the field, and is himself at present in east central Idaho superintending the work of his assistants in this almost unexplored region.

During the past year he has established a serial publication under the title 'North American Fauna,' the first and second numbers of which are dated October, 1889, and the third, August, 1890. The first two relate entirely to mammals, the last contains two papers on birds and a general preliminary discussion of the life areas of North America, incidental to a special report on 'Results of a Biological Survey of the San Francisco Mountain Region and Desert of the Little Colorado in Arizona,' based on his explorations of last season. The 'North American Fauna' is intended to provide a medium of publication for the scientific results of the investigations of the Division, to consist of faunal papers and other technical matter of special interest to naturalists, while the more purely economic results will appear in bulletins and special reports. A fourth number of the 'Fauna,' we understand, is already in press.

MR. JONATHAN DWIGHT, JR., finding that he cannot devote his time to the proposed study of the genus *Junco*, (see *Auk*, Vol. VII, p. 219) desires that those who contemplated sending material for this purpose will withhold it until some future time.

INDEX TO VOLUME VII.

- ACANTHIS** hornemannii, 322.
 linaria, 114, 239.
Accipiter atricapillus, 231, 322.
 atricapillus striatulus, 53.
 cooperi, 36, 53, 81, 101, 112.
 velox, 53, 82, 112, 231, 309, 388.
Actitis macularia, 52, 83, 308, 321, 328, 332, 375.
Ægialitis meloda, 328.
 meloda circumcincta, 309.
 montana, 80.
 semipalmata, 309, 321, 374.
 vocifera, 52, 295, 333, 374, 375, 390.
 wilsonia, 374, 375.
Agelaius phœniceus, 114, 200, 288, 297, 341, 368.
Aix sponsa, 390.
Alauda arvensis, 388.
 rufa, 150.
Alca torda, 203.
Allen, J. A., 'To what extent is it Profitable to Recognize Geographical Forms among North American Birds?', 1; Description of a New Species of *Icterus* from Andros Island, Bahamas, 343; notice of his 'Notes on a collection of Birds from Quito, Ecuador,' 380; notice of his 'List of Birds collected in Bolivia by Dr. H. H. Rusby,' etc., 381; notice of his 'On *Cyclorhis viridis* (Vieill.) and its Allies' etc., 382; notice of his 'Descriptions of New Species of South American Birds,' etc., 384; notice of his 'Remarks on Individual and Seasonal Variation in a Large Series of *Elainea*,' etc., 385; notice of his 'On the Maximilian Types in the American Museum of Natural History,' 386.
Amazilia fuscicaudata, 333.
Amblycercus solitarius, 269.
American Ornithologists' Union, Seventh Congress of the, 66.
American Ornithologists' Union Check-List of North American Birds, Second Supplement to the, 60.
Ammodramus caudacutus, 212, 290.
 caudacutus nelsoni, 56, 212, 241.
 caudacutus subvirgatus, 56, 212, 387.
 henslowii, 213, 240, 241.
 leconteii, 76, 241.
 maritimus, 212, 289.
 maritimus peninsulæ, 66, 212.
 passerinus, 191.
 passerinus perpallidus, 191.
 peninsulæ, 66.
 princeps, 211.
 rostratus guttatus, 215.
 samuelis, 215.
 sandwichensis, 191.
 sandwichensis alaudinus, 191.
 sandwichensis savanna, 240, 311, 342.
 savannarum passerinus, 191, 240, 241, 311, 242.
 savannarum perpallidus, 191.
Ampelis cedrorum, 83, 86, 110, 112, 125, 217, 278, 279, 290, 297, 369.
 garrulus, 82.
Amphispiza belli nevadensis, 296, 297.
 bilineata, 27.
Anabazenops immaculatus, 382.
Anas aberti, 275.
 americana, 48, 50, 283, 320.
 boschas, 48, 50, 320, 389.
 carolinensis, 297, 320.
 crecca, 294.
 cyanoptera, 51.
 discors, 48, 51, 332, 393.

- Anas fulvigula*, 88, 204.
fulvigula maculosa, 61.
maculosa, 61, 88.
obscura, 394.
penelope, 88, 204, 283, 397.
strepera, 48, 50, 387.
wywilliana, 275.
Anous stolidus, 303, 306.
 Anthony, A. W., notice of his
 'New Birds from Lower Cali-
 fornia, Mexico,' 281.
Anthothreptes phænicotis, 354.
Anthreptes flavigaster, 355.
phænicotis, 354.
Anthus pensilvanicus, 114.
rufus, 266.
Antrostomus carolinensis, 38, 80,
 310.
vociferus, 38, 83, 114, 199,
 231, 279.
Aphelocoma californica, 192.
californica hypoleuca, 192.
californica obscura, 63, 281.
couchi, 192.
cyanotis, 192.
sieberii, 192.
sieberii arizonæ, 29, 48, 192.
sumichrasti, 192.
ultramarina, 192.
woodhousei, 192.
Aquila chrysaëtos, 37, 48, 53, 54.
Ara hyacinthina, 131.
Arachnorhaphis flavigastra, 355.
Arachnothera chrysogenys, 355.
flavigastra, 355.
flaviventris, 355.
Arbelorhina cærulea, 266.
Archibuteo ferrugineus, 83.
lagopus sancti-johannis, 322,
 389, 395.
Ardea candidissima, 221, 278, 395.
cærulea, 308, 327, 332, 374,
 387, 392.
egretta, 221, 230, 332.
herodias, 35, 277, 332, 337,
 388, 397, 408.
occidentalis, 222.
virescens, 35, 48, 308, 327,
 332, 374, 375.
wardi, 308.
Arenaria interpres, 309, 321, 395.
Arundinicola leucocephala, 133,
 269.
Asio accipitrinus, 322, 400.
wilsonianus, 86.
Atthis heloisæ, 215.
Atticora cyanoleuca montana, 382.
Auk, Great, 201, 203.
 Razor-billed, 203.
Auriparus flaviceps, 296, 297.
 Averill, C. K., Jr., The Evening
 Grosbeak in Connecticut, 211.
Aythya affinis, 373.
americana, 83.
 BAGG, E., see Ralph, W. L.
 Baldpate, 50, 283.
Bartramia longicauda, 332.
 Batchelder, C. F., Recording the
 Number of Birds Observed, 216;
 The Snow Goose (*Chen hyper-
 borea nivalis*) on the Coast of
 Maine, 284; Notes on Several
 Birds in the Catskill Mountains,
 295; *Helminthophila chrysoptera*
 in Manitoba, 404.
 Becard, Xantus's, 62.
 Bee-bird, 28.
 Bell, J. G., death of, 98.
Bellona exilis, 374, 375.
 Bendire, C. E., Notes on *Pipilo*
fuscus mesoleucus and *Pipilo aber-
 ti*, their Habits, Nests and Eggs,
 22; *Megascops asio maxwelliæ*,
 91; A Second Nest and Eggs of
Picicorvus columbianus taken in
 Colorado, 92.
 Bent, A. C., *Coccothraustes vesper-
 tina* in Taunton, Massachusetts,
 289.
 Bergtold, W. H., *Coccothraustes ves-
 pertina* in Erie County, N. Y.,
 209.
 Berlepsch, H. v., notice of his
 'Notes on some Neotropical
 Birds belonging to the United
 States National Museum, 275.
 Bird, Butcher, 290.
Cocoanut, 344.
Egg, 306.
Lettuce, 82.
 Bittern, American, 51.
 Blackbird, Brewer's, 257.
Crow, 114, 209.
Red-winged, 114, 288, 341,
 368.
Yellow-headed, 257.
 Blackcock, 390.
 Blanchard, R., notice of his 'De la
 Nomenclature des êtres organi-
 sés,' 73.
 Bluebird, 113, 120, 130, 200.
Mountain, 264.
Western, 264.
 Bobolink, 39, 120, 311.
 Bob-white, 35, 396.
 Bolles, F., Barred Owls in Cap-

- tivity, 101; Snake Skins in the Nests of *Myiarchus crinitus*, 288; Young Cedarbirds and Great-crested Flycatchers in Captivity, 290.
- Bonasa umbellus, 36, 389, 390-398. umbellus togata, 393.
- Booby, 307, 327.
- Botaurus lentiginosus, 51, 320.
- Brachyurus atricapillus, 357.
baudi, 356.
cæruleus, 356.
mülleri, 357.
sordidus, 357.
venustus, 356.
- Brant, 391, 392.
- Branta bernicla, 391, 392.
canadensis, 284, 391, 392, 395, 396.
- Brewster, W., the Little Brown Crane (*Grus canadensis*) in Rhode Island, 89; Capture of a Canada Jay (*Perisoreus canadensis*) near Cambridge, Massachusetts, 91; Bullock's Oriole in Maine, 92; Recent Occurrence of the Turkey Vulture in Eastern Massachusetts, 204; Capture of a Third Specimen of the Barn Owl in Massachusetts, 205; Food of Young Hummingbirds, 206; The Purple Grackle at Charleston, South Carolina, 208; The Acadian Sharp-tailed Sparrow and Scott's Seaside Sparrow on the Coast of South Carolina, 212; Summer Robin Roosts, 360; A New Subspecies of the Solitary Sandpiper, 377; Breeding of the Pileated Woodpecker in Worcester County, Massachusetts, 400.
- Brimley, C. S., The Nesting of the Yellow-throated Warbler at Raleigh, N. C., 323.
- Broadbill, 327.
- Brotagerys virescens 133.
- Bryant, W. E., notice of his 'Catalogue of the Birds of Lower California,' 281.
- Buarremon gutturalis, 334.
- Bubo virginianus, 81, 83, 84, 286, 322, 391, 395.
virginianus subarcticus, 48, 54.
- Buceros galeatus, 347.
- Bull-bat, 38.
- Bunting, Cow, 114, 368.
Indigo, 125, 243.
Painted, 81.
- Busarellus nigricollis, 133.
- Buteo borealis, 36, 82, 84, 85, 205, 395.
borealis calurus, 53, 225, 297.
borealis harlani, 205, 285.
brachyurus, 56, 64, 90.
fuliginosus, 57, 64, 90.
latissimus, 101, 333, 395.
lineatus, 84, 392.
lineatus alleni, 309, 339.
swainsoni, 333, 390.
- Buzzard, 36.
Turkey, 36, 81, 83, 390, 392.
- CACOPITTA atrigularis, 350.
- Cactornis brevirostris, 273.
- Cahoon, J. C., Seaside Sparrows at Monomoy Island, Cape Cod, 289.
- Calamospiza bicolor, 215.
melanocorys, 27, 80, 215.
- Calcarius lapponicus, 239, 322, 395.
pictus, 240.
- Calichelidon cyaneoviridis, 265, 312.
- Calidris arenaria, 294, 308, 321, 374.
- Callipepla californica, 85.
gambeli, 48, 52, 297, 393.
squamata, 89, 216.
- Calliste boliviana, 267.
cayana, 267.
mexicana, 267.
- Callocalia fuciphaga, 358.
linchii, 358.
- Callothrux robustus, 334.
- Calopteryx ornatus, 270.
- Camarhynchus pauper, 273.
townsendi, 273.
- Campolaimus labradorius, 199.
- Campylorhynchus affinis, 215.
brunneicapillus, 297.
hypostictus, 137.
- Cantwell, G. C., Shrikes of Minnesota, 213.
- Cardellina rubrifrons, 50, 261.
- Cardinal, 125, 243.
- Cardinalis cardinalis, 82, 125, 200, 243, 395.
cardinalis coccineus, 191.
cardinalis igneus, 191, 215.
igneus, 215.
virginianus, 191.
- Carpodacus cassini, 49, 252, 258.
mexicanus frontalis, 48, 296, 297.
purpureus, 110, 239, 394.
- Cassicus persicus, 132, 269.
- Cassidix oryzivora, 269.
- Catbird, 110, 115, 129, 314.
- Catharista atrata, 36, 333.
- Cathartes aura, 36, 53, 81, 83, 84, 204, 223, 333, 390, 392.

- Catherpes mexicanus punctulatus, 48, 296.
 Ceblepyris culminata, 352.
 Cedarbird, 86, 110, 112, 290, 369.
 Centurus aurifrons, 215.
 Ceophlæus pileatus, 37, 81, 109, 339, 389, 400.
 Cepphus grylle, 283.
 Cercomacra hypoleuca, 380.
 Certhia familiaris americana, 83, 232.
 familiaris montana, 49, 262.
 jugularis, 354.
 trigonostigma, 354.
 Certhidea cinerascens, 273.
 Certhiola finschi, 274.
 Ceryle alcyon, 37, 111, 223, 310, 322, 328, 388.
 cabanisi, 333.
 Chadbourne, A. P., Song of the Female Butcher Bird, 290.
 Chætura pelagica, 38, 84, 111, 279, 391, 392.
 Chalcoparia singalensis, 354.
 Chapman, F. M., on the Eastern Forms of *Geothlypis trichas*, 9; on the Winter Distribution of the Bobolink (*Dolichonyx oryzivorus*) with Remarks on its Routes of Migration, 39; Note on *Cyanocitta stelleri litoralis* Maynard, 91; on the Changes of Plumage in the Bobolink (*Dolichonyx oryzivorus*), 120; notice of his paper on the genus *Xiphorhynchus*, 274; The Song of *Helminthophila leucobronchialis*, 291; see also Riker, C. B.
 Chaptia maylayensis, 351.
 Charadrius dominicus, 321, 332, 389, 397.
 squatarola, 230, 321.
 Charitonetta albeola, 320.
 Chat, Yellow-breasted, 22, 129.
 Chelidon erythrogaster, 110, 266, 279, 312, 335.
 Chen hyperborea, 284.
 hyperborea nivalis, 284.
 Cherrie, G. K., Notes on the Nesting Habits of Several Birds at San José, Costa Rica, 233; Notes on Habits and Nesting of *Vireo flavoviridis* (Cass.), 329; North American Birds found at San José, Costa Rica, with Notes on their Migration, 331.
 Chewink, 81, 83.
 Chickadee, 107, 108, 113, 114.
 Black-capped, 408.
 Chickadee, Carolina, 119, 130.
 Hudsonian, 291, 407.
 Mountain, 263.
 Chiroxiphia pareola boliviana, 382.
 Chlorophanes spiza caeruleus, 381.
 spiza guatemalensis, 381.
 Chloropsis gampsorhynchus, 349.
 zosterops, 349.
 Chondestes grammacus, 76, 191, 241.
 grammacus strigatus, 191, 259, 296.
 Chordeiles texensis, 333.
 virginianus, 38, 322.
 virginianus chapmani, 305, 310.
 virginianus henryi, 48, 254.
 Chuck-will's-widow, 38, 80, 310.
 Cinclodes rivularis, 382.
 Cinnyris jugularis, 354.
 Circus hudsonius, 82, 86, 296, 297, 322, 333, 395.
 Cistothorus marianæ, 117.
 palustris, 83, 117, 291, 408.
 palustris paludicola, 297, 409.
 stellaris, 56, 117, 291.
 Cittocinclá stricklandi, 348.
 Clangula hyemalis, 320.
 Clark, H. L., *Coccythraustes vespertina* at Amherst, Massachusetts, 210.
 Clarke, W. E., On a Collection of Birds from Fort Churchill, Hudson's Bay, 319.
 Clivicola riparia, 96.
 Coccythraustes vespertina, 49, 80, 93, 209, 210, 211, 230, 238, 247-249, 289, 395-97.
 vespertina montana, 246, 257, 258.
 Coccyzus americanus, 37, 310.
 erythrophthalmus, 333.
 minor, 375.
 Cœreba cærulea, 381, 382.
 cærulea microrhyncha, 382.
 chloropyga, 266.
 dominicensis, 374.
 martinicana, 274.
 portoricensis, 374, 375.
 Colaptes auratus, 38, 81, 82, 107, 109, 223, 322, 391.
 cafer, 48, 80, 254, 297.
 Colinus virginianus, 35, 85, 390, 392, 394-396, 398.
 virginianus floridanus, 339.
 Columba fasciata, 52.
 leucocephala, 375.
 montana, 62.

- Columbīgallina passerina, 81, 84,
 333, 374, 375.
 Colymbus auritus, 320.
 holbælli, 213.
 nigricollis californicus, 48,
 50.
 Comeau, N. A., Additional Notes on
 the Probable Breeding of *Saxi-*
cola ananthe near Godbout,
 Province of Quebec, Canada,
 294.
 Compsorthypis americana, 18, 101,
 127, 217, 313, 374, 375.
 Conopophaga rusbyi, 382.
 Contopus borealis, 48, 255, 334.
 pertenax, 215, 256.
 richardsonii, 49, 256, 334.
 virens, 39, 328, 334.
 Conurus carolinensis, 388.
 Cooke, W. W., Evening Gros-
 beaks in Vermont, 210.
 Cooper, J. G., Note on Pacific Coast
 Birds, 214.
 Coot, American, 52.
 Copsychus adamsi, 346, 348.
 seychellarum, 348.
 stricklandi, 348.
 Coracias sumatranus, 358.
 Cormorant, Double-crested, 55.
 Florida, 222, 223, 307.
 Pallas's 276.
 Corvus americanus, 49, 82, 83, 84,
 112, 124, 255, 256, 328, 329,
 391, 292, 397.
 americanus floridanus, 311,
 341.
 corax principalis, 124.
 corax sinuatus, 256, 296, 297.
 cryptoleucus, 256.
 javanensis, 355.
 ossifragus, 81, 223, 329.
 Cory, C. B., Eggs of the Florida
 Dusky Duck, 204; On a Collection
 of Birds made during the winter
 of 1889-90. by Cyrus S. Winch, in
 the Islands of St. Thomas,
 Tortola, Anegada, and Virgin
 Gorda, West Indies, 373.
 Corydon sumatranus, 358.
 Coues, W. P., *Passer domesticus* in
 Cape Breton, 212.
 Cowbird, 81, 329, 390.
 Dwarf, 257.
 Crane, 35.
 Little Brown, 89.
 Sandhill, 51, 89, 199.
 Whooping, 89.
 Creagrus furcatus, 273.
 Creeper, Black-and-white, 111, 335.
 Brown, 83.
 Creeper, Rocky Mountain, 262.
 Criniger phæocephalus, 349.
 Crossbill, American, 239.
 Mexican, 258.
 Red, 80.
 White-winged, 112, 239.
 Crotophaga ani, 374, 375.
 sulcirostris, 333.
 Crow, 82, 83, 84, 112, 255, 391, 392,
 397.
 American, 124, 256, 328.
 Carion, 36.
 Fish, 81, 329.
 Florida, 311, 341.
 Crymophilus fulicarius, 204, 230,
 321.
 Cuckoo, Black-billed, 111.
 Yellow-billed, 37, 310.
 Cyanocephalus cyanocephalus, 49,
 257.
 Cyanocitta cristata, 82, 112, 114,
 124, 200.
 cristata florincola, 305.
 stelleri, 91.
 stelleri frontalis, 91.
 stelleri litoralis, 65, 91.
 stelleri macrolopha, 49, 215,
 244, 256.
 Cyanospiza versicolor, 215.
 Cyanura macrolopha, 215.
 Cyclorhis albiventris, 383, 384.
 altirostris, 383.
 atirostris, 383.
 cearensis, 383, 384.
 flavipectus, 383, 384.
 flavipectus subflavescens, 383.
 flavipectus trinitatis, 383.
 flaviventris, 383, 384.
 flaviventris yucatanensis, 383.
 guianensis, 266, 383, 384.
 insularis, 383.
 ochrocephala, 383.
 viridis, 383, 384.
 wiedii, 383.
 Cymbirhynchus nasutus, 357.
 Cymborhynchus macrorhynchus,
 357.
 Cyphorinus griseolateralis, 137.
 Cypseloides niger, 333.
 Cypselus comatus, 358.
 Cyrtonyx montezumæ, 48, 52.
 DACNIS cayana, 266.
 egregia æquatorialis, 381.
 plumbea, 266.
 Dafila acuta, 48, 51.
 bahamensis, 373.
 Dendragapus canadensis, 321, 397.
 obscurus, 48, 52.

- Dendragapus obscurus fuliginosus*, 392.
Dendrochelidon comata, 358.
 longipennis, 359.
Dendrocolaptes chunchotambo, 176.
 eytoni, 165, 182.
 guttatus, 164, 170, 185.
 obsoletus, 164, 189.
 ocellatus, 164, 170.
 susurrans, 164, 171.
 tenuirostris, 164, 177.
Dendrocopus pardalotus, 164, 173.
Dendroica æstiva, 18, 81, 82, 127, 217, 322, 335.
 æstiva sonorana, 48.
 auduboni, 49, 261, 297.
 blackburniæ, 20, 127, 223, 231, 336.
 cærulea, 19, 291, 313.
 cærulescens, 18, 217, 231, 313, 406, 410.
 chrysopareia, 215.
 coronata, 19, 96, 223, 229, 313, 322, 336, 342.
 discolor, 21, 107, 128, 217, 314, 325, 375.
 dominica, 20, 97, 305, 313, 323.
 dominica albilora, 20, 127, 305, 313.
 graciæ, 50, 261.
 maculosa, 19, 111, 217.
 nigrescens, 48.
 olivacea, 49, 261.
 palmarum, 20, 223, 229, 232, 305, 314, 322.
 palmarum hypochrysea, 20, 223, 229, 305, 314.
 pensylvanica, 111, 127, 217, 336, 404-407.
 ruficapilla, 374, 375.
 striata, 19, 112, 217, 313, 322.
 tigrina, 18, 313.
 vigorsii, 20, 128, 217, 232, 323.
 virens, 20, 33, 34, 111, 128, 217, 223, 314.
Dendrophila corallipes, 351.
Dendrornis, 165.
 albirostris, 161, 179.
 albisquama, 161, 172.
 chunchotambo, 161, 164, 167, 169-171, 175, 177.
 d'orbignyianus, 164, 167, 168, 182-184.
 eburneirostris, 179.
 elegans, 163, 165, 167, 177, 207, 208.
 erythropygia, 165, 166, 187-189.
*Dendrornis erythropygia æquat-
 rialis*, 165, 168, 187.
 eytoni, 165, 167, 168, 182.
 flavigaster, 161, 164-167, 178-181.
 fraterculus, 161, 165, 171, 172.
 guttata, 166, 167, 168, 183-186.
 guttatoides, 161, 164, 166, 168, 186, 208.
 kieneri, 163, 165, 167, 169.
 lacrymosa, 161, 165-167, 181.
 lawrencei, 161, 165, 174, 175.
 lawrencei costaricensis, 161, 165, 174, 175.
 mentalis, 161, 165, 179.
 multiguttata, 161, 164, 166, 167, 175, 176.
 nana, 161, 163, 165-167, 174.
 obsoletus, 163, 167, 168, 189.
 ocellata, 163, 164, 167, 169-171, 175, 176, 177, 207, 208.
 palliatæ, 163, 165-167, 169, 176, 178.
 pardalotus, 163, 164, 166, 167, 173, 174, 184, 185.
 peruana, 161.
 peruviana, 176.
 polysticta, 163, 165-167, 182.
 punctigula, 161, 165, 166, 168, 188, 189.
 rostri-pallens, 161, 165, 166, 168, 183-186.
 spixi, 163, 167, 177, 207, 208.
 susurrans, 163-167, 171-174.
 tenuirostris, 164.
 triangularis, 161, 164, 167, 168, 187, 188.
 weddelli, 161, 165, 167-169, 176, 177, 208.
Dicæum trigonostigma, 354.
Dickcissel, 243.
Diglossa sittoides, 381.
Dionne, C. E., notice of his 'Catalogue des Oiseaux de la Province de Québec,' etc., 387.
Dissemurus brachyphorus, 351.
 paradiseus, 351.
Diver, Red-throated, 88.
Doan, W. D., notice of his 'Birds of West Virginia', 197.
Dolichonyx oryzivorus, 39-45, 120, 199, 311, 341.
 oryzivorus albinucha, 41.
Donacobius atricapillus, 137.
Dove, 36.
 Ground, 81, 84.
 Mourning, 36, 53, 82.
Dowitcher, 400.
Drymocataphus capistratoides, 350.

- Dryocotaphus nigricapitata*, 350.
Dryobates pubescens, 37, 109.
 pubescens fumidus, 65.
 pubescens oreæcus, 48, 62, 252.
 scalaris bairdi, 48, 251, 297.
 villosus, 37, 109, 395.
 villosus audubonii, 37.
 villosus hyloscopus, 48, 251.
 villosus leucomelas, 322.
Dryocopus eburneiostris, 164, 178.
 flavigaster, 179.
 Duck, Florida, 88.
 Florida Dusky, 204.
 Golden-eyed, 396.
 King, 397.
 King Eider, 88.
 Mottled, 61, 88.
 Ruddy, 51.
 Sea, 318.
 Shoal, 318.
 Velvet, 318.
 Wood, 390.
 Dunlin, 321.
 Dwight, J., Jr., The Horned Larks of North America, 138.
 EAGLE, 112.
 Bald, 37, 53, 85.
 Golden, 37, 53, 54.
 Sparrow, 37.
 Eames, E. H., Food and Habits of the Ruby-throated Hummingbird, 286.
Ectopistes migratorius, 199, 216, 284, 322, 389, 393-395.
Edolius brachyphorus, 351.
 Egret, White, 221.
 Eider, American, 315.
 King, 284.
 Pacific, 316.
Elænea cinerascens, 386.
 martinica, 374, 375.
 pagana, 235, 370, 385, 386.
 pagana albiceps, 385, 386.
 pagana martinica, 386.
 pagana subpagana, 386.
Elanoides forficatus, 36.
 Elliot, D. G., A Study of the Genus *Dendroornis* and its Species, 160; Remarks on Certain Species of *Dendroornis*, 207; A List of Birds from Northeast Borneo, with Field Notes by Mr. C. F. Adams, 346.
 Elliott, H. W., *Quiscalus quiscula æneus* Killing and Catching Goldfish, 208.
Embernagra chlorura, 193.
 platensis, 193.
Empidonax acadicus, 37, 81, 84, 334.
 bolivianus, 382.
 difficilis, 49, 256.
 flaviventris, 334.
 griseus, 62.
 lawrencei, 384.
 obscurus, 65.
 pusillus, 256.
 pusillus traillii, 81, 84.
 wrightii, 65.
Empidonomus varius, 270.
Enicornis striata, 382.
Ereunetes occidentalis, 227.
 pusillus, 321, 374.
Eriocnemis aurea, 315.
 cupreiventris, 315.
Erismatura rubida, 48, 51.
Euetheia bicolor, 374, 375.
Eugenes fulgens, 402.
Eulampis holosericeus, 374, 375.
Euphonia chlorotica, 267.
 crassirostris, 382.
 elegantissima, 334.
 laniirostris, 382.
 violacea, 266.
Eurylaimus javanicus, 357.
 ochromelas, 357.
Euscarthmus ochropterus, 384.
 pelzelni, 384.
 striaticollis, 270.
 FALCO caribbæarum, 374.
 columbarius, 231, 310, 322, 375.
 dominicensis, 374, 375.
 femorialis, 216.
 mexicanus, 53.
 peregrinus anatum, 38, 54, 309, 322, 375.
 rusticolus gyrfalco, 322.
 sparverius, 37, 54, 223, 297, 310, 333, 339.
 Falcon, Prairie, 53.
 Faxon, W., The Hudsonian Chickadee (*Parus hudsonicus*) in Vermont and Massachusetts, 407; The Long-billed Marsh Wren, Maryland Yellowthroat, Nashville Warbler, and Great Blue Heron in Eastern Massachusetts in Winter, 408.
 Finch, Bachman's, 82.
 Cassin's Purple, 252, 258.
 Grass, 111.
 Purple, 110, 239.
 Fisher, A. K., Capture of a Specimen of the Orange-crowned Warbler (*Helminthophila celata*) in the Vicinity of Washington, D.C., 96; The Appearance of the

- Razor-billed Auk (*Alca torda*)
on the Coast of North Carolina,
203; A Correction, 400.
- Flamingo, 221.
- Flicker, 38, 109, 391.
Red-shafted, 80, 254.
Yellow-shafted, 81.
- Fluvicola albiventris, 269.
- Flycatcher, Acadian, 39, 81, 84.
Coues's, 256.
Crested, 39.
Gray, 62.
Great Crested, 111, 113, 288,
290.
Little, 256.
Olive-sided, 255.
Scissor-tailed, 80.
Traill's, 81, 84.
Western, 256.
- Fly-up-the-creek, 327.
- Forbush, E. H., Evening Gros-
beaks in Hampden County, Mas-
sachusetts, 210.
- Formicarius analis, 382.
cayennensis, 380.
- Formicivora griseigula, 385.
- Foster, L. S., The Widgeon (*Anas
penelope*) near Baltimore, Md.,
283.
- Francolinus vulgaris, 397.
- Fregata aquila, 281, 307.
- Fringilla chlorura, 193.
- Fulica americana, 52.
- GADWALL, 50.
- Galbalcyrhynchus leucotis, 382.
- Galbula albirostris chalcophala,
381.
- Galeoscoptes carolinensis, 85, 110,
115, 129, 223, 295, 314, 393.
- Gallinago delicata, 321, 332, 388,
389, 390, 396, 398.
- Gallinula galeata, 308.
- Gallinule, Florida, 308.
- Gelochelidon nilotica, 327.
- Geocichla interpres, 348.
- Geococcyx californianus, 48, 80.
- Geositta longipennis, 274.
- Geospiza conirostris, 273.
media, 273.
- Geothlypis agilis, 21.
formosa, 21, 34, 81, 129, 314,
336.
macgillivrayi, 48, 336.
philadelphia, 295, 336.
trichas, 9-14, 21, 66, 76, 96,
129, 314, 336, 408.
trichas ignota, 11-13, 21, 63,
66, 223, 305.
trichas occidentalis, 10, 48,
76.
- Geothlypis, trichas roscoe, 9-14, 66.
- Geotrygon martinica, 90.
montana, 62.
- Glaucidium gnoma, 48, 54.
phalaenoides, 333.
- Glaucionetta clangula americana,
396.
- Glaucomyias thalassinioides, 353.
thalassoides, 353.
- Glaucopsis aterrimus, 356.
- Gnatcatcher, 324.
Blue-gray, 81, 119, 130, 314.
Western, 64.
- Godman, F. D., see Salvin, O.
- Goldana capistratoides, 350.
- Goldfinch, American, 80, 111, 124,
239.
Arkansas, 258.
- Goose, Snow, 284.
Wild, 284, 391, 395.
- Goshawk, Western, 53.
- Goss, N. S., The Mottled Duck
in Kansas, 88; *Phalacroptilus
nuttalli nitidus* Breeding in Kan-
sas. Is it a valid Race or a Color
Phase of *P. nuttalli*?, 286.
- Grackle, Boat-tailed, 341.
Bronzed, 368.
Florida, 341.
Purple, 208.
- Gracula javanensis, 355.
- Grallaria nigro-lineata, 380.
- Grebe, American Eared, 50.
Holboell's, 213.
Thick-billed, 86.
- Grosbeak, Black-headed, 244, 260.
Blue, 80, 82, 125.
Cardinal, 82, 84.
Evening, 80, 93, 209, 210,
211, 238, 246, 289, 395-397.
Pine, 211.
Rose-breasted, 111, 243, 410.
Western Evening, 258.
- Grouse, Canada, 397.
Dusky, 52.
Ruffed, 36, 390-394, 398.
- Grus americana, 89.
canadensis, 86, 394.
mexicana, 51, 89, 199.
- Guara alba, 222.
- Guillemot, Black, 283.
- Guiraca caerulea, 80, 82, 125.
cyanea, 268.
- Gull, Black-headed, 327.
Herring, 306.
Laughing, 306, 326, 328.
Little Sea, 410.
Summer, 327.
- Gurney, J. H., death of, 299.
- Gymnomystax melanicterus, 269.

- Gymnostinops yuracarium*, 269.
- HABIA* ludoviciana, 111, 243, 334, 381, 410.
 melanocephala, 49, 244, 260.
- Habrura minima*, 384.
 pectoralis, 384.
 superciliaris, 384.
- Hadrostomus albiventris*, 62.
- Hæmatopus galapagensis*, 273.
- Haliæetus leucocephalus*, 37, 48, 53, 85, 112, 223.
- Harpactes diardi*, 359.
 duvauceli, 359.
 kasumba, 359.
- Harporthynchus cinereus*, 215.
 crissalis, 297.
 lecontei, 296, 297.
 rufus, 107, 110, 115, 130, 200, 295, 369, 393.
- Hasbrouck, E. M., *Picoides arcticus* in Central New York, 206; *Dendroica cærulea* again in the District of Columbia, 291; *Cistothorus stellaris* at Washington, D. C., 291.
- Hawk, American Sparrow, 37, 54, 310.
 Blue-tailed, 36.
 Broad-winged, 101.
 Chicken, 36.
 Cooper's, 36, 53, 81, 101, 112.
 Duck, 37, 54, 309.
 Ferrugineous Rough-legged, 83.
 Fish, 81, 326.
 Florida Red-shouldered, 309, 339.
 Harlan's, 205, 285.
 Little Black, 64.
 Marsh, 82, 86.
 Pigeon, 310.
 Red-tailed, 36, 53, 82, 85, 205.
 Sharp-shinned, 53, 82, 309.
 Sparrow, 339.
 Western Red-tailed, 255.
- Helinaia swainsonii*, 16, 84, 90, 313, 403.
- Helminthophaga virginia*, 215.
- Helminthophila bachmani*, 16, 313.
 celata, 18, 96, 290.
 chrysoptera, 17, 127, 217, 335, 404.
 leucobronchialis, 291.
 lucia, 48.
 peregrina, 18, 335.
 pinus, 17, 214, 313.
 ruficapilla, 107, 217, 408.
 virginia, 215.
- Helmitherus vermivorus*, 16, 34, 127, 313, 335.
- Hemipus obscurus*, 352.
- Hen, Mud, 328.
 Wood, 37.
- Heron, Black-crowned Night, 51, 308, 327.
 Blue, 388.
 Great Blue, 35, 337, 408.
 Green, 35, 308, 327.
 Little Blue, 308, 327.
 Snowy, 221, 395.
 Ward's, 308.
 Yellow-crowned Night, 308.
- Himantopus mexicanus*, 81, 338.
- Hirundo fuciphaga*, 358.
 javanica, 354.
 longipennis, 359.
- Hitchcock, F. H., The Philadelphia Vireo in Vermont, 403; Capture of a Second Specimen of the Hooded Warbler in Massachusetts, 407.
- Hummingbird, 114.
 Black-chinned, 255.
 Broad-tailed, 54, 255.
 Rivoli, 403.
 Ruby-throated, 38, 84, 206, 286, 310.
- Hylactes castaneus*, 382.
- Hyloterpe grisola*, 351.
- Hypothymis azurea*, 353.
 occipitalis, 353.
- IBIS, White, 222.
 White-faced Glossy, 51.
- Icteria virens*, 22, 129, 191, 199, 337.
 virens longicauda, 48, 191.
- Icterus bullocki*, 92.
 croconotus, 267.
 cucullatus, 191.
 cucullatus igneus, 191.
 cucullatus nelsoni, 191.
 galbula, 80, 85, 114, 199, 200, 201, 334, 368.
 northropi, 344.
 spurius, 80, 81, 84, 230, 311, 334.
- Ictinia mississippiensis*, 84, 85.
- Indigo-bird, 113.
- Ionornis martinica*, 394.
- Irena crinigera*, 349.
 turcosa, 349.
- Ixos phæocephalus*, 349.
- JACKSNIFE, 390.
- Jay, Arizona, 29.
 Belding's, 63.
 Blue, 82, 112, 114, 124, 200.
 Canada, 91, 397.
 Gray, 389.
 Long-crested, 244, 256.
 Pifion, 257.

- Jay, Rocky Mountain, 256.
 Joe-ree, 125.
 Junco *alticola*, 193.
 cinereus dorsalis, 48, 252, 259.
 hyemalis, 82, 96, 110, 111,
 112, 242, 322, 397.
 hyemalis oregonus, 297.
 hyemalis shufeldti, 289.
 oregonus shufeldti, 244.
 ridgwayi, 243.
 townsendi, 63, 281.
 vulcani, 193.
 Junco, 96, 110, 111, 112.
 Red-backed, 48, 252, 259.
 Slate-colored, 242.
 Townsend's, 63.
 KILLDEER, 52, 295.
 Kimball, R. E., Capture of the
 Hudsonian Chickadee in Wor-
 cester County, Mass., 291.
 Kingbird, 38, 111, 311, 328, 340, 368.
 Arkansas, 255.
 Cassin's, 255.
 Gray, 311.
 Kingfisher, 111, 388.
 Belted, 37, 310, 328.
 Kinglet, 113.
 Ruby-crowned, 97, 119, 263,
 292.
 Kite, Mississippi, 85.
 Swallow-tailed, 36.
 Kittocincla *stricklandi*, 348.
 LAGOPUS *lagopus*, 321.
 lagopus alleni, 390.
 rupestris, 321.
 Lalage *culminata*, 352.
 Lampornis *elliotti*, 374.
 Lamprospiza *melanoleuca*, 267.
 Lanius *atricapillus*, 267.
 Lanius *borealis*, 82, 290, 322, 390.
 coronatus, 352.
 ludovicianus, 14, 213, 342.
 ludovicianus excubitorides,
 48, 213, 390.
 ludovicianus gambeli, 297.
 Lantz, D. E., Habits of the Barred
 Owl, 286.
 Lark, Desert Horned, 146.
 Dusky Horned, 153.
 Horned, 141.
 Mexican Horned, 149.
 Pallid Horned, 142.
 Prairie Horned, 86, 144.
 Ruddy Horned, 150.
 Scorched Horned, 148, 256.
 Shore, 85.
 Streaked Horned, 151.
 Texan Horned, 145.
 Larus *argentatus smithsonianus*,
 306.
 atricilla, 80, 306, 326, 327, 328.
 brachyrhynchus, 387.
 philadelphia, 82, 320.
 Lathria *cinerea*, 382.
 plumbea, 382.
 Lawrence, R. B., The Red Phala-
 rope on Lake Erie, 204.
 Legatus *albicollis*, 270.
 Leistes *guianensis*, 269.
 Leptasthenura *fuliginiceps bolivi-*
 ana, 382.
 fuscescens, 382.
 Leptoptila *erythrothorax*, 133.
 Lettuce-bird, 124.
 Leucocerca *perlata*, 353.
 Leucosticte *australis*, 49, 258.
 Lewis, S., The Red-bellied Wood-
 pecker in Northwestern New Jer-
 sey, 206.
 Limosa *fedoa*, 393.
 hæmastica, 321.
 Linnæan Society of New York,
 notice of its 'Proceedings,' 387.
 Liosceles *erithacus*, 380.
 Logcock, 109.
 Longspur, Lapland, 239.
 Painted, 240.
 Smith's 240.
 Loomis, L. M., Observations on
 some of the Summer Birds of the
 Mountain Portions of Pickens
 County, South Carolina, 30, 124.
 Loon, 85, 389, 393, 397.
 Lophocitta *coronata*, 352.
 Loxia *curvirostra americana*, 80.
 curvirostra minor, 228, 239.
 curvirostra stricklandi, 49,
 258.
 leucoptera, 112, 239, 322.
 Lucas, F. A., The Great Auk in the
 National Museum, 203; notice of
 his 'Notes on the Osteology of
 the Thrushes, Miminae, and
 Wrens,' 277; see also Stejneger, L.
 MABBETT, G., A Query in regard
 to the Least Tern, 410.
 Macaw, Great Blue, 131.
 Mackay, G. H., Notes on Several
 Species of Water Birds at Muske-
 get Island, Massachusetts, 294;
 Somateria dresseri, the American
 Eider, 315.
 Macrorhamphus *griseus*, 321, 393,
 400.
 scolopaceus, 374.
 Magpie, Black-billed, 80.
 Mallard, 50, 389.

- Man-o'-war-bird, 307.
 Margarops fuscatus, 374, 375.
 Martin, Bank, 125.
 Black, 125.
 Creek, 125.
 Purple, 125, 260.
 Western, 63.
 Maynard, C. J., notice of his 'Eggs of North American Birds,' 280.
 Meadowlark, 82, 84.
 Western, 199, 257.
 Mearns, E. A., Observations on the Avifauna of Portions of Arizona, 45; Addendum to 'A List of the Birds of the Hudson Highlands, with Annotations,' 55; Capture of the Widgeon (*Anas penelope*) on the James River, Virginia, 88; New York City Owls, 90; Another Capture of the Widgeon (*Anas penelope*) on the Atlantic Coast, 204; Descriptions of a New Species and Three New Subspecies of Birds from Arizona, 243; Observations on the Avifauna of Portions of Arizona, 251.
 Mecocerculus uropygialis, 384.
 Megalestris skua, 387.
 Magarhynchus pitangua, 270, 333.
 Megascops asio, 83.
 asio bendirei, 81.
 asio maxwelliæ, 80, 91.
 Melanerpes aurifrons, 215, 401.
 carolinus, 38, 206, 223, 339, 402.
 erythrocephalus, 38, 83, 84, 85, 231, 394.
 formicivorus, 250, 251.
 formicivorus aculeatus, 249-251, 253.
 formicivorus angustifrons, 215, 250, 251.
 formicivorus bairdi, 48, 249-251, 395.
 torquatus, 48, 254.
 Meleagris gallopavo, 36, 376, 390, 391, 393, 394, 396, 397.
 gallopavo mexicana, 49, 52, 216, 376, 377.
 gallopavo osceola, 376.
 mexicana, 216.
 Melopelia leucoptera, 216.
 Melospiza fasciata, 199, 242, 329, 389, 409.
 fasciata fallax, 27.
 fasciata heermanni, 191.
 fasciata mexicana, 191.
 fasciata montana, 191.
 fasciata samuelis, 215.
 Melospiza georgiana, 96, 242, 409.
 lincoln, 242.
 lincolni striata, 63.
 Menzbier, M. A., notice of his 'Ornithologie du Turkestan et des Pays adjacents,' 77.
 Merganser americanus, 48, 50.
 serrator, 320.
 Merganser, American, 50.
 Merriam, F. A., Was he a Philanthropist?, 404; Interesting Nesting Site of a Winter Wren (*Troglodytes hiemalis*), 407.
 Merula fumigata, 135.
 migratoria, 82, 83, 86, 107, 110, 113, 120, 199, 322, 360, 391, 394, 396, 397.
 migratoria propinqua, 49, 264, 297.
 Meyer, A. B., A Supposed New Species of Hummingbird in the Royal Zoölogical Museum of Dresden, 315.
 Micropalama himantopus, 321, 393.
 Micropus melanoleucus, 54, 255, 279, 297.
 Miller, G. S., Jr., Cape Cod Bird Notes, 226.
 Miller, J. H., The Great Gray Owl in Lewis County, New York, 206.
 Milvulus forficatus, 80.
 tyrannus, 271, 333.
 Mimus arenaceus, 135.
 gilvus, 192.
 modulator, 136.
 polyglottos, 30, 48, 115, 129, 192, 199, 200, 297, 343, 393.
 saturninus, 135.
 Minor ornithological publications, 79, 198.
 Mionectes oleagineus, 270.
 Miyothera cœrula, 356.
 Mniotilta varia, 16, 111, 127, 217, 313, 335.
 Mockingbird, 115, 129, 199, 200, 343, 393.
 Molothrus æneus, 192.
 ater, 80, 81, 114, 257, 329, 368, 390.
 ater obscurus, 257.
 bonariensis, 269.
 robustus, 192.
 Morris, R. O., The Evening Grosbeak (*Coccothraustes vespertina*) near Springfield, Mass., 289.
 Mortimer, D., Notes on Habits of a Few Birds of Orange County, Florida, 337.

- Munia fuscans*, 355.
Muscicapa obscura, 352.
 obsoleta, 384.
 occipitalis, 353.
 pyrrhopterum, 353.
Muscipeta incanescens, 384.
 paradisea, 353.
Muscivora regia, 270.
Myadestes obscurus, 200.
 townsendii, 98, 297, 408.
Myiarchus crinitus, 39, 85, 111, 113,
 288, 290, 334.
 ferox, 270.
 lawrencei olivascens, 49.
 nigriceps, 270.
 tyrannulus, 270.
Myiodynastes solitarius, 270.
Myiothera capistratoides, 350.
Myiozetetes cayennensis, 270.
 sulphureus, 270.
 texensis, 235, 333.
Myrmeciza pelzelni, 380.
Myrmochanes hypoleucus, 382.
Myrmotherula inornata, 380.

NASICA albisquama, 164, 171.
 beauperrhysii, 164, 171, 173.
 chunchotambo, 176.
 d'orbignyana, 164, 182.
 flavigaster, 179.
 guttatoides, 164.
 multiguttata, 164, 175.
 obsoletus, 189.
 susurrans, 171.
 triangularis, 164, 187.
Nectarinia phœnicotis, 354.
Nehrling, H., notice of his 'North
 American Birds,' 78.
Nesomimus macdonaldi, 273.
 melanotis, 273.
 personatus, 273.
Nighthawk, 38.
 Florida, 310.
 Western, 254.
Noddy, 303, 306.
Nonpareil, 81.
Nucifraga caryocatactes, 276.
 caryocatactes macrorhyn-
 chos, 276.
Numenius hudsonicus, 321, 374.
Nutcracker, Clarke's, 92, 256.
Nuthatch, Brown-headed, 80, 85,
 119, 130.
 Florida White-bellied, 118.
 Pygmy, 55, 83, 263.
 Red-bellied, 113, 114.
 Red-breasted, 263.
 Slender-billed, 252, 262.
 White-breasted, 80, 113, 130.
 White-naped, 64.
Nyctala acadica, 48, 54, 90, 231, 395.

Nyctea nyctea, 215, 394, 395.
Nycticorax nycticorax nævius, 51,
 308, 327.
 obscurus, 274.
 violaceus, 277, 308, 332, 376.

OCEANODROMA leucorhoa, 390.
Oethæca flaviventris, 384.
Oidemia americana, 318, 320.
 deglandi, 318, 394.
Olor columbianus, 230, 391.
Oreomyza wilsoni, 275.
Oreortyx pictus confinis, 61, 281.
Oriole, 114.
 Bullock's, 92.
 Orchard, 81, 311.
Oriolus xanthognotus, 351.
Ornithion cinerascens, 384.
 napæum, 270.
 obsoletum, 384.
Oroscoptes montanus, 297.
Orthotomus borneonensis, 350.
 cinerascens, 350.
 sepium, 350.
Osprey, 341.
 American, 310, 328.
Ostinops decumanus, 132, 269.
Otocoris alpestris, 139, 141-144,
 157, 158, 322.
 alpestris adusta, 139, 146,
 148-150, 157, 158, 256.
 alpestris arenicola, 139, 141,
 144-147, 149, 150, 154, 157,
 158, 256.
 alpestris chrysolæma, 139,
 147-150, 157, 158, 297.
 alpestris giraudi, 141, 145,
 146, 151, 157, 158.
 alpestris insularis, 152.
 alpestris leucolæma, 139,
 141-144, 152, 154, 156, 157,
 158.
 alpestris merrilli, 139, 143,
 146, 151-154, 157, 158.
 alpestris pallida, 139, 151,
 154, 155, 157, 158.
 alpestris praticola, 85, 86,
 139, 141, 144-147, 152, 157,
 158, 387.
 alpestris rubea, 141, 144, 148,
 150, 151, 157, 158.
 alpestris strigata, 139, 141,
 151-154, 157, 158.
 peregrina, 150.
Ovenbird, 21, 107, 108, 111, 128,
 314, 336.
Owl, Acadian, 113.
 American Barn, 90, 400.
 American Hawk, 91.
 American Long-eared, 86.
 Barn, 82, 205, 400.

- Owl, Barred, 101, 286, 328.
 Burrowing, 85, 213.
 California Mottled, 81.
 Great Gray, 206, 395.
 Great Horned, 81, 83, 84,
 286, 391.
 Hawk, 400.
 Pygmy, 54.
 Rocky Mountain Screech, 80.
 Saw-whet, 54, 90.
 Short-eared, 400.
 Snowy, 394, 395.
 Western Horned, 54.
- PACHYCEPHALA grisola, 351.
 Pachyrhamphus latirostris, 62.
 niger, 382.
 Pandion haliaëtus carolinensis, 48,
 81, 310, 326, 328, 341, 394.
 Parabuteo unicinctus harrisi, 333.
 Park, A. F., The American Barn
 Owl near Troy, New York, 400.
 Parker, W. K., death of, 411.
 Paroaria capitata, 382.
 gularis cervicalis, 382.
 Paroquet, Carolina, 388.
 Partridge, 35.
 Black, 397.
 Gambel's, 52.
 Massena 48, 52.
 San Pedro, 61.
 Scaled, 89.
 Parula, 101.
 Parus atricapillus, 107, 108, 113,
 114, 130, 394, 408.
 bicolor, 34, 35, 81, 85, 119,
 130.
 carolinensis, 34, 35, 119, 130.
 colletti, 275.
 cristatus, 275.
 gambeli, 49, 263.
 hudsonicus, 232, 291, 322, 407.
 inornatus griseus, 48, 55.
 mitratus, 275.
 wollweberi, 48.
 Passer domesticus, 83, 200, 212,
 342, 388, 392, 413.
 Passerculus guttatus, 215.
 Passerella iliaca, 242, 398.
 Passerina ciris, 81.
 cyanea, 113, 125, 243, 334.
 versicolor, 215.
 Pelecanus californicus, 281.
 fuscus, 222, 223, 307.
 Pelican, Brown, 222, 223, 307.
 Pennock, C. J., Note on the Nesting
 of *Buteo brachyurus* at St. Marks,
 Florida, 56.
 Pericrocotus igneus, 352.
 Perisoreus canadensis, 91, 322, 389,
 397.
 canadensis capitalis, 49, 256.
 Peristera mondetoura, 385.
 Petrel, Leach's, 390.
 Petrochelidon fulva, 264, 265, 311.
 lunifrons, 48, 396.
 pyrrhonota, 194.
 Peucea æstivalis bachmanii, 82, 242.
 arizonæ, 27.
 carpalis, 27.
 cassini, 215.
 ruficeps boucardi, 48.
 Pewee, Western Wood, 256.
 Wood, 39, 328.
 Phainopepla nitens, 296, 297.
 Phalacrocorax brasilianus, 274.
 dilophus, 55.
 dilophus albociliatus, 281.
 dilophus floridanus, 222, 223,
 307.
 perspicillatus, 276.
 vigua, 274.
 vigua mexicanus, 274.
 Phalænoptilus nuttalli, 254, 279,
 286.
 nuttalli nitidus, 286.
 Phalarope, Northern, 86.
 Red, 204.
 Phalaropus lobatus, 86, 230, 321.
 Pheasant, 36.
 Philentoma pyrrhopterum, 353.
 Philohela minor, 390-398.
 Phlogopsis notata, 382.
 Phæbe, 39.
 Phænicopterus ruber, 221.
 Phænicothraupis rhodinolæma,
 267.
 Phyllomyias berlepschi, 384.
 incanescens, 384.
 Phyllornis javensis, 349.
 sonneratii, 349.
 viridis, 349.
 Pica pica hudsonica, 80, 387.
 Picicorvus columbianus, 49, 92, 256.
 Picoides americanus, 322.
 americanus dorsalis, 48, 252.
 arcticus, 206.
 Picolaptes notatus, 164, 175, 176.
 obsoletus, 189.
 obtectus, 382.
 ocellatus, 170.
 spixi, 164, 177.
 Picus gairdnerii, 65.
 Pigeon, Band-tailed, 52.
 Wild, 284, 393-395.
 Pinicola enucleator, 211, 322, 394,
 395.
 Pintail, 51.

- Pipilo aberti*, 22, 24, 26-29, 297.
 albigula, 215.
 chlorosoma, 194.
 chlorurus, 49, 193, 259.
 complexus, 194.
 erythrophthalmus, 30, 81, 83, 114, 125, 199, 231, 242, 295, 387.
 erythrophthalmus alleni, 80, 305.
 fuscus albigula, 23.
 fuscus crissalis, 23.
 fuscus mesoleucus, 22-27, 214, 215.
 macronyx, 194.
 maculatus megalonyx, 48, 82.
 mesoleucus, 23, 215.
 rutilus, 194.
Pipit, American, 114.
Pipra auricapilla, 381.
Piranga æstiva, 191.
 cooperi, 191.
 erythromelas, 112, 125, 199, 311.
 hepatica, 49, 215, 260.
 ludoviciana, 49, 55, 260.
 rubra, 55, 82, 125, 191, 311, 335, 387.
 rubra cooperi, 191.
Pitangus derbianus, 333.
 lictor, 270.
 sulphuratus, 270.
Pithys albifrons, 381.
 peruvianus, 381.
Pitta baudi, 356.
 cærulea, 356.
 mülleri, 357.
 sordida, 357.
 venusta, 356.
Pitylus grossus, 267.
Platylophus coronatus, 352.
Platypsaris albiventris, 62.
Platyrhynchus bifasciatus, 384.
 insularis, 384.
Platysmus atterimus, 356.
Plautus impennis, 199, 201, 203.
Plectrophanes nivalis, 215.
Plectrophenax nivalis, 215, 322, 395.
Plegadis guarauna, 51.
Plover, Belted Piping, 309.
 Golden, 389, 397.
 Killdeer, 390.
 Piping, 328.
 Semipalmated, 309.
Podilymbus podiceps, 86, 375.
Pœcilonetta galapagensis, 273.
Poling, O. C., Notes on the Fringillidae of Western Illinois; 238; Notes on *Eugenes fulgens*, 402.
Polioptila cærulea, 48, 81, 119, 130, 229, 314, 324.
 cærulea obscura, 64.
 plumbea, 296, 297.
Polyborus cheriway, 333.
Poocætes gramineus, 111, 240.
 gramineus confinis, 49, 259.
Poor-will, 254.
 Dusky, 286.
 Frosted, 286.
Porphyrospiza cærulescens, 384.
 cyanella, 384.
Porzana carolina, 48, 51, 81, 321, 332, 388.
 jamaicensis, 400.
 noveboracensis, 389.
Procnias tersa, 381.
 viridis, 381.
 viridis occidentalis, 381.
Progne cryptoleuca, 66.
 subis, 49, 83, 125, 192, 260, 279.
 subis cryptoleuca, 66.
 subis hesperia, 63.
Protonotaria citrea, 16, 313, 335.
Psaltriparus minimus californicus, 82.
 plumbeus, 48.
Pteroptochos albifrons, 382.
 magellanicus, 382.
Publications received, 86, 201, 282, 398.
Puffinus cinereus, 387.
 cuneatus, 275.
 knudseni, 275.
Pyrotrogon diardi, 359.
 duvauceli, 359.
 kasumba, 359.
Pyrrhuloxia sinuata, 215.

 QUAIL, 339, 395, 396, 398.
 Quail-dove, Key West, 90.
 Ruddy, 62.
Quiscalus major, 341.
 quiscula, 208.
 quiscula æneus, 77, 83, 114, 208, 322, 368.
 quiscula aglæus, 341.

 RAGSDALE, G. H., *Melanerpes aurifrons* in Young Co., Texas, in 1878, 401.
Rail, Clapper, 327.
 Little Black, 400.
 Sora, 81.
 Yellow, 389.
Rallus crepitans, 64.
 crepitans saturatus, 65.
 longirostris crepitans, 64, 327.

- Rallus longirostris saturatus*, 65.
longirostris scottii, 65.
scottii, 65.
 Ralph, W. L., and Baggs, E., Additional Notes on the Birds of Oneida County, New York, 229.
 Raven, 124.
 American, 256.
 White-necked, 256.
 Razorbill, 327.
 Redbird, 125.
 Piny Woods, 125.
 Summer, 82.
 Redhead, 83.
 Redpoll, 114, 239.
 Red-shanks, 306.
 Redstart, 22, 111, 200, 404-406.
 American, 314.
 Painted, 261.
Regulus calendula, 49, 97, 119, 263, 292, 322.
 satrapa, 113, 232.
Rhamphocelus jacapa, 267.
Rhipidura perlata, 353.
Rhodinocichla rosea, 194.
 rosea schistacea, 194.
Rhynchocyclus rubicauda, 270.
 Rice-bird, 341.
 Ridgway, R., notice of his 'Ornithology of Illinois,' 74; *Buteo brachyurus* and *B. fuliginosus*, 90; Intergradation between *Zonotrichia leucophrys* and *Z. intermedia*, and between the latter and *Z. gambeli*, 96; Salvin and Godman's 'Biologia Centrali-Americana'—Aves, 189; Harlan's Hawk a Race of the Redtail, and not a Distinct Species, 205; notice of his 'Review of the Genus *Xiphocolaptes* of Lesson,' 271; notice of his 'Review of the Genus *Sclerurus* of Swainson,' 272; notice of his papers on birds from the Galapagos Islands, the Abrolhos, the Island of Santa Lucia, and from the Straits of Magellan, 273; *Junco hyemalis shufeldti* in Maryland, 289; A Yellow-crowned *Regulus calendula*, 292.
 Riker, C. B., A List of Birds observed at Santarem, Brazil, with Annotations by F. M. Chapman, 131, 265.
 Road-runner, 80.
 Roberts, T. S., Notes on some Minnesota Birds, 213.
 Robin, 82, 83, 86, 107, 110, 113, 120, 360, 391, 394, 396, 397.
 Western, 264.
 Rudolf, Crown Prince of Austria, notice of his 'Notes on Sport and Ornithology,' 196.
Rynchops nigra, 306, 327.
 SAGE, J. H., Black Guillemot in Connecticut, 283.
Salpinctes obsoletus, 49, 54, 262.
Saltator magnus, 267.
 Salvin, O., and Godman, F. D., notice of their 'Biologia Centrali-Americana,' 189.
 Sanderling, 294, 308.
 Sandpeter, 306.
 Sandpiper, Baird's, 89.
 Cinnamon Solitary, 377.
 Least, 308.
 Red-breasted, 294.
 Solitary, 377.
 Spotted, 52, 83, 308, 328.
 Sapsucker, Williamson's, 252.
 Yellow-bellied, 310.
 Saunders, H., notice of his 'Illustrated Manual of British Birds,' 195.
Saxicola oenanthe, 294.
Sayornis phœbe, 39.
 saya, 48, 228, 296, 297.
 Sclater, P. L., notice of his Catalogue of the Tracheophonæ, 379.
Scolecophagus carolinus, 322.
 cyanocephalus, 49, 257.
Scolopax rusticola, 393.
 Scoter, 318.
Scotiaptex cinerea, 206.
 Scott, W. E. D., A Summary of Observations on the Birds of the Gulf Coast of Florida, 14, 114; The Key West Quail-dove (*Geotrygon martinica*) at Key West, 90; An Account of Flamingoes (*Phenicopterus ruber*) observed in the Vicinity of Cape Sable, Florida, 221; Two Species of Swallow New to North America, 264; On Birds observed at the Dry Tortugas, Florida, during parts of March and April, 1890, 301; Description of a New Subspecies of Wild Turkey, 376; The Little Black Rail (*Porzana jamaicensis*) at Key West, Florida, 400.
Scytalopus bolivianus, 382.
Seiurus aurocapillus, 21, 34, 107, 108, 111, 128, 223, 314, 336.
 motacilla, 21, 34, 128, 230, 336.
 noveboracensis, 21, 223, 314, 336.

- Seiurus noveboracensis notabilis*, 314.
 Sennett, G. B., A New Wren from the Lower Rio Grande, Texas, with Notes on Berlandier's Wren of Northeastern Mexico, 57; The King Eider (*Somateria spectabilis*) at Erie, Pennsylvania, 88; notice of his 'Bird Legislation,' 282.
Setophaga picta, 50, 257, 261.
 ruticilla, 22, 111, 200, 314, 337, 375, 404-406.
 Shearwater, 327.
 Shick, C. S., Birds found Breeding on Seven Mile Beach, New Jersey, 326.
 Shoveller, 51.
 Shrike, Loggerhead, 342.
 Shufeldt, R. W., The American Hawk Owl near Washington, D. C., 91; Note upon *Coccothraustes vespertina* as a Cage-bird, 93; notice of his 'Osteological Studies of the Subfamily Ardeinæ,' 277; notice of his 'On the Position of *Chamaea* in the System,' 278; notice of his 'Studies of the Macrochires,' 278; of his paper on the osteology of the North American Passeres, 279.
Sialia arctica, 49, 264.
 mexicana, 264, 296, 297.
 mexicana anabelæ, 66, 281.
 sialis, 84, 85, 113, 120, 130, 199, 200, 396.
 sialis azurea, 191.
 sialis guatemalæ, 191.
Siphia beccariana, 353.
 Siskin, Pine, 239, 258.
Sitta canadensis, 49, 113, 114, 229, 232, 263.
 carolinensis, 80, 113, 118, 130, 322.
 carolinensis aculeata, 49, 252, 262.
 carolinensis atkinsi, 118.
 pusilla, 34, 80, 85, 119, 130.
 pygmæa, 49, 55, 83, 263.
 pygmæa leuconucha, 64, 281.
 Skimmer, Black, 306, 327.
 Snipe, 398.
 English, 389.
 Snowbird, Black, 82.
Somateria dresseri, 204, 315.
 mollissima, 316.
 spectabilis, 88, 284, 397.
 v-nigra, 316.
 Sora, 51.
 Sparrow, Acadian Sharp-tailed, 212.
 Bachman's, 242.
 Chipping, 124, 241, 329.
 Clay-colored, 242.
 English, 388.
 European, 388.
 European House, 413.
 Field, 96, 111, 124, 214, 242.
 Forbush's, 63.
 Fox, 242, 398.
 Grasshopper, 240, 311, 342.
 Harris's, 241.
 Henslow's, 213, 240, 241.
 House, 83, 212, 342.
 Intermediate, 259.
 Ipswich, 211.
 Lark, 241.
 Leconte's, 241.
 Lincoln's, 242.
 Nelson's, 56, 241.
 Savanna, 240, 311, 342.
 Scott's Seaside, 212.
 Seaside, 289.
 Sharp-tailed, 290.
 Song, 242, 329, 389, 409.
 Swamp, 96, 242, 409.
 Tree, 241, 409.
 Vesper, 240.
 Western Chipping, 259.
 Western Lark, 259.
 Western Vesper, 259.
 White-crowned, 96, 111, 241, 259.
 White-throated, 96, 110, 111, 112, 241, 295, 409.
 Yellow-winged, 241.
Spatula clypeata, 48, 51.
 Spelman, H. M., Wintering of the Red-winged Blackbird near Cambridge, Mass., 288.
Speotyto cunicularia hypogæa, 85, 87, 280, 297.
Spermestes fuscans, 355.
Sphyrapicus varius, 101, 109, 305, 310, 322, 394.
 varius nuchalis, 310.
 thyroideus, 48, 252.
Spinus pinus, 49, 231, 239, 257, 258.
 psaltria, 49, 258, 297.
 psaltria arizonæ, 258.
 tristis, 80, 82, 111, 124, 199, 229, 231, 239, 246.
 tristis pallidus, 244.
Spiza americana, 229, 243, 334.
Spizella atrigularis, 48.
 monticola, 241, 322, 409.
 pallida, 76, 242.
 pusilla, 96, 111, 124, 199, 214, 242.
 pusilla arenacea, 214.

- Spizella socialis*, 124, 191, 241, 329.
socialis arizonæ, 49, 191, 259.
Sporophila castaneiventris, 268.
lineata, 268.
minuta, 268.
Squawk, 327.
Stachyris nigricollis, 350.
Stejneger, L., notice of his papers on the European Titmice, 275; notice of his papers on Hawaiian birds, 275; notice of his 'Review of Japanese Birds,' 276.
Stejneger, L., and *Lucas, F. A.*, notice of their 'Contributions to the History of Pallas's Cormorant,' 276.
Stelgidopteryx serripennis, 48, 81, 125, 335.
Stephens, F., A New Vireo from California, 159; Notes on Birds Observed in the Colorado Desert in Winter, 296.
Stercorarius parasiticus, 320.
pomarinus, 320.
Sterna antillarum, 306, 327, 410.
dougalli, 327.
forsteri, 327.
fuliginosa, 306.
hirundo, 327.
maxima, 306, 374.
paradisæ, 94, 320.
Stilt, Black, 81.
Black-necked, 338.
Stone, W., The Delaware Valley Ornithological Club, 298.
Stoparola thalassinoides, 353.
Strix pratineola, 82, 90, 205, 400.
Sturnella hippocrepis, 192.
magna, 80, 82, 192, 199.
magna mexicana, 192, 334.
magna neglecta, 49, 76, 77, 84, 192, 199, 257.
Sublegatus virescens, 384.
Sula gossii, 273.
sula, 307.
Surnia ulula, 215.
ulula caparoch, 91, 322, 400.
Swallow, Bahaman, 265, 312.
Bank, 96.
Barn, 110, 312.
Chimney, 38, 392.
Cliff, 396.
Cuban Cliff, 264, 265, 311.
Rough-winged, 81, 125.
Sea, 327.
Tree, 312.
Violet-green, 54, 260.
Swan, Whistling, 391.
Sweep, Chimney, 38.
Swift, 111.
Chimney, 38, 84, 391.
White-throated, 54, 255.
Swinburne, J., The Nest and Eggs of *Regulus calendula*, 97.
Sycalis arvensis, 268.
columbiana, 268.
minor, 268.
Sylvania canadensis, 111, 337.
mitrata, 22, 129, 314, 407.
pusilla pileolata, 48, 337.
Sylvia roscoe, 11, 66.
Symphemia semipalmata, 328, 374, 388.
Synallaxis griseiventris, 382.
Syrnium nebulosum, 101, 231, 286, 328.
Syrhaptus paradoxus, 87.
TACHYCINETA albiventris, 266.
bicolor, 312, 322.
thalassina, 49, 54, 260, 279.
Tachyphonus cristatus, 267.
luctuosus, 267.
melaleucus, 267.
Tackzanowski, L., death of, 218.
Tænioptera nengeta, 269.
Talbot, D. H., Harlan's Hawk, 285.
Tanager, Hepatic, 260.
Louisiana, 55, 260.
Scarlet, 112, 125, 311.
Summer, 55, 125, 311.
Tanagra episcopus, 132, 267.
episcopus leucoptera, 267.
palmarum, 132, 267.
palmarum melanoptera, 267.
Tchitrea affinis, 353.
Teal, Blue-winged, 51, 332.
Cinnamon, 51.
European, 294.
Tephrodornis grisola, 351.
hirundinaceus, 352.
Terpsiphone affinis, 353, 354.
Tern, Arctic, 84.
Common, 327.
Forster's, 327.
Gull-billed, 327.
Least, 306, 327, 410.
Roseate, 327.
Royal, 306.
Sooty, 306.
Tetrao tetrix, 390, 397.
urogallus, 397.
Thamnophilus affinis, 384.
doliatus mexicanus, 384.
puncticeps, 380.
Thompson, E. E., Evening and Pine Grosbeaks in Ontario, 211.
Thrasher, 110, 130.

- Thrasher, Brown, 115, 130, 369.
 Thrush, Audubon's, 292.
 Audubon's Hermit, 263.
 Brown, 107.
 Dwarf Hermit, 263.
 Gray-cheeked, 119.
 Hermit, 108, 110, 113, 120, 295.
 Olive-backed, 119, 292.
 Swainson's, 110, 113.
 Willow, 292.
 Wilson's, 119.
 Wood, 119, 130.
 Thryophilus albipectus, 266.
 galbraithi, 266.
 leucotis, 265, 266.
 superciliaris, 265.
 tænioptera, 266.
 Thryothorus bewickii, 130, 291.
 bewickii bairdi, 48.
 coraya, 385.
 genibarbis, 384.
 herberti, 266.
 longipes, 384.
 ludovicianus, 34, 59, 60, 116, 130, 291, 312.
 ludovicianus berlandieri, 57-60, 116.
 ludovicianus lomitisensis, 58-60, 63.
 ludovicianus miamensis, 59, 115, 223, 305, 312.
 macrurus, 384.
 mysticalis, 384.
 Thurber, E. C., *Callipepla squamata* in Northeastern New Mexico, 89.
 Timalia nigricollis, 350.
 Tit, Least, 82.
 Titmouse, Plain, 55.
 Tufted, 81, 85, 119, 130.
 Tityra nigriceps, 381.
 personata, 381.
 Todirostrum cinereum, 233, 269.
 maculatum, 269.
 Todus macrorhynchus, 357.
 Toppan, G. L., *Myadestes townsendii* in Nebraska, 408.
 Totanus flavipes, 321, 374.
 melanoleucus, 321.
 solitarius, 133, 377-379.
 solitarius cinnamomeus, 377-379.
 Towhee, 114, 125, 242, 295.
 Abert's, 27-29.
 Cañon, 22-27.
 Green-tailed, 259.
 St. Lucas, 23.
 Spurred, 82.
 White-eyed, 80.
 Treat, W. E., Mortality among Bank Swallows, 96.
 Trichophorus caniceps, 349.
 Tringa alpina pacifica, 321.
 bairdii, 89, 230.
 canutus, 294.
 maculata, 332.
 minutilla, 230, 308.
 Trochilus alexandri, 255.
 calliope, 279.
 colubris, 38, 84, 85, 114, 206, 286, 310, 333, 391, 393.
 heloisa, 215.
 platycercus, 48, 54, 255, 279.
 rufus, 48.
 Troglodytes aëdon, 83, 84, 117, 232, 291.
 aëdon aztecus, 49, 262, 297.
 fumigatus, 276.
 fumigatus kurilensis, 276.
 hiemalis, 82, 113, 232, 291, 407.
 Trogon collaris, 382.
 diardi, 359.
 duvauceli, 359.
 kasumba, 359.
 mexicanus, 278, 279.
 puella, 278.
 Tryngites subruficollis, 332.
 Turdinus atrigularis, 350.
 Turdus aliciae, 119, 322.
 aonalschckæ, 263.
 aonalschckæ auduboni, 49, 191, 263, 292.
 aonalschckæ pallasii, 108, 110, 113, 120, 191, 199, 295.
 ferrugineus, 135.
 fuscescens, 110, 119, 199, 337.
 fuscescens salicicolus, 292.
 interpres, 348.
 mustelinus, 30, 77, 119, 130, 199, 392.
 saturninus, 135.
 sequoiensis, 66.
 sordidus, 357.
 ustulatus, 191.
 ustulatus swainsoni, 110, 113, 119, 191, 292, 337.
 Turkey, Florida Wild, 376.
 Mexican, 52.
 Wild, 36, 390, 391, 393, 394, 396, 397.
 Turnstone, 309.
 Tyrannulus elatus, 270.
 reguloides, 270.
 Tyrannus albogularis, 271.
 dominicensis, 311, 373, 375.
 melancholicus, 270.
 niveigularis, 271.

- Tyrannus tyrannus*, 38, 111, 311, 328,
 340, 368.
verticalis, 255, 279.
vociferans, 255.
- ULULA cinerea*, 206, 395.
Upucerthia propinqua, 274.
Uranomitra ellioti, 275.
quadricolor, 275.
Urinator arcticus, 320.
imber, 85, 199, 320, 389, 393,
 397.
lumine, 88, 230, 320.
Urubitinga anthracina, 48.
- VEERY, 110.
- Vireo altiloquus barbatulus*, 14, 312.
atricapillus, 215.
bellii, 80, 85, 215.
bellii pusillus, 215.
chivi agilis, 266.
flavifrons, 15, 126, 217, 312,
 335.
flavoviridis, 329, 335.
gilvus, 15, 217.
gilvus swainsoni, 49, 260.
noveboracensis, 15, 17, 127,
 217, 312.
noveboracensis maynardi, 15,
 17, 305, 312.
olivaceus, 15, 107, 108, 110,
 125, 217, 312, 329, 335.
philadelphicus, 335, 403.
solitairus, 15, 110, 111, 200,
 231.
solitarius alticola, 126.
solitarius cassini, 191.
solitarius plumbeus, 49, 191,
 260.
vicinior, 215.
vicinior californicus, 159.
- Vireo*, Bell's, 80, 85.
Black-whiskered, 14, 312.
Blue-headed, 15, 110.
California Gray, 159.
Key West, 15.
Mountain Solitary, 126.
Philadelphia, 403.
Plumbeous, 260.
Red-eyed, 15, 107, 108, 110,
 125, 312, 329.
Solitary, 111.
Warbling, 15.
Western Warbling, 260.
White-eyed, 15, 17, 127, 312.
Yellow-green, 329.
Yellow-throated, 15, 126, 312.
- Volvocivora schierbrandii*, 352.
- Vulture*, Black, 36.
 Turkey, 36, 53, 204.
- WALKER, M. L., notice of her pa-
 per, 'On the Form of the Quad-
 rate Bone in Birds,' 198.
- Wamp, 318.
- Warbler, Audubon's, 261.
Bachman's, 16, 313.
Black-and-white, 16, 127, 313.
Black-and-yellow, 111.
Blackburinan, 20, 127, 336.
Blackpoll, 19, 112, 313.
Black-throated Blue, 18, 313,
 406.
Black-throated Green, 20,
 111, 128, 314.
Blue-winged, 17, 313.
Blue-winged Yellow, 214.
Canadian, 111.
Cape May, 18, 313.
Cerulean, 19, 291, 313.
Chestnut-sided, 111, 127, 404-
 407.
Connecticut, 21.
Golden-winged, 17, 127, 404.
Grace's, 261.
Hooded, 22, 129, 314, 407.
Kentucky, 21, 81, 129, 314.
Macgillivray's, 336.
Magnolia, 19.
Mourning, 295.
Myrtle, 19, 313.
Nashville, 408.
Olive, 261.
Orange-crowned, 18, 96, 290.
Palm, 20, 314.
Parula, 18, 127, 313.
Pine, 20, 128, 323, 324.
Prairie, 21, 128, 314, 325.
Prothonotary, 16, 313.
Red-faced, 261.
Swainson's, 16, 84, 90, 313,
 403.
Sycamore, 20, 127, 313.
Tennessee, 18.
Worm-eating, 16, 127, 313.
Yellow, 18, 127.
Yellow Palm, 20, 314.
Yellow-rumped, 96, 342.
Yellow-throated, 20, 97, 305,
 313, 323.
- Waterhouse, F. H., notice of his
 'Index Generum Avium,' 71.
- Water-thrush, 21, 314.
Grinnell's, 314.
Louisiana, 21, 128.
- Waxwing, Cedar, 86, 125.
- Wayne, A. T., An Early Date of a
 Rare Bird in South Carolina, 88;
 A Curious Specimen of the Yel-
 low-throated Warbler (*Dendroica*
dominica), 97; Spotted Eggs of

- Swainson's Warbler, 403; Two Notes from South Carolina, 410.
- Wheatear, 294.
- Whippoorwill, 38, 83, 114.
Dutch, 38.
- White, G. R., Capture of a Specimen of *Somateria dresseri* in the Vicinity of Ottawa, Canada, 204; The Dowitcher at Ottawa, 400.
- Whitfield, R. P., Former Abundance of the Wild Pigeon in Central and Eastern New York, 284.
- Widgeon, 88, 204, 283.
European, 397.
- Willet, 328, 388.
- Williams, R. S., *Myadestes townsendii* Wintering in Montana, 98; The Breeding Ranges and Songs of Three Thrushes in Montana, 292.
- Wintle, E. D., The Evening Grosbeak at Montreal, 209; *Helminthophila celata* at Montreal, 290.
- Woodcock, 39c-398.
- Woodpecker, Alpine Three-toed, 252.
Arctic Three-toed, 206.
Baird's, 251.
Batchelder's 62, 252.
Cabanis's, 252.
Californian, 48.
Downy, 37, 109.
Golden-winged, 391.
Hairy, 109, 395.
Lewis's, 254.
Pigeon, 107.
Pileated, 37, 81, 109, 339, 389, 400.
Red-bellied, 38, 206, 339, 402.
Red-headed, 38, 83, 84, 85.
Southern Hairy, 37.
Yellow-bellied, 101, 109.
Yellow-faced, 401.
- Woodruff, L. B., Baird's Sandpiper at New Haven, Connecticut, 89.
- Worthington, W. W., The Ipswich Sparrow in Georgia, 211; The King Eider (*Somateria spectabilis*) at Brunswick, Ga., 284.
- Wren, Berlandier's, 57.
- Wren, Bewick's, 130, 291.
Carolina, 130, 312.
Florida, 115.
House, 84, 117.
Lomita, 58, 64.
Long-billed Marsh, 117, 408.
Marian's Marsh, 117.
Rock, 54, 262.
Short-billed Marsh, 56, 117, 291.
Western House, 262.
Winter, 82, 113, 407.
- XANTHOCEPHALUS xanthocephalus, 49, 257.
- Xanthosomus icterocephalus, 269.
- Xanthoura luxuosa, 192.
luxuosa guatemalensis, 192.
- Xema sabinii, 227.
- Xiphocolaptes cinnamomeus, 272.
emigrans costaricensis, 272.
ignotus, 272.
major castaneus, 272.
sclateri, 272.
virgatus, 272.
- Xiphorhynchus dorsoimmaculatus, 274.
falcularius 274.
flavigaster, 164, 178.
procurvus, 274.
rufodorsalis, 274.
venezuelis, 274.
- YELLOWBIRD, Summer, 81, 82.
- Yellowhammer, 38.
- Yellowthroat, Florida, 11, 63.
Maryland, 9, 21, 96, 129, 314, 408.
- ZENAIDA zenaida, 375.
- Zenaidura macroura, 36, 53, 77, 82, 83, 230, 297, 333.
- Zonotrichia albicollis, 96, 110, 111, 112, 241, 295, 322, 409.
gambeli, 65, 96.
intermedia, 65, 96.
leucophrys, 27, 49, 96, 111, 241, 259, 322.
leucophrys gambeli, 65, 96.
leucophrys intermedia, 27, 65, 96, 259, 296, 297.
querula, 82, 241.
vulcani, 193.

ERRATA.

Page 211, foot-note, at end of last line, add—Ed.

" 214, lines 7 and 8 from bottom, for "THOS. L. ROBERTS," read THOS. S. ROBERTS.

" 233, line 3, for "CHERIE," read CHERRIE.

" 290, line 7 from bottom, dele "as."

Old
Series,
Vol. XV

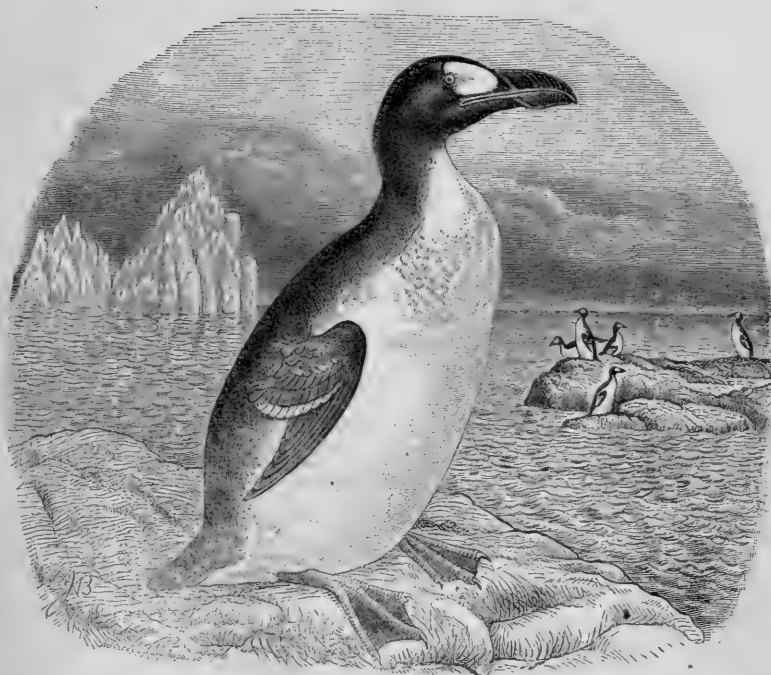
CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. VII

The Auk

A Quarterly Journal of Ornithology

Vol. VII — JANUARY, 1890 — No. 1



PUBLISHED FOR
The American Ornithologists'

NEW YORK

L. S. FOSTER



CONTENTS.

	PAGE
TO WHAT EXTENT IS IT PROFITABLE TO RECOGNIZE GEOGRAPHICAL FORMS AMONG NORTH AMERICAN BIRDS? By <i>J. A. Allen</i>	1
ON THE EASTERN FORMS OF <i>Geothlypis trichas</i> . By <i>Frank M. Chapman</i>	9
A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA. By <i>W. E. D. Scott</i>	14
NOTES ON <i>Pipilo fuscus mesoleucus</i> AND <i>Pipilo aberti</i> , THEIR HABITS, NESTS AND EGGS. By <i>Capt. Charles E. Bendire</i>	22
OBSERVATIONS ON SOME OF THE SUMMER BIRDS OF THE MOUNTAIN PORTIONS OF PICKENS COUNTY, SOUTH CAROLINA. By <i>Leverett M. Loomis</i>	30
ON THE WINTER DISTRIBUTION OF THE BOBOLINK (<i>Dolichonyx oryzivorus</i>), WITH REMARKS ON ITS ROUTES OF MIGRATION. By <i>Frank M. Chapman</i>	39
OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA. By <i>Dr. Edgar A. Mearns</i>	45
ADDENDUM TO 'A LIST OF THE BIRDS OF THE HUDSON HIGHLANDS, WITH ANNOTATIONS. By <i>Dr. Edgar A. Mearns</i>	55
NOTE ON THE NESTING OF <i>Buteo brachyurus</i> AT ST. MARKS, FLORIDA. By <i>C. J. Pennock</i>	56
A NEW WREN FROM THE LOWER RIO GRANDE, TEXAS, WITH NOTES ON BERLANDIER'S WREN OF NORTHEASTERN MEXICO. By <i>George B. Sennett</i>	57
SECOND SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS	60
SEVENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION	66

RECENT LITERATURE.—Waterhouse's 'Index Generum Avium,' 71; Blanchard on the Nomenclature of Organized Beings, 73; Ridgway's Ornithology of Illinois, 74; Menzbier's Ornithology of Turkestan, 77; Nehrling's Bird Biographies, 78; Minor Ornithological Publications, 79; Publications Received, 86.

GENERAL NOTES.—An Early Date of a Rare Bird in South Carolina, 88; The Mottled Duck in Kansas, 88; Capture of the Widgeon (*Anas penelope*) on the James River, Virginia, 88; The King Eider (*Somateria spectabilis*) at Erie, Pennsylvania, 88; The Little Brown Crane (*Grus canadensis*) in Rhode Island, 89; Baird's Sandpiper at New Haven, Connecticut, 89; *Callipepla squamata* in Northeastern New Mexico, 89; The Key West Quail-Dove (*Geotrygon martinica*) at Key West, 90; *Buteo brachyurus* and *B. fuliginosus*, 90; New York City Owls, 90; *Megascops asio maxwellia*, 91; The American Hawk Owl near Washington, D. C., 91; Note on *Cyanocitta stelleri litoralis* Maynard, 91; Capture of a Canada Jay (*Perisoreus canadensis*) near Cambridge, Massachusetts, 91; A Second Nest and Eggs of *Picicorvus columbianus* taken in Colorado, 92; Bullock's Oriole in Maine, 92; Notes upon *Coccothraustes vespertina* as a Cagebird, 93; Intergradation between *Zonotrichia leucophrys* and *Z. intermedia*, and between the latter and *Z. gambeli*, 96; Mortality among Bank Swallows, 96; Capture of a Specimen of the Orange-crowned Warbler (*Helminthophila celata*) in the vicinity of Washington, D. C., 96; A Curious Specimen of the Yellow-throated Warbler (*Dendroica dominica*, 97; The Nest and Eggs of *Regulus calendula*, 97; *Myadestes townsendii* Wintering in Montana, 98.

NOTES AND NEWS.—Obituary, John G. Bell, 98; Specimens Exhibited at the A. O. U. Congress, 99; Photographs of Birds, 99; Dr. E. A. Mearns's Collections, 100; Ornithologists at the American Museum, 100; The Late Mr. Snowdon Howland's Collection of Eggs, 100; Davie's 'Nests and Eggs of North American Birds,' 100.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is conducted as a Magazine of General Ornithology. In general character it differs little from the late 'BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB,' of which it forms virtually a Second Series.

'THE AUK' is edited by Mr. J. A. ALLEN, with the assistance of Mr. C. F. BATCHELDER.

TERMS:—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Members, and to Active and Associate Members of the A.O.U. not in arrears for dues.

Subscriptions and Advertisements should be addressed to the publisher, L. S. FOSTER, 35 PINE STREET, NEW YORK, N. Y. Foreign Subscribers may obtain 'THE AUK' through GURNEY AND JACKSON, 1 PATERNOSTER ROW, LONDON.

All articles and communications intended for publication, and all books and publications for notice, should be sent to J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

Old
Series,
Vol XV. }

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

{ New
Series,
Vol. VII

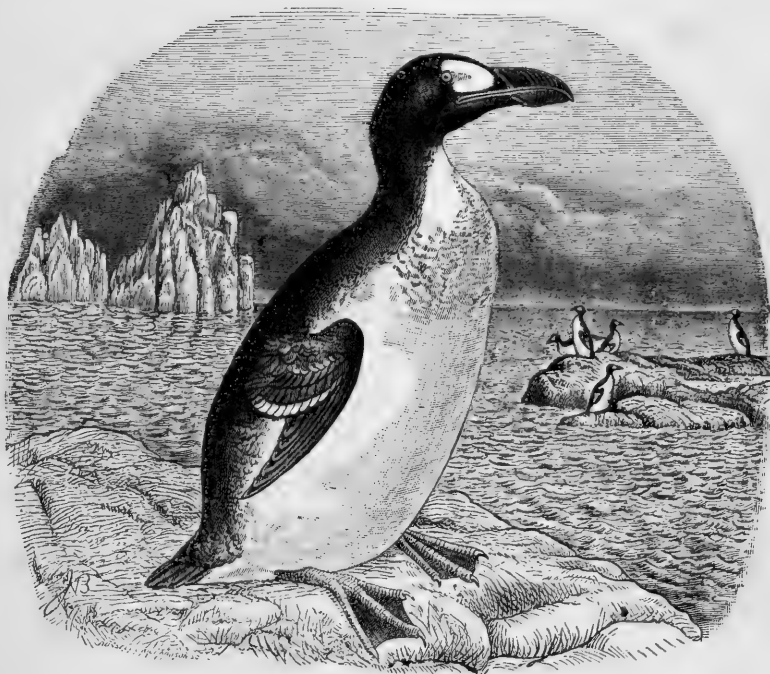
The Auk

A Quarterly Journal of Ornithology

Vol. VII

— JULY, 1890 —

No. 3



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER



CONTENTS.

	PAGE
AN ACCOUNT OF FLAMINGOES (<i>Phenicopterus ruber</i>) OBSERVED IN THE VICINITY OF CAPE SABLE, FLORIDA. By <i>W. E. D. Scott</i> .	221
CAPE COD BIRD NOTES. By <i>G. S. Miller, Jr.</i>	226
ADDITIONAL NOTES ON THE BIRDS OF ONEIDA COUNTY, NEW YORK. By <i>William L. Ralph and Egbert Bagg</i> .	229
NOTES ON THE NESTING HABITS OF SEVERAL BIRDS AT SAN JOSÉ, COSTA RICA. By <i>George K. Cherie</i> .	233
NOTES ON THE FRINGILLIDÆ OF WESTERN ILLINOIS. By <i>Otho C. Poling</i> .	238
DESCRIPTIONS OF A NEW SPECIES AND THREE NEW SUBSPECIES OF BIRDS FROM ARIZONA. By <i>Dr. Edgar A. Mearns, U. S. A.</i>	243
OBSERVATIONS ON THE AVIFAUNA OF PORTIONS OF ARIZONA. By <i>Dr. Edgar A. Mearns, U. S. A.</i>	251
TWO SPECIES OF SWALLOW NEW TO NORTH AMERICA. By <i>W. E. D. Scott</i> .	264
A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL. By <i>Clarence B. Riker</i> . With Annotations by <i>Frank M. Chapman</i> .	265

RECENT LITERATURE.—Ridgway on the Genus *Xiphocolaptes*, 271; Ridgway on the Genus *Sclerurus*, 272; Ridgway on Birds from the Galapagos Islands, the Abrolhos, the Island of Santa Lucia, and from the Straits of Magellan, 273; Chapman on the Genus *Xiphorhynchus*, 274; Berlepsch on some Neotropical Birds in the U. S. National Museum, 275; Stejneger on European Titmice, 275; Stejneger on Hawaiian Birds, 275; Stejneger's 'Review of Japanese Birds,' 276; Lucas on the Osteology of the Thrushes and Wrens, 277; Shufeldt on the Osteology of the Ardeinæ, 277; Shufeldt on the Relationships of the Genus *Chamaea*, 278; Shufeldt's Studies of the Macrochires, 278; Shufeldt on the Osteology of the North American Passeres, 279; Maynard's 'Eggs of North American Birds,' 280; Bryant's 'Catalogue of the Birds of Lower California,' 281; Anthony on New Birds from Lower California, 281; Sennett on Bird Legislation, 282; Publications Received, 282.

GENERAL NOTES.—Black Guillemot in Connecticut, 283; The Widgeon (*Anas penelope*) near Baltimore, Md., 283; The King Eider (*Somateria spectabilis*) at Brunswick, Ga., 284; The Snow Goose (*Chen hyperborea nivalis*) on the coast of Maine, 284; Former abundance of the Wild Pigeon in Central and Eastern New York, 284; Harlan's Hawk, 285; Habits of the Barred Owl, 286; *Phalanoptilus nuttalli nitidus* Breeding in Kansas. Is it a Valid Race or a Color Phase of *P. nuttalli*?, 286; Food and Habits of the Ruby-throated Hummingbird, 286; Snake Skins in the Nests of *Myiarchus crinitus*, 288; Wintering of the Red-winged Blackbird near Cambridge, Mass., 288; *Coccothraustes vespertina* in Taunton, Massachusetts, 289; The Evening Grosbeak (*Coccothraustes vespertina*) near Springfield, Mass., 289; *Junco hyemalis skufeldti* in Maryland, 289; Seaside Sparrows at Monomoy Island, Cape Cod, 289; Young Cedarbirds and Great Crested Flycatchers in Captivity, 290; Song of the Female Butcher Bird, 290; *Helminthophila celata* at Montreal, 290; The Song of *Helminthophila leucobronchialis*, 291; *Dendroica cerulea* again in the District of Columbia, 291; *Cistothorus stellaris* at Washington, D. C., 291; Capture of the Hudsonian Chickadee in Worcester County, Mass., 291; A Yellow-crowned *Regulus calendula*, 292; The Breeding Ranges and Songs of Three Thrushes in Montana, 292; Additional Notes on the Probable Breeding of *Saxicola ananthe* near Godbout, Province of Quebec, Canada, 294; Notes on Several Species of Water Birds at Muskeget Island, Massachusetts, 294; Notes on Several Birds in the Catskill Mountains, 295; Notes on Birds Observed in the Colorado Desert in Winter, 296.

CORRESPONDENCE.—The Delaware Valley Ornithological Club, 298.

NOTES AND NEWS.—Obituary, John Henry Gurney, 299; Zoe, a Biological Journal, 300; A New Book by Capt. Bendire, 300.

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TERMS:—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Members, and to Active and Associate Members of the A.O.U. not in arrears for dues.

Subscriptions and Advertisements should be addressed to the publisher, L. S. FOSTER, 35 PINE STREET, NEW YORK, N. Y. Foreign Subscribers may obtain 'THE AUK' through GURNEY AND JACKSON, 1 PATERNOSTER ROW, LONDON.

All articles and communications intended for publication, and all books and publications for notice, should be sent to J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

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CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

{ New
Series,
Vol. VII

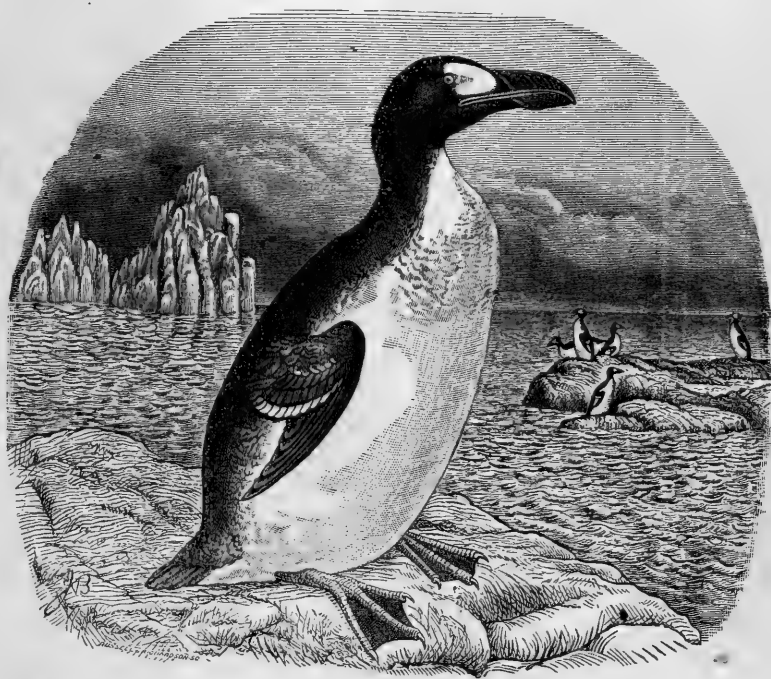
The Auk

A Quarterly Journal of Ornithology

Vol. VII

— OCTOBER, 1890 —

No. 4



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER



CONTENTS.

	PAGE
ON BIRDS OBSERVED AT THE DRY TORTUGAS, FLORIDA, DURING PARTS OF MARCH AND APRIL, 1890. By <i>W. E. D. Scott</i>	301
A SUPPOSED NEW SPECIES OF HUMMINGBIRD IN THE ROYAL ZOOLOGICAL MUSEUM OF DRESDEN. By <i>A. B. Meyer</i>	315
SOMATERIA DRESSERI, THE AMERICAN EIDER. By <i>George H. Mackay</i>	315
ON A COLLECTION OF BIRDS FROM FORT CHURCHILL, HUDSON'S BAY. By <i>W. Eagle Clarke</i>	319
THE NESTING OF THE YELLOW-THROATED WARBLER AT RALEIGH, N. C. By <i>C. S. Brimley</i>	323
BIRDS FOUND BREEDING ON SEVEN MILE BEACH, NEW JERSEY. By <i>Charles S. Shick</i>	325
NOTES ON HABITS AND NESTING OF <i>Vireo flavoviridis</i> (CASS.). By <i>George K. Cherrie</i>	329
NORTH AMERICAN BIRDS FOUND AT SAN JOSÉ, COSTA RICA, WITH NOTES ON THEIR MIGRATION. By <i>George K. Cherrie</i>	331
NOTES ON HABITS OF A FEW BIRDS OF ORANGE COUNTY, FLORIDA. By <i>D. Mortimer</i>	337
DESCRIPTION OF A NEW SPECIES OF <i>Icterus</i> FROM ANDROS ISLAND, BAHAMAS By <i>J. A. Allen</i>	343
A LIST OF BIRDS FROM NORTHEAST BORNEO, WITH FIELD NOTES BY MR. C. F. ADAMS. By <i>D. G. Elliot</i>	346
SUMMER ROBIN ROOSTS. By <i>William Brewster</i>	360
ON A COLLECTION OF BIRDS MADE DURING THE WINTER OF 1889-90, BY CYRUS S. WINCH, IN THE ISLANDS OF ST. THOMAS, TORTOLA, ANEGADA, AND VIRGIN GORDA, WEST INDIES. By <i>Charles B. Cory</i>	373
DESCRIPTION OF A NEW SUBSPECIES OF WILD TURKEY. By <i>W. E. D. Scott</i>	376
A NEW SUBSPECIES OF THE SOLITARY SANDPIPER. By <i>William Brewster</i>	377

RECENT LITERATURE.—Sclater's Catalogue of the Tracheophonæ, 379; Allen on Birds from Quito, 380; Allen on Birds collected in Bolivia, 381; Allen on the Genus *Cyclorhis*, 382; Allen's Descriptions of New South American Birds, 384; Allen on Individual and Seasonal Variation in the Genus *Elainca*, 385; Allen on the Maximilian Types of South American Birds, 386; Dionne's Catalogue of the Birds of Quebec, 387; Proceedings of the Linnean Society, 387; Minor Ornithological Publications, 388; Publications Received, 398.

GENERAL NOTES.—The Little Black Rail (*Porzana jamaicensis*) at Key West, Florida, 400; The Dowitcher at Ottawa, 400; The American Barn Ow near Troy, New York, 400; *Strix pratensis* in Western New York, 400; A Correction, 400; Breeding of the Pileated Woodpecker in Worcester County, Massachusetts, 400; *Melanerpes aurifrons* in Young Co., Texas, in 1878, 401; Notes on *Engenes fulgens*, 402; The Philadelphia Vireo in Vermont, 403; Spotted Eggs of Swainson's Warbler, 403; *Helminthophila chrysoptera* in Manitoba, 404; Was he a Philanthropist? 404; Capture of a Second Specimen of the Hooded Warbler in Massachusetts, 407; Interesting Nesting Site of a Winter Wren (*Troglodytes hiemalis*), 407; The Hudsonian Chickadee (*Parus hudsonicus*) in Vermont and Massachusetts, 407; *Myndestes townsendii* in Nebraska, 408; The Long-billed Marsh Wren, Maryland Yellowthroat, Nashville Warbler, and Great Blue Heron in Eastern Massachusetts in Winter, 408; Two Notes from South Carolina, 410.

CORRESPONDENCE.—A Query in regard to the Least Tern, 410.

NOTES AND NEWS.—Obituary, William Kitchen Parker, 411; Eighth Congress of the A. O. U., 412; Second International Ornithological Congress, 412; Sparrow Legislation, 413; New Books, 414; Work of the Division of Economic Ornithology and Mammalogy, 414; Mr. Jonathan Dwight, Jr., 414.

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